Instructions for

RCA Victor R-22

115 Volt AC/DC Universal Receiver

INTRODUCTION

This five-tube Superheterodyne receiver is a compact, readily portable instrument which may be operated from any 100 to 125 volt power supply circuit, either A. C. (alternating current—any frequency from 25 to 133 cycles per second) or D. C. (direct current).

The tuning range of this receiver is extended beyond the limits of the regular broadcast band, permitting reception of unusual and oftentimes interesting forms of intelligence (such as police calls) in addition to conventional broadcast entertainment. The actual range is from 540 to 1712 kilocycles (continuous); an additional range from 2400 to 2500 kilocycles is provided by turning a small knob which operates a frequency band switch.

INSTALLATION

Preliminary—After unpacking the instrument, remove the interior packing material used to protect the Radiotrons in the sockets during shipment. Refer to the tube location diagram on the bottom of the cabinet and make certain that all tubes are rigidly in position and that the three grid clips are firmly connected to the dome terminals of the proper Radiotrons. The RCA-78 and RCA-6A7 grid leads must be suspended over the notched supports as indicated in the diagram, in order to obtain proper operation.

Location—The receiver should be located so that its power cord is within reach of an electrical outlet or lamp socket of the proper rating. Because of its light weight and small size, the instrument may be mounted upon a convenient shelf or upon an article of furniture (such as a piano or end-table) if desired.

In any installation, care should be taken to avoid restriction of natural ventilation through the cabinet as would occur with the set resting upon a soft cloth pad or with the back of the set fitted into a small compartment or placed too close to a wall or other plane surface. To prevent damage to the cabinet finish and possibly more serious internal injury, the instrument should not be placed upon or close to a radiator or other heating device. It must be mounted only in an upright position as intended to insure proper ventilation and maximum tube life.

Antenna and Ground—For use as a portable receiver, the attached antenna (flexible black lead approximately 20 feet in length) will normally provide good reception of local and semi-distant stations. The antenna wire should be uncoiled to full length and suspended as high as possible. When the receiver is used in a building of metallic construction an outdoor antenna is essential. In such cases, sufficient pickup may often be obtained by dropping the attached antenna lead out of a nearby window. For any permanent installation, a regulation outdoor antenna from 25 to 75 feet in length is recommended.

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 by means of an approved ground clamp. The ground connection to the receiver is made by splicing the required length of flexible insulated copper wire to the short black lead extending from the receiver chassis.

Power Supply—Before connecting the power cord to the electrical outlet, make certain (1) that the supply voltage does not exceed 125 volts and (2) that the A. C.-D. C. line switch at the rear of the chassis is correctly set as indicated in the tube location diagram on the bottom of the cabinet—to the right (facing rear of set) for A. C. and to the left for D. C. supply.

OPERATION

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

- (1) Volume Control (Combined with Power Switch) (Left-hand Knob)—In the extreme counter-clockwise position the power is "off." Rotating the knob slightly clockwise turns on the power—further rotation increases the volume.
- (2) Station Selector (Right-hand Knob—Symmetrical with Volume Control)—This control is provided with an escutcheon upon which is embossed an arbitrary (0-100) graduated scale. Stations of low frequency (540 kilocycles and upward) will be received toward the "100" end of the scale. Police calls from stations transmitting at 1712 kilocycles will be received near the "0" end of the scale.
- (3) Frequency Range Switch (Small Knob Below and to Right of Station Selector)—With this knob in the counter-clockwise position, stations operating in the range from 540 to 1712 kilocycles will be received. Reception of police calls from stations in the 2400-2500 kilocycle band will be obtained with this knob in the clockwise position.

To operate the receiver, proceed as follows:

- 1. Set the Frequency Range Switch for the desired frequency band—see preceding paragraph (3).
- 2. Turn on the power and set the Volume Control fully clockwise for maximum volume—reduce the setting if too noisy.
- 3. Allow a minute or two for the tubes to heat, then turn the Station Selector slowly over the range of the dial until a desirable station program (or police call) is heard. If no sounds (station signals or static) are heard on D. C. supply, reverse the prongs of the power plug in the receptacle.

NOTE—Police calls in the 2400–2500 kilocycle band will be heard at dial settings between "25" and "50," approximately (each station in this band will be heard at two separate points within this portion of the dial range—the setting which provides the clearer reception should be used). The remainder of the dial range is ineffective with the Frequency Range Switch set for reception of this band. Strong local 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 2400–2500 kilocycles.

- 4. For best reproduction reduce the Volume Control setting and adjust the Station Selector accurately for loudest volume. Always use the Volume Control—never the Station Selector—for regulation of volume.
- 5. When through operating, turn the Volume Control knob fully counter-clockwise until the "off" click of the power switch is heard.

SERVICE DATA

ELECTRICAL SPECIFICATIONS

Voltage Rating	
Frequency Rating (A. C.	.)25-133 Cycles
Power Consumption:	A. C. 60 Cycles, 115 Volts-60 Watts
Power Consumption:	D. C. 115 Volts-40 Watts
Number and Types of R	adiotrons
	C.)1.5 Watts
	C.)
Frequency Range	540–1710 K. C. and 2400–2500 K. C.

This receiver is a five tube Super-Heterodyne designed to operate on A. C. or D. C. over a wide voltage and frequency range. Features such as compact construction, dynamic speaker, single Pentode Output tube and the inherent sensitivity, selectivity and tone quality of the Super-Heterodyne are included in this instrument.

The circuit consists of an R. F. stage using Radiotron RCA-78, a combined oscillator and first detector using Radiotron 6A7, an I. F. transformer using two tuned circuits, a second detector using Radiotron RCA-77 and a power stage using Radiotron RCA-43. The rectifier is Radiotron RCA-25Z5 which is used in a voltage doubling circuit. This results in considerable more output when the receiver is used on A. C. than that obtained from D. C. operation.

LINE-UP CAPACITOR ADJUSTMENTS

The line-up capacitor adjustments for the I. F. stage and the gang capacitors are made in the following manner:

(a) Procure a modulated oscillator giving a signal at 175

K. C., 1400 K. C., 1710 K. C. and 2440 K. C. An output meter and non-metallic screw driver are also necessary.

(b) The I. F. line-up capacitors should be first adjusted. This is done by placing the oscillator in operation at 175 K. C. coupling its output between the control grid and ground of the first detector, connecting the output meter across the cone coil of the loudspeaker and adjusting the two I. F. line-up capacitors until maximum output is obtained.

(c) After the I. F. circuits are aligned, the broadcast band R. F. is adjusted at 1710 K. C. This is done with the Range Switch at the broadcast position (counter-clockwise). A similar manner is used as that of the I. F. except that the oscillator is set at 1710 K. C., its output is connected from antenna to ground of the receiver, and the dial is set at 8 (minimum dial position). The adjustment is made with the trimming capacitors located on top of the gang capacitor and each capacitor is adjusted for maximum output.

each capacitor is adjusted for maximum output.

(d) After making the 1710 K. C. adjustment, set the dial at 18 and the oscillator at 1400. Then adjust the first detector and R. F. line-up capacitors only. This adjustment is made so that the R. F. and 1st detector will be aligned over the broadcast band but the receiver will still tune to 1710 K.

C. due to the oscillator line-up capacitor not being readjusted.

(e) Then set the Range Switch at its clockwise position. The oscillator should now be set at 2440 K. C. and the signal tuned in. Two points on the dial will be noted where the signal is heard, one of which may be louder than the other. Set the dial at either point. Note—the 2440 K. C. signal will still be heard at two points since these R. F. stages act as fixed tuned circuits. Adjust the two high frequency trimmers, located on the lower side of the gang capacitor until maximum output is obtained.

RADIOTRON SOCKET VOLTAGES—115 Volts D. C. or 60 Cycle A. C. Divide all A. C. Values (Except Heater) by 1.3 for 25 Cycles

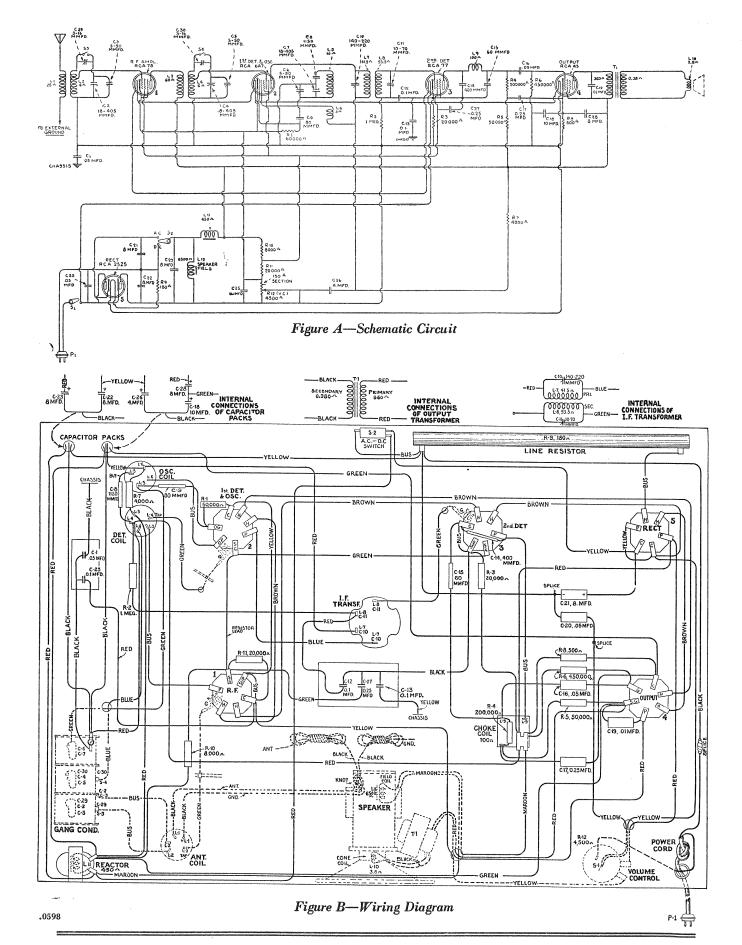
Radiotron No.	Cathode t Grid, Vo		Cathode to Screen Grid, Volts D. C.		Cathode to Plate, Volts D. C.		Plate Current, M. A.		Heater Volts
TO CALLED TO TO	A. C.	D. C.	A. C.	D. C.	A. C.	D. C.	A. C.	D. C.	
RCA-78 R. F.	2.6	1.5	90	50	157	88.5	5.5	3.0	6.0
RCA-6A7 Oscillator					157	88.5	1.7	1.0	6.0
1st Detector	2.6	1.5	90	50	157	88.5	2.5	1.5	
RCA-77 2nd Detector		Plat	e and Bias S		V	6.0			
RCA-43 Power	21.0	12.0	135	80	125	72.0	35.0	20.0	25.0
RCA-25Z5 Rectifier	115 R. M	115 R. M. S.						35.0 Total	25.0

Voltage Across Loudspeaker Field (115 Volts, 60 Cycles—185) (115 Volts, 25 Cycles—140) (115 Volts, D. C.—105)

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
2747 2963 3033 3555 3569 3572 3584 3692 3632 3641 3682 3641 3683 3684 3685 3697 3698 3700 3701	RECEIVER ASSEMBLIES Contact cap—Package of 5. Resistor—8,000 ohms—Carbon type—1 watt—Package of 5. Resistor—1 megohm—Carbon type—½ watt—Package of 5. Resistor—0.1 mfd.—Connected across loudspeaker field. Knob—Station selector and volume control knob—Package of 5. Socket—7 contact Radiotron socket. Ring—Antenna coil shield retaining ring—Package of 5. Resistor—50,000 ohms—Carbon type—½ watt—Package of 5. Resistor—60,000 ohms—Carbon type—½ watt—Package of 5. Shield—Antenna, R. F. or oscillator coil shield. Resistor—500 ohms—Carbon type—1 watt—Package of 5. Capacitor—0.05 mfd. Shield—Radiotron shield body. Shield—Radiotron shield body. Switch—Toggle type—AC—DC operation. Coil—Choke coil—Second detector plate. Escutcheon—Station selector escutcheon—Package of 2. Escutcheon—Volume control escutcheon—Package of 2. Resistor—450,000 ohms—Carbon type—½ watt—Package of 5. Capacitor—0.01 mfd.	\$0.50 1.10 1.00 .36 .65 .38 .40 1.00 1.00 .25 .35 .22 .20 .94 .54 .28 .28 1.00	3725 3752 3753 3755 6114 6228 6250 6303 6464 6505 6506 6507 6508 6510 6511 6518 6519 6520 6521 6621 7485	Capacitor—1,130 mmfd. Shaft—Range switch shaft. Contact—Range switch contact—Package of 2. Capacitor pack—Comprising two 0.1 mfd. and one 0.25 mfd. capacitors. Resistor—20,000 ohms—Carbon type—1 watt—Package of 5. Resistor—20,000 ohms—Carbon type—½ watt—Package of 5. Resistor—4,000 ohms—Carbon type—½ watt—Package of 5. Resistor—20,000 ohms—Carbon type—½ watt—Package of 5. Resistor—20,000 ohms—Carbon type—½ watt—Package of 5. Transformer—Intermediate frequency transformer. Reactor—Filter reactor Condenser—Three gang variable condenser assembly Resistor—180 ohms—Porcelain type. Volume control—Complete with mounting nut. Capacitor—Comprising one 3.0 mfd. one 10 mfd. and 4.0 mfd. Capacitor—Comprising two 8.0 mfd. capacitors. Coil—Antenna coil Coil—R. F. coil assembly. Coil—Oscillator coil assembly. Capacitor pack—Comprising one 0.05 mfd. and one 0.1 mfd. capacitor pack—Comprising one 0.05 mfd.	\$0.50 .40 .60 1.10 1.00 1.00 1.00 1.36 1.06 3.24 .60 1.36 1.09 1.49 1.58 .88 .94 .60 .40
3702 3710 3711 3712 3713	Capacitor—0.25 mfd. Capacitor—60 mmfd. Capacitor—80 mmfd. Capacitor—400 mmfd. Capacitor—0.05 mfd.	.36 .40	7606 8987	Coil assembly—Comprising field coil, magnet and cone support. Cone—Reproducer cone complete with voice coil—Package of 5.	2.06



RCA Victor Company, Inc.