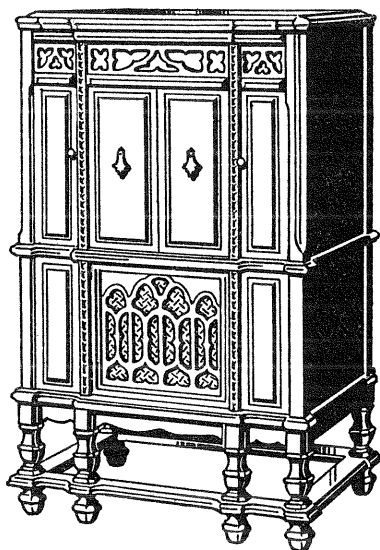


**RCA Victor**  
**Radiola Automatic Electrola**  
**Model RAE-84**

**SERVICE NOTES**



{ Fourth Edition  
December, 1933 }

**SERVICE DIVISION**

**RCA Victor Company, Inc.**

**Camden, N. J., U. S. A.**

**A RADIO CORPORATION OF AMERICA SUBSIDIARY**

**REPRESENTATIVES IN PRINCIPAL CITIES**

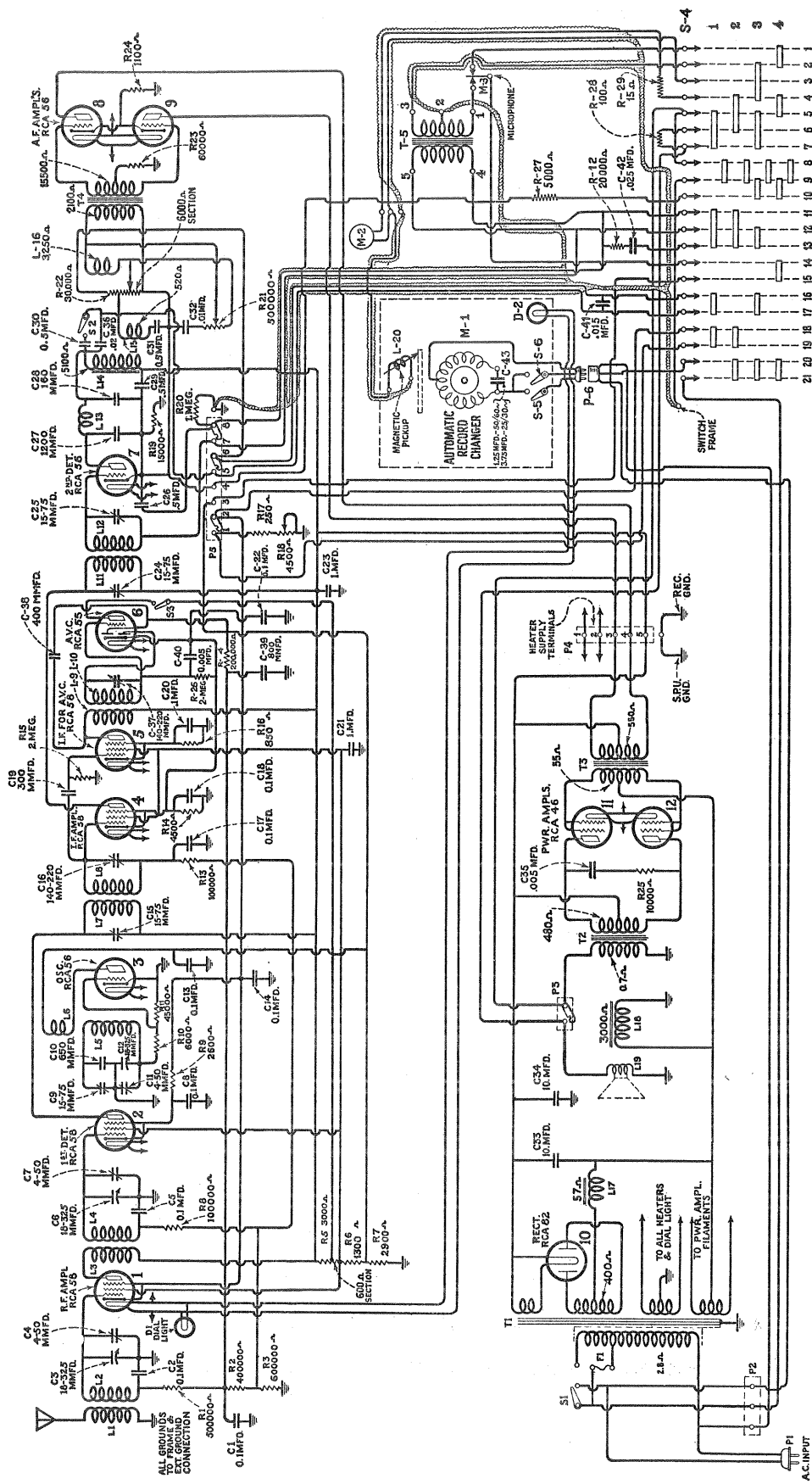


Figure 1—Schematic Wiring Diagram of RAE-84

# RCA Victor RAE-84

(BI-ACOUSTIC PHONOGRAPH COMBINATION)

## SERVICE NOTES

### ELECTRICAL SPECIFICATIONS

Voltage Rating.....	105-125 Volts
Frequency Rating.....	50-60 Cycles
Power Consumption.....	130 Watts Average (The input wattage may vary from 90 to 150 watts, depending on the output volume being used)
Recommended Antenna Length.....	25-100 Feet
Type of Circuit.....	Super-Heterodyne with A. V. C., Compensated A. F. System, Class "B" Output Stage and Noise Suppressor
Type and Number of Radiotrons.....	1 RCA-55, 4 RCA-58, 4 RCA-56, 2 RCA-46, 1 RCA-82—Total 12
Number of R. F. Stages.....	One
Type of First Detector.....	Exponential with Control Grid Voltage by A. V. C. Tube
Number of Intermediate Stages.....	Two, One for Signal and One for A. V. C. and Noise Suppressor
Type of Second Detector.....	Power Grid Bias
Number of A. F. Stages.....	Radio: Two, One Push-Pull Driver and One Class "B" Output Record: Three, One Single, One Push-Pull Driver and One Class "B" Output Home Recording: Three, One Single, One Push-Pull Driver and One Class "B" Output
Type of Tone Control.....	Reactor Capacitor and Variable Resistor for Reducing High Frequency Response
Type of Rectifier.....	Mercury Vapor Full Wave RCA-82
Undistorted Output.....	Approximately 20 Watts Maximum
Type of Record Changer.....	Perfected RCA Victor Ten 10-Inch Record Continuous Type
Type of Pickup and Tone Arm.....	Low Impedance Pickup with Inertia Tone Arm
Type of Microphone.....	Two Button Carbon

### PHYSICAL SPECIFICATIONS

Height.....	46 Inches
Width.....	29 $\frac{1}{4}$ Inches
Depth.....	20 $\frac{3}{4}$ Inches
Weight Alone.....	198 Pounds
Weight Packed for Shipment.....	263 Pounds

RCA Victor Radiola Automatic Electrola Model RAE-84 is a twelve tube Bi-Acoustic Radio Phonograph combination. A brief description of its four major functions follows:

**Radio.** The radio receiver, amplifier and loudspeaker are identical to those used in the famous RCA Victor R-78. This unit is characterized by its excellent performance in respect to sensitivity, selectivity and sensational tone quality. This latter feature is taken a step further in the RAE-84 due to the large area of the cabinet. This results in increased baffle area for the loudspeaker with the resulting greater and smoother low frequency response. A new feature of the RAE-84 is the inclusion of a noise suppression circuit in conjunction with the new Radiotron RCA-55. This feature eliminates background noises when tuning from station to station. The degree of suppression is adjustable by means of the sensitivity control.

**Phonograph.** The phonograph mechanism of the RAE-84 consists of the perfected RCA Victor continuous type record changing mechanism together with the low impedance pickup and tone arm. The output of the pickup is fed through the same amplifier and speaker as the radio receiver and gives an even greater degree of fidelity of reproduction. The automatic record changing mechanism is similar to that used in other RCA Victor combinations, but has a number of improvements.

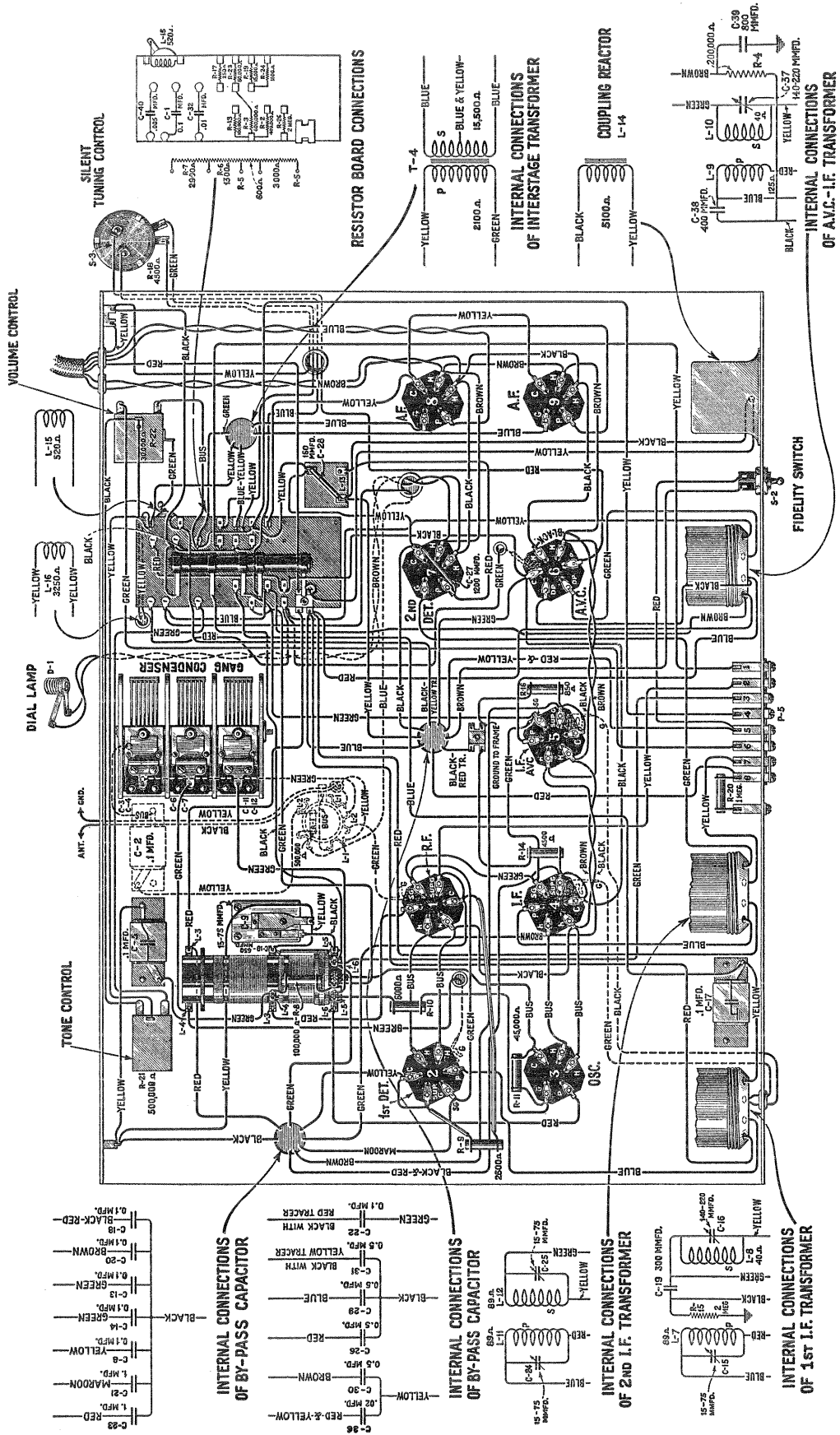


Figure 2—Receiver Wiring Diagram of RAE-84

These improvements are: turntable trip for manual operation that is operated by both concentric and eccentric groove records, 10-inch automatic trip for Brunswick and Columbia records that may be used to start and stop while playing manually by moving the tone arm, safety shift lever that prevents jamming while attempting to change from automatic to manual operation when the mechanism is in cycle and a record light to provide better illumination. The tone arm is mounted on rubber, which gives a greater degree of freedom from motor vibration.

**Recording.** Facilities of the RAE-84 make it the ideal instrument for home recording. This may be either voice, music or other sounds directed into the microphone or a radio program being broadcast on the air. The records so made are of practically studio quality. A feature of the home recording is the inclusion of a recording level meter which gives a visual indication of the output current so that the optimum value is used for making records. This gives a uniform quality to the records which heretofore has been impossible to maintain.

## SERVICE DATA—RADIO

A reference to the R-78 Service Notes gives the details of any service data necessary in conjunction with this receiver. It will be noted that an additional terminal has been added to the terminal strip at the rear of the receiver chassis. This will be included in later models of the R-78 as well as all models of the RAE-84. Figures 1, 2 and 3 show the schematic, receiver wiring and amplifier diagrams respectively, while Fig. 5 shows the assembly wiring. The amplifier and loudspeaker are identical with those used in the R-78. The replacement parts are shown on pages 10 and 11.

Due to the use of the noise suppressor circuit, which is not included in the older models of the R-78, a brief description of the functioning of this circuit follows:

The function of the noise suppressor circuit is to reduce noise, by greatly decreasing the sensitivity of the receiver when no carrier waves are being received. A manually operated sensitivity control is also provided so that the overall sensitivity of the receiver may be adjusted, thereby eliminating the reception of signals having too great a noise level. This feature operates without introducing distortion, a quality not present in other type noise suppressor circuits.

A reference to the schematic diagram, Figure 1, will show the circuit used in conjunction with the Radiotron RCA-55 for obtaining the noise suppressor action.

The two channel intermediate amplifiers are similar in operation to the older model R-78, with one channel supplying the signal voltage to the second detector and the other supplying signal voltage to the A. V. C. and noise suppressor circuit.

The untuned intermediate I. F. transformer used in the older model R-78 has been changed to a natural period plate coil L-9 and a sharply tuned secondary coil L-10. Coil L-9 supplies the voltage to operate the A. V. C. circuit, while Coil L-10 supplies that used to operate the suppressor circuits. An examination of this circuit will show that with no signal voltage impressed on Coil L-10, no current is rectified in the Diode plate and hence the grid of the Radiotron RCA-55 operates at zero bias. The plate current is then at a maximum value—approximately 10 M. A.—and since the cathodes of the Radiotron RCA-55 and the signal channel I. F. tube are common, the I. F. tube is biased to cut-off. This, therefore, prevents signal voltage from reaching the second detector.

When the receiver is tuned to a signal, the signal voltage is amplified in the A. V. C. amplifier and impressed on coils L-9 and L-10.

On the positive half of the signal voltage, the signal is rectified in the suppressor circuit, which generates a negative potential on the grid of the Radiotron RCA-55. The plate current is thereby reduced to approximately zero, which releases the high bias potential on the signal channel I. F. amplifier. Signal voltage will then be impressed on the second detector.

A. V. C. bias for the R. F., first detector and I. F. tubes will be generated when the I. F. voltage on the A. V. C. Diode overcomes and exceeds the positive potential on the cathode of the Radiotron RCA-55. This bias is approximately 10 volts when the receiver is tuned to signal.

The second I. F. transformer feeding the second detector has been changed to two high impedance circuits in order to provide the proper amplification with the increased bias resistor in the I. F. cathode circuit.

The suppressor circuit L-10 has been designed to be a sharp circuit so that the action of the suppressor comes as near the center of the carrier as possible.

The sensitivity control is in the cathode circuit of the R. F. and first detector and reduces the sensitivity of the receiver by increasing the residual bias on these Radiotrons. One end of the sensitivity control has a switch which is provided so that the noise suppression circuit may be cut out. Under this condition, the full sensitivity of the receiver is obtained.

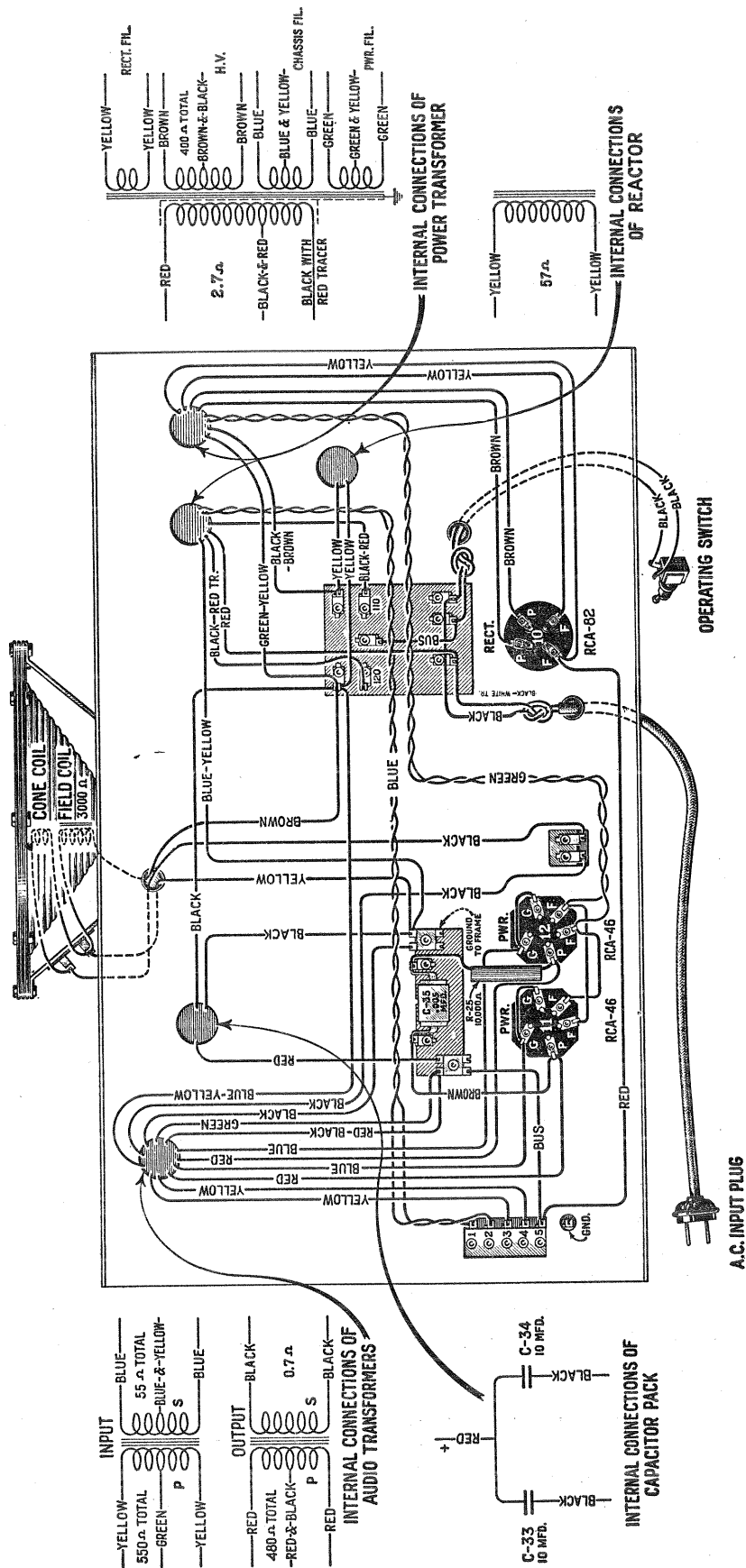


Figure 3—Amplifier Wiring Diagram of RAE-84

## (1) I. F. TUNING ADJUSTMENTS

Although this receiver has two I. F. stages, one for the second detector and one for the A. V. C., only five of the circuits are tuned by adjustable capacitors and require adjustment. The coil used for the A. V. C. is broadly tuned and does not require any adjustment, while the one used for the noise suppressor circuit is sharply tuned. Refer to Figure 4 for location of the adjusting screws.

The transformers are all tuned to 175 K. C., and adjustments are made for maximum output.

A detailed procedure for making this adjustment follows:

- (a) Procure a modulated R. F. oscillator that gives a modulated 175 K. C. signal. Also procure a non-metallic screw driver such as Stock No. 7065.
- (b) 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, or a low range A. C. voltmeter connected across the reproducer unit cone coil.

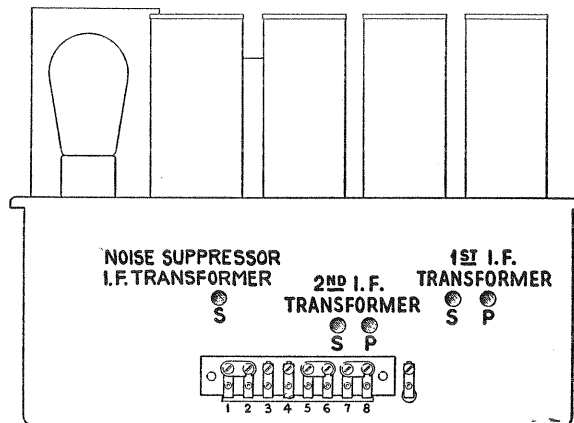


Figure 4—Location of I. F. Capacitors

- (c) Remove the oscillator tube and make a good ground connection to the chassis. Place the test oscillator in operation and couple its output from the control grid of the first detector to ground. With the receiver volume control at maximum, the noise suppressor control at its extreme counter-clockwise position and the noise suppressor switch open, adjust the oscillator output until a deflection is obtained in the output meter.
- (d) 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.
- (e) Then close the noise suppression control switch by advancing slightly clockwise, but do *not* advance the control beyond the snapping of the switch. The single noise suppressor circuit should then be adjusted for maximum output.

The points to remember when making these adjustments are that no dummy Radiotron is used and a minimum of input signal is necessary. An excessive signal will make it impossible to get correct adjustments of the signal channel I. F. and especially the suppressor circuit.

It is necessary, when adjusting the suppressor circuit, that the input signal be kept just as low as possible so that the output meter follows every change in the adjustment of the suppressor I. F. circuit.

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 R-78 Service Notes.

## (2) RADIOTRON SOCKET VOLTAGES

Due to the wide variation in Set Analyzers, the RCA Victor Company will, in the future, list the actual voltages at which the Radiotrons operate, rather than those that will be obtained with a particular Set Analyzer. It is therefore necessary that the serviceman allow corrections for circuits having high resistance and for meter scales having a relative low resistance. Usually an application of Ohms Law will give an approximate value of the voltage that will be read on a particular meter, assuming that the resistance of the meter is known.

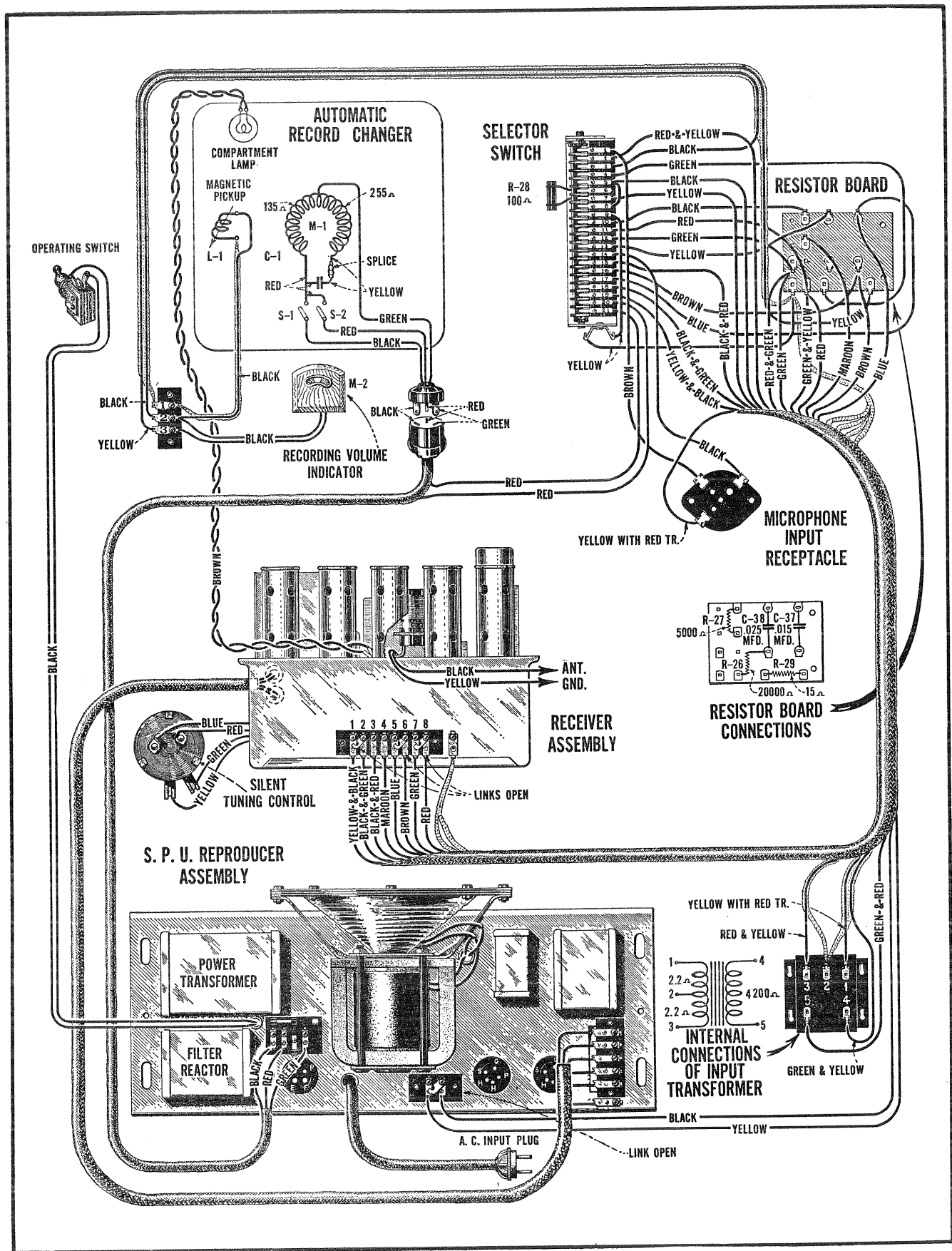


Figure 5—Assembly Wiring Diagram of RAE-84



## RADIOTRON SOCKET VOLTAGES

120 Volt Line—Fuse at 120 Volt Tap—Antenna Shorted to Ground—No Signal

Radiotron No.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts D. C.	Diode Plate No. 1 to Cathode Volts, D. C.	Diode Plate No. 2 to Cathode Volts, D. C.	Plate Current M. A.	Heater or Filament Volts, D. C.
1. RCA-58—R. F.	— 3.5	106	212	—	—	6.5	2.5
2. RCA-56—Osc.	—	—	65	—	—	4.5	2.5
3. RCA-58—1st Det.	— 9	101	206	—	—	1.8	2.5
4. RCA-58—I. F.	—12	98	203	—	—	2.0	2.5
5. RCA-58—A. V. C. I. F.	— 5	106	210	—	—	4.0	2.5
6. RCA-55—A. V. C. Sup. (Sensitivity Control at Minimum)	0	—	0	0	—12	0	2.5
6. RCA-55—A. V. C. Sup. (Sensitivity Control at Maximum)	0	—	69	0	36	8.0	2.5
7. RCA-56—2nd Det.	—15	—	200	—	—	1.0	2.5
8. RCA-56—Driver	—11	—	204	—	—	5.0	2.5
9. RCA-56—Driver	—11	—	204	—	—	5.0	2.5
10. RCA-46—Power	0	0	400	—	—	6.0	2.5
11. RCA-46—Power	0	0	400	—	—	6.0	2.5
12. RCA-82—Rectifier	462.5 Volts R. M. S. Each Plate—72 M. A. Total Plate Current.						

### SERVICE DATA—AUTOMATIC MECHANISM

The automatic mechanism used in the RAE-84 is similar to that used in other RCA Victor automatic combinations such as Models RAE-26, 59, or 79. Several minor changes have been made in these machines as follows:

1. Concentric Groove Trip. A trip so that either Brunswick or Columbia records may be mixed with Victor records in the automatic magazine has been provided.
2. An automatic starting switch, operated by pulling the tone arm to the right, has been added for manual playing.
3. A trip to stop the motor when playing either 10- or 12-inch records manually has been added.
4. An interlock has been provided so that the manual lever cannot be moved while the mechanism is in cycle. This prevents jamming due to improper operation.
5. A ball race speed reducer is used for changing the turntable speed from 78 to 33½ R. P. M. This is simple in operation and gives a greater freedom from "wows" than the gear type reducers.
6. Needle Lamp. A small electric lamp is provided so that proper illumination of the record and pickup is obtained. This assists in properly inserting the needle into the pickup as well as lowering the needle onto the record.

Service in conjunction with this mechanism will therefore be practically the same as that of the older type automatic record changing mechanisms. However, due to the new trips several additional adjustments are now included.

#### (1) ADJUSTMENT OF AUTOMATIC SWITCH

The automatic switch should be adjusted so that the contacts are at least 0.025 inches apart when the switch mechanism has been tripped. This is important, as otherwise arcing at the switch may occur.

#### (2) ADJUSTMENT OF 10-INCH AUTOMATIC SPIRAL GROOVE TRIP LEVER

The 10-inch automatic spiral groove trip lever should be adjusted by means of the screw assembled thereon. Proper adjustment is obtained when it forces the four finger lever out of contact with the clutch pawl, which trips the mechanism, when the needle is between a 1<sup>2</sup>/<sub>8</sub> inch and a 1<sup>7</sup>/<sub>8</sub> inch radius from the center of the turntable spindle.

#### (3) ADJUSTMENT OF 12-INCH AUTOMATIC SPIRAL GROOVE SWITCH

The 12-inch automatic spiral groove switch should be adjusted by means of the adjusting screw assembled in the trip lever so that it forces the switch lever out of contact with the switch trip lever, causing the latter to open the switch when the needle is between a 1<sup>2</sup>/<sub>8</sub> inch and a 1<sup>7</sup>/<sub>8</sub> inch radius from the center of the turntable spindle.

#### (4) LUBRICATION

The mechanism will seldom require lubrication. The motor gears run in grease. Unless gear replacements are made, it should not be necessary to relubricate this section. RCA Victor motor oil should be placed in the oil wells at each end of the motor occasionally. Wicks in these wells hold sufficient oil for normal operation from six months to one year. Oil should also be placed on the gear bearings, visible when the turntable is removed, and on the elevator shafts. RCA Victor motor grease should be placed on the slide and the mechanism gears once every six months.

# 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>					
2723	Switch—Fidelity switch—Package of 5.....	\$3.00	7479	Transformer—Interstage audio transformer in metal container.....	\$3.25
2746	Socket—Dial lamp socket.....	.20	7480	Transformer—First intermediate frequency transformer.....	2.15
2747	Contact cap—Package of 5.....	.50	7483	Reactor—Compensating reactor.....	.68
3047	Resistor—1,500 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	7484	Socket—UY type Radiotron socket—4 used.....	.35
3055	Cushion—Sponge rubber chassis support cushions—Package of 4.....	.30	7485	Socket—Radiotron 6-contact socket—5 used.....	.40
3076	Resistor—1 megohm—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	7486	Board—Phonograph terminal board—8 terminals and 3 links.....	.50
3252	Resistor—100,000 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	7498	Reactor—Coupling reactor.....	2.00
3435	Resistor—250 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	7500	Cable—6-conductor—From receiver to S. P. U.....	.95
3437	Knob—Noise suppressor rheostat knob.....	.60	7504	Coil—Detector and oscillator coil complete with mounting bracket.....	2.25
3439	Resistor—600,000 ohms—Carbon type—1 watt—Package of 5.....	1.00	7505	Shield—Tube shield top—1 used—Maroon.....	.25
3440	Resistor—4,500 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	7506	Shield—Radiotron tube shield—7 used—Maroon.....	.30
3441	Resistor—850 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	<b>AMPLIFIER ASSEMBLIES</b>		
6142	Resistor—6,000 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	2725	Fuse—1.5 ampere—Cartridge type fuse—Package of 5.....	.40
6188	Resistor—2 megohm—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	2731	Resistor—10,000 ohms—1 watt—Carbon resistor—Package of 5.....	1.10
6189	Bracket—Dial lamp bracket and indicator—Package of 2.....	.46	3032	Socket—UX type Radiotron socket with insulator.....	.30
6192	Spring—3-gang tuning capacitor drive cord tension spring—Package of 10.....	.30	3056	Shield—Radiotron tube shield—Package of 2.....	.40
6251	Capacitor—1,200 mmfd.—Package of 5.....	2.30	3099	Capacitor—0.005 mfd. capacitor.....	.50
6276	Tone control—Complete with mounting nut and washer.....	1.40	3147	Cover—Fuse cover with bushing and insulator.....	.60
6277	Capacitor—0.1 mfd. capacitor—Located in back of oscillator tube socket.....	.35	6289	Strip—Terminal strip—5 terminals.....	.45
6279	Resistor—15,000 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	6290	Board—Terminal board complete with terminals, fuse clips, and insulator.....	.65
6280	Resistor—400,000 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	6291	Board—Terminal board complete with terminals and insulator—Leas capacitor.....	.50
6281	Resistor—1,100 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	6292	Switch—Operating switch.....	1.00
6282	Resistor—60,000 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	7054	Cord—Power cord.....	.60
6284	Reactor—Tone control reactor.....	1.00	7370	Cover—Terminal strip cover with insulator—5 terminals.....	.20
6285	Choke coil—Second detector plate choke coil.....	.72	7491	Socket—UY type Radiotron socket with insulator.....	.35
6288	Knob—Station selector, tone control, radio or phonograph, volume control knob—Package of 5.....	1.00	7578	Capacitor—.05 mfd.—Buffer capacitor.....	1.04
6298	Cord—3-gang tuning capacitor drive cord—Package of 5.....	.60	8910	Capacitor pack—Comprising two 10 mfd. capacitors in metal container.....	4.10
6308	Coil—R. F. coil complete with mounting bracket.....	1.36	8911	Reactor—Filter reactor.....	3.15
6312	Capacitor—650 mmfd.—Oscillator series—Package of 5.....	1.50	8912	Transformer—Audio transformer pack comprising input and output transformer in metal container.....	4.36
6314	Capacitor—160 mmfd.—Package of 5.....	2.00	8913	Transformer—Power transformer—105-125 volts, 50-60 cycles.....	8.65
6315	Resistor—45,000 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	8914	Transformer—Power transformer—105-125 volts, 25-50 cycles.....	10.28
6316	Resistor—2,500 ohms—Carbon type— $\frac{1}{2}$ watt—Package of 5.....	1.00	8915	Transformer—Power transformer—200-250 volts, 50-60 cycles.....	8.40
6323	Shaft—Tuning condenser drive shaft with one flat washer and two "C" washers—Package of 2.....	.20	10907	Fuse—3 ampere fuse (for 25 cycle use)—Package of 5.....	.50
6351	Resistor—Voltage divider resistor.....	1.00	<b>REPRODUCER ASSEMBLIES</b>		
6352	Transformer—Third intermediate transformer.....	2.35	7292	Screw assembly—Comprising two screws, two nuts, two lock washers, and one plate—For mounting speaker to amplifier.....	.40
6353	Transformer—Second intermediate transformer.....	2.35	8559	Ring—Cone retaining ring.....	.25
6354	Rheostat—Noise suppressor rheostat.....	1.30	8916	Cone—Reproducer cone complete with voice coil—Package of 5.....	8.25
6355	Volume control—Complete with mounting nut.....	1.45	9418	Coil assembly—Comprising field coil, magnet, and cone support.....	9.50
6356	Capacitor—0.1 mfd. capacitor—Located on resistor board.....	.40	<b>AUTOMATIC RECORD CHANGING MECHANISM ASSEMBLIES</b>		
7062	Capacitor—Adjustable trimming capacitor—15 to 70 mmfd.....	.50	2893	Spring—Eccentric and spiral trip lever tension spring—Package of 10.....	.30
7065	Screw driver—Non-metallic screw driver for oscillator and I. F. adjustments.....	.80	2894	Pulley—Cable pulley complete with mounting stud—Mounted horizontally—Package of 5.....	.50
7298	Capacitor—0.01 mfd. capacitor—Located on resistor board.....	.40	2896	Spring—Cable lever adjustment spring—One end fastened to adjustment stud—Package of 10.....	.30
7438	Capacitor—3-gang variable tuning capacitor complete with mounting screws and washers.....	4.40	2898	Screw and nut—Elevator shaft adjustment—Package of 10.....	.50
7439	Drum—Dial drum with set screws and 3 dial mounting nuts.....	.35	2904	Lever—Front elevator actuating lever.....	.30
7440	Scale—Dial and dial scale.....	.50	2905	Screw—Gear and bracket mounting screw—Package of 10.....	.40
7477	Capacitor pack—Comprising two 1.0 mfd. and five 0.1 mfd. capacitors in metal container.....	2.25	2906	Spring—Check lever spring—Package of 10.....	.40
7478	Capacitor pack—Comprising four 0.5 mfd., one 0.02 mfd., and one 0.1 mfd. capacitors in metal container.....	2.20	2907	Screw—Gear and ratchet set screw—Package of 10.....	.40
			2909	Spring—Four finger lever spring— $\frac{11}{16}$ " long—Package of 10.....	.50
			2910	Spring—Four finger extension lever tension spring— $\frac{17}{16}$ " long—Package of 10.....	.50
			2911	Screw—Slide bracket mounting screw—Package of 10.....	.30
			2912	Roller—Slide roller complete with screw and stud—Package of 5.....	.75
			2913	Spring—Cable lever tension spring—Package of 10.....	.50
			2914	Spring—Flat spring and screw for locating lever—Package of 10.....	.80

# REPLACEMENT PARTS—(Continued)

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
2916	Plate—Four finger lever and motor switch latch plate with mounting screws—Package of 5.....	\$0.60	3390	Escutcheon—Pickup arm escutcheon complete with mounting rivets.....	\$0.46
2917	Washer—Spring "C" washer for locating cable, four finger levers and manual index levers—Package of 10.....	.25	3412	Board—Volume indicator meter and pickup terminal board.....	.52
2918	Spring—Locating and extension lever tension spring—Package of 10.....	.40	3417	Armature—Pickup armature.....	.72
2919	Screw and nut—Locating lever stop screw with nut—Package of 10.....	.40	3418	Cushions—Pickup rubber cushions—Comprising one damper, two spacer cushions and 1 damper bushing—Package of 5 sets.....	1.10
2920	Washer—Friction washer for slide and elevator actuating lever—Package of 10.....	.25	3419	Screw—Pickup cover mounting screw—Package of 10.....	.40
2929	Lever—Rear elevator actuating lever—Package of 2.....	.30	6335	Pickup—Pickup unit complete.....	4.00
3200	Shaft—Front or rear elevator shaft.....	.60	6336	Weight—Home recording weight.....	1.20
3214	Pulley—Cable pulley with mounting stud—Mounted vertically—Package of 5.....	.50	6346	Back—Pickup housing back.....	.45
3217	Lever—Check lever.....	.30	7532	Meter—Home recording volume indicator meter.....	2.50
3322	Switch—Motor switch complete.....	.75	7533	Mechanism—Microphone mechanism—Less housing.....	6.80
3401	Spring—Automatic trip lever tension spring—Package of 10.....	.50	7534	Cord—Microphone cord.....	.70
3402	Screw—Elevator pad screw—Package of 10.....	.60	7538	Arm—Pickup arm complete less escutcheon, pickup, pickup mounting screw and washer.....	4.00
3403	Spring—Clutch pawl spring—Package of 10.....	.50		<b>MOTOR ASSEMBLIES</b>	
3404	Spring—Brake lever tension spring—Located on motor starting switch plate—Package of 10.....	.50	3398	Motor mounting washer assembly—Comprising 2 cup washers, 4 springs and 1 "C" washer—One set.....	.48
3508	Stud assembly—Four finger lever mounting stud, washer and nut assembly.....	.15	6389	Capacitor—2.0 mfd. for motor No. 56933-G1.....	1.48
6340	Lever—Automatic trip lever.....	.55	6410	Capacitor—2.5 mfd.—For motor No. 56933-G2.....	1.56
6341	Lever—Manual index lever.....	.55	7330	Capacitor—Motor capacitor—3.75 mfd.—For 25 cycle operation.....	2.16
6342	Pawl—Clutch pawl complete.....	1.12	8644	Capacitor—Motor capacitor—1.25 mfd.—For 60 cycle motor 57085-2.....	1.10
6343	Gear—Gear and ratchet with set screw.....	2.10	8952	Motor—Motor complete—105-125 volts—60 cycles.....	35.40
6344	Lever—Eccentric and spiral trip lever complete—For manual position.....	1.15	8953	Motor—Motor complete—105-125 volts—25 cycles.....	41.16
7186	Gear—Gear and bracket.....	1.40	8954	Motor—Motor complete—105-125 volts—50 cycles.....	37.50
7188	Bracket—Slide bracket with roller.....	1.00	8955	Rotor and shaft for 60 cycle motor No. 57085-G 2.....	9.00
7189	Lever—Front and rear elevator cam lever—Package of 5.....	1.50	8956	Rotor and shaft for 50 cycle motor No. 56212-G 2.....	9.00
7190	Lever—Locating lever.....	.60	8957	Rotor and shaft for 25 cycle motor.....	9.00
7191	Lever—Cable lever.....	.40	8958	Spindle—Turntable spindle with fibre gear for 60 cycle motor No. 57085-G 2.....	4.68
7192	Cam—Cam gear and cam.....	1.10	8959	Spindle—Turntable spindle with fibre gear for 50 cycle motor, No. 56212-G 2.....	4.68
7321	Lever—Tone arm cable guide lever with pulley.....	.60	8960	Spindle—Turntable spindle with fibre gear for 25 cycle motor.....	4.68
7363	Pad—Front elevator rubber pad—Package of 10.....	2.00	8971	Rotor and shaft for 60 cycle motor No. 56933-G1.....	9.00
8646	Slide.....	2.20	8972	Spindle—Turntable spindle with fibre gear for motor No. 56933-G1.....	4.68
8647	Lever—Four finger lever.....	1.20	8973	Spindle—Turntable spindle with fibre gear for motor No. 56933-G2.....	4.68
	<b>MOTOR BOARD ASSEMBLIES</b>		8974	Rotor and shaft for 50 cycle motor No. 56933-G2.....	9.00
2779	Pointer—Selector switch pointer—Package of 10.....	.50		<b>MISCELLANEOUS PARTS</b>	
3262	Screw and nut—Record transfer lever adjusting screw and nut—Package of 10.....	.40	2737	Escutcheon—Operating switch escutcheon—Package of 5.....	.40
3394	Socket and base assembly—For compartment lamp.....	.72	2857	Plug—Three prong (male section) connector plug for power cable.....	.70
3395	Shade—Compartment lamp shade.....	.36	3173	Plug—Three prong (female section) connector plug for power cable.....	.90
3405	Spring—Record transfer lever spring—Package of 10.....	.40	3413	Resistor—5,000 ohms—Carbon type—½ watt—Package of 5.....	1.00
3406	Escutcheon—Engraved "AUTOMATIC".....	.36	3414	Resistor—15 ohms—Porcelain type—20 watt.....	.88
3407	Escutcheon—Engraved "MANUAL".....	.36	3415	Receptacle—Needle receptacle.....	.52
3408	Escutcheon—Engraved "33-78½".....	.40	3416	Box—Needle box with lid.....	.50
3409	Post—Roller post assembly for supporting record magazine.....	.60	3433	Capacitor—0.015 mfd.....	.35
3410	Suspension spring and washer for motor board—Comprising 1 bolt, 1 top spring, 1 bottom spring, 2 cup washers, 1 "C" washer and 1 nut.....	.50	3442	Resistor—100 ohms—Carbon type—½ watt—Located on selector switch—Package of 5.....	1.00
3431	Escutcheon—Selector switch escutcheon.....	.80	6292	Switch—Operating switch—Toggle type located on side of cabinet.....	1.00
6288	Knob—Selector control switch knob—Package of 5.....	1.00	6303	Resistor—20,000 ohms—Carbon type—½ watt—Package of 5.....	1.00
6345	Lever—Record transfer lever assembly complete.....	1.15	6348	Cable—Power three conductor power cable.....	1.65
7535	Switch—Selector control switch complete, less knob and escutcheon.....	4.80	6349	Cable—Shielded two conductor cable—From selector switch and resistor board to indicator meter and pickup terminal board.....	.40
	<b>TURNTABLE ASSEMBLIES</b>		7312	Transformer—Phonograph input transformer.....	6.00
3261	Bushing—Rubber bushing for turntable spindle—Long-playing records—Package of 5.....	.40	7362	Capacitor—0.025 mfd.....	.35
3338	Ring—Clamp ring assembly—Comprising spring, latch lever and stud.....	.50	7536	Cable—Braid covered interconnecting cable from receiver terminal strip to phonograph input transformer, S. P. U. terminal strip, selector switch and resistor board assembly.....	1.20
3340	Washer—Thrust washer—Package of 2.....	.56		<b>CABINET ASSEMBLIES</b>	
3341	Pin—Groov—Pin—Package of 2.....	.56		<b>(PRICES FURNISHED UPON REQUEST)</b>	
3411	Sleeve—Sleeve assembly complete with ball race.....	2.85	2776	Catch assembly—Door catch and strike with nails.....	
3570	Cap—Spindle nose cap and spring.....	.30	6294	Hinges—Door hinges—One set of 4 hinges with mounting screws.....	
8950	Turntable—Turntable complete.....	6.50	8949	Board—Motor board, less equipment.....	
	<b>MAGAZINE ASSEMBLIES</b>		X161	Panel—Control panel.....	
2900	Screw—Magazine lever set screw—Package of 10.....	.50	X162	Grille.....	
3210	Lever—Magazine lever.....	.50	X163	Lid—Cabinet lid.....	
6172	Washer—Metal washer located under record magazine—Package of 20.....	.40	X164	Leg—Cabinet leg.....	
8951	Magazine—Record magazine.....	3.36	X165	Foot—Cabinet foot.....	
	<b>PICKUP, ARM, MICROPHONE AND VOLUME INDICATOR ASSEMBLIES</b>		X166	Doors—Record compartment—One pair.....	
3183	Socket—Microphone socket—Package of 5.....	1.00	X167	Baffle board and grille cloth.....	
3204	Cable—Pickup arm cable—Package of 5.....	.80	X168	Escutcheon—Station selector escutcheon.....	
3215	Plug—Microphone cord plug.....	.40	X169	Support—Lid support with mounting screws.....	
3216	Cushion—Microphone rubber cushion—Package of 6.....	.24	X170	Doors—Cabinet center doors—One pair.....	
3385	Coil—Pickup coil.....	.50	X171	Knob—Record compartment door knob with mounting screw.....	
3386	Cover—Pickup cover.....	.56	X172	Pull—Door pull with mounting screw.....	
3387	Screw assembly—Pickup mounting screw assembly, comprising one screw, one nut and one washer—Package of 10.....	.40	X173	Hinge—Lid hinge with mounting screw—Package of 2.....	
3388	Screw—Pickup needle holding screw.....	.60			
3389	Rod—Automatic brake trip rod with lock nut—Package of 5.....	.40			



Printed in U. S. A.

# Instructions for RCA Victor R-90

## Bi-Acoustic Superheterodyne with Tonalite Control

### INTRODUCTION

This ten-tube superheterodyne radio receiver offers superb musical reproduction—the result of many recent developments and improvements. Two of the new A. F. Pentode Radiotrons RCA-2A5 are used in the push-pull output stage. Acoustic “tone equalizer” chambers are built into the cabinet, effectually preventing sound distortion resulting from cabinet resonance. A tuning meter, having a translucent illuminated scale, is mounted just above the station selector dial. This meter permits *exact* visual tuning of stations and thus prevents faulty reproduction resulting from inaccurate tuning.

An outstanding feature of this instrument is the use of colored illuminated indicators for all operating controls, showing at a glance just where each control is set. This feature is new, being used for the first time in this series of models. Not only does the harmonious color illumination provide a modern and artistic refinement in appearance, but the indicators will be found of great usefulness in the manipulation of

the receiver. Another improvement which has been initiated in this series of instruments is the recessing of the panel for all controls, reducing the extent of knob projection and rendering the controls less conspicuous. A double tone control is provided, also for the first time in this instrument series. Separate tone control knobs permit independent adjustment of the bass and treble response.

The automatic volume control minimizes the effects of “fading.” This control also tends to maintain the volume level for which it is set when the dial is shifted from one station to another, thus eliminating “blasting” when passing through the settings of powerful stations.

The silent-tuning control (noise “suppressor” or “silencer”) may be set for quiet tuning between station settings, without loss of ability to receive distant stations whose signals are above the background noise level.

### INSTALLATION

**Preliminary**—Remove the packing material from the Radiotrons. 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. *Never apply power to the instrument unless all Radiotrons are in place.*
- (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. Particular attention should be given to the proper connections of the adjacent green and black leads in accordance with the diagram.
- (d) That the lid is securely in place on the shield of the RCA-58 Radiotron designated by the heavy circle on the diagram.

**Location**—The instrument should be located close to the antenna lead-in and ground connections, and near 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

should not be run close to or parallel with electric circuits inside or outside the building. Generally, an indoor antenna of short or medium length should be found satisfactory. An outdoor antenna of greater length may provide some increase in the receiving range, and is recommended for localities remote from broadcasting stations. When the receiver is installed in a building of metallic construction, an outdoor antenna is essential for satisfactory results.

A *good* ground connection is necessary for best performance of this receiver. The connection to ground should be as short and direct as possible. If the ground connection cannot be made to a cold water pipe, a metal stake driven from 4 to 6 feet into moist earth is recommended. 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 connecting to the antenna and ground. Connect the antenna lead to the left-hand terminal (marked “ANT”) and the ground lead to the right-hand terminal (marked “GND”). Tighten the 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 voltage and frequency (cycles) specified on the rating label, located on the rear of the receiver.