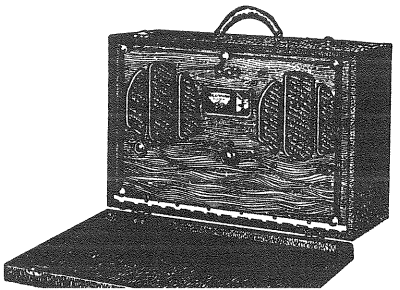
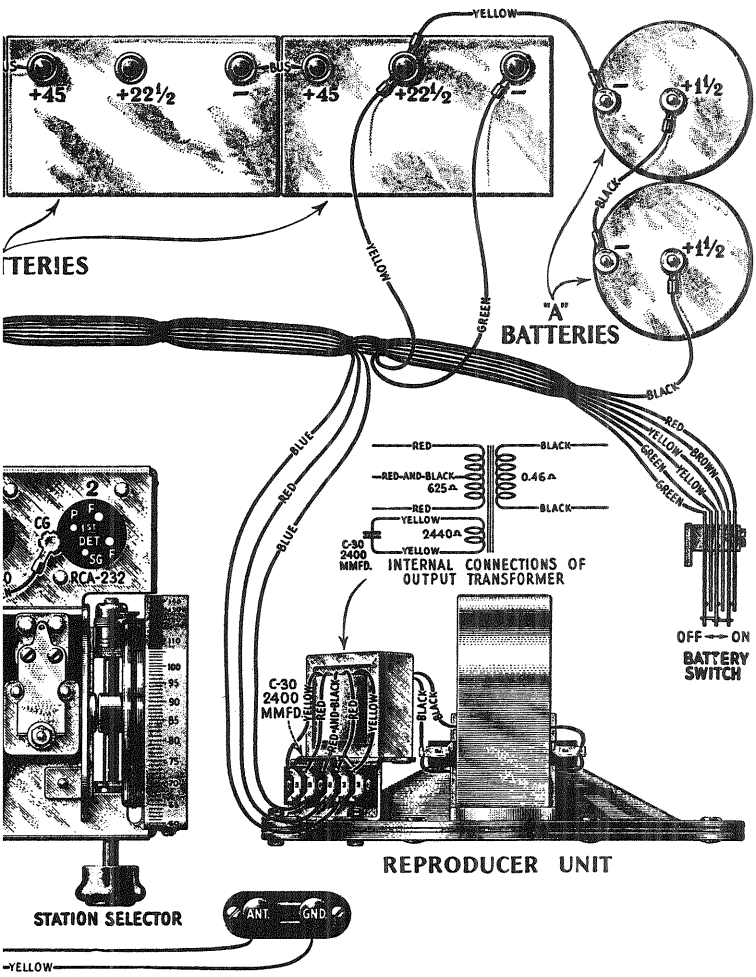
RCA Victor
Portable Radiola P-31

SERVICE NOTES





-Assembly Wiring Diagram

SERVICE NOTES

for

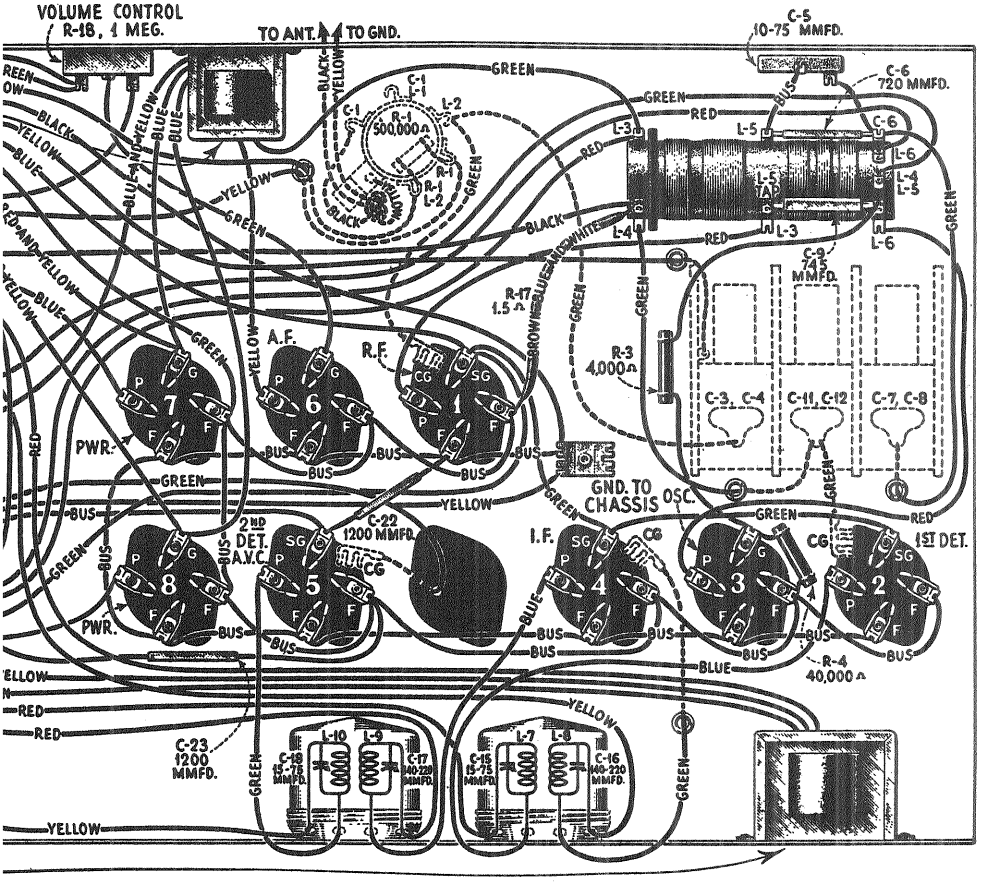
RCA Victor Portable Radiola P-31

ELECTRICAL SPECIFICATIONS

"A" Batteries required	Two No. 6 Dry Cells
"B" Batteries required	Four 45 volt blocks such as Burgess 5308
"A" Battery Current	0.48 Amps.
Average "B" Battery Current	18 M. A.
Type of Circuit	Super-Heterodyne with A. V. C.
Type and Number of Radiotrons	3 RCA-234, 1 RCA-232, 4 RCA-230
Number of R. F. Stages	One
Type of First Detector	Tuned Input Grid Bias
Number of Intermediate Stages	One
Type of Second Detector	Pentode combining detector, A. V. C. and audio amplification
Number of Audio Stages	Two
Type of Audio Output Amplifier	Class "B"
Undistorted Output	0.75 Watts

PHYSICAL SPECIFICATIONS

Height	14 3/16 inches
Depth	9 5/8 inches
Width	21 1/4 inches
Weight Alone (less batteries)	32 lbs.



gure 2.—Wiring Diagram

The plate circuit of the first detector, the grid circuit of the I. F. amplifier, the plate circuit of the I. F. amplifier and the grid circuit of the second detector are all tuned to 175 K. C.

The Radiotrons used for the R. F. and I. F. stages are the new Super-Control R. F. Amplifier Pentode Radiotrons, RCA-234. This Radiotron differs from the usual Super-Control Screen grid Radiotron in that it has a suppressor grid, similar to that in an output Pentode. Its characteristics are generally the same as the RCA-232 Screen grid Radiotron except for its exponential characteristics. The RCA-232 is used as a first detector.

The Radiotron RCA-234 used as the second detector is also the automatic volume control. It is a diode detector, being a straight rectifier, a triode audio amplifier and a bias control automatic volume control, the signal current across a resistor giving the necessary voltage drop. Details of its functioning follow. Refer to Figure 3 the schematic circuit.

The signal voltage is applied to the filament and plate of the second detector, being rectified by straight diode action. The audio output is then applied to the control grid and filament by means of capacitor C-19. The tube then operates as an Audio Amplifier, the screen grid acting as the plate. Now examining the input circuit it will be noted that the signal current flows through resistors R-7 and R-8. The drop across resistor R-8 constitutes the control grid bias for the I. F. amplifier and the drop across R-7 and R-8 constitutes the control grid bias for the R. F. stage. A small initial bias— 1.5 volts— is present on these tubes being the drop across the 65,000 ohm resistor of the voltage dividing system. Also the control grid bias for the second detector is obtained from the drop across the resistors R-10 and R-11, while R-9 and R-10 in parallel constitute a grid leak for its operation as an audio amplifier, C-19 being the coupling capacitor.

The output of the detector is then coupled by means of impedance coupling to the grid of the first A. F. amplifying tube. The grid leak is in the form of a potentiometer which is the volume control, its action controlling the audio voltage applied to the grid of the first A. F. tube. The output of this tube is then applied to the grids of the two Radiotrons RCA-230 which are connected in Push-Pull as a Class "B" amplifier. The output of this stage is then transformer coupled to the cone coil of the permanent magnet dynamic type loudspeaker. An extra winding, shunted by a capacitor, acts as a

RADIOTRON SOCKET VOLTAGES

(No Signal Being Received)

Radiotron No.	Control Grid to Filament Volts	Screen Grid to Filament Volts	Plate to Filament Volts	Screen Current M. A.	Plate Current M. A.	Filament Volts
1. R. F.	0.2	65	150	1.0	3.0	2.0
2. 1st Det.	0.5	65	150	0.1	0.2	2.0
3. Osc.	1.0	—	45	—	3.0	2.0
4. I. F.	0.5	65	150	1.0	3.0	2.0
5. 2nd Det.	2.0	150	—1.5	4.0	0	2.0
6. 1st A. F.	1.0	—	145	—	2.5	2.0
7. Power	14.0	—	150	—	1.5	2.0
8. Power	14.0	—	150	—	1.5	2.0

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2269	Capacitor—720 mmfd.	$0.75
2740	Cord—Tuning condenser drive cord—Package of 5.	1.00
2741	Idler—Tuning condenser drive cord idler—Package of 5	.80
2742	Spring—Tuning condenser drive cord tension spring—Package of 5	.50
2748	Binding post—Ground—Antenna twin binding post.	.50
2749	Capacitor—2400 mmfd.	1.50
2994	Coil—Detector choke coil complete with mounting rivet	.60
3033	Resistor—1 megohm—Carbon type—¼ watt—Package of 5	2.00
3079	Resistor—40,000 ohms—Carbon type—½ watt—Package of 5	2.50
3085	Capacitor—400 mmfd.	.60
6133	Socket—Four contact Radiotron socket complete with insulator—8 used	.50
6138	Coil—1st detector and oscillator coil complete with mounting brackets	3.30
6186	Resistor—500,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6239	Volume control—Volume control complete with mounting nut—Package of 5	5.25
6240	Resistor—19,000 ohms—Carbon type—½ watt—Package of 5	2.00
6241	Resistor—140,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6242	Resistor—2 megohm—Carbon type—¼ watt—Package of 5	2.00
6243	Resistor—6,000 ohms—Carbon type—¼ watt—Package of 5	2.00
8890	Capacitor pack—Comprising two 0.005 mfd., one 0.75 mfd., one 4.0 mfd., three 0.1 mfd., one 0.25 mfd. and two 0.05 mfd. capacitor in metal container	$5.40
8891	Transformer—1st intermediate transformer.	2.80
8892	Transformer—2d intermediate transformer.	2.90
8893	Board—Resistor board complete less resistors, coil and capacitor	1.00
8894	Coil—R.F. coil—Complete with mounting bracket.	2.30
8895	Capacitor—3 gang variable tuning capacitor—Comprising 3 variable capacitors drive drum, drive cord, drive cord spring, idlers and drive cord guides—Assembled.	7.75
8898	Cable.	1.15
	LOUDSPEAKER ASSEMBLY	
2749	Capacitor—2400 mmfd.	1.50
2975	Rivet—Cone retaining ring mounting rivet—Package of 100	.50
6166	Board—Terminal board with two terminals—Located on cone bracket—Package of 5.	1.00
6253	Board—Speaker terminal board—5 terminals—Complete with mounting eyelets—Package of 5.	1.00
6254	Transformer—Output transformer.	2.20
6255	Screw assembly—Speaker mounting screw assembly—Comprising 4 screws, 4 eyelets, 4 cushions, 4 bushings, 8 nuts and 8 lock washers—Package of 1 set	1.15
8828	Magnet assembly—Comprising cone bracket core and magnet.	4.60
8829	Cone—Speaker paper cone—Package of 5.	8.00
8896	Ring—Speaker cone retaining ring.	.90
	CABINET ASSEMBLY	
X-89	Grille and grille cloth—Receiver side—Package of 2	1.30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