

MODEL BP-4 PERSONAL RADIO

Four-Tube, Single-Band, Battery-Operated, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

— 1946 No. 17 —

SERVICE DIVISION

RCA VICTOR COMPANY LIMITED

MONTREAL

Specifications

Frequency Range Intermediate Frequency TUBE COMPLEMENT						
(1) Type-1R5 (2) Type-1T4 (3) Type-1S5 (4) Type 3S4	2nd I	Det., A-F, and A.V.C. Det., Power Output				
Type Battery		Approximate Life (Intermittent Duty)				
"A"-1.5 volt Eveready No. 950	0.25 amperes					
"B" 67.5 malta)	8.5 milliamperes	25-40 hours				
Power Output Undistorted 0.05 watts Maximum 0.12 watts Loudspeaker Type Permanent-Magnet Dynamic Elliptical						
Voice Coil Impedance	11	3/4 ohms at 500 cycles				
Cabinet Dimensions (inches Weight 31/4 lbs. (net)						



Replacement Parts

STOCK			STOCK		
NO.	DESCRIPTION		NO.	DESCRIPTION	
	RECEIVER ASSEMBLIES			MISCELLANEOUS ASSEMBLIES	
70444	Board-Speaker terminal board(5		70456		
10111	contact)		70988	Bottom-Case bottom - brown	
70445	Board-Terminal board (1 contact).		70457	Catch-Spring catch assembly	
33111	Capacitor-Ceramic 33 MMF. (C16)	1	70457	Center-case center-black	
60954	Capacitor-Ceramic 56 MMF. (C4)		70987	Center-Case center-brown	
71514	Capacitor-Ceramic 82 MMF. (C13)		70452		
70454	Capacitor-Tubular .002 Mfd.(C14,		36645	Connector-loop connector	
10101	C19)		30043	(Pkg.3)	
70627	Capacitor-Tubular .005 Mfd.(C20).		70429	Grommet-For tube support & var.cond.	
70453	Capacitor-Tubular .02 Mfd.(ClO,		10423	(Pkg.5)	
, 0 200	C15)		70459	Handle-Carrying handle - black	
71013	Capacitor-Tubular .05 Mfd.(C7)		70989		
36718	Capacitor-Electrolytic 10 Mfd.	1	70434		
00710	(C17)		70984		
70443	Coil-Oscillator Coil (L2,L4)		70441		
70438	Condenser-Variable tuning (Cl,		70424		
10400	C2, C5, C6)		70424	Knob-Volume Control	
70447	Loop-antenna loop complete (L1)		70708		
1011	less lid (black)		70450	Lid-Case lid & support, less loop	
70985	Loop-Antenna loop complete (L1)		70430	(Black)	
10000	less lid (brown)		70986	Lid-Case lid & supportless loop(brown)	
14076	Resistor,820 ohms 1/4 watt (R9)		70461	Link-Handle link - Black	
36714	Resistor, 15,000 ohms-1/4 watt(R2)		70990	Link-Handle link - Brown	
14138	Resistor,68,000 ohms-1/4 watt(R5)		70449	Nameplate - "RCA"	
3252			70427	Nut-Retaining mut for lid support	
30652	Resistor, 1 Megohm - 1/4 watt(R7).	1		stud (Pkg.10)	
12928	Resistor, 3.3 Megohm - 1/4 Watt(R3,		70420	Panel-Chrome panel	
	R10)		70422	Plate-Backing plate for mtg.hinge	
30931	Resistor, 4.7 Megohm -1/4 Watt(R8)	i	20 000000000000000000000000000000000000	on lid (black)	
30992	Resistor, 10 Megohm - 1/4 Watt(R4).		70983	on lid (black)	
70436	Socket-Tube Socket			on lid (brown)	
70430	Switch-Power Switch (S1)		70421	Screw-case cover mtg.screw(1 set blk)	
70442	Transformer-1st I.F.(L5,L6,C8,C9)		71150	Screw-case cover mtg.screw(1 set brwn)	
70437	Transformer-2nd I.F.(L7,L8,C11,		70446	Screw-#6-32x1/4" to mount battery	
	C12)		70423	holder(Pkg.10)(Pkg.5)	
70439	Volume Control (R6) 2 Megohms		70423	Spacer-Rubber shock spacer (Pkg.5). Spring-Tuning knob spring clip	
	- ADMINISTRATION OF STATE OF S	1	70426	Stud-Lid support stud (Pkg.5)	
			70451	Support-Lid support	
	SPEAKER ASSEMBLIES		70435	Support-Tube support less sockets &	
	JI LAKER AJJENULIUJ		.0100	transformer	
			70460	Screw-4-40 x 1/8" for case center	
70428	Speaker	- 1		strip (Pkg.5)	
70440	Transformer-Output (T1)	- 1	70433	Washer-Spring washer for V.C.knob	
				(Pkg.10)	

Replacement of Component Parts

I. To remove back cover:

- a. Depress locking spring clip through hole in top of case.
- b. With spring clip depressed, pull cover carefully out and up off the locking lug in the bottom of the case.

II. To replace batteries:

- a. Remove back cover.
- b. Remove, either or both, the "A" and "B" battery as the case may warrant. The "B" battery snap fasteners can best be removed by inserting a screwdriver under the snap fastener strip and prying upward.

III. To remove the case center strip:

- a. Remove one screw on the inside near the back cover.
- b. Tilt case center strip and lift.

IV. To replace tubes:

- a. Remove back cover.
- b. Remove "B" battery.
- c. Remove case center strip.
- d. Remove and replace tubes as required.

V. To remove the escutcheon plate (top cover):

- a. Remove the main dial knob, just pull.
- b. Remove the four corner nuts (B), rear.
- c. The plate may either be removed from the stay arm or folded into the lid.

VI. To remove speaker:

- a. Remove escutcheon plate (see item V above).
- b. Remove two Phillips screws (C) on chassis front of panel assembly holding speaker.
- c. Unsolder voice coil leads.
- d. Slide forward away from hinge side.

VII. To remove output transformer:

- a. Remove speaker (see item VI).
- b. Remove rivet (when replacing use small brass bolt).
- c. Unsolder mounting lug and leads.
- d. Pull out transformer.

VIII. To remove volume control:

- a. Remove speaker (item VI).
- b. Unsolder (disconnect) lead to positive terminal of "A" battery holder.
- c. Lift up the "A" battery holder by removing the one screw in its base. This holder has a hinge action and must be lifted up and back to remove.
- d. Remove front plate (panel) as follows:
 - Unsolder two copper strips (E) (from end of tube shelf to front plate) located under tubes 1R5 3S4.
 - Remove two screws (F) holding tube shelf to front plate. These screws are located between tubes 1R5 and 1T4, also 3S4 and 1S5. Rubber shock mounts may stick on studs, pry loose.
 - Remove nut (G) beneath tube shelf below second I-F transformer.
 - Remove screw (G) beneath the negative terminal of "A" battery holder, near cover hinge and also screw (G) adjacent to volume control below "A" battery holder near release catch.

- Unsolder three chassis leads to cover switch assembly or remove the switch assembly from the front cover plate.
- 6. Lay chassis on board or jig.
- 7. Remove front plate.
- 8. Unsolder volume control leads.
- 9. Remove volume control knob and spider.
- Remove volume control assembly by bending back four lugs.

Caution: Do not close lid unless center screw of switch assembly is in place.

e. Reassemble in reverse order.

IX. To remove oscillator coil:

- $\alpha.$ Same procedure and steps as covered in item VIII for removal of volume control plus the following.
- b. Unsolder oscillator coil leads.
- c. Remove coil by unsnapping spring mounting clips from angle bracket.

X. To remove 1st I-F transformer:

- a. Remove speaker.
- b. Unsolder four leads from 1st I-F transformer.
 - 1. Blue to plate (screen used as plate) of 1R5 tube.
 - 2. Green to grid of 1T4 tube.
 - 3. Red to $\mathbf{B}+$ terminal of 5 lug terminal board adjacent output transformer.
 - 4. Black to AVC terminal of same strip as above.
- c. Remove connections as required from two lug terminal board adjacent to 1st I-F transformer to permit this terminal board to be moved to a position free of the 1st I-F transformer.
- d. Unsolder and bend mounting lugs straight on the I-F transformer can. These lugs are immediately below the 2nd I-F transformer on tube shelf.
- e. Slip 1st I-F transformer forward toward volume control and out.

Note: It is possible to fold the 1st I-F transformer out the front of the chassis if the front plate is removed. This will eliminate the unsoldering of leads from the two lug terminal board.

XI. To remove 2nd I-F transformer:

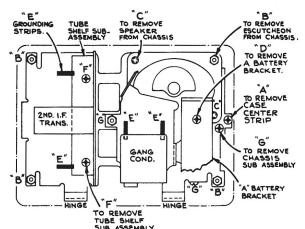
- a. Carefully remove the two 0.02 uf C10, C15 capacitors.
- b. Carefully depress the two leads (B+ and A+) near the I-F transformer case mounting lugs and unsolder these lugs from the tube mounting shelf and bend out.
- c. Unsolder the blue (plate of 1T4), green (grid of 1S5), red (B+ on terminal board), and black leads.
- d. Remove 2nd I-F transformer.

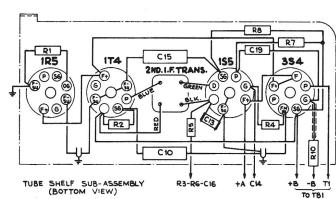
XII. To remove condenser tuning gang:

- a. Loosen oscillator coil.
- b. Unsolder leads to tuning gang.
- c. Unsolder grounding straps.
- d. Remove three screws holding gang assembly to chassis.
- e. Remove gang from rear of chassis.

XIII. To remove loop assembly:

- a. Unsolder loop leads in chassis.
- b. Remove screw holding fish paper insulating envelope to chassis switch.
- c. Remove snap fasteners holding loop in cover.





Alignment Procedure

Test Oscillator.—Connect test oscillator as indicated in chart keeping the output as low as possible to avoid A V C action.

Output Meter.—Connect meter from top lug of TB1 (plate of 3S4) to ground. Turn volume control to maximum position.

Fig. 1 shows the modifications necessary to convert the center strip portion of a case into a convenient shield to be used as a substitute for the regular case center strip in the RF, Osc. alignment.

Steps	Connect the high side of test osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—	
1	Connection lug of C2, located on rear of gang in series with .01 mf.	455 kc	Quiet point near 1,600 kc	Cll, Cl2 2nd I-F trans.	
2		455 kc	Quiet point near 1,600 kc	C8, C9 lst I-F trans.	
3	*Antenna coupling loop thru 200 mmf. capacitor	1,600 kc	1,600 kc	C5 (osc.)	
4		1,500 kc	1,500 kc	C2 (ant.)	
5	mmi. capacilor	600 kc	600 kc	L2 (osc.)	
6	Repeat steps 4 and 5 for final adjustments.				

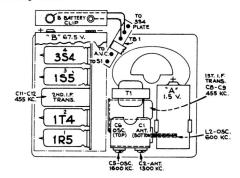
^{*} Steps 3, 4 and 5 require a coupling loop from the signal generator to feed a signal into the receiver loop located in the lid. This loop should be approximately one turn of 6 x $3\frac{1}{2}$ inches coupled to the signal generator through a 200 mmf. capacitor, and loosely coupled to the receiver loop antenna at about $1\frac{3}{4}$ inches distance, so as not to disturb the receiver loop inductance. Ground test oscillator through .1 mf. capacitor to receiver chassis.

Tools required:

- 1. One Phillips No. 1 screwdriver.
- 2. One small neutralizing alignment tool No. 70180.

CRITICAL LEAD DRESS

- Dress blue, green and black leads of second I-F transformer as direct as possible. If excess lead exists, dress down side of socket and flat against chassis to transformer opening.
- Cross the green and the black leads inside the first I-F transformer can, keeping the green lead to the outside. Keep the blue and the green leads separated as far as possible throughout their length.
- Dress audio coupling capacitor (C14; .002 mf.) and the lead to the volume control up and underneath the shelf supporting the output transformer.
- Dress the three capacitors pyramided behind the speaker, parallel to the complete assembly and with enough room behind the battery holder to allow the holder to move when a battery is installed or removed.
- 5. Dress the "B" battery leads behind the gang frame and over the top of the output transformer.
- Observe the outside foil connections on all paper capacitors, also the polarity of the electrolytic capacitor (C17).
- Keep blue and red leads of output transformer above the mounting shelf.



Note: DO NOT install "A" battery without cardboard cover.

A rubber band should be placed around each tube for cushioning.

