RADIO CORPORATION PTY. LTD.
DIVISION OF ELECTRONIC INDUSTRIES LTD.
126-130 GRANT STREET, SOUTH MELBOURNE, S.C.4.

TECHNICAL BULLETIN

SUBJECT-

Model "CJ"

5 Valve Superheterodyne Portable Receiver

For operation from:-

1.5 Volts "A" Battery

and

90 Volts "B" Battery.

This Bulletin Contains:-

1. Technical Specifications.
2. General Description.
3. Alignment Procedure.
4. Circuit Diagrams.
5. Voltage Table.
6. Component Parts Lists.
7. Coil and IF. Transformer Connections.

SUBJECT-Technical Specifications-Receiver Type "CJ"

Tube Complement:-

Type 1N5GT or 1P5GT	RF. Amplifier.
Type 1A7GT	Converter.
Type 1N5GT or 1P5GT	IF. Amplifier.
Type 1H5GT	Detector, AVC. and 1st Audio.
Type 1Q5GT	Power Output.

Intermediate Frequency:-173 Kc.

Tuning Range:-540-1600 Kc.

Operating Voltages:-

"B" voltage 90 volts (two 45 volt batteries connected in series)
"A" voltage 1.5 volts (nine 1.5 volt "A" cells connected in parallel)

Battery Consumption:-

"B" Battery 10 milliamps (no signal).
"A" Battery 300 milliamps.

Power Output:-

250 milliwatts maximum.
150 milliwatts undistorted.

General Description:-

The Model "CJ" is a 5 tube superheterodyne portable receiver having a sensitivity of 5 microvolts for an output of 25 milliwatts with a load impedance of 8,000 ohms. The receiver is entirely self contained requiring no external connections when operating. Signal pick-up is from a loop aerial and operation is from dry batteries which are fitted into the bottom of the carrying case.

The circuit is quite straight forward consisting of tuned aerial and RF. stages with a type 1N5GT tube as RF. amplifier, a pentagrid converter tube type 1A7GT followed by an IF. amplifier stage using a 1N5GT tube. A type 1H5GT tube for diode detection, AVC. and 1st audio which is resistance capacity coupled to a type 1Q5GT beam power amplifier tube.

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SUBJECT-Technical Specifications-Receiver Type "CJ"

General Description:-

Full AVC. is applied to the converter stage, half AVC. to the RF. stage and no AVC. to the IF. stage.

The diode load filter bypass condenser is taken from the moving arm of the volume control to earth and by this means the filtering efficiency on strong signals is improved and also provides a slight tone control effect as the moving arm of the volume control is moved.

Back-bias is employed in order to eliminate the necessity for a "C" Battery and to give a decrease in bias as the "B" Battery runs down. When the "B" Battery is at full voltage the bias developed across the 500 ohm back bias resistor circuit No. 31 is 4.5 volts.

A six pin socket and plug have been included in the design of the receiver for connection to external batteries or an eliminator should the receiver be required to operate other than from the internal batteries.

SUBJECT-Alignment Instructions-Receiver Type "CJ"

EQUIPMENT:-

Signal Generator.
Dummy Antenna.
.01MFD. Mica Capacitor.
200MMFD. Mica Capacitor.
Output Meter.
Alignment Tool.

ALIGNMENT CONDITIONS:-

Load Impedance-8,000 ohms.
Output Level-25 Milliwatts.
Volume Control-Maximum Volume (Fully clockwise).

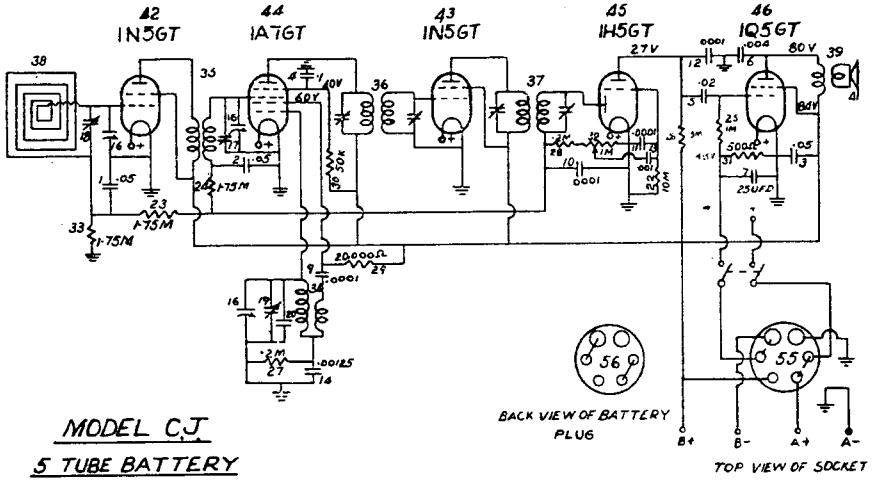
ALIGNMENT:-

Intermediate Frequency 173 Kcs.

Operation	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.				Remove set from cabinet and fit dial reading and escutcheon to metal plate in front of cond. gang then fit tuning knob to gang.
2.	To control grid of 1N5GT IF. tube	173 Kc.	.01MFD. mica capacitor in series with generator.	Gang plates full out. Leave grid clip on tube. Peak 2nd IF. primary and secondary for maximum output.
3.	To control grid of 1A7GT tube.	173 Kc.	.01MFD. mica capacitor in series with generator.	Gang plates full out. Leave grid clip on tube. Peak 1st IF. primary and secondary for maximum output.
4.	To AVC. end of loop.	1400 Kc.	200MMFD. mica capacitor in series with generator.	Adjust oscillator trimmer for logging and peak aerial and RF. coil trimmers for maximum output.
5.	To AVC. end of loop.	600 Kc.	200MMFD. mica capacitor in series with generator.	Turn cond. gang to 600 Kc. and check tracking.
6.				Remove dial reading and refit chassis to cabinet.

Tuning range 540-1600 Kc.

SUBJECT-Schematic Circuit Diagram-Receiver Type "CJ"



MODEL CJ
5 TUBE BATTERY
PORTABLE RECEIVER

ALL VOLTAGES TAKEN WITH
A 1000 OHMS PER VOLT METER
250 AND 10 VOLT SCALES

SUBJECT-Voltage Table-Receiver Type "CJ"

EQUIPMENT:-

Volt Meter: 1,000 ohm per volt meter with 0-10 and 0-250 volt scales.

Milliamp Meter: 0-50 and 0-500 milliamp scales.

CONDITIONS OF TEST:-

Set tuned to 1,000 Kc.
Volume control full on (clockwise) no signal.
All voltages measured from tube socket contacts to chassis.
"B" Battery 90 Volts. "A" Battery 1.5V.

Tube	Fil.	Plate	Screen	Grid	Oscillator Plate
1N5GT	1.4V.	84V.	84V.	-	-
1A7GT	1.4V.	84V.	40V.	-	60V.
1N5GT	1.4V.	84V.	84V.	-	-
1H5GT	1.4V.	27V.	-	-	-
1Q5GT	1.4V.	80V.	84V.	4.5V.	-

"A" Current consumption 300 milliamps.
"B" Current consumption 10 milliamps (no signal).

SUBJECT-Component Parts List-Receiver Type "CJ"

Circuit No.	Part Name	Tol.±	Rating	Part Number
1.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
2.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
3.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
4.	.1MFD. Paper Condenser	20%	200V. DCW	PC218
5.	.02MFD. Paper Condenser	20%	400V. DCW	PC111
6.	.004MFD. Paper Condenser	20%	600V. DCW	PC221
7.	25MFD. Electrolytic Condenser	20%	40VP.	PC269
8.				
9.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
10.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
11.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
12.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
13.	.001MFD. Mica Condenser	10%	1000VT.	PC108
14.	.00125MFD. Mica Condenser	1%	1000VT.	PC319
15.				
16.	3 Gang Varb. Condenser			PC316
17.	Trimmer Condenser 1.5-18MMFD.			PC250
18.	Trimmer Condenser 3-55MMFD.			PC224
19.	Trimmer Condenser Wire Wound			PC286
20.	Wire Wound Capacity 15MMFD.			PC196
21.				
22.	10 Megohm Carbon Resistor	10%	1 Watt	PR236
23.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
24.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
25.	1 Megohm Carbon Resistor	10%	½ Watt	PR246
26.	.5 Megohm Carbon Resistor	10%	½ Watt	PR245
27.	200,000 Ohm Carbon Resistor	10%	½ Watt	PR255
28.	200,000 Ohm Carbon Resistor	10%	½ Watt	PR255
29.	20,000 Ohm Carbon Resistor	10%	½ Watt	PR166
30.	50,000 Ohm Carbon Resistor	10%	½ Watt	PR160
31.	500 Ohm Carbon Resistor	10%	½ Watt	PR274
32.	1 Megohm Carbon Potentiometer with DP. ST. switch			PR235
33.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
34.	Transformer-Oscillator 173 Kc.			PT280
35.	Transformer-RF.			PT270
36.	Transformer-1st IF. 173 Kc.			PT281
37.	Transformer-2nd IF. 173 Kc.			PT282
38.	Loop Antenna Coil			PT283
39.	Transformer-Input 8,000 Ohms			PT284
40.				

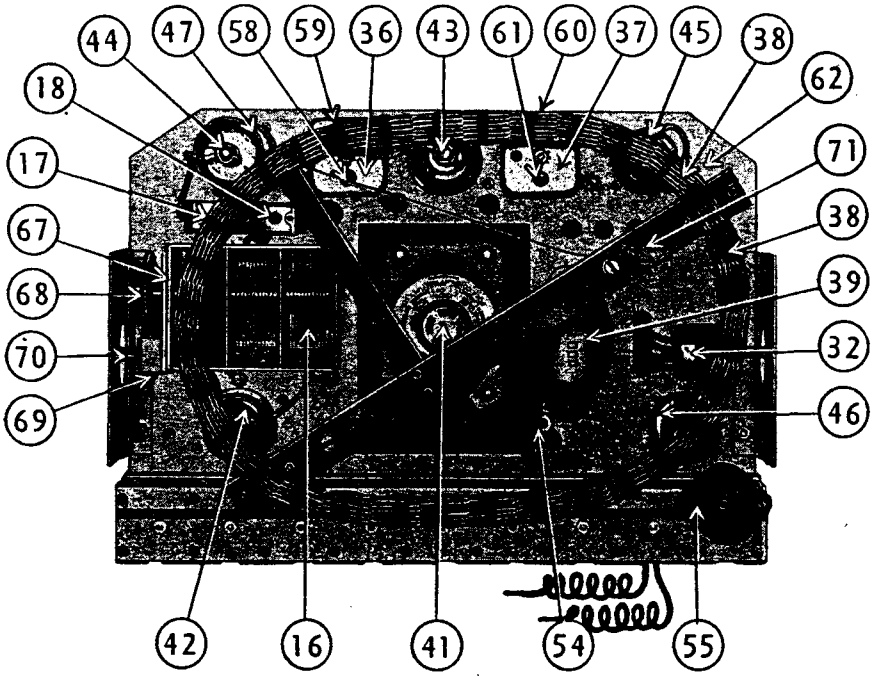
SUBJECT-Component Parts List-Receiver Type "CJ"

Circuit No.	Part Name	Tol.±	Rating	Part Number
41.	Permag Speaker			PM467
42.	1N5GT or 1P5GT			
43.	1N5GT or 1P5GT			
44.	1A7GT			
45.	1H5GT			
46.	1Q5GT			
47.	Shield-Valve			PM468
48.	Earth Contact for Valve Shield			22/30C
49.	Socket-8 pin			PM277
50.	Battery 1.5 volt "A" cell			PM466
51.	Battery 45 volt "B"			PM430
52.	Battery 45 volt "B"			PM430
53.	Socket Sub Base			3/514
54.	Junction Strips (3 lug)			A103/509
55.	Socket 6 pin			PM146
56.	Plug 6 pin			PM459
57.	Grid Clips			873/495
58.	1st IF. Primary Adj. Screw			
59.	1st IF. Secondary Adj. Screw			
60.	2nd IF. Primary Adj. Screw			
61.	2nd IF. Secondary Adj. Screw			
62.	Metal Chassis Assembly			A101/261
63.	Insulating Strip "A" Battery			16/261
64.	Positive Contact Strip "A" Battery			17/261
65.	Grille and Baffle Assembly			A106/261
66.	Escutcheon			11/261
67.	Gear Bracket and Strap			A108/261
68.	Large Gear			A111/261
69.	Small Gear			A117/261
70.	Small Gear Shaft			30/261
71.	Loop Support			A107/261
72.	Spacers-Speaker			14/261
73.	Spacers-Loop			28/261
74.	Spacers-6 pin Socket			22/261
75.	Mount Strip-Handle			42/261
76.	Cabinet Base-Angle Piece			3/261
77.				
78.	Volume Control Reading			25/261
79.	On/Off Indicator			52/261
80.	Dial Reading and Volume Celluloid			27/261

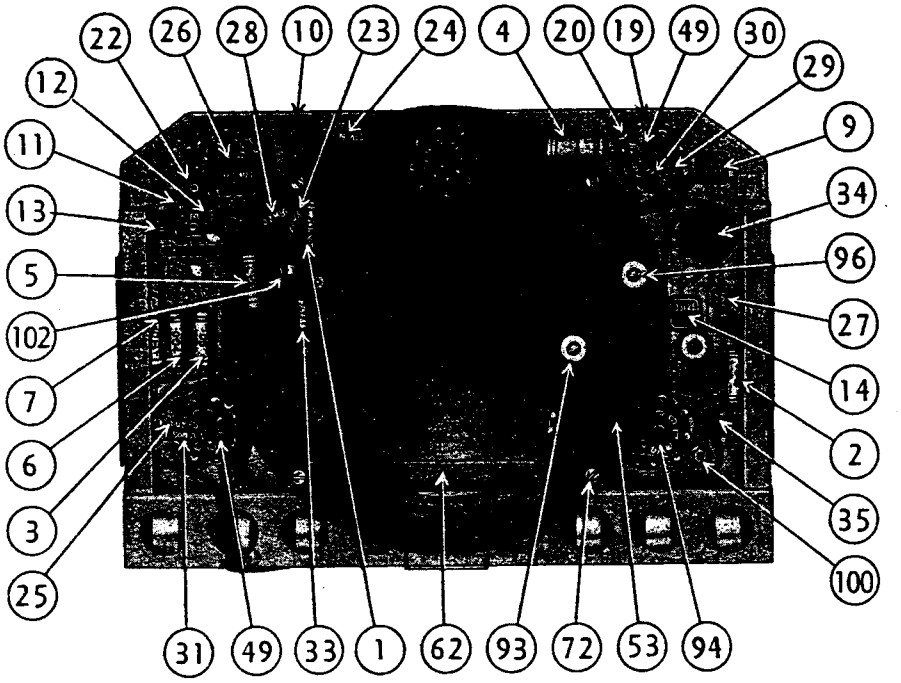
SUBJECT-Component Parts List-Receiver Type "CJ"

Circuit No.	Part Name	Tol. ±	Rating	Part Number
81.	Dial Reading Victoria			A114/261-3A
82.	Dial Reading New South Wales			A114/261-2A
83.	Dial Reading Queensland			A114/261-4A
84.	Dial Reading South Australia			A114/261-5A
85.	Dial Reading Western Australia			A114/261-6A
85(a).	Dial Reading Tasmania			A114/261-7A
86.				
87.	Cap-Rubber-Plug Connections			38/261
88.	Dial Pad			39/261
89.	Cabinet			1/261
90.	Cabinet Base			2/261
91.	Knobs-Tuning and Volume			52/81
92.	Screws-Escutcheon $\frac{1}{8}$"×$\frac{5}{8}$" Oval Csk. Hd. Whit.			54/261
93.	Grommets-Cond. Mounting			64/30A
94.	Grommets-Socket Sub Base			19/245
95.	Spacers-Trimmer Mounting			21/218A-5
96.	Spacers-Cond. Mounting			93/53
97.				
98.	Spacer-Sub Base Grommet			21/218A-1
99.	Washers-Cond. Grommet			45/60
100.	Washers-Socket Sub Base			70/30C
101.				
102.				
103.	Solder Lugs-Loop Mounting			31/30C
104.	Spring Insert-Control Knob			17/81
105.				
106.	Screws-IF. Mounting			39/560-20
107.	Screws-Chassis to Cabinet			38/560-4
108.	Screws-Cabinet Base			38/560-4
	Handle (Old Type)			
109.	Screws-Handle Mounting			16/560-10
110.	Leather Handle and Rings			A118/261
111.	Handle Mt. Nuts			3/478-4
	Handle (New Type)			
112.	Leather Handle			12/251-1
113.	Handle Bracket Assy. (screw 11/251 and bracket 10/251)			A101/251-1
114.	Handle Bracket Mt. Washers (2)			2/56-2
115.	Handle Bracket Mt. Nuts (2)			3/478-2

UBJECT-Schematic Circuit Diagram-Receiver Type "CJ"



Model "CJ" Chassis Top View



Model "CJ" Chassis Bottom View

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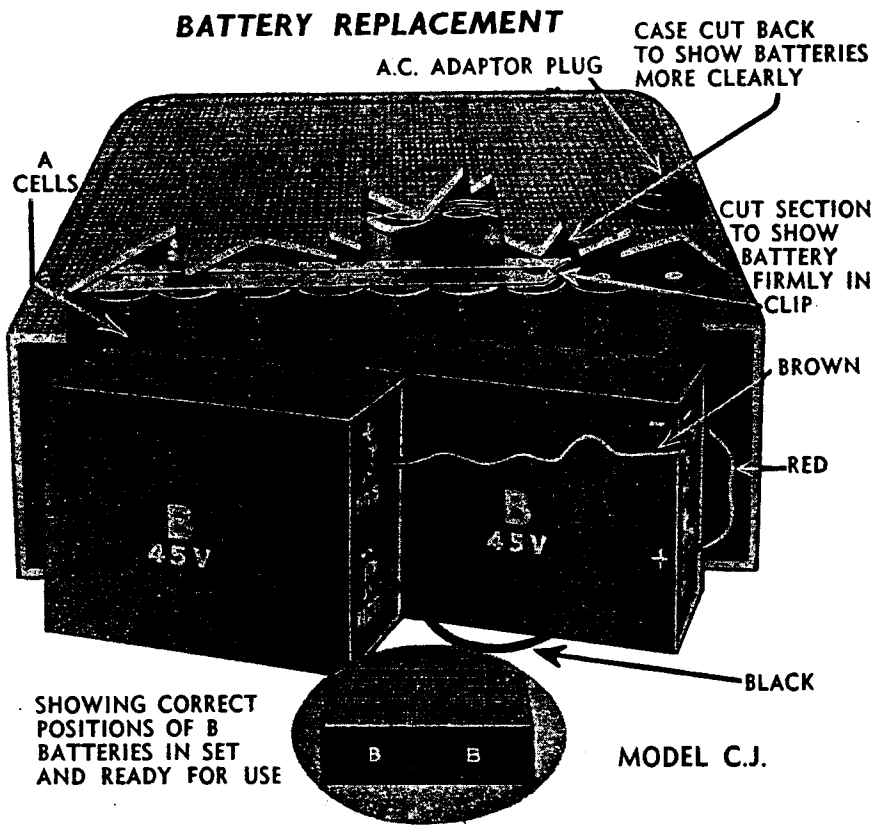
SUBJECT-View Showing Positions of Batteries-Receiver Type "CJ"



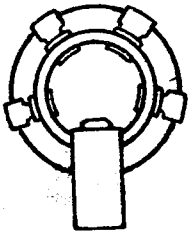
SUBJECT-Coil and IF. Transformer Connections-Receiver Type "CJ"

Inside turn-Grid
Outside turn-AVC.

LOOP ANTENNA COIL

(Outside primary) B+ — Plate

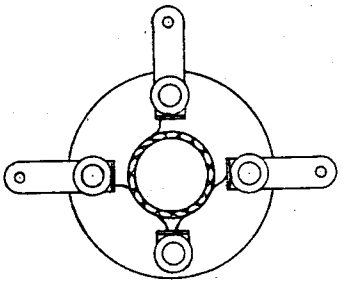
Grid — AVC. (Inside secondary)



RF. TRANSFORMER

Oscillator Grid

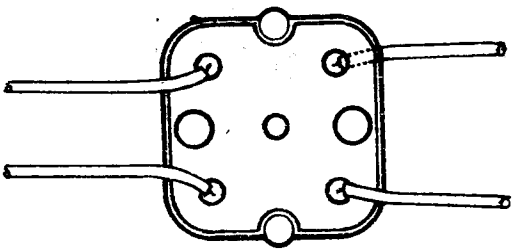
Series Pad. — .0001MFD. Cond. (circuit No. 9)



OSCILLATOR COIL

(B+) Red — Green (Grid)

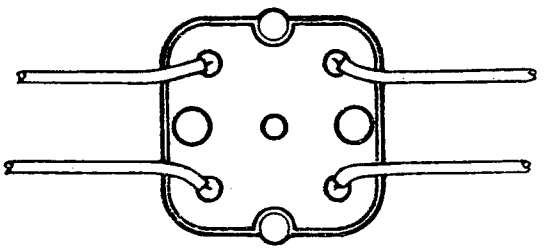
(Plate) Blue — Black (Earth)



1ST IF. TRANSFORMER

(B+) Red — Green (Diode)

(Plate) Blue — Black (Diode return)



2ND IF. TRANSFORMER

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SUBJECT- Summary of Circuit and Circuit Component Changes Since Beginning of Production 1/1/41 to 1/11/46.

1.	Circuit No. 20.	15MMFD. wire wound capacity across oscillator trimmer changed to 20MMFD. (Part number PC166) to provide an improved peaking position for oscillator trimmer.
2.	Circuit No. 14.	A variable padding condenser (part number PC164) with a .0008MFD. mica condenser (part number PC165) wired in parallel are being used in place of the .00125MFD. fixed series padder circuit No. 14 when this part is not obtainable.
3.	Circuit No. 30.	The 50,000 Ohm screen resistor circuit No. 30 changed to a 70,000 Ohm ½ Watt resistor (part number PR256) to provide better oscillator amplitude on low "A" batteries.
4.	Circuit No. 41.	15 oz. magnet on speaker changed to 11 oz. due to 15 oz. magnets not being obtainable.
5.	Circuit No. 32.	1 Megohm volume control PR235 changed to volume control (part number PR329) made by Radio Corp.
6.	- - -	8 pin valve sockets PM277 changed to improved type part number PM532. These sockets are interchangeable.
7.	Circuit No. 19 and 20.	An improved type wire wound trimmer part number PC663, capacity range 0-30MMFD. is being used in place of both the wire wound capacity circuit No. 20 and the wire wound trimmmer part number PC286 circuit number 19.