



RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

126-130 GRANT STREET, SOUTH MELBOURNE, S.C.4.

TECHNICAL BULLETIN

BULLETIN KP-1.

File:-Receivers
Portable.

Date: 30/11/46.

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SUBJECT-Technical Specifications-Receiver Type "KP"

General Description:-

The total weight is approximately three pounds lighter than the previous 5 tube Model "CJ", which is mainly due to the use of midget IF. transformers, miniature type tubes and sockets and the compact layer built socket type batteries.

A six pin plug and socket have been included in the design for connecting external batteries or an eliminator should the receiver be required to operate other than from the internal batteries. Provision has also been made on the loop aerial former and the cabinet for the fitting of a primary coupling winding for an external aerial and earth to provide additional signal pick-up in localities where insufficient signal pick-up is obtained from the loop aerial.

The circuit consists of tuned aerial and RF. stages using a type 1T4 tube as RF. amplifier, a converter tube, type 1R5 followed by an IF. amplifier stage using a type 1T4 tube. A type 1S5 tube is used for diode detection, AVC. and 1st audio which is resistance coupled to a type 3V4 pentode power amplifier tube.

The AVC. system employs the full DC. voltage available from the diode circuit which when filtered by the usual resistive capacitive filter network is used to control the grids of the RF. and converter tubes.

A grid leak and suitable by-pass condenser are included in the grid return lead of the first IF. transformer secondary to prevent the IF. tube drawing grid current and thereby dampening the tuned circuit.

The plate and screen current for the converter tube are supplied through the oscillator coil primary to maintain the magnitude and constancy of oscillator transconductance.

All the tubes are operated at zero bias except the output tube which has a back bias circuit. Back bias eliminates the necessity for a separate "C" bias battery and provided a decrease in bias as the "B" battery terminal voltage falls with use.



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SUBJECT-

Model "KP"

5 Tube 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 List.
7. Coil and IF. Transformer Connections.

SUBJECT--Technical Specifications--Receiver Type "KP"

Tube Complement:--

Type 1T4 RF. Amplifier.
Type 1R5 Converter.
Type 1T4 IF. Amplifier.
Type 1S5 Detector, AVC. and 1st Audio.
Type 3V4 Power Output Amplifier.

Intermediate Frequency:--455 Kc.

Tuning Range:--540-1640 Kc.

Operating Voltages:--

"B" Voltage 90 volts.
"A" Voltage 1.5 volts.

Battery Consumption:--

"B" Battery 12 milliamps (no signal).
"A" Battery 300 milliamps.

Power Output:--

250 milliwatts maximum.
100 milliwatts undistorted.

General Description:--

The Model "KP" is a 5 tube superheterodyne portable broadcast receiver having a sensitivity of 5 microvolts for an output of 25 milliwatts with a load impedance of 8,000 ohms. The receiver operates from dry batteries fitted into the cabinet and requires no external connections when operating. Signal pick-up is from an internal loop aerial.

The tubes used in the design of the receiver are the new series Miniature type which have no bases and fit a special 7 pin socket. They have parallel sided envelopes and are single ended in all cases with an exhaust tip at the top of the bulb. The tube filaments operate from 1.4 volts including the type 3V4 output tube, the dual filaments of which are wired in parallel.

SUBJECT-Alignment Instructions-Receiver Type "KP"

Equipment:-

Signal Generator.
 Dummy Antenna.
 .01MFD. Mica Capacitor.
 200MMFD. Mica Capacitor.
 Output Meter.
 Alignment Tool Part Number M125.

Alignment Conditions:-

Load Impedance - 8,000 Ohms.
 Output Level - 25 Milliwatts.
 Volume Control - Maximum Volume (Fully Clockwise).
 "B" Battery - 90 Volts.
 "A" Battery - 1.5 Volts.

Alignment:-

Intermediate Frequency - 455 Kcs.

Opera- tion	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.				Remove set from cabinet then remove speaker and loop aerial from mounting supports.
2.	To control grid of 1T4 IF. tube (Pin No. 6)	455 Kc.	.01MFD. mica capacitor in series with generator lead.	Leave grid lead attached to grid. Gang plates full out. Peak 2nd IF. transformer primary and secondary.
3.	To control grid of 1R5 tube (Pin No. 6)	455 Kc.	.01MFD. mica capacitor in series with generator lead.	Leave grid lead attached to grid. Gang plates full out. Peak 1st IF. transformer primary and secondary.
4.				Refit speaker and loop aerial.



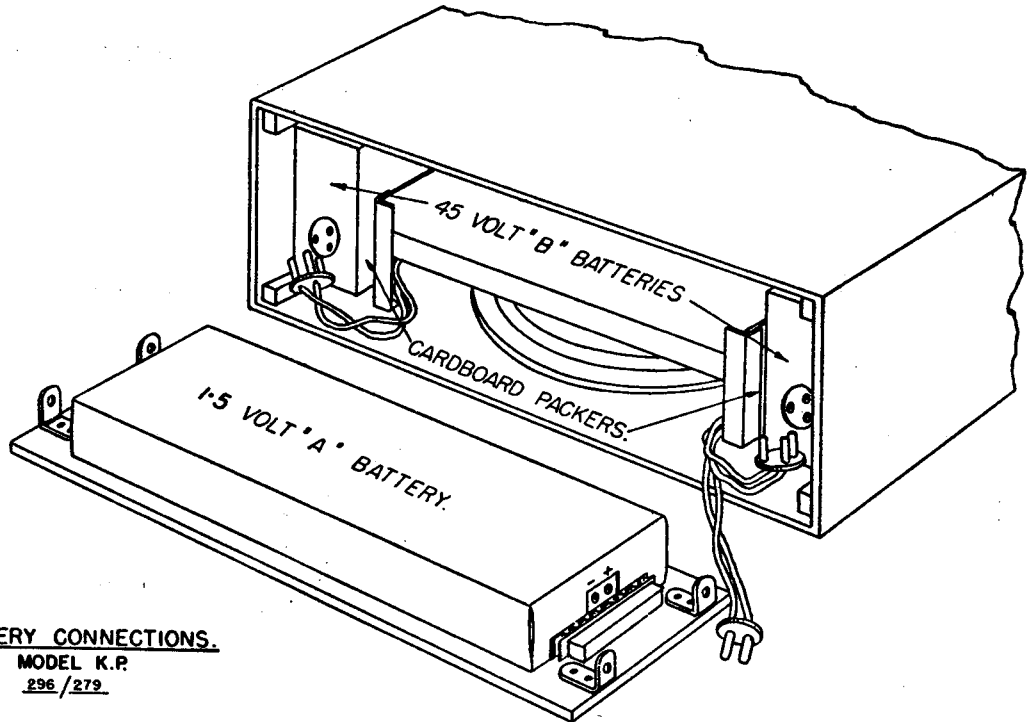
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SUBJECT—Battery Replacement Diagram—Receiver Type "KP"



BATTERY CONNECTIONS.

MODEL K.P.

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SUBJECT—Alignment Instructions—Receiver Type "KP"

Opera- tion	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
5.				Fit logging template (part number 39/635) supplied with this bulletin to the chassis in front of cond. gang then fit condenser knob.
6.	To AVC. end of loop (outside turn).	600 Kc.	200MMFD. mica capacitor in series with generator lead.	Turn condenser gang to 600 Kc. and peak oscillator and RF. transformer inductance trimmers (iron cores) for maximum output rocking gang to and fro through the signal while adjusting.
7.	To AVC. end of loop.	1400 Kc.	200MMFD. mica capacitor in series with generator lead.	Turn condenser gang to 1400 Kc., adjust oscillator trimmer for logging and peak RF. and loop aerial trimmers.
8.				Repeat operations 6 and 7
9.				Remove logging template and refit chassis to cabinet.

NOTE:—When aligning the signal circuits the batteries must be placed in their respective positions around the chassis. This is to provide the same amount of mass around the loop aerial as exists when fitted into the cabinet.

SUBJECT-Voltage Table-Receiver Type "KP"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 1.5 volts.

Tube	Fil.	Plate	Screen	Grid
1T4	1.4V.	83.5V.	28V.	
1R5	1.4V.	83.5V.	56V.	
1T4	1.4V.	83.5V.	28V.	
1S5	1.4V.	17.5V.	Joined to plate	
3V4	1.4V.	82.5V.	83.5V.	-6.5V.

"A" Current consumption 300 milliamps.

"B" Current consumption 12 milliamps (no signal).



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SUBJECT—Mechanical Parts List—Receiver Type "KP"

Part Name	Part Number
Chassis Assembly	A101/635
Chassis Side Packing (2)	25/635
Mount Block—Vol. Control	16/589
Socket Spacer— $\frac{7}{8}$ " (2)	15/635-1
Loop Spacer	16/635
Speaker Spacer (3)	17/635
Terminal Strip Assy. 2 lug (6)	A103/509
Spring—Valve Socket Mounting	32/635
Transformer Mt. Strip	347/64
6 Pin Plug Assy.	A107/635
Handle Assy.	A108/635
Handle Grip	34/635
Rubber Feet—Cabinet Base	236/250
Cabinet Covered	A106/635
Cabinet Base Assy.	A105/635
Dial Reading Celluloid	27/261
Handle—Support Plate (2)	6/635
Handle—Mt. Plate (2)	8/635
Baffle Card	3/635
Escutcheons (2)	11/261
Grille Fabric	7/635
Astor Badge	314/30C
Knobs (2)	52/81-1
Knob Spring (2)	17/81
Rubber Cap for 6 pin plug	38/261
Dial Reading—Vic.	28/635-1
Dial Reading—N.S.W.	28/635-2
Dial Reading—Queensland.	28/635-3
Dial Reading—W.A.	28/635-4
Dial Reading—S.A.	28/635-5
Dial Reading—Tas.	28/635-6
Dial Reading—Vol. Control	29/635
Battery Plugs 3 Pin (2)	335/30C
Battery Plugs 2 Pin	336/30C
Valve Shield	38/635
Valve Sockets—Midget Type	A104/58
Mount Screws—Cabinet Base	185/415
Mount Screws—Handle	185/415-1
Mount Screws—Set to Cabinet	17/560-6
Mount Screws—Escutcheon	47/560-57



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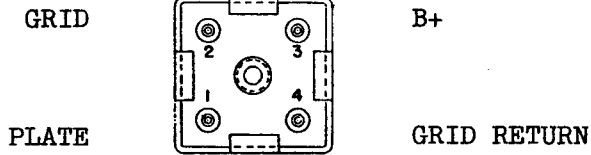
SUBJECT--Component Parts List--Receiver Type "KP"

Circuit No.	Description	Tol.±	Rating	Part Number
1.	.1MFD. Paper Condenser	20%	200V.DCW	PC218
2.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
3.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
4.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
5.	.02MFD. Paper Condenser	20%	400V.DCW	PC111
6.	.002MFD. Paper Condenser	20%	600V.DCW	PC112
7.	.004MFD. Paper Condenser	20%	600V.DCW	PC221
8.	.005MFD. Paper Condenser	10%	600V.DCW	PC700
9.	.001MFD. Mica Condenser	10%	1000VT.	PC108
10.	.00025MFD. Mica Condenser	10%	1000VT.	PC126
11.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
12.	.00005MFD. Mica Condenser	10%	1000VT.	PC141
13.	450MMFD. Silvered Mica Condenser	2½%	1000VT.	PC692
14.	8MFD. Electrolytic Condenser	20%	525PV.	PC262
15.	1.5-18MMFD. Trimmer Condenser			PC250
16.	1.5-18MMFD. Trimmer Condenser			PC250
17.	0-30MMFD. Trimmer Condenser Wire Wound			PC663
18.	3 Gang Variable Condenser			PC698
19.				
20.	10 Megohm Carbon Resistor	10%	1 Watt	PR236
21.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
22.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
23.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
24.	1 Megohm Carbon Resistor	10%	½ Watt	PR246
25.	.5 Megohm Carbon Resistor	10%	½ Watt	PR245
26.	100,000 Ohm Carbon Resistor	10%	½ Watt	PR103
27.	60,000 Ohm Carbon Resistor	10%	½ Watt	PR125
28.	50,000 Ohm Carbon Resistor	10%	½ Watt	PR160
29.	10,000 Ohm Carbon Resistor	10%	½ Watt	PR164
30.	600 Ohm Carbon Resistor	10%	½ Watt	PR338
31.	1 Megohm Carbon Potentiometer with DP.ST. switch			PR329
32.				
33.	1st IF. Transformer			PT800
34.	2nd IF. Transformer			PT800
35.	RF. Transformer			PT804
36.	Input Transformer 10,000 Ohms Imped. (less insulating strips)			PT816
	Input Transformer 10,000 Ohms Imped. (with insulating strips)			PT817
37.	Oscillator Coil			PT793
38.	Loop Antenna Coil			PT818
39.				

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

Inside turn-GRID
 Outside turn-AVC.

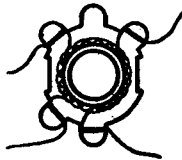
Loop Antenna Coil



RF. Transformer



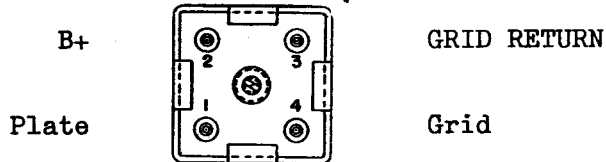
Junction of Grid Cond.
 and Series Pad



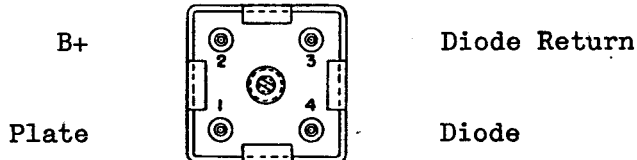
Junction of 1st IF. and
 circuit numbers 9, 37 and 39

B+ CHASSIS

Oscillator Coil



1st IF TRANS.



2nd IF TRANS.



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SUBJECT Component Parts List Receiver Type "KP"

Circuit No.	Description	Tol.±	Rating	Part Number
40.	Permag Speaker 8 inch			K119
41.	"B" Battery 45 Volt (Eveready Type 482)			M130
42.	"B" Battery 45 Volt (Eveready Type 482)			M130
43.	"A" Battery 1.5 Volt (Eveready Type 745)			M129
44.	Socket 6 Pin			PM146
45.	Plug 6 Pin			A107/635
46.	Tube Type 1T4			
47.	Tube Type 1T4			
48.	Tube Type 1R5			
49.	Tube Type 1S5			
50.	Tube Type 3V4			



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SUBJECT—

Substitute Output Tube - Receiver Type "KP"

The first production run of the five tube portable receiver Model KP has been modified to use a type 1Q5GT tube in place of the 3V4 tube.

The modification is due to the shortage of type 3V4 tubes at the commencement of production.

Should it be required to change the 1Q5GT tube to a type 3V4, no circuit alterations are necessary except for the fitting of an adaptor plate to mount the small 3V4 socket. The socket wiring connections are as below:-

Socket Connections

<u>1Q5GT Tube</u>		<u>3V4 Tube</u>	
Pin No. 1	No. Connection	Pin No. 1	Filament +
2	Filament +	2	Plate
3	Plate	3	Screen
4	Screen	4	No Connection
5	Grid	5	Filament - (Mid-tap)
6	No Connection	6	Grid
7	Filament-	7	Filament +
8	No Connection	8	No Connection

Adaptor Plate Fittings

	<u>Part Number</u>
1 off Adaptor Plate	42/635
1 off Socket	A104/58
2 off Eyelets - socket mounting	2/291-1
2 off Screws - adaptor plate mounting	10/560-4
2 off Nuts - adaptor plate mounting	3/478-2
2 off S/P Washers - adaptor plate mounting	2/562-1



TECHNICAL BULLETIN

SUBJECT-

INSTRUCTIONS FOR FITTING AND ASSEMBLY

OF

THE 6 PIN PLUG AND SOCKET

FOR

EXTERNAL BATTERIES.

ADDITIONAL PARTS REQUIRED:-

PART NUMBER

1 - Socket, 6 pin
1 - Plug Assembly, 6 pin
1 - Plug Assembly, 6 pin

PM146
A107/635
PM459

METHOD OF ASSEMBLY:-

1. Remove set from cabinet, then remove loop aerial from chassis. Carefully note the connections to the loop aerial before removing it.
2. Assemble the 6 pin socket on to the two loop spacers on the gang mount plate so that the socket contacts face the chassis and contacts number 1 and 6 (large holes) point to the gang spindle.
3. The A+ lead from the thick pin in the A battery plug is disconnected from the switch on the rear of the volume control and wired to the 6 pin socket contact No. 4.
4. From 6 pin socket contact No. 5, connect a wire across to the switch lug where the A+ lead was connected.
5. The B- lead from the B battery plug is disconnected from the switch on the rear of the volume control and wired to 6 pin socket contact No. 1.
6. From 6 pin socket contact No. 2 connect a wire across to the switch lug where the B- lead was connected.
7. From 6 pin socket contact No. 6 connect a wire across to the earth point of the 600 Ohm bias resistor situated on rear of the volume control.

SUBJECT—

METHOD OF ASSEMBLY:- (Contd.)

8. From 6 pin socket contact No. 3 connect a wire across the chassis through the A+ and B- lead grommet to the screen grid contact of the output tube socket.
9. All the leads from the 6 pin socket extending across the chassis are to be bound for about an inch with adhesive tape to form a cable.
10. Refit loop aerial to chassis then refit set to cabinet.

OPERATION FROM INTERNAL BATTERIES:—

The 6 pin plug assembly (A107/635) with the knotted cord attached is inserted into the 6 pin socket through the hole in the rear of the cabinet and covered by a rubber insert when operating from internal batteries. On this plug the rear of contact pins numbers 1 and 2 are bridged with tinned copper wire and soldered, also pins number 4 and 5 are bridged and soldered.

OPERATION FROM EXTERNAL BATTERIES:—

Remove the rubber insert and plug required for internal battery operation and insert the 6 pin plug (PM459) having external battery leads attached as follows:—

Pin No. 2	B-
Pin No. 3	B+
Pin No. 5	A+
Pin No. 6	A-