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

TECHNICAL BULLETIN

SUBJECT- Model "BP"

4 Tube Superheterodyne Mantel

Receiver.

For operation from:-

200-250 Volt 50 Cycle AC. Mains.

This Bulletin Contains:-

1. Technical Specifications.
2. General Description.
3. Alignment Procedure.
4. Circuit Diagram.
5. Voltage Table.
6. Component Parts List.
7. Coil and IF. Transformer Connections.
8. Summary of Circuit Changes Made During Production.

This Receiver is NOT in Production

Information is for Service Purposes ONLY

SUBJECT-Technical Specifications-Model "BP"

Tube Complement:-

Type 6A8G Converter.
Type 6U7G IF. Amplifier.
Type 6B6G Diode Detector, AVC. and 1st Audio.
Type 32L7GT Pentode Output Amplifier and Half Wave Rectifier.

Intermediate Frequency:-455 Kc.

Tuning Range:-540 Kc. (Kilocycles) to 1650 Kc.

Power Consumption:-40 Watts (approximately).

Power Output:-Max. 1.5 Watts. Undistorted .75 Watts.

General Description:-

The Mantel Model "BP" is a 4 tube superheterodyne broadcast receiver designed to operate from 200-250 volts 50 cycle AC. mains. The sensitivity, 30 microvolts for an output of 50 milliwatts with a 2,500 ohm load is comparatively high for a 4 tube receiver.

The circuit is very conventional and needs no note of any features beyond drawing attention to the dual purpose rectifier/output tube type 32L7GT, the rectifier section of which is half wave.

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SUBJECT-Alignment Procedure-Model "BP"

Equipment:-

Signal Generator.
Output Meter.
Alignment Tool.
Dummy Antenna:-
.01MFD. Mica Capacitor.
50MMFD. Mica Capacitor.

Alignment Conditions:-

Output Level 50 Milliwatts.
Load Impedance 2,500 ohms.
Volume Control-Maximum Volume (Fully Clockwise).

Dial Pointer Setting:-

Fully mesh the gang plates then set the pointer directly beneath the horizontal line at the low frequency end of the dial calibration.

SUBJECT-Alignment Procedure-Model "BP"

Alignment:-

Operation	Generator Frequency	Generator Connection	Dummy Antenna	Instructions
1.	455 Kc.	To control grid of IF tube.	.01MFD. mica capacitor in series with generator.	Leave grid cap on tube. Peak 2nd IF. trans. primary and secondary.
2.	455 Kc.	To control grid of converter tube.	.01MFD. mica capacitor in series with generator.	Leave grid cap on tube. Gang plates full out. Peak 1st. IF. trans. primary and secondary.
3.	1400 Kc.	To antenna lead.	50MMFD. mica capacitor in series with generator.	Turn gang and dial pointer to 1400 Kc. Adjust oscillator trimmer for logging and peak aerial coil trimmer.
4.	600 Kc.	To antenna lead.	50MMFD. mica capacitor in series with generator.	Turn gang and pointer to 600 Kc. Peak series padder condenser for max. output, rocking gang to and fro while adjusting.
5.	Repeat operations numbers 3 and 4.			

Tuning range after alignment 540-1650 Kc.

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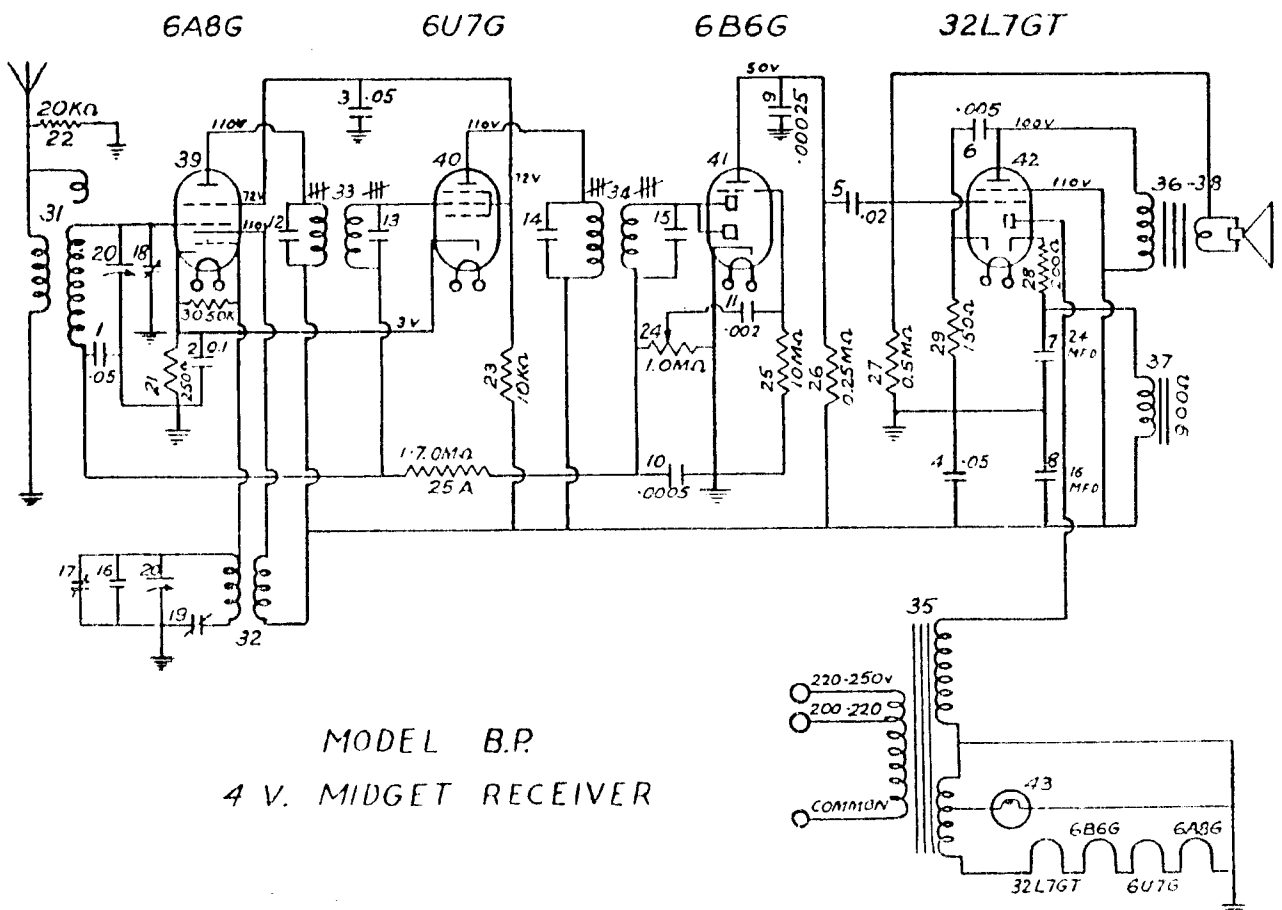
SUBJECT-Schematic Circuit Diagram-Model "BP"



MODEL B.P.

4 V. MIDGET RECEIVER

SUBJECT-Voltage Table-Model "BP"

Equipment:-

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

AC. Volt Meter: 0-10 and 0-250 volt scales.

Conditions of Test:-

230 volts 50 cycle AC. input, primary tap adjusted to 220-250 volt position. Volume control full on, no signal, set tuned to 1,000 Kc.

Heater voltages measured across filaments. All other voltages measured from socket contacts to chassis.

Tube	Fil.	Plate	Screen	Cathode	Oscl. Plate
6A8G	6.3V.	110V.	72V.	3V.	110V.
6U7G	6.3V.	110V.	72V.	3V.	–
6B6G	6.3V.	50V.	–	–	–
32L7GT (Pentode Section)	32.5V.	100V.	110V.	7V.	–
32L7GT (Rectifier Section)	32.5V.	210V.	RMS. The initial surge voltage across the first electrolytic is 190V. dropping to normal operating value of 160V.		

DC. voltage across field coil is 52V.

TECHNICAL BULLETIN

SUBJECT-Component Parts List-Model "BP"

Circuit No.	Part Name	Tol.±	Rating	Part No.
1.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
2.	.1MFD. Paper Condenser	20%	200V. DCW	PC218
3.	.05MFD. Paper Condenser	20%	400V. DCW	PC109
4.	.05MFD. Paper Condenser	20%	400V. DCW	PC109
5.	.02MFD. Paper Condenser	20%	400V. DCW	PC111
6.	.005MFD. Paper Condenser	20%	600V. DCW	PC252
7.	24MFD. Electrolytic Condenser	20%	350VP.	PC276
8.	16MFD. Electrolytic Condenser	20%	350VP.	PC275
9.	.00025MFD. Mica Condenser	10%	1000VT.	PC126
10.	.0005MFD. Mica Condenser	10%	1000VT.	PC144
11.	.002MFD. Paper Condenser	20%	600V. DCW	PC112
12.	.0001MFD. Mica Condenser	5%	1000VT.	PC227
13.	.00005MFD. Mica Condenser	5%	1000VT. in 1st IF.	PC268 transformer
14.	.0001MFD. Mica Condenser	5%	1000VT.	PC227
15.	.0001MFD. Mica Condenser	5%	1000VT. in 2nd IF.	PC227 transformer
16.	25MMFD. Wire Wound Condenser			PC222
17.	Trimmer Condenser oscl. coil wire wound			PC367
18.	Trimmer Condenser antenna trans.			PC256
19.	Series Padding Condenser 150-500MMFD.			PC164
20.	2 Gang Variable Condenser			PC272
21.	250 Ohm Wire Wound Resistor	10%	½ Watt	PR259
22.	20,000 Ohm Carbon Resistor	10%	½ Watt	PR166
23.	10,000 Ohm Carbon Resistor	10%	½ Watt	PR164
24.	1 Megohm Carbon Potentiometer			PR202
25.	10 Megohm Carbon Resistor	10%	1 Watt	PR236
25A	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
26.	250,000 Ohm Carbon Resistor	10%	½ Watt	PR249
27.	500,000 Ohm Carbon Resistor	10%	½ Watt	PR245
28.	200 Ohm Wire Wound Resistor	5%	3 Watt	PR206
29.	150 Ohm Wire Wound Resistor	10%	½ Watt	PR237
30.	50,000 Ohm Carbon Resistor	10%	½ Watt	PR160
31.	Antenna Transformer			PT223
32.	Oscillator Transformer			PT230
33.	1st IF. Transformer.			PT208
34.	2nd IF. Transformer			PT209
35.	Power Transformer			PT237
36.	Input Transformer			
37.	900 Ohm Field Coil			PM377
38.	Dynamic Speaker 5 inch			
39.	Tube Type 6A8G			
40.	Tube Type 6U7G			

SUBJECT-Component Parts List-Model "BP"

Circuit No.	Part Name	Tol.±	Rating	Part No.
41.	Tube Type 6B6G			
42.	Tube Type 32L7GT			
43.	Dial Lamp Miniature Bayonet, G3½ Bulb.		6-8 Volt. .15 Amp	PM220
44.	Mains Tap Board Assembly			PM204 changed to 152/30A
45.	Mains Tap Board Cover			PM205 changed to 151/30A
46. 47. 48.	8 Pin Socket-Small			PM227 changed to PM532
49.	8 Pin Socket-Large			PM148
50. 51. 52.	Contact Strip Assembly			PM316 changed to A103/509
53.	IF. Trans. Mounting Plate			10/220
54.	Dial and Speaker Mt. Frame			2/220
55.	Rubber Grommet			40/300
56.	Power Cord (2 core)			WM144
57.	B/c Adaptor			PM281
58.	1st IF. Pri. Adj. Screw			
59.	1st IF. Sec. Adj. Screw			
60.	2nd IF. Pri. Adj. Screw			
61.	2nd IF. Sec. Adj. Screw			
62. 63. 64.	Valve Shield			PM378
65.	Contact for Dial Lamp Lead			17/245
66.	Small Grid Clip			76/30A
67.	Metal Chassis			
68.	Tuning Control			10/30A
69.	Aerial Lead-16 ft.			WM50
70.	2nd IF. Trans. Mounting Clamp			11/220
71.	Dial Glass			14/220
72.	Drive Pulley			20/220
73.	Cabinet			26/220
74.	Knob			37/55-3
75.	Cabinet Back Strap-metal			39/220
76.	Dial Pointer			16/220
77.	Earth Contact-valve shield			22/300
78.	Dial Cord Spring			7/55

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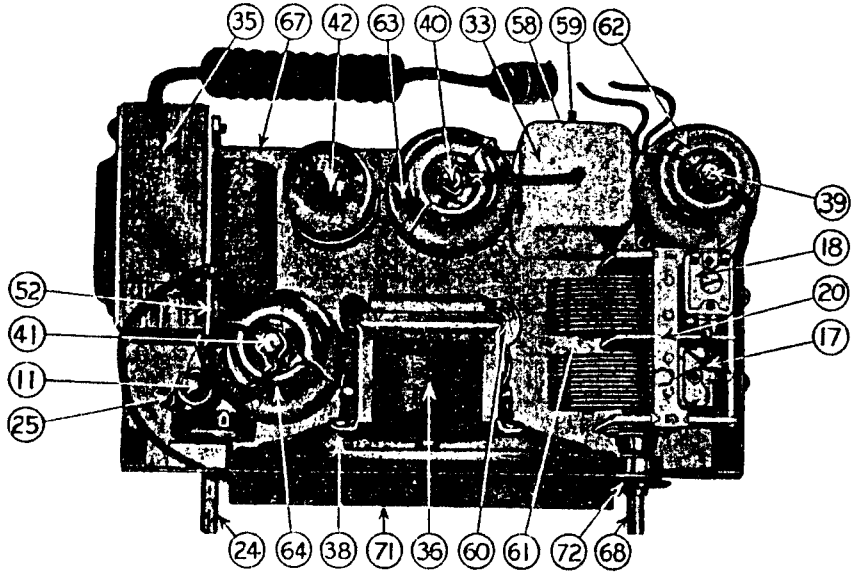
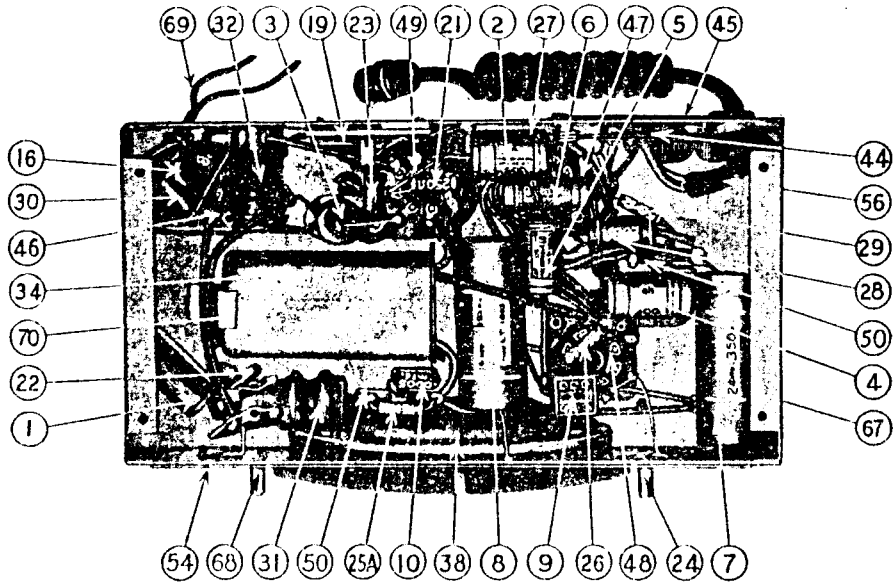
SUBJECT--Top View of Chassis-Model "BP"



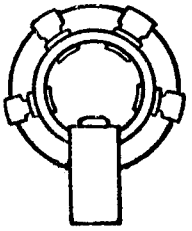
Bottom View of Chassis-Model "BP"



SUBJECT--Coil and IF. Transformer Connections--Model "BP"

Antenna

Earth (Chassis)



Grid

AVC.

Ant. Trans.

(B+) Red

Black (Series Pad)

(Oscl. plate) Blue

Green (Oscl. Grid)

Oscl. Coil

Red lead-B+
Blue lead-Plate
Green lead-Grid
Black lead-Grid return

1st IF. Trans.

Red lead-B+
Blue lead-Plate
Green lead-Diode
Black lead-Diode return

2nd IF. Trans.

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SUBJECT-Coil and IF. Transformer Connections-Model "BP"

Primary: Common-red
Primary: 230V. Tap-green
Primary: 250V. Tap-black
} all pri. leads out one side.

HT. Secondary: Both leads-blue.
Static Shield-yellow.
Fil.: Earth lead-black.
Fil.: Tap (pilot lamp) green
Fil.: Inside-red.

Note:-The HT. sec. and Fil. earth leads were later joined internally and brought out as one lead.

SUBJECT-Summary of Changes Made During Production of This Receiver.

15/2/40 to 30/1/41.

A. Dial lamp (PM220) .15 Amp 6-8 volt bayonet base, small round bulb changed to a lamp of the same type (part number PM395) with a tubular type bulb (T3¼) to provide more illumination.

B. .1MFD./200V. paper condenser circuit number 2 on cathode of converter and 1F. tubes changed to a .5MFD. paper condenser Tol. ±20% 200V. DCW part number PC158 to prevent instability and regeneration.

C. 250 ohm bias resistor changed to a 500 ohm wire wound adjustable resistor part number PR201. This change was made to overcome variations in tubes.

D. 20MMFD. wire wound capacity part number PC166 used in place of 25MMFD. cond. across oscl. trimmer cond. to improve peaking position.

E. An improved type wire wound trimmer 0-30MMFD. part number PC663 is to be used for replacing oscl. trimmer cond. PC367. The 20 or 25MMFD. capacity is not required with trimmer condenser PC663.

F. Two 5 megohm resistors wired in series were used in place of 10 meg. (circuit number 25) when 10 meg. resistors were not obtainable.

G. Midget type 1 meg. volume control part number PR202 changed to a slightly larger 1 meg. control (part number PR343) made by Radio Corporation when the midget type were unprocurable. This change necessitated 6B6G tube to be changed to a 6Q7 tube. 6B6G tube shield and shield earth contact also being deleted.

H. A built in aerial was added to receiver. This aerial utilized the 3rd wire (green lead) of the 3 core mains cable and the cabinet back strap for signal pick-up.

A single pin socket in the cabinet back strap was provided so that the built in aerial plug could be removed and an ordinary aerial (15-20 ft.) inserted.

Alignment:-

Dummy Antenna 133MMFD:-

Connected to single pin socket in cabinet back strap. Receiver fully assembled or 150MMFD. dummy antenna connected to eyelet lug on wire direct from aerial coil. Built in aerial disconnected.

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TECHNICAL BULLETIN

SUBJECT—Substitute Rectifier/Output Tube – Receiver Type "BP"

The four tube midget receiver Model "BP" may use a type 117L7/M7GT tube in place of the 32L7GT tube providing the following alterations are made.

1. The wiring of the socket to suit a 117L7/M7GT tube is the same as for a 32L7GT tube except for the amplifier grid and screen connections as shown below.

Socket Connections

32L7GT	117L7/M7GT
Pin 1. Rectifier Cathode	Pin 1. Rectifier Cathode
Pin 2. Heater	Pin 2. Heater
Pin 3. Amplifier Plate	Pin 3. Amplifier Plate
Pin 4. Amplifier Screen	Pin 4. Amplifier Grid
Pin 5. Amplifier Grid	Pin 5. Amplifier Screen
Pin 6: Rectifier Plate	Pin 6. Rectifier Plate
Pin 7. Heater	Pin 7. Heater
Pin 8. Amplifier Cathode	Pin 8. Amplifier Cathode

2. The power transformer part number PT237 must be replaced with a different power transformer part number PT825 the physical dimensions being identical.

   The wiring of this transformer PT825 is the same as for PT237 except for the following:-

   (a) The 6A8G, 6U7G and 6B6G tube filaments are connected in series and wired to the LT. secondary tap. (yellow lead)

   (b) The 117L7/M7GT tube filament is wired across the full LT. secondary winding.

   (c) Transformer lead colours and positions are shown below.