



RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

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

TECHNICAL BULLETIN

BULLETIN FP-1.
File:--Receivers AC.
Date: 15/4/47.
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SUBJECT-

Model "FP"

5 Tube Dual Wave 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.

SUBJECT-Technical Specifications-Model "FP"

Tube Complement: Type 6J8G Converter.
Type 6U7G IF. Amplifier.
Type 6B6G Detector, AVC. and 1st Audio.
Type 6V6GT Beam Power Output.
Type 5Y3G Full Wave Rectifier.

Intermediate Frequency: 455 Kcs.

Tuning Range: Broadcast: 540 Kc. (Kilocycles) to 1640 Kc.
555 M. (Meters) to 182.9 M.
Shortwave: 5.8 Mc. (Megacycles) to 18.5 Mc.
50 M. (Meters) to 16 M.

Calibration: Straight Line Frequency.

Power Consumption: 55 Watts (approx.).

General Description:

The Model "FP" is a 5 tube dual wave superheterodyne receiver designed as a mantel model. The sensitivity on broadcast is 10 microvolts and 20 microvolts on shortwave for an output of 50 milliwatts with a load impedance of 5000 ohms.

The circuit consists of a Triode Heptode converter tube type 6J8G followed by an IF. amplifier using a type 6U7G tube, a type 6B6G tube for diode detection, AVC. and 1st audio with a type 6V6G tube as output amplifier. A type 5Y3G tube is used for full wave rectification.

Bias for the converter, IF. amplifier and output tubes is obtained from separate cathode bias circuits and for the 1st audio stage grid leak bias is obtained from the 3 megohm resistor (48) in the 6B6G tube grid circuit.

AVC. voltage is obtained from the signal diode and applied to the converter and IF. tubes. Delay is obtained by connecting the AVC. line to the second diode in the 6B6G which has a small positive potential applied to it through resistor (47) causing it to conduct. No negative voltage is applied to the controlled tubes until the signal diode negative voltage is high enough to cut off the current through this diode.

Three distinct conditions of tone have been provided in the design of the circuit. The first position provides a condition of maximum intelligibility when receiving long distance stations. In this position no feedback is used. For the second position inverse feedback is applied to the grid of the 6B6G tube from the speaker voice coil via the volume control tap and bringing into operation circuit components 62, 11, 60, 56 and 4, providing bass and treble boost. The third position switches out of circuit resistor 56 and condenser 4 producing bass cut. On positions two and three the circuit operates from very low to maximum volume, but the boost is progressively reduced as maximum is approached.

Shortwave Operation: The operation of the circuit on shortwave is substantially the same as on broadcast except that no AVC. is applied to the converter stage.



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SUBJECT-Alignment Procedure-Model "FP"

Equipment:- Signal Generator.
Output Meter.
Alignment Tool. PM581

Dummy Antenna: .01MFD. Mica Capacitor.
.0002MFD. Mica Capacitor.
400 Ohm Non-Inductive Resistor.

Alignment Conditions:- Load Impedance-5,000 Ohms.
Output Level-50 Milliwatts.
Volume Control Full on (Clockwise).
Tone Control- Fully Anti-clockwise.

Alignment:- Intermediate Frequency - 455KC

Opera- tion	Generator Connection	Frequency	Dummy Antenna	Instructions
<u>TURN WAVE CHANGE SWITCH ON BROADCAST POSITION</u>				
1.	To control grid of 6U7G tube.	455 Kc.	.01MFD. mica capacitor in series with generator.	Leave grid cap on tube. Gang plates full out. Peak 2nd IF. trans. primary and secondary.
2.	To grid of 6J8G tube	455 Kc.	.01MFD. mica capacitor in series with generator.	Leave grid cap on tube. Gang plates full out. Peak 1st IF. trans. primary and secondary.
3.	To antenna terminal.	1400 Kc.	200MMFD. mica capacitor in series with generator.	Turn dial pointer and gang to 1400 Kc. Adjust B/cast. oscl. trimmer for logging and peak B/cast. aerial coil trimmer.
4.	To antenna terminal.	600 Kc.	200MMFD. mica capacitor in series with generator.	Turn dial pointer and gang to 600 Kc. Peak B/cast. series padder for maximum output rocking the gang to and fro through the signal while adjusting. Repeat operations No. 3 and 4.
<u>TURN WAVE CHANGE SWITCH TO SHORTWAVE POSITION</u>				
6.	To antenna terminal.	16 Mc.	400 Ohm non- inductive re- sistor in series with generator.	Turn dial pointer and gang to 16 Mc. Adjust S/wave oscl. trimmer for logging and peak S/wave aerial coil trimmer.
7.	To antenna terminal.	7 Mc.	" " " " "	Turn gang and dial pointer to 7 Mc. and check tracking.



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SUBJECT-Voltage Table-Model "FP"

Equipment:-

DC. Volt Meter: 1,000 ohm per volt meter with 0-10, 0-250 and 0-500 volt scales.

AC. Volt Meter: 0-10, 0-250 and 0-500 volt scales.

Conditions of test:-

230 volts 50-cycle AC. input to 220-250 volt primary tap. Set tuned to 1,000 Kc., volume control full on, no signal. Filament voltages measured across heaters. All other voltages measured from tube socket contacts to chassis.

Tube	Fil.	Plate	Screen	Cathode	Oscl. Plate
6J8G	6.3V.	245V.	82V.	2.26V.	126V.
6U7G	6.3V.	245V.	82V.	2.2V.	
6B6G	6.3V.	70V.			
6V6G	6.3V.	240V.	245V.	12V.	
5Y3G	5V.	275/275V.			

RMS. The initial surge voltage across the first electrolytic (circuit No. 32) is 370 volts dropping to normal operating value of 275 volts. DC voltage drop across filter choke is 30 volts.

SUBJECT—Component Parts List—Model "FP"

Circuit No.	Part Name	Tol.±	Rating	Part No.
1.	.5MFD. Paper Condenser	20%	200V. DCW	PC121
2.	.25MFD. Paper Condenser	20%	400V. DCW	PC128
3.	.1MFD. Paper Condenser	20%	400V. DCW	PC103
4.	.1MFD. Paper Condenser	20%	200V. DCW	PC218
5.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
6.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
7.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
8.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
9.	.03MFD. Paper Condenser	20%	200V. DCW	PC303
10.	.02MFD. Paper Condenser	20%	400V. DCW	PC111
11.	.01MFD. Paper Condenser	20%	600V. DCW	PC140
12.	.002MFD. Paper Condenser	20%	600V. DCW	PC112
13.				
14.	.004MFD. Mica Condenser	5%	1000VT	PC299
15.	.00025MFD. Mica Condenser	10%	1000VT	PC126
16.	.0001MFD. Mica Condenser	10%	1000VT	PC110
17.	.0001MFD. Mica Condenser	10%	1000VT	PC110
18.	.0001MFD. Mica Condenser	10%	1000VT	PC110
19.	.00005MFD. Mica Condenser	10%	1000VT	PC141
20.	.00005MFD. Mica Condenser	10%	1000VT	PC141
30.	25MFD. Electrolytic Condenser	20%	40PV	PC269
31.	16MFD. Electrolytic Condenser	20%	525PV	PC300
32.	8MFD. Electrolytic Condenser	20%	525PV	PC313
35.	Trimmer Condenser (B/cast.) Ant. Trans. }			
36.	Trimmer Condenser (S/wave.) Ant. Trans. }			
			Ant. Trimmer Ass.	PC658
42.	Trimmer Condenser, Wire Wound (B/cast. Osc. Trans.)			PC663
43.	Trimmer Condenser, Wire Wound (S/wave. Osc. Trans.)			PC663
44.	2 Gang Variable Condenser			PC636
45.	Variable Padder Condenser (B/cast.)			PC164
47.	10 Megohm Carbon Resistor	10%	1 Watt	PR236
48.	3 Megohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR282
49.	1.75 Megohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR248
50.	500,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR245
51.	250,000 ohm Carbon Resistor	10%	1 Watt	PR496
52.	100,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR103
53.	50,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
54.	50,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
55.	50,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR160
56.	20,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR166
57.	20,000 ohm Carbon Resistor	10%	1 Watt	PR171
58.	20,000 ohm Carbon Resistor	10%	1 Watt	PR171
59.	10,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR164
60.	5,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR250
61.	2,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR253
62.	2,000 ohm Carbon Resistor	10%	$\frac{1}{2}$ Watt	PR253
63.	300 ohm Wire Wound Resistor	10%	1 Watt	PR122
64.	300 ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR258
65.	300 ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR258
66.	50 ohm Wire Wound Resistor	10%	$\frac{1}{2}$ Watt	PR280



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SUBJECT--Component Parts List Model "FP"

Circuit No.	Part Name	Tol.±	Rating	Part No.
67.	50 ohm Wire Wound Resistor	10%	½ Watt	PR280
68.	.5 Megohm Volume Control	20%		PR377
69.	{ Power Transformer (200-250 Volt 50 Cycle)			PT807
	{ Power Transformer (200-260 Volt 40 Cycle)			PT809
71.	1st IF. Transformer			PT461
72.	2nd IF. Transformer			PT462
73.	Antenna Transformer (B/cast.)			PT381
74.	Antenna Transformer (S/wave.)			PT463
75.	Osc. Transformer (B/cast.)			PT383
76.	Osc. Transformer (S/wave.)			PT464
79.	Type 6J8-G Tube			
80.	Type 6U7-G Tube			
81.	Type 6B6-G Tube			
82.	Type 6V6-G Tube			
83.	Type 5Y3-G Tube			
85.	8-Pin Socket (5)			PM532
87.	Valve Shields (2)			PM217
88.	6-in. Permag. Speaker 5,000 ohm input			K126
89.	Wave Change Switch			PM635
90.	Tone Control			PM597
91.	Dial Lamp	6.2V.	.25A.	PM678
92.	Filter Choke 14 Henry 60 M/a.			PT806

Part Name

Part No.

Cond. Mt. Bracket Front	45/409-1
Cond. Mt. Bracket Rear	45/409-2
Dial Drum Assembly	A102/617
Manual Drive Assembly	A109/295
Gramo Pickup Plug Assembly	A101/513
Contact Strip Assembly (6)	A103/509
Coil Mt. Piece (Shortwave Coils)	94/30C
Valve Shield Earth Contacts (2)	22/30C
Dial Back Assembly	A110/407-2
Diffuser	27/407
Dial Pointer Assembly	A111/407
Dial Pulley Stud (Short)	18/87
Dial Pulley Stud (Long)	18/87-2
Dial Idler Pulley (2)	17/87
Lamp Holder	A129/30C
Bakelite Cabinet	59/81
Control Knob (4)	61/81
Knob Spring (4)	17/81
A.C. Mains-Tap Strip Assembly	A101/30C-1
Dial Reading-Glass	2/618

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

