

RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

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

TECHNICAL BULLETIN

BULLETIN MJ-1

File: Receivers,
Battery

Date: 4/4/46

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SUBJECT—Alignment Instructions—Receiver Type “MJ.”

Equipment:—

Signal Generator

Dummy Antenna:—

.01MFD. Mica Capacitor.

.0002MFD. Mica Capacitor.

400 Ohm Non Inductive Resistor.

Output Meter.

Alignment Tool.

Alignment Conditions:—

Load Impedance—15,000 Ohms.

Output Level—50 milliwatts.

Battery Supply—“A” 2 volts. “B” 135 volts.

Volume Control—Maximum Volume (Fully clockwise).

Tone Control—High tone position

Wave change Switch—Broadcast Band.

Alignment:—

Intermediate Frequency 455Kc.

Do not use a screw driver or alignment tool with an iron point for aligning IF. transformers. A special tool, part Number PM581 is obtainable from the factory or failing this an insulated rod with a small brass blade may be used.

Tuning Range 540Kc—1640Kc.

Set the dial pointer on the end of travel mark on the dial reading near 550Kc.

(Condenser gang plates fully meshed).

Operation	Generator Connection.	Frequency	Dummy Capacity	Instructions
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WAVE CHANGE SWITCH ON B/CAST POSITION.

- | | | | | |
|---|---|--------|---|--|
| 1 | To grid of
1M5G. tube.
Circuit No. 80 | 455Kc. | .01MFD. mica
capacitor in
series with
generator. | Leave grid cap on. Peak
3rd IF. transformer prim-
ary and secondary. |
| 2 | To grid of
1M5G tube.
Circuit No. 79 | 455Kc. | .01MFD. mica
capacitor in
series with
generator. | Leave grid cap on. Peak
2nd IF. transformer prim-
ary and secondary. |



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SUBJECT-

Type "MJ" Mantel Model

5 Tube Battery Operated Superheterodyne

Dual Wave Receiver

Operation is from 135 Volt "B" Battery
2 Volt Accumulator.

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 Transformer Connections.

SUBJECT-Technical Specifications-Receiver Type "MJ."

Tube Complement:

Type 1C7G Converter.
Type 1M5G IF. Amplifier.
Type 1M5G IF. Amplifier.
Type 1K7G Detector, AVC. and Driver.
Type 1L5G Output Amplifier.

Intermediate Frequency-455Kc.

Tuning Range.

Broadcast: 540Kc. (Kilocycles) to 1640Kc.
Short Wave: 5-8Mc. (Megacycles) to 18.5Mc.

Calibration-Straight Line Frequency.

Operating Voltages.

Operating voltages are "B" Battery 135 Volts,
"A" Battery 2 Volt Accumulator.

General Description.

This receiver is a five valve dual wave superheterodyne. The circuit design comprises tuned aerial and oscillator stages, a 1C7G converter, two intermediate frequency amplifier stages using 1M5G tubes, a 1K7G tube for diode detection, A.V.C. and 1st audio followed by a 1L5G pentode power output tube.

Three positions are provided for tone control. The first position being normal tone, the second position bringing into circuit a .006MFD. cond. and a 1 megohm resistor (circuit numbers 13 and 36) providing negative feedback and producing bass boost. The third position switches into circuit a .0003MFD. condenser (circuit number 23) providing treble cut.

Broadcast Operation.

Full A.V.C. is applied to the converter and 1st IF. stages. No A.V.C. is applied to the 2nd IF. stage. 4.6V bias for the output tube is developed across the back bias resistors consisting of 250 Ohms and 150 Ohms in series (circuit numbers 59 and 60) 1.8 volts bias developed across the 150 ohm resistor (circuit number 60) is applied to the converter, 1st and 2nd IF. valves.

Shortwave Operation.

Operation on shortwaves is substantially the same as on broadcast, except that no A.V.C. or bias is applied to the converter valve.

SUBJECT—Alignment Instructions—Receiver Type "MJ."

Operation	Generator Connection	Frequency	Dummy Capacity	Instructions
3	To grid of 1C7G tube.	455Kc.	.01MFD. mica capacitor in series with generator	Cond. gang plates full out Leave grid cap on. Peak 1st IF. transformer primary and secondary
4	To antenna lead	1400Kc.	.0002MFD. mica capacitor in series with generator	Set dial pointer on 1400Kc Adjust B/cast oscillator trimmer for logging and peak B/cast aerial coil trimmer for maximum
5	To antenna lead	600Kc	.0002MFD. mica capacitor in series with generator.	Set dial pointer on 600Kc. Peak B/cast series padder, rocking gang to and fro while adjusting for maximum output
TURN WAVE CHANGE SWITCH TO S/WAVE POSITION.				
6	To antenna lead	16Mc.	400 Ohm non-inductive resistor in series with generator	Set dial pointer on 16Mc. Adjust S/wave oscillator trimmer for logging and peak S/wave aerial coil trimmer for maximum output
7	To antenna lead	7Mc.	400 Ohm non-inductive resistor in series with generator.	Check tracking



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SUBJECT—Component Parts List—Electrical—Receiver Type “MJ.”

Circuit No.	Part Name	Rating	Tol.±	Radio Cor Part No.
1.	.1 MFD. Paper Condenser	400V. DCW.	20%	PC103
2.	.1 MFD. Paper Condenser	200V. DCW.	20%	PC218
3.				
4.	.05 MFD. Paper Condenser	400V. DCW.	20%	PC109
5.	.05 MFD. Paper Condenser	400V. DCW.	20%	PC109
6.	.05 MFD. Paper Condenser	400V. DCW.	20%	PC109
7.	.05 MFD. Paper Condenser	200V. DCW.	20%	PC102
8.	.05 MFD. Paper Condenser	200V. DCW.	20%	PC102
9.	.05 MFD. Paper Condenser	200V. DCW.	20%	PC102
10.	.02 MFD. Paper Condenser	400V. DCW.	20%	PC111
11.	.02 MFD. Paper Condenser	400V. DCW.	20%	PC111
12.				
13.	.006 MFD. Paper Condenser	600V. DCW.	20%	PC217
14.	.006 MFD. Paper Condenser	600V. DCW.	20%	PC217
15.				
16.				
17.	.004 MFD. Mica Condenser	1000VT.	5%	PC299
18.	.001 MFD. Mica Condenser	1000VT.	10%	PC108
19.	.0002 MFD. Mica Condenser	1000VT.	10%	PC124
20.	.00005 MFD. Mica Condenser	1000VT.	10%	PC141
21.	.00005 MFD. Mica Condenser	1000VT.	10%	PC141
22.	.0001 MFD. Mica Condenser	1000VT.	10%	PC110
23.	.0003 MFD. Mica Condenser	1000VT.	10%	PC212
24.				
25.				
26.	8 MFD. Electrolytic Condenser	525VP	20%	PC313
27.	8 MFD. Electrolytic Condenser	525VP	20%	PC313
28.	0-30 MMFD. W.W. Trimmer	—	—	PC663
29.	0-30 MMFD. W.W. Trimmer	—	—	PC663
30.	150-500 MMFD. Padder Cond. (B/cast)	—	—	PC164
31.	2 Gang Varb. Condenser	—	—	PC636
32.	Neutralizing Condenser	—	—	PC675
33.	1.5-18 MMFD	} Double Trimmer Assembly	—	PC658
34.	3-55 MMFD.			
35.				
36.	1 Megohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR246
37.	3 Megohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR282
38.	1.75 Megohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR248
39.	1.75 Megohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR248
40.	1 Megohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR246
41.	1 Megohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR246
42.	500,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR245
43.	250,000 Ohm Carbon Resistor	1 Watt	10%	PR496
44.	250,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt	10%	PR249



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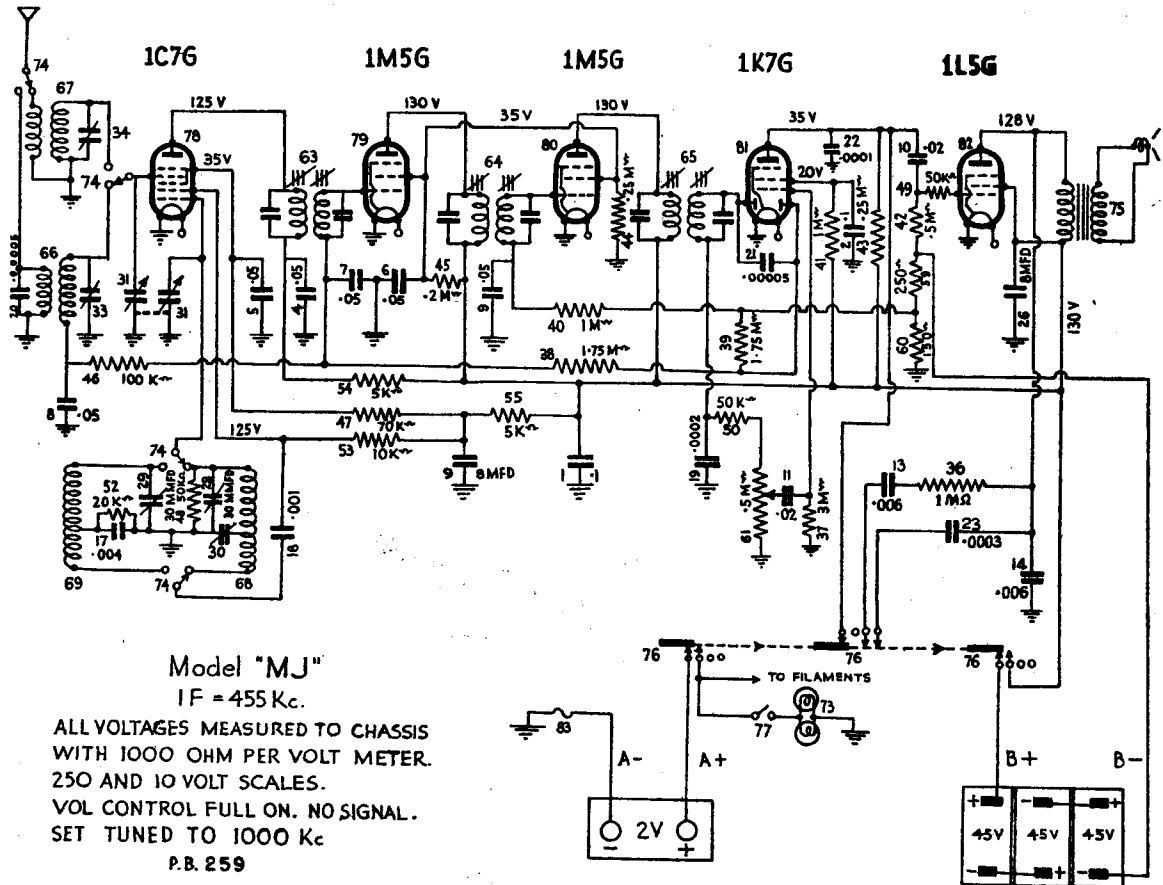
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SUBJECT-Schematic Circuit Diagram-Receiver Type "MJ."



SUBJECT--Component Parts List--Electrical--Receiver Type "MJ."

Circuit No.	Part Name	Rating	Tol	±	Radio Corp. Part No.
45.	200,000 Ohm Carbon Resistor	1 Watt		10%	PR414
46.	100,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR103
47.	70,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR256
48.	50,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR160
49.	50,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR160
50.	50,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR160
51.					
52.	20,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR166
53.	10,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR164
54.	5,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR250
55.	5,000 Ohm Carbon Resistor	$\frac{1}{2}$ Watt		10%	PR250
56.					
57.					
58.					
59.	250 Ohm W.W. Resistor	$\frac{1}{2}$ Watt		10%	PR259
60.	150 Ohm W.W. Resistor	$\frac{1}{2}$ Watt		10%	PR237
61.	.5 Megohm Carbon Volume Control	—		—	PR380
62.					
63.	1st IF. Transformer	—		—	PT386
64.	2nd IF. Transformer	—		—	PT386
65.	3rd IF. Transformer	—		—	PT387
66.	Antenna Transformer (B/cast)	—		—	PT381
67.	Antenna Transformer (S/wave)	—		—	PT463
68.	Oscillator Coil (B/cast)				PT414
69.	Oscillator Coil (S/wave)				PT464
70.					
71.					
72.	Socket, 8 pin				PM532
73.	Lamp, Min. Screw Base, G3 $\frac{1}{2}$ Bulb, 2.5V. .3A				PM477
74.	Switch 2D, 3P, 2-way (Wave Change)				PM635
75.	Speaker 6/12 Permag. 15,000 ohm input.				PM631
76.	Switch 1D, 3P, 4-way (Battery switch)				S114
77.	Switch Press Button				PM395
78.	Tube Type 1C7G				
79.	Tube Type 1M5G				
80.	Tube Type 1M5G				
81.	Tube Type 1K7G				
82.	Tube Type 1L5G				
83.	Fuse (1 Strand of .012 tinned copper wire).				

SUBJECT-Voltage Table-Receiver Type "MJ"

Equipment:-

1,000 Ohm per volt meter with 0-250 volt and 0-10 volt scales.
0-1,000 M/a meter.

Conditions of Test:-

Set turned to 1,000 Kc.
Volume control full on (clockwise) no signal.
All voltages measured from tube socket contacts to chassis.
"A" Battery 2 volts. "B" Battery 135 volts.

Tube	Fil.	Plate	Screen	Grid	Oscillator Plate
1C7G	2V.	125V	35V	1.8V.	83V.
1M5G	2V.	130V.	35V.	1.8V.	-
1M5G	2V.	130V.	35V.	1.8V.	-
1K7G	2V.	35V.	20V.	-	-
1L5G	2V.	128V.	130V.	4.6V.	-

"A" Current drain 720 M/a (does not include dial lamps)

"B" Current drain 12 M/a (no signal).



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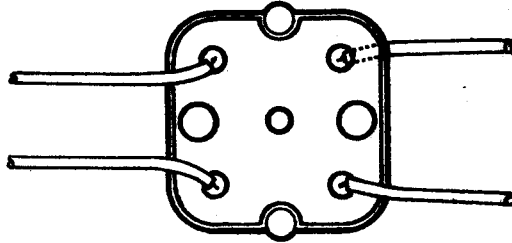
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SUBJECT-Coil and Transformer Connections-Receiver Type "MJ."

(AVC) Black Green (1M5G Grid)



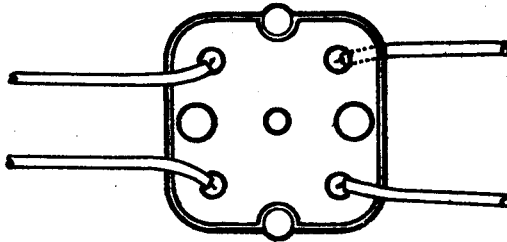
(1C7G Plate)

Blue

Red (Junction of circuit Nos.
4 & 54)

1st IF. TRANSFORMER.

(AVC) Black Green (1M5G Grid)



(1M5G Plate)

Blue

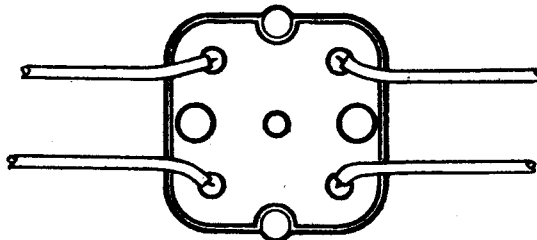
Red (B+)

2nd IF. TRANSFORMER.

(Junction of circuit
Nos. 19 & 50)

Black

Green (1K7G diode)



(1M5G Plate)

Blue

Red (B+)

3rd IF. TRANSFORMER.



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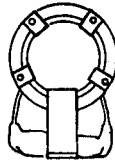
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SUBJECT—Component Parts List—Mechanical—Receiver Type “MJ.”

Part Name	Radio Corp. Part No.
Chassis	A101/618
Valve Shield (3)	162/30A
Valve Shield Clamp (3)	161/30A
Dial Drum Assembly	A103/612
Manual Drive Assembly	A109/295
Single Pin Socket Bottom	18/96
Single Pin Socket Top	19/96
Single Pin Socket Contact	15/58-2
Negative Battery Clip	3/245-2
Positive Battery Clip	3/245-1
Dial Frame Assembly	A110/407-2
Lamp Socket Assembly (2)	A108/246
Dial Pointer	A111/407
Diffuser Glass	27/407
Dial Glass	6/618
Cabinet Type M2	59/81-1
Control Knobs (4)	61/81
Dial Springs (2)	27/87
Knob Springs	17/81
Valve Shield Earth Contacts (3)	22/30C
Cabinet Feet (4)	96/47
Speed Nuts (8)	227/250

SUBJECT—Coil and Transformer Connections—Receiver Type “MJ.”

A.V.C.



Earth

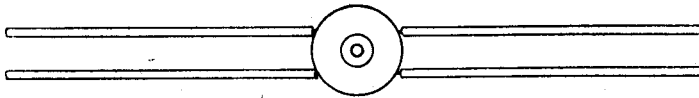
(Outside secondary) Grid

Antenna. (Inside Primary)

ANT. TRANS. B/CAST.

(padder cond.) Red

Black (padder cond.)



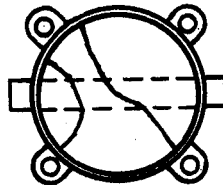
(1C7G Oscl. Plate cond.) Blue

Green (1C7G Oscl. grid)

OSCL. COIL B/CAST.

Earth

Antenna



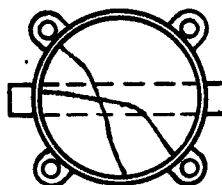
Earth

Grid

ANT. TRANS. S/WAVE.

1C7G Oscl. Grid

Series Padder



1C7G Oscl. plate cond.

Series Padder

OSCL. COIL S/WAVE.