



# RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

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

## TECHNICAL BULLETIN

BULLETIN-"HMQ"-1

File: RECEIVERS  
VIBRATOR

Date: 1/9/50.

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### SUBJECT-MANTEL MODEL "H.M.Q."

5 Tube Superheterodyne Receiver  
Incorporating Bandspreading of the  
19, 25 and 31 metre Shortwave Bands

For operation from: A 32 volt D.C. Supply.

Current Consumption: 0.53 Amps (Does not include dial lamps or band indicator lamp)

0.75 Amps (Includes three dial lamps and one band indicator lamp all wired in series. Each lamp 6-8 volt 0.25 amp).

#### TUNING RANGE.

Broadcast Band	535-1640 Kc/s.
19 metre band	14.9-15.5 Mc/s (Bandspread)
25 metre band	11.6-12.1 Mc/s (Bandspread)
31 metre band	9.4- 9.8 Mc/s (Bandspread)

#### RECEIVER COVERAGE.

(approx.)
560.7-182.9 metres
20.13- 19.29 metres
25.86- 24.79 metres
31.91- 31.63 metres

#### This Bulletin contains:

1. Alignment Instructions.
2. Circuit Diagram.
3. Component Parts List.
4. Connections for IF and RF Trans.

SUBJECT-Alignment Instructions.-Model "HMQ".

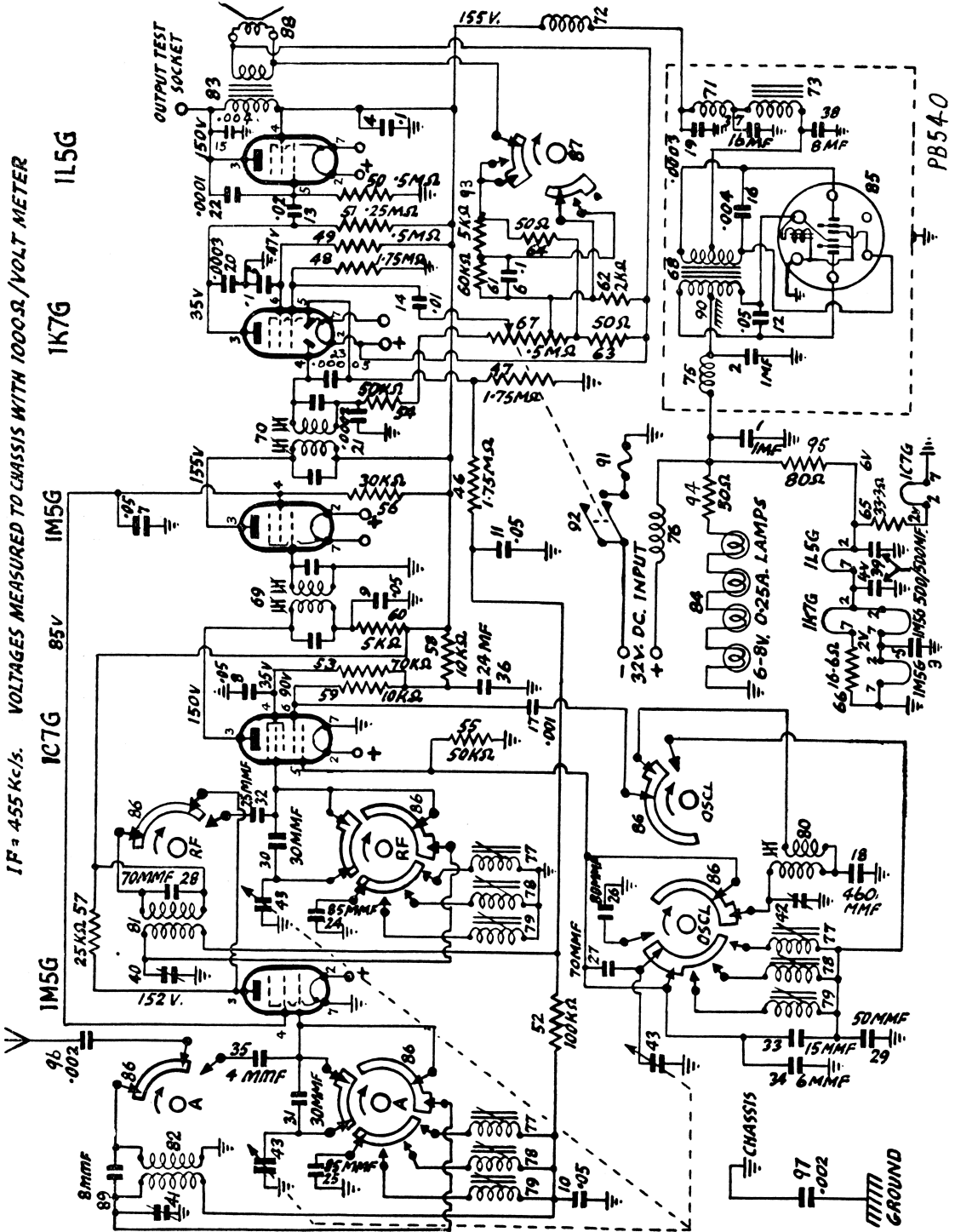
<u>Alignment Conditions.</u>		<u>Equipment.</u>
Load impedance	-15,000 ohms	Signal generator
Output level	-50 milliwatts	Output meter
Volume control	-Max. Vol. (fully clockwise)	Mica capacitor -0.01 MFD
		Dummy Antenna -200 MMFD Mica capacitor
Tone control	-Treble position	
Intermediate freq.	-455 Kc/s	Dummy Antenna -400 Ohm non-inductive resistor
DC Supply	32 volt DC mains	Alignment tools-Type M195 & PM581

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
				Turn wave change switch to B/cast band.
1.	To control grid of 1M5G IF tube	455 Kc/s	0.01MFD Mica capacitor in series with generator.	Leave grid cap on. Peak 2nd IF trans. pri. and sec. for max. output.
2.	To control grid of 1C7G tube	455 Kc/s	0.01MFD Mica capacitor in series with generator	Gang plates fully out of mesh. Leave grid cap on. Peak 2nd IF. trans. pri. and sec. for max. output.
3.				Set centre of dial pointer on centre of end of travel mark near 550 Kc/s cond. gang plates fully meshed.

## RECEIVERS FITTED WITH IRON CORED B/CAST ANTENNA, R.F. AND OSCL. TRANSFORMERS

4.	To antenna terminal	600 Kc/s	200 MMFD Mica capacitor in series with generator	Turn gang and dial pointer until dial pointer is on 600 Kc/s dial mark. Leave the gang and dial pointer set in this position and peak the B/cast oscl. coil. ind. trim (iron core) for max. output.
5.	To antenna terminal	1400 Kc/s	200MMFD Mica capacitor in series with generator	Turn gang and dial pointer to 1400 Kc/s dial mark. Adjust B/cast oscl. coil trim. cond. for logging and peak B/cast ant. and RF. trans. trim. condensers for max. output.

- |     |  |           |   |  |
|-----|--|-----------|---|--|
| 6.  | To antenna terminal  | 600 Kc/s  | 200 MMFD Mica capacitor in series with generator        | Turn gang and dial pointer to 600 Kc/s dial mark. Leave the gang and dial pointer set in this position. Re-peak the B/cast oscl. coil ind. trim. (iron core) then peak the B/cast ant. and RF. trans. ind. trimmers (iron cores) for max. output. Do not rock the gang to and fro through the signal while adjusting or move the dial pointer off 600 Kc/s dial mark until after the inductance trimmers of these three transformers have been peaked for max. output. |
| 7.  | To antenna terminal  | 1400 Kc/s | 200MMFD Mica capacitor in series with generator         | Turn gang and dial pointer to 1400 Kc/s dial mark. Adjust B/cast oscl. coil trim. cond. for logging and peak B/cast ant. and RF. trans. trim. condensers for max. output.  |
| 8.  |  |           |   | Turn wave change switch to 31 metre band (this band must be aligned before the 25 and 19 metre bands).   |
| 9.  | To antenna terminal  | 9.6 Mc/s  | 400 Ohm non-inductive resistor in series with generator | Turn dial pointer and gang to 9.6 Mc/s. Adjust 31 metre band oscl. coil ind. trim. (iron core) for logging and peak 31 metre ant. and RF. trans trims. (iron cores) for max. output. Rock gang to and fro through the signal while adjusting.  |
| 10. | To antenna terminal  | 11.8 Mc/s | 400 Ohm non-inductive resistor in series with generator | Turn wave change switch to 25 metre band. Turn dial pointer and gang to 11.8 Mc/s. Adjust 25 metre band oscl. coil ind. trim. (iron core) for logging and peak ant. and RF. trans. trims. (iron cores) for max. output. Rock gang to and fro through the signal while adjusting.   |
| 11. | To antenna terminal  | 15.2 Mc/s | 400 Ohm non-inductive resistor in series with generator | Turn wave change switch to 19 metre band. Turn dial pointer and gang to 15.2 Mc/s. Adjust 19 metre band oscl. coil ind. trim. (iron core) for logging and peak ant. and RF. trans. trims. (iron cores) for max. output. Rock gang to and fro through the signal while adjusting.   |
| 12. | Check the logging of the shortwave bands on some well-known short-wave stations. If a crystal calibrator is available check the logging at each 100 Kc/s mark on the dial. |           |   |  |



## COMPONENT PARTS LIST-MODEL "HMQ".

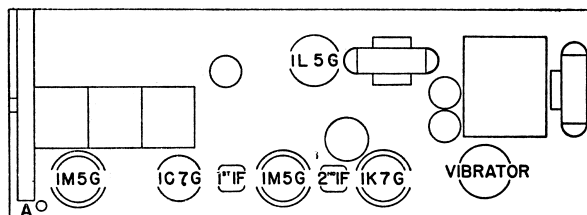
Circuit No.	Description	Tol.±	Rating	Part No.
1.	1MFD Paper Condenser	20%	200V DCW	PC182
2.	1MFD Paper Condenser	20%	200V DCW	PC182
3.	.5MFD Paper Condenser	20%	200V DCW	PC121
4.	.1MFD Paper Condenser	20%	400V DCW	PC103
5.	.1MFD Paper Condenser	20%	200V DCW	PC218
6.	.1MFD Paper Condenser	20%	200V DCW	PC218
7.	.05MFD Paper Condenser	20%	400V DCW	PC109
8.	.05MFD Paper Condenser	20%	400V DCW	PC109
9.	.05MFD Paper Condenser	20%	400V DCW	PC109
10.	.05MFD Paper Condenser	20%	200V DCW	PC102
11.	.05MFD Paper Condenser	20%	200V DCW	PC102
12.	.05MFD Paper Condenser	20%	200V DCW	PC102
13.	.02MFD Paper Condenser	20%	400V DCW	PC111
14.	.01MFD Paper Condenser	20%	600V DCW	PC140
15.	.004MFD Paper Condenser	20%	600V DCW	PC221
16.	.004MFD Paper Condenser	10%	2000VW	PC771
17.	.001MFD Mica Condenser	10%	1000VT	PC108
18.	.00046MFD Mica Condenser	2½%	1000VT	PC728
19.	.0003MFD Mica Condenser	10%	1000VT	PC212
20.	.0003MFD Mica Condenser	10%	1000VT	PC212
21.	.0002MFD Mica Condenser	10%	1000VT	PC124
22.	.0001MFD Mica Condenser	10%	1000VT	PC110
23.	.00005MFD Mica Condenser	10%	1000VT	PC141
24.	85MMFD Silvered Mica Condenser	2½%	1000VT	PC809
25.	85MMFD Silvered Mica Condenser	2½%	1000VT	PC809
26.	80MMFD Silvered Mica Condenser	2½%	1000VT	PC798
27.	70MMFD Silvered Mica Condenser	2½%	1000VT	PC799
28.	70MMFD Silvered Mica Condenser	2½%	1000VT	PC799
29.	50MMFD Silvered Mica Condenser	2½%	1000VT	PC801
30.	30MMFD Silvered Mica Condenser	±1MMFD	1000VT	PC810
31.	30MMFD Silvered Mica Condenser	±1MMFD	1000VT	PC810
32.	25MMFD Silvered Mica Condenser	±1MMFD	1000VT	PC802
33.	15MMFD Silvered Mica Condenser	±1MMFD	1000VT	PC811
34.	6MMFD Ceramicon Condenser	+1MMFD-0	1000VT	PC831
35.	4MMFD Ceramicon Condenser	+1MMFD-0	1000VT	PC830
36.	24MFD Electrolytic Condenser	20%	350PV	PC184
37.	16MFD Electrolytic Condenser	20%	350PV	PC283
38.	8MFD Electrolytic Condenser	20%	350PV	PC640
39.	500MFD Electrolytic Condenser			
	500MFD Electrolytic Condenser	20%	12PV }	
	Composite type	20%	12PV }	PC803
40.	1.5-18MMFD Trimmer Condenser			PC250
41.	1.5-18MMFD Trimmer Condenser			PC250
42.	0-30MMFD Trimmer Condenser Wire Wound			PC662
43.	3 Gang Varb. Condenser			PC653
44.				
45.				
46.	1.75 Megohm Carbon Resistor	10%	½ watt	PR248
47.	1.75 Megohm Carbon Resistor	10%	½ watt	PR248
48.	1.75 Megohm Carbon Resistor	10%	½ watt	PR248

## COMPONENT PARTS LIST-MODEL "HMQ".

Circuit No.	Description	Tol.±	Rating	Part No.
49.	.5 Megohm Carbon Resistor	10%	1 watt	PR277
50.	.5 Megohm Carbon Resistor	10%	$\frac{1}{2}$ watt	PR245
51.	.25 Megohm Carbon Resistor	10%	1 watt	PR496
52.	100,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ watt	PR103
53.	70,000 Ohm Carbon Resistor	10%	1 watt	PR617
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.	30,000 Ohm Carbon Resistor	10%	1 watt	PR156
57.	25,000 Ohm Carbon Resistor	10%	1 watt	PR116
58.	10,000 Ohm Carbon Resistor	10%	1 watt	PR325
59.	10,000 Ohm Carbon Resistor	10%	1 watt	PR325
60.	5,000 Ohm Carbon Resistor	10%	1 watt	PR304
61.	60,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ watt	PR125
62.	2,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ watt	PR253
63.	50 Ohm Wire Wound Resistor	10%	$\frac{1}{2}$ watt	PR280
64.	50 Ohm Wire Wound Resistor	10%	$\frac{1}{2}$ watt	PR280
65.	33.3 Ohm Wire Wound Resistor	5%	$\frac{1}{2}$ watt	PR506
66.	16.6 Ohm Wire Wound Resistor	5%	1 Watt	PR374
67.	.5 Megohm Carbon Potentiometer tapped at 40K Ohms and with DP. ST. switch on rear of housing	20%		PR662
68.	Transformer-Vibrator, Power			PT937
69.	Transformer-IF. No. 1			PT869
70.	Transformer-IF. No. 2			PT869
71.	Choke, HT.			PT109
72.	Choke HT.			PT109
73.	Choke HT.-Laminated			PT108
74.				
75.	Choke LT.-Layer Wound			PT111
76.	Choke LT.-Spiral Wound			PT439
77.	Spread Band Coil, 19 Metre			PT914
78.	Spread Band Coil, 25 Metre			PT913
79.	Spread Band Coil, 31 Metre			PT912
80.	Coil, Oscillator-B/cast			PT860
81.	Transformer, RF.-B/cast			PT906
82.	Transformer Antenna-B/cast			PT905
83.	Transformer, Speaker input 15,000 Ohms pri. imped.			PT915
84.	Dial and Band Indicator Lamps 6-8 Volt, 0.25 Amp. Min. Screw Base, T3 $\frac{1}{4}$ size bulb			PM678
85.	Vibrator 32 Volt Synchronous			M225
86.	Wave Change Switch			S166
87.	Tone Control Switch			S175
88.	Speaker 6" Permag			K147
89.	8MMFD-(Part of Circuit No. 82)			PC832
90.	(Mica Strip for Hash Plate (Bakelite Strip for Hash Plate			29/216 19B/47 S36T
91.	Fuse-1 Strand of No. 36 SWG Tinned Copper Wire			
92.	On/Off Switch (Part of volume control, Circuit No. 67)			
93.	5,000 Ohm Carbon Resistor	10%	$\frac{1}{2}$ watt	PR250
94.	50 Ohm Wire Wound Resistor	5%	5 watt	PR708

## Component Parts List-Model "HMQ"

Circuit No.	Part Name	Tol±	Rating	Part No.
95.	80 Ohm Wire Wound Resistor	5%	10 watt	PR707
96.	.002MFD Paper Condenser	20%	600V DCW	PC112
97.	.002MFD Paper Condenser	20%	600V DCW	PC112
	Socket 8 Pin			PM532
	Socket 6 Pin-Vibrator			A102/58
	Terminal-Press Down Type			PM306
	Valve Shield			PM217
	Valve Shield Earth Contact			22/30C
	Clip-IF. Trans. Mounting			7/670
	Dial Drum			A104/698
	Dial Pointer Assembly			A101/698
	Knob-Front			167/81
	Knob-side			178/81
	Knob-Spring			161/81
	Cabinet-Bakelite			155/81
	Speaker Clip			20/698
	Dial Background Assembly			A112/698
	Coil Mount Clip			6/622
	Dial Reading-N.S.W.			165/81-2
	Dial Reading-Vic. and Tas.			165/81-3
	Dial Reading-Qld.			165/81-4
	Dial Reading-S.A. and W.A.			165/81-5
	Cabinet Back			19/698
	Clips-Back Retaining			17/620
	Battery Clip A+			3/245-1
	Battery Clip A-			3/245-2
	Cabinet Mount Feet (4)			A138/30C
	Dial Retaining Cup			3/683-1
	Indicator Lamp Socket and Bracket Assembly			A110/698
	Band Indicator Light Button-Clear			27/688-3
	Band Indicator Light Button-Blue			27/688-4
	Band Indicator Light Button-Green			27/688-2
	Band Indicator Light Button-Red			27/688-1
	Dial Lamp Socket Assembly			A105/661



575/279

VALVE PLACEMENT DIAGRAM

19, 25 AND 31 METRE ANT. TRANS.

Lead from top lug (iron core end):-  
GRID

Lead from bottom lug (mounting end):-  
AVC.

19, 25 AND 31 METRE RF. TRANS.

Lead from top lug (iron core end):-  
GRID

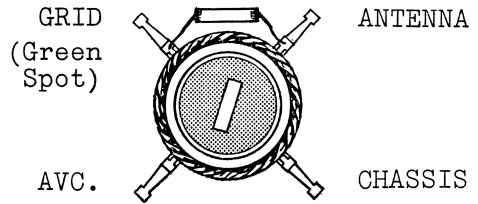
Lead from bottom lug (mounting end):-  
CHASSIS

19, 25 AND 31 METRE OSCL. COIL

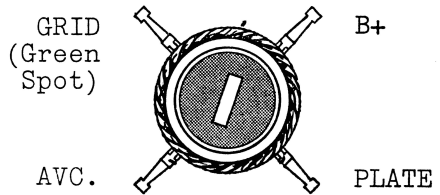
Lead from top lug (iron core end):-  
GRID

Lead from bottom lug (mounting end):-  
PLATE

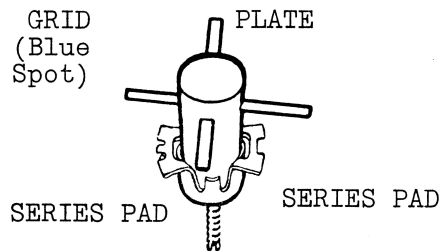
ANTENNA TRANS. B/CAST.



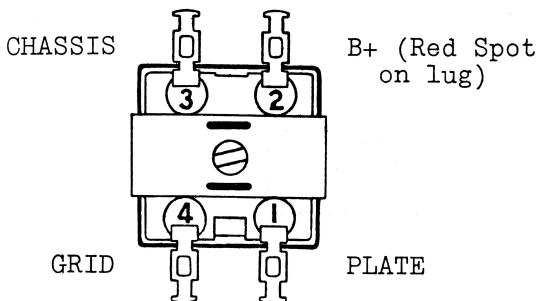
RF. TRANS. B/CAST.



OSCL. COIL B/CAST.



1ST IF. TRANS.



2ND IF. TRANS.

