

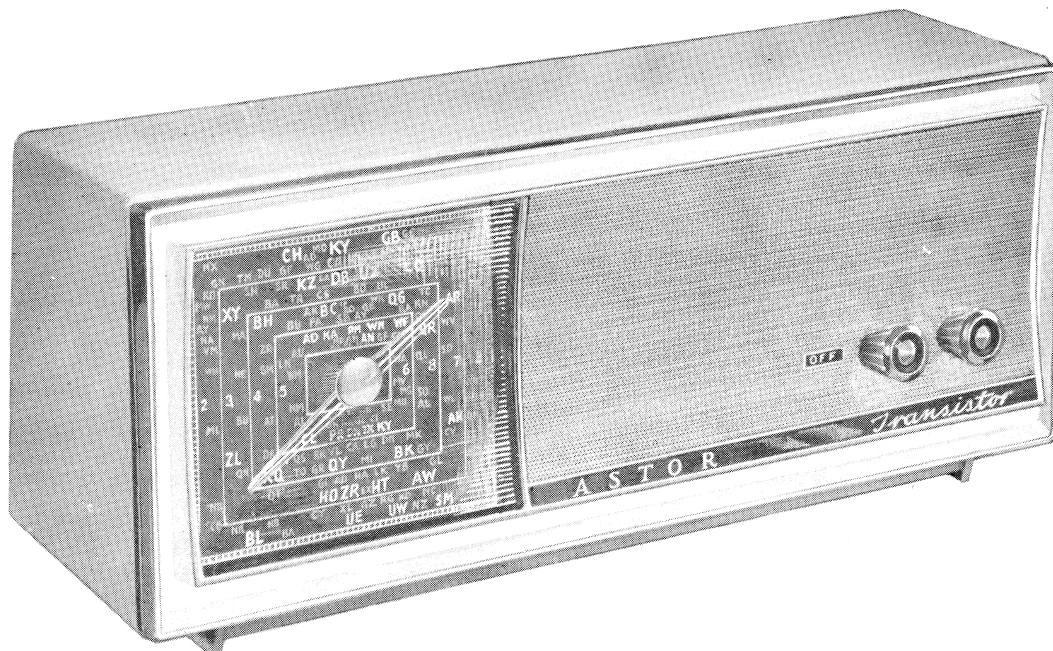
ASTOR

RADIO CORPORATION PTY. LTD.
DIVISION OF ELECTRONIC INDUSTRIES LTD.
Astor House, 161-173 Sturt Street, South Melbourne.

HQV-1
File: Receivers
Battery
Date: 28-9-61
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SERVICE DATA

ASTOR MODEL "HQV"
CORDLESS MANTEL
7 TRANSISTOR SUPERHETERODYNE BROADCAST RECEIVER



TUNING RANGE:
INTERMEDIATE FREQUENCY:
BATTERY SUPPLY:
BATTERY CONSUMPTION:
POWER OUTPUT:
TRANSISTOR COMPLEMENT:

530-1630 Kilocycles
455 Kilocycles
9 Volts DC. (internal battery)
10.2 mA. (no signal)
.5 Watt (undistorted)
2N412 Mixer-Oscillator
2N410 I.F. Amp. 1.
2N410 I.F. Amp. 2.
2N406 Audio Amplifier
2N406 Audio Driver
OC74 Audio Output } 2-OC74
OC74 Audio Output } Matched Pair
IN295 AGC.
IN295 Detector/AGC.

GERMANIUM DIODES:

Circuit No.	Condensers		Tol.	Rating D.C.W.	Part No.
25	2 mF	Electrolytic	+250%-10%	6V	C323
26	.0047mF	Ceramic disc	G.M.V.	500V	C327
27	50 mF	Electrolytic	+250%-10%	3V	C307
28	2 mF	Electrolytic	+250%-10%	6V	C323
29	50 mF	Electrolytic	+250%-10%	3V	C307
30					
31	.01 mF	Ceramic disc	+80%-10%	25V	4008-039-06
32	.01 mF	Ceramic disc	+80%-10%	25V	4008-039-06
33	100 mF	Electrolytic	+250%-10%	12V	C457
34	100 mF	Electrolytic	+250%-10%	12V	C457
35	.1 mF	Ceramic disc	+80%-20%	25V	4008-004-04
	Resistors		Tol. <u>±</u>	Rating Watts	
36	56,000 ohm carbon		10%	$\frac{1}{2}$	R5632
37	8,200 ohm carbon		10%	$\frac{1}{2}$	R8222
38	2,200 ohm carbon		10%	$\frac{1}{2}$	R2222
39	1,800 ohm carbon		10%	$\frac{1}{2}$	R1822
40	100,000 ohm carbon		10%	$\frac{1}{2}$	R1042
41					
42	330 ohm carbon		10%	$\frac{1}{2}$	R3312
43	3,300 ohm carbon		10%	$\frac{1}{2}$	R3322
44	2,200 ohm carbon		10%	$\frac{1}{2}$	R2222
45	22,000 ohm carbon		10%	$\frac{1}{2}$	R2232
46	560 ohm carbon		10%	$\frac{1}{2}$	R5612
47	4,700 ohm carbon		10%	$\frac{1}{2}$	R4722
48	150,000 ohm carbon		10%	$\frac{1}{2}$	R1542
49	220 ohm carbon		10%	$\frac{1}{2}$	R2212
50					
51					
52	Volume control - 10,000 ohm SP.ST. switch attached				4032-007-03
53	1.8 ohm wire wound		10%	$\frac{1}{2}$	R208
54	6,800 ohm carbon		10%	$\frac{1}{2}$	R6822
55	56,000 ohm carbon		10%	$\frac{1}{2}$	R5632
56	1,000 ohm carbon		10%	$\frac{1}{2}$	R1022
57	6,800 ohm carbon		10%	$\frac{1}{2}$	R6822
58	4,700 ohm carbon		10%	$\frac{1}{2}$	R4700
59	22,000 ohm carbon		10%	$\frac{1}{2}$	R2232
60					
61					
62	680 ohm carbon		10%	$\frac{1}{2}$	R6812
63	470 ohm carbon		10%	$\frac{1}{2}$	R4712
64	470 ohm carbon		10%	$\frac{1}{2}$	R4712
65	220 ohm disc N.T.C.		20%	$1\frac{1}{4}$	R441
66	3,900 ohm carbon		10%	$\frac{1}{2}$	R3922
67	220 ohm disc N.T.C.		20%	$1\frac{1}{4}$	R441
68	3,900 ohm carbon		10%	$\frac{1}{2}$	R3922
69	2,700 ohm carbon		10%	$\frac{1}{2}$	R2722
70					
71					
72	220 ohm carbon		10%	$\frac{1}{2}$	R2212

MISCELLANEOUS

73	Aerial loading coil	PT942
74	Rod aerial	L578
75	Oscillator coil	L532
76	No. 1 I.F. transformer 455 Kc/s	L574
77	No. 2 I.F. transformer 455 Kc/s	L643
78	No. 3 I.F. transformer 455 Kc/s	L576
79	Driver transformer - 6000:375+375 ohms impd.	T289
80		
81		
82	Speaker - 5 ins. dia. permag. type 5F00/87/15 15 ohms voice coil impedance.	K239
83	Switch - battery ON/OFF SP.ST. part of circuit No.52	
84	Plug - two pin battery	482/30C
85	Battery - 9 volt, Eveready type No. 276-P	M470
86		
87	Transistor - mixer/oscillator type 2N412	4128-011-02
88	Transistor - I.F. amp. No.1 type 2N410	4128-010-02
89	Transistor - I.F. amp. No.2 type 2N410	4128-010-02
90	Transistor - audio amp. type 2N406	4128-009-02
91	Transistor - audio driver, type 2N406	4128-009-02
92	Transistor - audio output, type OC74	} matched pair 2-OC74
93	Transistor - audio output, type OC74	
94	Diode - overload, type 1N295 (refer this page)	1N295
95	Diode - detector/A.G.C., type 1N295 (refer this page)	1N295

Circuit No.6 - Oscillator Trimmer Condenser

As stocks become available, the 3-30pF trimmer will be changed to 5-15pF wire wound trimmer Part No. 4000-024-01.

Circuit No. 94 Overload Diode

Type 1N66 diode Part No. 4127-003-01 may be used as a replacement for type 1N295 in the overload diode stage.

Type 1N66 must not be used in the detector stage.

Circuit No. 95 Detector Diode

Type SFD106 diode may be used as a replacement for type 1N295 in the detector stage.

Type SFD106 must not be used in the overload diode stage.

COLOUR CODE. SFD106 is identified by a grey coloured band near the cathode end of the diode.

MECHANICAL

Tuning knob assy. - includes clip	A105/864
Volume knob assy. - includes clip	A106/864
Retaining clip (2) control knobs	15/864
Front escutcheon assy. - includes grille	7099-003-01
Escutcheon	1/864-1
Grille	2/864
Indicator plate - "OFF"	16/864-1
Speednut - indicator plate	627/250-10
Dial cover	803/81
Dial reading	73/395
Dial pointer	804/81
Dial drum	799/81
Bush - dial drum	56/678
Grub screw (2) $\frac{1}{4}$ " x 5/32" Whit - bush	7198-802-04
Tuning spindle	19/864
Bush- tuning spindle	3/287-3
Dial cord - 56 ins.	34/754
Spring - dial cord	21/698
Pulley - large	9/864
Pulley (2) small	23/71
Mount stud - long pulley	11/864
Mount stud - short, pulley	11/864-1
Screw - $\frac{3}{8}$ " x No.5 pan hd. mt. stud	7209-116-12
Screw - $\frac{1}{2}$ " x No.5 pan. hd. mt. stud	7209/116-13
Screw (3) $\frac{3}{8}$ " x 4BA csk. hd. cond. gang mt.	7196-055-75
Screw (2) $\frac{3}{8}$ " x $\frac{1}{8}$ " Whit. truss hd. gold, fastens cabinet to front assy.	7198-301-14
Screw (2) $\frac{5}{8}$ " x No.10 chrome, ext. aerial and earth terminals	7204-080-09
Screw (4) $\frac{1}{2}$ " x No.5 pan hd. speaker mt.	7209-166-13
Washer (4) flat bakelite speaker mt.	63/30C-1
Screw (3) $\frac{3}{8}$ " x No.5 pan. hd. rod aerial and condenser bracket	7209-116-12
Screw (6) 3/16" x No.2 pan. hd. fastens mt. panel to front assy.	7209-107-12
Washer (6) flat steel fastens mt. panel to front assy.	7261-020-07
Speednut (2) No.10 ext. aerial and earth terminals	476/250-11
Speednut (2) No.4 circuit board mount brackets	476/250-4
Screw (2) $\frac{3}{8}$ " x No.4 bdr. hd. circuit board mt. brackets	93/560-6
Washer (2) flat steel, circuit board mt. brackets	63/30C-12
Dedlock hex. nut. (2) control spindles	542/250
Grommet (3) rubber, cond. gang mt.	5/91
Grommet (2) rubber, rod aerial mt.	40/30C-2
Transistor mount spacer (7)	7294-012-01
Terminal strip assy. - 4 lug type 2E1	A602/30C
Washer - shakeproof, $\frac{3}{8}$ " int., control spindle	1/562-15

STYLING

<u>Colour</u>	<u>Cabinet Part No.</u>	<u>Battery Slide Part No.</u>
WEDGEWOOD	800/81-1	802/81-1
SPRUCE	800/81-2	802/81-2
WATTLE	800/81-3	802/81-3
CHARCOAL	800/81-4	802/81-4
CHERRY	800/81-5	802/81-5
CINNAMON	800/81-6	802/81-6
WILLOW	800/81-7	802/81-7
GREY	800/81-8	802/81-8
FLAMINGO	800/81-9	802/81-9
SQUIRREL	800/81-10	802/81-10

GLASS ENCAPSULATED DIODES

When types 1N66 and 1N295 diodes are supplied in glass capsules a suffix letter will follow the type number, i.e. 1N66A.

The glass diodes will be identified by a series of 4 colour bands around the diode, starting from the cathode end. The colours of the first 3 bands will conform to standard Retma colour coding, and the 4th band denoting the suffix letter, will be coloured in accordance with the following list :-

<u>Suffix Letter</u>	<u>Colour</u>
A	Brown
B	Red
C	Orange
D	Yellow
E	Green
F	Blue

Two digit numbers will be identified as follows: First band - black, the second and third bands denoting the two digits in sequence, e.g. 1N67A Black, Blue, Violet, Brown. 1N295A Red, White, Green, Brown.

2N412

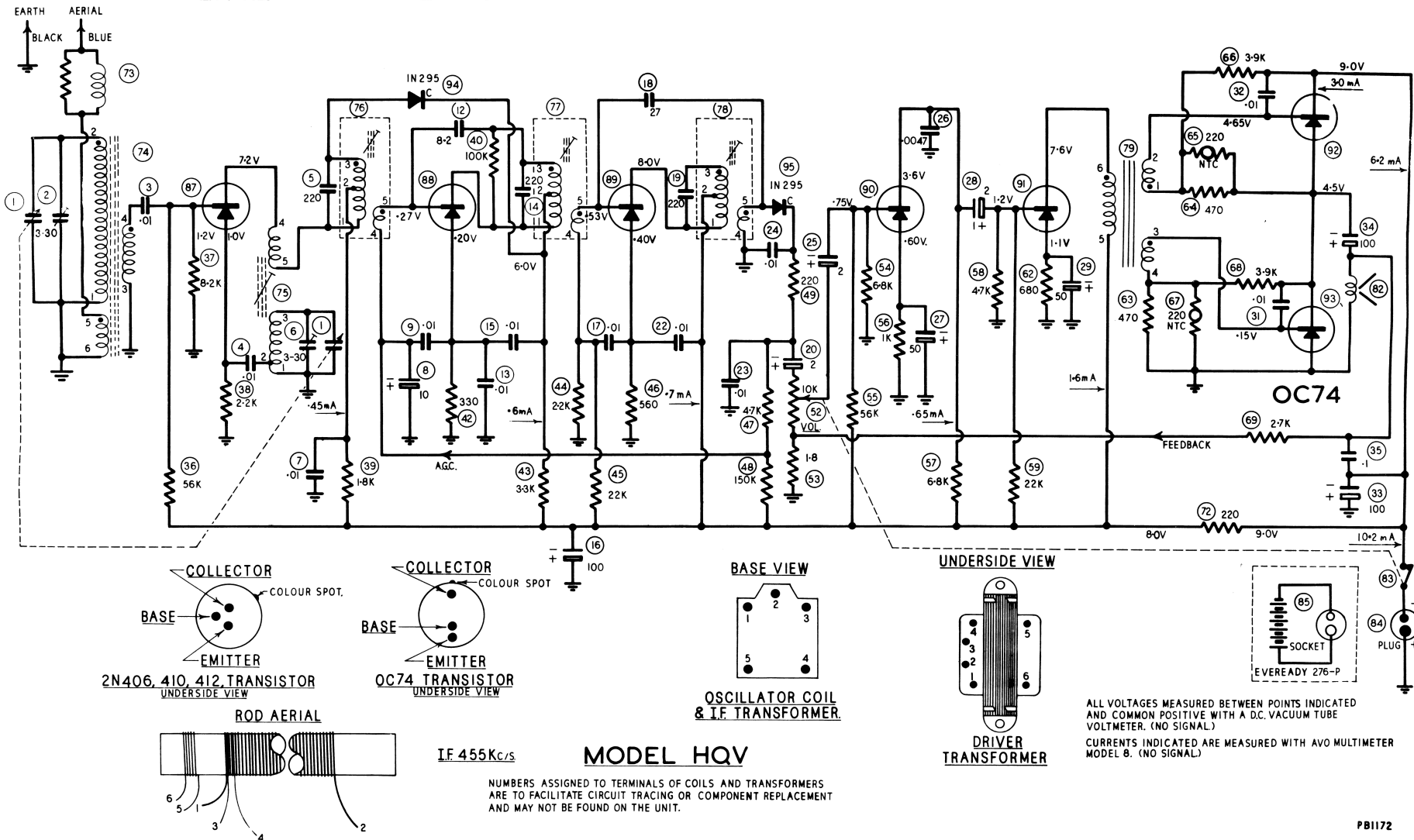
2N410

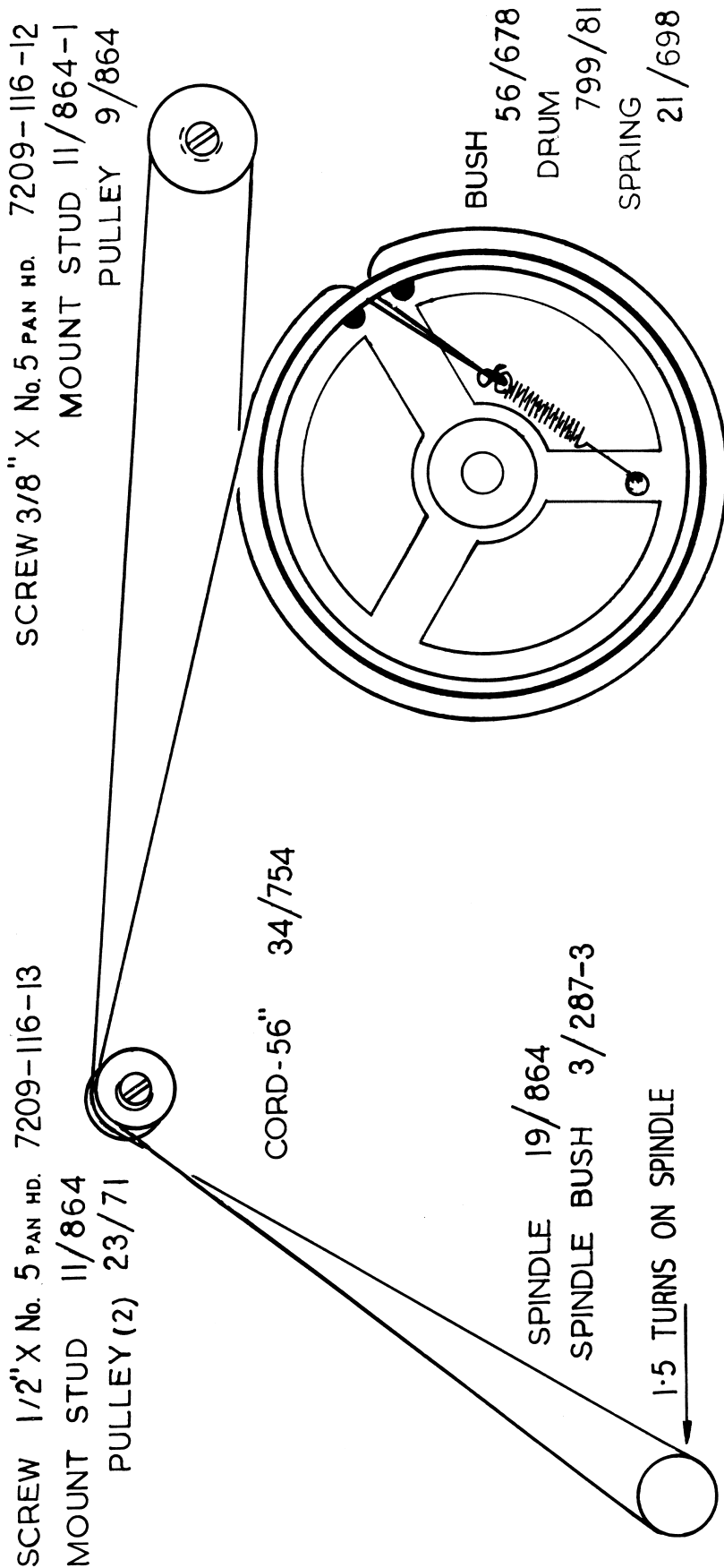
2N410

2N406

2N406

OC74

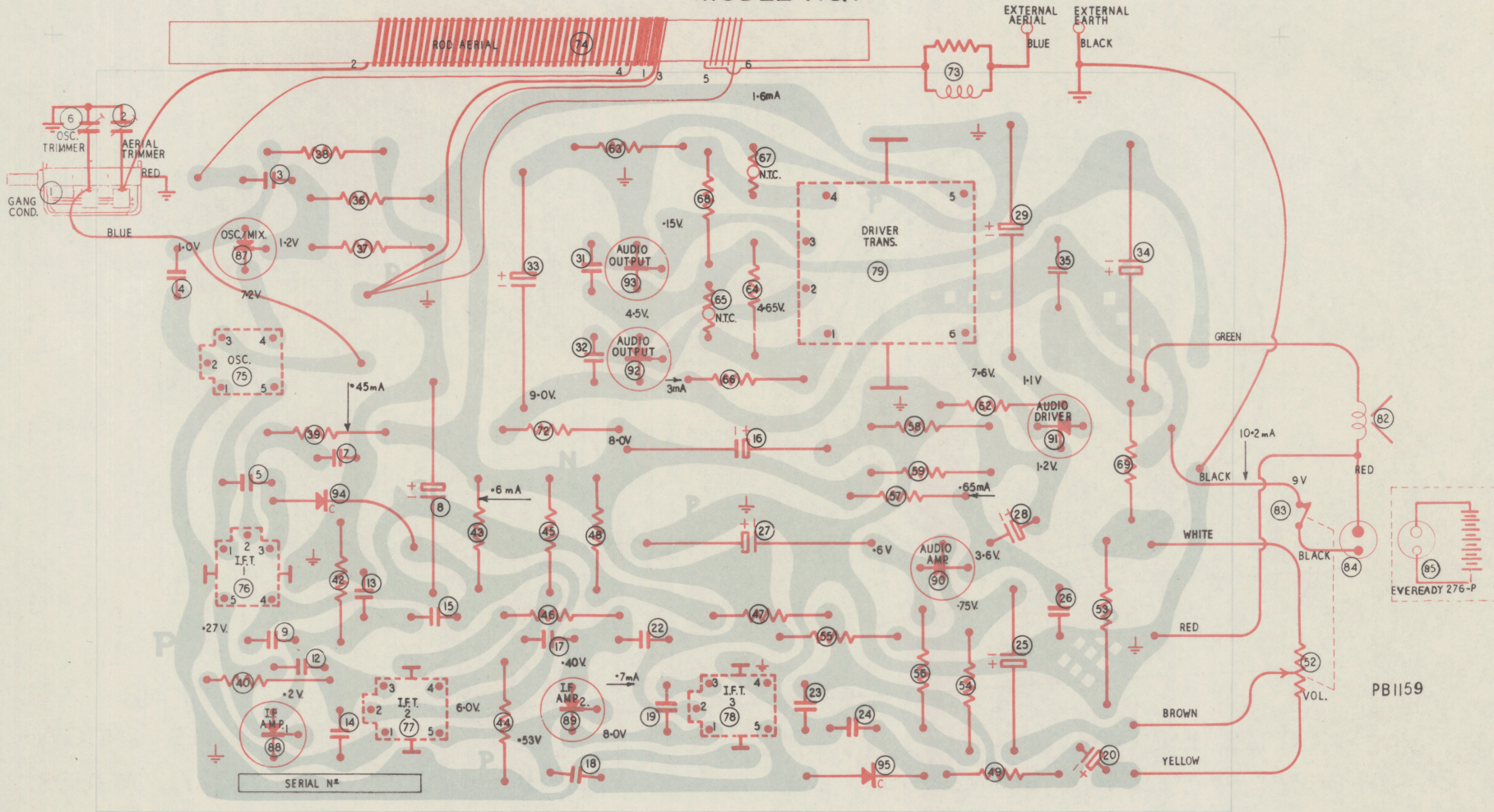




REAR VIEW — TUNING CONDENSER PLATES FULLY MESHED

PB1173

CIRCUIT BOARD
PRINTED WIRING SIDE
MODEL HQV



SERVICE INSTRUCTIONS—electrical

ALIGNMENT EQUIPMENT

Signal Generator - modulated 400 cps.
 Output Meter - 15 ohm impedance
 Series Capacitor - Sign. gen. for I.F.T. alignment .1 MF Part No. C113

Alignment Tools

- (a) Flat metal blade each end - Part No. A101/2076 for I.F.T. and osc. coil iron core adjustment.
- (b) Chisel point type Part No. M195 for trimmer cond. adjustment.

ALIGNMENT CONDITIONS

Remove two screws from rear of cabinet and two screws (external aerial and earth terminals) from base of cabinet.

Remove cabinet from front section escutcheon.

Volume Control - maximum volume (fully clockwise)
 Output Level - 50 milliwatts
 Output Meter - across speaker voice coil
 Connection
 Supply Voltage - 9 volt battery
 Source

INTERMEDIATE FREQUENCY TRANSFORMER ALIGNMENT

Oper. No.	Generator Connection	Generator Frequency	Dummy Aerial	Instructions
1.	To junction of term.4 of rod aerial and .04 cond. circuit No. 2.	455Kc/s	.1MF cond. in series with generator.	Turn tuning gang cond. to high freq. end stop, plates full open. Peak iron core of 3rd I.F. trans. for max. output.
2.	As oper. 1.	455Kc/s	As oper. 1.	Peak iron core of 2nd I.F. trans. for max. output
3.	As oper. 1.	455Kc/s	As oper. 1.	Peak iron core of 1st I.F. trans. for max. output
4.	Repeat operations 1, 2 and 3.			

DIAL POINTER SETTING

The dial pointer may be adjusted from the rear of the front panel. Hold pointer boss and rotate tuning mechanism.

Fully mesh the gang condenser plates and align centre of indicator line of pointer over the centre of the low frequency end of travel spot on dial.

BROADCAST ALIGNMENT

- A. To inject a signal into the receiver rod aerial, connect to the active terminal of the signal generator approximately two feet of aerial wire, then fashion the wire into a vertical position.
- B. Place receiver chassis so that ferrite rod aerial is uppermost and horizontal and so that the movable winding end of the ferrite rod points to the 2ft. of aerial wire. A distance of not less than 1ft. is to be between the end of the ferrite rod and the 2ft. of vertical aerial wire attached to the signal generator.

Oper. No.	Generator Connection	Generator Frequency	Instructions
1.	Refer para. A & B	600 Kc/s	Turn tuning gang until centre of indicator line on pointer aligns with centre of 600 Kc/s spot on dial reading. Peak iron core of oscillator coil for max. output while rocking gang to and fro through signal.
2.	As oper. 1.	1400 Kc/s	Set dial 1400 Kc/s spot on dial to pointer line. Peak oscillator and aerial trimmer condenser for maximum output.
3.	Repeat oper. 1.		
4.	Repeat oper. 2.		
	Tuning range after alignment - 530:1630 Kilocycles.		

PRECAUTIONS WHEN TESTING TRANSISTOR RECEIVERS

- A. A transistor is extremely sensitive to heat. If a soldering iron is to be used close to a transistor move the transistor or place non-conductive material between the iron and transistor.
When making soldered connections to the leads of the transistors hold the lead which is being soldered between the heat source and transistor body with pliers; excess heat will be dissipated away into the pliers. Use a soldering iron which supplies just the requirement of heat for satisfactory soldering of connections.

- B. When checking components, cut the long pigtail of the component in preference to unsoldering from the circuit board. Components checked in this way may be returned into the circuit by pressing the ends of the pigtail together then solder. Faulty components should be removed from the circuit board by cutting through the body of the component leaving two short stubs of wire protruding (approx. $\frac{1}{8}$ ") above the circuit board. The pigtail leads of the new component are to be soldered to these stubs.
- C. A continuity meter must not be applied to the receiver wiring with the transistor in circuit. A transistor must not be checked for continuity with an ohmmeter as the applied voltage and resultant excess current flow may result in permanent damage to the transistor. A voltmeter of at least 20,000 ohms/volt or a high impedance vacuum tube type voltmeter is a safe means of measuring circuit voltage.
- D. A screwdriver or similar instrument must not be used to short components together or to the common positive. The use of this method of checking for the existence of voltage or signal clicks may result in permanent damage to the transistors and components.

FAULT LOCATION GUIDE - GENERATOR TEST

Connect generator through a 0.1 mfd capacitor to the following points:-

CAUTION: Always start with low generator output. Strong signals, may, overload the receiver, or cause the AGC to function. Set volume control at maximum.

CHECKPOINT	LOCATION Circuit Nos. at Junction Point	SIGNAL GENERATOR FREQUENCY	SIGNAL STRENGTH
OC74 Output Base	No.32 Driver sec.	Audio	Weak
OC74 Output Base	No.31 & Driver sec.	Audio	Weak
2N406 Driver Base	Nos. 58, 59, 28	Audio	Increased level
2N406 First Audio Base	Nos. 54, 55, 25	Audio	Further increase
Det.output at vol. cont.	Nos. 20, 52	Audio	Further increase
Turn tuning capacitor fully open.			
Det.output at Diode	Pin 5 I.F.T. 3	455Kc/s	Weak
2N410 I.F.2. Base	Pin 5 I.F.T. 2	455Kc/s	Increased level
2N410 I.F.1. Base	Pin 5 I.F.T. 1	455Kc/s	Further increase
2N412 Converter Base	No.3 and aerial sec.	455Kc/s	Further increase
Tune receiver to generator at broadcast frequency.			
2N412 Converter Base	No. 3 and aerial sec.	Sig. Freq.	Same level as at 455Kc/s.

FAULT LOCATION GUIDE - CLICK TEST

Connect one end of a 6.8K ohm resistor to common positive. Touch the other end on and off the following points and listen for clicks. Volume control at maximum.

CHECK POINT Transistor Base	LOCATION Circuit Numbers at Junction Point	STRENGTH OF CLICK
OC74 Output	No. 31 & Driver secondary	very weak
OC74 Output	No. 32 & Driver secondary	weak
2N406 Driver	Nos. 58, 59, 28	loud
2N406 First Audio	Nos. 54, 55, 25	loud
2N410 I.F.2	Pin 5 I.F.T. 2	very weak
2N410 I.F.1	Pin 5 I.F.T. 1	weak
2N412 Converter	Nos. 36, 37, 3	loud

SERVICE INSTRUCTIONS – mechanical

1. TO REMOVE RECEIVER FROM CABINET

- A. Remove two screws from rear of cabinet.
- B. Remove two screws (external aerial and earth terminal) from base of cabinet.
- C. Pull or prise cabinet away from front section.

2. TO REMOVE THE BATTERY

- A. A slide cover is located in the base of the cabinet.
- B. Slide off the cover, withdraw the battery plug and remove the battery.
- C. Fitting a new battery is the reverse procedure to removal.

3. TO REMOVE FRONT MOUNT PANEL FROM ESCUTCHEON GRILLE ASSY.

- A. Remove receiver from cabinet as detailed in par. 1. A, B & C.
- B. Unplug and remove battery.
- C. Pull control knobs and washers straight off spindles.

- D. Remove six screws and washers located around edge of mount panel.
- E. Lift escutcheon grille assy. off mount panel.

4. RECEIVER SERIAL NUMBER

Serial number is visible through a slot located in rear of cabinet.

5. STORAGE WHEN OUT OF USE

It is not advisable to leave an exhausted battery in the receiver. If the receiver is stored away or not required for long periods, even partly-used batteries **must** be removed and stored in a dry cool place. This is a precautionary measure against the swelling and corroding action of worn-out batteries, which applies to all battery operated devices, such as torches, etc.

6. CLEANING AGENT FOR CABINET

Do not polish the moulded plastic or metal sections with an abrasive material, motor car polish, boot polish or similar household cleaning fluids as permanent damage may result to the finish of the cabinet. To restore the lustre of the cabinet wipe with a soft cloth dampened with water and lightly polish with a neutral wax.

Circuit No.	Condensers	Tol.	Rating D.C.W.	Part No.
1	Tuning, two gang			4000-018-02
2	5-30pF Trimmer, compression			4000-023-01
3	.01mF Ceramic disc	+80%-20%	25V	4008-039-06
4	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
5	220 pF Ceramic tubular	+5%	33V	C392
6	3-30pF Trimmer wire wound - refer page 11.			PC663
7	.01 mF Ceramic, disc	+80%-20%	25V	4008-039-06
8	10 mF Electrolytic	+250%-10%	6V	C322
9	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
10				
11				
12	8.2 pF Ceramic disc	+5%	500V	C404
13	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
14	220 pF Ceramic tubular	+5%	33V	C392
15	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
16	100 mF Electrolytic	+250%-10%	12V	C457
17	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
18	27 pF Ceramic disc	+5%	500V	C451
19	220 pF Ceramic tubular	+5%	33V	C392
20	2 mF Electrolytic	+250%-10%	6V	C323
21				
22	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
23	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06
24	.01 mF Ceramic disc	+80%-20%	25V	4008-039-06