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

TECHNICAL BULLETIN

Bulletin: HQR-1.
File: Receivers AC.
Date: 20-6-55.

MODEL HQR

GRAMO-RADIO COMBINATION

An Automatic 3 Speed Record Changer (78, 45, 33⅓ r.p.m.) and a 5 Valve Superheterodyne Five Band Receiver incorporating Bandspreading of the 19 Metre, 25 Metre, 31 Metre and 49 Metre Shortwave Bands.

FOR OPERATION FROM:—

200-250 Volts 50 Cycle AC. Supply Mains.
Power Trans. Primary Mains Taps: 200-220V. and 221-250V.

POWER CONSUMPTION:—

Radio Operation:- 55 Watts-approx.
Gramo Operation:- 75 Watts-approx.

TUNING RANGES:—

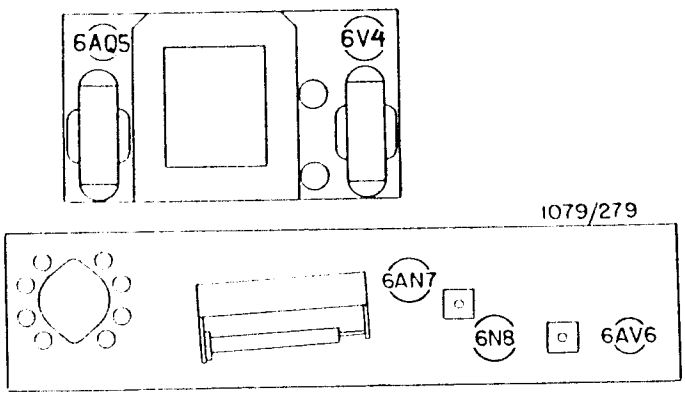
Broadcast Band,	535-1610 Kc/s.	
19 Metre Band,	14.9-15.5 Mc/s.	(Bandspread)
25 Metre Band,	11.6-12.1 Mc/s.	(Bandspread)
31 Metre Band,	9.4-9.8 Mc/s.	(Bandspread)
49 Metre Band,	5.95-6.25 Mc/s.	(Bandspread)

RECEIVER COVERAGE:—

560.7-186.3	Metres.
20.13-19.29	Metres (approx.)
25.86-24.79	Metres (approx.)
31.91-30.61	Metres (approx.)
50.42-48.0	Metres (approx.)

THIS BULLETIN CONTAINS:—

1. Alignment Instructions.
2. Circuit Diagram.
3. Component Parts List.
4. Connections for IF. and RF. Transformers.
5. Dial Drive Cording Diagram.
6. Valve Placement Diagram.
7. Instructions for Changing Mains Input Voltage Tap.
8. Instructions for Removing Chassis from Cabinet.



ALIGNMENT PROCEDURE

EQUIPMENT

Signal Generator:	
Output Meter:	
Mica Capacitor:	0.01MF. (for IF. trans. alignment)
Dummy Antenna:	200MMF. Mica Capacitor.
Dummy Antenna:	400 Ohm non-inductive resistor.
Alignment Tools:	Type M195 and PM581.

ALIGNMENT CONDITIONS

Load Impedance:	5,000 ohms.
Output Level:	50 Milliwatts.
Vol. Control:	Max. Vol. fully clockwise.
Intermed. Freq.:	455 Kc/s.
Input Voltage:	230 Volts 50 Cycle AC. input to trans. 221-250 volt pri. tap.
Tone Control:	Treble position.

I.F. TRANS. ALIGNMENT

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.	Remove receiver power supply chassis and tuning unit chassis from cabinet as detailed on page 8.			
2.	Remove dial back plate from tuning unit chassis:– A. Loosen off grub screws in tone control gear wheel hub, then pull gear wheel straight upward off the control spindle. B. Unscrew large nut fastening small metal gear plate to bush on tone control. C. From volume control shaft remove small gear plate with gears attached by pulling it straight upward. D. Remove dial pointer by prising up centre clip which fastens it to dial cord at rear of pointer carriage. E. Remove from each end of dial plate the large lock nut fastening dial plate to chassis.			
3.	Connect speaker leads and leads from tuning unit chassis to power supply chassis.			
4.	To control grid of 6N8 valve pin No. 2.	455 Kc/s.	0.01 MF Mica capacitor in series with generator.	Turn wave change switch to b/cast. band. Leave grid wire attached to valve socket. Peak 2nd IF. trans. pri. and sec. for max. output.
5.	To control grid of 6AN7 valve, pin No. 2.	455 Kc/s.	0.01 MF Mica capacitor in series with generator.	Leave grid wire attached to valve socket. Turn perm. tuner so that iron cores are out of windings on coil formers. Peak 1st IF. trans. pri. and sec. for max. output.
6.	Refit dial back plate, dial pointer, gear wheel and plate assy. to volume control shaft and gear wheel to tone control shaft. Make sure that the gear wheel teeth mesh correctly.			

B/CAST. AND S/WAVE. ALIGNMENT

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.	DIAL POINTER SETTING. Turn tuning spindle so that perm tuner iron cores are out of the windings on the coil formers and the unit is hard against the stop. Set the centre of the dial pointer on the centre of the end of travel spot on the dial near 1700 Kc/s.			
2.	To antenna lead	1000 Kc/s.	200 MMF mica capacitor in series with generator.	Turn tuning control and perm. tuner until centre of dial pointer aligns with centre of spot on dial reading at 1000 Kc/s. Peak b/cast. oscl. coil trimmer cond., then peak b/cast. antenna coil trim. cond. for max. output. Re-peak oscl. coil trim. condenser.
3.				Tuning range after alignment 535-1610 Kc/s.
4.				Check logging at each end of the dial.
5.	Turn wave change switch to 49 metre band (this band must be aligned before the 31, 25 and 19 metre bands).			
6.	To antenna lead	6.08 Mc/s.	400 ohm non-inductive resistor in series with generator.	Turn wave change switch to 49 metre band. Turn tuning spindle and perm. tuner until dial pointer aligns with the 6.08 Mc/s. mark on the dial. Adjust 49 metre band oscl. coil ind. trimmer (iron core) for logging, then peak 49 metre antenna coil ind. trimmer (iron core) for max. output.
7.	To antenna lead	9.6 Mc/s.	400 ohm non-inductive resistor in series with generator.	Turn wave change switch to 31 metre band. Turn tuning spindle and perm. tuner until dial pointer aligns with 9.6 Mc/s. mark on dial. Adjust 31 metre oscl. coil ind. trimmer (iron core) for logging, then peak 31 metre antenna coil ind. trim. (iron core) for max. output.
8.	To antenna lead	11.8 Mc/s.	400 ohm non-inductive resistor in series with generator.	Turn wave change switch to 25 metre band. Turn tuning spindle and perm. tuner until dial pointer aligns with the 11.8 Mc/s. mark on the dial. Adjust 25 metre band oscl. coil ind. trim. (iron core) for logging, then peak 25 metre antenna coil ind. trim. (iron core) for max. output.

9.	To antenna lead	15.2 Mc/s.	400 ohm non-inductive resistor in series with generator.	Turn wave change switch to 19 metre band. Turn tuning spindle and perm. tuner until dial pointer aligns with 15.2 Mc/s. mark on the dial. Adjust 19 metre band oscl. coil ind. trim. (iron core) for max. output.
10.	To antenna lead	Multi-vibrator		Check logging on 49, 31, 25 and 19 metre bands at each 100 Kc/s. mark on the dial.

NOTE: The iron cores in the perm. tuner coils and the s/w. conds. on the perm. tuner are set to an exact dimension. No adjustment to the dimensions is to be made if misalignment and incorrect logging are to be avoided.

COIL COLOUR CODE

49 Metre spreadband coil, YELLOW spot on iron core end of former.
31 Metre spreadband coil, RED spot on iron core end of former.
25 Metre spreadband coil, WHITE spot on iron core end of former.
19 Metre spreadband coil, BROWN spot on iron core end of former.

INSTRUCTIONS FOR CHANGING MAINS VOLTAGE INPUT TAPS

MAINS VOLTAGE.—The mains adjustment tap should be adjusted as follows: For any AC. voltage between 200 V. and 220 V., on the 200-220 V. tap, and for any AC. voltage between 221 V. and 250 V., on the 221-250 V. tap.

MAINS VOLTAGE ADJUSTMENT: For 200-220 volt operation: The receiver or the power unit chassis do not have to be removed from the cabinet for the adjustment. SWITCH THE RECEIVER OFF AND DISCONNECT THE RECEIVER MAINS LEAD PLUG FROM THE POWER POINT SOCKET.

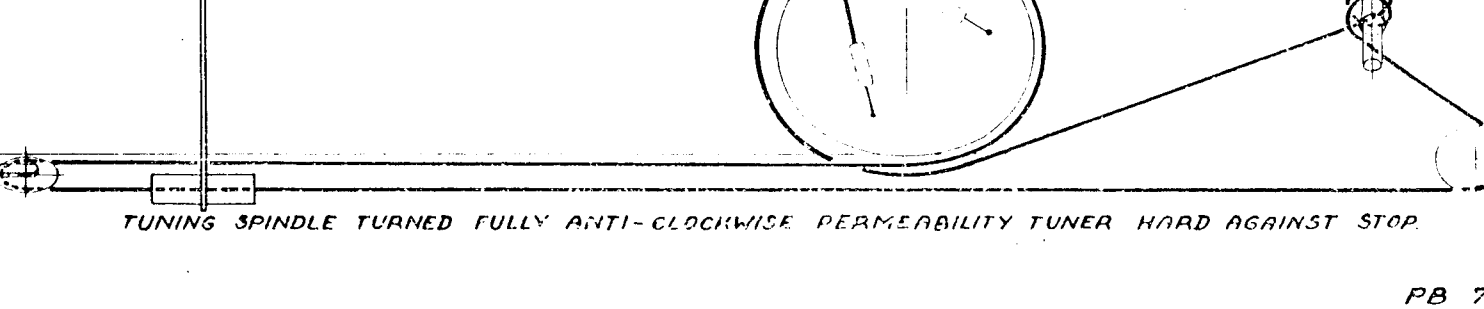
Remove cabinet back board from the cabinet by unscrewing the screws fastening it to the cabinet. From the rear of the cabinet, the mains tap terminal strip may be seen on the side of the power unit chassis mounted to the base of the cabinet. Unsolder the mains lead wire from the AC. junction block which is attached to the mains terminal strip tap marked 221-250V. and re-solder it to the terminal strip tap marked 200-250V. Refit cabinet back board to cabinet.

CORDING OF DIAL DRIVE

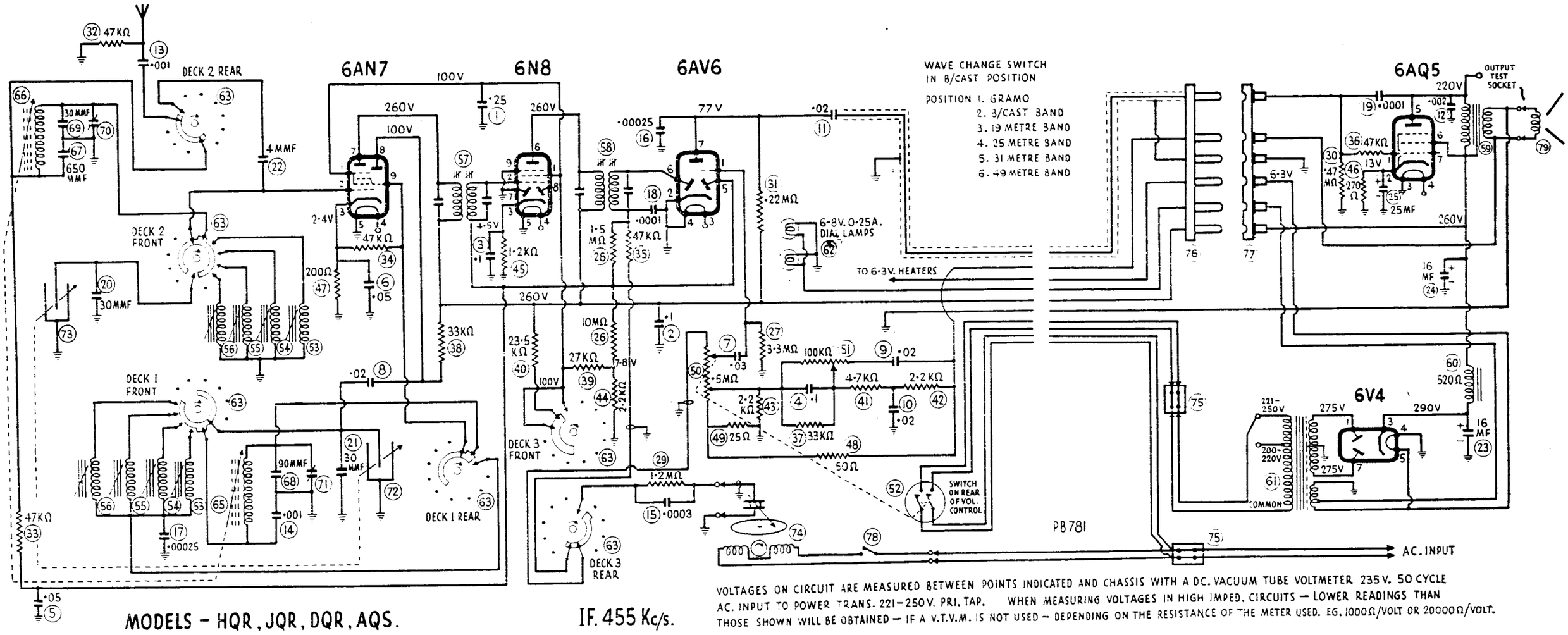
Length of cord required is 5 ft. 6 ins., which includes about 8 ins. to spare for tying to tension spring.

Cord Part No. 34/754.

Tension Spring (2) Part No. 508/30C.



TUNING SPINDLE TURNED FULLY ANTI-CLOCKWISE PERMEABILITY TUNER HARD AGAINST STOP



MODELS – HQR, JQR, DQR, AQS.

IF. 455 Kc/s.

VOLTAGES ON CIRCUIT ARE MEASURED BETWEEN POINTS INDICATED AND CHASSIS WITH A D.C. VACUUM TUBE VOLTMETER 235 V. 50 CYCLE AC. INPUT TO POWER TRANS. 221–250V. PRI. TAP. WHEN MEASURING VOLTAGES IN HIGH IMPED. CIRCUITS – LOWER READINGS THAN THOSE SHOWN WILL BE OBTAINED – IF A V.T.V.M. IS NOT USED – DEPENDING ON THE RESISTANCE OF THE METER USED. EG. 1000Ω/VOLT OR 20000Ω/VOLT.

Circuit No.	Description	Tol ±	Rating	Part No.
1.	.25 MF Paper condenser	20%	400V DCW	PC128
2.	.1 MF Paper condenser	20%	400V DCW	PC103
3.	.1 MF Paper condenser	20%	200V DCW	PC218
4.	.1 MF Paper condenser	20%	200V DCW	PC218
5.	.05 MF Paper condenser	20%	200V DCW	PC102
6.	.05 MF Paper condenser	20%	200V DCW	PC102
7.	.03 MF Paper condenser	20%	200V DCW	PC303
8.	.02 MF Paper condenser	20%	400V DCW	PC111
9.	.02 MF Paper condenser	20%	400V DCW	PC111
10.	.02 MF Paper condenser	20%	400V DCW	PC111
11.	.02 MF Paper condenser	20%	400V DCW	PC111
12.	.002 MF Paper condenser	20%	600V DCW	PC112
13.	.001 MF Mica condenser	10%	1000 VT	PC108
14.	.001 MF Mica condenser	10%	1000 VT	PC108
15.	.0003 MF Mica condenser	10%	1000 VT	PC212
16.	.00025 MF Mica condenser	10%	1000 VT	PC126
17.	.00025 MF Mica condenser	10%	1000 VT	PC126
18.	.0001 MF Mica condenser	10%	1000 VT	PC110
19.	.0001 MF Mica condenser	10%	1000 VT	PC571
20.	30 MMF Silvered mica condenser	5%	500V DCW	PC879
21.	30 MMF Silvered mica condenser	5%	500V DCW	PC879
22.	4 MMF Ceramicon condenser	1MMF-0	500V DCW	PC830
23.	16 MF Electrolytic condenser	20%	525 PV	PC952
24.	16 MF Electrolytic condenser	20%	525 PV	PC952
25.	25 MF Electrolytic condenser	20%	40 PV	PC318
26.	10 Megohm carbon resistor	15%	½ W.	R1063
27.	3.3 Megohm carbon resistor	15%	½ W.	R3353
28.	1.5 Megohm carbon resistor	15%	½ W.	R1553
29.	1.2 Megohm carbon resistor	15%	½ W.	R1253
30.	.47 Megohm carbon resistor	15%	½ W.	R4743
31.	.22 Megohm carbon resistor	10%	½ W.	R2242
32.	47,000 ohm carbon resistor	15%	½ W.	R4733
33.	47,000 ohm carbon resistor	15%	½ W.	R4733
34.	47,000 ohm carbon resistor	15%	½ W.	R4733
35.	47,000 ohm carbon resistor	15%	½ W.	R4733
36.	47,000 ohm carbon resistor	15%	½ W.	R4733
37.	33,000 ohm carbon resistor	15%	½ W.	R3333
38.	33,000 ohm carbon resistor	10%	½ W.	R3332
39.	27,000 ohm carbon resistor	10%	1 W.	Z2732
40.	23,500 ohm carbon resistor consisting of two 47,000 ohm 1 watt 10% resistors part No. Z4732 wired in parallel			
41.	4,700 ohm carbon resistor	15%	½ W.	R4723
42.	2,200 ohm carbon resistor	15%	½ W.	R2223
43.	2,200 ohm carbon resistor	15%	½ W.	R2223
44.	2,200 ohm carbon resistor	10%	½ W.	R2222
45.	1,200 ohm carbon resistor	10%	½ W.	R1222
46.	270 ohm carbon resistor	10%	1 W.	Z2712
47.	200 ohm Wire Wound resistor	10%	½ W.	PR176
48.	50 ohm Wire Wound resistor	10%	½ W.	PR280
49.	25 ohm Wire Wound resistor	10%	½ W.	PR281
50.	.5 Megohm Carbon Poentiometer tapped at 40 K. ohms DP.ST. switch attached	20%		PR819
51.	100,000 ohm carbon potentiometer	20%		PR699

Circuit No.	Description	Tol. ±	Rating	Part No.
52.	ON/OFF Switch – part of vol. control circuit No.50			–
53.	19 metre spreadband coil (brown spot)			L131
54.	25 metre spreadband coil (white spot)			PT913
55.	31 metre spreadband coil (red spot)			PT912
56.	49 metre spreadband coil (yellow spot)			L116
57.	IF. Transformer 455 Kc/s.			PT869
58.	IF. Transformer 455 Kc/s.			PT869
59.	Input. trans. 5,000-2 ohms imped. code No. KBG81			PT799
60.	Choke 14 H. 60 mA-520 ohms DC. resist.			PT806
61.	Power trans. 200-250V. 50 cycle mains			T119
61.	Power trans. 200-260V. 40 cycle mains			T120
62.	Dial lamp 6-8V. 0.25A. Min. screw base T3¼ bulb			PM678
63.	Gramo-radio/wave-change switch 6 position			S201
64.	Perm. tuner – complete assy.			L115
65.	Osc. coil - less iron core			PT961
66.	Antenna coil - less iron core			PT960
67.	650 MMF Silvered mica cond.	5%	500V DCW	PC926
68.	90 MMF Silvered mica cond	5%	500V DCW	PC965
69.	30 MMF Silvered mica cond.	5%	500V DCW	PC879
70.	3-55 MMF Trimmer cond.			PC899
71.	3-55 MMF Trimmer cond.			PC899
	Iron core - ant. and oscl. coils (white spot)			11/766-1
	Iron core - ant. and oscl. coils (blue spot)			11/766-2
72.	Short wave trim. cond. (male section)			A108/766
	Short wave trim. cond. (female section)			A109/766
73.	Short wave trim. cond. (male section)			A108/766
	Short wave trim. cond. (female section)			A109/766
74.	Record changer: Collaro type 3RC531, cream colour, 200-250V. 50 cycle, 3 speed, turnover head, ''Studio'' crystal cartridge			M308
	Crystal cartridge – includes needles and plug-in pick-up head			236/524
	Crystal cartridge – includes needles			A134/524
	Crystal cartridge - less needles			512/524
	L.P. needle - red spot			520/524
	STD. needle - green spot			521/524
	40 cycle drive bush			237/524
	Record changer: Collaro 3RC54, cream colour, 200-250V. 50 cycle operation, turnover head, ''Studio 0'' crystal cartridge			M371
	Crystal cartridge - includes needles			A134/524
	Crystal cartridge - less needles			512/524
	L.P. needle - red spot			520/524
	STD. needle - green spot			521/524
	40 cycle drive bush			237/524
75.	AC. lead junction block			297/279
76.	6 pin oblong plug			A102/366
77.	6 pin oblong socket			–
	cover section			6/366
	base section			5/366
	contact lugs			15/58-2
78.	ON/OFF switch, part of record changer circuit No. 74			–
79.	12″ permag. speaker type 12M			K172

Dial background assy.	A103/816	Dial pointer assy.	A101/816
Dial reading	35/816-2	Rubber grommet (4)	64/30A

Dial drum	41/785
Collar dial drum	56/678-1
7 pin socket	A104/58
9 pin socket	279/250
Pick-up lead phone tip socket	15/58-2
Aerial transfer	29/250
Earth transfer	30/250
Valve retainer wire (long)	307/250
Valve retainer wire (short)	308/250
Lamp socket assy. (2)	A105/861
Cabinet light bezel	292/250-1
Light bezel socket assy.	A574/30C
Insulated staple	238/250
Phone tip - pick-up lead	11/252
Terminal strip - 2 lug	A557/30C
Terminal strip - 3 lug (2)	A555/30C
Terminal strip - 5 lug	A573/30C
Terminal strip - 8 lug	A572/30C
Terminal strip - 8 lug	A150/30C
Terminal strip - 5 lug AC. mains	A567/30C
Audio power unit assy. complete with valves	A105/816-1
Screw - chassis/cab. mt. Csk. hd. N.P. (4)	269/250-1
Cup washer on chassis mt. screw N.P. (4)	293/250
Screw - receiver cover board ½" x No. 6 rd. hd. N.P. (4)	46/560-33
Pulley ¾" dia. wood	17/87
Pulley	13/613
Pulley stud (2)	18/87
I.F.T. Mt. clips	7/670
Circlip (2)	22/755
Nut - dial background fastening to chassis (2)	41/161
Nut - ¼" thick, tone control mt.	7/347
Nut - tone control gear plate mt.	17/304-6
Tone control mt. plate	37/816
Tone control spindle and brass gear assy.	A108/816
Tone control bakelite gear and bush assy.	A107/816
Brass bush - switch and vol. control mt. (2)	972/495-1
Hollow spindle - tuning	24/816
Knob - wave change	291/81-3
Knob - volume	291/81-4
Knob - tuning	292/81-3
Knob - tone	292/81-4
Knob spring insert	22/755
Cabinet assy.	266/221

INSTRUCTIONS FOR REMOVING CHASSIS FROM CABINET

1. Remove cabinet back by unscrewing the screws fastening it to the cabinet.
2. Unplug 6 pin plug from power supply unit and disconnect AC. mains leads from the two AC. mains junction blocks.
3. Unsolder two speaker leads connected to terminal strip on power supply unit.
4. Unsolder black earth lead and ¼" braid lead connected to power supply unit.
5. Unsolder cabinet indicator lamp lead connected to power supply unit.
6. Unclip aerial and earth leads from inside cabinet door.
7. Unscrew four 1" x 5/32" Whit. screws fastening power supply unit to cabinet.
8. Unscrew the small grub screw in the vol. and w/change knobs, then withdraw all four knobs.
9. Remove polished plywood plate from top of chassis by unscrewing the six screws fastening it to the chassis.
10. Unsolder pick-up leads connected to wave change switch on early production receivers or unplug the leads on later production receivers.
11. Unscrew and remove four screws – two at each end of chassis – then lift chassis out of the cabinet.

TRANSFORMER CONNECTIONS

B/CAST ANTENNA TRANS.

Start of winding – furthest from mounting end – Antenna, A.V.C.

Finish of winding – nearest to mounting end – Grid.

B/CAST OSCL COIL.

Start of winding – furthest from mounting end – Oscl. plate.

Finish of winding – nearest to mounting end – Oscl. grid.

19, 25, 31 AND 49 METRE ANT. TRANS.

Lead from top lug (iron core end) :– GRID.

Lead from bottom lug (mounting end) :– CHASSIS – EARTH.

19, 25, 31 AND 49 METRE OSCL. COIL

Lead from top lug (iron core end) :– GRID.

Lead from bottom lug (mounting end) :– OSCL. PLATE COND.

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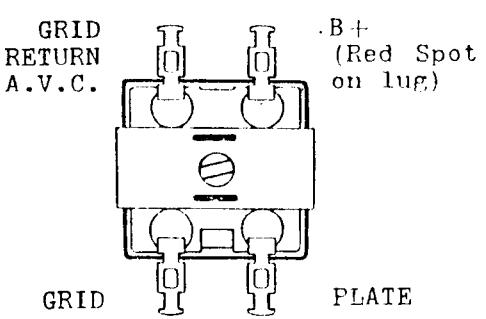
49 Metre spreadband coil, YELLOW spot on iron core end of former.

31 Metre spreadband coil, RED spot on iron core end of former.

25 Metre spreadband coil, WHITE spot on iron core end of former.

19 Metre spreadband coil, BROWN spot on iron core end of former.

1st IF. TRANS.



2nd IF. TRANS.