



# PHILCO



## Radio Service Bulletin No. 81

Published by the Philco Radio & Television Corporation of Great Britain Ltd., Perivale, Greenford, Middlesex.

**TYPE CIRCUIT.** Six valve Superheterodyne Unit-constructed Auto-radiogram Receiver with full A.V.C. and Pentode Output (4 watts) for operation on Short, Medium and Long wave-bands. Built-in connections for di-pole or Philco All-wave Noise Reducing Aerial, automatic bridge balanced aerial selector and alternative link connections — "C" for di-pole aerial and "B" for Philco All-wave Noise Reducing Aerial. Provision is made for connecting an external speaker of the permanent magnet moving-coil type, having an impedance of 2-3 ohms.

**GRAMOPHONE:** Automatic record changing equipment (with crystal pick-up) is incorporated, which plays either eight 10-inch or eight 12-inch records consecutively if desired. Any record may be rejected whilst the instrument is in operation should it be desired to do so, and the turntable is automatically stopped on conclusion of the final record of a series. Operation of the gramophone is controlled by the extreme clockwise rotation of the wave-change switch, which makes change over from radio to gramophone without the possibility of radio break-through.

**POWER SUPPLY:** Alternating current mains of 200-229 volts or 230-250 volts, 50-60 cycles, when the voltage adjusting plug is fully screwed into the correct socket on the rear-of-chassis panel.

**WAVE-BANDS:** COVERAGE: Three; (a) Long, 2,000-930 metres (150-322.5 kc.); (b) Medium, 550-200 metres (545.4-1,500 kc.); (c) Short, 5.8-18 mc. (51.7-16.6 metres).

**CONTROLS:** All controls are on the motor board.

**TUNING DRIVE:** Two-speed drive—ratios 8-1 and 40-1 for slow and accurate tuning, and new full-visibility spread band scale.

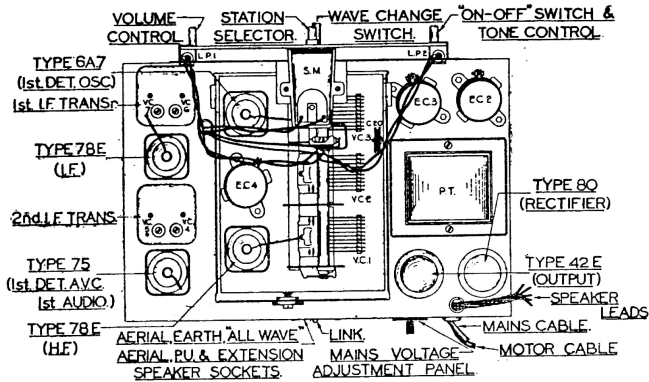
**TONE CONTROL:** Four positions, enabling a fine degree of tone between brilliant and mellow to be obtained. The "on-off" switch is combined with this control, thus enabling a particular setting of the separate volume control to be maintained.

**LOUD SPEAKER:** A 9½-inch diameter fully energised moving-coil speaker is used, which in conjunction with the Philco system of Audio Degeneration, gives the highest efficiency audio output, and greater bass response is obtained due to the large baffle.

**INTERMEDIATE FREQUENCY:** 470 kc.

**POWER CONSUMPTION:** Radio—65 watts approx. Gramophone—80 watts approx.

### Model A-638 Auto-Radiogram



TOP CHASSIS DIAGRAM.

TABLE 1—VOLTAGES

Valve socket readings to chassis taken with an 065 or 077 Philco Set Tester, using the 500, 250 and 10 volts ranges. Volume control at minimum, tone control fully brilliant, wave-change switch in M.W. position and no aerial connected. A.C. line 230 volts, 50 cycles.

Position.	Valve.	Anode.	Screen.	Bias.
H.F. Amplifier, S.3 ... ..	78E	Pin 3. 220 v.	Pin 4. 75 v.	Pin 5. -1.25 v.
1st Detector and Oscillator, S.4 ... ..	6A7	Pin 3. 245 v. Pin 5. 120 v.*	Pin 4. 75 v.	Pin 7. 2.5 v.
I.F. Amplifier, S.6 ... ..	78E	Pin 3. 245 v.	Pin 4. 75 v.	Pin 5. -1.25 v.
2nd Detector, A.V.C. and 1st L.F. ... ..	75	Pin 3. 140 v.	—	—
1st L.F. Amplifier, S.5 ... ..	75	Pin 3. 265 v.	Pin 4. 275 v.	—
Pentode Output, S.2 ... ..	42E	Pin 3. 320 v. A.C.	—	-20 v. †
Full-wave Rectifier, S.1 ... ..	80	Pin 4. 320 v. A.C.	—	—

\* Oscillator Anode Volts.

† Bias measured between C.2-2 and chassis.

Total D.C., 380 volts, measured between V.2-2 and C.2-2.

V.2 filament, 5 volts A.C.; V.1, 3, 4, 5, 6, L.P.1, L.P.2 and L.P.3 filaments, each 6.3 volts A.C.; measured between Pins 1 and 2 on each socket.

TABLE 2—RESISTANCES OF COILS.

Link on TB.3 to be in socket "B."

Ref. No.	Test Prod. 1.	Test Prod. 2.	Resistance (Ohms)	Ref. No.	Test Prod. 1.	Test Prod. 2.	Resistance (Ohms)
T.1 Primary .. ..	TB.3 Socket "A"	TB.3 Socket "Blk."	Less than 0.1	T.4 Secondary .. ..	V.4/5	TB.6/1	0.1
T.1 Primary tapping .. ..	TB.3 Socket "A"	TB.3 Socket "C"	Less than 0.1	T.6 .. ..	V.4/6	Sw.3/2 Tag 1A	Sw.3. L.W. 16.5 Sw.3. M.W. 2.5
T.1 Secondary .. ..	V.3 Cap	TB.10/3	Sw.3. S.W. 0.1 Sw.3. Gram 0.1	T.7 Primary .. ..	TB.10/10	TB.8/1	8
T.2 Primary .. ..	TB.3 Socket "Blk"	Chassis	Sw.3. L.W. 60 Sw.3. M.W. 60 Sw.3. S.W. Zero Sw.3. Gram 60	T.7 Primary tapping .. ..	TB.10/10	V.6/3	4
T.2 Secondary .. ..	V.3 Cap	TB.10/3	Sw.3. L.W. 40 Sw.3. M.W. 2.5	T.7 Secondary .. ..	TB.10/2	VC.5 Tag (inside can)	8
S.M. .. ..	TB.10/10	TB.10/9	3,500	T.7 Secondary tapping .. ..	TB.10/2	V.5/5	4
T.3 Primary .. ..	Sw.3/2 Tag 5	TB.10/9	60	T.9 Primary .. ..	V.1/3	TB.10/12	265
T.3 Secondary .. ..	V.4 Cap	TB.7/1	Sw.3 L.W. 150 approx. (R.14 in series) Sw.3. M.W. 2.5	T.9 Secondary .. ..	Output Transformer	Output Transformer	0.2**
T.5 Primary .. ..	V.3/3	Sw.3/2 Tag 5	2	Speech Coil .. ..	Lead 1	Lead 2	2**
T.5 Secondary .. ..	V.4 Cap	Chassis	Sw.3. S.W. 0.1 Sw.3. Gram 100,000 approx.	CK.3 .. ..	V.2/2	TB.10/12	1,140
T.8 Primary .. ..	TB.10/10	VC.6 Tag (inside can)	8	P.T. Primary .. ..	C.1/2	200-229 v. Tap	Sw.1. "ON" 30
T.8 Primary tapping .. ..	TB.10/10	V.4/3	8	P.T. Primary .. ..	C.1/2	230-250 v. Tap	Sw.1. "ON" 35 Sw.1. "OFF" Infinity
T.8 Secondary .. ..	V.6 Cap	TB.7/1	8	H.T. Secondary .. ..	V.2/3	C.2/2	240
T.4 Primary .. ..	V.4/6	C.20 Tag	Sw.3. S.W. 0.1 Sw.3. Gram Infinity	H.T. Secondary .. ..	V.2/4	C.2/2	240
				Rectifier L.T. Sec. .. ..	V.2/1	V.2/2	0.1††
				Heater L.T. Sec. .. ..	V.1/1	V.1/2	0.2††
				CK.1 .. ..	TB.1A/2	O.1/3	2.5
				CK.2 .. ..	TB.1A/3	C.1/2	2.5

\*\* Resistance of T.9 Secondary alone and Speech Coil alone (taken when disconnected).

†† Resistance of L.T. windings taken with all valves removed.

Note.—Reference numbers for valves should be read in conjunction with the socket numbers, e.g., V.1—S.1.



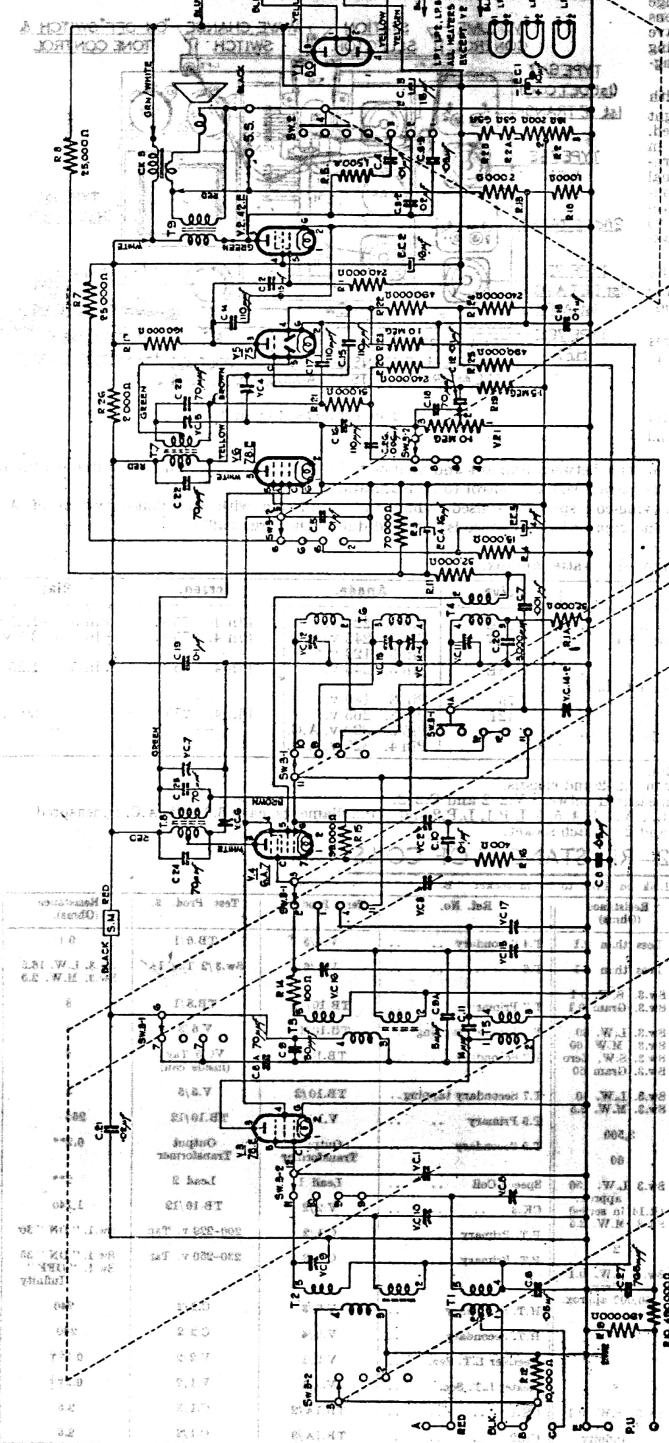
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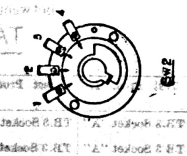
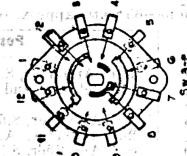
Published by the Philco Radio & Television Corporation of Great Britain, Limited, 15, Abchurch Lane, London, E.C. 4, Middlesex.

## Model A-688 ARG Radiogram



**TYPE CIRCUIT:** Six valve superheterodyne Unit connected to a radio receiver with full A.V.C. and Pentode Output (4 watts) for operation on short, medium and long wavebands. Built-in connections for diode or Philco Hi-Wave Noise Reducing Aerial, automatic balanced aerial selector and alternative link connections for "C" or "B" for Philco All-wave Noise Reducing Aerial. Provision is made for connecting an external speaker of the permanent magnet type, coil type, having an impedance of 5 ohms.

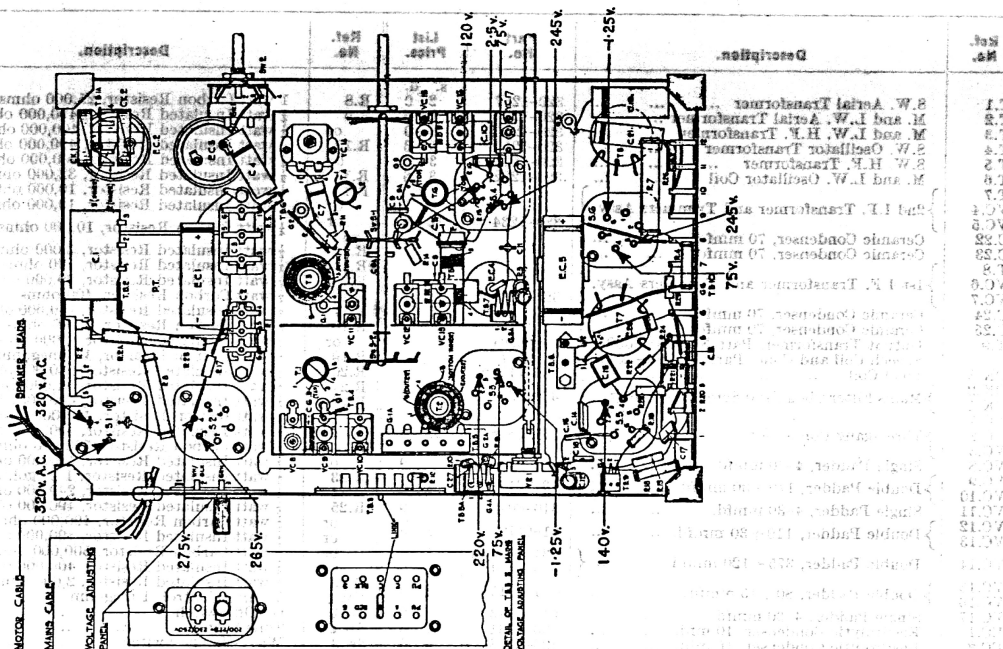
**GRAMMOPHONE:** Automatic record changing (with record) is incorporated which allows the other side of each or eight 12 inch records to be played. Any record may be selected while the instrument is in operation. Records should be held in the table in a predetermined order for the purpose of being recorded by a master control. The instrument is controlled by the master control and the master control may be operated by a hand control or a remote control.



CHASSIS BEING VIEWED FROM REAR  
 CHASSIS BEING VIEWED FROM FRONT  
 SHADDED AREA INDICATES REAR OF SWITCH WAFER

### SCHEMATIC DIAGRAM — MODEL A-688 ARG.

Ref. No.	Description
T.1 Primary	T.1 Secondary
T.2 Primary	T.2 Secondary
T.3 Primary	T.3 Secondary
T.4 Primary	T.4 Secondary
T.5 Primary	T.5 Secondary
T.6 Primary	T.6 Secondary
T.7 Primary	T.7 Secondary
T.8 Primary	T.8 Secondary
T.9 Primary	T.9 Secondary
T.10 Primary	T.10 Secondary
T.11 Primary	T.11 Secondary
T.12 Primary	T.12 Secondary
T.13 Primary	T.13 Secondary
T.14 Primary	T.14 Secondary
T.15 Primary	T.15 Secondary
T.16 Primary	T.16 Secondary
T.17 Primary	T.17 Secondary
T.18 Primary	T.18 Secondary
T.19 Primary	T.19 Secondary
T.20 Primary	T.20 Secondary
T.21 Primary	T.21 Secondary
T.22 Primary	T.22 Secondary
T.23 Primary	T.23 Secondary
T.24 Primary	T.24 Secondary
T.25 Primary	T.25 Secondary
T.26 Primary	T.26 Secondary
T.27 Primary	T.27 Secondary
T.28 Primary	T.28 Secondary
T.29 Primary	T.29 Secondary
T.30 Primary	T.30 Secondary
T.31 Primary	T.31 Secondary
T.32 Primary	T.32 Secondary
T.33 Primary	T.33 Secondary
T.34 Primary	T.34 Secondary
T.35 Primary	T.35 Secondary
T.36 Primary	T.36 Secondary
T.37 Primary	T.37 Secondary
T.38 Primary	T.38 Secondary
T.39 Primary	T.39 Secondary
T.40 Primary	T.40 Secondary
T.41 Primary	T.41 Secondary
T.42 Primary	T.42 Secondary
T.43 Primary	T.43 Secondary
T.44 Primary	T.44 Secondary
T.45 Primary	T.45 Secondary
T.46 Primary	T.46 Secondary
T.47 Primary	T.47 Secondary
T.48 Primary	T.48 Secondary
T.49 Primary	T.49 Secondary
T.50 Primary	T.50 Secondary



UNDER CHASSIS DIAGRAM — MODEL A-638 ARG.

**ALIGNMENT PROCEDURE—MODEL A-638 ARG.**

Before leaving the factory, all Philco Receivers are accurately aligned, but if misalignment is suspected through damage, no alteration should be made without instruction in the correct adjustment of the trimming and padding condensers. It should only be carried out with the aid of an accurately calibrated Signal Generator and for this purpose the PHILCO ALL-PURPOSE SET TESTER MODEL 077 is recommended.

Connect the Output Meter across the Primary of the Output Transformer, i.e., green and white leads. With gang condenser fully closed, check that pointer reads on the white dot in bottom corner of L.W. scale. Set wave-change switch to second position from left (M.W.), turn volume control fully clockwise and tone control as far counter-clockwise as possible without switching off.

**NOTE.**—The link on TB.3 must be placed in socket "B."

**INTERMEDIATE FREQUENCY.**—The I.F. trimmers V.C.'s 4, 5, 6 and 7 must first be carefully adjusted by feeding in a 470 kc. signal from the Signal Generator through a Standard Dummy to the grid cap of the 6A7 valve (with grid lead connected) and the Signal Generator earthed to the receiver earth socket or chassis. Adjust the Signal Generator Attenuator to give a half-scale reading on the Output Meter. The I.F. trimmers must then be adjusted for maximum output.

Transfer Signal Generator lead via the Standard Dummy to the Aerial socket.

**NOTE.**—It is important that the following order of alignment be followed.

**LONG WAVES.**—Turn wave-change switch to L.W. position (fully counter-clockwise) and set pointer at 290 kc. (small mark on outer edge of S.W. scale above 14.6 mc.). Feed in a 290 kc. signal and trim V.C.'s 12, 9 and 16 underneath chassis in that order for maximum output.

Set pointer at 160 kc. (small mark on outer edge of S.W. scale above 6.1 mc.) and feed in a signal of 160 kc. Rock gang and pad VC.14 (nut) for maximum output. Readjust VC.12 at 290 kc. Repeat the above operation until no further improvement results.

**MEDIUM WAVES.**—Turn wave-change switch to second position clockwise (M.W.) and set pointer at 1,400 kc. (corresponding to 16 mc. on S.W. scale). Feed in a signal of 1,400 kc. and trim V.C.'s 13, 10 and 15 underneath chassis in that order for maximum output.

Set pointer at 600 kc. ("500" metres on scale) and feed in a signal of 600 kc. Rock gang and pad VC.14 (screw) for maximum output. Readjust VC.13 at 1,400 kc. Repeat the above operation until no further improvement is obtainable.

**SHORT WAVES.**—Turn wave-change switch to third position clockwise (S.W.). Substitute a 400 ohms resistor for the Standard Dummy and feed in an 18 mc. signal. Set pointer at 18 mc. and adjust VC.11 underneath chassis for the second signal heard from tight (care is necessary as the two peaks are narrowly spaced).

**NOTE.**—Due to the very small difference between the pre-selector and oscillator frequencies, the adjustment of VC.'s 8 and 17 will have a tendency to "pull" or change the frequency of the oscillator. By shunting a 21-plate variable condenser (approx. .00035 mfd.) across the oscillator section of the gang and tuning it so that the second harmonic instead of the fundamental beats with the incoming signal, this "pull" can be minimised.

Connect the shunt condenser between VC.11 tag and chassis and tune it (about half open) for signal at 18 mc. Trim VC.'s 8 and 17 underneath chassis in that order for maximum output. Disconnect shunt condenser and retrim VC.11.

Check that 18 mc. image is obtained at approximately 17.1 mc.

Feed in and tune a signal of 6 mc. and check for correct reading on scale. It should not be necessary to adjust the semi-fixed tracker (C.20), but if sensitivity is found to be low at 6 mc., very slight adjustment only may be made while rocking the gang. (See note below.) Finally, retrim VC.11 at 18 mc.

**NOTE.**—It is permissible to make this adjustment only on oil-filled condensers. Any adjustment of a wax-sealed condenser will be unstable and on no account must be made.

Check calibration.

PARTS AND PRICE LIST — MODEL A-638 ARG.

Ref. No.	Description.	Part No.	List Price.	Ref. No.	Description.	Part No.	List Price.
T.1	S.W. Aerial Transformer ...	320-1257	s. d.	R.8	1 watt Carbon Resistor, 25,000 ohms ...	3656	s. d.
T.2	M. and L.W. Aerial Transformer ...	320-1214	2 c	R.9	1 watt Insulated Resistor, 490,000 ohms ...	330-2001	9
T.3	M. and L.W. H.F. Transformer ...	320-1216	6 0	or	1 watt Insulated Resistor, 400,000 ohms ...	339-2026	
T.4	S.W. Oscillator Transformer ...	320-1259	6 0	R.10	1 watt Insulated Resistor, 490,000 ohms ...	330-2001	9
T.5	S.W. H.F. Transformer ...	320-1258	3 6	or	1 watt Insulated Resistor, 400,000 ohms ...	339-2026	
T.6	M. and L.W. Oscillator Coil ...	320-1232	3 6	R.11	1 watt Insulated Resistor, 32,000 ohms ...	330-2031	9
T.7	2nd I.F. Transformer and Trimmers Assy.	320-1234	12 6	R.12	1 watt Insulated Resistor, 10,000 ohms ...	330-2014	9
VC.4					or	1 watt Insulated Resistor, 10,000 ohms ...	339-2018
VC.5				or	1 watt Carbon Resistor, 10,000 ohms ...	33-1000 or	9
C.22	Ceramic Condenser, 70 mmfd. ...			R.13	1 watt Insulated Resistor, 2,000 ohms ...	330-2023	9
C.23	Ceramic Condenser, 70 mmfd. ...			R.14	1 watt Insulated Resistor, 100 ohms ...	330-2060	9
T.8	1st I.F. Transformer and Trimmers Assy.	320-1233	12 6	R.15	1 watt Insulated Resistor, 99,000 ohms ...	330-2003	9
VC.6						R.16	1 watt Carbon Resistor, 400 ohms ...
VC.7				R.17	1 watt Insulated Resistor, 160,000 ohms ...	330-2024	9
C.24	Ceramic Condenser, 70 mmfd. ...			R.18	1 watt Carbon Resistor, 1,000 ohms ...	5837	9
C.25	Ceramic Condenser, 70 mmfd. ...			or	1 watt Insulated Resistor, 1,000 ohms ...	338-2013	
T.9	Output Transformer, Part No. 320-8062	Complete		R.19	1 watt Carbon Resistor, 1.5 megohms ...	33-1188	0
	Speech Coil and Cone, Part No. 360-4019	360-1124†		R.20	1 watt Insulated Resistor, 240,000 ohms ...	330-2002	9
	Field Coil ...	320-1260	3 0	R.21	1 watt Insulated Resistor, 51,000 ohms ...	330-2004	9
CK.3	Mains Filter Choke and Screen Assembly ...	320-1260	3 0	R.22	1 watt Insulated Resistor, 490,000 ohms ...	330-2001	9
CK.2						or	1 watt Carbon Resistor, 490,000 ohms ...
VC.1				or	1 watt Insulated Resistor, 490,000 ohms ...	330-2013	9
VC.2	Three-gang Condenser ...	31-1818	21 0	or	1 watt Insulated Resistor, 500,000 ohms ...	33-1036	9
VC.3				or	1 watt Insulated Resistor, 400,000 ohms ...	339-2026	
VC.8	Single Padder, 4-30 mmfd. ...	31-6161	9	R.23	1 watt Insulated Resistor, 1 megohm ...	330-2018	9
VC.9	Double Padder, 110+30 mmfd. ...	31-6179	1 6	R.24	1 watt Insulated Resistor, 240,000 ohms ...	330-2002	9
VC.10	Single Padder, 4-30 mmfd. ...	310-6043	9	R.25	1 watt Insulated Resistor, 490,000 ohms ...	330-2001	9
VC.11	Double Padder, 110+30 mmfd. ...	31-6179	1 6	or	1 watt Carbon Resistor, 490,000 ohms ...	330-1020	9
VC.12				or	1 watt Insulated Resistor, 490,000 ohms ...	330-2013	9
VC.13				or	1 watt Carbon Resistor, 500,000 ohms ...	33-1036	9
VC.14	Double Padder, 375+120 mmfd. ...	31-6180 or 310-6054	1 8 1 8	or	1 watt Insulated Resistor, 400,000 ohms ...	339-2023	
VC.15				or	1 watt Insulated Resistor, 2,000 ohms ...	330-2023	
VC.16	Double Padder, 80+15 mmfd. ...	31-6115	2 0	R.26	Volume Control, 1 megohm ...	330-5021	3 6
VC.17	Single Padder, 4-30 mmfd. ...	310-6043	9	VR.1	On-Off Switch ...	420-1036	5 3
EC.1	Electrolytic Condenser, 10 mfd. ...	300-4031	1 6	Sw.1	Tone Switch ...		
EC.2	Electrolytic Condenser, 16 mfd. ...	300-2013	6 0	Sw.2	Wave-change Switch ...	420-1031	9 6
EC.3	Electrolytic Condenser, 16 mfd. ...	300-2013	6 0	Sw.3	6-prong Valve Holder ...	27-6036	9 6
EC.4	Electrolytic Condenser, 16 mfd. ...	300-2013	6 0		4-prong Valve Holder ...	27-6044 or	9 9
EC.5	Electrolytic Condenser, 4 mfd. ...	300-2008	2 6		7-prong Valve Holder ...	27-6037	9 9
C.1	Moulded Condenser, .09+.09 mfd. ...	4989-DG	2 0	P.T.	Power Transformer, 50-100 cycles ...	320-8005	22 6
C.2	Moulded Condenser, .015 mfd. ...	3793-SU	1 0	or	Power Transformer, 25-100 cycles ...	320-8020	
C.3	Moulded Condenser, .02+.05 mfd. ...	3615-ZU	1 6	LP.1 & 2	Pilot Bulbs ...	34-2141	10
C.4	Tubular Condenser, .01 mfd. ...	30-4051	9	S.M.	Shadowmeter ...	450-2001P	10 6
C.5	Tubular Condenser, .01 mfd. ...	30-4145	9	LP.3	Shadowmeter Bulb ...	34-2141	10
C.6	Tubular Condenser, .05 mfd. ...	30-4020	9		Valve Shield ...	28-2726	8
C.7	Tubular Condenser, .001 mfd. ...	30-4201	10		Grid Clip ...	28-2214	
C.8	Tubular Condenser, .05 mfd. ...	30-4020	9		Rubber Crommett ...	270-7264	
C.8A	Mica Condenser, 70 mmfd. ...	300-1049	1 0		Rubber Buffers ...	270-7189	
C.9	Mica Condenser, 50 mmfd. ...	300-1045	9		Motor Cable ...	LO-1002	1 9
C.9A	Ceramic Condenser, 5 mmfd. ...	300-1074 or 300-1044	1 0 1 0		Mains Cable ...	LO-1009	1 9
C.10	Tubular Condenser, .1 mfd. ...	30-4122	9		Speaker Cable ...	LO-1035	1 9
C.11	Ceramic Condenser, 14 mmfd. ...	300-1070	9		Aerial Panel and Leads Assembly ...	380-5154	1 6
or	Ceramic Condenser, 10 mmfd. ...	300-1068	9		Mains Voltage Adjusting Panel ...	380-5342	9 9
C.12	Tubular Condenser, .01 mfd. ...	30-4124	1 0		Mains Voltage Adjusting Plug ...	380-5340	6
C.13	Tubular Condenser, .1 mfd. ...	30-4122	1 0		Scale Holder Assembly ...	380-1074	8 0
C.14	Mica Condenser, 110 mmfd. ...	30-1031 or 300-1056	10 10		Dial Scale Assembly ...	380-5530	
C.15	Mica Condenser, 110 mmfd. ...	30-1031 or 300-1056	9 10		Wave-band Indicator Assembly ...	380-5587	
C.16	Mica Condenser, 110 mmfd. ...	30-1031 or 300-1056	9 10		Vernier Dial Assembly ...	380-5586	
C.17	Mica Condenser, 110 mmfd. ...	30-1031 or 300-1056	9 10		Pointer and Hub Assembly ...	389-5026	
C.18	Mica Condenser, 70 mmfd. ...	30-1049	1 0		Noise Reducing Screen ...	280-1555	2 6
C.19	Tubular Condenser, .1 mfd. ...	30-4170	1 0		Chassis Mounting Washers ...	29-4189	
C.20	Mica Condenser, 3,000 mmfd. ...	31-6219 or 310-6055	1 10 1 0		Kalon Screw ...	W-1496	
C.21	Tubular Condenser, .02 mfd. ...	30-4113	1 0		Chassis Mounting Bracket ...	280-7001	1 6
C.26	Tubular Condenser, .006 mfd. ...	30-4125	9		Chassis Mounting Bolt ...	WB-1109	
C.27	Mica Condenser, 765 mmfd. ...	300-1066 or 30-1069	9 9		Chassis Mounting Nut ...	WN-1109	
R.1.A	1 watt Insulated Resistor, 32,000 ohms ...	330-2031	9		Chassis Mounting Knob and Spring ...	270-4120	
R.1	1 watt Insulated Resistor, 240,000 ohms ...	330-2002	9		Large Tuning Knob and Spring ...	270-4118	6
R.2	Candohm Wirewound Resistor, 18+200 ohms ...	33-3345	1 0		Small Tuning Knob and Spring ...	270-4118	6
R.2.A	1 watt Insulated Resistor, 63 ohms ...	330-2044	9		Knob (Wave-change) and Spring ...	270-4114	
or	1 watt Carbon Resistor, 63 ohms ...	330-1037	9		Knob (Tone) and Spring ...	270-4114	
R.2.B	1 watt Insulated Resistor, 63 ohms ...	330-2044	9		Knob (Volume) and Spring ...	270-4140	
or	1 watt Carbon Resistor, 63 ohms ...	330-1037	9	V.1	Knob Spring for Large Knob ...	28-1738	
R.3	1 watt Carbon Resistor, 70,000 ohms ...	5885	9	V.2	Knob Spring for Small Knobs ...	280-5262	
or	1 watt Insulated Resistor, 70,000 ohms ...	330-2034	9	V.3	Red Wander Plug ...	380-5087	9
R.4	1 watt Insulated Resistor, 15,000 ohms ...	330-2016	9	V.4	Black Wander Plug ...	380-5015	9
or	1 watt Carbon Resistor, 15,000 ohms ...	6208	9	V.5	Type RC.4A Automatic Record Changer, Motor, Turntable, Needle Cups and Crystal Pick-up Assembly ...	359-2000	
R.5	1 watt Carbon Resistor, 1,500 ohms ...	7951	9	V.6	Type 80 Full Wave Rectifier Valve ...	3149	
or	1 watt Carbon Resistor, 1,500 ohms ...	33-1072 or	10		Type 42E Pentode Output Valve ...	6447-E	
R.7	2 watt Carbon Resistor, 25,000 ohms ...	339-1320			Type 78E Variable-mu H.F. Pentode Valve ...	8315-E	
					Type 6A7 Variable-mu Heptode Valve ...	34-2002	
					Type 75 Double-diode Triode Valve ...	8002	
					Type 78E Variable-mu H.F. Pentode Valve ...	8315-E	
					Instruction Manual ...	399-30.8	

† When ordering Speaker parts the letter which will be found in the part number of the Speaker must also be given.

MARCH, 1938.

ABOVE PRICES DO NOT APPLY IN EIRE.

A RADIO MANUFACTURERS SERVICE PUBLICATION.