

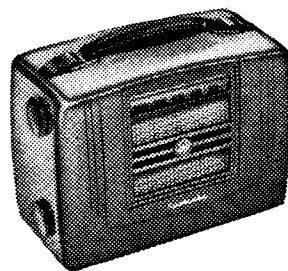
TECHNICAL INFORMATION
AND
SERVICE DATA

AWA **RADIOLA**

Model 647-P

SIX VALVE, BROADCAST, DRY-CELL BATTERY or
A.C. POWER UNIT OPERATED SUPERHETERODYNE

ISSUED BY:
AMALGAMATED WIRELESS (AUSTRALASIA) LTD.



ELECTRICAL SPECIFICATIONS

Frequency Range 540-1600 Kc/s
(555-187.5 Metres)

Intermediate Frequency 455 Kc/s

Battery Complement:

- "A" Battery — 9 volt battery pack consisting of
3 cycle lamp batteries, No. 701.
- "B" Battery — one 90 volt No. 490P battery.

Battery Consumption:

- "A" Battery — 50 mA.
- "B" Battery — 13 mA "Battery Full".
8 mA "Battery Saving".

Power Unit Operation:

The receiver may be operated on the following voltage ranges by altering the transformer tappings.

- 200 — 215 volts
- 216 — 230 volts
- 231 — 245 volts
- 246 — 260 volts

Power Unit Frequency Range 50-60 C.P.S. and 40 C.P.S.

A.C. Power Consumption 17 watts

Valve Complement:

- (1) 1T4 — R.F. Amplifier
- (2) 1R5 — Converter
- (3) 1T4 — I.F. Amplifier
- (4) 1S5 — Detector, A.F. Amplifier, A.V.C.
- (5) 3V4 — Output
- (6) 6X4 — Rectifier

Loudspeaker (Permanent Magnet):

- 4 inch — Code No. BH3.
- Transformer — XA320.
- V.C. Impedance — 3 ohms at 400 C.P.S.

Undistorted Power Output: 200 milliwatts.

Controls: Tuning Control — right-hand end of cabinet.
Volume Control — top left-hand end of cabinet.
Power Selector Switch — bottom left-hand end of cabinet.

Chassis Removal:

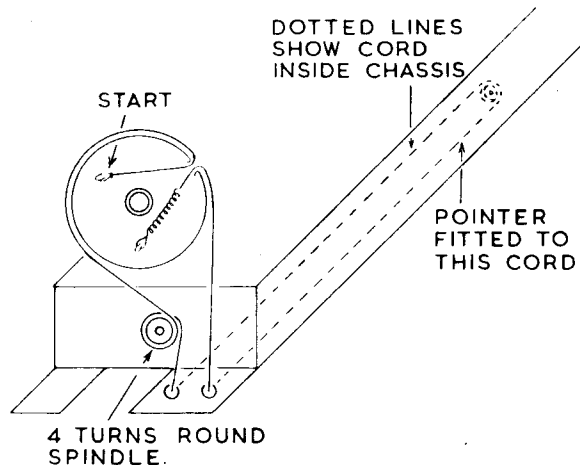
Power Unit. Remove the Power Selector Knob by pulling it straight off its spindle, disconnect the batteries and remove the receiver cable plug from the socket on the Power Unit chassis.

The chassis is held in the cabinet by two screws through the base of the cabinet. Removal of these enables the chassis to be withdrawn.

Receiver. Disconnect and remove the batteries and pull the knobs straight off their spindles. Loosen the two 2BA screws retaining the chassis which then may be withdrawn. If necessary unsolder the loop leads.

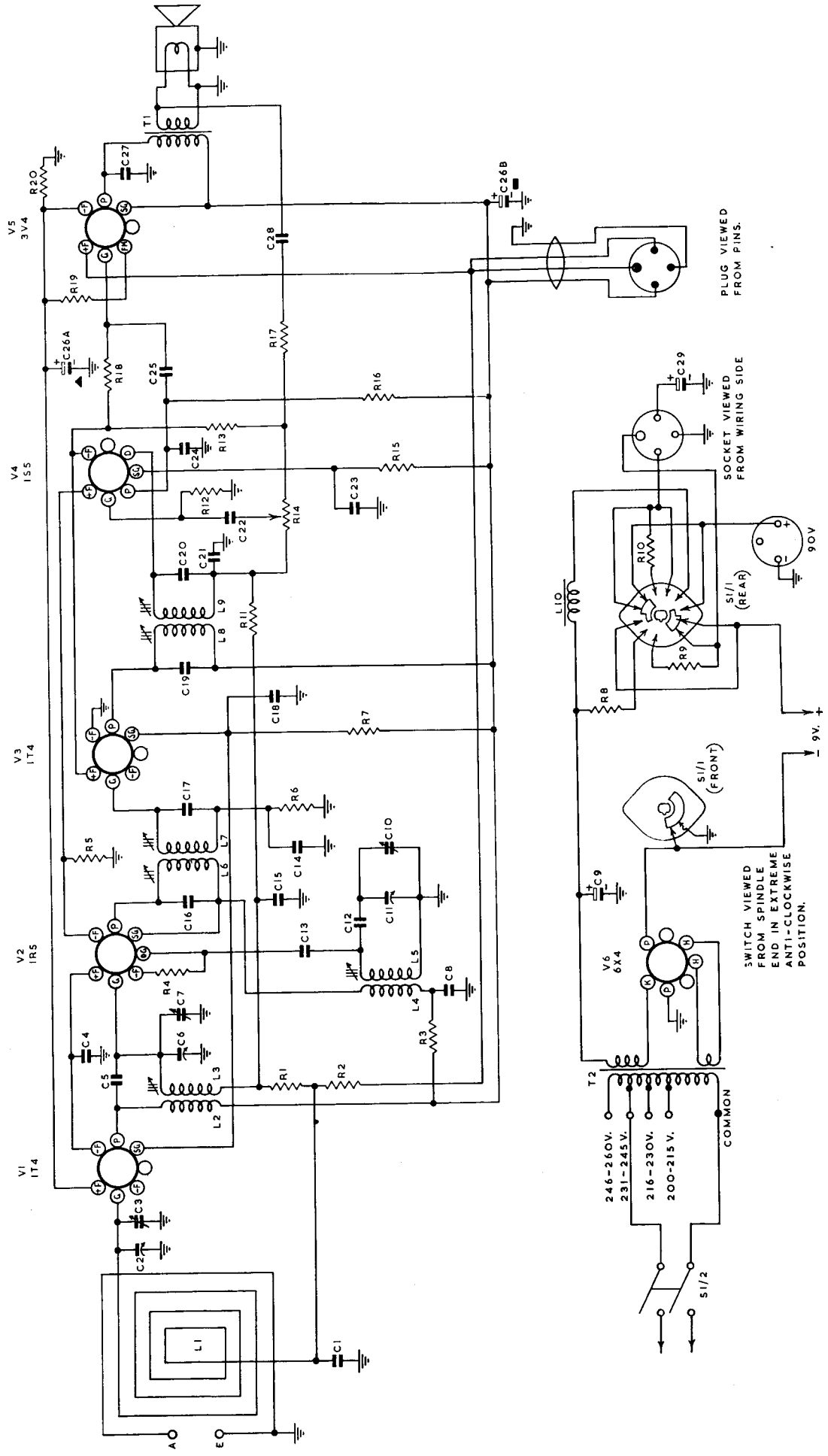
When re-fitting the chassis, make sure that the two rectangular washers on the 2BA screws are replaced so that their "teeth" are towards the front of the cabinet.

When soldering the loop leads, always connect the green lead so that it connects to the inside, or start, of the loop.



Drive Cord Replacement:

The accompanying diagram shows the route of the cord and the method of attachment.



PLUG VIEWED FROM PINS.

SOCKET VIEWED FROM WIRING SIDE

90V
 S1/1 (FRONT)
 S1/1 (REAR)
 SWITCH VIEWED FROM SPINDLE END IN EXTREME ANTI-CLOCKWISE POSITION.

T2
 246-260V.
 231-245V.
 216-230V.
 200-215V.
 COMMON

V6 6X4

V5 3V4

V4 I55

V3 IT4

V2 IR5

V1 IT4

A0

E0

ALIGNMENT PROCEDURE

Manufacturer's Setting of Adjustments.

The receiver is tested by the manufacturer with precision instruments and all adjusting screws are sealed. Re-alignment should be necessary only when components in tuned circuits are repaired or replaced, or when it is found that the seals over the adjusting screws have been broken.

It is especially important that the adjustments should not be altered unless in association with the correct testing instruments listed below.

Under no circumstances should the plates of the ganged tuning capacitor be bent, as the unit is accurately aligned during manufacture and cannot be readjusted unless by skilled operators using special equipment.

For all alignment operations, keep the generator output as low as possible to avoid A.V.C. action. Also, keep the volume control in the maximum clockwise position.

Testing Instruments.

- (1) A.W.A. Junior Signal Generator, type 2R3911, or
- (2) A.W.A. Modulated Oscillator type J6726.

If the modulated oscillator is used, connect a 0.25 megohm non-inductive resistor across the output terminals.

- (3) A.W.A. Output Meter, type 2M8832.

ALIGNMENT TABLE

Order	Connect "high" side of Generator to:	Tune Generator to:	Tune Receiver to:	Adjust for Maximum Peak Output:
NOTE: If loop leads protruding from the chassis are disconnected, connect a 1.0 megohm resistor across them.				
1	Grid of 1R5 * (Centre Section of Gang)	455 Kc/s	Gang in full mesh	L9 and L8 Cores
2	Grid of 1R5 * (Centre Section of Gang)	455 Kc/s	Gang in full mesh	L7 and L6 Cores
Replace the cover over the receiver chassis which should then be fitted in the cabinet, the resistor removed from the loop leads, and the leads then connected to the aerial in the cabinet back. The batteries and power unit must be in place in the cabinet and the back closed for alignment of aerial circuits. Connect a 10,000 ohm resistor from the centre section of the gang to chassis.				
3	Inductively coupled to loop †	600 Kc/s	600 Kc/s (Approx. 10 on dial)	L.F. Osc. Core Adj. (L5) ‡§
4	Inductively coupled to loop †	1620 Kc/s	Gang fully open	H.F. Osc. Adj. (C10) ¶
5	Inductively coupled to loop †	1500 Kc/s	1500 Kc/s (Approx. 90 on dial)	H.F. Aer. Adj. (C3) §
Repeat Adjustments 3 and 5 until the maximum output is obtained. Remove the 10,000 ohm resistor.				
6	Inductively coupled to loop †	600 Kc/s	600 Kc/s (Approx. 10 on dial)	L.F., R.F. Core Adj. (L3) ¶
7	Inductively coupled to loop †	1500 Kc/s	1500 Kc/s (Approx. 90 on dial)	H.F., R.F. Adj. (C7) §
Repeat adjustments 6 and 7 until the maximum output is obtained and finally check adjustments 3 and 5.				

* A 0.001 μ F capacitor should be connected in series with the high side of the test instrument.

† A coil comprising 3 turns of 16 gauge D.C.C. wire and about 6 inches in diameter should be connected between the output terminals of the test instrument, placed co-axial with the loop and distant not less than 1 foot from it.

‡ Rock the tuning control back and forth through the signal.

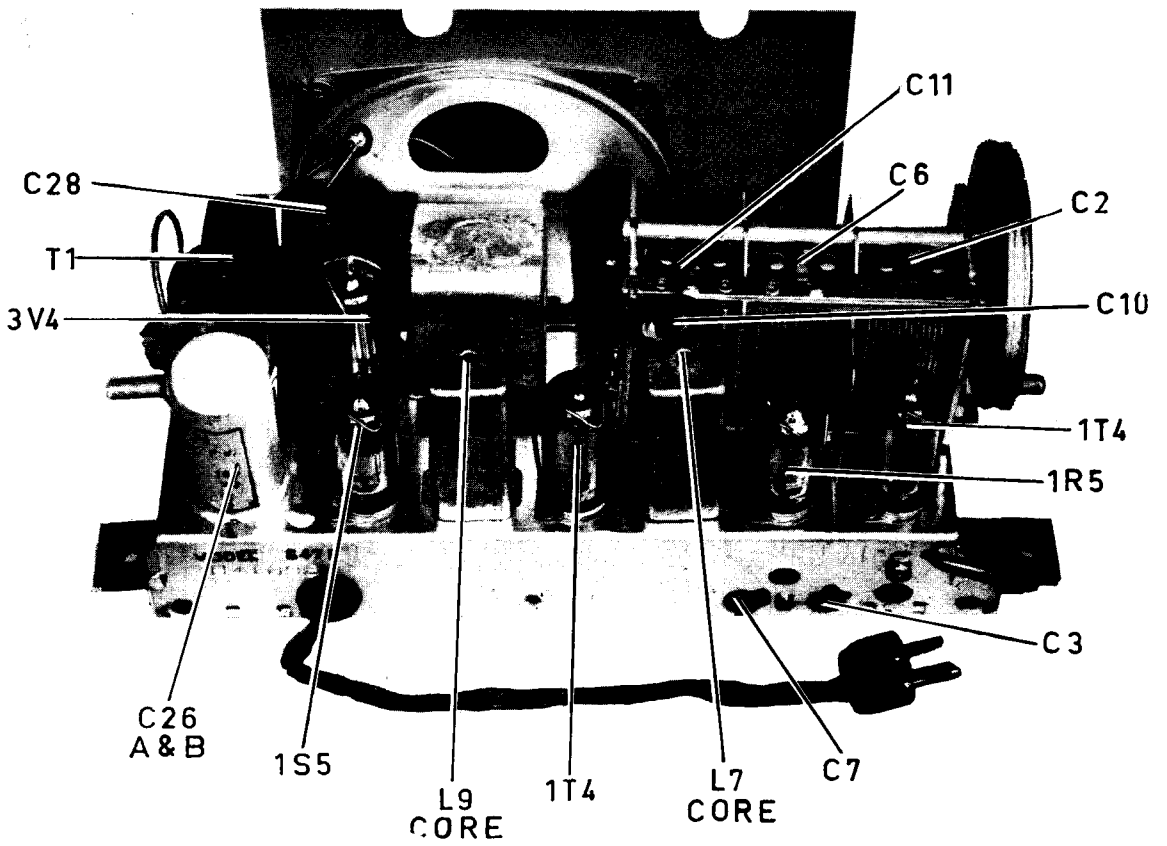
§ These adjustments are accessible through 3 holes in the cabinet back.

¶ Open the back to make this adjustment and then close to complete alignment.

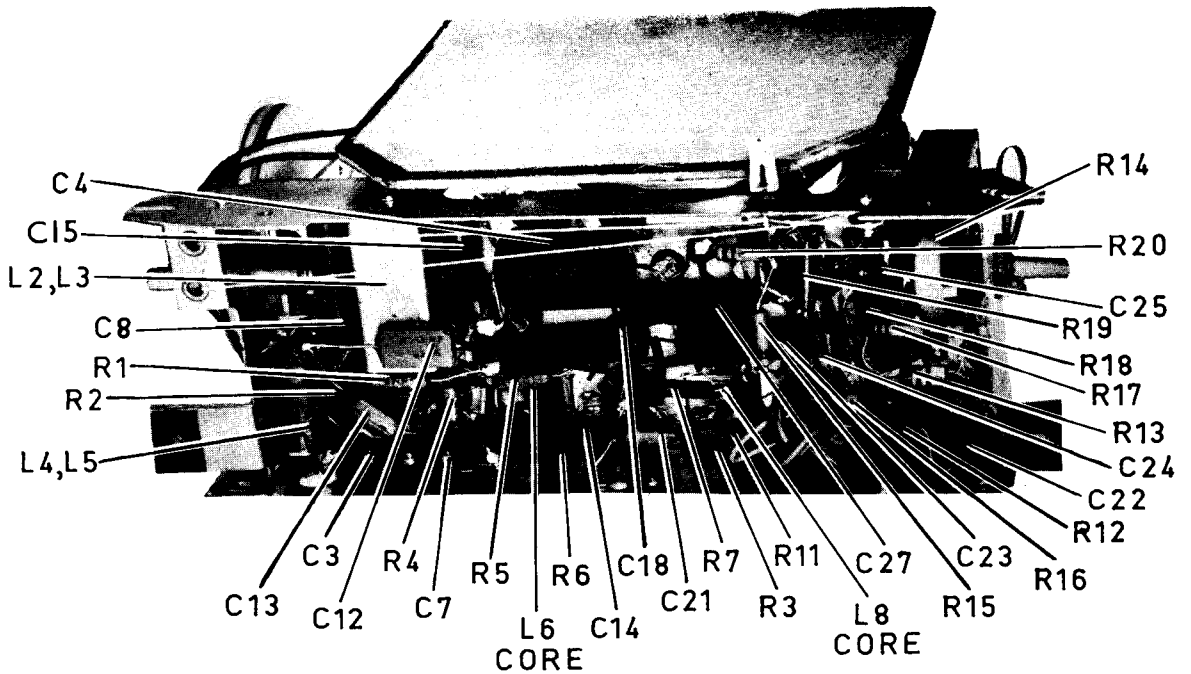
Power Unit Operation.

With the switch in the A.C. position, the 6X4 is operated as a half wave rectifier with both plates connected to the chassis, which is negative for both "A" and "B" circuits. The transformer secondary voltage is applied between cathode and load.

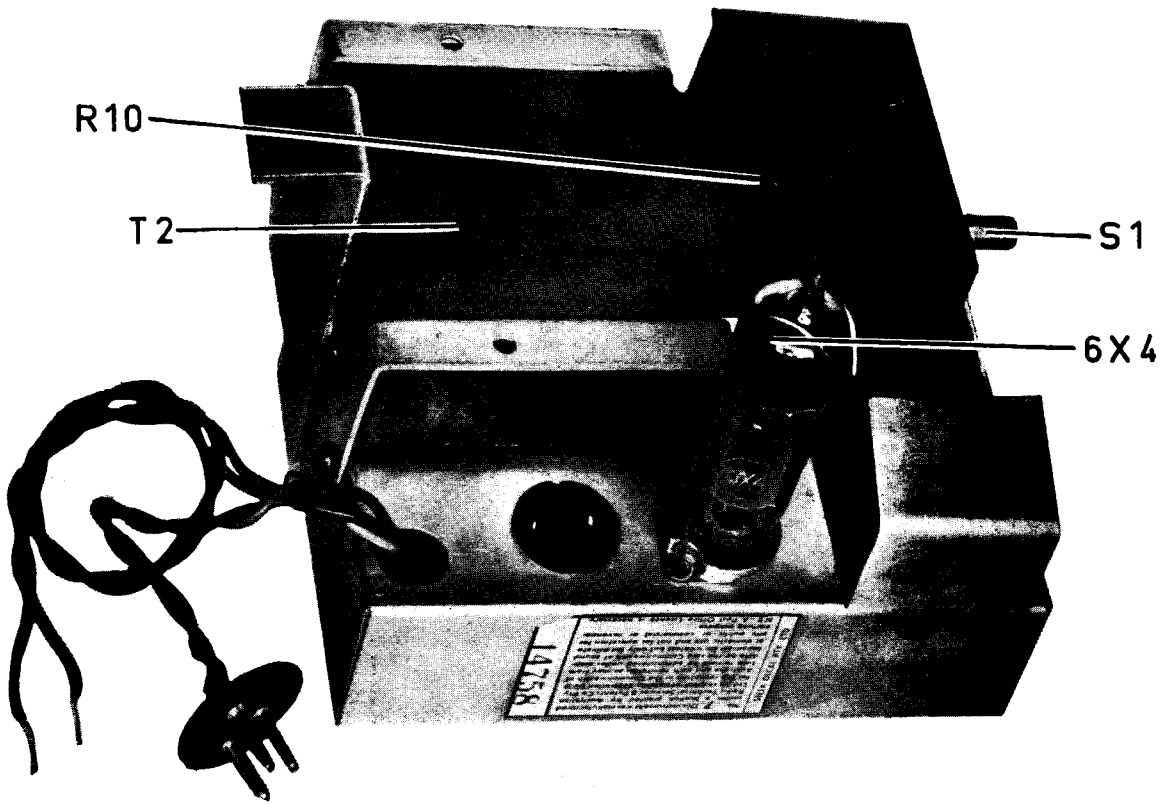
With the switch in the "ACTIVATE" position, one rectifier plate and "A" battery negative are disconnected from the chassis and connected together, thus isolating the "A" and "B" circuits. The 6X4 is then used as two half-wave rectifiers with a common cathode.



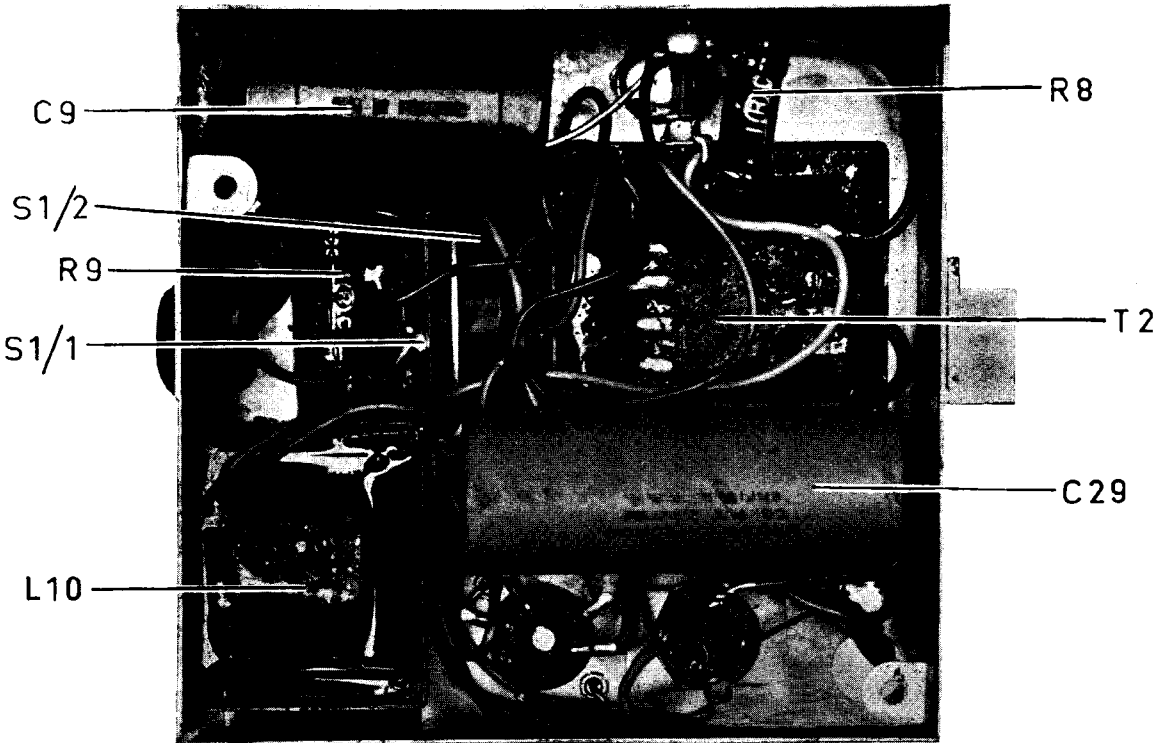
CHASSIS TOP VIEW MODEL 647-P



CHASSIS UNDERNEATH VIEW MODEL 647-P



TOP VIEW POWER UNIT MODEL 647-P



UNDERNEATH VIEW POWER UNIT MODEL 647-P

D.C. RESISTANCE OF WINDINGS

Winding	D.C. Resistance in ohms
R.F. Coil	
Primary (L2)	130
Secondary (L3)	7
Oscillator Coil	
Primary (L4)	2
Secondary (L5)	6
Filter Choke (L10)	160
I.F. Transformer Windings	15
Loudspeaker Input	
Transformer (T1)	
Primary	450
Secondary	*
Power Transformer (T2)	
Primary	170
Secondary	80

* Less than 1 ohm.

The above readings were taken on a standard chassis, but substitution of materials during manufacture may cause variations, and it should not be assumed that a component is faulty if a slightly different reading is obtained.

SOCKET VOLTAGES

VALVES	Bias Volts	Screen to Chassis Volts	Anode to Chassis Volts	Anode Current mA	Filament Volts *
1T4 R.F. Amp	0	30	90	0.5	1.3 — 1.4
1R5 Converter	0	42	42	0.6	1.3 — 1.4
1T4 I.F. Amp.	0	30	90	1.3	1.3 — 1.4
1S5 Det., A.F. Amp., A.V.C.	0	20 †	30 †	0.1	1.3 — 1.4
3V4 Output	-5	90	88	8	2.6 — 2.8

* These will rise to 1.5V and 3.0V with a new battery and will be slightly lower than the above values when operated from the A.C. power supply.

† Calculated from measured current. An ordinary voltmeter will register a lower value. Measured with no signal input. Volume Control maximum clockwise.

A.C. Power Unit Operation:—

H.T. Secondary Volts = 115V A.C.

6X4 Cathode to Chassis Volts = 100V, D.C.

Heater Volts = 6.3V A.C.

CIRCUIT CODE — RADIOLA 647-P

Code No.	Description	Part No.	Code No.	Description	Part No.
L1	INDUCTORS		C6	12-445 μ F tuning	18635
L2, L3	Loop Aerial Coil	29598	C7	3-25 μ F trimmer	27526
L4, L5	R.F. Coil 540-1600 Kc/s	28261	C8	0.05 μ F paper 200V working	
L6, L7	Oscillator Coil 540-1600 Kc/s	25145	C9	20 μ F 200 P.V. electrolytic	
L8, L9	1st I.F. Transformer	27351	C10	5-50 μ F trimmer	
L10	2nd I.F. Transformer	27351	C11	12-445 μ F tuning	18635
	H.T. Filter Choke	26865B	C12	470 μ F padder \pm 2 1/2%	
R1	RESISTORS		C13	70 μ F mica	
R2	1.5 megohms	1/2 watt	C14	0.05 μ F paper 200V working	
R3	5.0 megohms	1/2 "	C15	0.05 μ F paper 200V working	
R4	20,000 ohms	1/2 "	C16	100 μ F silvered mica	
R5	0.1 megohm	1/2 "	C17	100 μ F silvered mica	
R6	800 ohms	1/2 "	C18	0.05 μ F paper 200V working	
R7	2.5 megohms	1/2 "	C19	100 μ F silvered mica	
R8	50,000 ohms	1/2 "	C20	100 μ F silvered mica	
R9	950 ohms	3 "	C21	200 μ F mica	
R10	1500 ohms	3 "	C22	0.025 μ F paper 400V working	
R11	1.0 megohm	3 " (wire wound)	C23	0.05 μ F paper 200V working	
R12	10 megohms	3 " (wire wound)	C24	50 μ F mica	
R13	100 ohms	1/2 "	C25	0.025 μ F paper 400V working	
R14	1.0 megohm Volume Control	28311	C26A	25 μ F 40 P.V. Electrolytic	
R15	3.0 megohms	1/2 watt	C26B	40 μ F 150 P.V. Electrolytic	
R16	0.63 megohm	1/2 "	C27	0.0025 μ F paper 600V working	
R17	1,000 ohms	1/2 "	C28	0.25 μ F paper 200V working	
R18	1.0 megohm	1/2 "	C29	400 μ F 12 P.V. Electrolytic	
R19	500 ohms	1/2 "		TRANSFORMERS	
R20	800 ohms	1/2 "	T1	Loudspeaker Transformer	XA320
C1	CAPACITORS		T1	Power Transformer 50 C.P.S.	25815A
C2	0.05 μ F paper 200V working			40 C.P.S.	25817A
C3	12-445 μ F tuning	18635		LOUDSPEAKER	
C4	3-25 μ F trimmer	27526		4 inch permanent magnet	BH3
C5	0.4 μ F paper 200V working			SWITCH	
	6.8 μ F ceramic		S1	Power Selector	29637