

AERODYNE 49

BATTERY ALL-WAVE RECEIVER

THREE wavebands are covered by the Aerodyne 49, one of these being a short-wave range of 18-50 metres. The receiver is for battery operation and the circuit is a straightforward arrangement employing a variable-mu pentode H.F. amplifier, a triode detector and a pentode output valve. Provision is made for both an extension speaker and a gramophone pick-up.

CIRCUIT DESCRIPTION

Two alternative aerial connections via series condensers **C1** and **C2** to coupling coils **L1** (S.W.) and **L2, L3** (M.W. and L.W.). Single tuned circuit **L4, C8** (S.W.) and **L5, L6, C8** (M.W. and L.W.) precedes variable-mu pentode H.F. amplifier (**V1, Mullard metallised VP2**). Gain control by variable potentiometer **R2** which varies G.B. applied.

Tuned-anode coupling by **L7, C11** (S.W.) and **L10, L11, C11** (M.W. and L.W.) to triode detector valve (**V2, Mullard metallised PM1HL**) which operates on grid leak system with **C5** and **R5**. Reaction is applied from anode by coils **L8** (S.W.) and **L9** (M.W. and L.W.), and controlled by variable condenser **C10**. Provision for connection of gramophone pick-up in grid circuit.

Parallel-fed transformer coupling by **R6, C6**, and **T1** to output pentode (**V3**

Mullard PM22A). Tone correction by fixed condenser **C7** in anode circuit. Provision for connection of low-impedance external speaker across secondary of internal speaker transformer **T2**.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 C.G. decoupling	50,000
R2	V1 gain control	10,000
R3	V1 S.G. and anode decoupling	3,000
R4*	Reaction circuit stabiliser ..	50
R5†	V2 grid leak	1,000,000
R6	V2 anode load	50,000
R7	V3 C.G. H.F. stopper	100,000

* Two 100 Ω resistances in parallel.
† Two resistances in series.

Condensers		Values (μF)
C1	Aerial series condensers {	0.0002
C2§		0.00005
C3§	V1 C.G. decoupling	0.1012
C4§	V1 S.G. and anode decoupling	0.1012
C5	V2 grid condenser	0.0003
C6	Coupling to T1	0.1
C7§	Fixed tone corrector	0.005
C8†	Aerial circuit tuning	0.0005
C9†	Aerial circuit trimmer	—
C10†	Reaction control	0.0005
C11†	V1 anode circuit tuning	0.0005
C12†	V1 anode circuit trimmer	—

† Variable. ‡ Pre-set. § See General Notes.

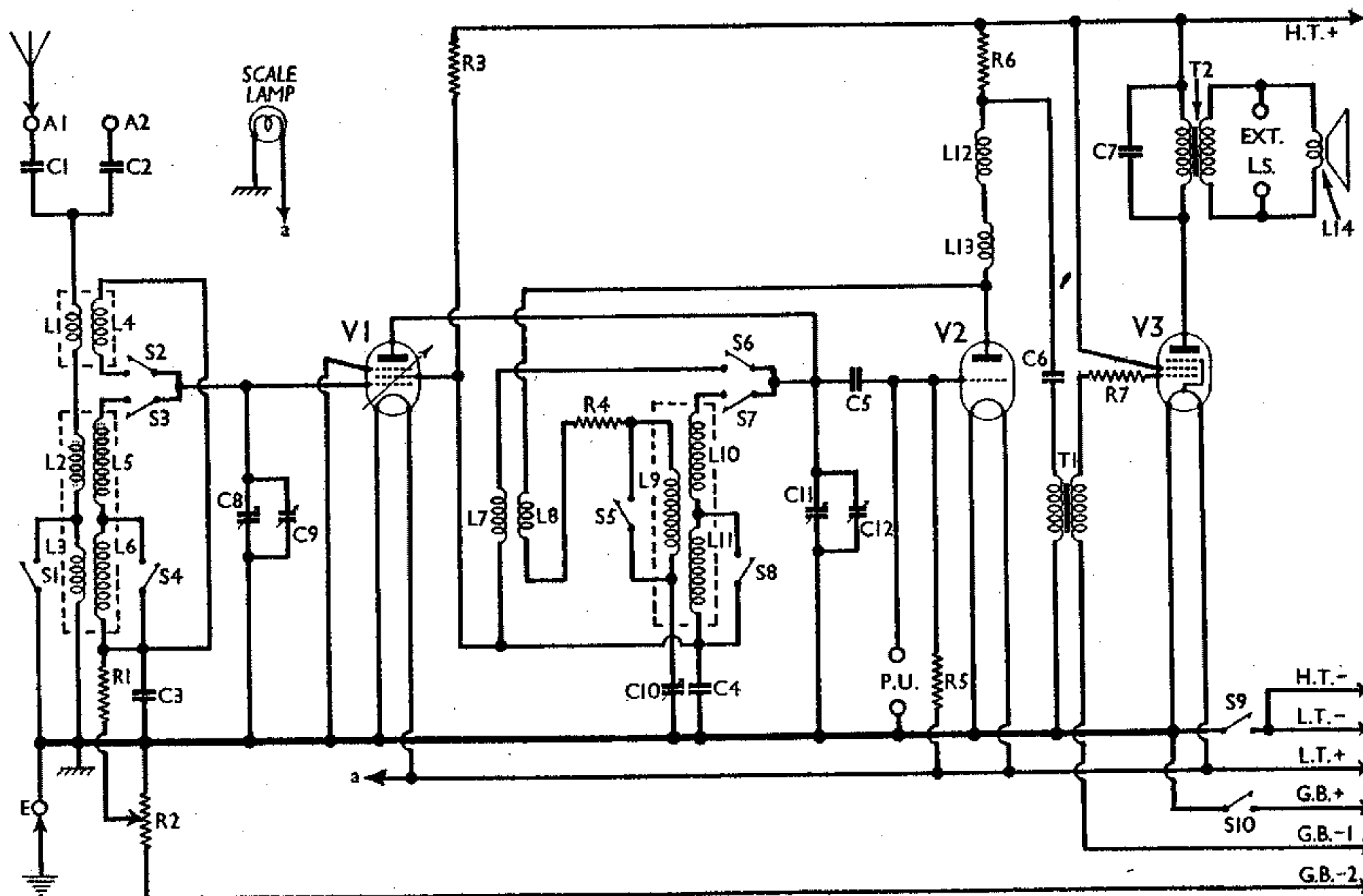
Other Components		Approx. Values (ohms)
L1	Aerial coupling coil (S.W.) ..	0.1
L2	Aerial coupling coils (M.W. and L.W.)	0.3
L3		35.0
L4	Aerial tuning coil (S.W.) ..	0.05
L5	Aerial tuning coils (M.W. and L.W.)	1.2
L6		13.0
L7	V1 anode circuit tuning coil (S.W.)	0.05
L8	S.W. reaction coil	0.25
L9	M.W. and L.W. reaction coil ..	7.0
L10	V1 anode circuit tuning coils (M.W. and L.W.)	3.75
L11		15.0
L12	V2 anode H.F. choke (M.W. and L.W.)	200.0
L13	V2 anode H.F. choke (S.W.) ..	7.5
L14	Speaker speech coil	2.2
T1	Intervalve trans. { Pri. ..	1,300.0
	{ Sec. ..	3,500.0
T2	Speaker input trans. { Pri. ..	650.0
	{ Sec. ..	0.3
S1-S8	Waveband switches	—
S9	L.T. switch	—
S10	G.B. switch } ganged R2 ..	—

DISMANTLING THE SET

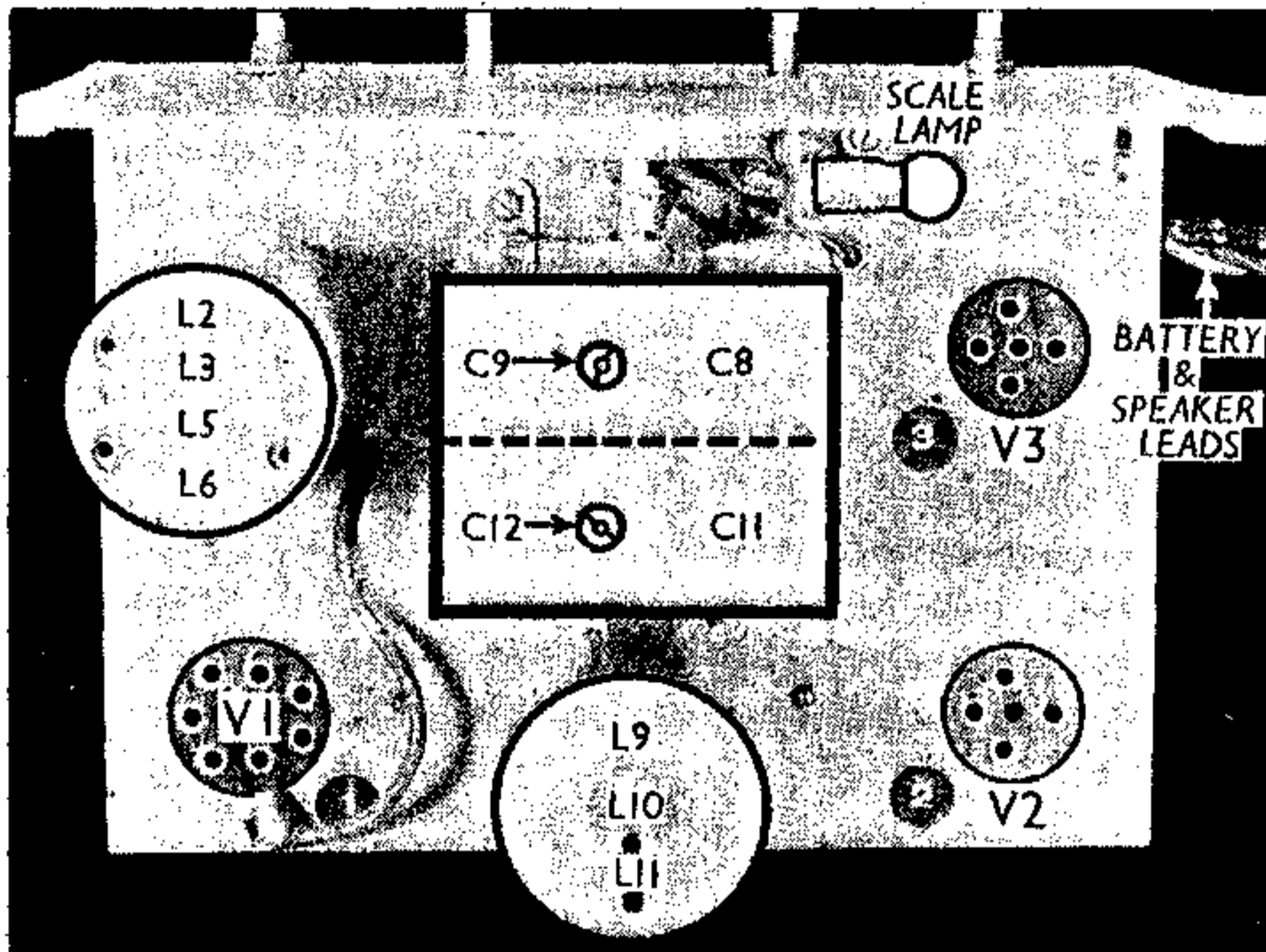
Removing Chassis.—If it is necessary to remove the chassis from the cabinet, first remove the back and batteries. Now remove the four control knobs (pull off), the two small round-head wood screws holding the top of the tuning dial to the front of the cabinet and the three bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient to allow of normal repairs being carried out.

To free the chassis entirely, unsolder the leads from the terminal panel on the speaker input transformer.

Removing Speaker.—To remove the speaker from the cabinet, remove the two



Circuit diagram of the Aerodyne 49 battery all-wave receiver. L1, L4 and L7, L8 are the S.W. coils. Later models have a Droitwich filter circuit in series between C2 and the top of L1. C3 and C4 each consist of two condensers in parallel.



Plan view of the chassis. The coil units shown contain only the M.W. and L.W. coils, the S.W. units being beneath the chassis.

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round-head wood screws (with washers) at the sides of the speaker and slacken the four clamps (with nuts and lock-nuts) holding it to the sub-baffle. When replacing, see that the transformer is at the top and that the condenser C7 is connected across the tags on the speaker transformer terminal panel to which the leads from the chassis are connected.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a new H.T. battery reading 128 V. The volume control was at maximum and the reaction control was at minimum but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 VP2	116	2.2	116	0.8
V2 PM1HL	58	1.2	—	—
V3 PM22A	122	3.5	128	0.8

GENERAL NOTES

Switches S1-S8 are the waveband switches, in a single unit beneath the chassis. S2, S3 and S6, S7 each have one common contact. The table below gives the switch positions for the various control settings, O indicating open, and C, closed.

Switch	S.W.	M.W.	L.W.
S1	O	C	O
S2	C	O	O
S3	O	C	O
S4	O	C	O
S5	C	O	O
S6	C	O	O
S7	O	C	O
S8	O	C	O

Note that the control knob is marked with two L.W. positions, both closing the same switches.

S9 and S10 are the L.T. and G.B. switches, ganged with the gain control, R2. The brown and black battery leads connect to one tag of S9, and the white lead to one tag of S10. The other two tags are common and are connected to chassis.

Coils.—L2, L3, L5, L8 and L9, L10, L11 are in two screened units on the chassis deck. L1, L4 and L7, L8, the S.W. coils, are in two units beneath the chassis, of which the first is screened. The chokes L12 and L13 are also unscreened, and beneath the chassis.

Scale Lamp.—This is an Osram M.E.S. type rated at 3.5 V, 0.15 A.

External Speaker.—Two sockets are provided on the speaker terminal strip for a low resistance (2-3 O) external speaker.

Batteries.—The receiver requires a 2 V L.T. cell, 120V H.T. battery and a separate 9 V G.B. battery. In some cases, when close to local stations, a 15 V G.B. battery may be necessary.

Battery Leads and Voltages.—Black lead, L.T. negative; Red lead, L.T. positive 2 V; Brown lead, H.T. negative; Mauve lead, H.T. positive 120 V; White lead, G.B. positive; Blue lead, G.B. negative 4.5 V; Green lead, G.B. nega-

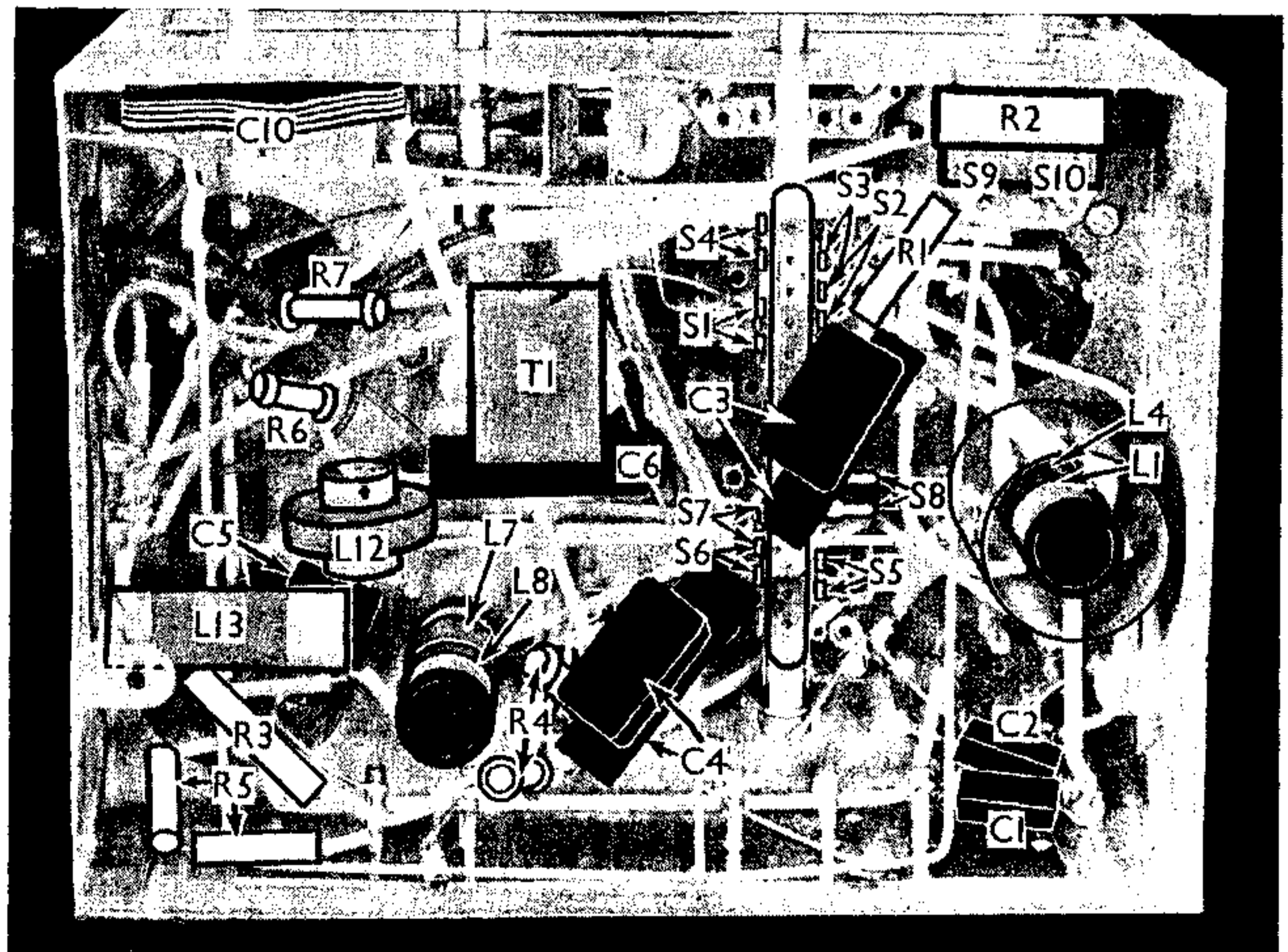
tive 9 V. If the volume cannot be effectively controlled with 9 V bias, a 15 V bias should be used for this tapping.

Chassis Divergencies.—Later models include a Droitwich filter circuit, comprising a coil and pre-set condenser in parallel, connected between C2 and L1. In this case, C2 will be 0.0001 μF instead of 0.00005 μF.

R4 may be 40 O, instead of 50 O (two 100 O resistances in parallel in our chassis).

C7 is connected across the primary of T2, and is mounted on the speaker terminal panel. It may have a capacity of 0.01 μF in some chassis, instead of 0.005 μF.

Condensers C3, C4.—These each comprise two condensers in parallel, a paper 0.1 μF type and a mica 0.0012 μF type.



Under-chassis view. The switches in the wavechange unit are clearly shown. L1, L4 and L7, L8 are the S.W. coils. C3 and C4 each consist of two condensers in parallel.