

AERODYNE 67

3-BAND BATTERY RECEIVER

A SHORT-WAVE range of 16.5-50 metres is covered by the Aerodyne 67 3-valve 3-band battery-operated receiver. It has a variable-mu pentode R.F. amplifier, a triode detector and a pentode output valve, and includes provision for a gramophone pick-up and an extension speaker. Two alternative aerial sockets are fitted, one bringing a Droitwich rejector into circuit.

CIRCUIT DESCRIPTION

Two alternating aerial input connections. A1 includes Droitwich rejector L1, C10 and A2 connects direct to coupling coils L6 (S.W.), L2 (M.W.) and L4 (L.W.). On M.W. and L.W. input is via capacity-coupled band-pass filter. Primaries L3 (M.W.), L5 (L.W.), are tuned by C11; secondaries L8 (M.W.), L9 (L.W.) are tuned by C15; common coupling condenser C1. On S.W. band input is via single-tuned circuit comprising L7 and C15.

First valve (V1, Mullard metallised VP2) is a variable-mu pentode operating as R.F. amplifier with gain control by potentiometer R2, shunted across G.B. battery, which varies bias applied.

Tuned anode coupling by L11, C20 (S.W.), L13, C20 (M.W.) and L14, C20 (L.W.) between V1 and triode detector (V2, Mullard metallised PM2HL) which operates on grid leak system with C6 and R4. Reaction is applied from anode by coils L10 (S.W.) and L12 (M.W. and L.W.) and controlled by variable con-

denser C17. Provision for connection of gramophone pick-up in grid circuit. R.F. filtering in anode circuit by chokes L16 (S.W.) and L15 (M.W. and L.W.) and condenser C4 (M.W. and L.W. only).

Parallel fed auto-transformer coupling by R5, C7 and T1 via R.F. stopper R7 between V2 and pentode output valve (V3, Mullard PM22A). Fixed tone correction in anode circuit by R.C. filter R8, C9. Provision for connection of low-impedance external speaker across secondary of internal speaker transformer T2.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Band-pass coupling	0.02
C2	V1 S.G. R.F. by pass	0.1
C3	V1 S.G. and anode decoupling	1.0
C4	V2 anode M.W. and L.W. R.F. by-pass	0.0003
C5	V1 anode R.F. by-pass	0.1
C6	V2 grid condenser	0.00004
C7	A.F. coupling to T1	0.1
C8	V2 anode decoupling	1.0
C9	Part of T.C. filter	0.01
C10†	Droitwich rejector tuning	0.002
C11†	Band-pass primary tuning	0.00035
C12†	Band-pass primary trimmer	—
C13†	Band-pass sec. L.W. trimmer	0.000035
C14†	Band-pass sec. M.W. trimmer	0.000035
C15†	Band-pass sec. and S.W. tuning	0.00035
C16†	Aerial S.W. trimmer	—
C17†	Reaction control	0.0005
C18†	V1 anode circuit L.W. trimmer	0.000035
C19†	V1 anode circuit M.W. trimmer	0.000035
C20†	V1 anode circuit tuning	0.00035

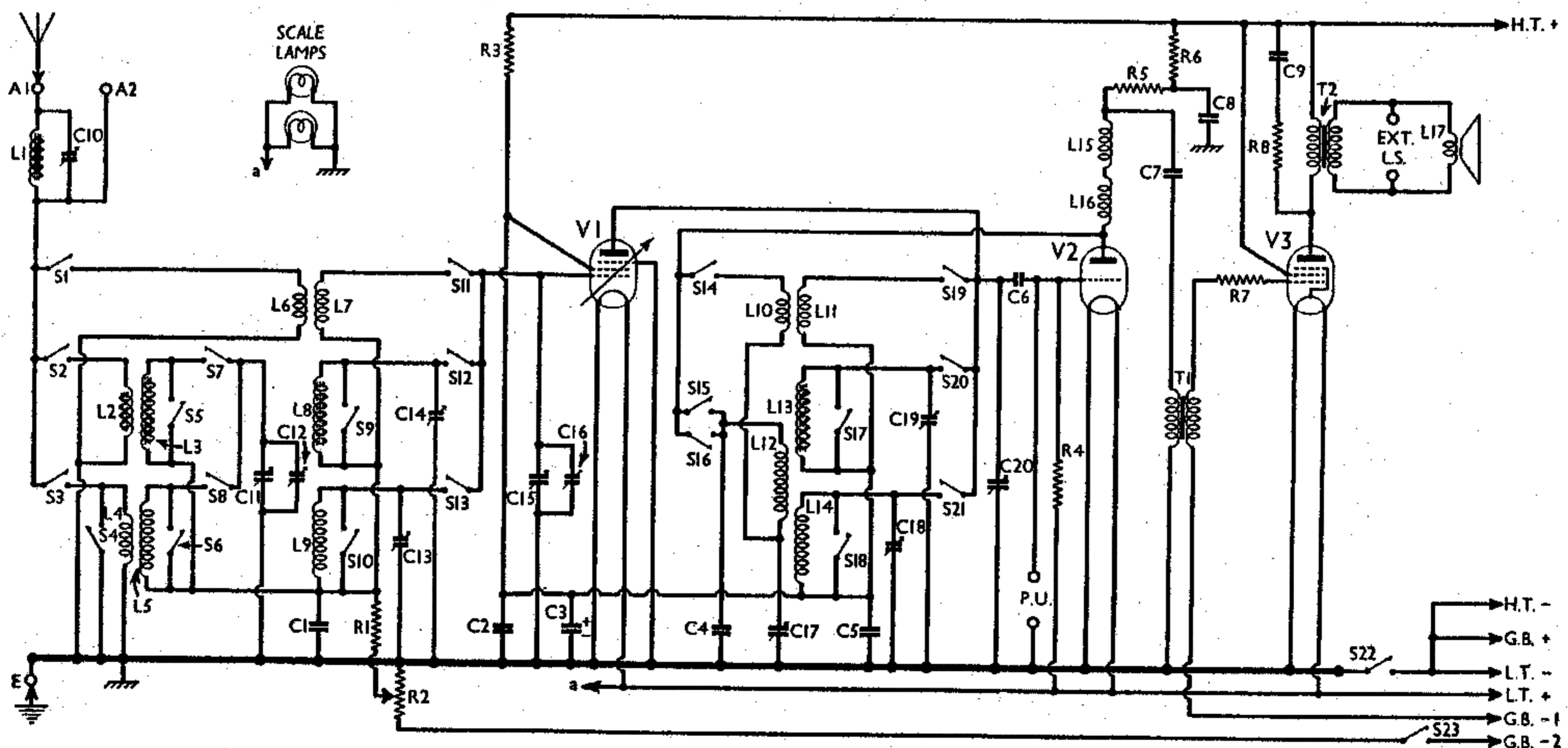
* Electrolytic. † Variable. ‡ Pre-set.

RESISTANCES		Values (ohms)
R1	V1 C.G. decoupling	50,000
R2	V1 gain control	10,000
R3	V1 S.G. and anode H.T. feed	2,000
R4	V2 grid leak	2,000,000
R5	V2 anode load	40,000
R6	V2 anode decoupling	10,000
R7	V3 C.G. R.F. stopper	250,000
R8	Part of T.C. filter	20,000

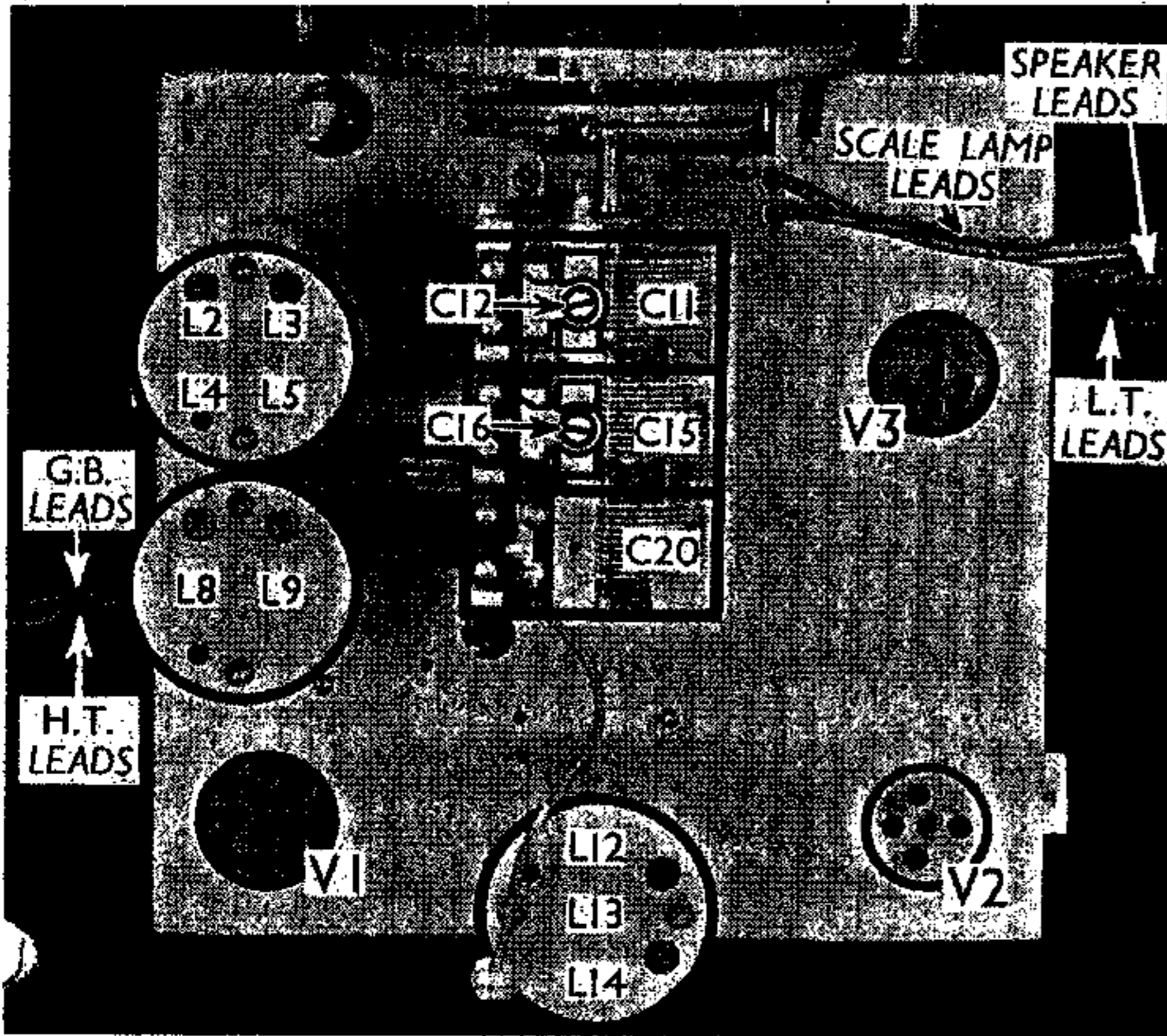
OTHER COMPONENTS		Approx. Values (ohms)
L1	Droitwich rejector coil	1.5
L2	Aerial M.W. coupling coil	0.3
L3	M.W. band-pass primary	1.4
L4	Aerial L.W. coupling coil	16.0
L5	L.W. band-pass primary	17.0
L6	Aerial S.W. coupling coil	0.3
L7	Aerial S.W. tuning coil	0.05
L8	M.W. band-pass secondary	1.4
L9	L.W. band-pass secondary	18.0
L10	S.W. reaction coil	0.5
L11	V1 anode S.W. tuning coil	0.05
L12	M.W. and L.W. reaction coil	3.0
L13	V1 anode M.W. tuning coil	1.4
L14	V1 anode L.W. tuning coil	17.0
L15	V2 anode M.W. and L.W. R.F. choke	200.0
L16	V2 anode S.W. R.F. choke	8.0
L17	Speaker speech coil	2.2
T1	Intervalve trans. { Pri.	1,200.0
	{ Sec.	4,000.0
T2	Speaker input trans. { Pri.	700.0
	{ Sec.	0.25
S1-S21	Waveband switches	—
S22	H.T., L.T. and G.B. + circuit switch	—
S23	G.B. - circuit switch	—

DISMANTLING THE SET

Removing Chassis.—If it is desired to remove the chassis from the cabinet,



Circuit diagram of the Aerodyne 67 3-band battery receiver. Note that the M.W. coils (except reaction) are iron-dust cored.



Plan view of the chassis. The S.W. coils are not included in the cans, but are beneath the chassis. The scale lamps are mounted on the scale assembly inside the cabinet.

two tags on the right, looking from the rear of the chassis, belong to S22, while the two close together on the left belong to S23. Coils.—L1 is beneath the chassis; L2-L5, L8, L9 and L12-L14 are in three screened units on the chassis deck; while L6, L7 and L10, L11 are on two tubular units beneath the chassis. L7 and L11 are the thick wire windings, L6 and L10 each consisting of a few turns of fine wire interwound with L7 and L11 respectively. L15 and L16 are also beneath the chassis.

External Speaker.—Two sockets are provided on T2 terminal panel for a low resistance (about 20) external speaker.

Scale Lamps.—These are two Osram M.E.S. types, rated at 2.5 V, 0.2 A, and wired in parallel.

Chassis Divergencies.—In earlier versions of the chassis, slight differences in components and values may occur. Thus R8 may not be used, while C9 may be 0.005 μF, or 0.001 μF. C3 may not occur in early models.

Batteries.—A 2 V L.T. cell, and separate 120 V H.T. and 9 V G.B. batteries are required.

Battery Leads and Voltages.—Black lead, spade tag, L.T. negative; red lead, spade tag, L.T. positive 2 V; black braided lead and plug, H.T. negative; red braided lead and plug, H.T. positive 120 V; red rubber lead and plug, G.B. positive; white rubber lead, yellow plug, G.B. negative 1, -4.5 V; black rubber lead, green plug, G.B. negative 2, -9 V. Where the volume cannot be reduced sufficiently by the gain control, G.B.-2 should be increased to 15 V.

Continued overleaf

first remove the four control knobs (recessed screws) and the three bolts (with washers) and the two round-head wood screws holding the chassis to the bottom of the cabinet.

Now unhook the switch indicator control cord from the indicator and free it from the cleat holding it to the front of the cabinet, and unhook the scale pointer drive cord from the drum on the tuning condenser. The chassis can now be withdrawn to the extent of the speaker and scale lamp leads, which should be sufficient for normal purposes.

To free the chassis entirely, unsolder the leads from the scale lamps and free them from the two staples holding them to the side of the cabinet, and unsolder the speaker leads.

When replacing, connect the speaker leads to the two outer tags on the transformer.

Removing Speaker.—To remove the speaker from the cabinet, slacken the three clamps (with nuts and lock nuts) holding it to the sub-baffle. When replacing, see that the transformer is pointing to the top right-hand corner of the cabinet.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an H.T. battery reading 120 V on load, and a 9 V G.B. battery. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input.

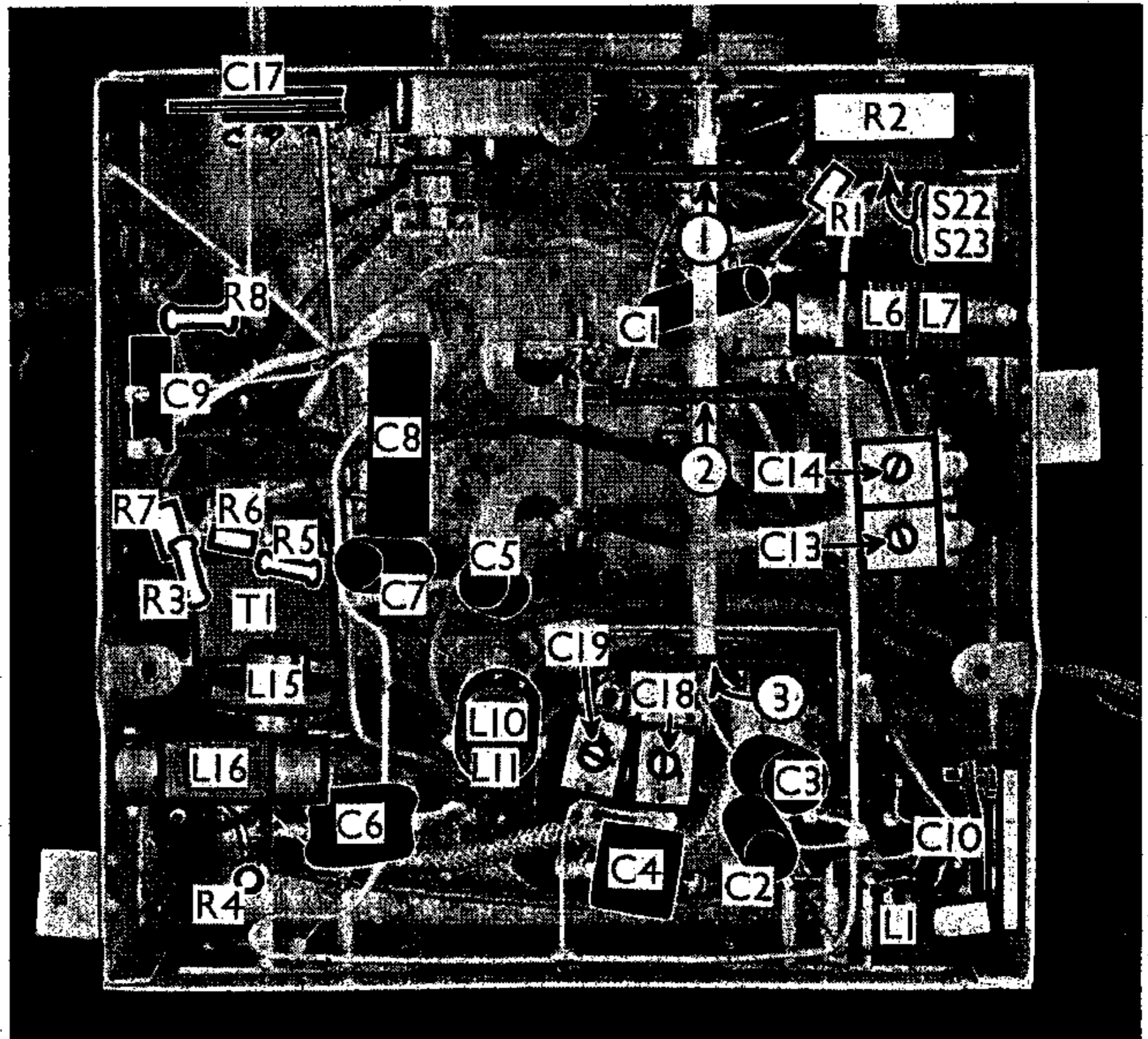
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	115	1.9	115	0.7
V2 PM2HL	60	0.7	—	—
V3 PM22A	118	3.1	120	0.6

GENERAL NOTES

Switches.—S1-S21 are the wavechange switches, in three ganged rotary units beneath the chassis, indicated by numbers in circles in the under-chassis view. The arrows show the directions in which the units are viewed in the diagrams on page iv. The table (p. iv) gives the switch positions for the three control settings, starting from fully anti-clockwise, O indicating open, and C closed.

S22 and S23 are the battery circuit switches, of the Q.M.B. type, in one unit ganged with the gain control, R2. The



Under-chassis view. Note the three switch units, shown in detail on page iv.

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CIRCUIT ALIGNMENT

S.W.—Feed in a 19 m. signal from the signal generator to the **A2** and **E** sockets. Tune it in on the receiver, and adjust **C16** for maximum output, rocking the gang for optimum results. Feed in a 50 m. signal and tune it in. If set needs re-alignment here and calibration is correct, adjust loose turn on **L7** so that the minimum amount of reaction is needed to cause the set to oscillate. If calibration is wrong at 50 m., adjust loose turn on **L11** first, then proceed as above with **L7**.

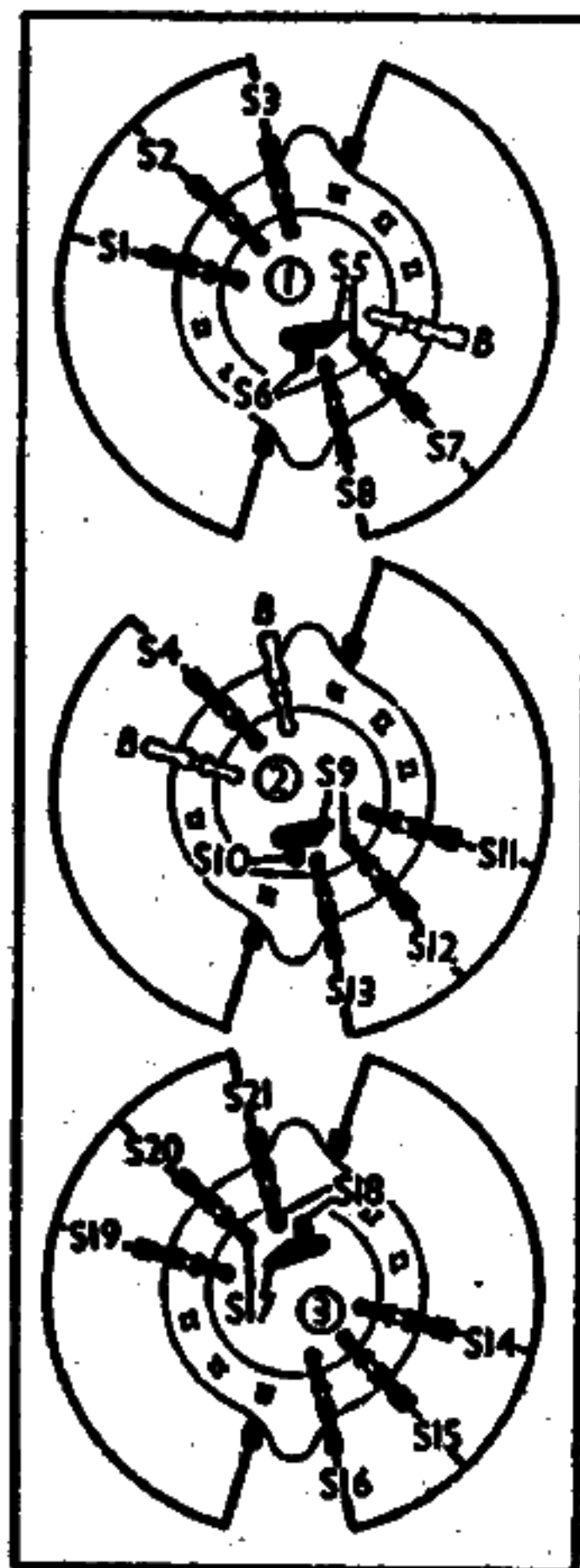
Switch	L.W.	M.W.	S.W.
S1	○	○	○
S2	○	○	○
S3	○	○	○
S4	○	○	○
S5	○	○	○
S6	○	○	○
S7	○	○	○
S8	○	○	○
S9	○	○	○
S10	○	○	○
S11	○	○	○
S12	○	○	○
S13	○	○	○
S14	○	○	○
S15	○	○	○
S16	○	○	○
S17	○	○	○
S18	○	○	○
S19	○	○	○
S20	○	○	○
S21	○	○	○

M.W.—Adjust **C19** for correct calibration at 250 m., then adjust **C14** and **C12**.

L.W.—Whilst rocking the gang slightly adjust **C18** for maximum signals at 1,300 m., then adjust **C18**.

C16 should not be touched after it has been adjusted for S.W.

Droitwich Rejector.—Feed in a 1,500 m. signal to **A1** and **E**, tune it in, and adjust **C10** (at side of chassis) for *minimum* output.



Aerodyne 67
switch diagrams,
looking from the
rear of the
underside of the
chassis. The
three units are
indicated in our
under-chassis
view. On the
left is the table
of switch
positions.