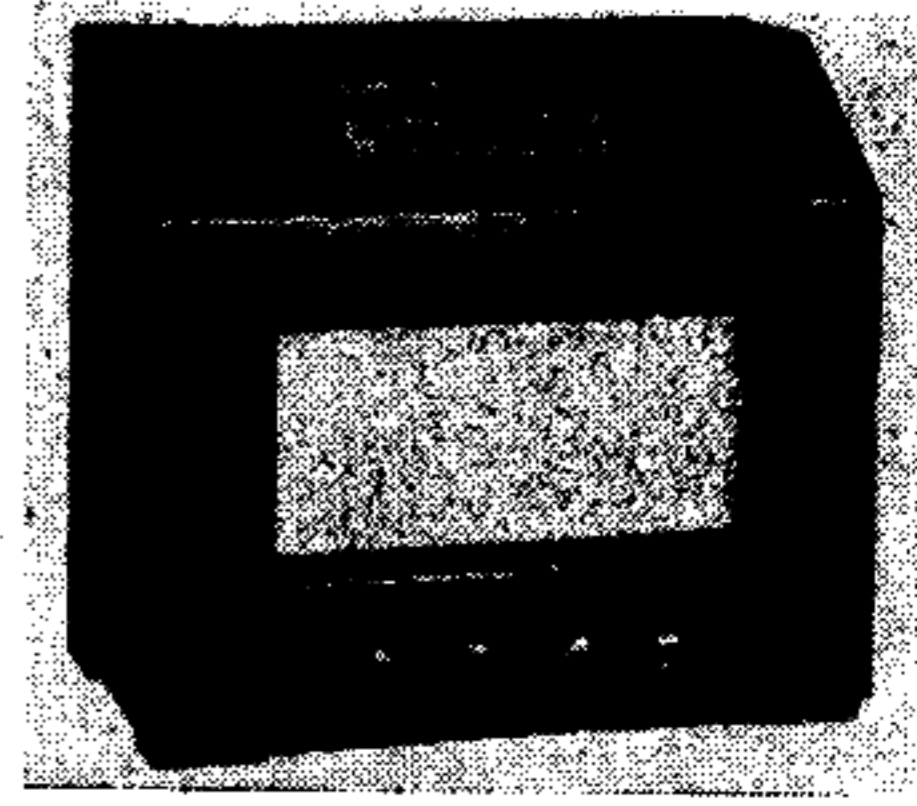


"TRADER" SERVICE SHEET
604

**AERODYNE
284**



REVISED ISSUE OF
SERVICE SHEET No. 267

TWO short-wave bands of 13-49 and 48-170 metres are covered by the Aerodyne 284 3-valve battery 4-band receiver. Its valve arrangement comprises a variable-mu pentode RF amplifier, a triode detector and a pentode output valve, and provision is made for the connection of an external speaker.
Release date; August, 1937. Original price: £8 8s., less batteries.

CIRCUIT DESCRIPTION

Aerial input from A1 on MW and LW via coupling coils L1 (MW) and L2 (LW) to capacity coupled band-pass filter. Primary coils L3 (MW) and L4 (LW) are tuned by C17; secondaries L9 (MW), L10 (LW) by C20; coupling by condensers C3 and C4. On SW input is via C2 and coupling coil L5 (SW1), or L6 (SW2) to single tuned circuits L7, C20 (SW1) and L8, C20 (SW2). From A2 socket aerial input is fed to A1 via series condenser C1.

First valve (V1, Mullard metallised VP2), is a variable-mu pentode operating as RF amplifier with gain control by potentiometer R3, which varies GB applied.

Tuned-anode coupling by L15, C23 (SW1), L16, C23 (SW2), L17, C23 (MW) and L18, C23 (LW), between V1 and triode detector valve (V2, Mullard metallised PM2HL) which operates on leaky grid system with C8 and R7. Reaction is applied from anode by coils L11 (SW1), L12 (SW2), L13 (MW) and L14 (LW) and controlled by variable condenser C21. RF filtering in anode circuit by R10, C10 and L19. Fixed tone correction by C11. Provision for connection of gramophone pick-up in grid circuit.

Parallel-fed auto-transformer coupling by R9, C12 and T1 between V2 and pentode output valve (V3, Mullard PM22A). GB is obtained automatically from drop along potentiometer R12, R13 in HT negative lead to chassis. Fixed tone correction by RC filter C13, R11 in anode circuit. Provision for connection of low impedance external speaker across secondary of output transformer T2.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 fixed GB resistance ...	200
R2	V1 CG decoupling ...	30,000
R3	V1 gain control ...	10,000
R4	V1 anode HT feed ...	12,000
R5	V1 SG HT feed ...	2,000
R6	Reaction circuit damping ...	1,000
R7	V2 grid leak ...	2,000,000
R8	V2 anode decoupling ...	10,000
R9	V2 anode load ...	30,000
R10	V2 anode RF stopper ...	5,000
R11	Part of fixed TC filter ...	20,000
R12	V3 automatic GB potential divider ...	1,000
R13		380

CONDENSERS		Values (μF)
C1	A2 aerial series condenser	0.001
C2	Aerial SW series condenser ...	0.00003
C3	Band-pass bottom coupling ...	0.05
C4	Band-pass top coupling ...	0.000003
C5	V1 SG decoupling ...	0.1
C6	HT circuit reservoir ...	1.0
C7	V1 anode decoupling ...	0.1
C8	V2 CG condenser ...	0.00003
C9	V2 anode decoupling ...	1.0
C10	V2 anode RF by-pass ...	0.0003
C11	Fixed tone corrector ...	0.001
C12	V2 to V3 AF coupling ...	0.1
C13	Part of fixed TC filter ...	0.01
C14*	Auto. GB decoupling ...	25.0
C15†	B-P pri. MW trimmer ...	0.00003
C16†	B-P pri. LW trimmer ...	0.00003
C17†	B-P pri. tuning ...	0.00044
C18†	B-P sec. MW trimmer ...	0.00003
C19†	B-P sec. LW trimmer ...	0.00003
C20†	B-P sec. and SW1, SW2 aerial tuning	0.00044
C21†	Reaction control ...	0.00075
C22†	V1 anode LW trimmer ...	0.00003
C23†	V1 anode circuit tuning	0.00044

* Electrolytic; † Variable; ‡ Pre-set.

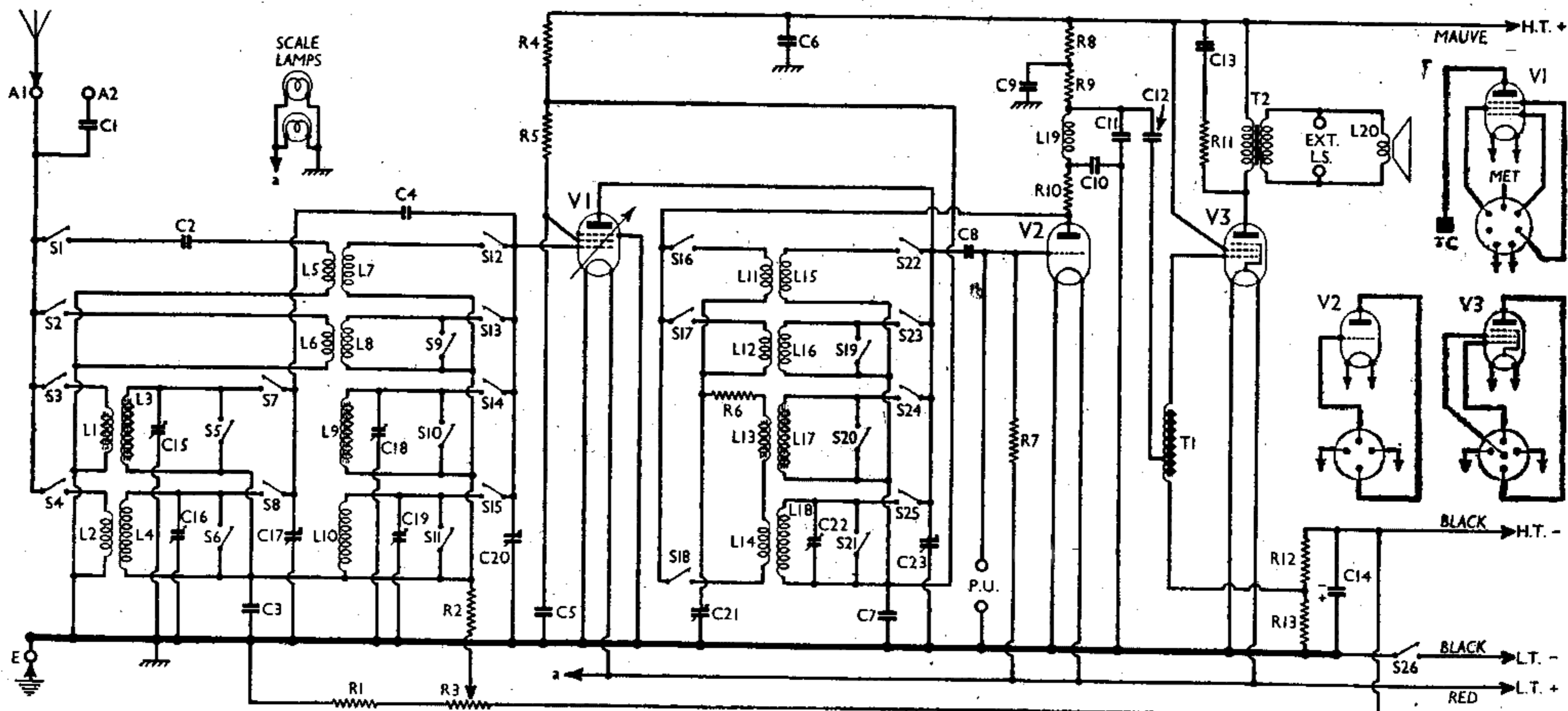
OTHER COMPONENTS

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial MW coupling ...	0.3
L2	Aerial LW coupling ...	15.0
L3	Band-pass primary coils	1.3
L4		15.0
L5	Aerial SW1 coupling ...	0.3
L6	Aerial SW2 coupling ...	0.7
L7	Aerial SW1 tuning coil ...	0.05
L8	Aerial SW2 tuning coil ...	0.3
L9	Band-pass secondary coils	1.3
L10		15.0
L11	SW1 reaction coil ...	0.4
L12	SW2 reaction coil ...	0.7
L13	MW and LW reaction coils	3.5
L14		3.5
L15	V1 anode SW1 tuning coil	0.05
L16	V1 anode SW2 tuning coil	0.25
L17	V1 anode MW tuning coil	1.3
L18	V1 anode LW tuning coil	15.0
L19	V2 anode RF choke ...	35.0
L20	Speaker speech coil ...	2.25
T1	Intervalve transformer, total	5,000.0
T2	Output trans. { Pri. ...	1,000.0
	{ Sec. ...	0.2
S1-S25	Waveband switches ...	—
S26	LT circuit switch, ganged R3	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an HT battery read-

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	112	1.5	110	0.4
V2 PM2HL	62	1.0	—	—
V3 PM22A	111	5.4	117	1.0



Circuit diagram of the Aerodyne 284 4-band battery TRF receiver. Coils L5, L7 and L11, L15 are used on the SW1 band, and coils L6, L8 and L12, L16 on the SW2 band. C4 is a small coupling made by winding the ends of a piece of wire round the leads to C17 and C20.

ing 130 V, on load. 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 400 V scale of a model 7 Universal Avometer, chassis being negative.

DISMANTLING THE SET

The cabinet is fitted with a detachable bottom, upon removal of which (four round-head wood screws) access may be gained to most of the components beneath the chassis.

Removing Chassis.—Remove the detachable bottom described above; remove the four screws (with washers) holding the chassis to the bottom of the cabinet; remove the battery shelf (pull out); release the switch indicator control cord from the cleat holding it to the sub-baffle, and unclip it from the indicator; unhook and free from the drum on the tuning condenser the pointer drive cord; free the scale lamp leads from the two staples holding them to the side of the cabinet. The chassis may now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, first code, and then unsolder, the leads to the scale lamps, speaker and external speaker panel.

Removing Speaker.—Remove the two round-head wood screws holding the speaker to the sub-baffle, and slacken the nuts (with lock-nuts), holding the clamps to the rim of speaker.

When replacing, the connecting panel should be directed towards the top right-hand corner of the cabinet.

GENERAL NOTES

Switches.—S1-S25 are the waveband switches, in three rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams in col. 3, where they are drawn as seen when viewed from the rear of the underside of the chassis.

The table (col. 2) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

S26 is the QMB LT circuit switch, ganged with gain control R3.

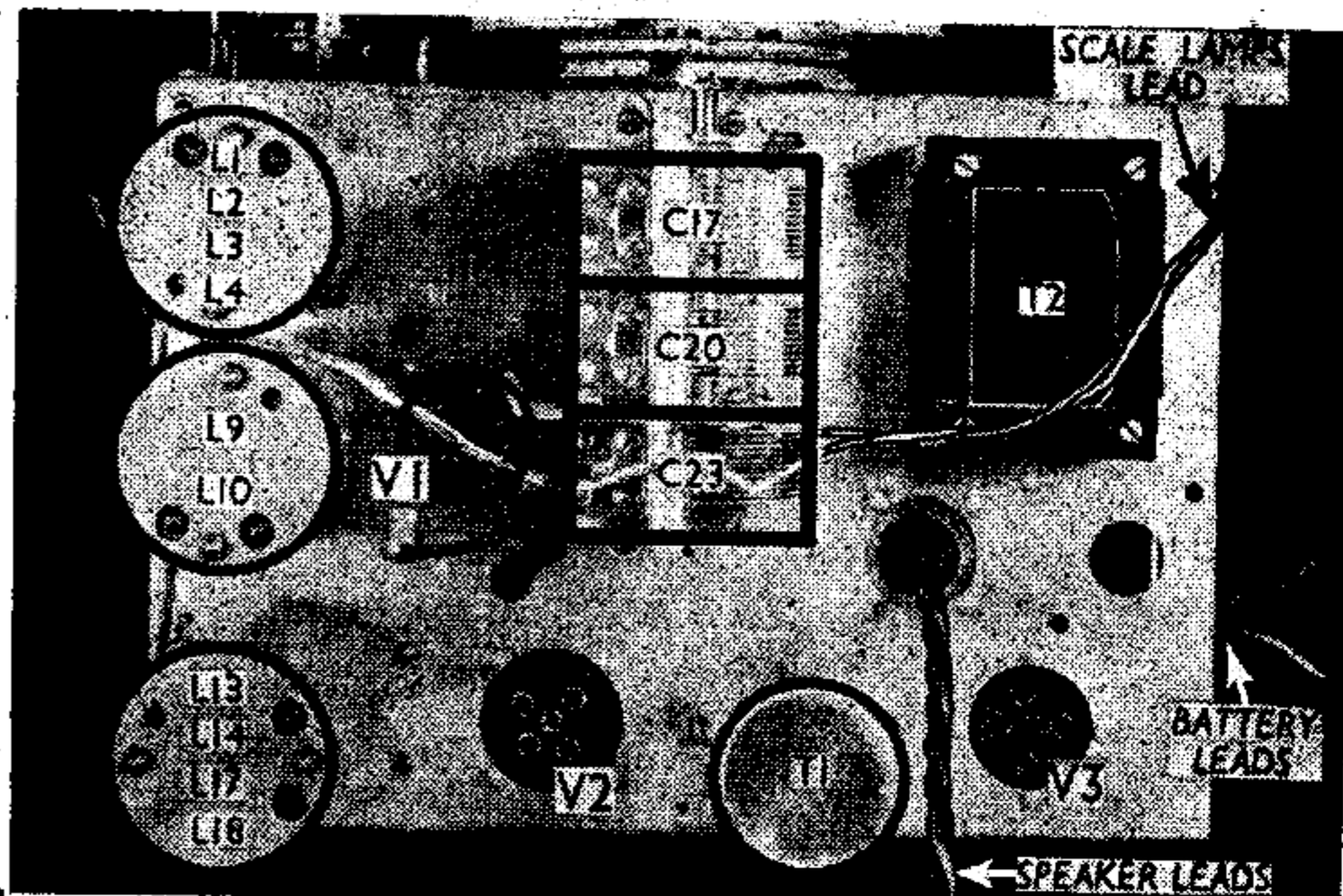
Coils.—L1-L4; L9, L10 and L13, L14, L17, L18 are in three screened units on the chassis deck. The SW coils L5, L7; L6, L8; L11, L15 and L12, L16 are on four tubular formers beneath the chassis, and are unscreened. The choke L19 is also beneath the chassis.

The auto-transformer T1 is in a screened unit on the chassis deck.

Scale Lamps.—These are two Osram MES types, rated at 2.5 V, 0.2 A.

External Speaker.—Two sockets are provided

Plan view of the chassis. Although holes are seen in the cans of the tuning units, the trimmers are not in them, but are all beneath the chassis, as indicated in the under-chassis view below. T1 is in a screened unit.



on a panel at the right of the back of the cabinet for a low impedance (2-3 Ω) external speaker.

Condenser C4.—This is a small capacity coupling between the top of C17 and the top of

C20 in our chassis. In the makers' diagram it is from the top of L3 to the top of L9, and so is only in circuit on MW.

Condensers C6, C9.—These are two 1 μF paper types in a rectangular metal case beneath the chassis. The tag nearest the front of the chassis is common to both condensers. Of the others, that going to R9 and R8 belongs to C9, and that connected to R8 and R4 belongs to C6.

Batteries.—LT, 2V accumulator cell; HT, 130 V dry HT battery. GB is automatic.

Battery Leads and Voltages.—Black lead, spade tag, LT negative; red lead, spade tag, LT positive 2 V; black lead and plug, HT negative; mauve lead, red plug, HT positive 130 V.

Switch Table

Switch	LW	MW	SW2	SW1
S1	—	—	—	○
S2	—	—	—	—
S3	—	○	—	—
S4	○	—	—	—
S5	—	—	—	—
S6	—	—	—	—
S7	—	—	—	—
S8	—	—	—	—
S9	—	—	—	—
S10	—	—	—	—
S11	—	—	—	—
S12	—	—	—	—
S13	—	—	—	—
S14	—	—	—	—
S15	—	—	—	—
S16	—	—	—	—
S17	—	—	—	—
S18	—	—	—	—
S19	—	—	—	—
S20	—	—	—	—
S21	—	—	—	—
S22	—	—	—	—
S23	—	—	—	—
S24	—	—	—	—
S25	○	—	—	—

CIRCUIT ALIGNMENT

SW1 and SW2.—There are no trimmers for the SW1 and SW2 ranges, alignment being effected at the works by the disposition of the anode coil wiring at the lower ends of the wavelength scales, and by moving the top turn of L15 and L16 at the higher ends of the wavelength scales. The top turns of L7 and L8 are also adjusted at the higher ends of the wavelength scales, using critical reaction.

Normally these adjustments will not be necessary.

MW.—Switch set to MW, feed in a 250 m (1,200 kc/s) signal into A1 and E sockets, tune to 250 m on scale, and adjust C15 and C18 for maximum output.

LW.—Switch set to LW, feed in a 1,200 m (250 kc/s) signal, tune to 1,200 m on scale, and adjust C22, then C19 and C16, for maximum output.

For optimum results on MW and LW, the receiver should be maintained in a condition just short of oscillation.

Left: Under-chassis view. The trimmers and switch units are indicated. C4 consists of a piece of wire whose ends are wound round the leads of C17 and C20.

Right: Diagrams of the waveband switch units, as seen from the rear of the underside of the chassis.

