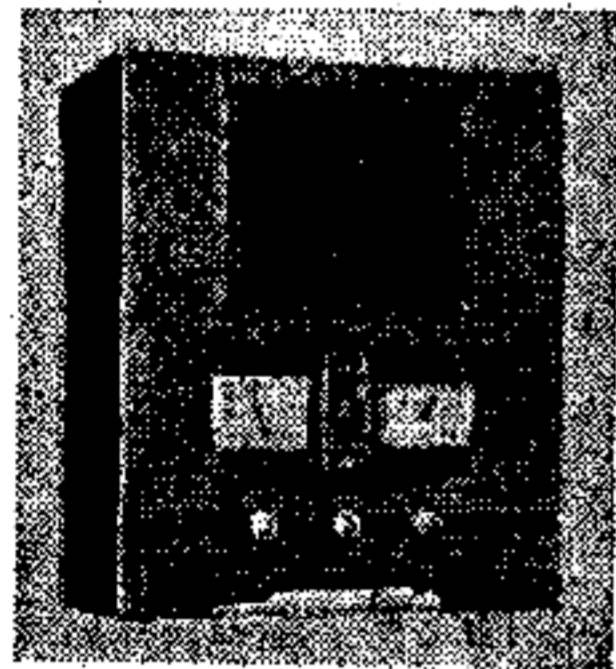


"TRADER" SERVICE SHEET

551

REVISED ISSUE OF SERVICE SHEET No. 32



The Aerodyne Merlin receiver.

A SPRING-DRIVEN clock, whose dial matches the tuning scale, is fitted in the Aerodyne Merlin. The receiver employs a 3-valve, 2-band TRF circuit, and provision is made for a gramophone pick-up and extension speaker.

Release date: 1934.

CIRCUIT DESCRIPTION

Aerial input via coupling coils L1, L2 to capacity coupled band-pass filter. Primary coils L3, L4 are tuned by C10; secondaries L5, L6 by C12; coupling by condensers C1 and C2.

First valve (V1, Mullard metallised VP2) is a variable-mu pentode operating as RF amplifier. Gain control by potentiometer R2, which varies GB applied.

Tuned-anode coupling by L7, L8 and C14 between V1 and triode detector valve (V2, Mullard metallised PM1HL) which operates on the grid leak system with C4 and R4. Reaction is applied from anode

AERODYNE MERLIN

BATTERY TRF RECEIVER

by coil L9 and controlled by variable condenser C16. RF filtering by C5, L10 and C6. Provision for connection of gramophone pick-up in control grid circuit.

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

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 CG decoupling ...	20,000
R2	V1 gain control ...	8,000
R3	V1 anode and SG HT feed	8,000
R4	V2 grid leak ...	500,000
R5	V2 anode load ...	30,000
R6	V2 anode decoupling ...	10,000
R7	Part fixed tone corrector	30,000
R8	V3 grid stopper ...	250,000

CONDENSERS		Values (μF)
C1	Band-pass coupling condensers	Very low
C2		
C3		
C4	V1 anode and SG decoupling	0.1
C5	V2 CG condenser ...	0.00005
C6	RF by-pass condensers ...	0.0003
C7		
C8	AF coupling to T1 ...	0.05
C9	V2 anode decoupling ...	1.0
C10†	Part fixed tone corrector	0.01
C11†	Band-pass pri. tuning ...	0.0005
C12†	B-P pri. MW trimmer ...	—
C13†	Band-pass sec. tuning ...	0.0005
C14†	B-P sec. MW trimmer ...	—
C15†	V1 anode circ. tuning ...	0.0005
C16†	V1 anode MW trimmer ...	—
	Reaction control ...	0.0005

† Variable.

†† Pre-set.

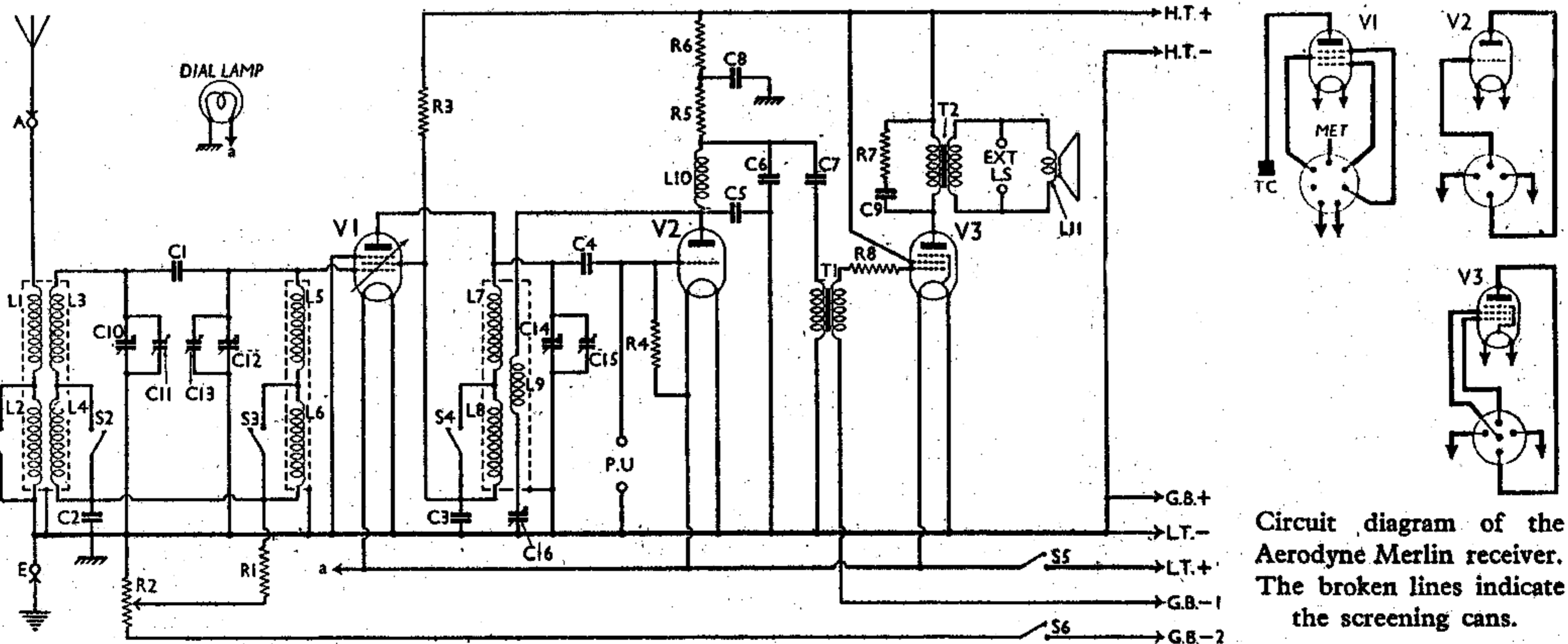
OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils	0.75
L2		14.25
L3		3.75
L4	Band-pass primary coils	13.5
L5		3.75
L6	Band-pass secondary coils	15.5
L7		3.75
L8	V1 anode circuit tuning coils	14.5
L9	Reaction coil ...	6.5
L10	V2 anode RF choke ...	260.0
L11	Speaker speech coil ...	2.0
T1	Intervolve trans. { Pri. ...	1,350.0
	{ Sec. ...	4,000.0
T2	Speaker input trans. { Pri. ...	1,000.0
	{ Sec. ...	0.2
S1-S4	Waveband switches ...	—
S5	LT circuit switch ...	—
S6	GB circuit switch ...	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those to be expected in the average chassis when it is operating with a new HT battery, with the volume control at maximum, the reaction control at minimum, and with no signal input. Voltages were measured on the 1,200 V scale of an Avometer, whose negative lead was connected to chassis.

The anode current of V1 should be measured with the milliammeter connected in the low potential end of the circuit.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	115	1.85	115	0.75
V2 PM1HL	65	1.75	—	—
V3 PM22A	130	7.0	140	1.7



Circuit diagram of the Aerodyne Merlin receiver. The broken lines indicate the screening cans.

Removing Chassis.—Remove the four control knobs (pull-off); remove the battery shelf (two wood screws); unsolder the two leads from the speaker transformer; remove the clock control rods, turning the winder clockwise; the hand-setting rod pulls off; remove the rectangular stirrup (two nuts) holding the scale in position, and two further nuts; remove the four screws holding the chassis to the base of the cabinet.

Removing Speaker.—Remove eight nuts holding the four metal clamps at the rim of the speaker, and the two wood screws holding the transformer bracket to the top of the cabinet.

Removing Clock.—Remove the three knurled screws holding the back-plate to the front of the cabinet.

GENERAL NOTES

Switches.—S1, S4 are the waveband switches, and S5, S6 the battery switches, in a single assembly beneath the chassis. This is shown in our under-chassis view, where the individual switches are indicated. S1-S4 are all closed on MW, and open on LW.

Coils.—The tuning coils are in three screened units on the chassis deck. They are indicated in our plan view, where the screens have been removed for photographing purposes.

The RF choke L10 is fitted beneath the chassis deck, and is seen in our under-chassis view to the right just below the switch assembly.

Dial Lamp.—This is an Osram MES type, with a mushroom bulb, rated at 2.5 V, 0.2 A. A low-consumption type

could be used if available, and the bulb-size is not critical, since there is plenty of room for a large bulb.

External Speaker.—Two sockets are provided on the internal speaker input transformer T2 for a low-impedance (2-4 Ω) external speaker.

Gramophone Pick-up.—Two sockets are provided for the connection of a gramophone pick-up, but an external volume control must be employed. When the pick-up is in use the receiver must be detuned to avoid radio break-through.

Condenser C1.—This is a very small capacity formed by spiral wire wound over a straight insulated wire.

Batteries and Leads.—The recommended HT battery is a GEC type L258; it consists of a 130 V HT section plus a 9 V GB section, and the two sections are connected internally.

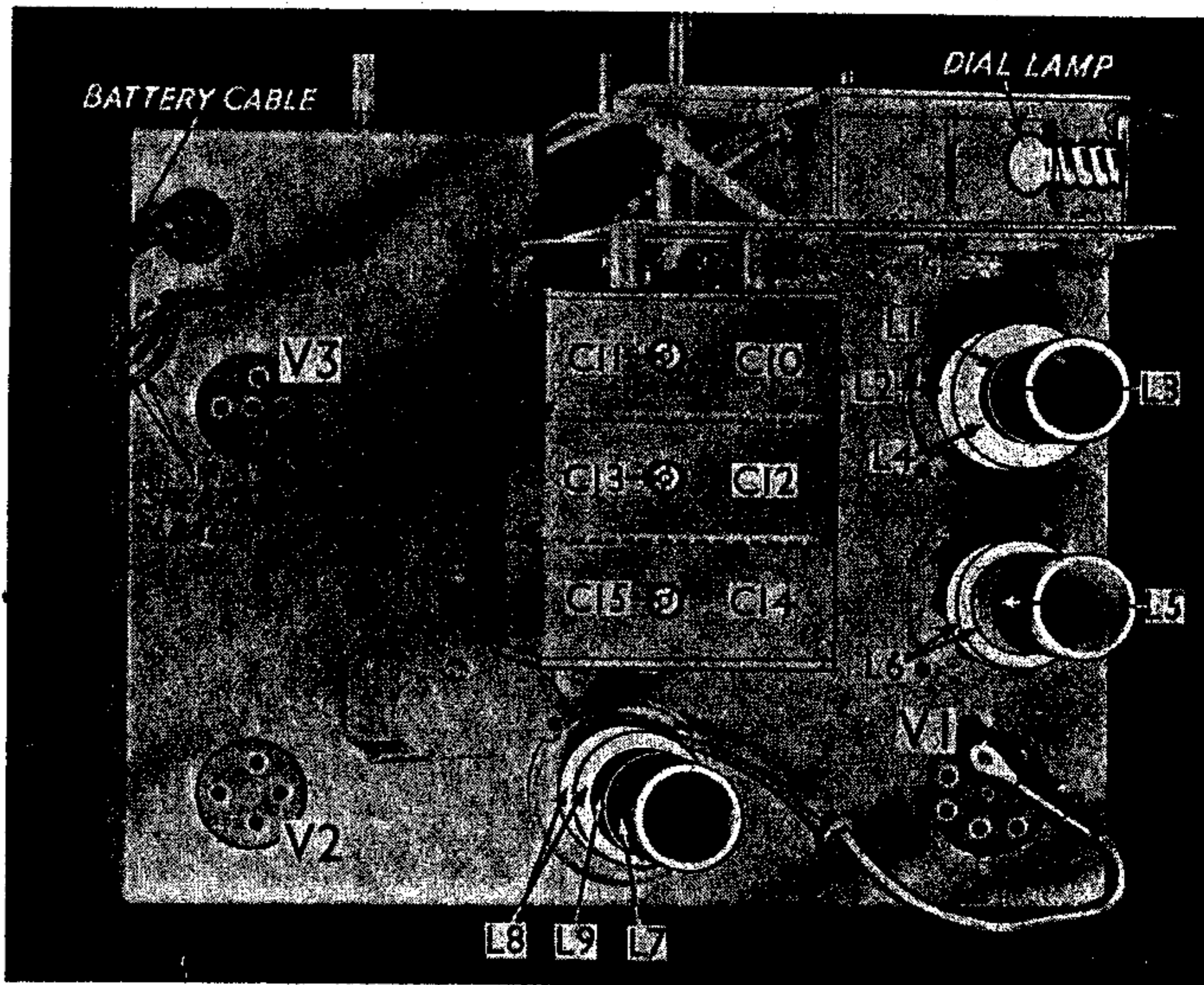
The leads are: black lead, spade tag, LT-; red lead, spade tag, LT+ 2 V; white lead and plug, HT-; maroon lead and plug, HT+ 130 V; blue lead and plug, GB-1 4.5 V; green lead and plug, GB-2 9 V. No GB+ lead is fitted, as the connection occurs in the HT battery, but one could be connected to the HT- lead if separate HT and GB batteries were used.

CIRCUIT ALIGNMENT

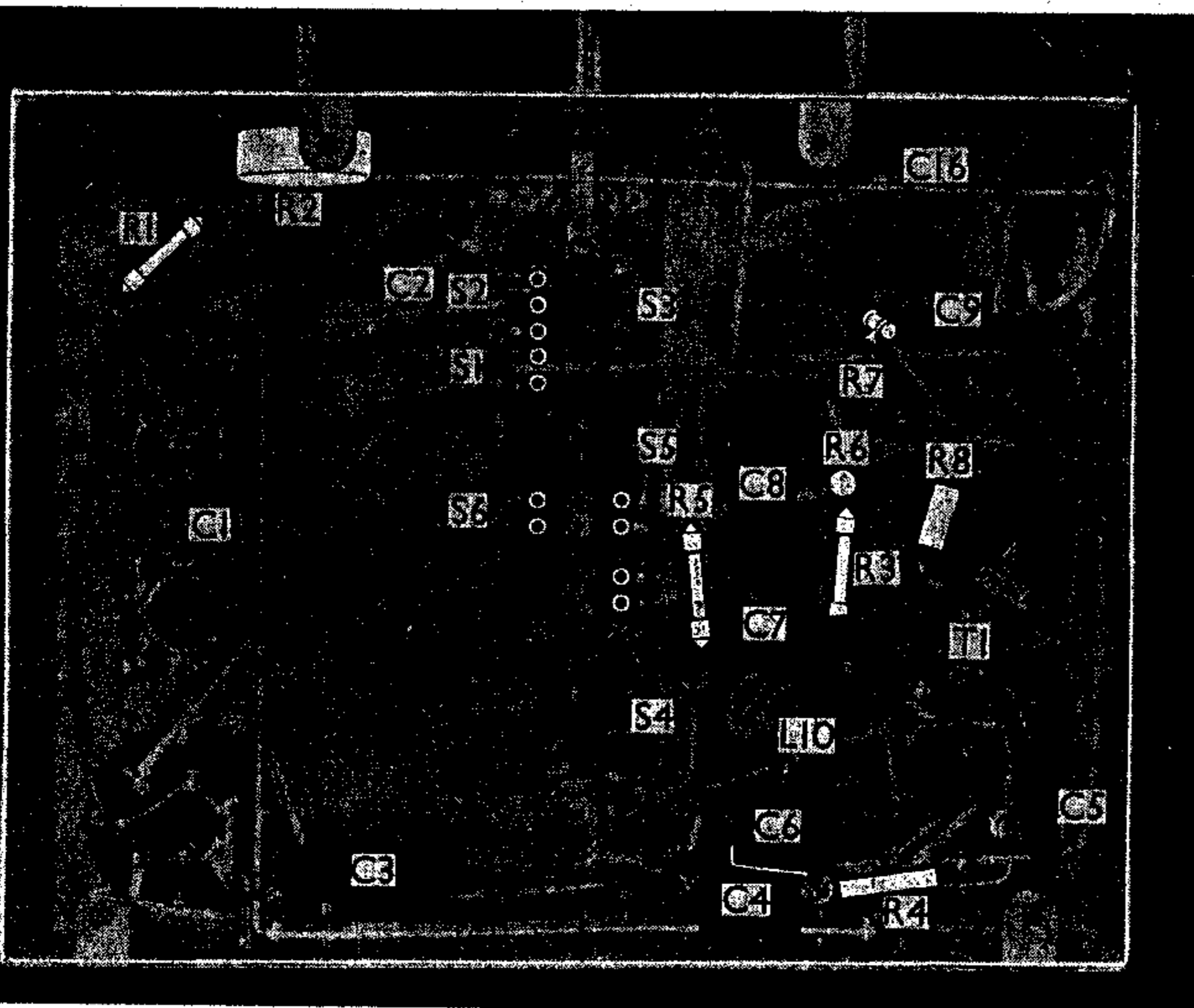
Connect signal generator via a suitable dummy aerial to A and E sockets, turn volume control to maximum, and reaction control to minimum.

Switch set to MW, tune to 214 m on scale, feed in a 214 m (1,400 KC/S) signal, and adjust C11, C13 and C15 for maximum output. Now advance the reaction to a point just short of oscillation, and readjust C15 and the reaction control in turn for maximum output. Readjust C11 and C13.

Check the performance and calibration at several points on the MW band, then on the LW band, and if necessary adjust the pointer for the best compromise at all scale settings.



Plan view of the chassis. The coil screens have been removed to show the positions of the windings. The three trimmers are indicated on the gang.



Under-chassis view. The switch unit is seen at the centre, and the individual switches are indicated. C1, seen on the left, is a small condenser made of wire.