

TRADER SERVICE SHEETS

RECEIVER SERIES (NUMBER SIXTEEN)

CLIMAX S5 SUPERHET FOR A.C. MAINS

TWO models of the Climax S5 A.C. mains receiver have been released—one with a horizontal table cabinet and the other with a cabinet of the vertical type—but the chassis embodied are identical. A 4-valve (plus rectifier) super-heterodyne circuit is employed and special features are the band-pass input circuit, the octode frequency-changer, and the high-slope output pentode.

CIRCUIT DESCRIPTION

Aerial input by way of switch **S1** and coupling coils **L1, L2** to inductively-coupled band-pass filter. Primary coils **L3, L4** tuned by **C12**; secondary coils **L5, L6** tuned by **C14**. M.W. and L.W. aerial coupling coils ensure that ganging of first tuned circuit holds good with any aerial. First valve (**V1, Mullard metallised FC4**) is an octode functioning as frequency-changer with electron coupling. Oscillator grid coils **L7, L8** tuned by **C16**; anode reaction coils, **L9, L10**. One variable- μ tetrode intermediate frequency amplifier (**V2, Mullard metallised MM4V**) with band-pass couplings **L11, L12**, and **L13, L14**. **I.F. 115 KC/S.** Gain controlled by variable cathode resistance **R4** which varies G.B. applied to both **V1** and **V2**. Triode second detector (**V3, Mullard metallised 354V**) working on power-grid system with **C5** and **R7**. Provision for gramophone pick-up in grid circuit. R.C. coupling to high-efficiency I.H.C. output pentode (**V4, Mazda AC2/Pen**). Usual tone compensating condenser **C9** in anode circuit. Special arrangement for cutting out either internal or external speaker. **R13** shunts external speaker and thus prevents open circuiting.

H.T. current supplied by full-wave rectifying valve (**V5, Cossor 442BU**). Smoothing by speaker field **L15** and electrolytic condensers **C10, C11**.

DISMANTLING THE SET

For many service repairs it will probably not be necessary to remove the

chassis of this set, since, at the base of the cabinet, there is a thin sliding board held by one wood screw. On removing this, it is possible to gain access to the components mounted beneath the chassis.

Removing Chassis.—If the chassis has to be removed, first take off the three knobs, held to the spindles by axial screws (4BA heads). The spindles are fitted with projecting pins which engage in slots behind the knobs, preventing rotation. Now remove four screws and washers holding chassis to base of cabinet. The heads of these screws are sunk in deep holes in the strip "feet," covered with felt pads, in the case of the vertical model.

The chassis can now be removed to the extent of the speaker leads, which will be sufficient for most purposes.

To remove chassis entirely, free the speaker cable from the clip on the inside of cabinet, and unsolder wires at the speaker transformer terminal strip. *When replacing*, note that in the case of the vertical model the top two tags are connected together and to the red lead, the centre tag is free, the fourth tag from the top carries the black lead, while the blue lead goes to the bottom tag. In the case of the horizontal model, the connections from left to right are: blue, black, blank, red (2 tags joined).

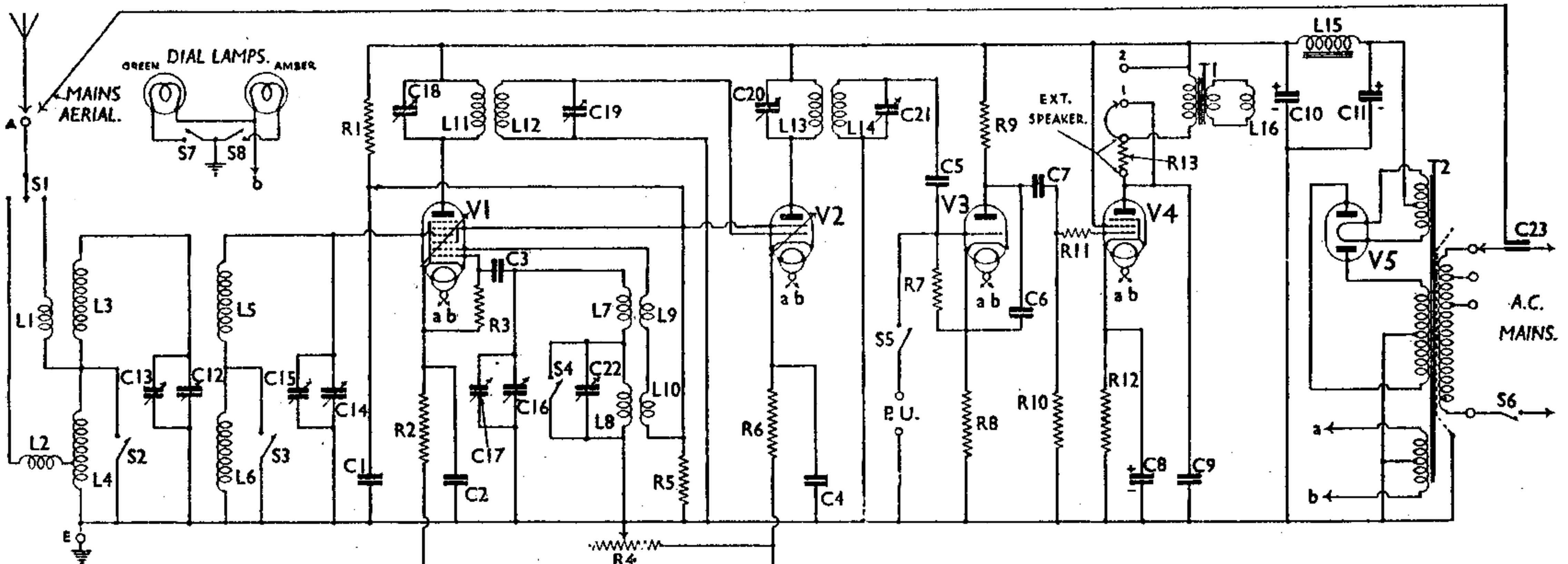
Removing Speaker.—The speaker, on its sub-baffle, is held to the front of the cabinet by four pieces of wood fitting into slots in the cabinet. Remove these pieces of wood (2 wood screws each), when the speaker and baffle can be removed. *When replacing*, note that the speaker transformer is to the left of the chassis in the vertical model, and at the top in the horizontal model.

COMPONENTS AND VALUES

	Resistances	Values (ohms)
R1	V1 and V2 S.G.'s pot. div., top	20,000
R2	V1 fixed G.B. resistance	300
R3	Oscillator grid resistance	250,000
R4	Manual volume control	7,500
R5	V1 and V2 S.G.'s pot. div., bottom	20,000
R6	V2 fixed G.B. resistance	450
R7	V3 grid resistance	250,000
R8	V3 G.B. resistance	1,000
R9	V3 anode resistance	20,000
R10	V4 grid resistance	50,000
R11	V4 grid H.F. stopper	1,000
R12	V4 G.B. resistance	140
R13	Ext. speaker shunt	50,000

	Condensers	Values (μ F)
C1	V1 and V2 S.G.'s by-pass	0.1
C2	V1 cathode by-pass	0.01
C3	Oscillator grid condenser	0.0001
C4	V2 cathode by-pass	0.1
C5	V3 grid condenser	0.0001
C6	V3 anode H.F. by-pass	0.006
C7	L.F. coupling to V4	0.1
C8	V4 cath. by-pass, electrolytic	50.0
C9	V4 anode tone compensator	0.01
C10	H.T. smoothing, electrolytics	8.0
C11		16.0
C12	Band-pass pri. tuning	—
C13	Band-pass pri. trimmer, pre-set	—
C14	Band-pass sec. tuning	—
C15	Band-pass sec. trimmer, pre-set	—
C16	Oscillator tuning	—
C17	Oscillator trimmer, pre-set	—
C18	1st I.F. trans. pri. tuning, pre-set	—
C19	1st I.F. trans. sec. tuning, pre-set	—
C20	2nd I.F. trans. pri. tuning, pre-set	—
C21	2nd I.F. trans. sec. tuning, pre-set	—
C22	Oscillator L.W. trimmer, pre-set	—
C23	Mains aerial condenser	—

(Continued overleaf)



The circuit diagram of the Climax S5 A.C. superhet. C23 is the mains aerial condenser formed by the capacity between the mains aerial lead and the mains lead, which run together, and are of the same length.

CLIMAX 55 A.C. SUPERHET
(cont'd)

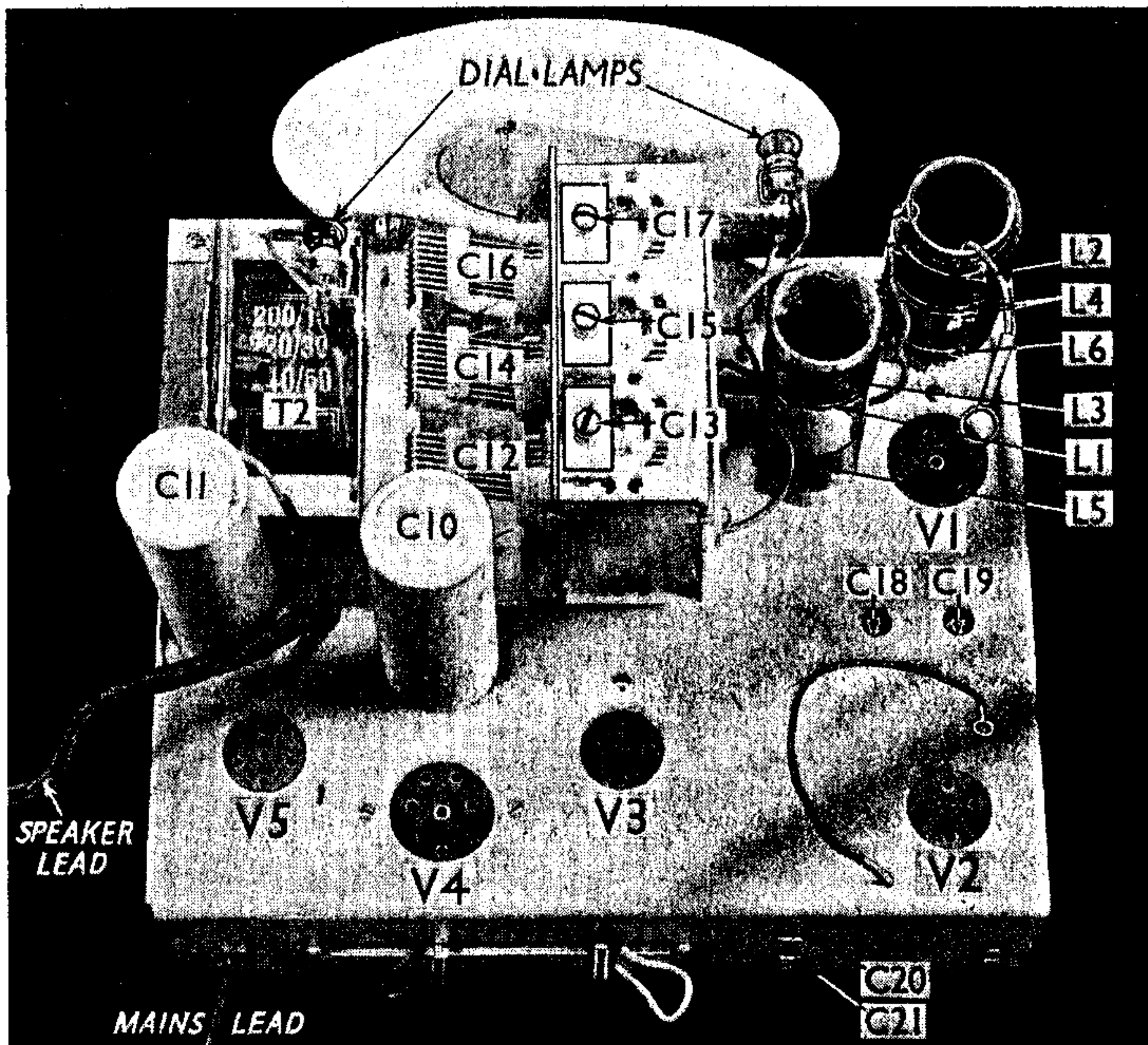
Other Components		Values (ohms)
L1	Aerial coupling coils ..	1.5
L2		10.0
L3		2.0
L4		10.5
L5	Band-pass pri. coils ..	2.0
L6		10.5
L7	Band-pass sec. coils ..	1.7
L8		6.7
L9	Osc. tuning coils ..	5.8
L10		5.8
L11	1st I.F. transformer	Pri. .. 47.0
L12		Sec. .. 47.0
L13	2nd I.F. transformer	Pri. .. 47.0
L14		Sec. .. 47.0
L15	Speaker field ..	2000.0
L16	Speaker speech coil ..	1.25
T1	Speaker input trans.	Pri. .. 420.0
		Sec. .. 0.2
T2	Mains transformer	Pri. total .. 40.0
		Heater sec. .. 0.05
		Rect. fil. sec. .. 0.05
		H.T. sec. .. 400.0
S1-S4	Waveband switches (ganged) ..	—
S5	Gram. pick-up switch ..	—
S6	Mains switch (ganged R4) ..	—
S7-S8	Dial lamp switches ..	—

VALVE ANALYSIS

The values in the table below are average ones, measured with the volume control at maximum and with no signal input. All voltages were read on an Avometer (1,200 V scale) with the chassis negative, while the anode and screen currents of V1, V2 and V3 were measured in the low H.F. potential ends of the circuits.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 FC4*	270	1.3	90	2.8
V2 MM4V	270	2.2	90	0.6
V3 354V	140	5.8	—	—
V4 AC2/Pen	255	35.0	270	8.0
V5 442BU	350†	—	—	—

*Osc. anode (G2) 90 V. † Each anode, A.C.



Above.—Plan view of the chassis. The right-hand dial lamp is mounted on the end of a lever and can be raised for replacing the bulb. The I.F. trimmers, C18, C19, C20 and C21, can be reached through holes in the chassis.

Below.—Under-chassis view. The I.F. coils, L11, L12, L13 and L14, are contained in screening boxes. The details of the switch assembly are shown in Col. 3.

GENERAL NOTES

Switches.—The layout of the ganged switch assembly comprising S1-S5 and S7-S8 as seen from underneath is shown clearly in the diagram. The following gives the contact positions for M.W., L.W. and Gram. settings:—

S1—Contacts 1, 3, 5, 6. M.W. 1, 3 closed, 5, 6 open. L.W. 5, 6 closed, 1, 3 open. Gram. all open.

S2—Contact 10 and spindle. M.W. closed. L.W. open. Gram. open.

S3—Contact 8 and spindle. M.W. closed. L.W. open. Gram. open.

S4—Contact 11 and spindle. M.W. closed. L.W. open. Gram. closed.

S5—Contacts 2 and 4. M.W. open. L.W. open. Gram. closed.

S7—Contact 13 and spindle. M.W. closed. L.W. open. Gram. closed.

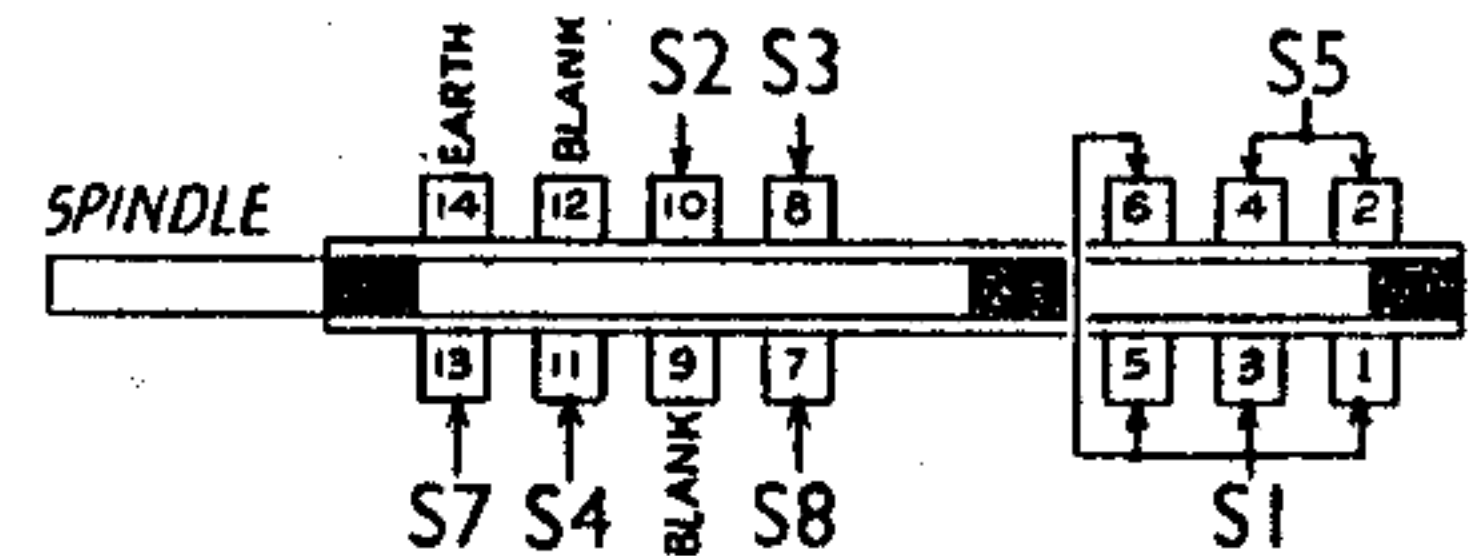
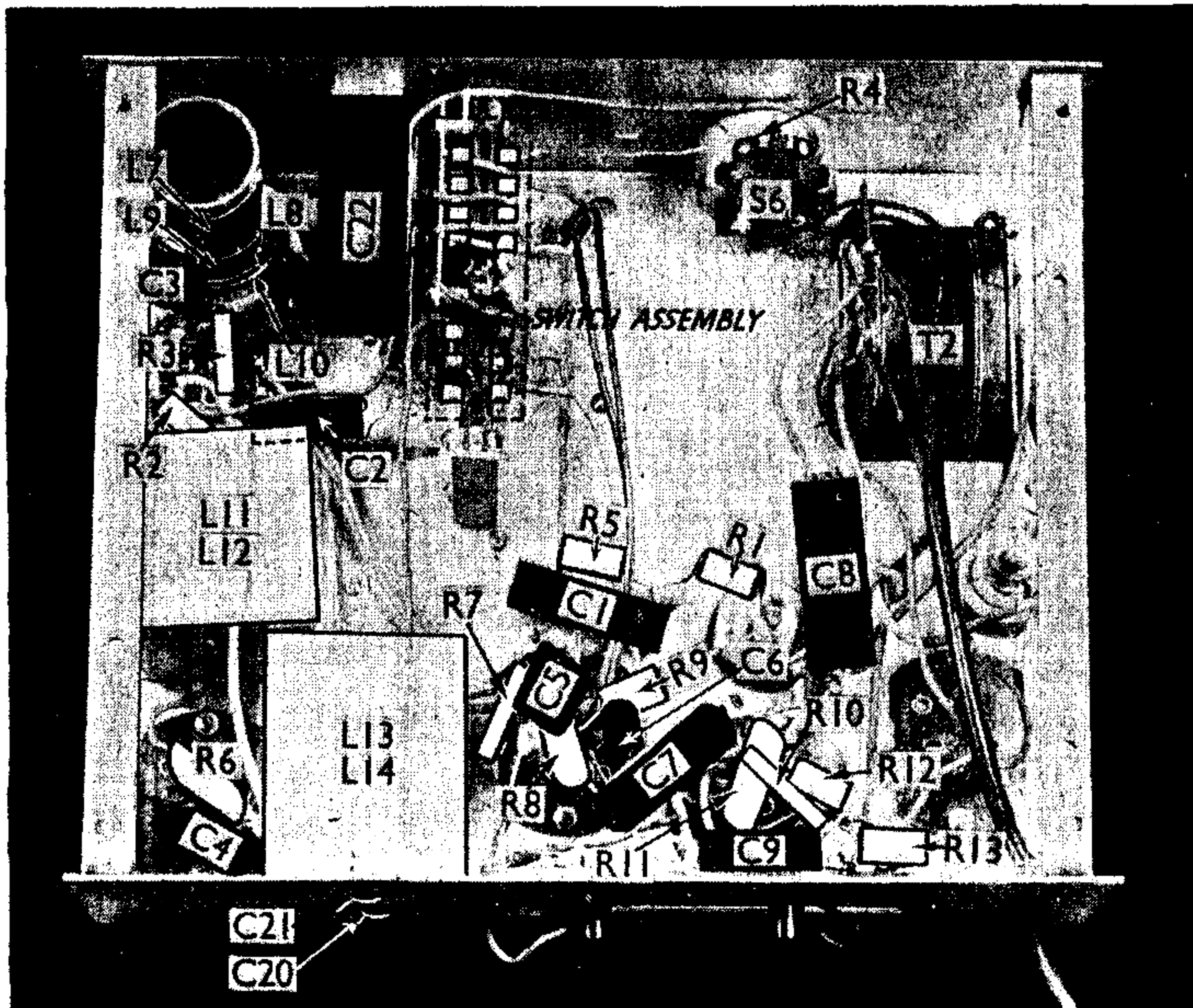
S8—Contact 7 and spindle. M.W. open. L.W. closed. Gram. closed.

S6—Mains Q.M.B. switch ganged with R4.

Frequency Changer, V1.—Connections and description of the octode frequency changer, FC4, are given in Service Sheet No. 14, pp. 78 and 79.

Output Pentode, V4.—Connections are given in Service Sheet No. 13, p. 35, Col. 2 (left-hand diagram).

Dial Lamps.—These are Osram M.E.S. type, rated at 2.5 V 0.2 A., and are connected across half the heater winding.



Sketch showing the switch assembly.