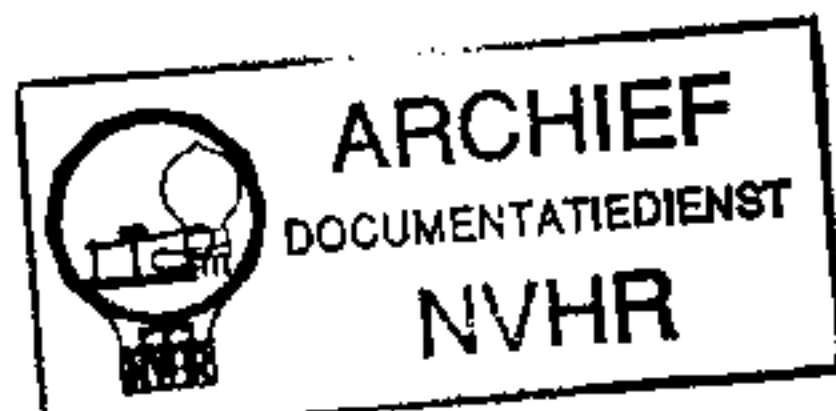


Ned. Ver. v. Historie v/d Radio



DECCA 33

3-BAND BATTERY RECEIVER

A SHORT-WAVE range of 19-49 metres is included in the Decca 33 3-valve battery-operated receiver. There is provision for both a gramophone pick-up and an extension speaker.

CIRCUIT DESCRIPTION

Aerial input via coupling coil L1 (S.W.), L2 (M.W.) and L3 (L.W.) to single tuned circuits L4, C16 (S.W.), L5, C16 (M.W.) and L6, C16 (L.W.), which precede first valve (V1, Tungram metallised VP2B), a variable-mu pentode operating as R.F. amplifier with gain control by potentiometer R2, which varies G.B. applied.

Tuned anode coupling by L10, C21 (S.W.), L11, C21 (M.W.) and L12, C21 (L.W.) between V1 and detector valve (V2, Mullard metallised SP2), an R.F. pentode operating on the grid leak system with R4 and C5. Reaction is applied from anode by coils L7 (S.W.), L8 (M.W.) and L9 (L.W.), and controlled by C20. R.F. filtering in anode circuit by R.C. network R8, C7, R9 and C8.

Resistance-capacity coupling by R7, C9 and R10 via R.F. stopper R11, between V2 and pentode output valve (V3, Mullard PM22D). Provision for connection of gramophone pick-up across R10 in C.G. circuit. G.B. voltage for V3 is obtained from drop across resistance R12 in H.T. negative lead. Fixed tone correction in anode circuit by C12. Provision for connection of high impedance external speaker across the primary of T1.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 G.B. minimum limit resistance	20,000
R2	V1 gain control	600,000
R3	V1 S.G. and anode H.T. feed	10,000
R4	V1 grid leak	3,000,000
R5	V2 G.B. filament potentiometer	100
R6	V2 anode load resistance	1,000
R7	V2 anode load resistance	100,000
R8	Parts of V2 anode R.F. filter	10,000
R9	V2 anode R.F. filter	50,000
R10	V3 C.G. resistance	300,000
R11	V3 C.G. R.F. stopper	100,000
R12	V3 automatic G.B. resistance	500

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial S.W. coupling	0.3
L2	Aerial M.W. coupling	14.0
L3	Aerial L.W. coupling	73.0
L4	Aerial S.W. tuning coil	Very low
L5	Aerial M.W. tuning coil	5.0
L6	Aerial L.W. tuning coil	17.0
L7	S.W. reaction coil	0.5
L8	M.W. reaction coil	0.4
L9	L.W. reaction coil	4.0
L10	V1 anode S.W. tuning coil	0.1
L11	V1 anode M.W. tuning coil	3.2
L12	V1 anode L.W. tuning coil	26.0
L13	Speaker speech coil	1.8
T1	Speaker input trans.	Pri. 650.0 Sec. 0.2
S1-S18	Waveband switches	—
S19	L.T. circuit switch	—

CONDENSERS		Values (μF)
C1	V1 C.G. decoupling and R.F. by-pass condensers	0.1
C2	V1 S.G. and anode R.F. by-pass	0.01
C3	V1 S.G. and anode decoupling	4.0
C4*	V2 C.G. condenser	0.00005
C5	V2 S.G. decoupling	0.1
C6	Parts of V2 anode R.F. filter	0.0003
C7	V2 anode R.F. filter	0.0003
C8	V2 anode R.F. filter	0.0003
C9	V2 to V3 A.F. coupling	0.02
C10*	Automatic G.B. circuit by-pass	50.0
C11*	H.T. reservoir condenser	8.0
C12	V3 anode fixed tone corrector	0.006
C13†	Aerial circuit S.W. trimmer	—
C14†	Aerial circuit M.W. trimmer	—
C15†	Aerial circuit L.W. trimmer	—
C16†	Aerial circuit tuning	—
C17†	Anode circuit S.W. trimmer	—
C18†	Anode circuit M.W. trimmer	—
C19†	Anode circuit L.W. trimmer	—
C20†	Reaction control	0.0005
C21†	Anode circuit tuning	—

DISMANTLING THE SET

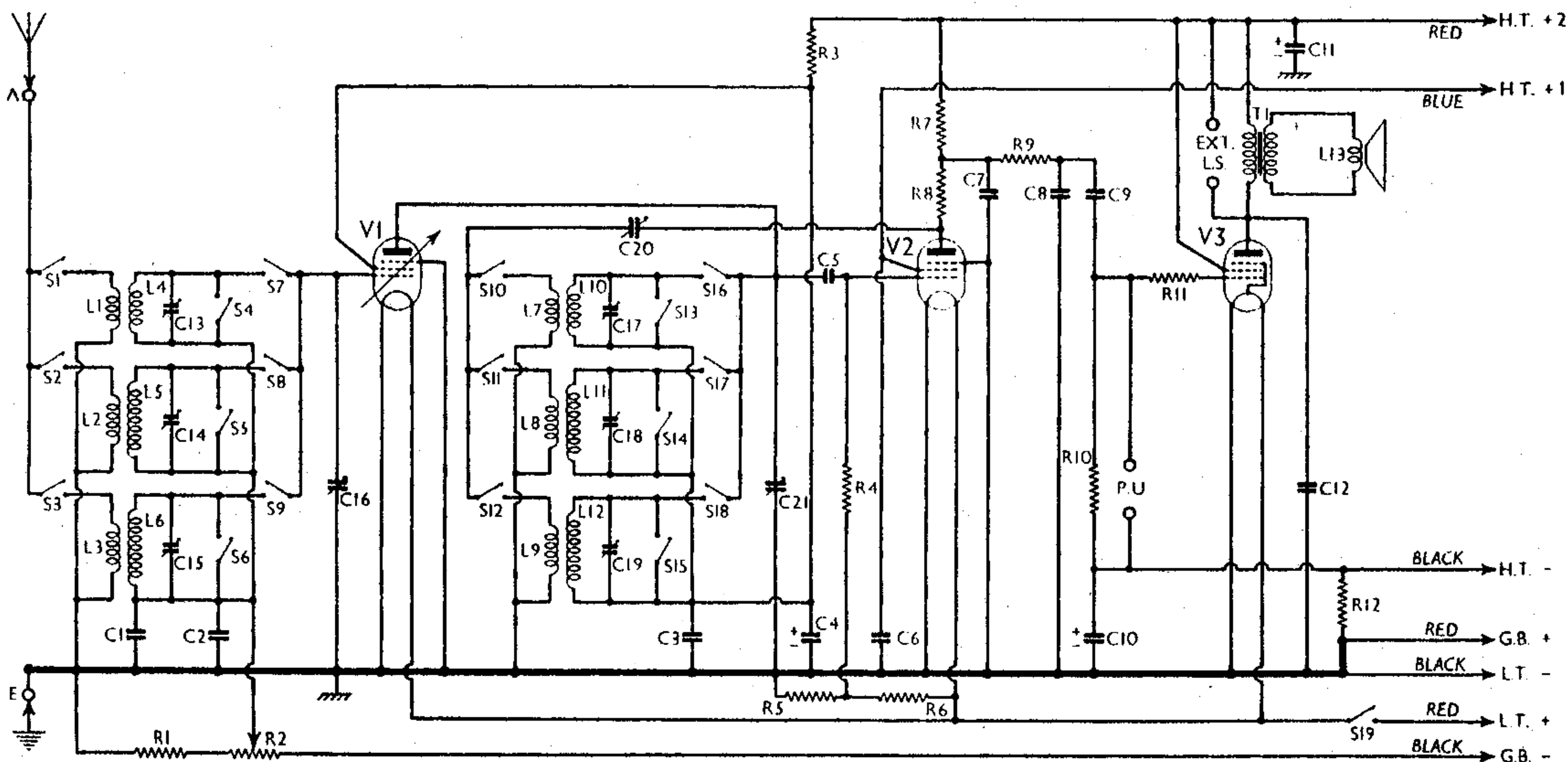
A detachable bottom is fitted to the cabinet and upon removal (six counter-sunk-head wood screws) gives access to most of the components beneath the chassis.

Removing Chassis.—If it should prove necessary to remove the chassis from the cabinet, remove the four control knobs (recessed grub screws) and the two bolts (with washers and lock-washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn to the extent of the leads, which is sufficient for normal purposes.

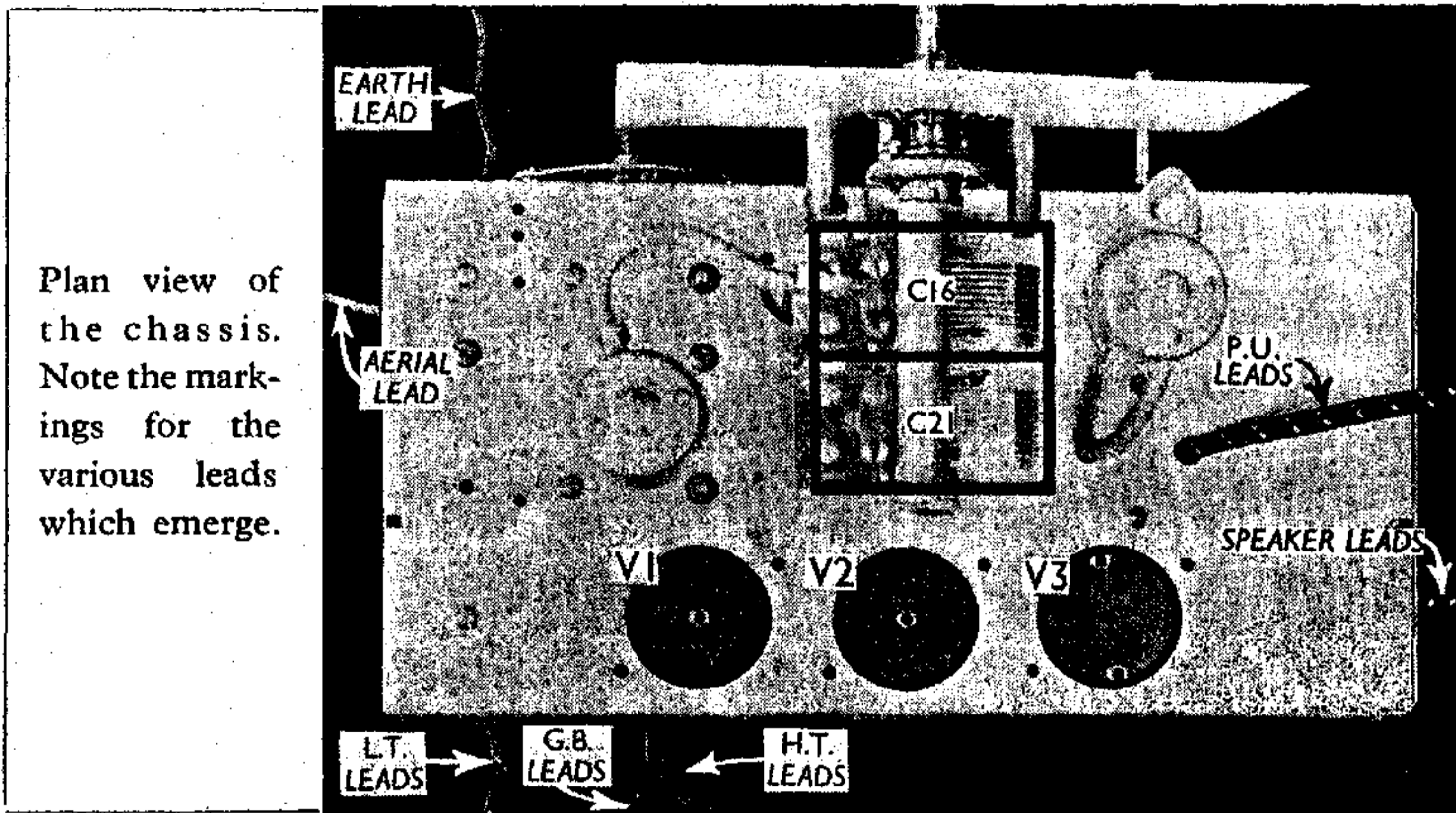
When replacing, note that one of the knobs is fitted with a sleeve. This should be placed on the spindle of the reaction control.

To free the chassis entirely, unsolder

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Decca 33 3-band battery receiver.



Plan view of the chassis. Note the markings for the various leads which emerge.

view. Each unit has its associated trimmer fitted at the end of its former.

External Speaker.—Two sockets are provided on a small panel at the top of the back of the cabinet for a high impedance (about 20,000 Ω) external speaker.

Batteries.—L.T., 2 V accumulator cell; H.T., 120 V H.T. battery; G.B., 16.5 V G.B. battery. The H.T. battery should not exceed 8½ in. by 7 in. by 3 in. in size.

Battery Leads and Voltages.—Black lead, spade tag, L.T. negative; red lead, spade tag, L.T. positive 2 V; black lead and plug, H.T. negative; blue lead and plug, H.T. positive 1, +60 or +80 V; red lead and plug, H.T. positive 2, +120 V; short red lead and plug, G.B. positive; short black lead and plug, G.B. negative, —12 V.

Bearer Plates.—Two paxolin plates fitted inside the back of the chassis, and provided with tags, serve to carry a number of connections.

A and E Connections.—The aerial lead (brown-yellow) and the earth lead (black) from the chassis go to two sockets on a paxolin panel at the top of the back of the chassis.

CIRCUIT ALIGNMENT

When the gang is at maximum the pointer should cover the right-hand horizontal lines on the scale plate.

Connect a signal generator to A and E sockets or leads. Turn volume control to maximum, and reaction control to a point just short of oscillation. Switch set to L.W., tune to 1,200 m. on scale, feed in a 1,200 m. (250 KC/S) signal, and adjust C19 and C15 for maximum output, keeping set just short of oscillation.

Switch set to M.W., tune to 220 m. on scale, feed in a 220 m. (1,360 KC/S) signal, and adjust C18 and C14 for maximum output, keeping set just short of oscillation.

Switch set to S.W., tune to 20 m. on scale, feed in a 20 m. (15 MC/S) signal, and adjust C17 and C13 for maximum output, again keeping set just short of oscillation.

the leads from the speaker and remove the panel carrying the aerial, earth and pick-up sockets (two round-head wood screws).

Removing Speaker.—To remove the speaker from the cabinet, unsolder the leads coming from the chassis and extension speaker socket panel and remove the nuts from the four screws holding it to the sub-baffle. When replacing, see that the transformer is at the top.

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 123 V on load, and with the H.T. -1 plug in the 60 V socket.

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.

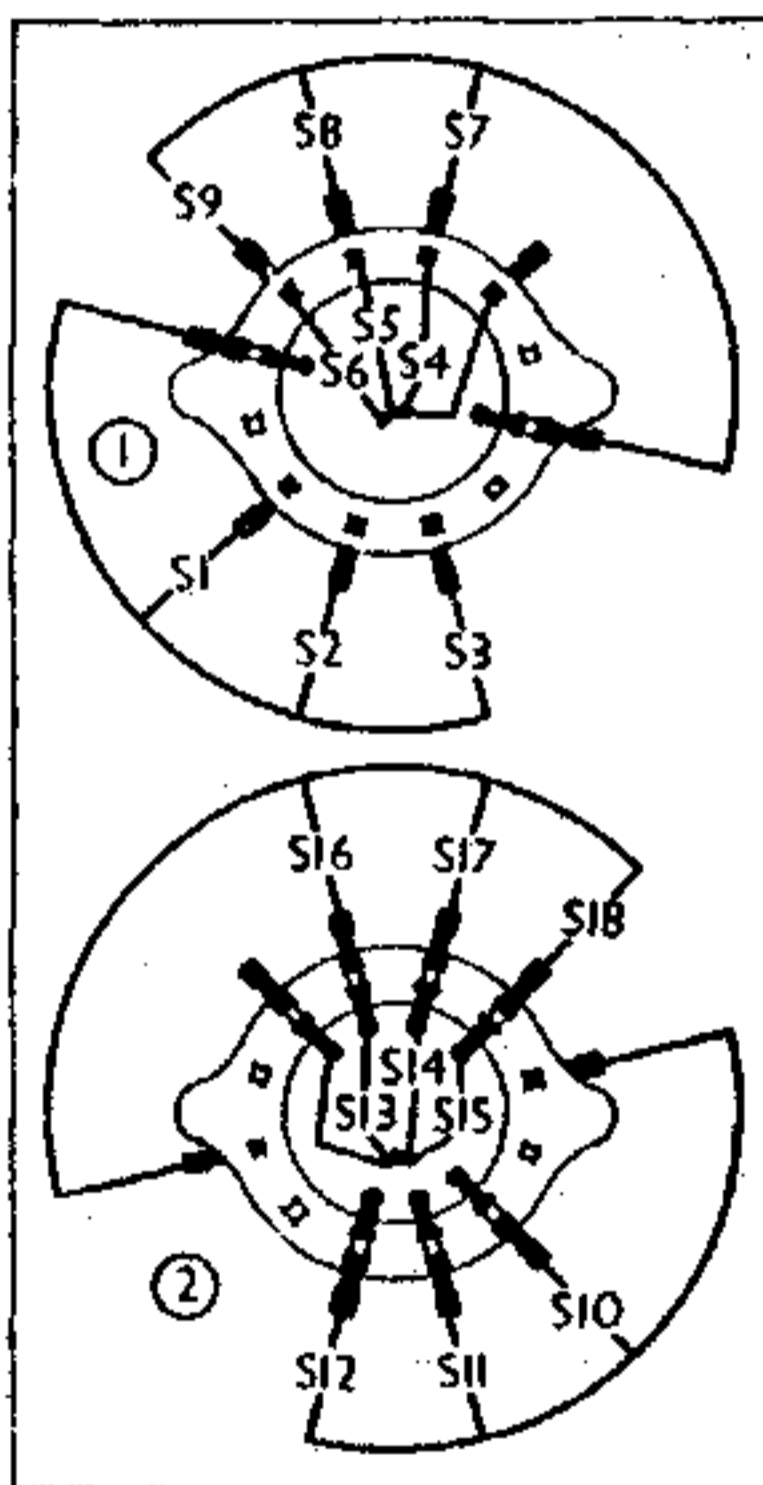
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2B	100	1.3	100	0.4
V2 SP2	55	0.4	60	0.1
V3 PM22D	120	2.7	123	0.4

positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed.

S19 is the Q.M.B. L.T. circuit switch, ganged with the gain control R2.

Coils.—All the coils are included in pairs in six unscreened units, wound on tubular formers beneath the chassis. These are indicated in our under-chassis



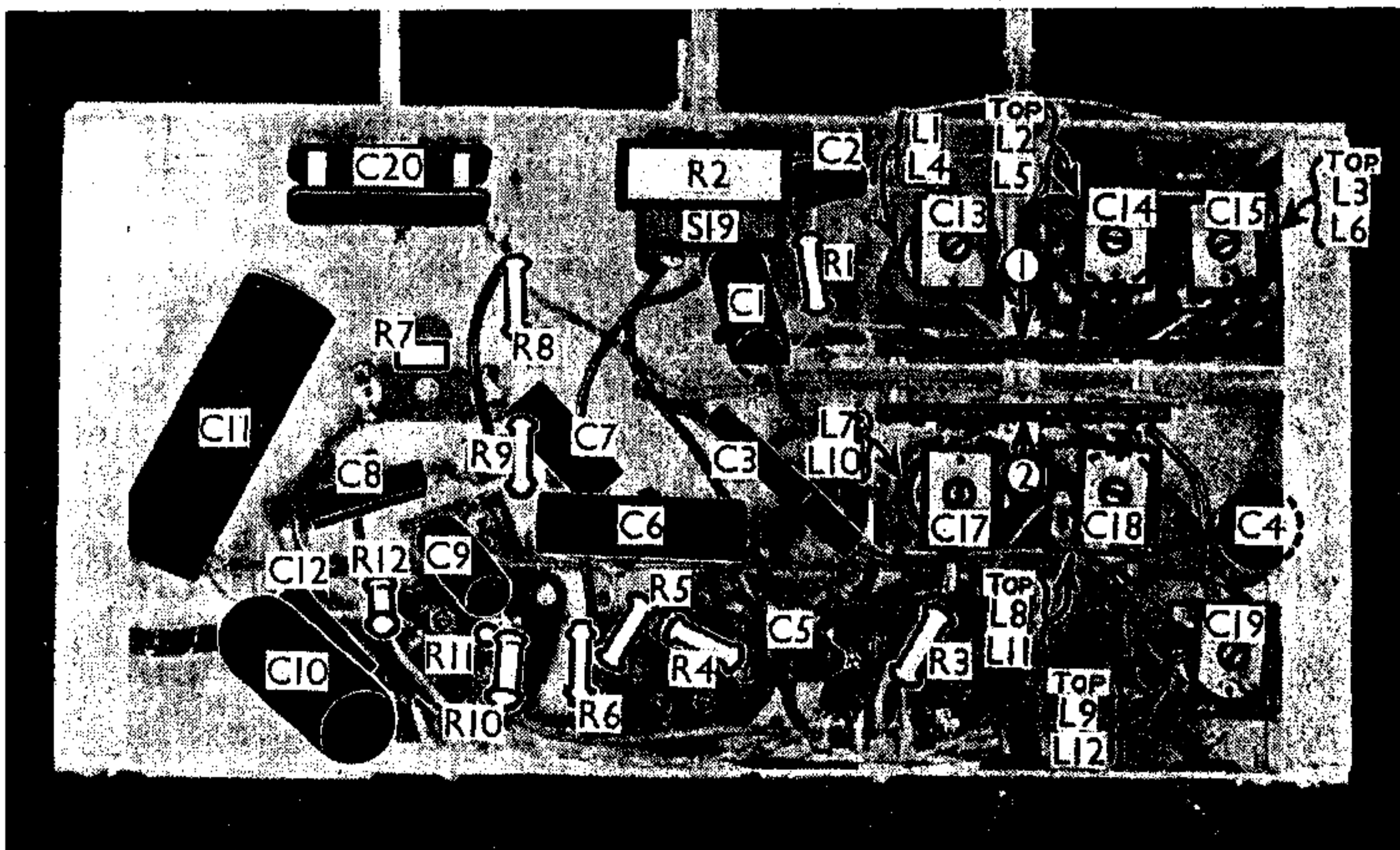
Switch diagrams, looking in the directions of the arrows in the under-chassis view.

GENERAL NOTES

Switches.—S1-S18 are the waveband switches, in two rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams on this page. Note that the first unit is viewed from the front of the chassis, and the second from the rear.

The table below gives the switch

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



Under-chassis view. Note the six coil units and their trimmers.