

'TRADER' SERVICE SHEET

247

# DEC GA 33

## 3-BAND BATTERY RECEIVER

A SHORT-WAVE range of 10-40 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	meter	1,000
R7	V2 anode load resistance	100,000
R8	Parts of V2 anode R.F. filter	10,000
R9	V3 C.G. resistance	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

CONDENSERS		Values ( $\mu$ F)
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	0.03
C4*	V2 C.G. condenser	4.0
C5	V2 S.G. decoupling	0.0005
C6	Parts of V2 anode R.F. filter	0.1
C7	V2 to V3 A.F. coupling	0.0003
C8	Automatic G.B. circuit by-pass	0.0003
C9	H.T. reservoir condenser	0.02
C10*	V3 anode fixed tone corrector	50.0
C11*	H.T. reservoir condenser	8.0
C12	V3 anode circuit S.W. trimmer	0.006
C13†	Aerial circuit M.W. trimmer	—
C14†	Aerial circuit L.W. trimmer	—
C15†	Aerial circuit S.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	—

\* Electrolytic. † Variable. ‡ Pre-set.

### OTHER COMPONENTS

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

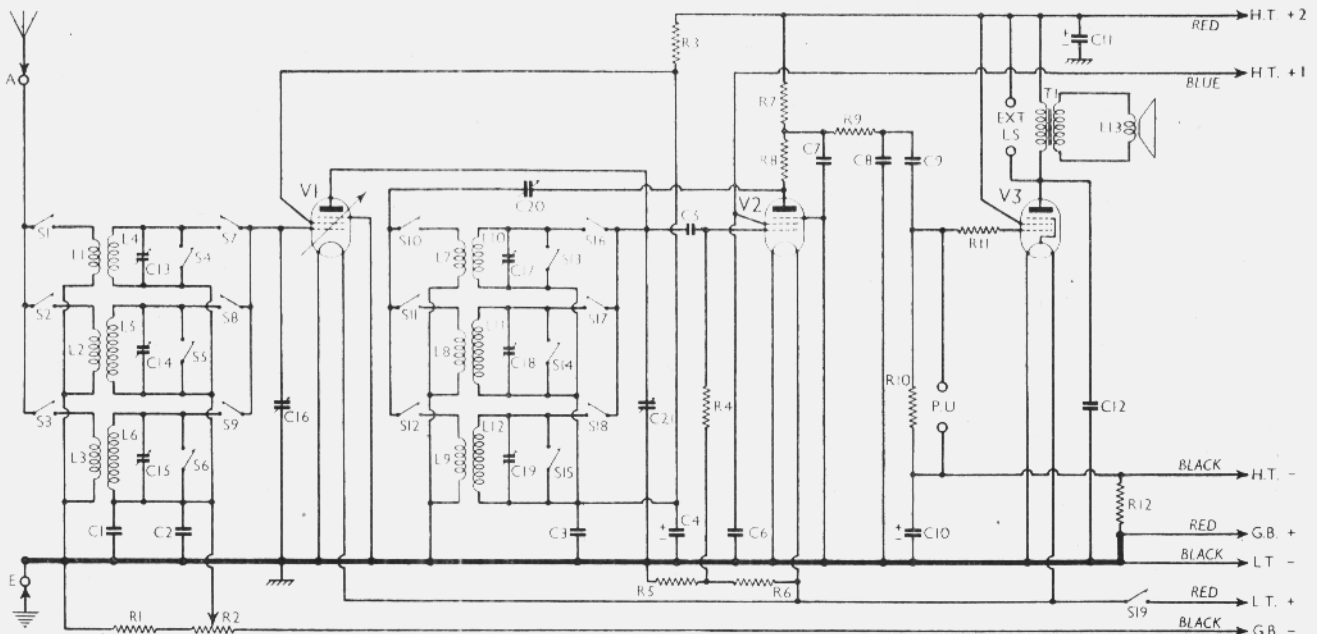
### DISMANTLING THE SET

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.

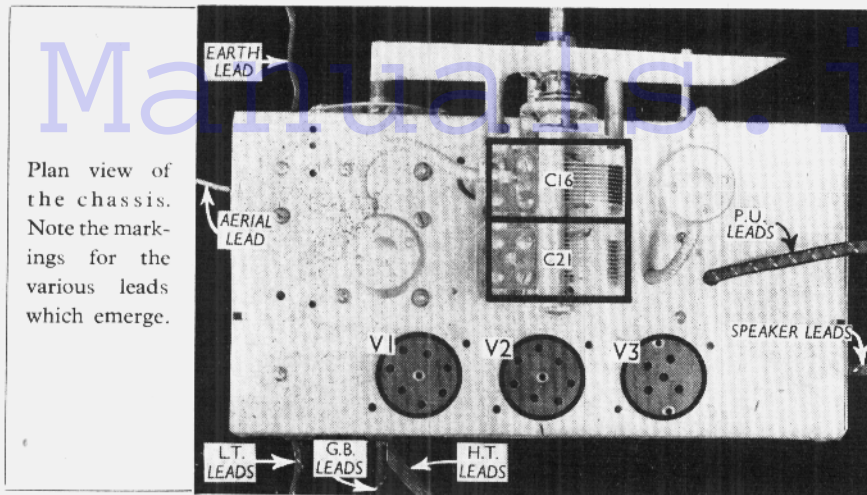
When replacing, note that one of the knobs is fitted with a sleeve. This should be placed on the spindle of the reaction control.

To free the chassis entirely, unsolder



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

For more information remember  
[www.savoy-hill.co.uk](http://www.savoy-hill.co.uk)



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

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

**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.

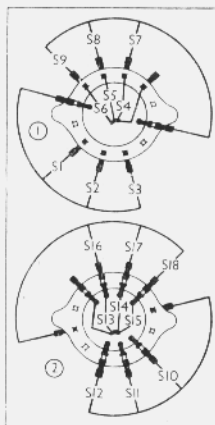
The table below gives the switch

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	—	—

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.

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.

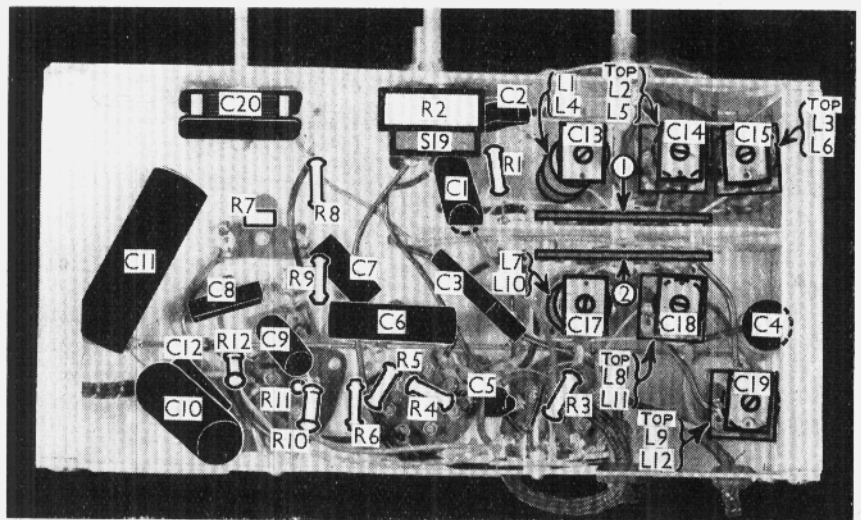
**CIRCUIT ALIGNMENT**

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.



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