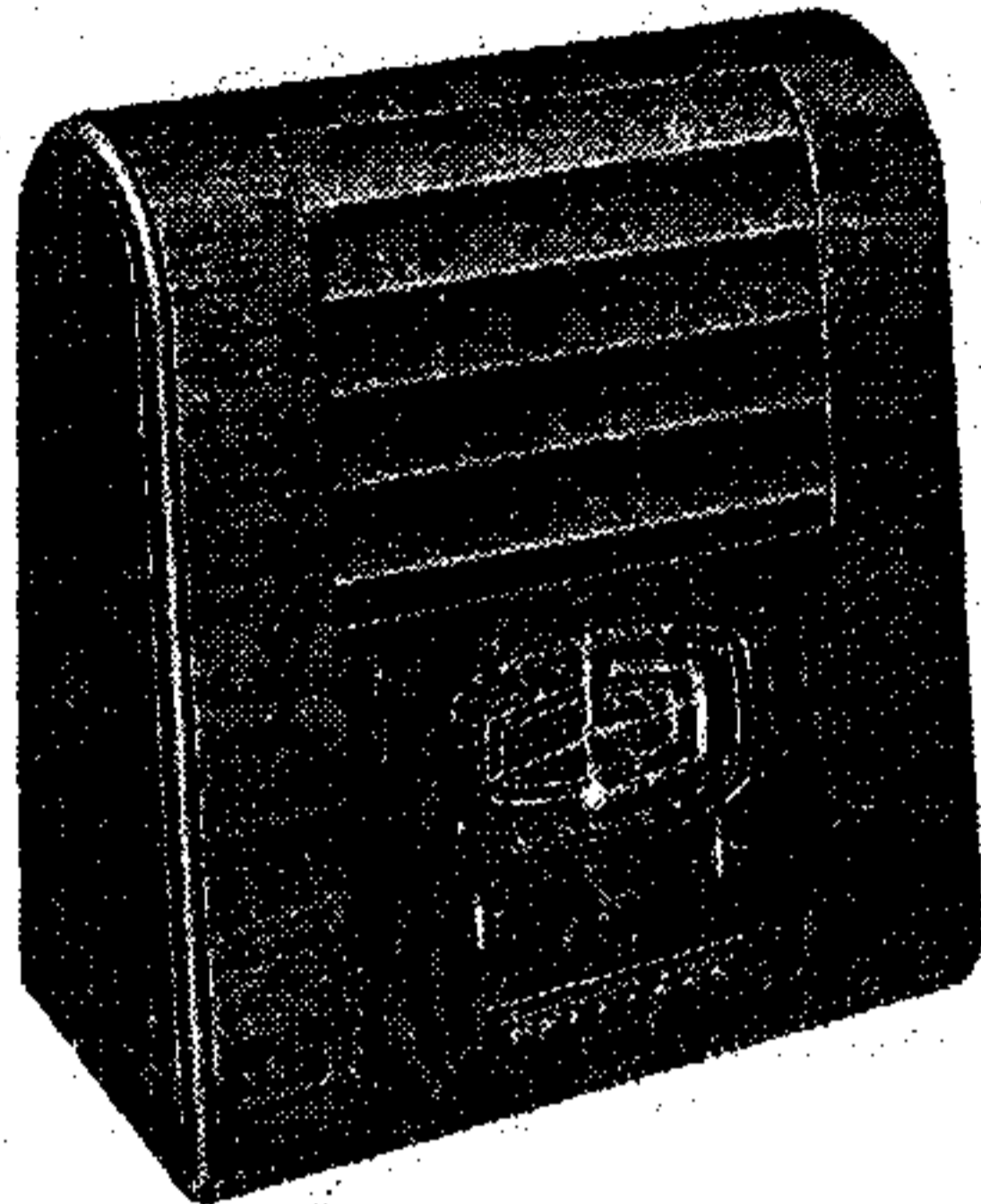


Ned. Ver. v. Historie v/d Radio



DECCA PT/AC AND PG/AC RADIOGRAM



THE Decca PT/AC Prestomatic receiver is a 4-valve (plus rectifier) AC 3-band superhet with press button tuning for eight pre-determined stations (seven buttons), the buttons switching into circuit trimmers adjusted to the required wavelength. An eighth button switches the set to manual tuning. The receiver has a short-wave range of 19-49 m, and includes provision for both a gramophone pick-up and extension speaker, while it is suitable for mains of 200-250 V, 50-60 C/S.

A very similar chassis is fitted in the PG/AC Prestomatic radiogram but this Service Sheet was prepared on a PT/AC. The difference in the PG/AC is explained under "Radiogram Modifications."

CIRCUIT DESCRIPTION

Aerial input via series condenser C1 and coupling coils L2 (SW), L3 (MW), and (via 261 m rejector circuit

L1, C2) L4 (LW) to single tuned circuits comprising L5 (SW), L6 (MW), L7 (LW), and C27 (manual tuning) or one of pre-set trimmers C35-C45 (auto tuning) according to which button is depressed, auto/manual change-over being effected by S20, S21.

First valve (V1, Mazda metallised AC/TH1) is a triode hexode operating as frequency changer with internal coupling. Triode oscillator grid coils L8 (SW), L9 (MW) and L10 (LW) are tuned by C28 (manual) or one of pre-set trimmers C46-C56 (auto tuning) again according to which button is depressed, auto/manual change-over being effected by S29, S30. Parallel trimming by C57 (MW) and C9, C30 (LW); series tracking by C10 (SW), C58 (MW) and C29 (LW). Reaction by coils L11 (SW), L12 (MW) and L13 (LW).

Second valve (V2, Mazda metallised AC/VP2) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings C31, L14, L15, C32 and C33, L16, L17, C34.

Intermediate frequency 465 KC/S.

Diode second detector is part of separate double diode valve (V3, Mullard metallised 2D4A). Audio frequency component in rectified output is developed across load resistance R13 and passed via IF stopper R12, AF coupling condenser C17 and manual volume control R15 to CG of tetrode output valve (V4, Mazda AC5/Pen). Provision for connection of gramophone pick-up across R15. Fixed tone correction by C21 and variable tone control by R18, C19 in anode circuit. Provision for connection high impedance external speaker across primary of internal speaker input transformer T1.

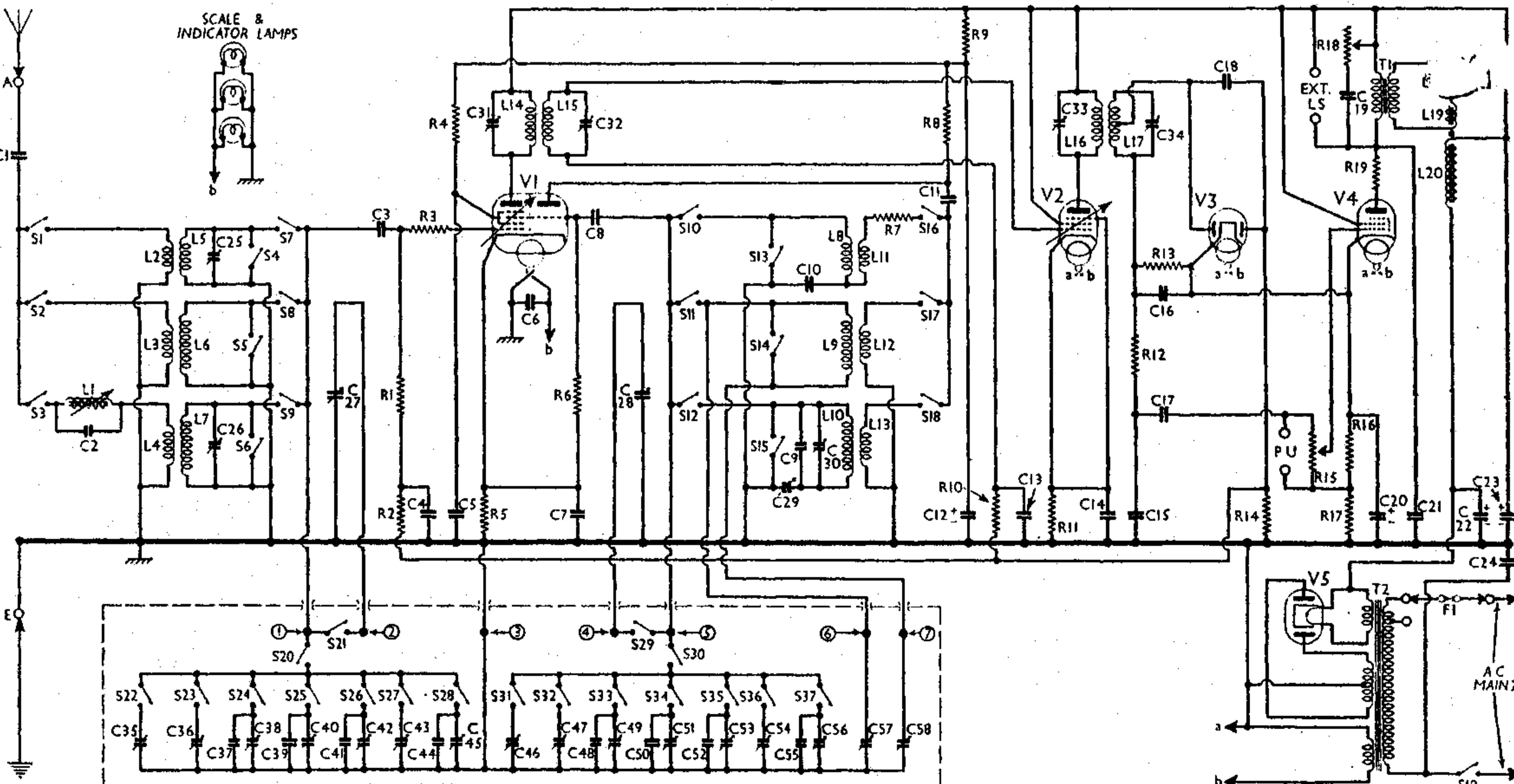
Second diode of V3, fed from tapping on L17 via C18, provides DC potential which is developed across load resistance R14 and fed back through decoupling circuits as GB to FC and IF valves, giving automatic volume control. Delay voltage is obtained from drop along R16, R17 in V4 cathode circuit.

HT current is supplied by IHC full-wave rectifying valve (V5, Mullard 1W4/350 or Brimar R2). Smoothing by speaker field L20 and dry electrolytic condensers C22, C23. Mains circuit RF filtering by C24. Fuse F1 protects mains input circuit against accidental short circuit.

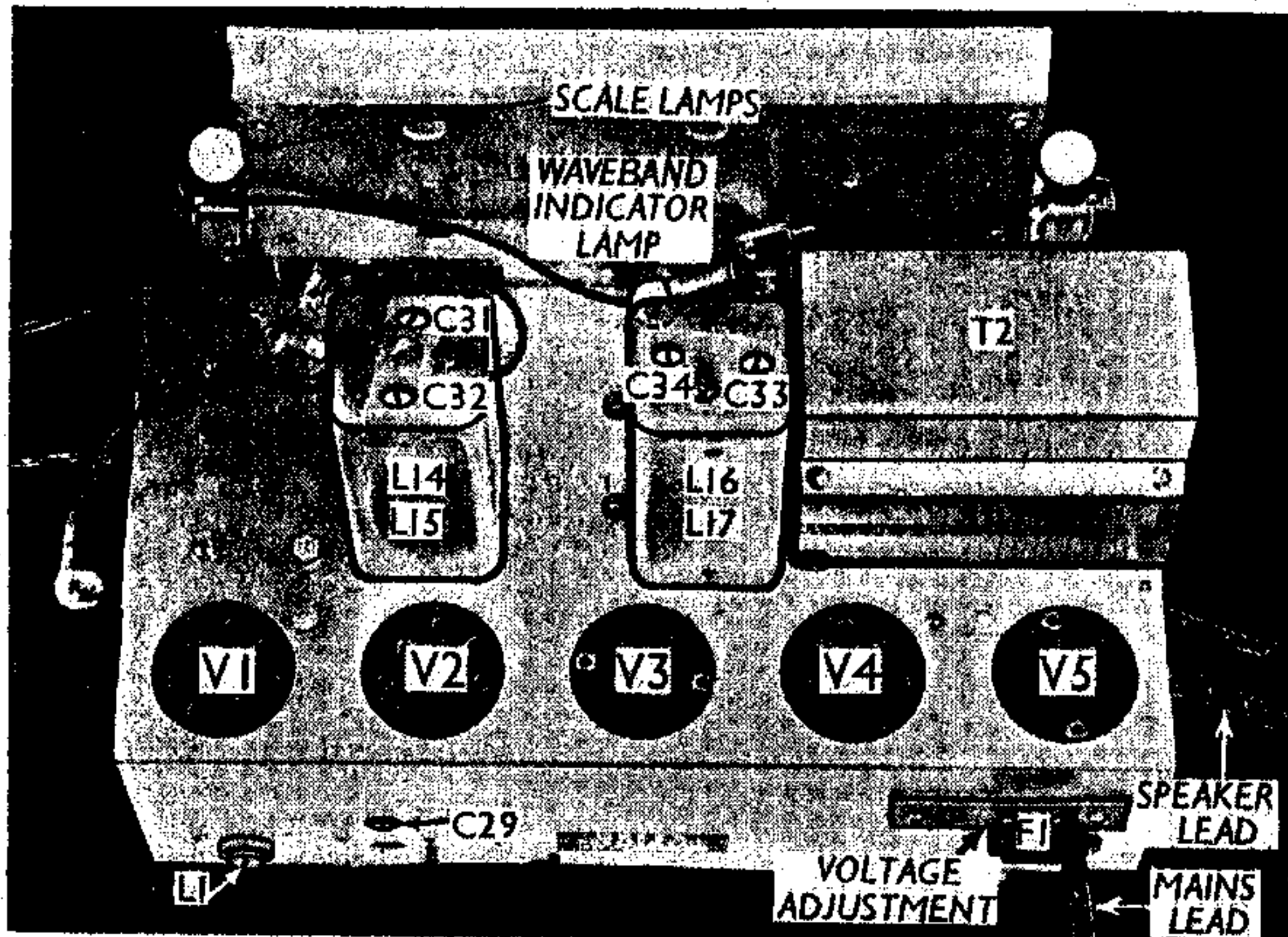
COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial series condenser ..	0.0004
C2	LW aerial circuit 261 m rejector tuning ..	0.0001
C3	V1 hexode CG condenser ..	0.000012
C4	V1 hexode CG decoupling ..	0.02
C5	V1 SG RF by-pass ..	0.1
C6	V1 heater RF by-pass ..	0.01
C7	V1 cathode by-pass ..	0.1
C8	V1 osc. CG condenser ..	0.0001
C9	Osc. circuit LW fixed trimmer ..	0.00006
C10	Osc. circuit SW tracker ..	0.0038
C11	V1 osc. anode coupling ..	0.0002
C12*	V1 SG and osc. anode decoupling ..	4.0
C13	V2 CG decoupling ..	0.02
C14	V2 cathode by-pass ..	0.1
C15	} IF by-pass condensers	0.0001
C16		0.0001
C17	AF coupling to V4 ..	0.02
C18	Coupling to V3 AVC diode ..	0.0001
C19	Part of variable tone control ..	0.05
C20*	V4 cathode by-pass ..	50.0
C21	Fixed tone corrector ..	0.006
C22*	} HT smoothing	8.0
C23*		8.0
C24	Mains RF by-pass ..	0.006
C25†	Aerial circuit SW trimmer ..	---
C26†	Aerial circuit LW trimmer ..	---
C27†	Aerial circuit manual tuning ..	---
C28†	Oscillator circuit manual tuning ..	---
C29†	Osc. circuit LW tracker ..	---
C30†	Osc. circuit LW trimmer ..	---
C31†	1st IF trans. pri. tuning ..	---
C32†	1st IF trans. sec. tuning ..	---
C33†	2nd IF trans. pri. tuning ..	---
C34†	2nd IF trans. sec. tuning ..	---

* Electrolytic. † Variable. ‡ Pre-set. § Two in parallel.



Circuit diagram of the Decca PT/AC. The automatic unit circuit is shown below the main circuit, connected up by the seven wires which are numbered to correspond with the same wires in the illustrations of the under-chassis and auto-unit.



Plan view of the chassis. L1 and C29 can be adjusted from the rear. F1 is a fuse incorporated in the mains adjustment plug.

OTHER COMPONENTS (Continued)		Approx. Values (ohms)
L3	Aerial circuit MW coupling coil	14.0
L4	Aerial circuit LW coupling coil	75.0
L5	Aerial circuit SW tuning coil	0.05
L6	Aerial circuit MW tuning coil	3.5
L7	Aerial circuit LW tuning coil	17.0
L8	Osc. circuit SW tuning coil	0.05
L9	Osc. circuit MW tuning coil	2.0
L10	Osc. circuit LW tuning coil	4.0
L11	Osc. SW reaction coil	0.4
L12	Osc. MW reaction coil	1.0
L13	Osc. LW reaction coil	6.25
L14	1st IF trans.	Pri. 6.0
L15		Sec. 6.0
L16	2nd IF trans.	Pri. 6.0
L17		Sec., total 6.0
L18	Speaker speech coil	1.6
L19	Hum neutralising coil	0.1
L20	Speaker field coil	1,000.0
T1	Speaker input trans.	Pri. 290.0
		Sec. 0.15
T2	Mains trans.	Pri., total 29.0
		Heater sec. 0.1
		Rect. heat sec. 0.1
		HT sec., total 550.0
F1	Mains circuit fuse	—
S1-S18	Waveband switches	—
S19	Mains switch, ganged R15	—
S20, 21	Aerial circuit auto/manual change switches	—
S22-28	Aerial circuit auto selector switches	—
S29, 30	Osc. circuit auto/manual change switches	—
S31-37	Osc. circuit auto selector switches	—

CONDENSERS (Continued)		Values (μF)
AUTO-TUNING UNIT		
C35†	Aerial circuit automatic tuning trimmers	—
C36†		—
C37		0.00003
C38†		—
C39		0.00019§
C40†		—
C41		0.00003
C42†		—
C43†		—
C44		0.00003
C45†	Oscillator circuit automatic tuning trimmers	—
C46†		—
C47†		—
C48		0.00003
C49†		—
C50		0.00019§
C51†		—
C52		0.00003
C53†		—
C54†		—
C55	0.00003	
C56†	Osc. circuit MW trimmer	—
C57†		—
C58†		Osc. circuit MW tracker

† Pre-set. § Two in parallel.

RESISTANCES		Values (ohms)
R1	V1 hexode CG resistance	500,000
R2	V1 hexode CG decoupling	500,000
R3	V1 hexode CG stabiliser	40
R4	V1 SG HT feed	15,000
R5	V1 fixed GB	200
R6	V1 osc. CG resistance	50,000
R7	Osc. reaction SW stabiliser	40
R8	V1 osc. anode HT feed	30,000
R9	V1 SG and osc. anode HT feed	5,000
R10	V2 CG decoupling	500,000
R11	V2 fixed GB	200
R12	IF stopper	70,000
R13	V3 signal diode load	3,000,000
R14	V3 AVC diode load	500,000
R15	Manual volume control	500,000
R16	V4 GB and AVC delay resistances	140
R17		160
R18	Variable tone control	50,000
R19	V4 anode RF stopper	150

OTHER COMPONENTS		Approx. Values (ohms)
L1	LW aerial circuit 261m rejector coil	5.0
L2	Aerial circuit SW coupling coil	0.25

DISMANTLING THE SET

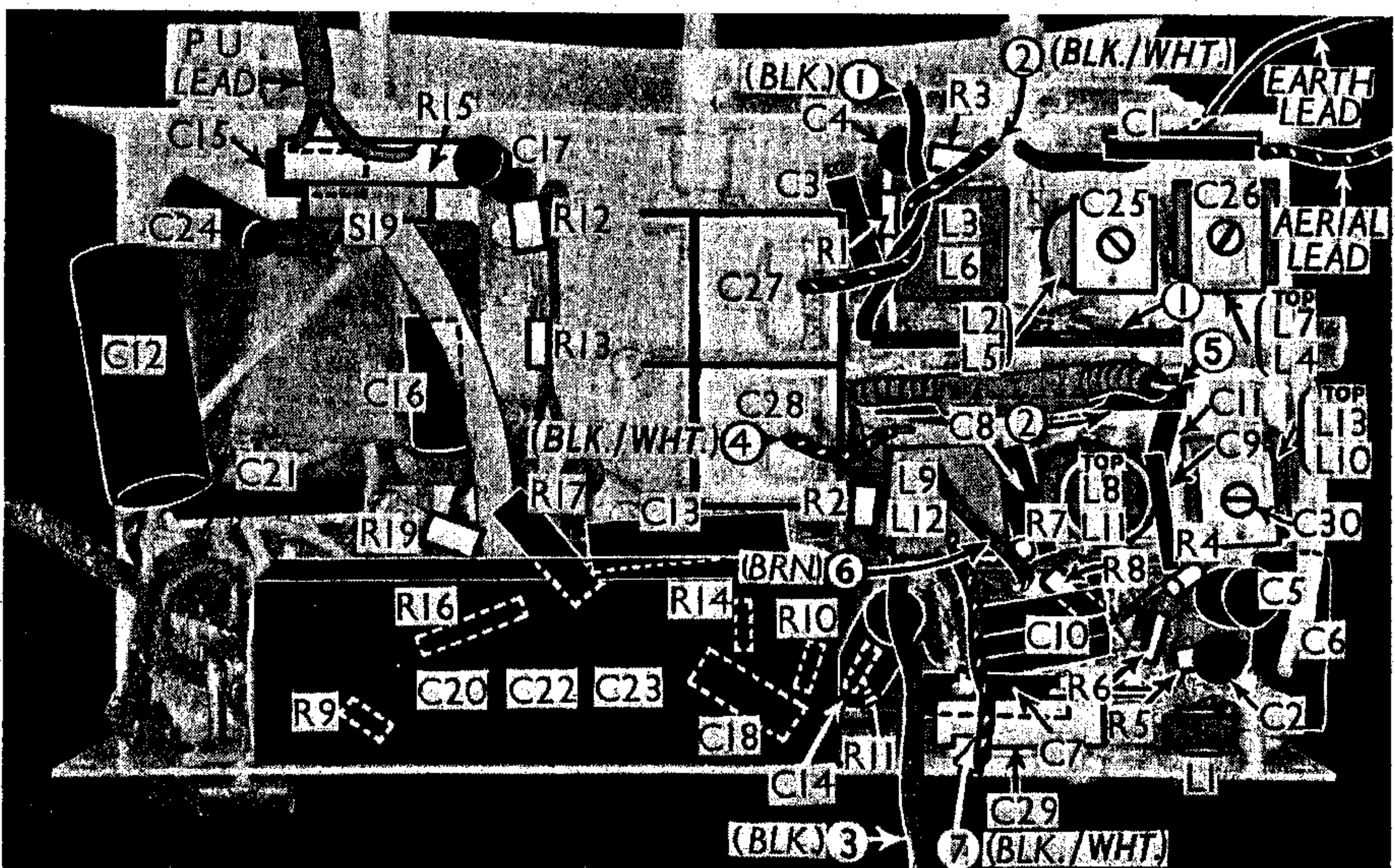
A detachable bottom is fitted to the cabinet and upon removal (four countersunk-head wood screws) gives access to most of the trimmers.

Removing Chassis.—To remove the chassis from the cabinet, remove the three knobs (recessed grub screws) and the two bolts (with claw and lock washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes. When replacing, make sure that the chassis is central in the cabinet as otherwise the push buttons may jam on the escutcheon.

If it is desired to free the chassis entirely, unsolder the aerial, earth, pick-up and speaker leads. When replacing, note that the black/white lead goes to the aerial socket and connect the speaker leads as follows, numbering the tags from left to right:—1, no lead to chassis; 2, red; 3, no lead to chassis; 4, black; 5, blue.

Continued overleaf

Under-chassis view, with the auto-unit removed. The connecting leads are all numbered to correspond with the numbers on the auto-unit on page VIII, and on the circuit diagram.



DECCA PT/AC—Continued

Removing Auto-Unit.—Before access can be gained to the components beneath the chassis it will be necessary to remove the auto-unit. To do this unsolder the seven wires connecting it to the main chassis and remove the four self-tapping screws holding it in place. When replacing, refer to the chassis illustrations for the connections.

Removing Speaker.—To remove the speaker from the cabinet, unsolder the leads and remove the nuts (and lock washers) from the four screws holding the speaker to the sub-baffle. When replacing, see that the transformer is at the bottom and connect the leads as follows, numbering the tags from left to right:— 1, black lead to tone control and one end of C19; 2, red leads to tone control, extension speaker panel and chassis; 3, blank; 4, black leads to extension speaker panel and chassis, and other end of C19; 5, blue lead to chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 232V, using the 220-240 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input as the aerial and earth leads were shorted.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 AC/TH1	247	3.5	92	6.5
	63	4.1		
V2 AC/VP2	247	11.0	247	3.1
V3 2D4A	—	—	—	—
V4 AC/5Pen	227	42.0	247	7.3
V5 IW4/350	308†	—	—	—

† Each anode, AC.

GENERAL NOTES

Switches.—S1-S18 are the waveband switches, in two rotary units beneath the chassis, which are indicated in our under-chassis view, and shown in detail in the diagrams in col. 3, where they are seen looking from the underside of the chassis, in the directions of the arrows in the under-chassis view.

TABLE AND DIAGRAMS OF THE SWITCH UNITS

Switch	LW	MW	SW
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	—	—

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

S19 is the QMB mains switch, ganged with the volume control R15.

S20, S21 are the auto/manual change switches for the aerial circuit, while S29, S30 operate similarly for the oscillator circuit. The four together form a double-pole double-throw switch, and are indicated in our view of the auto-unit. On pushing the manual button, S21 and S29 are closed, and S20 and S30 are open, while with any station button depressed, S21, S29 are open and S20, S30 closed.

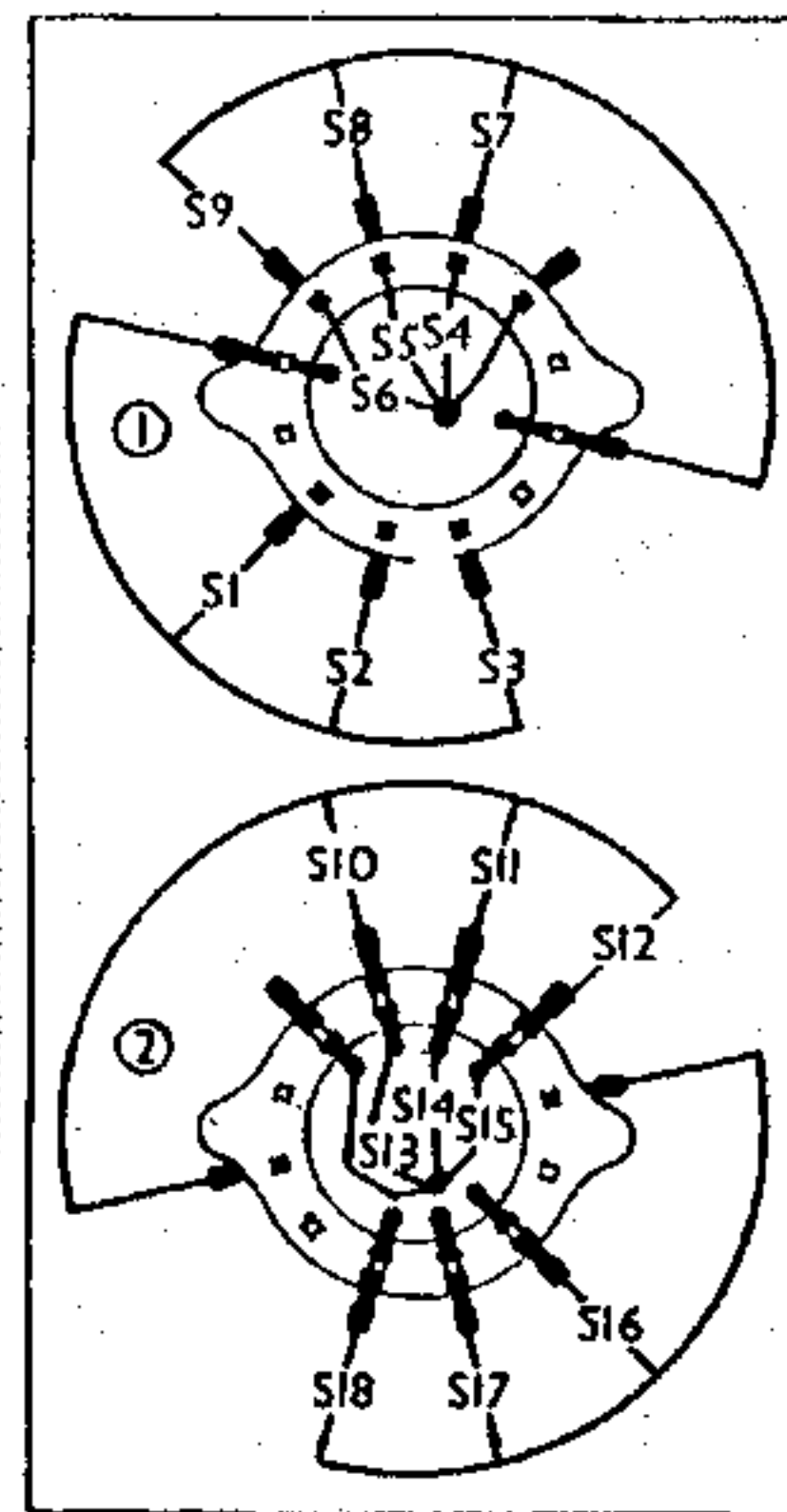
S22-S28 and S31-S37 are the aerial and oscillator station selector switches, there being one of each to each button, as indicated in our view of the auto-unit. When a station button is depressed, its two switches (e.g., S22 and S31) are closed, but all the other similar pairs are open.

Coils.—L1 is mounted on the rear chassis member. It has a screw-type iron core for adjustment if necessary.

L2-L13 are in pairs on tubular formers beneath the chassis, and are indicated in our under-chassis view.

The IF transformers L14, L15 and L16, L17 are in two screened units on the chassis deck, with their associated trimmers (see also "Chassis Divergencies").

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



Scale and Indicator Lamps.—The two scale lamps and the waveband indicator lamp are all MES types, rated at 6 V, 0.3 A. The indicator lamp has a small bulb.

Fuse F1.—This is incorporated in the voltage adjustment plug, and is of the wire type. It should be replaced with 2 A fuse wire if necessary.

External Speaker.—Two sockets are provided at the rear of the cabinet for a high impedance (6,000-10,000 Ω) external speaker.

Components R18, C19.—R18 is mounted at the top of the right-hand side of the cabinet, and C19 is on the speaker transformer T1. They do not therefore appear in our chassis illustrations.

Condensers C20, C22, C23.—These are three dry electrolytics in a single carton beneath the chassis, with a common negative (black) lead. The yellow lead is the positive of C20 (50 μF, 15 V peak); the blue lead is the positive of C22 (8 μF, 525 V peak), while the red lead is the positive of C23 (8 μF, 450 V peak).

Trimmer Condensers.—The normal RF and oscillator trimmers (as distinct from those used for the pre-selected stations) are beneath the main chassis, and are indicated in the under-chassis view. There are two exceptions, however, C57 and C58, the oscillator MW trimmer and tracker, which are both on the auto-unit. C57 is either a silver-mica scrapable type, or a Tempa pre-set (in late chassis). C58 is a large Tempa pre-set.

The trimmers for the pre-selected stations comprise fourteen Tempa pre-sets (seven for aerial, and seven oscillator trimming), some of which incorporate a fixed trimmer in their base. We do not indicate this in our diagrams, for the sake of clarity. In other cases the required capacity is made up by fixed trimmers connected externally, and situated beneath the paxolin plate carrying the Tempa pre-sets. In the case of C39 and C50, two external fixed trimmers in parallel are used.

Auto-Unit Connections.—There are seven connections to the auto-unit, and these are indicated in the under-chassis view, the auto-unit view, and the circuit diagram, by numbers in circles and arrows.

Chassis Divergencies.—In chassis below serial number 51,100 C57 is a scrapable silver-mica condenser (as in our illustrations), but in later chassis this is replaced by a Tempa pre-set.

In our chassis the two IF transformers are tuned by dual pre-sets (similar to the Tempa types) in the cans. In earlier models the first IF transformer had fixed ceramic trimmers, and was adjusted by movable iron cores. The second transformer had ordinary trimmers and was fairly broadly tuned.

Models issued since the Radio Normandie change to 212.6 m will have different values for C45 and C56, while C44 and C55 will not be present. Early models will need these alterations, and new Tempa pre-sets for the C45 and C58 positions are obtainable from Decca.

RADIOGRAM MODIFICATIONS

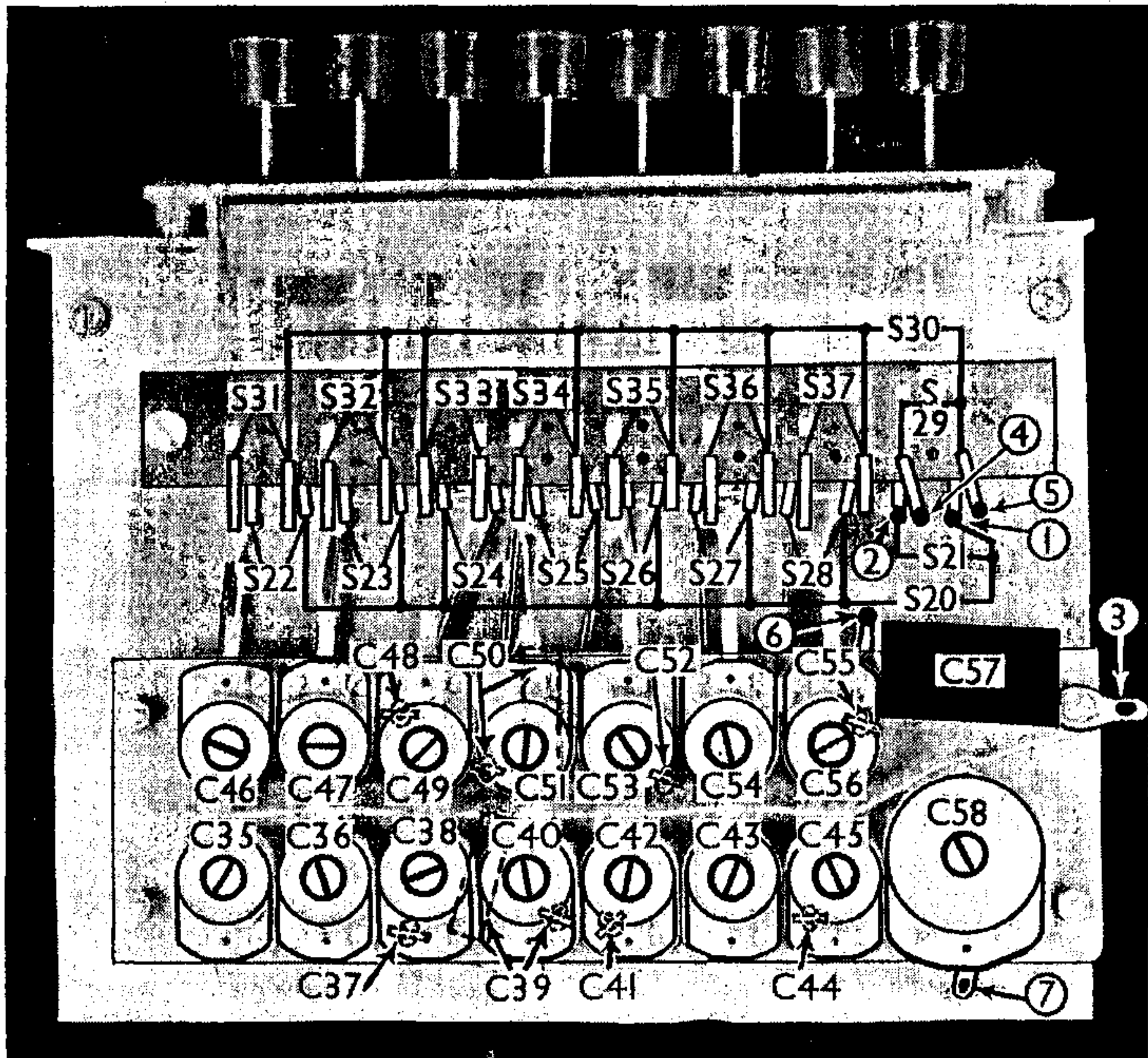
The radiogram model, PG/AC, has a similar chassis, but with the addition of a radio-gram change-over switch.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator to control grid (top cap) of V1 and chassis, and feed in a 465 KC/S signal. Adjust C31, C32, C33 and C34 for maximum output. In early models, adjust C33 and C34, and the iron cores of L14 and L15.

RF and Oscillator Stages.—Connect signal generator

Continued on page V



Plan view of the auto-unit, with the connection points to the main chassis indicated and numbered.

DECCA PT/AC

Continued from page VIII

to **A** and **E** sockets, switch set to MW, depress manual button, and feed in a 500 m (600 KC/S) signal. Tune it in, and adjust **C58** for maximum output, while rocking the gang.

Tune to 250 m on scale, feed in a 250 m (1,200 KC/S) signal, and adjust **C57** for maximum output. In early models, this will mean carefully scraping the silver deposit from **C57** until it is thought that the peak has been reached. If too much deposit is scraped off, or if the capacity was originally too low, a new condenser will have to be fitted. In this case, a Tempa pre-set (obtainable from Decca) should be substituted for the scrapable silver-mica type.

Switch set to SW, tune to 15 MC/S on scale, feed in a 15 MC/S (20 m) signal, and adjust **C25** for maximum output.

Switch set to LW, depress Droitwich button, feed in a 1,500 m (200 KC/S) signal and adjust **C29** (at back of chassis) for maximum output. Now depress manual button, feed in a 1,200 m (250 KC/S) signal, tune to 1,200 m on scale, and adjust **C30**, then **C26**, for maximum output. Re-check **C29** on 1,500 m.

The 261 m rejector **L1**, **C2** may be re-adjusted if necessary by switching set to LW, feeding in a strong 261 m signal, and adjusting the core of **L1** for *minimum* output.

Pre-Selected Stations.—Any inaccuracy of tuning of the pre-selected stations can best be corrected by adjusting the appropriate pair of Tempa pre-sets on the actual station signal.

Each pair of pre-sets covers a band of anything from 35 to 55 m, and hence can be used to select certain stations other than those originally chosen, if desired.

To adjust the set so that a certain button is to receive a station outside its normal range, it will be necessary to substitute a different set of condensers. The cost of new condensers for any particular wavelength is 3s. per pair. When ordering, quote the number 1035, with a letter following depending on the wavelength required: A, 215-270 m; B*, 270-320 m; C, 315-360 m; D, 350-390 m; E*, 385-420 m; F*, 420-465 m; G*, 465-500 m; H*, 514-550 m. An asterisk (*) indicates that external shunt condensers, in addition to the Tempa pre-sets, are supplied. These can be fitted above the Tempa pre-sets, and wired to their tags, if desired.