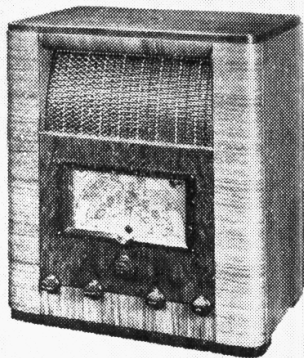


'TRADER' SERVICE SHEET

318

H.M.V. 469

AND 479 RADIOGRAM



TWO short-wave ranges of 11-35 m (referred to below as SW1) and 35-100 m (SW2) are covered by the H.M.V. 469 7-valve (plus rectifier) AC 4-band superhet, which is suitable for mains of 195-255 V, 50-100 C/S.

An almost identical chassis is fitted in the 479 radiogram, which, however, is for mains of 195-255 V, 50-60 C/S. This *Service Sheet* was prepared on a 469.

CIRCUIT DESCRIPTION

Aerial input via coupling coils **L1** (SW2) and **L3** (MW and LW) to single-tuned circuits **L4**, **C52** (SW1), **L5**, **C52** (SW2), **L6**, **C52** (MW) and **L7**, **C52** (LW). Provision for connection of H.M.V. anti-static aerial via sockets **TL** to impedance matching tapings on tuning coils, and chassis. First valve (**V1**, Marconi **W63**) is a variable-mu pentode operating as RF amplifier.

Tuned-anode coupling by **L8**, **C56** (SW1), **L9**, **C56**

L14 (SW2), **L15** (MW) and **L16** (LW), tuned by **C63**; parallel trimming by **C57** (SW1), **C18**, **C58** (SW2), **C19**, **C59** (MW) and **C20**, **C60** (LW); series tracking by **C21** (SW1), **C22** (SW2), **C23**, **C61** (MW) and **C24**, **C62** (LW). Anode is coupled via **C15**, **C16**, **C17** (except on SW1) and chassis to one end of each coil. Oscillator output at **V3** cathode is coupled via **C14**, **R7** to injector grid of **V2**.

Fourth valve (**V4**, Marconi **W63**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C64**, **L17**, **L18**, **L19**, **L20**, **C65** and **C66**, **L21**, **L22**, **L23**, **C67**. Normally, the frequency response of these couplings is broad for purposes of high fidelity, but when switches **S46**, **S48** are closed, the coils **L18**, **L22**, interposed between primary and secondary coils of first and second IF transformers respectively, are short-circuited, and the resulting eddy currents introduce losses which reduce the effective coupling, thus increasing the selectivity. The balance coil **L20** in the first IF transformer is included to preserve a good band-pass effect in the high fidelity position.

Intermediate frequency 465 KC S.

Diode second detector is part of separate double diode valve (**V5**, Marconi metallised **D65**), a separate cathode being used for each anode. Audio-frequency component in rectified output is developed across load resistance **R20** and passed via IF filter **C32**, volume control **R26**, to CG of AF amplifier (**V6**, Marconi **Z63** or **KTZ63**), an RF pentode with suppressor and anode strapped to operate as a triode. Provision for gramophone PU across **R26** via **S45**.

Second diode of **V5**, fed from tapping on **L28**, via **C35**, provides DC potentials, which are developed across load resistances **R23**, **R24** and fed back through decoupling circuits as GB to RF, FC and IF valves, giving automatic volume control. Operating potential for tuning indicator (**T.I. 6G5**) is obtained from AVC line.

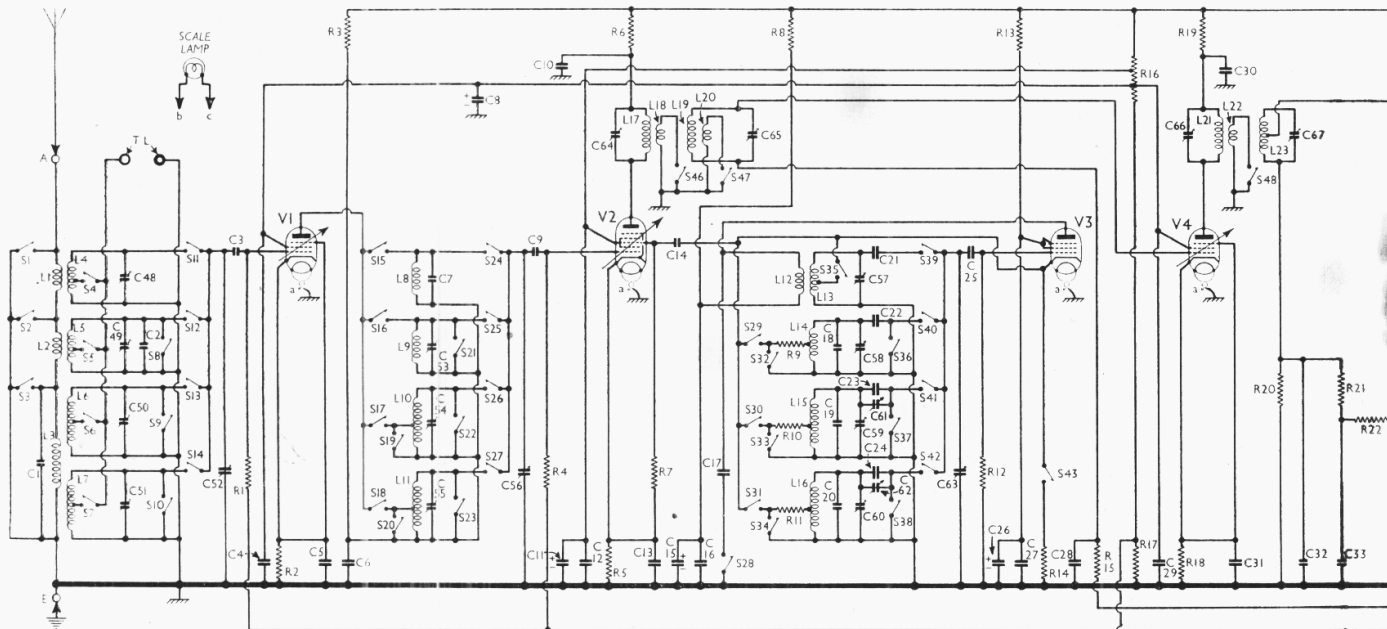
Parallel-fed transformer coupling by **R30**, **C40** and **T1** between **V6** and beam tetrode output valve (**V7**, Marconi **KT66**). Fixed tone correction by **C42**, **R33** between CG and anode. Variable tone control by "Brilliance" attenuator circuit **C43**, **R34** across

secondary of **T1** and "Bass" attenuator network **R31**, **R32**, **C41** in **T1** primary lead to chassis. Provision for external speaker across secondary of **T2**.

HT current is supplied by full-wave rectifying valve (**V8**, Marconi **U50**). Smoothing by speaker field **L26**, iron-cored choke **L27** and wet electrolytic condensers **C45**, **C46**, **C47**.

COMPONENTS AND VALUES

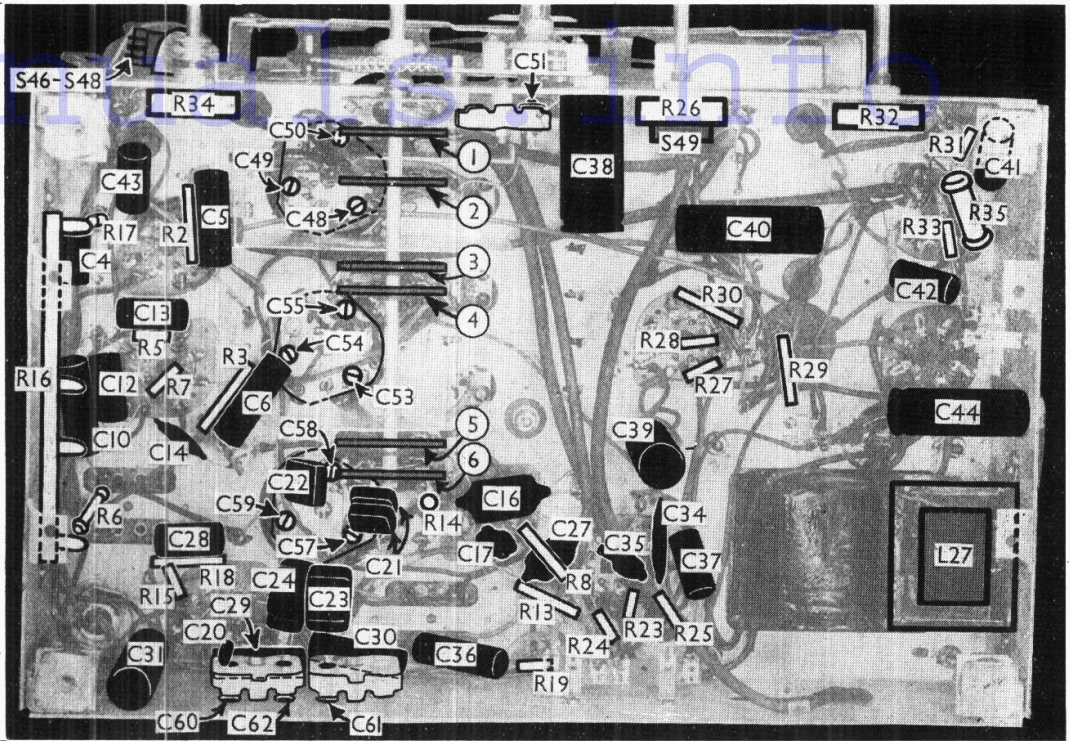
RESISTANCES		Values (ohms)
R1	V1 CG resistance	500,000
R2	V1 fixed GB resistance	150
R3	V1 anode HT feed	5,000
R4	V2 CG resistance	500,000
R5	V2 fixed GB resistance	350
R6	V2 anode HT feed	5,000
R7	V2 injector grid resistance	50,000
R8	V3 anode HT feed	5,000
R9	Osc. circuit SW2 stabiliser	150
R10	Osc. circuit MW stabiliser	500
R11	Osc. circuit LW stabiliser	230
R12	V3 CG resistance	50,000
R13	V3 SG HT feed	15,000
R14	V3 Gram. GB resistance	500
R15	V4 CG decoupling	1,000,000
R16	V1, V2, V4 SG's HT feed and T.I. GB potential divider	17,100*
R17	V4 fixed GB resistance	75
R18	V4 anode HT feed	500
R19	V4 anode HT feed	3,500
R20	V5 signal diode load	350,000
R21	IF stopper resistances	100,000
R22		100,000
R23	V5 AVC diode load resistances	500,000
R24		500,000
R25	AVC line and T.I. CG decoupling	500,000
R26	Manual volume control	2,000,000
R27	V6 GB and AVC delay voltage resistances	1,500
R28		500
R29	V6 anode decoupling	23,000
R30	V6 anode load resistance	50,000
R31	Part "Bass" attenuator circuit	10,000



(SW2), **L10**, **C56** (MW) and **L11**, **C56** (LW) between **V1** and frequency changer (**V2**, Marconi **X64**), a heptode operating with grid injection in conjunction with separate oscillator valve (**V3**, Marconi **Z63** or **KTZ63**), an RF pentode with suppressor and screen grids strapped to operate as a tetrode. A Hartley type oscillator circuit is used, comprising coils **L13** (SW1), with additional feed-back by anode coil **L12**,

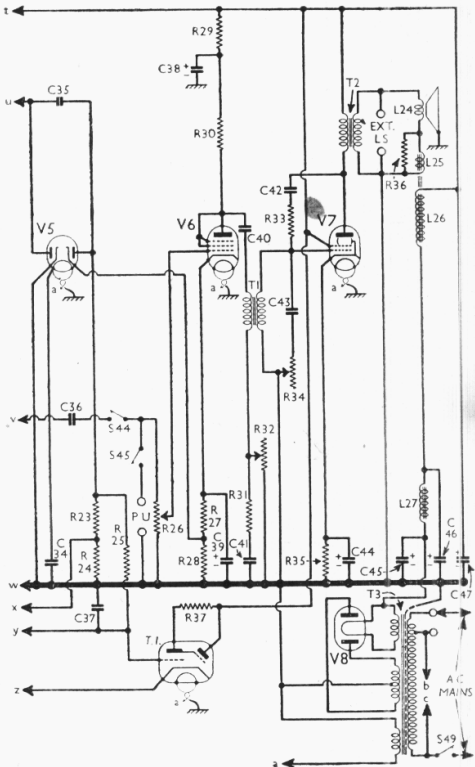
Circuit diagram of the H.M.V. 469, divided between **V4** and **V5**, and continued on the facing page. Note in particular the IF transformer arrangements, and the two tone controls **R32** and **R34**, the latter being ganged with **S46-S48**.

Under-chassis view. Note the six switch units, shown in detail on page v. R16 is a tapped metal-clad resistor. C21 consists of two condensers in parallel in our chassis, but may be a single unit in some cases. Note the trimmers for the tubular coil units, indicated by slotted screw-heads.



RESISTANCES (Continued)	Values (ohms)
R32	" Bass " control .. 2,000,000
R33	Part of fixed tone corrector .. 5,000,000
R34	" Brilliance " control .. 1,000,000
R35	V7 GB resistance .. 200
R36	Hum neut. coil shunt .. 0.4
R37	T.I. anode HT feed .. 1,000,000

* Tapped at 5,000 Ω + 3,100 Ω + 9,000 Ω from HT +.



CONDENSERS	Values (μF)
C1	MW and LW aerial shunt .. 0.00005
C2	Aerial SW2 fixed trimmer .. 0.00001
C3	V1 CG condenser .. 0.00005
C4	V1 SG RF by-pass .. 0.01
C5	V1 cathode by-pass .. 0.1
C6	V1 anode decoupling .. 0.1
C7	V1 anode circuit SW1 trimmer .. 0.000005
C8*	V1, V4 SG's decoupling .. 1.0
C9	V2 CG condenser .. 0.00005
C10	V2 anode decoupling .. 0.1
C11*	V2 SG decoupling .. 8.0
C12	V2 SG RF by-pass .. 0.01
C13	V2 cathode by-pass .. 0.01
C14	V2 injector grid coupling .. 0.00005
C15*	V3 anode decoupling .. 2.0
C16*	V3 anode RF by-pass .. 0.005
C17	V3 anode SW2, MW and LW coupling .. 0.001
C18	Osc. circ. SW2 fixed trimmer .. 0.000015
C19	Osc. circ. MW fixed trimmer .. 0.00001
C20	Osc. circ. LW fixed trimmer .. 0.000023
C21	Osc. circuit SW1 tracker .. 0.0078
C22	Osc. circuit SW2 tracker .. 0.0023
C23	Osc. circuit MW fixed tracker .. 0.00035
C24	Osc. circ. LW fixed tracker .. 0.00015
C25	V3 CG condenser .. 0.0001
C26*	V3 SG decoupling .. 2.0
C27	V3 SG RF by-pass .. 0.001
C28	V4 CG decoupling .. 0.05
C29	V4 SG RF by-pass .. 0.1
C30	V4 anode decoupling .. 0.1
C31	V4 cathode by-pass .. 0.5
C32	IF by-pass condensers .. 0.00005
C33	V5 heater RF by-pass .. 0.00005
C34	Coupling to V5 AVC diode .. 0.01
C35	AF coupling to V6 .. 0.00005
C36	AVC line and T.I. CG decoupling .. 0.1
C37	AVC line and T.I. CG decoupling .. 0.05
C38*	V6 anode decoupling .. 2.0
C39*	V6 cathode by-pass .. 25.0
C40	AF coupling to T1 .. 0.5
C41	Part " Bass " attenuator circuit .. 0.015
C42	Part of fixed tone corrector .. 0.05
C43	Part " Brilliance " attenuator .. 0.005
C44*	V7 cathode by-pass .. 25.0
C45*	HT Smoothing .. 10.0
C46*	HT Smoothing .. 16.0
C47*	HT Smoothing .. 32.0
C48†	Aerial circuit SW1 trimmer .. —
C49†	Aerial circuit SW2 trimmer .. —
C50†	Aerial circuit MW trimmer .. —
C51†	Aerial circuit LW trimmer .. —
C52†	Aerial circuit tuning .. —
C53†	V1 anode SW2 trimmer .. —

CONDENSERS (Continued)	Values (μF)
C54†	V1 anode MW trimmer .. —
C55†	V1 anode LW trimmer .. —
C56†	V1 anode circuit tuning .. —
C57†	Osc. circuit SW1 trimmer .. —
C58†	Osc. circuit SW2 trimmer .. —
C59†	Osc. circuit MW trimmer .. —
C60†	Osc. circuit LW trimmer .. —
C61†	Osc. circuit MW tracker .. —
C62†	Osc. circuit LW tracker .. —
C63†	Oscillator circuit tuning .. —
C64†	1st IF trans. pri. tuning .. —
C65†	1st IF trans. sec. tuning .. —
C66†	2nd IF trans. pri. tuning .. —
C67†	2nd IF trans. sec. tuning .. —

* Electrolytic. † Variable. ‡ Pre-set.
§ Two 0.0035 in parallel in our chassis.

OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial SW1 coupling coil .. 1.0
L2	Aerial SW2 coupling coil .. 8.0
L3	Aerial MW and LW coupling .. 40.0
L4	Aerial SW1 tuning coil .. 0.1
L5	Aerial SW2 tuning coil .. 0.2
L6	Aerial MW tuning coil .. 6.0
L7	Aerial LW tuning coil .. 19.0
L8	V1 anode SW1 tuning coil .. 0.1
L9	V1 anode SW2 tuning coil .. 0.2
L10	V1 anode MW tuning coil .. 6.0
L11	V1 anode LW tuning coil .. 19.0
L12	Osc. circuit SW1 reaction .. 8.5
L13	Osc. circuit SW1 tuning coil .. 0.1
L14	Osc. circuit SW2 tuning coil .. 0.1
L15	Osc. circuit MW tuning coil .. 6.0
L16	Osc. circuit LW tuning coil .. 5.0
L17	1st IF trans. pri. coil .. 6.7
L18	1st IF trans. selectivity coil .. 4.0
L19	1st IF trans. sec. coil .. 6.7
L20	1st IF trans. balance coil .. 4.5
L21	2nd IF trans. pri coil .. 6.7
L22	2nd IF trans. selectivity coil .. 4.0
L23	2nd IF trans. sec. coil .. 6.7
L24	Speaker speech coil .. 5.0
L25	Hum neutralising coil .. 0.7
L26	Speaker field coil .. 400.0
L27	HT smoothing choke .. 170.0
T1	Intervalve trans. { Pri. .. 350.0 Sec. .. 2,730.0

Continued overleaf

H.M.V. 469—Continued

OTHER COMPONENTS (Continued)		Approx. Values (ohms)
T2	Output trans. (Pri. Sec. ...)	150·0 0·7
T3	Mains trans. (Pri., total)	8·8
	Heater sec. ...	0·1
	Rect. heat. sec. (HT sec., total)	180·0
S1-S43	Waveband switches ...	---
S44,45	Radio-gram change switches ...	---
S46-48	Selectivity switches, ganged R34	---
S49	Mains switch, ganged R26	---

DISMANTLING THE SET

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

Removing Chassis.—If it should be necessary to remove the chassis from the cabinet, remove the small tuning knob (recessed grub screw), the large tuning knob (pull off) and the other four knobs (recessed self-tapping screws). Now remove the four bolts (with washers and spring washers) holding the chassis to the bottom of the cabinet, free the speaker leads from the cleat holding them to the sub-baffle and free the mains lead from the cleat holding it to the bottom of the cabinet (round-head wood screw).

The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, unsolder the speaker leads and when replacing, connect them as follows, noting that the tags on the terminal panel are numbered: 7, red; 6, red/black; 5, yellow/black; 3, black; 1, yellow. The black rubber-covered lead goes to the tag on one of the screws holding the electrolytic condenser bracket to the speaker.

Removing Speaker.—If it is desired to remove the speaker, unsolder the leads and remove the four bolts (with lock washers) holding it to the sub-baffle. When replacing, connect the leads from the chassis as above and take the yellow lead from the extension speaker terminal panel to tag 1 and the black lead to the earthing tag on the speaker.

VALVE ANALYSIS

Valve voltages and currents given in table (col. 2) are those measured in our receiver when it was operated on mains of 228 V, using the 224-255 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.

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

If V4 should become unstable when its screen current is being measured, as in our case, it can be stabilised by connecting a non-inductive condenser of about 0·1 μ F from grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 W63	192	7·0	88	1·9
V2 X64	207	3·4	127	6·3
V3 Z63	192	6·6	187	1·7
V4 W63	197	4·5	88	1·2
V5 D63	---	---	---	---
V6 Z63*	93	1·3	93	0·3
V7 KT66	215	61·0	225	4·3
V8 U50	340†	---	---	---
T.I. 6G5	15	0·2	---	---
	225	2·7	---	---

* Used as a triode. G3 93 V, 0·2 mA.

† Each anode, AC.

GENERAL NOTES

Switches.—S1-S43 are the waveband switches, and S44, S45 the radio-gram, switches, ganged together in six rotary units beneath the chassis, which are indicated in our under-chassis view. The units are shown in detail in the diagrams on page v. The table (page v) gives the switch positions for the five control settings, starting from fully anti-clockwise. A dash indicates open, and C, closed.

S46-S48 are the QMB selectivity switches, ganged with the "brilliance" control, R34. The individual switches are indicated in our plan chassis view. In the fully anti-clockwise position of R34, S46 and S48 are open, and S47 closed. On turning R34 clockwise, the QMB unit operates, and S46, S48 are closed, and S47 open.

S49 is the QMB mains switch, ganged with the volume control R26.

Coils.—These are all contained in five screened units on the chassis deck. The RF and oscillator coils are in the three tubular cans, and the IF transformers in the rectangular cans. The latter have their trimmers at the tops of the cans, but the trimmers of the tubular units are reached from beneath the chassis. Note that in most cases the coil units contain a number

of additional components. The choke L27 is beneath the chassis.

Scale Lamp.—This is a special Osram tubular lamp, rated at 230 V, 15 W. It is fitted with a double contact small bayonet cap, and fits into a suitable holder mounted horizontally. The lamp is connected permanently to the 195-223 V tapping on T3 primary.

External Speaker.—Two sockets are provided on a bracket at the top right hand corner of the back of the cabinet for a low impedance (5 O) external speaker. See also under "Chassis Divergencies."

Condensers C45-C47.—These are three tubular wet electrolytics, mounted on a bracket secured to speaker magnet. In each case the can is negative, and makes contact with the bracket and hence, via the speaker frame, to chassis. The positive connections are red leads to tags on the speaker terminal plate, as follows: C45 (16 μ F), to tag 5; C46 (16 μ F), to tag 6; C47 (32 μ F), to tag 7.

Condensers C8, C11, C15, C26.—These are four dry electrolytics in a single metal tubular can on the chassis deck, the can forming the common negative connection. The green lead is the positive of C8 (1 μ F), the red lead is the positive of C11 (8 μ F), the yellow lead to C16 is the positive of C15 (2 μ F) and the other yellow lead, to C27, the positive of C26 (2 μ F).

Condenser C21.—This consists of two 0·0035 μ F types in parallel in our chassis. In some models there may be a single 0·007 μ F condenser.

Resistance R26.—This 0·4 O resistance consists of a short length of resistance wire, covered with insulating sleeving and connected between tags 3 and 4 on the speaker connection panel.

Resistance R16.—This is a metal-clad wire-wound resistor, with a total resistance of 17,100 O. It is tapped at two intermediate points (see resistance table).

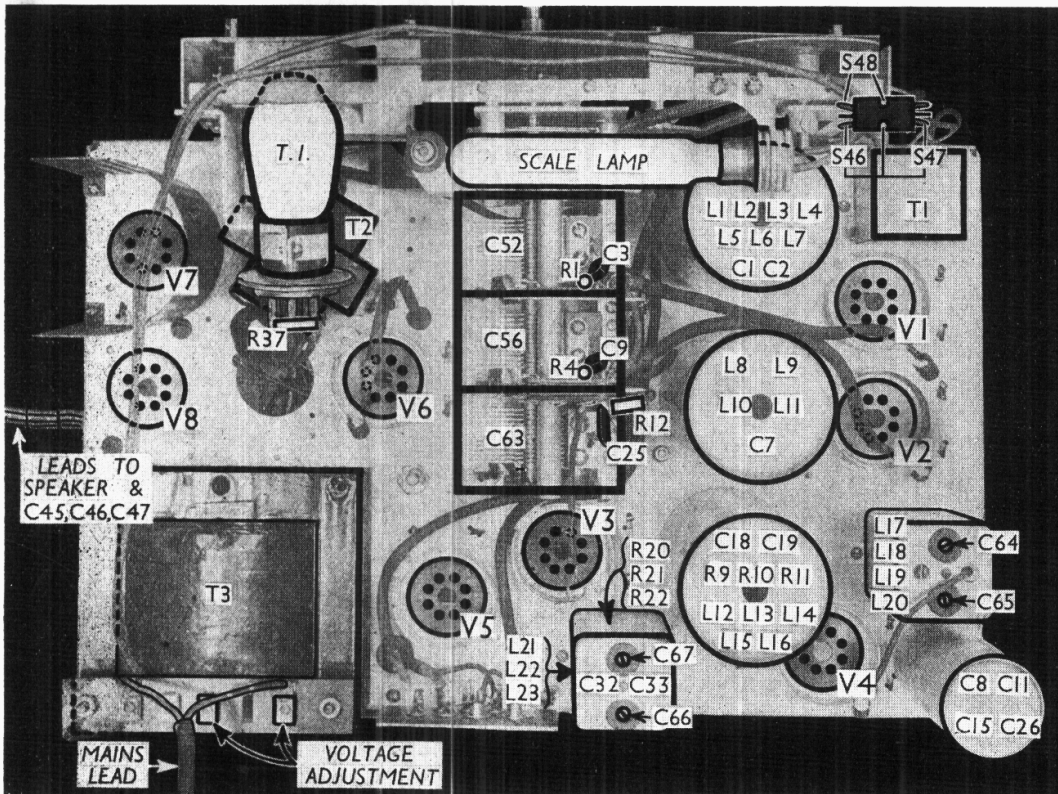
A, E Arrangements.—When using an ordinary aerial-earth system, use the sockets A and E. If the H.M.V. anti-static aerial is used, the transmission line should be connected direct to the TL sockets by means of the non-reversible plug supplied with the aerial system. In this case, the A and E sockets must be bridged by the second special plug supplied with the aerial.

CHASSIS DIVERGENCIES

In some table models (and in the radiogram model 479) a more elaborate external speaker arrangement is used, including a switch at the rear of the cabinet for internal or external speakers, or both. Across the external speaker sockets is connected a 50 O resistor for safety purposes.

The external speaker panel has three sockets into which is plugged a connector from the rotary switch. The three sockets are wired as follows: the first to one

Continued on page v



Plan view of the chassis. Note that some of the coil units contain several additional components. The trimmers for the RF and oscillator units are beneath the chassis. S46-S48 are ganged with R34, seen in the under-chassis view.