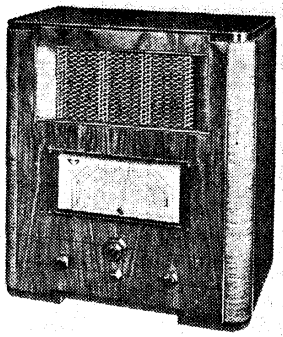
'TRADER' SERVICE SHEET

356

MARCONIPHONE 571, 572 AND 573



The Marconiphone 571

A SHORT-WAVE range of 16.8-52 m is covered by the Marconiphone 571 5-valve (plus rectifier) AC/DC 3-band superhet. It is suitable for mains of 105-255 V (40-100 C/S in the case of AC) and includes a cathode-ray tuning indicator.

A similar chassis is fitted in the 572 radiogram and 573 radiogram with record changer, but these are for 40-60 C/S in the case of AC supplies, owing to the limitation imposed by the motor. The differences are given under "572 and 573 Modifications."

This *Service Sheet* was prepared on a 571 table model.

CIRCUIT DESCRIPTION

The aerial socket is connected via series condenser **C1**, which reduces the aerial loading and isolates the aerial from the mains, directly to aerial tuning circuit comprising tuning coils **L1** (SW), plus **L2** (MW), plus **L3** (LW) and tuning condenser **C41** which precedes first valve (**V1, Marconi KTW63 or W63**), a variable-mu RF tetrode or pentode operating as signal frequency amplifier.

One side of the split earth socket **E** is connected via isolating condenser **C3** to chassis, the other side being connected to **L19**, speaker grille and frame and other exposed metal parts including the metal casing (via pin **4** of the interconnecting plug) of the mains resistance unit. The two halves of **E** are connected only when the earth connecting plug is inserted.

Tuned-anode coupling by **L4** (SW), plus **L5** (MW), plus **L6** (LW), tuned by **C44** between **V1** and heptode valve (**V2, Marconi X63**) operating as frequency changer with electron coupling. Oscillator grid coils **L8** (SW), plus **L9** (MW), plus **L10** (LW) are tuned by **C45**; parallel trimming by **C46** (SW), **C47** (MW) and **C9, C49** (LW); series tracking by **C10** (SW), **C11, C48** (MW) and **C50** (LW). Reaction by coils **L11** (SW), **L12** (MW) and **L13** (LW).

Third valve (**V3, Marconi KTW63 or W63**) is a variable-mu RF tetrode or pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C51, L14, L15, R4, C52** and **C53, L16, L17, C54**.

Intermediate frequency 465 KC/S.

Diode second detector is part of double-diode triode valve (**V4, Marconi DH63**). Audio frequency component in rectified output is developed across load resistance **R11** and passed via IF stopper **R9**, AF coupling condenser **C21** and **S10** (on MW and LW) or **C21, C23, S11** (on SW) and manual volume control **R10** to CG of triode section, which operates as AF amplifier. IF filtering by **C27** in anode circuit, and **R9, C22**.

Second diode of **V4**, fed from **V3** anode via **C20**, provides DC potentials which are developed across load resistances **R14, R15, R16, R17** and fed back through decoupling circuits as GB to RF, FC and IF valves, giving automatic volume control. Delay voltage is obtained mainly from potential divider comprising resistances **R18, R19** which are connected in series between **V1, V3's** HT feed line and chassis, this HT line in turn being fed from another potential divider comprising resistances **R20, R21, R22, R23.**

The balance of the delay voltage is obtained from the drop automatically developed across **R28** in negative HT lead to chassis, this additional voltage also providing fixed GB for **V1, V2** and **V3.**

Control grid potentials for cathode-ray tuning indicator (**T.I. Marconi Y63** or **T164**) are obtained from **V1, V2** AVC line.

Resistance-capacity coupling by **R13, C28, R24**, via grid stopper **R25**, between **V4** triode and beam tetrode output valve (**V5, Marconi KT32**). Variable condenser **C55** coupling anode and grid circuits provides variable tone control, while **C31** in anode circuit provides fixed tone correction. Provision for connection of low impedance external speaker across secondary of output transformer **T1.**

When the receiver is used with AC mains, HT current is supplied by IHC half-wave rectifying valve (**V6, Marconi U31**). Smoothing is effected by two iron-cored chokes **L18, L20** and dry electrolytic condensers **C29, C32, C33.**

Valve heaters are connected in series, together with scale lamps and voltage adjustment resistance **R29**, across mains input. Filter comprising chokes **L21, L22** and condensers **C36, C37,** and **C35** in rectifier anode circuit, suppress mains-borne interference, while fuses **F1, F2** guard against accidental short-circuits.

Special provision has been made in the design of the receiver to render it operative over a voltage range of 105 to 255 V on AC or DC mains, and the voltage adjustment arrangements are more elaborate than usual. In addition to the usual heater circuit ballast adjustment, provision is made for simultaneously adjusting the voltage applied to **V6** anode so that it coincides with mains voltage up to the 162-180 V tapping, after which it rises no further. At the same time provision is made for adjusting the point at which HT is applied to the potential divider **R20, R21, R22, R23,** so that for mains voltages between 144 V and 255 V, **R20** is connected to **L18** as shown in our diagram, but for voltages between 105 V and 143 V the junction of **R21, R22** is connected to **L18.**

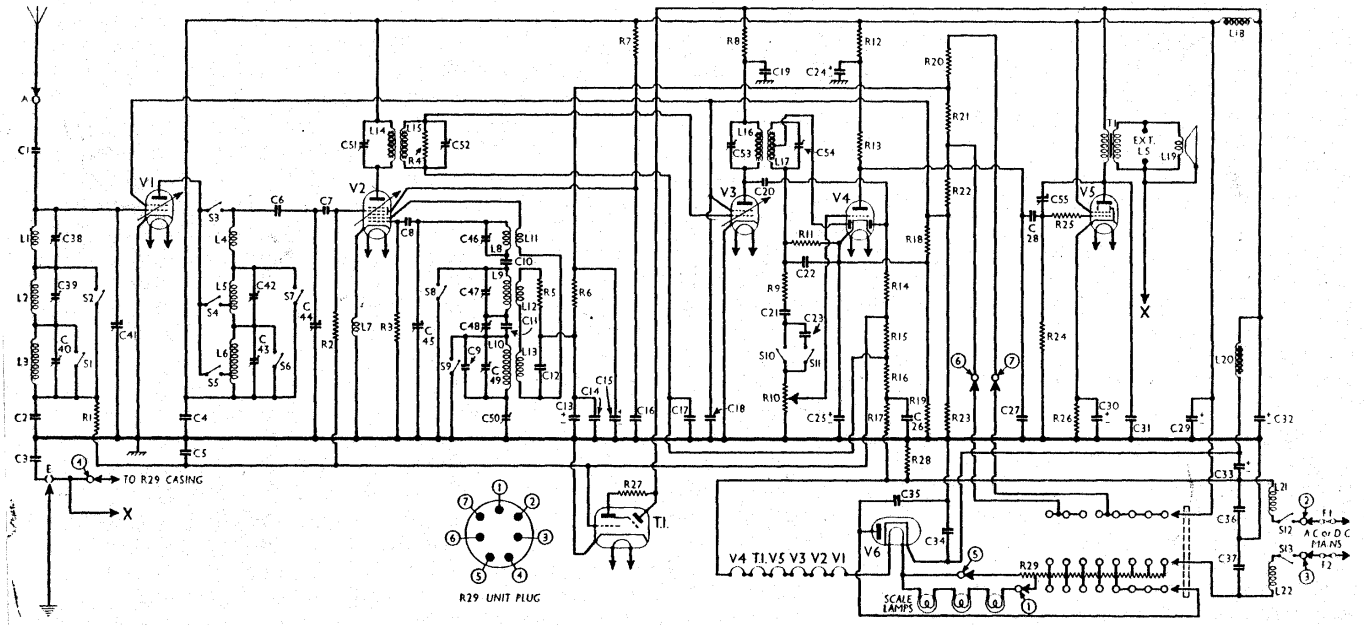
In operation, these adjustments are automatically effected by the three-pin voltage adjustment plug.

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 is necessary to remove the chassis from the cabinet, remove the small tuning and tone control knobs (recessed grub screws covered with wax), the large tuning knob (pull off) and the other two knobs (recessed self-tapping screws covered with wax).

Then free the speaker leads from the cleat on the



Circuit diagram of the Marconiphone 571 AC/DC superhet. The differences in the radiograms 572 and 573 are given on page VIII. Note the unusual mains voltage adjustment arrangements.

sub-baffle, unplug the lead from the mains resistance to the socket on the chassis, withdraw the mains voltage adjustment plug and remove the earthing tag on the rear member of the chassis (round-head self-tapping screw).

Next remove the four bolts (with washers and spring washers) holding the chassis to the bottom of the cabinet, when the chassis can be withdrawn to the extent of the leads, which is sufficient for normal purposes. *When replacing*, cover the heads of the screws in the control knobs with wax, and if the valves have been removed, note that the top cap screen goes on **V4**.

If it is desired to operate the chassis outside the cabinet, the mains resistance must be removed from the brackets holding it to the side of the cabinet (four round-head screws with lock washers) and connected up to the chassis. *When replacing*, do not forget to secure the tag for the earthing lead to the speaker grille to one of the bottom fixing screws.

To free the chassis entirely, unsolder the speaker leads and *when replacing*, connect the black lead to the right-hand tag.

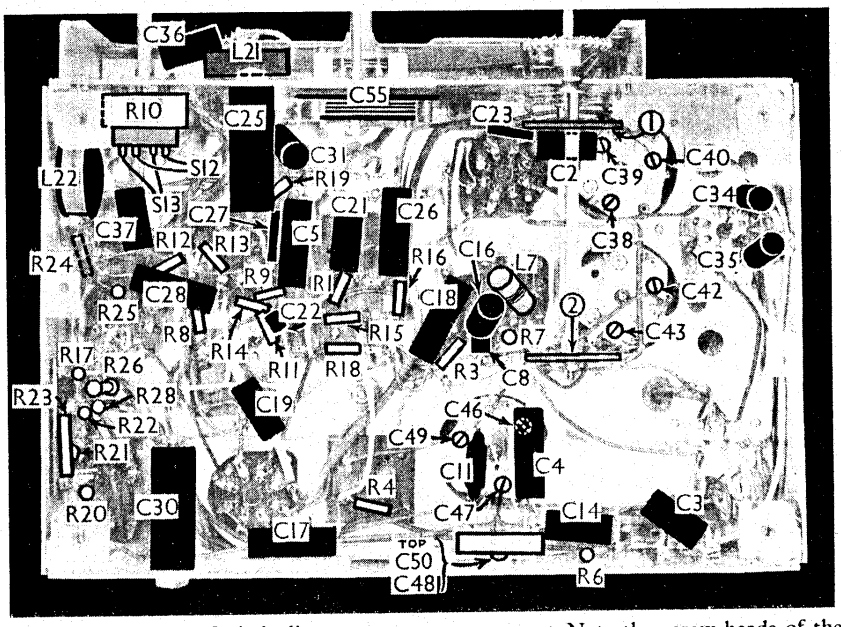
Removing Speaker.—To remove the speaker from the cabinet, unsolder the leads and remove the four screws (with washers) holding it to the sub-baffle. *When replacing*, see that the terminal panel is at the bottom, do not forget to replace the earthing tag on the bottom right-hand fixing screw, and take the black lead from the chassis to the right-hand tag.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 CG decoupling	75,000
R2	V2 tetrode CG resistance	500,000
R3	V2 osc. CG resistance	50,000
R4	1st IF trans. sec. shunt	750,000
R5	Oscillator reaction stabiliser	100
R6	V2 osc. anode HT feed	1,000
R7	V2 SG HT feed	35,000
R8	V3 anode HT feed	5,000
R9	IF stopper	100,000
R10	Manual volume control	2,000,000
R11	V4 signal diode load	500,000
R12	V4 triode anode decoupling	35,000
R13	V4 triode anode load	75,000
R14	V4 AVC diode load resistances	750,000
R15		750,000
R16		230,000
R17		500,000
R18	V4 triode GB and AVC delay potential divider	100,000
R19		1,000
R20	V1, V3 SG HT feed; V4 cathode pot. feed; V2 osc. anode HT feed potential divider resistances	1,500
R21		1,500
R22		3,500
R23		15,000
R24	V5 CG resistance	350,000
R25	V5 grid stopper	50,000
R26	V5 GB resistance	100
R27	T.I. anode HT feed	500,000
R28	V1, V2, V3 fixed GB resistance	23
R29	Voltage adjustment resistance, total	458·5*

* 61 Ω + 54 Ω + 61 Ω + 62 Ω + 40 Ω + 55 Ω + 37 Ω + 17·5 Ω + 68 Ω, starting from free end.

	CONDENSERS	Values (μF)
C1	Aerial series condenser	0·00010·375
C2	V1 CG decoupling	0·05
C3	Earth isolating condenser	0·005
C4	V1, V2, V4 HT line RF by-pass	0·1
C5	AVC line decoupling	0·1
C6	HT blocking condenser	0·1
C7	V2 tetrode CG condenser	0·000035
C8	V2 osc. CG condenser	0·00005
C9	Osc. circuit LW fixed trimmer	0·000015
C10	Osc. circuit SW tracker	0·0035
C11	Osc. circuit MW fixed tracker	0·00035
C12	Osc. SW reaction coupling	0·0001
C13*	V2 osc. anode decoupling	4·0
C14	V2 osc. anode RF by-pass	0·005
C15*	V2 osc. anode decoupling	4·0
C16	V2 SG decoupling	0·05
C17	V3 CG decoupling	0·1
C18	V1, V3 SG's decoupling	0·1
C19	V3 anode decoupling	0·05
C20	Coupling to V4 AVC diode	0·000075
C21	MW and LW AF coupling to V4 triode	0·005
C22	HF by-pass	0·0001
C23	SW AF coupling to V4 triode	0·001
C24*	V4 triode anode decoupling	1·0
C25*	V4 cathode by-pass	50·0
C26	V4 AVC diode RF by-pass	0·1
C27	HF by-pass	0·0005
C28	V4 triode to V5 AF coupling	0·035
C29*	Part HT smoothing	8·0
C30*	V5 cathode by-pass	50·0
C31	Fixed tone corrector	0·0023



Under-chassis view. Switch diagrams are on page VIII. Note the screw heads of the various trimmers.

	CONDENSERS (*Continued*)	Values (μF)
C32*	Parts HT smoothing	32·0
C33*		16·0
C34	V6 cathode RF by-pass	0·05
C35	V6 anode RF by-pass	0·05
C36	Mains RF filter condensers	0·01
C37		0·01
C38‡	Aerial circuit SW trimmer	—
C39‡	Aerial circuit MW trimmer	—
C40‡	Aerial circuit LW trimmer	—
C41†	Aerial circuit tuning	—
C42‡	V1 anode MW trimmer	—
C43‡	V1 anode LW trimmer	—
C44†	V1 anode circuit tuning	—
C45†	Oscillator circuit tuning	—
C46‡	Osc. circuit SW trimmer	—
C47‡	Osc. circuit MW trimmer	—
C48‡	Osc. circuit MW tracker	—
C49‡	Osc. circuit LW trimmer	—
C50‡	Osc. circuit LW tracker	—
C51‡	1st IF trans. pri. tuning	—
C52‡	1st IF trans. sec. tuning	—
C53‡	2nd IF trans. pri. tuning	—
C54‡	2nd IF trans. sec. tuning	—
C55†	Variable tone control	0·0005

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial SW tuning coil	0·1
L2	Aerial MW tuning coil	6·0
L3	Aerial LW tuning coil	14·0
L4	V1 anode SW tuning coil	0·1
L5	V1 anode MW tuning coil	5·5
L6	V1 anode LW tuning coil	14·0
L7	V2 cathode frequency stabiliser	0·1
L8	Osc. circuit SW tuning coil	0·1
L9	Osc. circuit MW tuning coil	5·5
L10	Osc. circuit LW tuning coil	4·2
L11	Osc. SW reaction coil	1·0
L12	Osc. MW reaction coil	2·0
L13	Osc. LW reaction coil	3·0
L14	1st IF trans. Pri.	6·3
L15	Sec.	6·3
L16	2nd IF trans. Pri.	6·3
L17	Sec.	6·3
L18	Part HT smoothing	550·0
L19	Speaker speech coil	1·0
L20	Part HT smoothing	65·0
L21	Mains RF filter chokes	3·0
L22		3·0
T1	Output trans. Pri.	180·0
	Sec.	0·9
S1-S11	Waveband switches	—
S12,13	Mains switches, ganged R10	—
F1,F2	Mains circuit fuses	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on AC mains of 228 V, using the 210-230 V tapping on the mains resistance. 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, as in our case, **V2** should become unstable when its anode current is being measured and **V3** when its screen current is being measured, they can be stabilised by connecting a non-inductive condenser of about 0·1 μF from grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 KTW63	117	3·9	65	1·0
V2 X63	117	1·5	52	1·9
	Oscillator			
	95	2·3		
V3 KTW63	105	4·4	65	1·2
V4 DH63	60	0·4	—	—
V5 KT32	119	54·0	117	4·0
V6 U31	†	—	—	—
T.I. Y64	22	0·2	—	—
	Target			
	130	0·3		

† Cathode to chassis. 138 V, DC

GENERAL NOTES

In examining the table receiver chassis, it will be found that the wiring for a gramophone pick-up and for its switching is carried out, but no pick-up sockets are fitted. The leads which would connect to them are actually connected to chassis and to a blank (bearer) socket on **V3** valve-holder. Although the gramophone switches are included in the switch units, and are wired up, they are not used, a stop being fitted to limit the travel of the switches to the three radio wavebands. Hence the extra switches and wiring are not shown in our diagrams.

Switches.—**S1-S11** 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 page VIII. The table (page VIII) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and **C**, closed.

As explained above, certain tags, which would form radio-gram switches, are wired up, but they are not included in the diagrams, the tags being marked bearer (Be).

Continued overleaf

MARCONIPHONE 571—*Continued*

S12, S13 are the QMB mains switches, ganged with the volume control **R10.**

Coils.—**L1-L3**; **L4-L6**; **L8-L13**, and the IF transformers **L14, L15** and **L16, L17** are in five screened units on the chassis deck. Most of these contain additional components as indicated in our plan chassis view. **L7** is a small coil on a tubular former beneath the chassis.

Scale Lamps.—These are three Bulgin MES types, rated at 8 V, 0·15 A. They are connected in series in the heater circuit, and are shunted by a portion of **R29.**

Fuses F1, F2.—These are two 1¼ in. glass tubular types, mounted in clips on the mains input resistance. They are rated at 1·25 A each.

External Speaker.—Two tags are provided on the internal speaker connection panel for a low impedance (5 O) external speaker.

Condensers C13, C15, C24, C29, C32, C33.—These are six dry electrolytics in a single metal-cased unit on the chassis deck. The case is isolated. The red lead is the positive of **C33** (16 μF) and the black lead is its negative. The brown lead is the common negative of all the other condensers. Their positive leads are: yellow, **C32** (32 μF); green, **C29** (8 μF); blue to junction of **R6** and **C14, C13** (4 μF); blue to **R6, R20** and **R21. C15** (4 μF); white, **C24** (1 μF).

Voltage Adjustment.—A special and rather elaborate form of mains voltage adjustment is provided to enable the set to work efficiently on voltages as low as 105 V. The arrangement is given in detail at the end of "Circuit Description."

The mains adjustment resistance **R29** has a number of tappings, and is enclosed in a metal case, fixed inside the cabinet. It is not shown in our chassis illustrations.

From this unit emerges a standard 7-pin plug, which fits into a socket on the chassis deck. The sockets are numbered in our plan chassis view, and the pins and sockets are shown by arrows and numbers in circles in the circuit diagram.

Voltage adjustment is carried out by a special 3-pin plug on a 3-way lead emerging from the chassis. These fit into corresponding sockets on the voltage adjustment unit, there being three sockets for each voltage tapping.

Holding the plug so that the two pins close together are on the left, the left hand pin is that connected to **V6** anode, the next pin is that connected to **C37** and **L22,** and the right hand pin is that connected to **L18** and **V5** screen. These pins are shown by arrows in the diagram, but are not numbered. They are, however, lined up to be opposite the rows of sockets into which they are plugged.

It should be noted that certain connections have rather a complicated path in the receiver. For instance, the lower mains input connection goes to one fuse on the resistance unit, then, via pin 3 on the 7-pin plug, into the chassis, through **S13** and **L22,** then out to the 3-pin plug, through part of **R29,** then into the chassis again via pins 1 and 5 on the 7-pin plug.

Model 571 on 25 C/S.—It is possible to use the table model 571 on AC mains down to 25 C/S, but in this case it will be necessary to wire an extra 16 μF electrolytic condenser in parallel with **C33,** making a total of 32 μF in this position. The part number of the correct additional condenser is 22675F.

This addition may also be found effective in clearing up hum in 571, 572 and 573 models when they are operated on bad 40 C/S mains.

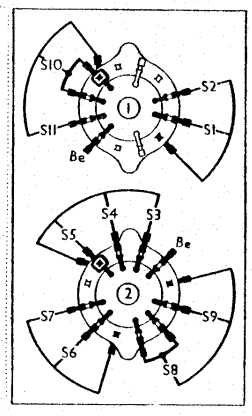
Earthing Arrangements.—The chassis (and all the screens returned to chassis) is earthed for RF via **C3.** A split earth socket is used, one side going to **C3** and the other side to socket 4 of the 7-pin connector and to the speaker frame, one side of **L19** and various exposed metal parts. Pin 4 of the connector plug goes to the casing of **R29.** When the earth plug is inserted, therefore, all these parts are directly earthed, and the chassis is earthed via **C3.**

Chassis Divergencies.—**C25** is 50 μF in our chassis, not 25 μF. In some models **L22** and **C37** may be found on the front outside edge of the chassis.

TABLE AND DIAGRAMS OF THE SWITCH UNITS

SWITCH	LW	MW	SW
S1	..	C	..
S2	..	..	C
S3	..	..	C
S4	..	C	..
S5	C	..	..
S6	..	C	..
S7	..	..	C
S8	..	..	C
S9	..	C	..
S10	C	C	..
S11	..	..	C

Switch diagrams, as seen from beneath the chassis, in the directions of the arrows in the under-chassis view. The bearer tags (Be) are wired up, but are only used in the radiogram models (see under Models 572 and 573 Modifications).



MODELS 572 AND 573 MODIFICATIONS

The radiogram models 572 and 573 have chassis similar to the 571, except that, of course, a pick-up is fitted, and there is a fourth (gram) position of the switch. The same switch units are fitted, and in fact the pick-up wiring not used in the table model is brought into use.

For the extra switches the tags marked Be (bearer) in our switch diagrams are used.

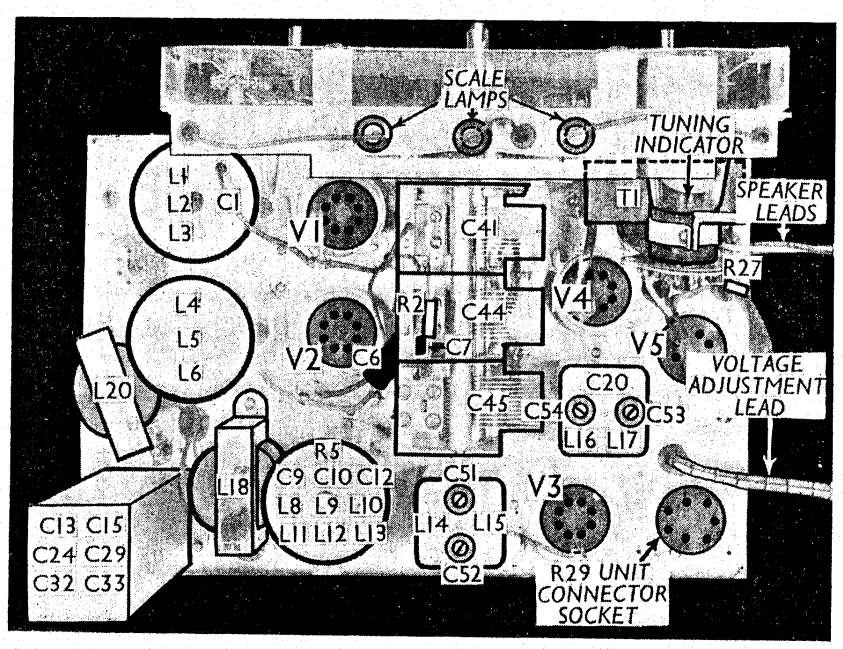
The pick-up is connected across the primary of an input transformer, which also has a 15,000 O resistance across its primary. One side of the secondary goes to chassis, and the other side to the Be tag on switch unit 1. The other side of the switch so formed goes to the top of the volume control **R10.** This switch closes on gram, and is open on all other positions.

The input transformer has a primary resistance of 172 O and a secondary of 280 O. The pick-up resistance is 850 O. The socket for earthing the pick-up screening goes to one side of the primary of the transformer, and to chassis via a 0·005 μF condenser.

The Be tag on switch unit 2 is connected to the HT line, and on gram the switch so formed closes, and connects the anode of **V1** direct to the HT line.

The external speaker arrangements differ from those of the table model, and two sockets are provided for a 5 O external speaker. Across these sockets is connected a 50 O resistance. A switch is fitted, which connects into circuit either the internal **or** external speakers separately, or both together.

The motor is a series wound commutator type, operating on 35 V input, via an adjustable voltage dropping resistance. Two extra chokes are inserted in the motor feed, for interference suppression, while there are two fixed condensers in series across the brushes, their common connection being earthed.



Plan view of the chassis. Note the leads to the 3-pin voltage adjustment plug and the socket which takes the 7-pin plug from the voltage adjustment unit.

CIRCUIT ALIGNMENT

IF Stages.—Switch set to LW, turn gang to maximum and volume control to maximum. Connect signal generator to grid (top cap) of **V2,** via a 0·1 μF condenser, leaving existing top cap connection in place, and to chassis. Feed in a 465 KC/S signal and adjust **C51, C52, C53** and **C54** in that order, for maximum output. Re-check these adjustments.

RF and Oscillator Stages.—**SW**—Connect signal generator to **A** and **E** sockets and switch set to SW. Feed in an 18 m (16·7 MC/S) signal, tune it in, and adjust **C46** and **C38** for maximum output, rocking the gang slightly for optimum results.

Feed in a 50 m (6 MC/S) signal, and tune it in. Then adjust the inductance of **L1, L4** and **L8** if necessary. A loop of wire will be found running across the coil formers and this loop must be bent up or down until maximum output is obtained. Identify the loop by first removing the coil can; then replace the can and move the loop by a strip of insulating material with a suitable nick in it. This adjustment will not normally be necessary.

Return to 18 m and re-adjust **C38** very carefully, while rocking the gang.

MW.—Switch set to MW, turn gang to 205 m mark, and feed in a 205 m (1,463 KC/S) signal. Adjust **C47** for maximum output. Feed in a 225 m (1,333 KC/S) signal, tune it in, and adjust **C39** and **C42** for maximum output. Feed in a 530 m (565 KC/S) signal, tune it in, and adjust **C48** for maximum output, rocking the gang for optimum results. Return to 205 m, and check setting of **C47.**

LW.—Switch set to LW, turn gang to minimum, and feed in a 725 m (414 KC/S) signal. Adjust **C49** for maximum output. Feed in an 850 m (353 KC/S) signal, tune it in, and adjust **C40** and **C43** for maximum output. Feed in a 1,900 m (158 KC/S) signal, tune it in, and adjust **C50** for maximum output, rocking the gang for optimum results. Check setting of **C49** at 725 m.

Finally, return to MW, and go through whole of MW and LW alignment again. Set the scale pointer to give best possible calibration compromise.

Printed in Great Britain as a supplement to *The Wireless & Electrical Trader* by Sanders Phillips & Co., Ltd., The Baynard Press, Chryssell Road, London, S.W.9