"TRADER" SERVICE SHEET
1142

PHILCO A3626

Covering A.C. 3-band Table Superhet A3626 and A.C./D.C. Model A3626U.

HOUSED in a plastic cabinet the Philco A3626 is a compact 4-valve (plus rectifier) 3-band table superhet designed to operate from 40-60 c/s A.C. mains of 105-125 V, 140-160 V, 200-225 V, and 226-250 V. The waveband ranges are 16.67-50 m, 200-520 m and 800-2,000 m.

Model A3626U is the A.C./D.C. version of model A3626, on which this *Service Sheet* was prepared. The differences between the two models are explained under "Model A3626U" in "General Notes" overleaf.

Release dates and original prices: Model A3626, September 1953, £12 6s 5d; Model A3626U, October 1953, £12 6s 5d. Purchase tax extra.

CIRCUIT DESCRIPTION

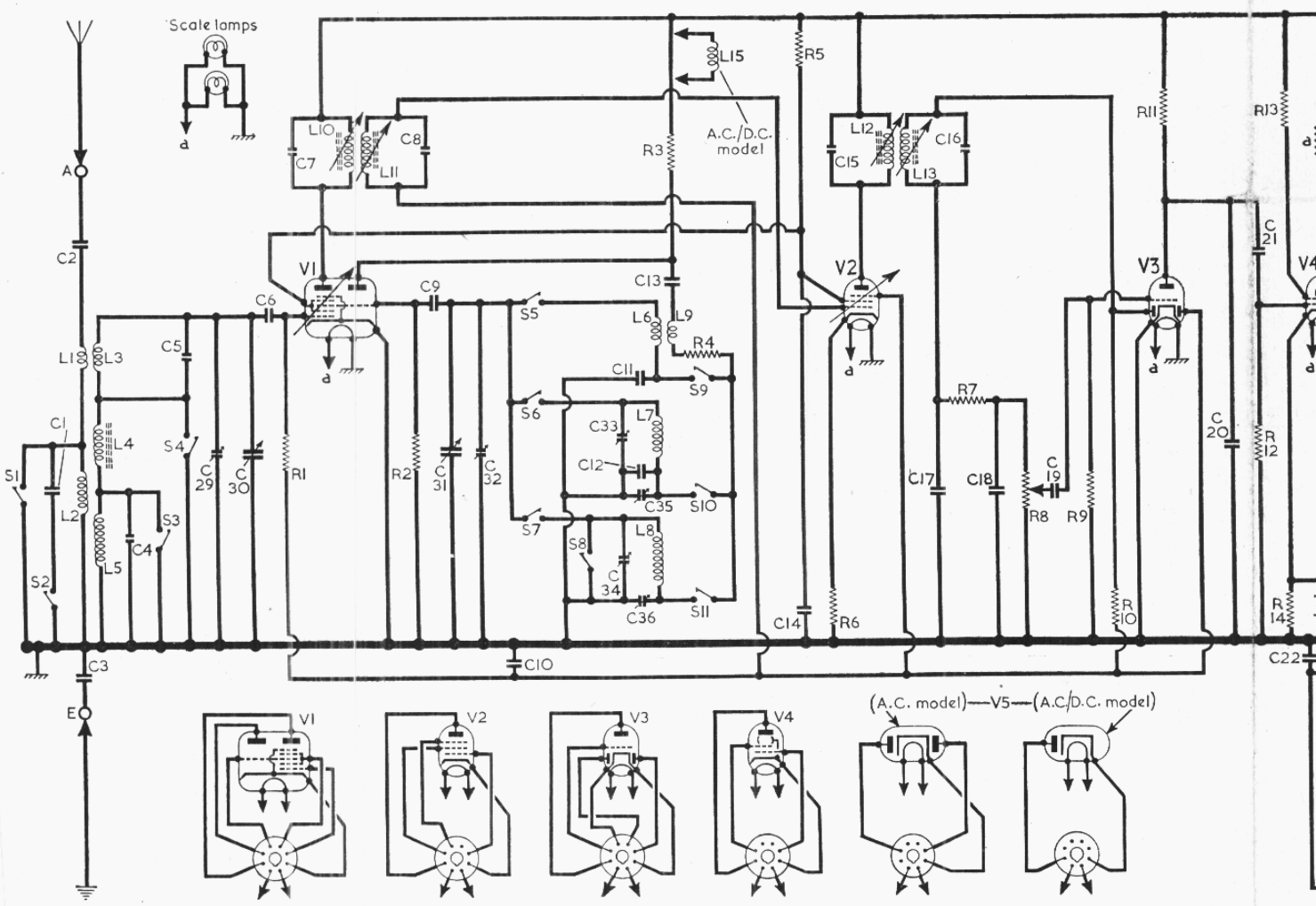
Aerial input via coupling coils **L1** (S.W.) and **L2** (M.W. and L.W.) to single tuned circuits **L3, C30** (S.W.), **L3, L4, C30** (M.W.) and **L3, L4, L5, C30** (L.W.) which precede triode hexode valve **(V1, Brimar 7S7** (A.C. model) or **14S7** (A.C./D.C. model)**)** operating as frequency changer with internal coupling. **C1** shunts **L2** on L.W. to move its resonance outside the band.

Oscillator grid coils **L6** (S.W.), **L7** (M.W.) and **L8** (L.W.) are tuned by **C31.** Parallel trimming by **C32** (S.W.), **C32, C33** (M.W.) and **C32, C34** (L.W.); series tracking by **C11** (S.W.), **C12, C35** (M.W.) and **C36** (L.W.) Reaction coupling from oscillator anode via the common impedance of the trackers, with additional coupling on S.W. by **L9.** Oscillator stabilization by **R4.** In the A.C./D.C. model, choke **L15** is added in series with **R3** to boost the oscillator output.

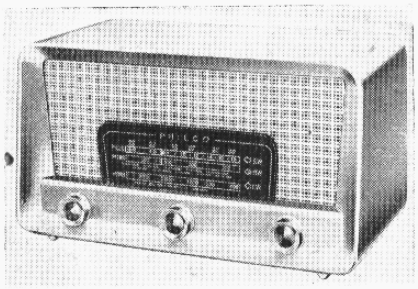
Second valve **(V2, Brimar 7B7** (A.C. and A.C./D.C. models)**)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C7, L10 L11, C8** and **C15, L12, L13, C16.**

Intermediate frequency 470 kc/s.

Diode signal detecter is part of double diode triode valve **(V3, 7B6** or **7C6** (A.C. model) or **7C6** (A.C./D.C. model)**).** Audio frequency component in rectified output is developed across volume control **R8,** which operates as diode load, and is passed via **C19** to grid of triode section. I.F. filtering by **C17, R7** and **C18.**



Circuit diagram of the Philco A.C. 3-band table superhet, model A3626. Provision is made for the connection of a low impedance external speaker acr and not to chassis, which is "live" to the mains. A separate section of circuit showing the differences in the output and mains input stages of small differences between the two models are indicated under "Model A3626U" in "General Notes" ove



Appearance of the Philco models A3626 and A3626U.

D.C. potential developed across **R7, R8** is tapped off at the signal diode anode and fed as bias via decoupling circuit **R10, C10** to **V1** and **V2** giving automatic gain control. Second diode of **V3** is connected to the A.G.C. line to prevent it from going positive.

Resistance-capacitance coupling between **V3** and pentode output valve **(V4 Brimar 7C5** (A.C. model) or **35A5** (A.C./D.C. model)**).** Further I.F. filtering by **C20.** Tone correction in anode circuit by

(*Continued in Column 6*)

COMPONENT VALUES AND LOCATIONS

	RESISTORS	Values	Locations
R1	V1 C.G.	1MΩ	G4
R2†	V1 osc. C.G. ...	33kΩ	G4
R3‡	Osc. anode feed ...	22kΩ	F4
R4§	Osc. stabilizer ...	150Ω	G3
R5¶	S.G. H.T. feed ...	39kΩ	F4
R6	V2 G.B.	680Ω	F4
R7	I.F. stopper ...	47kΩ	E4
R8	Volume control ...	500kΩ	D3
R9	V3 C.G.	10MΩ	E3
R10	A.G.C. decoupling ...	2·2MΩ	E4
R11	V3 anode load ...	470kΩ	E4
R12	V4 C.G.	470kΩ	E4
R13	V4 S.G. stopper ...	100Ω	E4
R14	V4 G.B.	270Ω	E4
R15	V5 surge limiter ...	100Ω	D4
R16	H.T. smoothing ...	150Ω	D4
R17		1kΩ	F3
R18	V4 G.B.	180Ω	—
R19	Brimistor CZ2 ...	—	—
R20	Heater ballast ...	707Ω*	—
R21	H.T. smoothing ...	150Ω	—
R22		1kΩ	—
R23	Scale lamp shunts...	50Ω	—
R24		56Ω	—

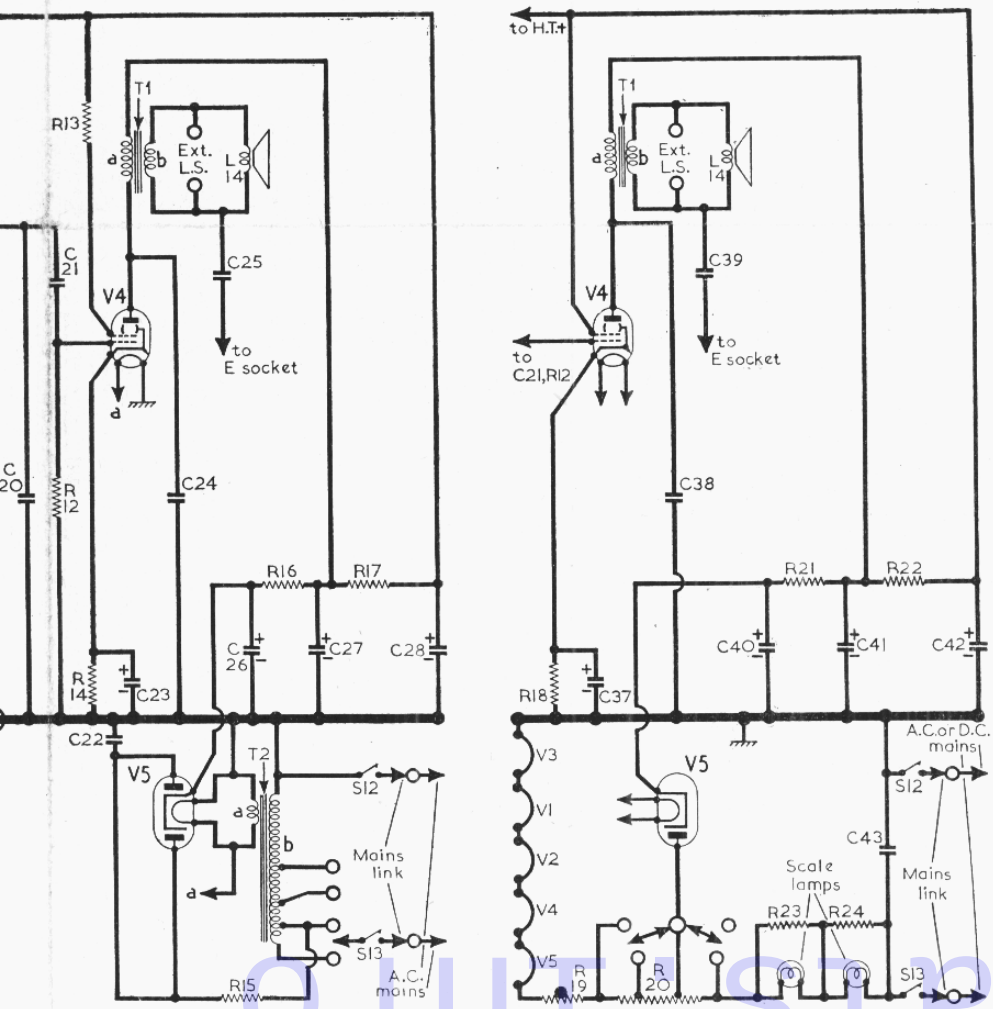
* Tapped at 325Ω + 150Ω + 232Ω from R19.

† 47kΩ
‡ 10kΩ
§ 68Ω
¶ 15kΩ
} Values in A.C./D.C. model.

	CAPACITORS	Values	Locations
C1	L.W. aerial shunt...	0·001μF	G3
C2	Aerial and earth isolators...	0·002μF	F4
C3		0·01μF	G4
C4	L.W. aerial trim. ...	5pF	B1
C5	S.W. aerial trim. ...	12pF	F3
C6	V1 C.G.	100pF	F4
C7	1st I.F. trans. tuning	75pF	A2
C8		75pF	A2
C9	V1 osc. C.G. ...	100pF	G3
C10	A.G.C. decoupling	0·05μF	F3
C11	S.W. osc. tracker ...	0·0039μF	G3
C12	M.W. osc. tracker...	450pF	G3
C13	Osc. reaction coup.	220pF	F4
C14	S.G. decoupling ...	0·05μF	F4
C15	2nd I.F. trans. tuning	75pF	B2
C16		75pF	B2
C17	I.F. by-passes ...	100pF	E4
C18		100pF	E4
C19	A.F. coupling ...	0·005μF	E3
C20	I.F. by-pass ...	220pF	E3
C21	A.F. coupling ...	0·01μF	E4
C22	Mains R.F. by-pass	0·05μF	D4
C23*	V4 cath. by-pass ...	25μF	E4
C24	Tone corrector ...	0·01μF	E4
C25	Speaker isolator ...	0·005μF	F4
C26*	H.T. smoothing ...	40μF	B1
C27*		30μF	B1
C28*		20μF	B1
C29‡	S.W. aerial trim. ...	25pF	A2
C30†	Aerial tuning ...	438pF	A1
C31†	Oscillator tuning ...	438pF	A1
C32‡	S.W. osc. trim. ...	25pF	A2
C33‡	M.W. osc. trim. ...	40pF	G3
C34‡	L.W. osc. trim. ...	40pF	G4
C35‡	M.W. osc. tracker...	70pF	G3
C36‡	L.W. osc. tracker...	120pF	G4
C37*	V4 cath. by-pass ...	25μF	—
C38	Tone corrector ...	0·02μF	—
C39	Speaker isolator ...	0·005μF	—
C40*	H.T. smoothing ...	40μF	—
C41*		30μF	—
C42*		20μF	—
C43	Mains R.F. by-pass	0·05μF	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Aerial coupling coils	2·5	F3
L2		30·0	A1
L3	Aerial tuning coils	—	F3
L4		2·0	A1
L5		35·0	A1
L6	Oscillator tuning coils	—	G4
L7		3·5	G4
L8		9·0	G4
L9	S.W. osc. reaction...	—	G4
L10	1st I.F. trans. Pri.	7·5	A2
L11	1st I.F. trans. Sec.	7·5	A2
L12	2nd I.F. trans. Pri.	7·5	B2
L13	2nd I.F. trans. Sec.	7·5	B2
L14	Speech coil ...	2·5	—
T1	O.P. trans. a ...	540·0	B1
	b ...	—	
T2	Mains trans. a ...	—	C2
	b, total	120·0	
S1-S11	Waveband switches	—	G3
S12, S13	Mains sw., g'd R8	—	D3



l speaker across **T1** secondary winding, the speaker circuit being connected via **C25** to the **E** socket, ut stages of the A.C./D.C. model A3626U appears on the right of the main circuit diagram. Other Notes" overleaf and in the table of resistors in col. 5 above.

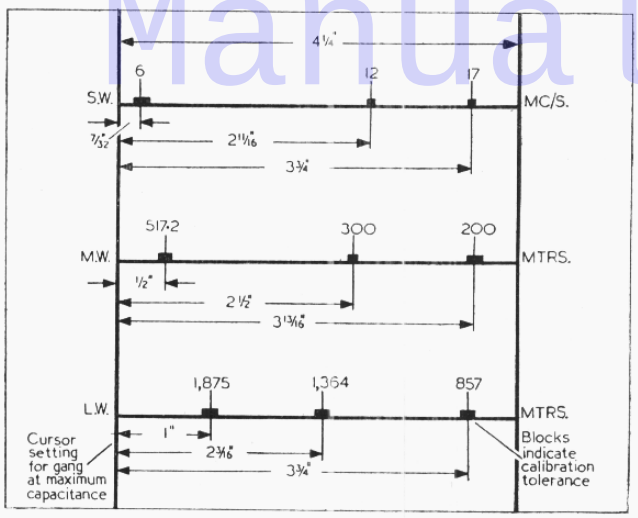
C24. Provision is made for the connection of a low-impedance external speaker across the secondary of the output transformer **T1. C25** isolates the external speaker sockets from chassis.

H.T. current in the A.C. model is supplied by full-wave I.H.C. rectifying valve **(V5, Brimar 7Y4).** The anodes of **V5** are connected together to form a half-wave rectifier and are fed, via surge limiting resistor **R15,** from the 200-225 V tapping on the primary of the mains transformer **T2.**

H.T. smoothing by **R16, R17** and electrolytic capacitors **C26, C27** and **C28.**

(*Continued Col. 1 overleaf*)

Substitute Calibration Scale for Alignment



Sketch showing the positions of the alignment calibration points on the substitute tuning scale, which should be made up and used as described under "R.F. and Oscillator Stages" in "Circuit Alignment."

The heaters of all the valves, including **V5,** are fed from winding **a** on **T2.** Mains R.F. filtering by **C22.**

H.T. current in the A.C./D.C. model is supplied by half-wave I.H.C. rectifying valve **(V5, Brimar 35Z3).** H.T. smoothing by **R21, R22** and electrolytic capacitors **C40, C41** and **C42.** Valve heaters, together with **R19 (Brimistor CZ2),** heater ballast resistor **R20** and scale lamps, are connected in series across the mains input. The scale lamps are shunted by **R23, R24** to protect them from switching surges. Mains R.F. filtering by **C43.**

GENERAL NOTES

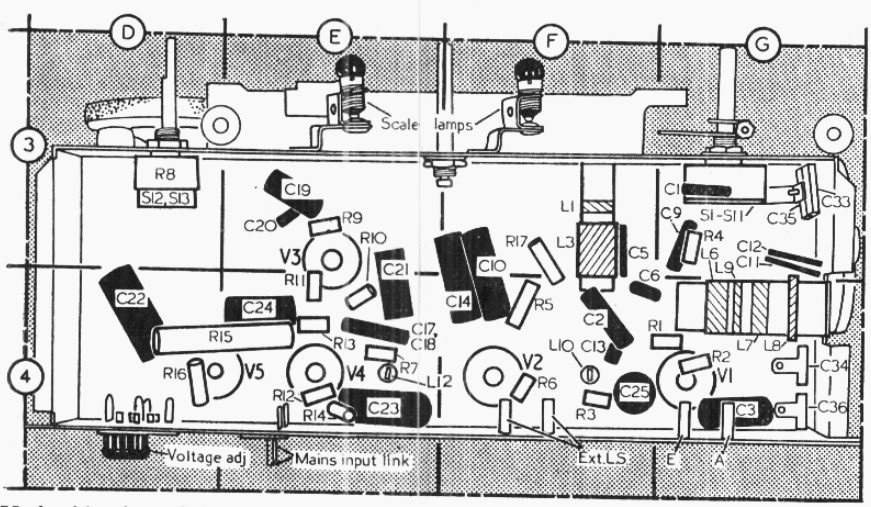
Switches.—S1-S11 are the waveband switches, ganged in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis illustration (location reference G3), and is shown in detail in the waveband switch diagram in column 3, where it is drawn as seen from the rear of an inverted chassis. The associated switch table appears in col. 3, where a dash indicates open, and **C,** closed.

S12, S13.—These are the Q.M.B. mains switches ganged with the volume control **R8.**

Drive Cord Replacement.—About 38in of nylon-braided glass yarn is required for a new drive cord, which should be run as shown in the sketch of the drive system (col. 4). The gang should be turned to minimum capacitance and the cord run anti-clockwise round the drive drum, pulling against the gang stop.

Mains Link.—As a safety precaution, a 2-pin plug and socket mains link is fitted between the receiver chassis and the cabinet back cover, and disconnects the mains input to the receiver upon the removal of the back cover.

Model A3626U.—This is the A.C./D.C. version of model A3626, on which this service sheet was produced, and differs from it mainly in the output and power supply section. A separate circuit of this section appears on the right-hand side of the main circuit diagram overleaf. The only alteration in the main circuit diagram is the addition of **L15** in the H.T. feed to **V1** triode anode, which serves to boost the oscillator output. Apart from the small differences indicated in the component tables, the remaining information applies equally to both receivers.



Underside view of the chassis. The mains input link shown in location reference E4 connects with a socket on the cabinet back cover.

Switch Table

Switches	L.W.	M.W.	S.W.
S1	—	—	C
S2	C	—	—
S3	—	C	—
S4	—	—	C
S5	—	—	C
S6	—	C	—
S7	C	—	—
S8	—	C	—
S9	—	—	C
S10	—	C	—
S11	C	—	—

Modification.—Resistor **R13** is added in series with **V4** screen grid lead in later A.C. receivers to act as a screen grid stopper.

V3 Alternative.—Either a Brimar **7B6** or a Brimar **7C6** may be used for **V3** in the A.C. model. No component changes are involved.

Scale Lamps, A.C. Model.—These are two 6.3 V, 0.3 A lamps with small clear spherical bulbs and M.E.S. bases.

Scale Lamps, A.C./D.C. Model.—These are two 6 V, 0.115 A lamps with small clear spherical bulbs and M.E.S. bases.

External Speaker.—Provision is made for the connection of a low-impedance (2-7Ω) external speaker across **T1** secondary winding via two sockets at the rear of the chassis.

Switch Diagram

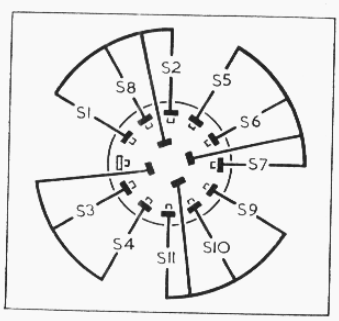


Diagram of the waveband switch unit, drawn as seen from the rear of an inverted chassis. The associated switch table appears at the head of this column.

VALVE ANALYSIS

Valve voltages and currents in the table (column 4) are those measured in an A.C. model when it was operating from A.C. mains of 230 V, 50 c/s, the voltage adjustment being set to the 226-250 V tapping. The receiver was switched to M.W.,

and the gang was turned to maximum capacitance, but there was no signal input.

In the A.C./D.C. model, the voltages on **V1** hexode anode, **V2** anode, **V4** screen grid and anode, and **V5** cathode were about 15% lower than those given for the A.C. model; the remaining readings were approximately the same.

Voltages were measured with an Avo Electronic TestMeter, and as this instrument has a high internal resistance, allowance should be made for the current drawn by other types of meter. Chassis was the negative connection in every case. The voltage measured across **C27** was 230 V.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 7S7 ...	220	1·7	78	3·4	—
	Oscillator				
	120	4·6			
V2 7B7 ...	220	3·8	78	0·7	2·5
V3 7C6‡	90	0·32	—	—	—
V4 7C5 ...	216	34·0	220	3·3	10·0
V5 7Y4	210*	—	—	—	238·0†

* A.C. reading. † Cathode current 52 mA.
‡ May be 7B6.

DISMANTLING

Removing Chassis.—Unscrew four self-tapping screws securing back cover to cabinet, and remove cover, disconnect the mains link plug;

remove control knobs from front of cabinet (pull off);

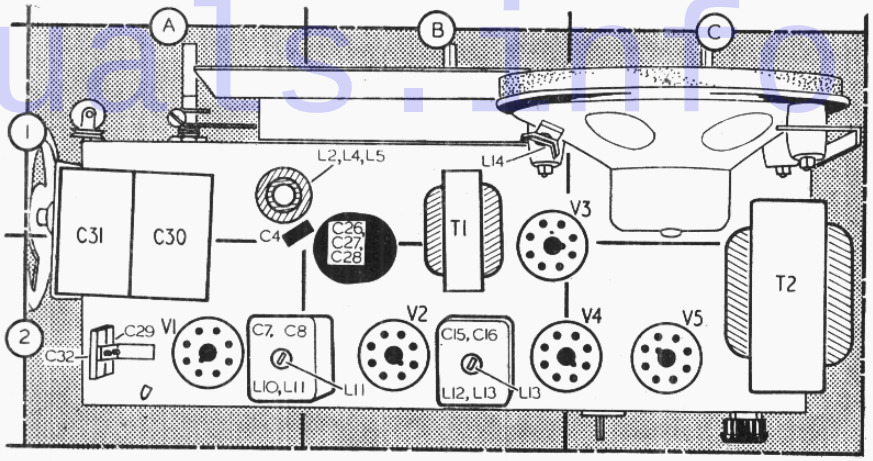
unscrew two self-tapping screws securing lower rear edges of chassis to sides of cabinet, and withdraw chassis.

To operate receiver, the back cover may be positioned at the rear of the chassis so that the mains link is connected to its socket.

CIRCUIT ALIGNMENT

Remove chassis from cabinet and position it on the bench so that all the core and trimmer adjustments are accessible. The receiver should be connected to the mains so that the chassis is at earth potential.

I.F. Stages.—Switch receiver to M.W. and turn gang to minimum capacitance. Connect output of signal generator, via an 0.05μF capacitor in each lead, to control grid (pin 6) of **V1** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L13** (location reference B2), **L12** (E4), **L11** (A2) and **L10** (F4) for maximum output. Repeat these adjustments until no further improvement results.



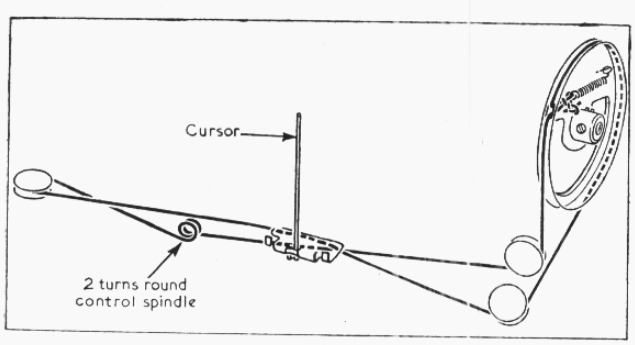
Plan view of the chassis. The speaker, shown in location reference C1, is suspended in an anti-microphonic mounting consisting of three large rubber grommets.

R.F. and Oscillator Stages.—As the tuning scale remains in the cabinet when the chassis is withdrawn, a substitute tuning scale must be made up and clipped to the scale backing plate. A sketch showing the positions of the calibration marks on the substitute scale appears in column 1, the measurements being given of the distances between the marks and the maximum capacitance setting of the cursor. When the chassis is finally replaced in its cabinet check that with the gang at maximum capacitance the cursor coincides with the dots at the high wavelength ends of the tuning scales.

S.W.—Switch receiver to S.W. and transfer signal generator leads to **A** and **E** sockets, using a 400Ω series resistor in the "live" lead as dummy aerial. Tune receiver to 17 Mc/s, feed in a 17 Mc/s (17.65 m) signal and adjust **C32** (A2) and **C29** (A2) for maximum output. Feed in a 12 Mc/s (25 m) signal and check the calibration. Feed in a 6 Mc/s (50 m) signal and check the calibration. If a large error is found, greater than the tolerance margin indicated in the sketch of the substitute tuning scale, then tracker **C11** should be checked.

L.W.—Switch receiver to L.W. and replace 400Ω dummy aerial with a 200pF capacitor. Tune receiver to 857 m, feed in an 857 m (350 kc/s) signal and adjust **C34** (G4) for maximum output while rocking the gang for optimum results. Tune receiver to 1,875 m, feed in a 1,875 m (160 kc/s) signal and adjust **C36** (G4) for maximum output while rocking the gang for optimum results. Repeat there adjustments until no further improvement results. Feed in a 1,364 m (220 kc/s) signal and check calibration.

M.W.—Switch receiver to M.W., tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust **C33** (G3) for maximum output while rocking gang for optimum results. Tune receiver to 517.2 m, feed in a 517.2 m (580 kc/s) signal and adjust **C35** (G3) for maximum output while rocking gang for optimum results. Repeat these adjustments until no further improvement results. Feed in a 300 m (1 Mc/s) signal and check calibration.



Sketch of the tuning drive system, drawn as seen from the front of the chassis with the gang set at minimum capacitance.

Service Sheet Correction

The makers point out that in Service Sheet 1128/T49, which covers the Philips 1115U Series of television receivers, a mis-statement occurs in the introduction, where it is said that channel changing is accomplished by replacing three coil units and readjusting the R.F. and oscillator trimmers.

This is incorrect, and they ask us to make it clear that it is necessary only to replace the coils and tune the oscillator trimmer for maximum sound. The R.F. trimmer settings are a factory adjustment and should not in any circumstances be disturbed.

Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.