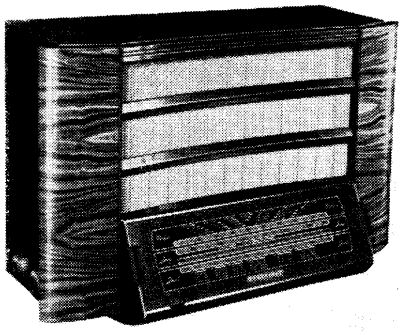
"TRADER" SERVICE SHEET

1030

REGENTONE 25 Series

Covering Models A25, U25, ARG85 and ARG90



The appearance of the table models.

THE A.C. and A.C./D.C. versions of the same receiver are covered in this *Service Sheet* which was prepared from a sample of each. The receiver is the Regentone A25 and U25, a 4-valve, 3-band superhet. The waveband ranges are 16.6-50 m (calibrated as 18-6 Mc/s), 176-550 m and 1,000-2,000 m.

Our circuit diagram is drawn in solid line for the A25 (A.C. model), with a separate output and mains input diagram on the right to show the main differences in the U25 (A.C./D.C.). Small incidental differences in various parts of the A.C./D.C. chassis are indicated by connections in dotted line.

The ARG85 is a single-speed radiogram employing a chassis which, although different physically from the A25, contains almost the same circuit. The slight differences are explained under "Radiogram Modifications" overleaf. The ARG90 is a 3-speed version of the ARG85.

Release dates and original prices: A25, May 1951, £21 6*s* 6*d*; U25, *May* 1951, £22 1*s* 3*d*; *ARG*85, *June* 1951, £65 9*s*; *ARG*90, *June* 1951, £69 2*s* 7*d*.

CIRCUIT DESCRIPTION

Aerial input via intermediate frequency rejector circuit **L1, C1,** coupling coil **L3** (S.W.) and bottom capacitance coupler **C3** (M.W. and L.W.) to single-tuned circuits **L4, C34** (S.W.), **L5, C34** (M.W.) and **L6, C34** (L.W.), which precede triode hexode valve **(V1, Mullard ECH42** (A.C. Model) or **UCH42** (A.C./D.C. Model)**)** operating as frequency changer with internal coupling. Mudulation hum is by-passed by **L2.** In the A.C./D.C. model, **C39, C40** isolate the aerial and earth sockets from the chassis, while **R23** provides a D.C. path between the sockets to prevent the build up of static charges on the aerial.

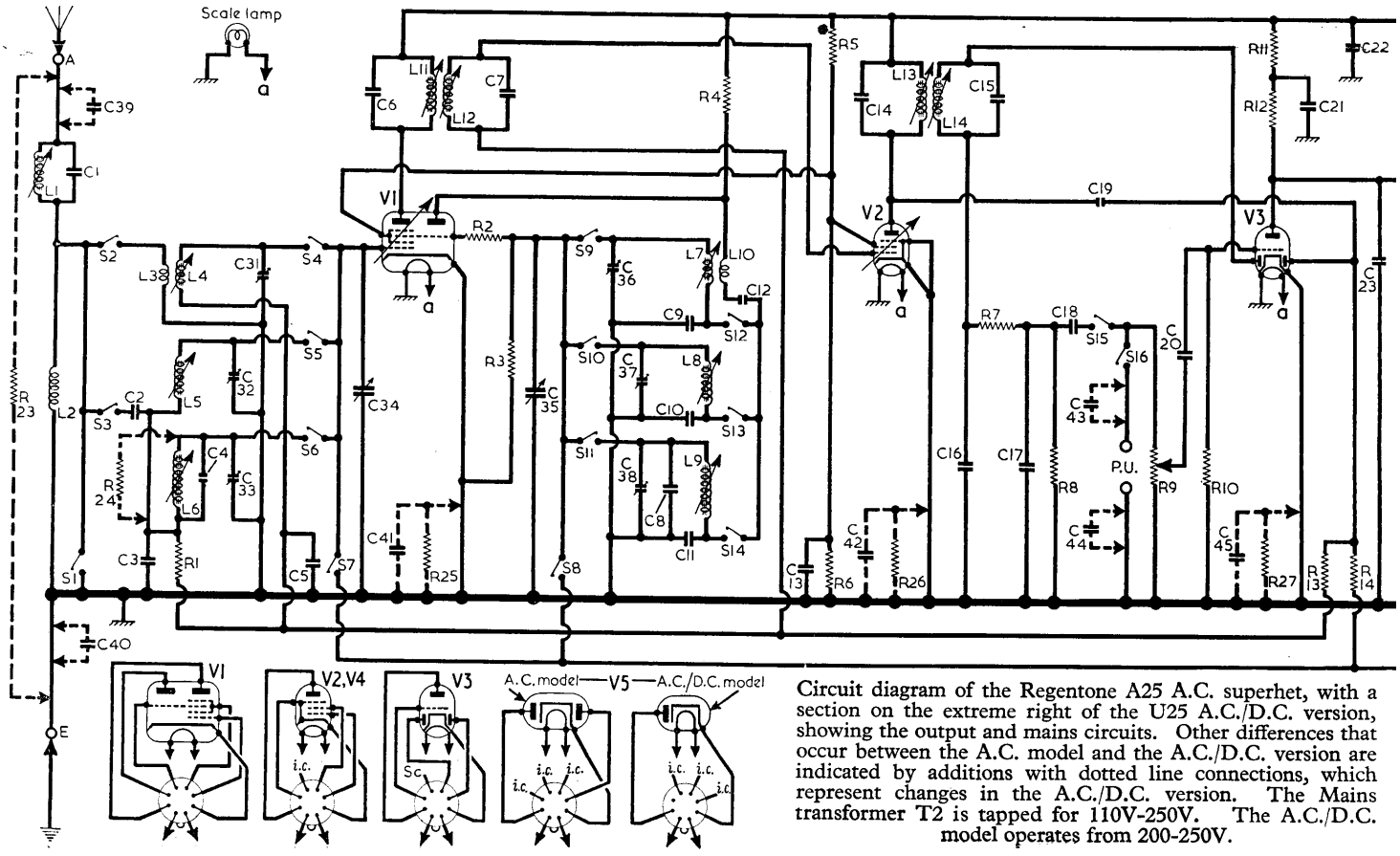
Oscillator grid coils **L7** (S.W.), **L8** (M.W.) and **L9** (L.W.) are tuned by **C35.** Parallel trimming by **C36** (S.W.), **C37** (M.W.) and **C8, C38** (L.W.); series tracking by **C9** (S.W.), **C10** (M.W.) and **C11** (L.W.). Reaction coupling from anode across the common impedance of the trackers with additional coupling by **L10** on S.W.

Second valve **(V2, Mullard EF41** (A.C. Model) or **UF41** (A.C./D.C. Model)**)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C6, L11, L12, C7** and **C14, L13, L14, C15.**

Intermediate frequency 470 kc/s.

Diode signal detector is part of double diode triode valve **(V3, Mullard EBC41** (A.C. Model) or **UBC41** (A.C./D.C.)**).** Audio-frequency component in rectified output is developed across diode load resistor **R8** and passed via **C18,** volume control **R9** and **C20** to control grid of triode section.

Second diode of **V3** is fed from **V2** anode via **C19** and the resulting D.C.



Circuit diagram of the Regentone A25 A.C. superhet, with a section on the extreme right of the U25 A.C./D.C. version, showing the output and mains circuits. Other differences that occur between the A.C. model and the A.C./D.C. version are indicated by additions with dotted line connections, which represent changes in the A.C./D.C. version. The Mains transformer T2 is tapped for 110V-250V. The A.C./D.C. model operates from 200-250V.

potential developed across load resistor **R14** is fed back as bias to F.C. and I.F. valves, giving automatic gain control. I.F. filtering by **C16, R7, C17** and **C23.** Provision is made for the connection of a gramophone pick-up across **R9** via **S16,** which closes in the Gram position of the waveband switch. **S1, S7, S8** close, and **S15** opens on Gram to mute radio. In the A.C./D.C. model **C43** and **C44** isolate the pick-up sockets.

Resistance-capacitance coupling between **V3** triode and pentode output valve **(V4, Mullard EL41** (A.C. Model) or **UL41** (A.C./D.C. Model)**)** via **R12, C24** and **R15.** Tone correction by **C27** and negative feed-back between **V4** and **V3** anodes via **R16.** Three-position tone-control by **S17, S18, C26** and **R20.** Provision is made for the connection of a low impedance external speaker across **T1** secondary winding, which feeds twin internal speakers. In the A.C./D.C. model, the external speaker sockets are isolated from chassis by connecting one side of **T1** secondary to the earth socket. and not to chassis as in the A.C. model.

In the A.C. model, H.T. current is supplied by I.H.C. full-wave rectifying valve **(V5, Mullard EZ40).** Smoothing by **R21, R22** and electrolytic capacitors **C28, C29** and **C30.** The voltages developed across **R18, R19** in the H.T. negative lead to chassis are fed to **V4** and, via the A.G.C. line, to **V1, V2** as grid bias.

In the A.C./D.C. model, H.T. current is supplied by I.H.C. half-wave rectifying valve **(V5, Mullard UY41).** Smoothing by **R22,** choke **L17** and electrolytic smoothing capacitors **C28, C29** and **C30.** Grid bias for **V1, V2, V3** and **V4** is obtained from the voltage drops across the cathode resistors **R25, R26, R27** and **R28.** The valve heaters, together with ballast resistor **R32,** thermistor **R31,** scale lamp and **R30** are in series across mains input.

COMPONENTS AND VALUES

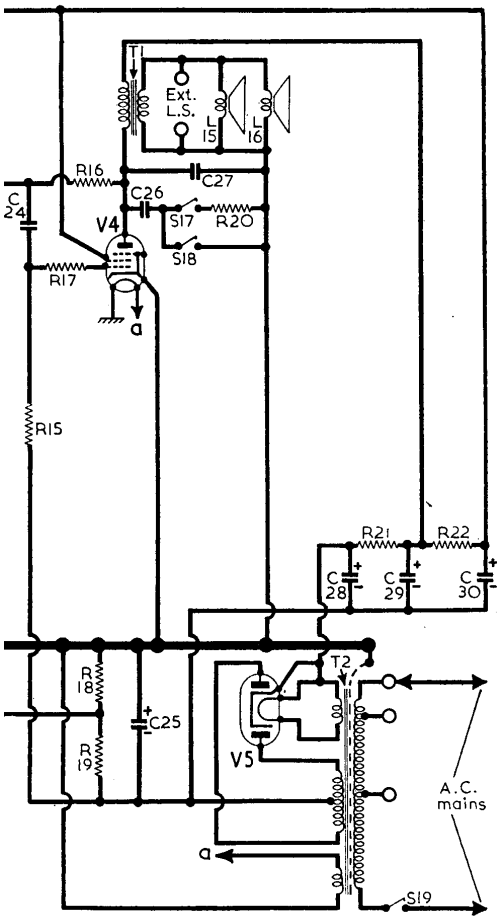
	CAPACITORS	Values	Locations
R1	A.G.C. decoupling	100kΩ	F4
R2	Osc. stabilizer ...	100Ω	F3
R3	V1 osc. C.G. ...	47kΩ	F3
R4	Osc. anode feed ...	27kΩ	F4
R5	S.G. H.T. pot. ...	33kΩ	F4
R6	divider	27kΩ	F3
R7	I.F. stopper ...	47kΩ	C2
R8	Diode load ...	330kΩ	E4
R9	Volume control ...	250kΩ	D3
R10§	V3 C.G.	10MΩ	E4
R11‡	H.T. decoupling ...	100kΩ	D4
R12	V3 anode load ...	270kΩ	E4
R13	A.G.C. decoupling	1.2MΩ	E4
R14	A.G.C. diode load ...	1.2MΩ	E4
R15	V4 C.G.	470kΩ	D4
R16	Neg. feed-back ...	2.2MΩ	D4
R17	V4 C.G. stopper ...	10kΩ	D4
R18	V1, V2, V4, G.B. ...	51Ω	E4
R19		100Ω	D4
R20	Part tone control	4.7kΩ	D4
R21	H.T. smoothing	1kΩ	E3
R22		1kΩ	E4
R23*	Aerial shunt ...	1.2MΩ	—
R24*	L.W. aerial shunt ...	100kΩ	—
R25*	V1 G.B.	220Ω	—
R26*	V2 G.B.	330Ω	—
R27*	V3 G.B.	3.9kΩ	—
R28*	V4 G.B.	220Ω	—
R29*	V5 surge limiter ...	100Ω	—
R30*	Scale lamp shunt ...	200Ω	—
R31*	Thermistor, CZ1 ...	—	—
R32*	Ballast resistor ...	†1·1kΩ	B1

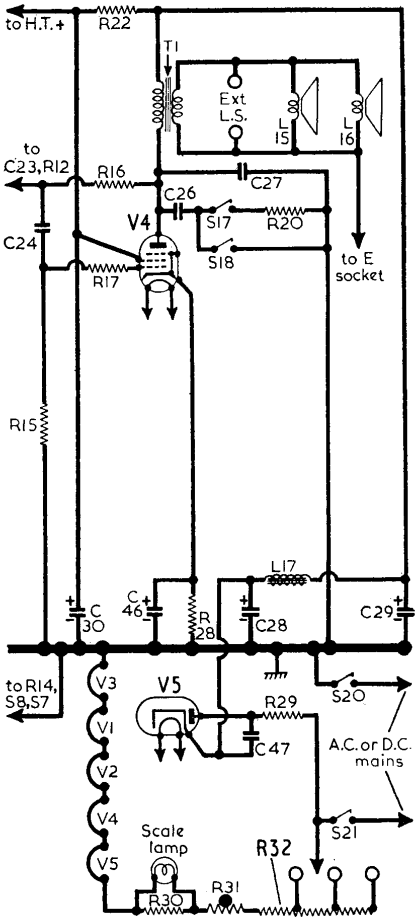
* Model U25 only. † Tapped at 700Ω + 200Ω + 200Ω from R31. ‡ 47 kΩ in A.C./D.C. model. § 2·2 MΩ in A.C./D.C. model.

	CAPACITORS	Values	Locations
C1	I.F. filter tune ...	350pF	F4
C2	Aerial coupling ...	0·01μF	G4
C3		3,750pF	G4
C4	L.W. trimmer ...	50pF	G4
C5	A.G.C. decoupling	0·1μF	G4
C6	1st I.F. trans	100pF	B2
C7	tuning	100pF	B2
C8‖	L.W. trimmer ...	100pF	G3
C9	S.W. osc. tracker ...	3,750pF	G3
C10	M.W. osc. tracker	420pF	F3
C11	L.W. osc. tracker	125pF	G3
C12	Osc. coupling ...	50pF	G3
C13	S.G. decoupling ...	0·1μF	F3
C14	2nd I.F. trans. ...	100pF	C2
C15	tuning	100pF	C2
C16	I.F. by-passes ...	100pF	C2
C17		100pF	C2
C18	A.F. coupling ...	0·01μF	E4
C19	A.G.C. coupling ...	35pF	E4
C20	A.F. coupling ...	0·01μF	E4
C21	H.T. decoupling ...	0·1μF	E4
C22		0·1μF	F4
C23	I.F. by-pass ...	100pF	D4
C24	A.F. coupling ...	0·01μF	D4
C25*	G.B. decoupling ...	50μF	E3
C26	Part tone control	0·05μF	D4
C27¶	Tone corrector ...	0·005μF	D3
C28*	H.T. smoothing ...	16μF	C1
C29*		32μF	C1
C30*		8μF	C1
C31‡	S.W. aerial trim. ...	40pF	G4
C32‡	M.W. aerial trim.	40pF	F4
C33‡	L.W. aerial trim. ...	40pF	G4
C34†	Aerial tuning ...	501pF	A2
C35†	Oscillator tuning	501pF	A2
C36‡	S.W. osc. trim. ...	40pF	G3
C37‡	M.W. osc. trim. ...	40pF	G3
C38‡	L.W. osc. trim. ...	40pF	G3
C39§	Aerial isolator ...	0·01μF	—
C40§	Chassis isolator ...	0·02μF	—
C41§	V1 cath. by-pass ...	0·1μF	—
C42§	V2 cath. by-pass ...	0·1μF	—
C43§	P.U. isolators ...	0·01μF	—
C44§		0·01μF	—
C45§	V3 cath. by-pass ...	*50μF	—
C46§	V4 cath. by-pass ...	*25μF	—
C47§	Mains R.F. filter	0·01μF	—

* Electrolytic. † Variable. ‡ Pre-set. §Model U25 only. ‖ 80pF in A.C./D.C. Model. ¶ 0·001μF A.C./D.C. model.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	I.F. filter coil ...	4	F4
L2	Mod. hum filter ...	8	F4
L3	S.W. aerial coup. ...	—	G4
L4	Aerial tuning coils	—	G4
L5		3	F4
L6		28	G4
L7	Oscillator tuning coils	—	G3
L8		3	F3
L9		12	G3
L10	S.W. osc. reaction	—	G3
L11	1st I.F. trans. Pri.	8	B2
L12	Sec.	8	B2
L13	2nd I.F. trans. Pri.	8	C2
L14	Sec.	8	C2
L15	Speech coils ...	3	—
L16		3	—
L17	H.T. choke, (U25)	—	C1
T1	O.P. trans. Pri.	300	D3
	Sec.	—	
T2	Pri., total ...	35	
	H.T. sec., total ...	640	
	Rect. htr. ...	—	F3
	Valve htr.	—	
S1-S16	Waveband switches	—	G4
S17, S18	Tone switches ...	—	D4
S19-S21	Mains sw., ...	—	D3
	g'd R9	—	—





VALVE ANALYSIS

Valve voltages and currents given below were derived from the manufacturer's information and were taken with the receivers operating from A.C. mains of 230V. The sets were tuned to the highest wavelength end of M.W., but there was no signal input.

Voltage measurements were made with a Model 7 Avometer, chassis being the negative connection.

A.C. Model

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 ECH42	212	2·5	68	3·5	—
	Oscillator				
	70	5·5			
V2 EF41	212	3·0	68	1·0	—
V3 EBC41	60	0·5	—	—	—
V4 EL41	225	22·0	212	3·0	—
V5 EZ40	255†	—	—	—	270

† A.C. reading.

A.C./D.C. Model

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 UCH42	190	1·5	92	2·5	2·5
	Oscillator				
	83	3·5			
V2 UF41	190	4·1	92	1·3	1·9
V3 UBC41	63	0·3	—	—	1·0
V4 UL41	196	42·0	190	7·8	5·5
V5 UY41	223†	—	—	—	231

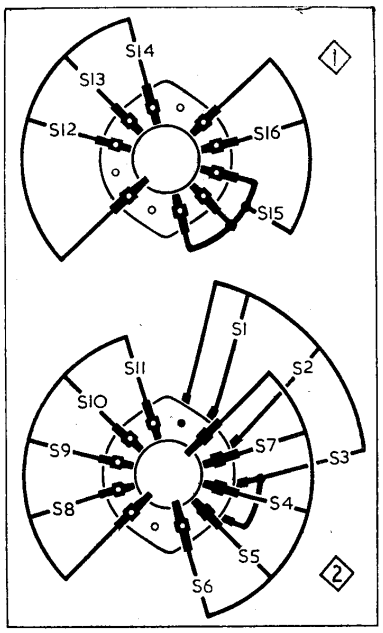
† A.C. reading.

GENERAL NOTES

Switches.—**S1-S14** are the waveband switches, and **S15, S16** are the radio/gram change-over switches, ganged in two rotary units beneath the chassis. These units are indicated in our underside drawing of the chassis by the numbers **1** and **2** in diamond surrounds, with arrows to indicate the direction in which they are viewed in the diagrams in col. 2, where they are shown in detail.

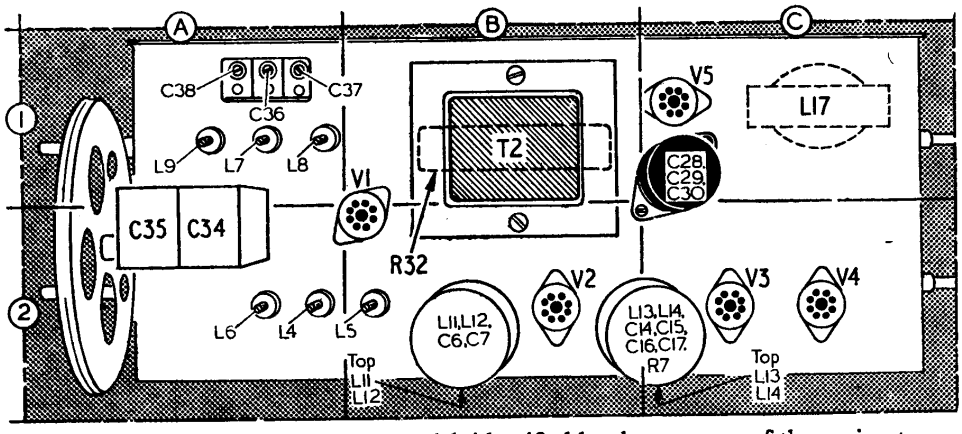
The table below them gives the switch positions for the four control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and **C**, closed.

S17, S18 are the tone control switches, in a small 3-position rotary unit at the opposite end of the chassis, where they are indicated in our underside drawing. In the fully anti-clockwise position of the control knob **S18** is closed, giving deep tone; in the next position **S18** opens and **S17** closes, giving medium tone; in the clockwise position both switches open, giving brilliant tone.



Diagrams of the waveband switch units, drawn as seen in the direction of the arrows in our underside view of the chassis. Below is the associated switch table.

Switches	L.W.	M.W.	S.W.	Gram.
S1	—	—	—	C
S2	—	—	C	—
S3	C	C	—	—
S4	—	—	C	—
S5	—	C	—	—
S6	C	—	—	—
S7	—	—	—	C
S8	—	—	—	C
S9	—	—	C	—
S10	—	C	—	—
S11	C	—	—	—
S12	—	—	C	—
S13	—	C	—	—
S14	C	—	—	—
S15	C	C	C	—
S16	—	—	—	C



Plan view of the chassis of the A.C. model, identified by the presence of the mains transformer **T2**. The mains resistor **R32** drawn over it is found in the A.C./D.C. model.

S19 in the A.C. model, or **S20, S21** in the A.C./D.C. model, are the Q.M.B. mains switches, ganged with the volume control knob **R9.**

Scale Lamp.—In both versions this is an Osram lamp with an M.E.S. base and a small clear spherical bulb. In the A.C. model it is rated at 6.5V, 0.3A, and in the A.C./D.C. model it is 6V, 0.06A. To replace the bulb, the glass scale panel can be removed if the two moulded side clamps are first removed (one Phillips screw each).

A Plasticine pad behind the glass serves to hold it just clear of the cabinet, absorbing shock, and providing an adhesive grip. Beneath the panel is an arc-shaped plastic sheet light diffuser, which can be pulled away forwards to give access to the lamp.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 2-4Ω) external speaker.

R21, R22.—These two resistors are both wire wound and cemented. They are rated at 1,000Ω, ±10% tolerance.

Chassis Divergencies.—**R6** was not shown in the maker's diagram, and may be omitted in some chassis. In these cases **R5** is still 33KΩ. In some models, too, there may be a 270KΩ resistor connected across **L12.**

Intermediate Frequency.—When they left the factory, A25 receivers up to Serial No. GF5000, and U25 receivers up to HA2000, were aligned with an intermediate frequency of 465 kc/s. No component change was involved, but subsequent models were tuned to 470 kc/s. When being realigned, all models should be tuned to 470 kc/s.

CIRCUIT ALIGNMENT

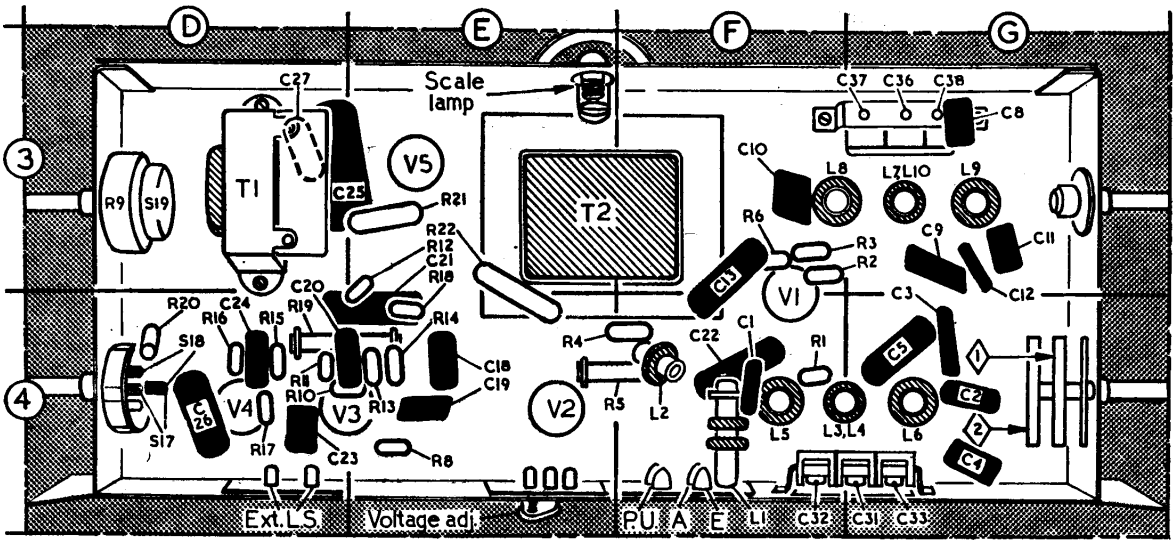
All the following adjustments, with the exception of I.F. filter **L1,** are accessible with the chassis in its cabinet. Connect output of signal generator, via an 0.05μF capacitor in "live" lead, to control grid (pin 6) of **V1** and chassis.

I.F. Stages.—Switch set to M.W., turn gang to minimum, feed in a 470 kc/s (638.3m) signal and adjust the cores of **L14, L13** (location reference C2) and **L12, L11** (B2) for maximum output. Repeat these adjustments.

I.F. Filter.—Transfer signal generator leads, via a dummy aerial, to **A** and **E** sockets and, feeding in a 470 kc/s signal, adjust the core of **L1** (F4) for minimum output.

R.F. and Oscillator Stages.—As the tuning scale is fixed to the cabinet, and a substitute tuning scale is not provided on the chassis, the following adjustments should be made with the chassis in its cabinet. Check that with the gang at minimum the cursor coincides with the dots at the short-wavelength ends of the S.W. and M.W. tuning scales.

S.W.—Switch set to S.W., tune to 18 Mc/s on scale, feed in an 18 Mc/s (16.67m) signal, and screw up **C36** (A1) to its maximum capacitance. 18 Mc/s is in the centre of the calibration mark "18.0," approximately where the decimal point appears. Now unscrew **C36** carefully until the first peak is reached, careful adjustment being necessary because several closely spaced peaks may occur. Then adjust **C31** (G4) for maximum output. Tune



Underside view of the A.C. chassis. In the A.C./D.C. version a number of components are in different positions, and others are added, but the general layout is the same. Diagrams of the waveband switch units 1 and 2 appear at the head of col. 2.

to 6 Mc/s on scale, feed in a 6 Mc/s (50m) signal and adjust the cores of **L7** (A1) and **L4** (A2) for maximum output. Repeat these adjustments until no further improvement results.

M.W.—Switch set to M.W., tune to 200m, feed in a 200m (1,500 kc/s) signal and adjust **C37** (A1) and **C32** (F4) for maximum output. Tune set to 500m, feed in a 500m (600 kc/s) signal and adjust the cores of **L8** (A1) and **L5** (B2) for maximum output. Repeat these adjustments.

L.W.—Switch set to L.W., tune to 1,000m, feed in a 1,000m (300 kc/s) signal and adjust **C38** (A1) and **C33** (G4) for maximum output. Tune set to 1,800m, feed in a 1,800m (166.7 kc/s) signal and adjust the cores of **L9** (A1) and **L6** (A2) for maximum output. Repeat these adjustments.

DISMANTLING THE SET

Removing Chassis.—Remove four control knobs (pull-off) from sides of cabinet;

unsolder speaker leads from speech coil tags on right-hand side (viewed from rear) of speaker;

remove two hexagon-head self-tapping screws, with washers, securing rear edges of chassis to cabinet, and withdraw chassis.

When replacing, check that the two wooden dowels are in position in front of cabinet and that they engage in the grommets in the chassis scale backing plate.

Removing Speakers.—Unsolder leads from speech coil tags, and remove four self-tapping Phillips screws from circumference of each speaker.

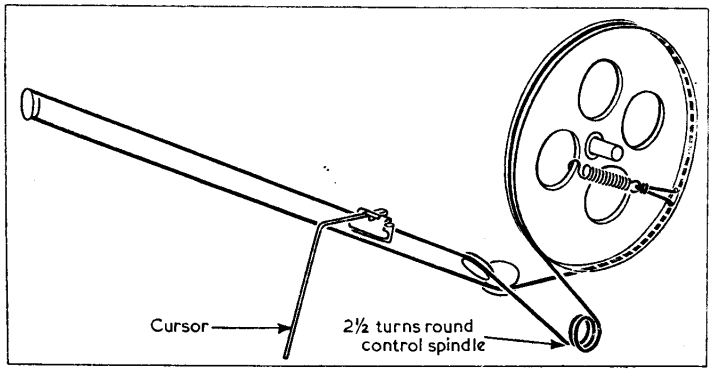
When replacing, it is important to reconnect the speakers in phase by positioning them on the baffle board with their speech coil tags facing each other and then connecting the top and bottom tags of one speaker to the bottom and top tags respectively of the other speaker. Coloured inter-connecting leads facilitate the correct method of connecting them.

DRIVE CORD REPLACEMENT

Six feet of high-grade flax fishing line, plaited and waxed, is required for a new drive cord, this length providing an ample margin for tying off. It should be run as shown in the accompanying sketch, where the tuning drive system is drawn as seen when viewed from the front right-hand corner of the chassis, with the gang at maximum capacitance.

Both ends of the cord are tied to the tension spring, but the simplest method of running it is first to tie on one end with a non-slip knot, thread the cord through the hole in the rim of the drum, then start the first anti-clockwise run for a quarter of a turn, and so on, finally tying off so that the spring is extended to about one and a half times its relaxed length.

The cursor can be fitted afterwards, the upper cord being slipped over its three claws. It should be so adjusted that with the gang at minimum capacitance the cursor coincides with the dots at the left-hand ends of the top and bottom tuning scales.



Sketch of the tuning drive system, drawn as seen from the front right-hand corner of the chassis when the gang is at maximum capacitance.

RADIOGRAM MODIFICATIONS

The chassis used in the ARG85/2 and ARG90/2 autoradiograms are basically A25 chassis, but a number of modifications are made to them. The common bias line derived from resistors in the negative H.T. lead to chassis is discarded, and each valve has its own cathode bias resistance. **R18, R19, C25** are therefore omitted, and **R14** and **R15** go to chassis. In the H.T. smoothing circuit, **R21** is replaced by an iron-cored choke.

In consequence the cathode circuits are more like those in the U25, and their values are as follows : **C41, R25** are 0.1 μF and 180 Ω; **C42, R26** are 0.1μF and 330 Ω; **C45, R27** are 50 μF and 2.2 kΩ; **C46, R28** are 25μF and 180 Ω.

C20 and **R10** in **V3** control grid circuit are omitted, the slider of **R9** going straight to the grid. **C18** becomes 0.002 μF, and at its junction with **S15** a 200 pF capacitor drops down to chassis. The diode load **R8** becomes 820 kΩ and is returned to **V3** cathode. **R12** becomes 68 kΩ.

Negative feed-back is taken from the speech coil circuit, and **R16** is deleted. A potential divider consisting of an 820Ω and a 30 Ω resistor shunts **T1** secondary, the 30 Ω going to chassis, and **R27,** instead of going directly to chassis, is returned to the junction of the two resistors.

The pick-up input circuits include filter circuits for tone correction. (1) Consists of a potential divider of 270 kΩ, 270 kΩ and 0.002 μF across the pick-up, the output being taken from across the second 270 kΩ and 0.002 μF. The output leads are then shunted by 100 pF capacitor.

(2) Consists of a somewhat similar circuit, but the first resistor becomes 120 kΩ, and the 100 pF capacitor is omitted. The output comes from the same tappings, and in both cases it goes thence to the P.U. sockets. (1) is used in the ARG85, and (2) in the ARG90.

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