

Appearance of models 85A, 85U.

RESISTORS	Values	Locations
R1	V1 G.B. ...	220Ω F2
R2	V1 osc. C.G. ...	47kΩ F2
R3	V1 osc. stabilizer ...	100Ω F2
R4	A.G.C. decoupling ...	100kΩ G2
R5	Osc. anode feed ...	27kΩ F3
R6	V2, G.B. ...	68Ω E2
R7	I.F. stopper ...	47kΩ E2
R8	Volume control ...	500kΩ D2
R9	V3 C.G. ...	10MΩ D2
R10	A.G.C. decoupling ...	1MΩ F2
R11	A.G.C. diode load ...	1MΩ E2
R12	V3 anode load ...	470kΩ E2
R13	Part tone control ...	220kΩ E3
R14	Tone control ...	500kΩ D3
R15	Neg. feed-back ...	1.5MΩ E3
R16*	H.T. potential divider ...	4.7kΩ D2
R17	V4 G.B. ...	15kΩ E2
R18	V4 C.G. stopper ...	4.7kΩ E3
R19	V4 G.B. ...	180Ω E3
R20	H.T. smoothing ...	1kΩ D3
R21	V5 surge limiter ...	100Ω D3
R22	Brimistor CZ2 ...	—
R23	Heater ballast ...	740Ω —
R24	Heater ballast ...	100Ω —

\* 6-8kΩ in Model 754.

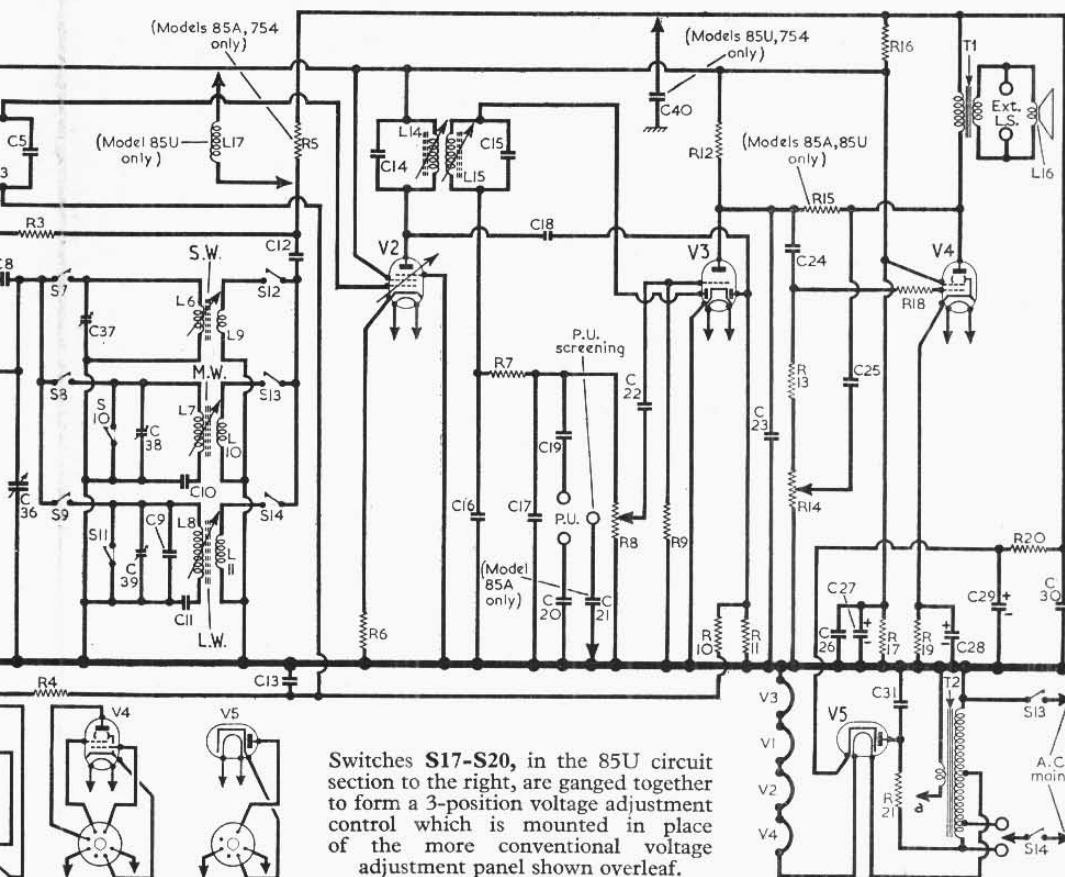
CAPACITORS	Values	Locations
C1	L.W. aerial trim ...	230pF A1
C2	Aerial series ...	500pF G2
C3	A.G.C. decoupling ...	0.1μF G2
C4	I.F. transformer ...	150pF B1
C5	tuning ...	150pF B1
C6	Osc. neutralizer ...	— A1
C7	V1 cath. by-pass ...	0.02μF F2
C8	V1 osc. C.G. ...	100pF F2
C9	L.W. osc. trim ...	220pF F2
C10	M.W. osc. tracker ...	520pF F3
C11	L.W. osc. tracker ...	225pF F3
C12	Osc. anode coupling ...	100pF G2
C13	A.G.C. decoupling ...	0.1μF F2
C14	I.F. transformer ...	150pF B1
C15	tuning ...	150pF B1
C16	I.F. by-passes ...	110pF E2
C17	I.F. by-passes ...	110pF E2
C18	A.G.C. coupling ...	20pF E2
C19	P.U. isolators ...	0.02μF E3
C20	P.U. isolators ...	0.02μF F3
C21	P.U. isolators ...	0.02μF F3
C22	A.F. coupling ...	0.001μF E2
C23	I.F. by-pass ...	300pF E2
C24	A.F. coupling ...	0.04μF E2
C25	Part tone control ...	500pF E3
C26*	H.T. by-pass ...	0.1μF D2
C27*	H.T. smoothing ...	8μF C1
C28*	V4 cathode by-pass ...	50μF E3
C29*	H.T. smoothing ...	32μF C1
C30*	H.T. smoothing ...	32μF C1
C31	Mains R.F. by-pass ...	0.05μF D3
C32†	S.W. aerial trim ...	60pF A1
C33†	L.W. aerial trim ...	60pF A1
C34†	M.W. aerial trim ...	60pF A1
C35†	Aerial tuning ...	532pF A1
C36†	Oscillator tuning ...	532pF A1
C37†	S.W. osc. trim ...	60pF A1
C38†	M.W. osc. trim ...	60pF A1
C39†	L.W. osc. trim ...	60pF A1
C40	H.T. decoupling ...	0.1μF —
C41	Chassis isolator ...	0.002μF —
C42†	S.W.1 aerial trim ...	60pF —
C43†	S.W.2 aerial trim ...	60pF —
C44†	M.W. aerial trim ...	60pF —
C45†	L.W. aerial trim ...	60pF —
C46†	S.W.1 aerial trim ...	60pF —
C47†	S.W.2 aerial trim ...	60pF —

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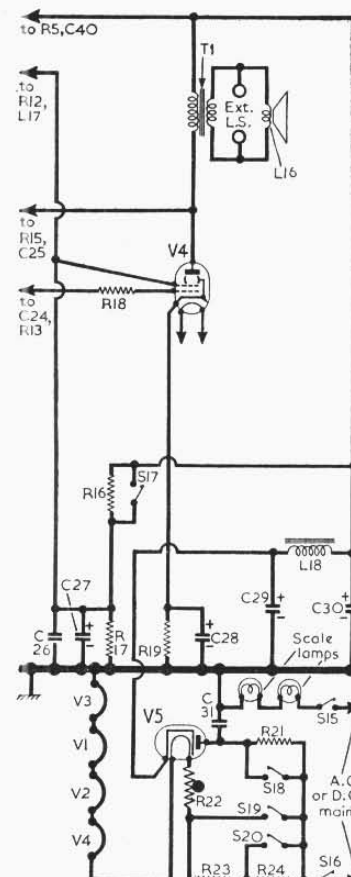
CAPACITORS (continued)	Values	Locations
C48†	M.W. aerial trim ...	60pF —
C49†	L.W. aerial trim ...	60pF —
C50	S.W.1 osc. tracker	0.005μF —
C51	S.W.2 osc. tracker	0.0026μF —

\* Electrolytic. † Variable. ‡ Pre-set.  
§ "Swing" value, minimum to maximum.  
¶ Very low capacitance, formed by twisted wires

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	L.W. frame aerial	16-0	A1
L2	M.W. frame aerial	2-0	A1
L3	S.W. aerial coupling	—	G3
L4	S.W. aerial tuning	—	G3
L5	Loading coil ...	1-0	G2
L6	Oscillator tuning coils ...	—	F3
L7		3-0	F3
L8		7-5	F3
L9	Oscillator reaction coils ...	—	F3
L10		1-5	F3
L11		2-0	F3
L12	1st I.F. trans. { Pri.	7-0	B1
L13		Sec.	7-0
L14	2nd I.F. trans. { Pri.	7-0	B1
L15		Sec.	7-0
L16	Speech coil ...	2-5	—
L17	Osc. anode choke	25-0	—
L18	Smoothing choke...	150-0	—
L19-L34	R.F. and oscillator coils (S.S.M.L.), Model 754	—	—
			—
T1	O.P. trans. { Pri.	340-0	—
		Sec.	
T2	Mains trans. { Pri.	76-0	C1
		total Sec.	1-0
S1-S14	Waveband switches	—	G3
S15-S16	Mains sw., g'd R14	—	D3
S17-S20	Voltage adj. sw. ...	—	—
S21-S42	Waveband switches	—	—



Switches S17-S20, in the 85U circuit section to the right, are ganged together to form a 3-position voltage adjustment control which is mounted in place of the more conventional voltage adjustment panel shown overleaf.





"TRADER" SERVICE SHEET

1126

# PILOT 85 Series

Covering Models 754, 85A & 85U

**H**OUSED in a plastic cabinet, the Pilot 85A is a 4-valve (plus rectifier) 3-band transportable superhet, designed to operate from A.C. mains of 200-250 V., 40-100 c/s. The waveband ranges are 16-50 m, 185-550 m, 1,200-2,000 m.

Model 85U is an A.C./D.C. version of model 85A, on which this *Service Sheet* is based, and is covered as explained under "General Notes" by a separate section of circuit diagram to the right of the main diagram.

Model 754 is a 4-band version of model 85A, its R.F., oscillator and I.F. circuits being re-drawn to the left of the main circuit diagram. Further notes on this model appear under "General Notes" overleaf.

Release date, all models, September 1953. Original prices: 85A, £14 5s 10d; 85U, £15 1s 8d; 754, £18 5s 3d.

## CIRCUIT DESCRIPTION

Tuned frame aerial input on M.W. by L2, loading coil L5 and C35, and on L.W. by L1, L2, loading coil L5 and C35. For S.W. reception an external aerial is neces-

sary and is coupled via L3 to single-tuned circuit L4, C35. An external aerial may also be used on M.W. and L.W., when it is connected either to the junction of L2, L5 (M.W.) or to the junction of L1, L2 (L.W.) by switches S2, S3.

Model 754 has four waveband ranges comprising S.W.1, S.W.2, M.W. and L.W. No frame aerials are fitted and the external aerial is fed via aerial coupling coils to the single-tuned grid circuits.

First valve (V1, Brimar 12AH8) is a triode heptode valve operating as frequency changer with internal coupling. Oscillator grid coils L6 (S.W.), L7 (M.W.) and L8 (L.W.) are tuned by C36. Parallel trimming by C37 (S.W.), C38 (M.W.) and C39 (L.W.); series tracking by C10 (M.W.) and C11 (L.W.). Reaction coupling from anode circuit by L9 (S.W.), L10 (M.W.) and L11 (L.W.). The oscillator circuit in model 754, but for the addition of a second S.W. band, is similar.

Second valve (V2, Brimar 12BA6) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C4, L12, L13, C5 and C14, L14, L15, C15.

Diode signal detector is part of double diode triode valve (V3, Brimar 12AT6). Audio frequency component in rectified output is developed across volume control R8, which acts as diode load, and is passed via C22 to grid of triode section.

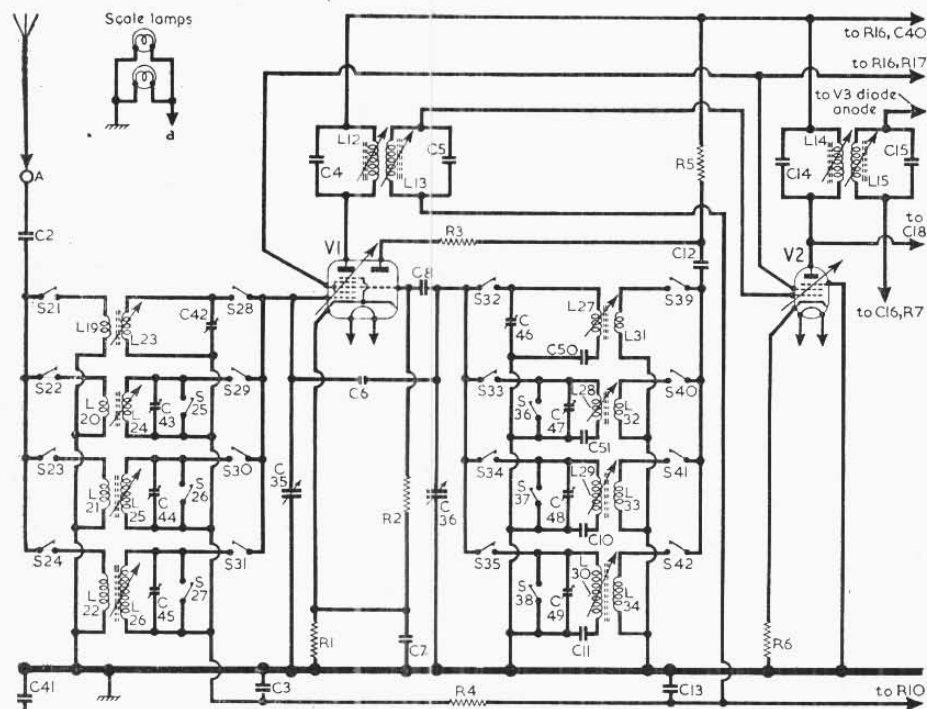
Intermediate frequency 471 kc/s.

Second diode of V3 is fed via C18 from V2 anode, and the resulting D.C. potential developed across load resistor R11 is fed back as bias to V1 and V2, giving automatic gain control.

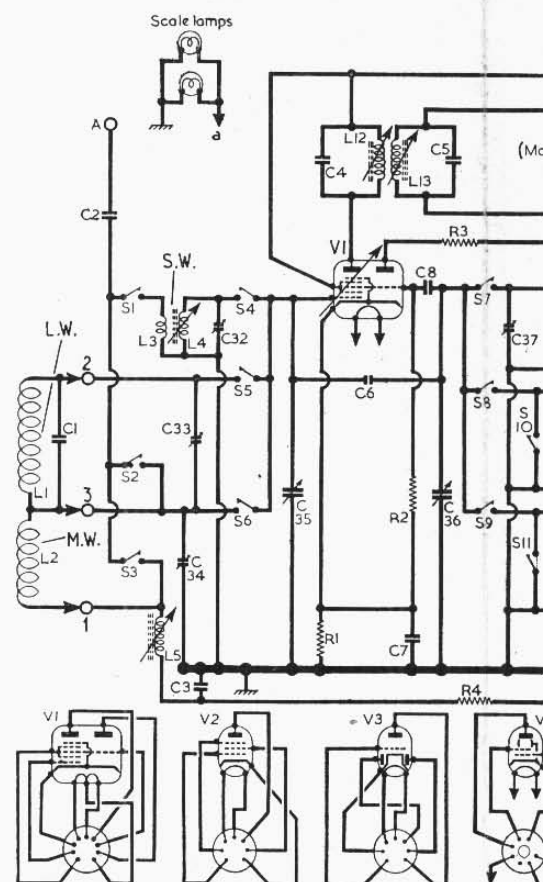
Resistance-capacitance coupling by R12, C24, R13 and R14 between V3 and pentode output valve (V4, Brimar 35L6). Fixed tone correction by negative feedback via R15 between the anodes of V4 and V3. Tone control R14 is part of the negative feed-back chain C25, R13, R14 between the anode and control grid circuits of V4.

H.T. current in models 85A and 754 is supplied by I.H.C. half-wave rectifying valve (V5, Brimar 35Z4). Smoothing by R16, R20 and electrolytic capacitors C27, C29, C30. The valve filaments are connected in series across a section of the primary winding of mains transformer

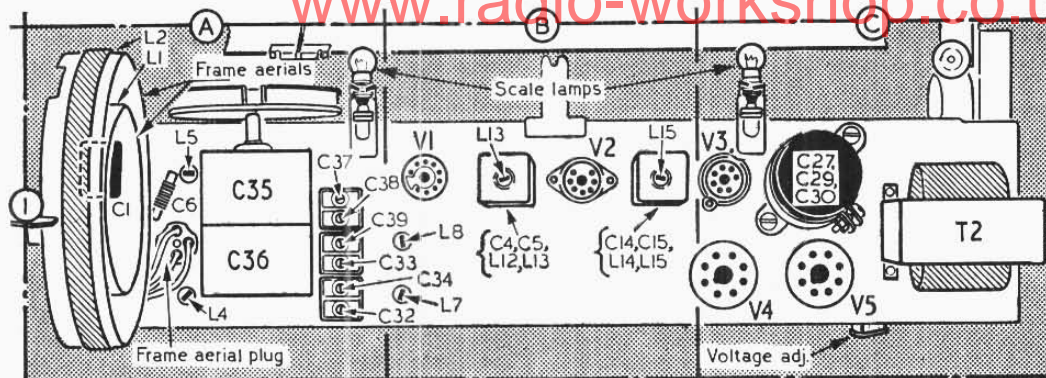
(Continued col. 1 overleaf)



Circuit diagram of the Pilot 85 series, a 3-band A.C. transportable table receiver. The A.C./D.C. version, model 85U, is covered by the separate circuit section on the extreme right of the main diagram, where the sound output and mains input stages have been re-drawn. Above, on left of the main diagram, are shown the aerial, oscillator and I.F. stages of model 754, which is otherwise mainly like the 85A, although a few further details are given under "General Notes" overleaf.







Plan view of the 85A chassis. The frame aerials L1, L2 shown in location reference A1 are normally mounted in the cabinet, chassis connections being made by a 3-pin plug and socket, but they are shown here for the purpose of identification.

#### Circuit Description—continued.

T2, which acts as an auto-transformer. An isolated secondary winding is provided on T2 for the scale lamps.

H.T. current in model 85U is supplied by I.H.C. half-wave rectifying valve (V5, Brimar 35Z4). Smoothing by R16, choke L18 and electrolytic capacitors C27, C29, C30. Valve heaters, together with scale lamps, thermistor R22 and ballast resistors R23, R24, are connected in series across the mains input. Voltage adjustment is by means of a three-position switch unit S17-S20.

#### GENERAL NOTES

**Switches.**—S1-S14 are the waveband switches in models 85A and 85U, and are ganged in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis illustration and shown in detail in the diagram in column 2 where

Switch Table, Models 85A & 85U

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

it is drawn as seen from the volume control end of an inverted chassis. The associated table (above) shows the three control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and C closed.

S15, S16 are the Q.M.B. mains switches, ganged with the tone control R14.

S17-S20 are the voltage adjustment

switches in model 85U, and are ganged in a single rotary unit which takes the place of the voltage adjustment panel in our plan view of the chassis. In the 110 V position of the switch S17, S18 and S19 close, and S20 opens; in the 200-225 V position S20 closes and S17, S18, S19 open; in the 225-250 V position all switches open.

S21-S42 are the waveband switches in model 754, and are ganged in two rotary units beneath the chassis deck in place of the single rotary unit shown in our under chassis illustration. The switch table in column 3 gives the switch operations for the four control settings, a dash indicating open, and C closed.

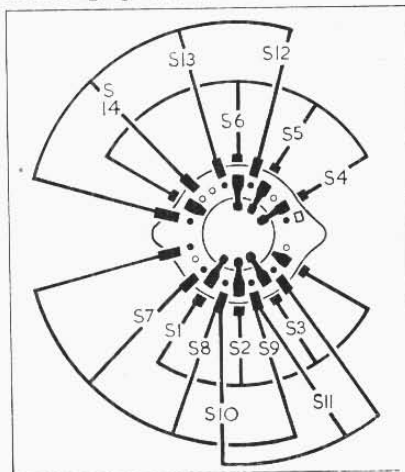


Diagram of the waveband switch unit for the 85A and 85U, drawn as seen from the volume control end of an inverted chassis.

**Model 85U.**—This is an A.C./D.C. version of the model 85A on which this Service Sheet was based. It differs from the 85A mainly in the power input stage,

and this section has been re-drawn to the right of the main circuit diagram overleaf.

The receiver is designed to operate from A.C. or D.C. mains of 110 V and 200-250 V, 40-100 c/s in the case of A.C. Apart from other small differences, which are indicated in the main circuit diagram and in the valve voltage table, the remaining information applies equally to both receivers.

**Model 754.**—This is a 4-band version of model 85A, an extra S.W. band covering the range 50-180 m being added. No frame aerials are fitted to this model and the full H.T. voltage is applied to the anodes of V1 and V2. The complete R.F., oscillator and I.F. section of this receiver has been re-drawn to the left of the main circuit diagram. The remainder of the 754 circuit, except where otherwise indicated, is the same as that for the 85A.

**Scale Lamps.**—These are 6.5 V, 0.3 A lamps with small clear spherical bulbs and M.E.S. bases.

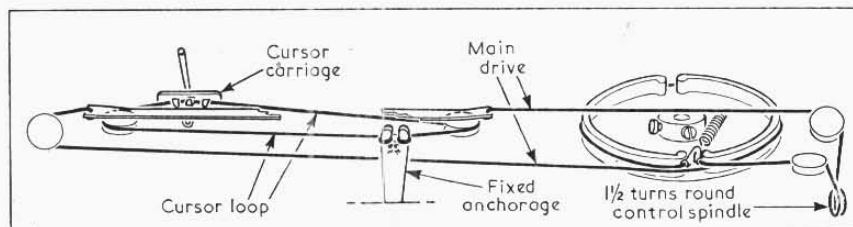
#### DISMANTLING

**Removing Chassis.**—Remove four control knobs from sides of cabinet (pull-off); unsolder four leads from speech coil and output transformer tags on speaker; remove two 2BA nuts (with washers) from rear lower edges of chassis; release two 2BA captive bolts securing lower front edges of chassis to cabinet, and withdraw chassis.

When replacing, the brown and black speaker leads should go to the speech coil tags, and the red and blue leads to the tags on the output transformer.

Switch Table, Model 754

Switch	S.W.1	S.W.2	M.W.	L.W.
S21	...	C	—	—
S22	...	—	C	—
S23	...	—	—	C
S24	...	—	—	—
S25	...	C	—	—
S26	...	—	C	—
S27	...	—	—	C
S28	...	C	—	—
S29	...	—	C	—
S30	...	—	—	C
S31	...	—	—	—
S32	...	C	—	—
S33	...	—	C	—
S34	...	—	—	C
S35	...	—	—	—
S36	...	C	—	—
S37	...	—	C	—
S38	...	—	—	C
S39	...	C	—	—
S40	...	—	C	—
S41	...	—	—	C
S42	...	—	—	—



Drive cord as seen from beneath the chassis with the gang at minimum capacitance.



