FITTED with a ferrite rod A.M. aerial, which is rotatable by means of a control knob on the front of the receiver, the Philips 543A is a 6-valve (plus rectifier) A.M./F.M. table receiver. It is housed in a plastics cabinet, and is designed to operate from A.C. mains of 200-250V, 50-100 c/s. The waveband ranges are : F.M., 87.5-100 Mc/s; A.M., 25-51m, 187-580m, and 1,150-2,000m.

Model 643A employs the same basic chassis as the 543A, but it is housed in a wooden cabinet and has a tuning indicator. Other small differences between the two receivers are indicated in the component tables.

Release date, both models, November, 1954. Original prices: 543A, £23 1s; 643A, £33 7s 9d. Purchase Tax extra.

CIRCUIT DESCRIPTION

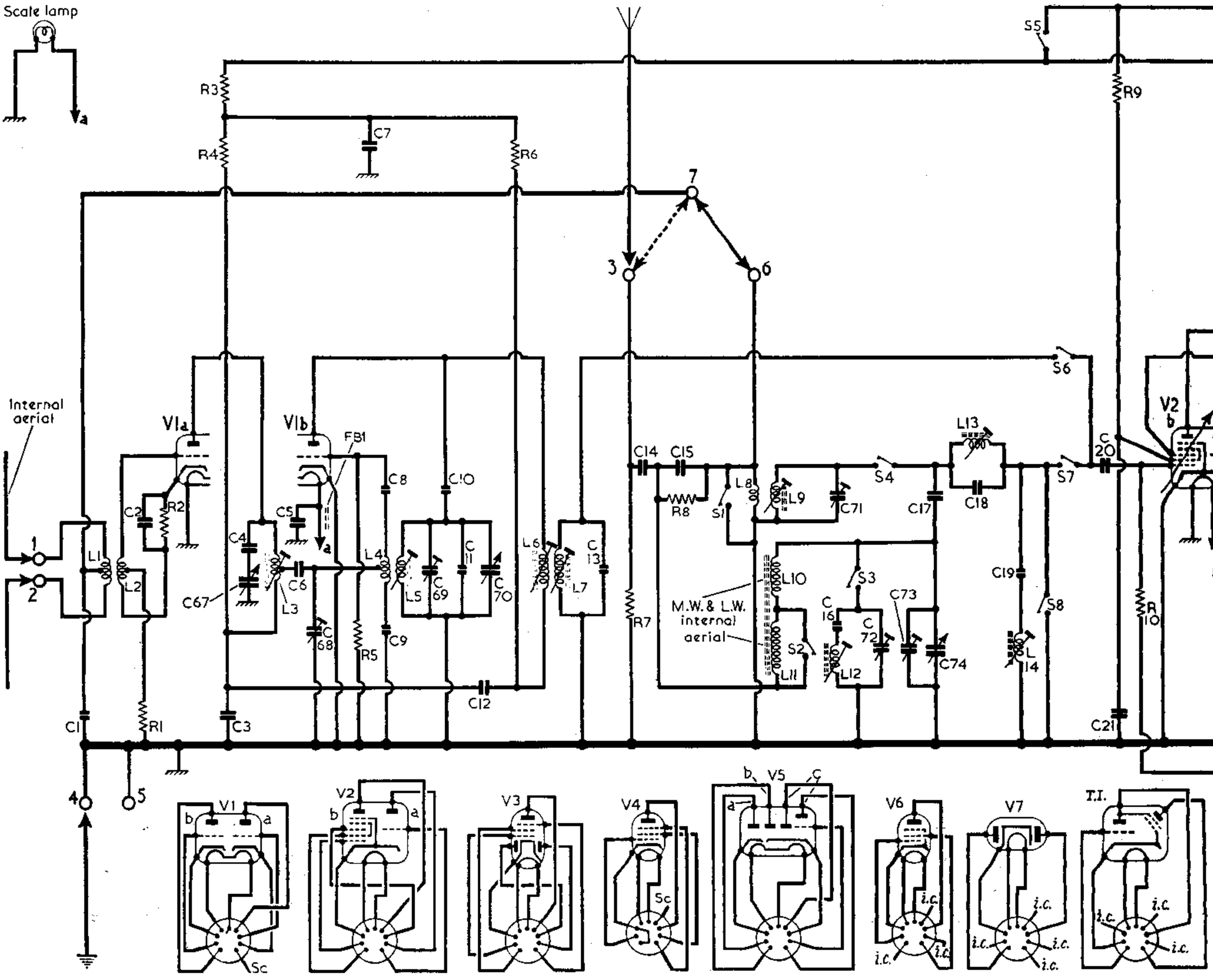
A.M. aerial input via **L8** (S.W.) and the common impedance of **C15, R8** (M.W. and L.W.) to single tuned circuits **L9, C74** (S.W.), **L10, C74** (M.W.) and **L11, C74** (L.W.). The M.W. and L.W. tuning coils **L10, L11** are mounted at opposite ends of a length of ferrite rod to form the M.W. and L.W. internal aerial. **C16, L12, C72** form a L.W. image filter and **L13, C18, C19, L14** form an I.F. filter.

Section **b** of **V2 (Mullard ECH81)** operates as mixer, and section **a** as oscillator. Oscillator anode coils **L17** (S.W.) and **L18** (M.W. and L.W.) are tuned by **C77.** Parallel trimming by **C25** (S.W.), **C75** (M.W.) and **C75, C23, C76** (L.W.); tracking by means of shaped vanes of oscillator section of the gang. Oscillator reaction coupling from grid circuit by **L15** (S.W.), **L16** (M.W. and L.W.).

Appearance of the Philips 543A.

Pentode section of diode pentode valve **(V3, Mullard EBF80)** operates as single-valve A.M. intermediate frequency amplifier with tuned transformer couplings **C30, L21, L22, C31** and **C36, L25, L26, C37.**

A.M. intermediate frequency 470 kc/s.



PHILIPS 543A & 643A

Press-button A.M./F.M. Table Superhets for A.C. Mains

Diode section of **V3** functions as A.M. signal detector, and the A.F. component in its rectified output is developed across load resistor **R19** and passed via **C48,** volume control **R26** and **C52** to grid of **V5c** (triode section of **V5, Mullard EABC80).** I.F. filtering by **C38, R16, C39.**

D.C. potential developed across **R19** is fed back as bias to **V2b** and **V3** giving automatic gain control on the A.M. bands.

Resistance-capacitance coupling by **R30, R31, R34, C54** and **R38** between **V5c** and pentode output valve **(V6, Mullard EL84).** Tone correction by **R28, C51** and **R44, C65.** Tone control by **R37** in the negative feed-back network **R39, R36, C58, R38, C59, R37, C57, R33, C55, R34, C56, R35** between windings **c, d** on output transformer **T1, V6** cathode and control grid circuits, and **V5c** anode circuit. Switches **S23, S26** are ganged with the tone control **R37** and give bass-boost.

The tone control is connected to give top-cut when rotated in either direction from its mid-position setting, and switches **S23, S25** open to give bass boost in the anti-clockwise direction only.

Provision is made for the connection of a gramophone pick-up across **R26** via **S22** which closes when the Gram key is depressed. **S20** also closes and **S21** opens to prevent radio break-through.

Operation on F.M.

Balanced 300Ω or co-axial 75Ω F.M. aerial input to F.M. RF amplifier, section **a** of **V1 (Mullard ECC85).** The aerial input transformer **L1, L2** is fixed-tuned to the centre of Band II, and the anode circuit is tuned by **C67.**

Section **b** of **V1** operates as an oscillator/mixer stage with tuned oscillator anode circuit **L5, C70.** Oscillator temperature drift is compensated for by negative temperature coefficient capacitor **C11.** The amplified output of **V1a** is coupled to **V1b** grid circuit by a tapping on the oscillator grid reaction coil **L4.** The selectivity of the R.F. tuned circuit is improved by a degree of regenerative coupling between the anode circuits of **V1a** and **V1b** via **C12.** F.M. tuning is by means of **C67** and **C70** which form two sections of the tuning gang.

(Continued foot of col. 9)

Circuit diagram of the 543A. **FB1, FB2,** and **FB3** are ferrite beads threaded on the leads to **V1, V2** and **V5** heaters to act as R.F. stoppers. The broken lines in the right-hand side half of the diagram show the extra circuitry added for the tuning indicator in model 643A. **C46** is omitted in the 643A. **S23** and **S26** are bass boost switches, ganged with the tone control **R37,** and they open to emphasize the bass response.

COMPONENT VALUES AND LOCATIONS

RESISTORS		Values	Locations
R1	V1a G.B. ...	33Ω	H4
R2	V1a G.B. ...	470Ω	H4
R3	H.T. feed... ...	1kΩ	F3
R4	H.T. feed... ...	4·7kΩ	H4
R5	F.M. osc. C.G. ...	220kΩ	H4
R6	V1b H.T. feed ...	10kΩ	H4
R7*	A.M. aerial shunt...	180kΩ	G3
R8	A.M. aerial coup....	33kΩ	G3
R9	V2b S.G. feed ...	39kΩ	G3
R10	V2b C.G.	1·2MΩ	G3
R11†	V2a osc. C.G. ...	47kΩ	G4
R12	A.M. osc. H.T. feed	33kΩ	G4
R13	V2b H.T. decoupling	2.2kΩ	G4
R14	V3 S.G. feed ...	82kΩ	G4
R15	V3 H.T. decoupling	6·8kΩ	F4
R16	A.M. I.F. stopper...	180kΩ	G4
R17	V4 C.G. stopper ...	10Ω	F4
R18	A.G.C. decoupling	1·2MΩ	G4
R19	A.M. diode load ...	220kΩ	G4
R20	V4 C.G.	100kΩ	F4
R21	V4 S.G. feed ...	56kΩ	F4

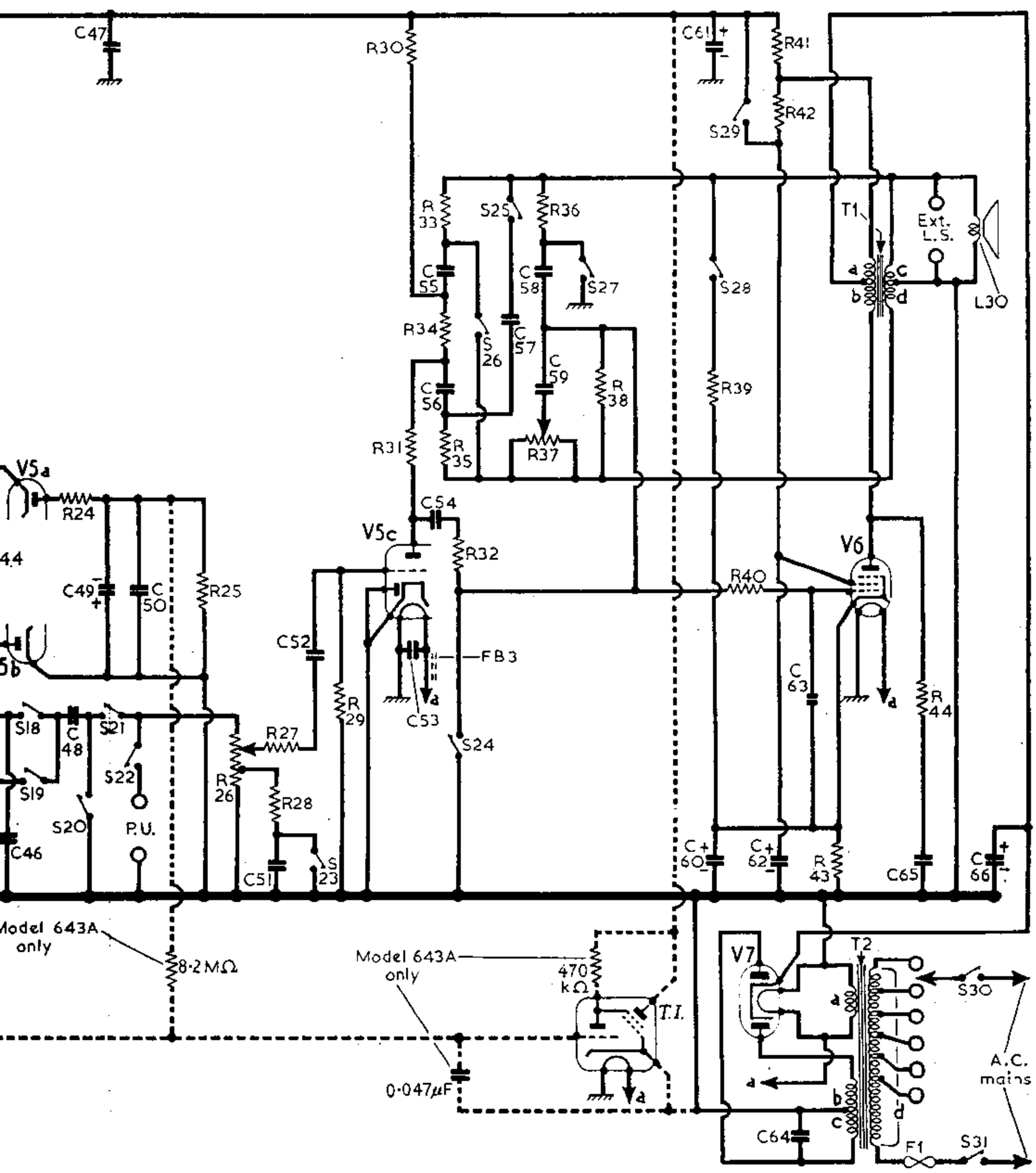
(*Continued next col.*)

RESISTORS (*continued*)		Values	Locations
R22	V4 H.T. decoupling	2·2kΩ	F4
R23	De-emphasis ...	180kΩ	F4
R24	Stabilizer ...	150Ω	F4
R25	D.C. load	10kΩ	F4
R26††	Volume control ...	2MΩ	D1
R27	Tone correctors ...	82kΩ	E3
R28‡	Tone correctors ...	68kΩ	D1
R29	V5c C.G.	10MΩ	F4
R30	V5c anode loads	100kΩ	E4
R31*	V5c anode loads	56kΩ	E4
R32	Tone corrector ...	47kΩ	F4
R33	Neg. feed-back tone correctors ...	2·7kΩ	E3
R34	Neg. feed-back tone correctors ...	56kΩ	E3
R35	Neg. feed-back tone correctors ...	22kΩ	E3
R36	Neg. feed-back tone correctors ...	33kΩ	F3
R37	Tone control ...	1MΩ	E3
R38	Neg. feed-back	820kΩ	E3
R39	Neg. feed-back	560Ω	F4
R40¶	V6 C.G.	39kΩ	F4
R41	H.T. smoothing	1·8kΩ	H4
R42	H.T. smoothing	1·8kΩ	H4
R43	V6 G.B.	180Ω	F4
R44‡‡	Tone corrector ...	5·6kΩ	D1

CAPACITORS		Values	Locations
C1	Aerial shunt ...	10pF	H4
C2	V1a cath. by-pass	1,500pF	H4
C3	F.B. Coupling ...	200pF	H3
C4	F.M. R.F. tun. ...	220pF	H4
C5	Heater by-pass ...	4,700pF	H4
C6	F.M. R.F. coup.	100pF	H4
C7	H.T. by-pass ...	4,700pF	H4
C8	F.M. Osc. couplings	33pF	H4
C9	F.M. Osc. couplings	12pF	H4
C10	F.M. Osc. couplings	18pF	H4
C11‡‡	F.M. Osc. trim. ...	4·7pF	H4
C12	F.B. Coupling ...	4,700pF	H4
C13	1st F.M. I.F. trans. tuning ...	15pF	A2
C14	A.M. aerial couplings ...	560pF	G3
C15	A.M. aerial couplings ...	0·003μF	H3
C16	L.W. image filter...	47pF	F3
C17	A.M. aerial coup....	380pF	G3
C18	A.M. I.F. filter tuning	270pF	G3
C19	A.M. I.F. filter tuning	12pF	G3
C20	V2b C.G.	100pF	G4
C21	V2b S.G. decoup....	0·01μF	G3
C22	A.M. osc. C.G. ...	47pF	G4
C23	L.W. osc. trim. ...	270pF	F3
C24	A.G.C. decoupling	0·01μF	G4
C25‡	S.W. osc. trim. ...	30pF	B2
C26	A.M. osc. coupling	470pF	G3
C27	H.T. decoupling	4,700pF	G4
C28	2nd F.M. I.F. trans. tuning ...	33pF	B2
C29	2nd F.M. I.F. trans. tuning ...	33pF	B2
C30	1st A.M. I.F. trans. tuning ...	110pF	B2
C31	1st A.M. I.F. trans. tuning ...	195pF	B2
C32	V3 S.G. decoup.	4,700pF	G4
C33	H.T. decoupling	6,800pF	G4
C34	3rd F.M. I.F. trans. tuning ...	33pF	C2
C35	3rd F.M. I.F. trans. tuning ...	33pF	C2
C36	2nd A.M. I.F. trans. tuning ...	110pF	C2
C37	2nd A.M. I.F. trans. tuning ...	195pF	C2
C38§	I.F. by-passes ...	47pF	F4
C39	I.F. by-passes ...	100pF	F4
C40	V4 C.G. limiter ...	100pF	F4
C41	V4 S.G. decoup.	4,700pF	F4
C42	H.T. decoupling	6,800pF	F4
C43	4th F.M. I.F. trans. tuning ...	22pF	C2
C44	4th F.M. I.F. trans. tuning ...	47pF	C2
C45¶	Discriminator load	4,700pF	F4
C46§§	De-emphasis ...	0·001μF	F4
C47	H.T. by-pass ...	6,800pF	F4
C48	A.F. coupling ...	0·01μF	F4
C49*	D.C. reservoir ...	10μF	F4
C50	I.F. by-pass ...	4,700pF	F4
C51	Tone corrector ...	8,200pF	E3
C52	A.F. coupling ...	0·01μF	F4
C53	Heater by-pass ...	4,700pF	F4
C54	A.F. coupling ...	0·022μF	F4
C55	Neg. feed-back tone correctors ...	0·1μF	E3
C56	Neg. feed-back tone correctors ...	0·01μF	E3
C57	Neg. feed-back tone correctors ...	0·01μF	F3
C58	Neg. feed-back tone correctors ...	560pF	E4
C59	Neg. feed-back tone correctors ...	1,500pF‖	E3
C60*	V6 cath-by-pass...	100μF	E4
C61*	H.T. smoothing ...	50μF	A2
C62*	H.T. smoothing ...	50μF	A2
C63††	Tone corrector ...	33pF	F4
C64	Mains R.F. by-pass	1,000pF	E4
C65	Tone corrector ...	3,300pF	D1
C66*	H.T. reservoir ...	50μF	A1
C67†	F.M. R.F. tuning	--	B1
C68‡	F.M. R.F. trim. ...	30pF	H4
C69‡	F.M. osc. trim. ...	30pF	H3
C70†	F.M. osc. tuning ...	—	B2
C71‡	S.W. aerial trim. ...	20pF	B1
C72‡	L.W. image filter...	58pF	G4
C73‡	M.W. aerial trim.	20pF	G3
C74†	A.M. aerial tuning	—	B1
C75‡	M.W. osc. trim. ...	20pF	F3
C76‡	L.W. osc. trim. ...	100pF	G3
C77†	A.M. osc. tuning ...	—	B2

* May be 100kΩ. † May be 27kΩ. ¶ May be 2·7kΩ. ‡ May be 47kΩ. †† Tapped at 400kΩ from chassis. ‡‡ May be 2·2 kΩ.

*Electrolytic. †Variable. ‡Pre-set. §May be 100pF. ¶May be 2,200pF. §§Omitted in 643A. ††May be 68 pF. ‡‡Neg. temp. coefficient. ‖or 3,300pF.

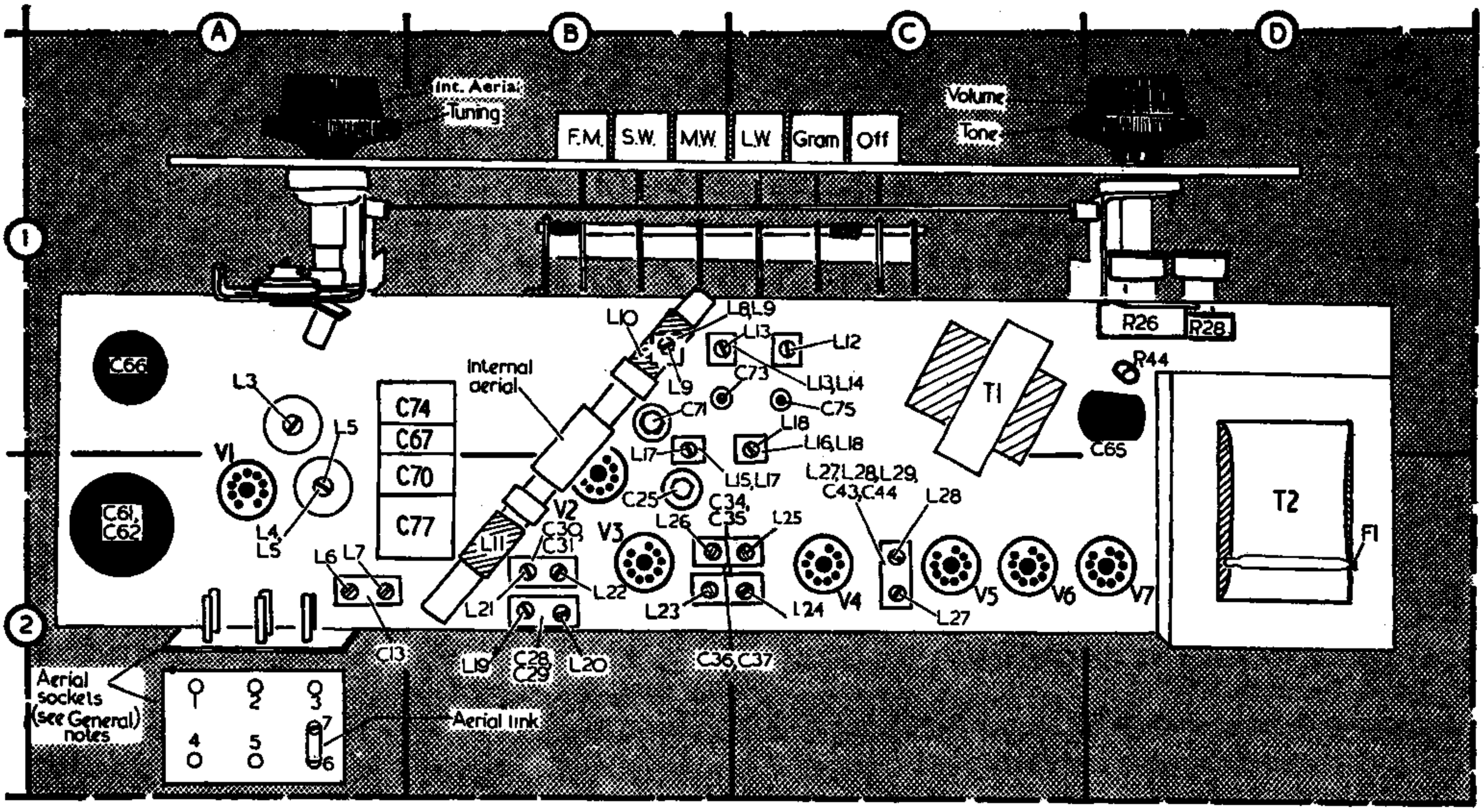


Circuit Description—*continued.*

V2b, V3, V4 (Mullard EF85) form a three-valve F.M. intermediate frequency amplifier with tuned transformer couplings **L6, L7, C13; C28, L19, L20, C29; C34, L23, L24, C35** and the discriminator transformer **C43, L27, L28, C44. R20, C40** provide grid limiting.

F.M. intermediate frequency 10.7 Mc/s.

Diode sections **a** and **b** of **V5** operate in an F.M. ratio detector circuit, whose A.F. output is fed via de-emphasis circuit **R23, C46** to **R26.**



Plan illustration of the chassis showing the rotatable A.M. internal aerial and the 6-pin aerial connecting panel.

OTHER COMPONENTS			Approx. Values (ohms)	Locations
L1	F.M. aerial coupling coils		—	H4
L2			—	H4
L3	F.M. R.F. tuning		—	A1
L4	F.M. osc. coils		—	A2
L5			—	A2
L6	1st F.M. I.F. trans.	Pri.	1·75	A2
L7		Sec.	1·75	A2
L8	S.W. aerial coils		2·2	B1
L9			—	B1
L10	M.W., L.W. internal aerial coils		1·0	B1
L11			3·0	B2
L12	L.W. image filter		8·0	C1
L13	I.F. filter coils		2·75	B1
L14			45·0	B1
L15	A.M. osc. reaction coils		—	B1
L16			3·5	C1
L17	A.M. osc. tuning coils		—	B1
L18			7·0	C1
L19	2nd F.M. I.F. trans.	Pri.	—	B2
L20		Sec.	—	B2
L21	1st A.M. I.F. trans.	Pri.	8·0	B2
L22		Sec.	5·0	B2
L23	3rd F.M. I.F. trans.	Pri.	—	B2
L24		Sec.	—	C2
L25	2nd A.M. I.F. trans.	Pri.	8·0	B2
L26		Sec.	5·0	C2
L27	4th F.M. I.F. trans.	Pri.	1·25	C2
L28		Sec.	—	C2
L29		Tert.	—	C2
L30	Speech coil		3·5	—
T1	O.P. trans.	a	5·5	C1
		b	295·0	
		c	—	
		d	60·0	
T2	Mains trans.	a	—	D2
		b	100·0	
		c	100·0	
		d, total	43·0	
S1-S29	Waveband and tone switches		—	F3
S30, S31	Mains switches		—	F3

GENERAL NOTES

Switches.—**S1-S29** are the A.M./F.M./Gram and tone switches, ganged (with exception of **S17, S23, S24** and **S26**) in five rotary units beneath the chassis. These units are press-key operated, and are identified in locations F3, G3 in the underside illustration of the chassis, where they are numbered 1-5 to correspond with the detailed diagrams of the units at the foot of column 9.

S17 is a separate switch in location G4, but it is not shown. It is ganged to switch unit 5 by means of a length of nylon braided glass yarn.

S24 is shown in location F3 and consists of a small spring strip which short-circuits the grid circuit of **V6** to chassis when the "Off" key is depressed.

S23, S26 are the bass boost switches ganged with the tone control **R37.**

Aerial Connections.—The receiver is provided with an internal dipole for F.M. reception and a rotatable ferrite rod aerial for M.W. and L.W. reception. The aerial input circuit is provided with six input sockets and a change-over link to provide for the use of various combinations of internal and external F.M. and A.M. aerials. A table showing the connections for these various combinations appears below. The socket numbers correspond with those used in the circuit diagram and in the plan illustration above.

Tuning Drive Cord.—Two lengths of nylon braided glass yarn are required for a new tuning drive, a short length of 65cm (26in) and a longer length of 98cm (39in). These are labelled short cord and long cord respectively in the sketch of the tuning drive system at the top of columns 4 and 5.

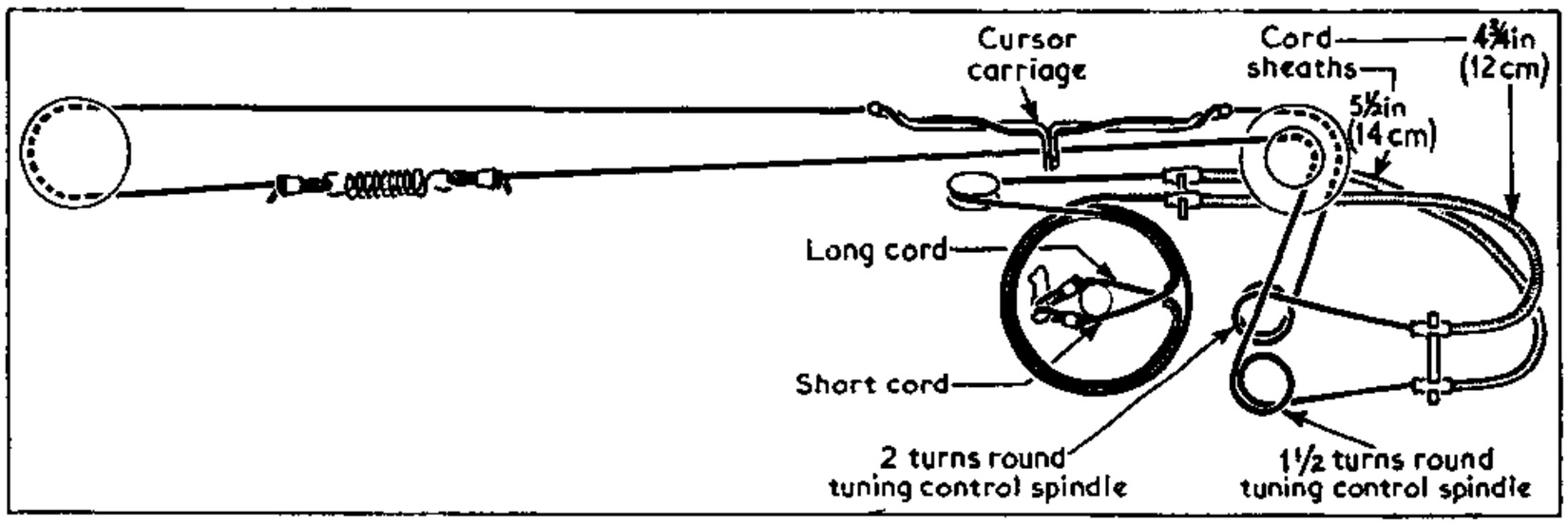
Anchor one end of the long cord to the lug in the drive drum and take it 1¾ turns clockwise round the drum. Thread the shorter cord sheath on the cord. Anchor one end of the short cord to the lug in the drive drum and pass it a quarter turn anti-clockwise round the drum and round the top pulley. Thread the longer cord sheath on the cord.

Wind the ends of the cords round the tuning spindle and run on as shown in the sketch, finally fitting the spring.

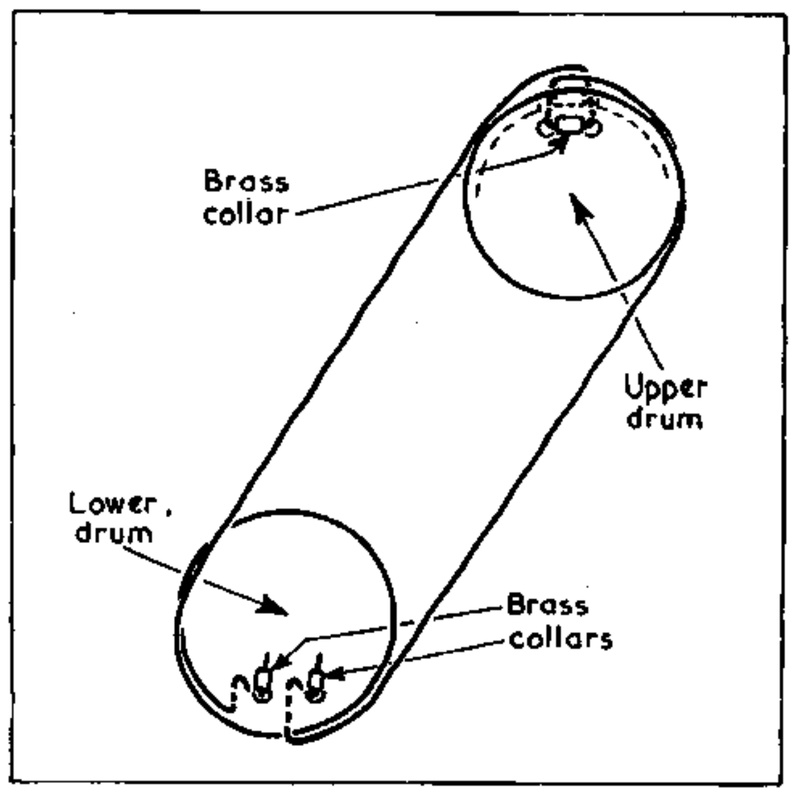
Tone Control Drive.—About 14in of drive wire is required for a new control drive. The control should be turned fully anti-clockwise, and a small brass collar threaded on to the wire and clamped at its centre.

The two ends of the wire should be threaded through the two small holes in the top flange of the upper drum, and pulled through so that the brass collar

Connections	Socket Numbers					
	1	2	3	4	5	3, 6, 7 (Link)
Ext. 300Ω dipole (F.M.)	Dipole	Dipole	—	—	—	6–7
Ext. A.M. aerial (A.M. and F.M.) ...	Aerial	—	—	Earth	—	3–7
Ext. 300Ω dipole (A.M. and F.M.) ...	Dipole	Dipole	—	Earth	—	3–7
Ext. 300Ω dipole (F.M.) ... ... Ext. A.M. aerial (A.M.)	Dipole	Dipole	Aerial	Earth	—	6–7
Ext. 75Ω dipole (F.M.)	Dipole	—	—	Dipole	—	6–7
Ext. 75Ω dipole (A.M. and F.M.) ...	Dipole	—	—	Dipole	Earth	3–7
Ext. 75Ω dipole (F.M.) ... ... Ext. A.M. aerial (A.M.)	Dipole	—	Aerial	Dipole	Earth	6–7



Above: Sketch of tuning drive system.



Right: Sketch of tone control drive.

rests between the two holes on the front of the drum flange. The two ends of the wire should then be run as indicated in the sketch in column 6, finally pulling the ends of the wire through the holes in the lower drum and clamping a brass collar on each. The wire should be taut.

Internal Aerial Drive Cord.—An overall length of about 20in of nylon braided glass yarn is required for a new drive cord which should be run as shown in the sketch at the foot of column 7.

With the control knob at the centre of its rotation, the stud on the control spindle should be at the top. With the knob in this position, the axis of the internal A.M. aerial should be parallel to the edge of the chassis, with the stud on its shaft towards the front of the chassis.

Make the cord up to the dimensions shown in the sketch and with the internal A.M. aerial set to its mid-position, pass the middle loop on the cord over the stud on the aerial shaft. Take the longer end of the cord and wind it three turns anti-clockwise (viewed from above) round the shaft. Run on as indicated in the sketch, finally taking the other end of the cord and winding it 1½ turns clockwise round the shaft and hooking it to the spring.

Scale Lamp.—This is a 6.2V, 0.3A tubular lamp with an S.B.C. base.

VALVE ANALYSIS

Valve voltages given in the table below are those derived from the manufacturers' information. They were measured with a valve voltmeter when the receiver was operating from A.C. mains of 245V. Except where otherwise indicated, the receiver was switched to M.W. Chassis was the negative connection in every case.

The voltage measured across **C61** was 285V for A.M. operation and 190V for F.M. operation.

Valve		Anode V	Screen V	Cath. V
V1 ECC85	a	150§	—	2§
	b	120§	—	—
V2 ECH81	a	120**	—	—
	b	225††	70	—
V3 EBF80	...	195	75	—
V4 EF85	...	185	85	—
V5 EABC80	a, b	—	—	—
	c	76	—	—
V6 EL84	...	245	285‡‡	7
V7 EZ80	...	230*	—	285†
T.I. EM80	...	—	—	—

* A.C., each anode. † Cathode current, 190 mA (A.M.), 220 mA (F.M.). § Receiver switched to F.M. ** Zero (F.M.). †† 165 (F.M.). ‡‡ 250 (F.M.).

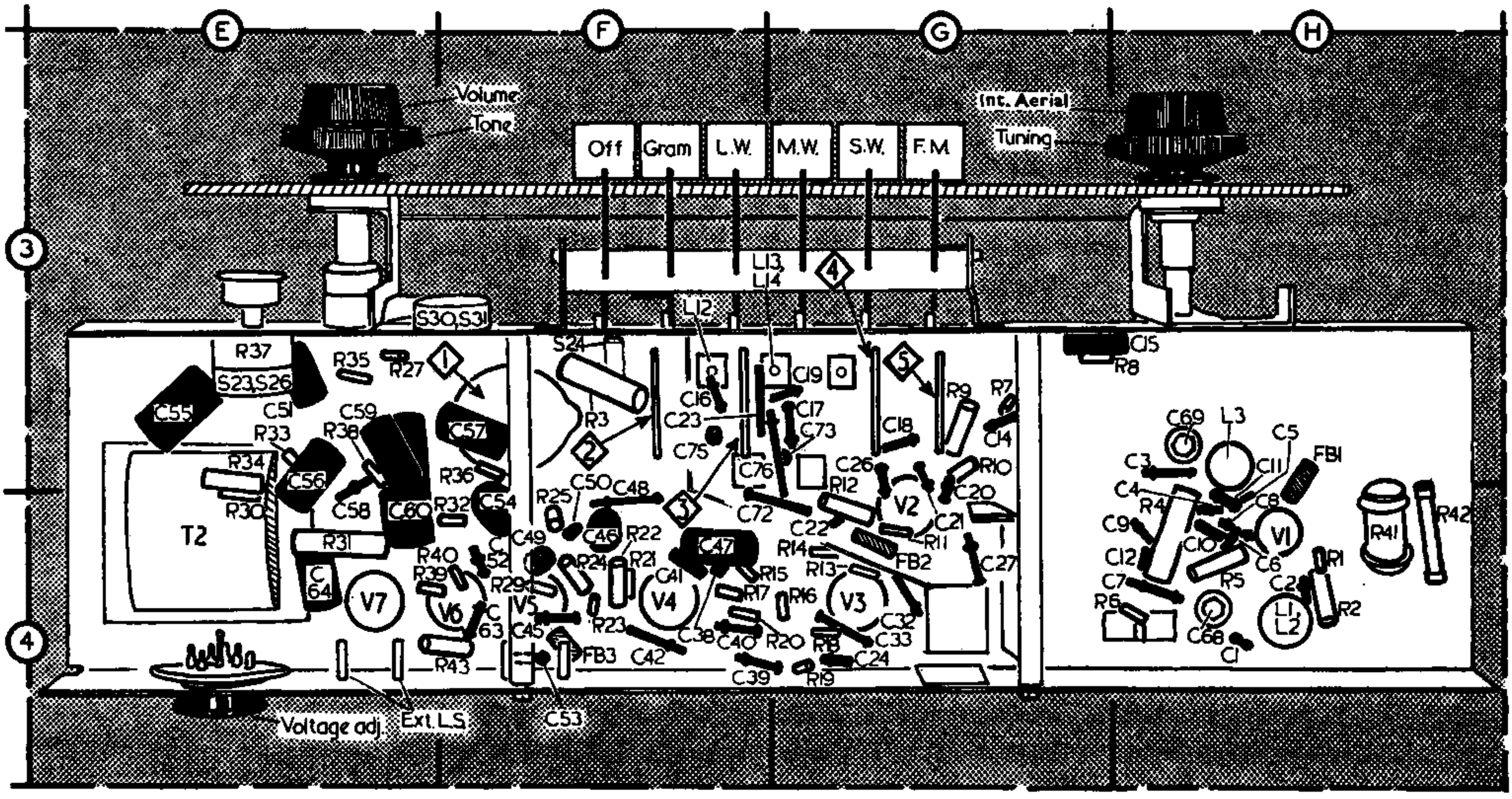
CIRCUIT ALIGNMENT

A.M. I.F. Stages.—Switch receiver to M.W. and set gang to its mid-position. Fully unscrew the cores of **L21** (location reference B2), **L22** (B2), **L25** (C2) and **L26** (B2). Connect output of signal generator, via an 0.05μF capacitor in the "live" lead, to control grid (pin 2) of **V2b** and chassis.

Feed in a modulated 470 kc/s signal and adjust the cores of **L26, L25, L21** and **L22** in that order for maximum output. Finally re-adjust the core of **L25** for maximum but do not disturb other cores.

I.F. Filter.—Fully unscrew the cores of **L13** (G3) and **L14** (B1). Connect the signal generator output, via a dummy aerial, to sockets 3 and 4 (**A** and **E** respectively) on the aerial panel. Feed in a 470 kc/s signal and adjust the core of **L13** (G3) for minimum output.

Short-circuit the internal aerial coils **L10, L11** (B1, B2), and adjust the core of **L14** (B1) for minimum output. Re-adjust



Underside view of chassis. The waveband/tone switch units in the diagrams at the foot of col. 9 are identified in locations F3, G3

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the core of **L13** for minimum output. Remove short-circuit from **L10, L11.**

A.M. R.F. and Oscillator Stages.—Check that, with the gang at minimum capacitance, the cursor coincides with the datum mark at the low wavelength end of the M.W. tuning scale.

S.W.—Switch receiver to S.W. and tune to 46.4m. With signal generator output connected, via a dummy aerial, to aerial sockets 3 and 4, feed in a 46.4m (6.47 Mc/s) signal and adjust the cores of **L17** (B1) and **L9** (B1) for maximum output. Tune receiver to 25.6m, feed in a 25.6m (11.73 Mc/s) signal and adjust **C25** (B2) and **C71** (B1) for maximum output.

M.W.—Switch receiver to M.W. and turn gang to maximum capacitance. Short-circuit **L10, L11** and feed in a 581.5m (516 kc/s) signal. Adjust the core of **L18** (C1) for maximum output. Tune receiver to 200m, feed in a 200m (1,500 kc/s) signal and adjust **C75** (C1) for maximum output.

Remove short-circuit from **L10, L11.** Tune receiver to 475m, feed in a 475m (630 kc/s) signal and adjust the inductance of **L10** (B1) for maximum output by sliding the coil along the ferrite rod. Tune receiver to 200m, feed in a 200m (1,500 kc/s) signal and adjust **C73** (B1) for maximum output.

L.W.—Switch receiver to L.W., tune to 1,750m and short-circuit **L10, L11.** Feed in a 1,750m (171.5 kc/s) signal and adjust **C76** (G3) for maximum output. Remove short-circuit from **L10, L11** and at the same frequency, adjust the inductance of **L11** (B2) for maximum output by sliding the coil along the ferrite rod.

L.W. Image Filter.—Switch receiver to L.W. and tune to 1,304m. Screw the core of **L12** (C1) fully in to the coil former. With the signal generator output connected to aerial sockets 3 and 4, feed in a 1,170 kc/s (256.4m) signal and unscrew the core of **L12** for minimum output, passing first through a maximum peak.

F.M. I.F. Stages.—Switch receiver to F.M. and turn gang to maximum capacitance. Connect valve voltmeter, via a 100kΩ resistor, across **C49** (F4), and connect output of signal generator, via a 1,500pF capacitor in "live" lead, to control grid (pin 2) of **V3** and chassis. Turn volume control to minimum. During the following adjustments, it is important that the voltage across **C49** should not exceed 6-8V, and the output of the signal generator should be adjusted to keep the voltage below this level.

Connect 47kΩ damping resistor across **L23,** and, feeding in an unmodulated 10.7 Mc/s signal, adjust the core of **L24** (C2) for maximum output. Transfer damping unit from **L23** to **L24,** and adjust the core of **L23** (B2) for maximum output. Remove damping unit.

Adjust the core of **L27** (C2) for maximum output, and then adjust the signal generator output to give an output reading of 8V across **C49.**

Connect valve voltmeter to junction of **R23, C46** (F4) and to chassis. Adjust the core of **L28** (C2) for a 4V reading on the meter. Re-connect valve voltmeter across **C49.** Transfer live signal generator lead to control grid (pin 2) of **V2b.**

Connect damping unit across **L20** and adjust the core of **L19** (B2) for maximum output. Transfer damping unit to **L19** and adjust the core of **L20** (B2) for maximum output. Remove damping unit.

Transfer live signal generator lead to anode (pin 1) of **V1b.** Connect damping unit across **L7** and adjust the core of **L6** (A2) for maximum output. Remove damping unit and adjust the core of **L7** (A2) for maximum output.

Adjust the output of the signal generator to give an 8V reading across **C49.** Tune the signal generator around 10.7 Mc/s, and check that the maximum reading does not exceed 8.5V and that it occurs between 10.67 Mc/s and 10.73 Mc/s. If the I.F. response does not fall within these limits, the F.M. I.F. alignment adjustments should be repeated.

F.M. R.F. and Oscillator Stages.—With the receiver still switched to F.M., tune it to 8 on the F.M. logging scale. Adjust **C69** (H3) to half maximum capacitance and adjust **C68** (H4) to minimum capacitance. Screw the core of **L5** (A2) fully out, and screw core of **L3** (A1) halfway out of its coil former. Connect signal generator output to aerial sockets 1 and 2.

With the valve voltmeter connected across **C49,** feed in an unmodulated 87.5 Mc/s signal and adjust the cores of **L5** and **L3** for maximum output.

Tune receiver to 100 Mc/s, and, feeding in an 87.5 Mc/s signal, adjust **C69** for maximum output (setting it to the first peak from minimum capacitance).

Tune receiver to 87.5 Mc/s and, feeding in an 87.5 Mc/s signal, re-adjust the core of **L3** for maximum output.

Tune receiver to 100 Mc/s, and, feeding in an 87.5 Mc/s signal, adjust **C68** for maximum output.

Switch Table

Sw.	Off	Gram	L.W.	M.W.	S.W.	F.M.
S1	C	C	C	C	—	C
S2	C	C	—	C	C	C
S3	C	C	C	—	C	C
S4	—	—	—	—	C	—
S5	—	—	—	—	—	C
S6	—	—	—	—	—	C
S7	C	C	C	C	C	—
S8	—	—	—	—	—	C
S9	—	—	—	—	C	—
S10	—	—	C	—	—	—
S11	—	—	—	—	C	—
S12	—	—	—	—	C	—
S13	C	C	C	C	—	C
S14	—	—	—	—	—	C
S15	C	C	C	C	C	—
S16	C	C	C	C	C	—
S17	C	C	C	C	C	—
S18	—	—	—	—	—	C
S19	C	C	C	C	C	—
S20	—	C	—	—	—	—
S21	C	—	C	C	C	C
S22	—	C	—	—	—	—
S24	C	—	—	—	—	—
S25	C	C	C	C	C	—
S27	C	C	C	C	C	—
S28	—	—	—	—	—	C
S29	C	C	C	C	C	—
S30	—	C	C	C	C	C
S31	—	C	C	C	C	C

Right: Diagram of waveband switches. *Below:* Sketch of internal aerial drive cord system.