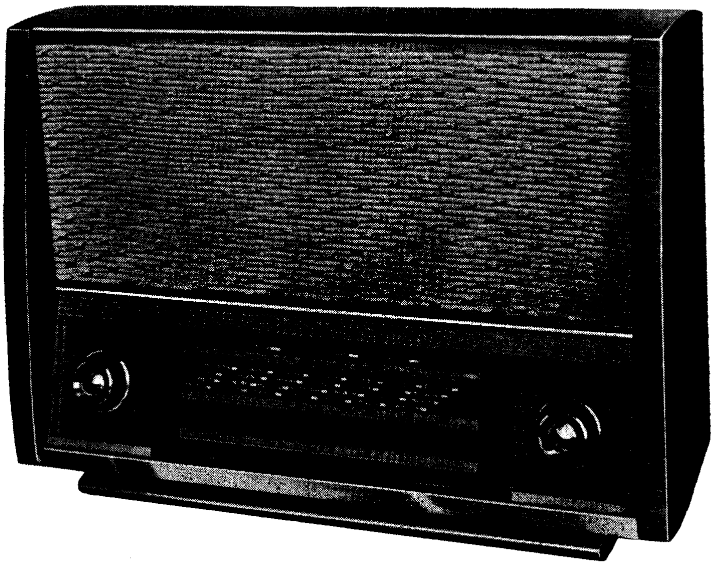
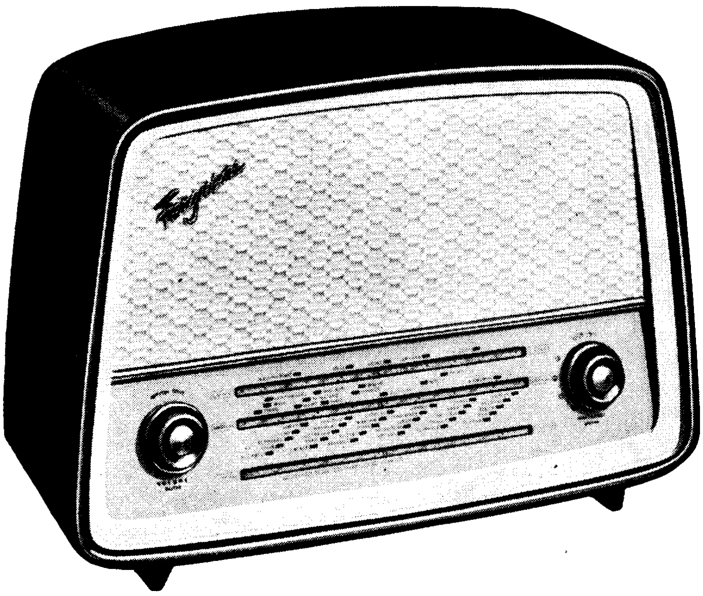
SERVICE MANUAL

MODELS 383A and 385RG (SCH. A & B)
MODEL 382U (SCH. A & B)





MODELS 382 U, 383 A AND 385 RG

1. GENERAL SPECIFICATION

1.1. DESCRIPTION

382U—Table model in moulded plastic cabinet.

383A—Table model in walnut veneered cabinet.

385RG—Console radiogram in walnut veneered cabinet.

These receivers employ the same basic chassis, providing reception on the V.H.F./F.M. band and the medium and long wave ranges.

Model 382U is an AC/DC version with a half wave valve rectifier. Models 383A and 385RG are for A.C. power supplies only and use a contact cooled bridge type metal rectifier with a double wound mains transformer.

A V.H.F. aerial and a rotatable ferrite-rod aerial are fitted in the cabinets of all models, but provision is made for external aerials if desired.

1.2. CONTROLS

Four controls at the front of the cabinet :—

Left-Hand Inner—Tone control/On-Off Switch

Left-Hand Outer — Volume Control

Right-Hand Inner — Tuning Control

Right-Hand Outer — Waverange Switch

The control for rotating the ferrite-rod aerial is accessible from the rear of the cabinet in the 382U and 383A, and in the 385RG the control is located at the side of the record changer well.

1.3. WAVEBAND COVERAGE

Long Wave	-	1160—1940 Metres
Medium Wave	-	188— 545 Metres
V.H.F./F.M.	-	88— 101 Mc/s

1.4. VALVES

The valves used in the 383A and 385RG are listed below, with the 382U types given in brackets ; all are of Mullard manufacture.

ECC85 (UCC85)	V.H.F. Amplifier and Mixer Oscillator
ECH81 (UCH81)	A.M. Frequency Changer and F.M. I.F. Amplifier
EF89 (UF89)	A.M. and F.M. I.F Amplifier.
EABC80 (UABC80)	A.M. and F.M. Detector and Audio Amplifier
EL84 (UL84)	Audio Output
(UY85)	Half Wave Rectifier (382U only)

1.5. LOUDSPEAKER

Models 383A and 382U

$6\frac{1}{2}$ inch diameter, speech coil impedance 3 ohms.

Model 385RG

8 inch diameter, speech coil impedance 3 ohms.

1.6. RECORD CHANGER

(Model 385RG)

Garrard RC120 automatic record changer, with turnover crystal pick-up. Apart from a small number of receivers which are equipped with the three speed version of this record changer, the majority provide, in addition, a $16\frac{2}{3}$ r.p.m. playing speed.

1.7. MAINS SUPPLY

Model 382U

200 to 250 Volts. A.C. or D.C. mains (50—60 cycles A.C.).

Power consumption, 50 Watts (approximately).

Model 383A

200 to 250 Volts, 50—60 cycles A.C. mains only.

Model 385RG

200 to 250 Volts, 50 cycles, A.C. mains only.

Consumption : Radio 50 Watts, Gram. 65 Watts (approximately).

Record changer motor pulleys for 60 cycle mains are obtainable from the changer manufacturers.

1.8. CABINET

382U. Moulded plastic table model. Dimensions $17\frac{3}{4}$ in. wide x 13 in. high x $6\frac{3}{4}$ in. deep.

383A. Walnut veneered table model. Dimensions : 18 in. wide x $13\frac{1}{4}$ in. high x 7 in. deep.

385RG. Walnut veneered console with top lid and record storage space. Dimensions : $32\frac{1}{2}$ in. wide x 29 in. high x $16\frac{5}{8}$ in. deep.

2. INSTALLATION AND OPERATION

2.1. MAINS VOLTAGE ADJUSTMENT

This takes the form of a shorting plug and socket panel mounted on the mains transformer in the A.C. models and on the chassis in the 382U. (See Figs. 1 and 2.)

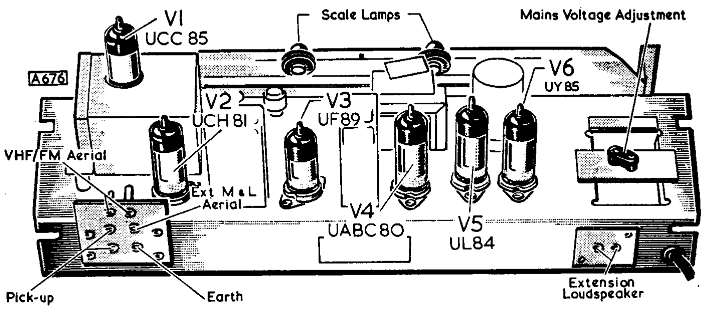


Fig. 1. 382U chassis, showing valve locations.

2.2. AERIALS

A.M.

The internal ferrite-rod aerial will, in most situations, provide an adequate signal with the advantage that its directional properties help in reducing interference. The control for altering the bearing of the aerial should be adjusted for maximum signal, or, if reception is marred by interference such as an overlapping station, a compromise setting can usually be found to reduce the interfering signal without seriously affecting the reception of the wanted station.

Aerial and earth sockets are provided for an external aerial system if desired.

V.H.F./F.M.

The high sensitivity of this receiver enables the internal V.H.F. aerial to be used where a reasonably good signal is available. It should however be noted that sufficient signal input to obtain satisfactory limiting action is necessary to ensure maximum discrimination against interference. If an external aerial is fitted a 75Ω balanced feeder should be used.

Multipath Propagation

Individual cases of multipath propagation can occur anywhere within the service area of an F.M. transmitter and cause severe audio distortion. Such cases are fortunately rare and the A.M. rejection provided by the receiver materially reduces the effect except where reception conditions are very poor.

When a high proportion of the signals picked up by the aerial are received indirectly from the transmitter via reflections, the phase differences, due to the various path lengths, produce both amplitude and phase modulation of the direct signal. The effect of this spurious modulation is extremely unpleasant, producing severe "break-up" at the higher audio frequencies.

Due to the nature of the distortion, the cause may not be immediately evident and could be mistaken for a receiver fault. If the effect is more noticeable on one of the three V.H.F. stations, it can be assumed that the distortion is caused by reception conditions. It is unlikely that all stations will be equally affected.

Re-orientation of the receiver, when using its internal aerial, may effect some improvement, but usually an efficient external aerial will be needed. The improved directional response of a full sized aerial with reflector will be effective in most cases in reducing the pick-up of reflected signals provided it is carefully orientated.

2.3. EXTERNAL LOUDSPEAKER

Sockets are provided for use with an external loudspeaker, which should have a speech coil impedance of about 3 ohms.

2.4. RECORD REPRODUCTION

Detailed instructions for operating the automatic record changer fitted in the 385RG are supplied with the instrument.

Pick-up sockets are provided in Models 382U and 383A. The pick-up may either be a crystal or high impedance magnetic type.

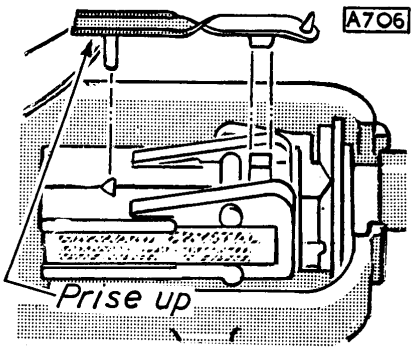


Fig. 3. Stylus replacement (Garrard GC2/PA). Remove by prising out the spigot as shown in the diagram. Replacement styli: LP—GC2/1, STD.—GC2/3.

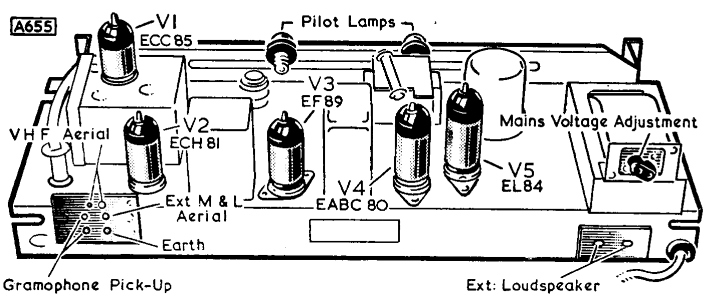


Fig. 2. 383A and 385RG chassis, showing valve locations.

3. THE CIRCUIT

Early 383A and 385RG receivers (SCH.A) differed from current SCH.B production, chiefly in the circuit arrangement of the ferrite-rod aerial. The following circuit description applies to the SCH.B arrangement — for the differences in early receivers see Modifications in Production, page 12.

No model 382U receivers were made with the early type A.M. aerial and all 382U receivers include the aerial circuit described below.

3.1. A.M. RECEPTION

With the receiver switched to the Medium or Long wave ranges, the H.T. supply to the V.H.F. tuner unit is disconnected and H.T. is fed to the triode anode of the frequency changer, **V2,** through contacts on **S1A.** On M.W., **L10** is short circuited by **S1B** and the ferrite-rod aerial **L9** is tuned by **C17** with trimmer **C18.** The signal is fed to the heptode control grid of **V2** via **C16** and **L7,** the secondary of the first F.M. I.F. transformer.

On L.W. the inductance of the ferrite-rod aerial is supplemented by the loading coil **L10** and a fixed L.W. trimmer **C20** is switched in parallel with **C18** and the tuning capacitor, **C17.**

When an external aerial is used, the signal is developed across **C6** in the low potential end of the aerial tuned circuit. **R4,** in parallel with **C6** prevents modulation hum by limiting the grid circuit impedance of **V2** at low frequencies. The A.G.C. control voltage is applied through **R6** and **L7** to **V2** grid circuit ; **C16** provides D.C. isolation.

The triode section of **V2** functions as a tuned grid oscillator. **L15, L16** provide the feedback coupling and on M.W. **L16** is tuned by **C32 (ganged with C17)** and the M.W. trimmer **C31.** For L.W. reception, **C35,** the L.W. trimmer and **C34** are connected through contacts on **S1C,** in parallel with **L16.**

The intermediate frequency of 470 Kc/s appears in **V2** heptode anode circuit and the first 470 Kc/s I.F. transformer, **L13, C27** and **L14, C28,** couples the signal to **V3** control grid.

L11, the primary of the 10.7 Mc/s I.F. transformer is switched out of circuit by contacts on **S1A** to prevent any possibility of harmonics generated by the local oscillator reaching **V3** control grid. **V3** serves as the I.F. amplifier and the signal is coupled to the A.M. detector by the 2nd 470 Kc/s I.F. transformer **L17, C38** and **L18, C39.** One of the diode sections of **V4** is used as a detector and **R16, C42** forms part of the I.F. filter.

The volume control **R25,** connected into circuit by **S1D,** is the diode load and the audio signal developed across it is coupled by **C51** to the control grid of the triode section of **V4,** the audio amplifier. The D.C. voltage developed across the volume control is fed as A.G.C. bias through **R15** to the grid circuits of **V2** and **V3. C.43** completes the I.F. filtering and **R29** functions as the tone control with **C54.**

The triode section of **V4** is resistance capacitance coupled to the audio output stage, **V5,** by **R22, C50** and **R26. R32** acts as a grid stopper. A hum neutralising output transformer, **T1,** is used in the 383 A and 385 RG, but in the 382 U an output transformer with untapped primary and a standard smoothing circuit is employed.

Negative feedback is provided over the audio stages in the 383 A and 385 RG but not in the 382 U. In the 383 and 385 the voltage developed across the loudspeaker speech coil is fed back through **R31** and injected in **V4** grid circuit across **R28.**

A bridge type metal rectifier is employed for H.T. supply in the 383 and 385 with a double wound mains transformer, **T2.** The valve heaters are parallel connected. In the 382 U, a series heater line is employed and H.T. supply is provided by a half wave rectifier, **V6.**

3.2 V.H.F./F.M. RECEPTION

The V.H.F. tuner unit is enclosed in a small screening box and utilises a double triode valve **V1A** and **V1B. V1A** functions as an earthed grid R.F. amplifier and the 75 ohm aerial feeder is coupled into the cathode circuit by **L1, L2. L2** is broadly tuned by **C4** and the control grid is effectively earthed at R.F. by **C3. R1** is the grid leak and A.G.C. feed resistor.

The anode load **L3** is capacitively tuned by trimmer **C2,** and is tunable over the band by means of an adjustable aluminium slug core.

V1B functions as a self-oscillating mixer with inductive coupling between anode and grid circuits provided by **L4** and **L5. L5,** the grid winding, is fitted with an aluminium slug core mechanically ganged with **L3** to provide variable tuning. The tuning capacitance is made up by a pre-set trimmer, **C8 ; C9** and **C10,** which have compensating temperature coefficients to reduce the possibility of oscillator drift ; and **C11, C12** in series. The junction of **C11** and **C12** provides a point of injection for the signal voltage developed across **L3.**

Additive mixing takes place and the resulting 10.7 Mc/s intermediate frequency is developed across **L6** in **V1B** anode circuit. **L6** is tuned to 10.7 Mc/s by **C7** which also serves as the anode coupling capacitor for the oscillator feedback coil.

A small proportion of the I.F. output is also developed across **C14** and provides I.F. feedback to **V1B** grid which increases the impedance of the oscillator circuits which shunt **L6.**

L6 and **L7** (tuned by **C15**) form the first 10.7 Mc/s I.F. transformer which couples the output of the tuner unit to the heptode control grid of **V2** operating as an I.F. amplifier. The H.T. supply to the triode section of **V2** is broken by contacts on **S1A** which, also switches H.T. to the V.H.F. tuner.

The second 10.7 Mc/s I.F. transformer **L11, C25** and **L12, C26** is included in **V2** anode circuit and couples the signal to **V3** control grid which provides a further stage of I.F. amplification. The grid is returned to the A.G.C. line through the secondary of the 470 Kc/s I.F. transformer. The A.G.C. line is common to both A.M. and F.M. circuits, but with the receiver switched to V.H.F./F.M. one side of **R15** is connected directly to chassis through contacts on **S1B.** The grid circuit of **V3,** therefore, is returned to chassis through **R15** and **C22** in parallel. On signals strong enough to drive **V3** into grid current, **C22** charges and provides a negative bias which reduces the gain of the stage. This voltage is also applied to **V2** and **V1A** via the A.G.C. line.

The signal developed in the anode circuit of **V3** is coupled to the ratio detector by a tuned transformer, **L19, C40** and **L21, C41** with a tertiary winding, **L20.** Two of the diode sections of **V4** are connected in a ratio detector circuit with **C49** as the stabilising reservoir capacitor and **R20,** the detector load. **C44** and **C48** are the I.F. filtering capacitors and **C45/R18** provide F.M. de-emphasis. **C46** couples the signal to the volume control and audio amplifier through contacts on **S1D.**

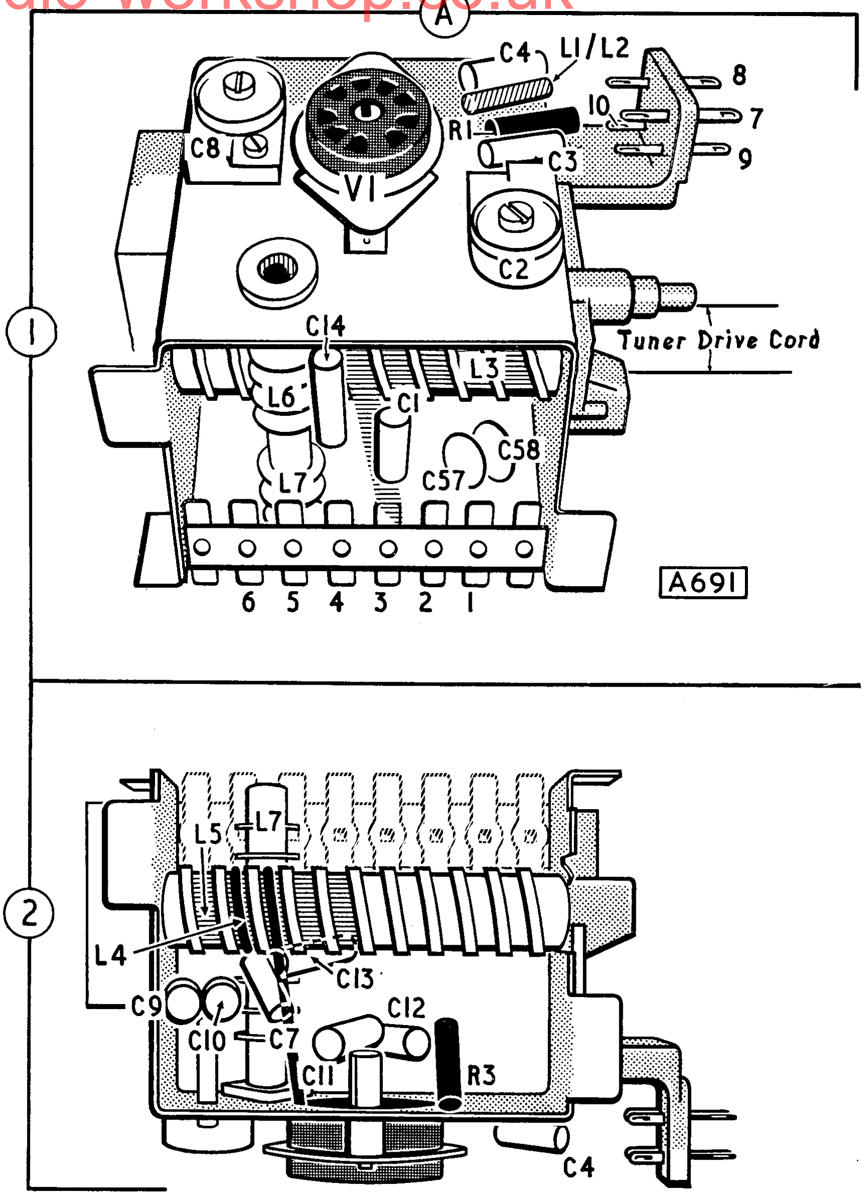


Fig. 4. V.H.F./F.M. tuner unit with screening box removed to show component locations.

C1	— A1	C58	— A1
C2	— A1	R1	— A1
C3	— A1	R3	— A2
C4	— A1	L1 } L2 }	— A1
C7	— A2	L3	— A1
C8	— A1	L4	— A2
C9	— A2	L5	— A2
C10	— A2	L6 } L7 }	— A1
C11	— A2		
C12	— A2		
C13	— A2		
C14	— A1		
C57	— A1		

3.3 CIRCUIT DETAILS

CAPACITORS

(All 350 V. working 20% tolerance unless otherwise stated)

Ref.	Value	Rating	Function	Part No.
C 1	1500 pF		VIA H.T. decoupling	
C 2	2-10 pF	Pre-set	L3 tuning	Z13903
C 3	220 pF		VIA grid coupling	
C 4	20 pF	5%	L2 tuning	
C 5	500 pF		A.M. Ae. isolating	
C 6	3000 pF	10%	A.M. Ae. coupling	
C 7	25 pF	5%	VIB anode coupling	
C 8	2-10 pF	Pre-set	L5 tuning (with C9, C10)	Z13903
C 9	4.7 pF	±0.5 pF N750		C47XH75/F14
C10	14 pF	10% P100		C140S75/F13
C11	10 pF	±0.5 pF P100	Osc.-mixer signal injection (with C12)	
C12	10 pF	±0.5 pF P100		C100H75/F13
C13	10 pF	±0.5 pF P100	Oscillator balancing	C100H75/F13
C14	85 pF	2.5%	I.F.-mixer feedback	Y850R35/SU4
C15	33 pF	5%	L7 tuning	Y330G35/SU4
C16	220 pF	10%	V2 hept. C.G. coupling (A.M.)	
C17	528 pF †	Variable	A.M. ae. tuning	
C18	50 pF*	Pre-set	M.W. ae. trimmer	Z13915
C20	165 pF	5%	L.W. ae. trimmer	S/N45753
C21	5000 pF		V2 S.G. decoupling	
C22	0.1 uF	150 V.	A.G.C. decoupling	
C23	5000pF		V2 hept. anode decoupling	
C24	5000pF		H.T. decoupling	
C25	12 pF	5%	L11 tuning	Y120G35/SU4
C26	15 pF	5%	L12 tuning	Y150G35/SU4
C27	220 pF	2%	L13 tuning	Y221R35/SU4
C28	220 pF	2%	L14 tuning	Y221R35/SU4
C29	220 pF		Osc. anode coupling (A.M.)	
C30	100 pF		Osc. grid coupling (A.M.)	
C31	50 pF *	Pre-set	M.W. osc. trimmer	Z13911
C32	528 pF†		A.M. osc. tuning	
C33	390 pF	2%	A.M. osc. padder	Y391R35/SU2
C34	375 pF	2%	L.W. osc. trimmer (with C35)	45752
C35	50 pf	Pre-set		Z13911
C36	5000 pF		V3 S.G. decoupling	
C37	5000 pF		V3 anode decoupling	
C38	220 pF	2%	L17 tuning	Y221R35/SU4
C39	220 pF	2%	L18 tuning	Y221R35/SU4
C40	12 pF	5%	L 19 tuning	Y120G35/SU4
C41	47 pF	5%	L21 tuning	Y470G35/SU4
C42	100 pF		I.F. filter (A.M.) (with C43)	
C43	100 pF			
C44	400 pF	10%	F.M. I.F. filter & de-emphasis (with C45)	
C45	500 pF			
C46	0.02 uF	150 V.	Audio coupling (F.M.)	
C47	32 uF	Electrolytic 275V.	H.T. smoothing	Y13200/6/P6
C48	400 pF	10%	Part ratio det. circuit	
C49	4 uF	Electrolytic 150V.	Ratio det. stabiliser	Z13210/1/P1
C50	0.01 uF (382) / 0.001 uF (383/5)		V5 C.G. coupling	
C51	0.02 uF	150 V.	V4 C.G. Coupling	
C52	0.004 uF	300 V. A.C.	Tone correction	
C53	50 uF	Electrolytic 25V.	V5 cathode bypass	Z13202
C54	0.01 uF		Part tone control	
C55	40 uF	Electrolytic 275V.	H.T. smoothing	Y13200/6/P6 (C55, C56)
C56	40 uF	Electrolytic 275V.	H.T. reservoir	
C57	1000 pF	—20+80%	Heater R.F. bypass (C57–C59)	
C58	1000 pF	—20+80%		
C59	2500 pF	—20+80%		
C60	0.02 uF	300 V. A.C.	Mains R.F. bypass	
C70	0.02 uF		Earth isolating	
C71	0.002 uF		Pick-up isolating (with C72)	
C72	0.02 uF			

† Swing value. Part No. Y10506.
* Maximum.

MISCELLANEOUS

Ref.	Function and Description	Part No.
S1A	A.M./F.M. H.T. switch	Z17139 (S1A–S1D)
S1B	A.M. Aerial and F.M. I.F. circuit switch	
S1C	A.M. Oscillator circuit switch	
S1D	Radio/Gram. and A.G.C. switch	
S3, S4	Mains On-Off switch (ganged with R29)	Y13038
P.L.1, P.L.2†	Pilot lamps 12 V., 0.1 A. (382 SCH.B)	33764
P.L.1, P.L.2	Pilot lamps 6.5 V., 0.3 A. (383/5)	33755
L.S. (382/3)	P.M. 3Ω speech coil, 6½in. diameter	Y16002/4
L.S. (385)	P.M. 3Ω speech coil, 8in. diameter	Y16003/8
W1 (383/5)	H.T. rectifier (Siemens B250 C75)	Z10508
X1, X2, X3* (382U)	Thermistors, Varite V1010	Z4558/7

* X3 382U (SCH.A) only.
† 22 V. 0.1A in SCH. A.

RESISTORS

(All ¼ Watt carbon 20% tolerance unless otherwise stated)

Ref.	Value	Rating	Function	Part No.
R 1	680 KΩ		VIA grid leak	
R 2	10 KΩ	10%	VIA anode feed	
R 3	680 KΩ		VIB grid leak	
R 4	3.3 KΩ		A.M. Ae. shunt	
R 5	15 KΩ	10%	VIB anode feed	
R 6	2.2 MΩ		V2 hept. A.G.C. feed	
R 7	15 KΩ / 47 KΩ	10% (382) / 10% (383/5)	V2 S.G. feed	
R 8	1 KΩ		H.T. decoupling	
R 9	3.3 KΩ		V2 hept. anode feed	
R10	15 KΩ / 27 KΩ	10% (382) / 10% (383/5)	Osc. anode feed	
R11	47 KΩ	10%	Osc. grid leak	
R12	68 KΩ	10%	Osc. limiter	
R13	47 KΩ	10%	V3 S.G. feed	
R14	3.3 KΩ		V3 anode feed	
R15	2.2 MΩ		A.G.C. decoupling	
R16	100 KΩ		I.F. filter (A.M.)	
R17	68 Ω		Part ratio det. circuit	
R18	100 KΩ		I.F. filter & de-emphasis (F.M.)	
R19	820 Ω	10%	Part ratio det. circuit	
R20	27 KΩ	10%	Ratio det. load	
R21	120 KΩ / 470 KΩ	10% (382) / (383/5)	Pick-up series	
R22	220 KΩ		V4 triode anode load	
R23	6.8 MΩ		V4 grid leak	
R24	1.5 KΩ / 680 Ω	10% 1W. (382) / ½W. (383/5)	H.T. smoothing	
R25	500 KΩ †	Potr. (log.)	Volume control	
R26	470 KΩ		V5 grid leak	
R27	270 Ω / 150 Ω	10% ½W. (382) / 10% ½W. (383/5)	V5 cathode bias	
R28	82Ω	10%	Negative feedback injection	
R29	250 KΩ †	Potr. (log.)	Tone control	
R30	500 Ω / 820 Ω	5% W.W. 6W. (382) / 10% 1W. (383/5)	H.T. smoothing	501GW06 / 821S02/E
R32	4.7 KΩ		V5 grid stopper	
R40	100 Ω	10% W.W. 6 W.	V6 current limiter	101GW06
R41	250 Ω	10% W.W. 6 W.	Mains dropper	251SW06
R42	2.7 KΩ	10% 1 W.	X1 shunt	
R43	4.7 KΩ	10% ½W.	Pilot lamps shunt	

† Concentric controls, Part No. Y13038.

INDUCTORS AND TRANSFORMERS

(D.C. resistance not given if less than 1 ohm)

Ref.	Function		Resistance	Part No.
L 1, L 2	V.H.F. aerial input transformer		—	Z10475
L 3	V.H.F. Amplifier tuning		—	
L 4	V.H.F. oscillator feedback		—	
L 5	V.H.F. oscillator tuning		—	
L 6, L 7	1st F.M. I.F.T.	Pri. / Sec.	— / —	Y10474
L 9	Ferrite-rod aerial		*	Y10567
L10	L.W. Aerial loading coil		15Ω	Y10570
L11, L12	2nd F.M. I.F.T.	Pri. / Sec.	— / —	Z10509 (L11–L14)
L13, L14	1st A.M. I.F.T.	Pri. / Sec.	5.5Ω / 5.5Ω	
L15	Oscillator feedback (A.M.)		—	Y10489 (L15, L16)
L16	Oscillator tuning (A.M.)		2Ω	
L17, L18	2nd A.M. I.F.T.	Pri. / Sec.	5.5Ω / 5.5Ω	X17017 (L17–L21)
L19, L20, L21	3rd F.M. I.F.T.	Pri. / Tert. / Sec.	— / — / —	
T 1 (382U)	Audio output transformer	Pri. / Sec.	150 / —	Z10395
T 1 (383/5)	Audio output transformer	Pri. / Sec.	450 / —	Z14586
T 2 (383/5)	Mains transformer	Pri. (total) / H.T. sec. / L.T. sec.	38 / 100 / —	Y17020

* 383/5 SCH.B and 382U SCH.A.
383/5 SCH.A aerial, Part No. Y10487.

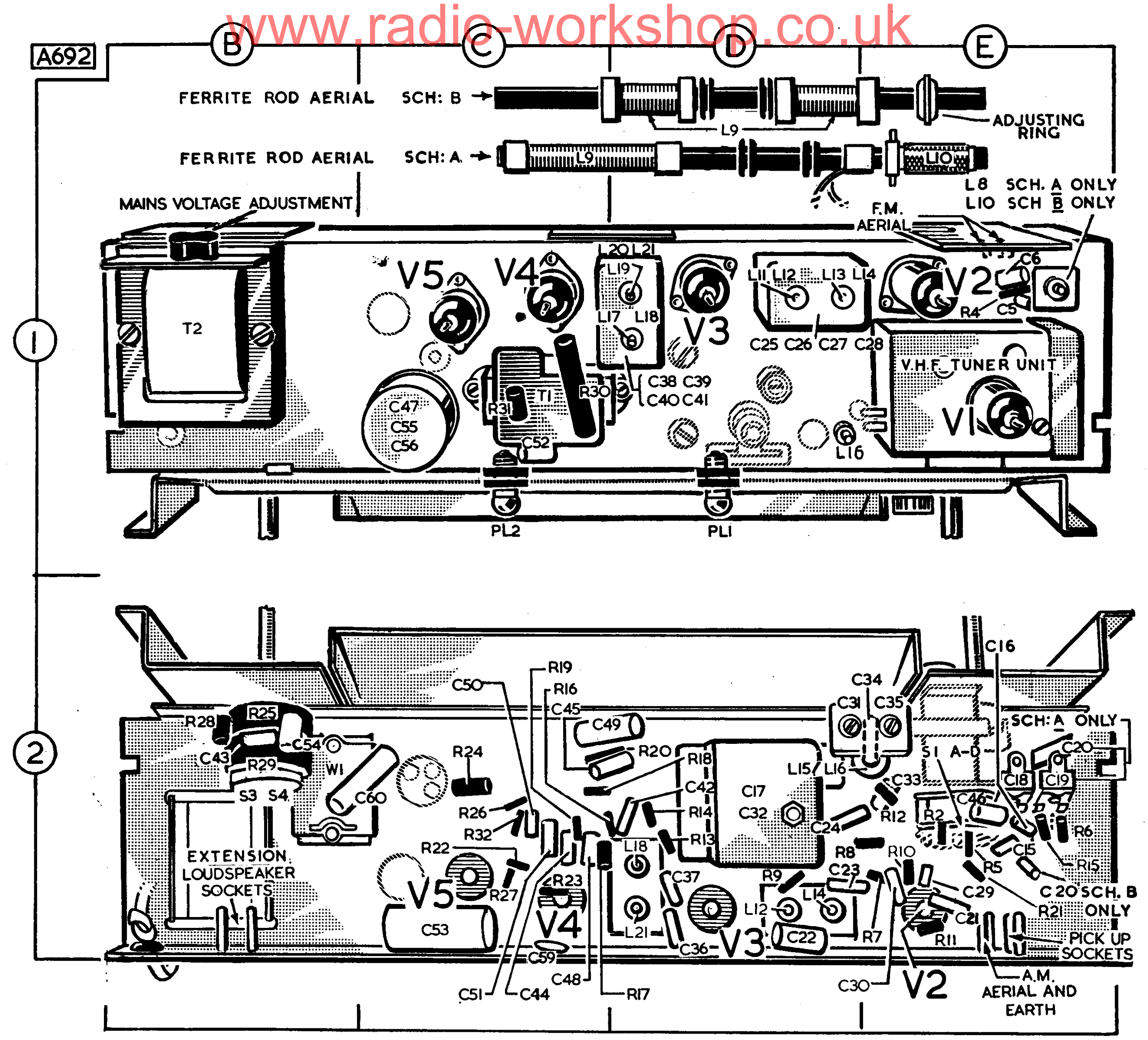


Fig. 5. 383 A and 385 RG chassis, showing component locations. The SCH.A and SCH.B ferrite-rod aerials are shown and the component locations affected by the aerial modifications are noted on the diagram.

C 5	E 1	C31	D 2	C49	D 2	R 2	E 2	R21	E 2	L 8	E 1
C 6	E 1	C32	D 2	C50	C 2	R 4	E 1	R22	C 2	L 9	D 1
C15	E 2	C33	E 2	C51	C 2	R 5	E 2	R23	C 2	L10	E 1
C16	E 2	C34	E 2	C52	C 1	R 6	E 2	R24	C 2	L11	
C17	D 2	C35	E 2	C53	C 2	R 7	E 2	R25	B 2	L12	D 1
C18	E 2	C36	D 2	C54	B 2	R 8	E 2	R26	C 2	L13	
C19	E 2	C37	D 2	C55	C 1	R 9	D 2	R27	C 2	L14	
C20	E 2	C38	D 1	C56	C 1	R10	E 2	R28	B 2	L15	D 2
C21	E 2	C39	D 1	C59	C 2	R11	E 2	R29	B 2	L16	
C22	D 2	C40	D 1	C60	C 2	R12	E 2	R30	C 1	L17	
C23	D 2	C41	D 1			R13	D 2	R31	C 1	L18	
C24	D 2	C42	D 2			R14	D 2	R32	C 2	L19	D 1
C25	D 1	C43	B 2			R15	E 2			L20	
C26	D 1	C44	C 2	PL 1	D 1	R16	D 2			L21	
C27	D 1	C45	C 2	PL 2	C 1	R17	C 2			T 1	C 1
C28	D 1	C46	E 2	S1A-D	E 2	R18	C 2			T 2	B 1
C29	E 2	C47	C 1	S3/S/4	B 2	R19	C 2				
C30	E 2	C48	C 2	W 1	B 2	R20	D 2				

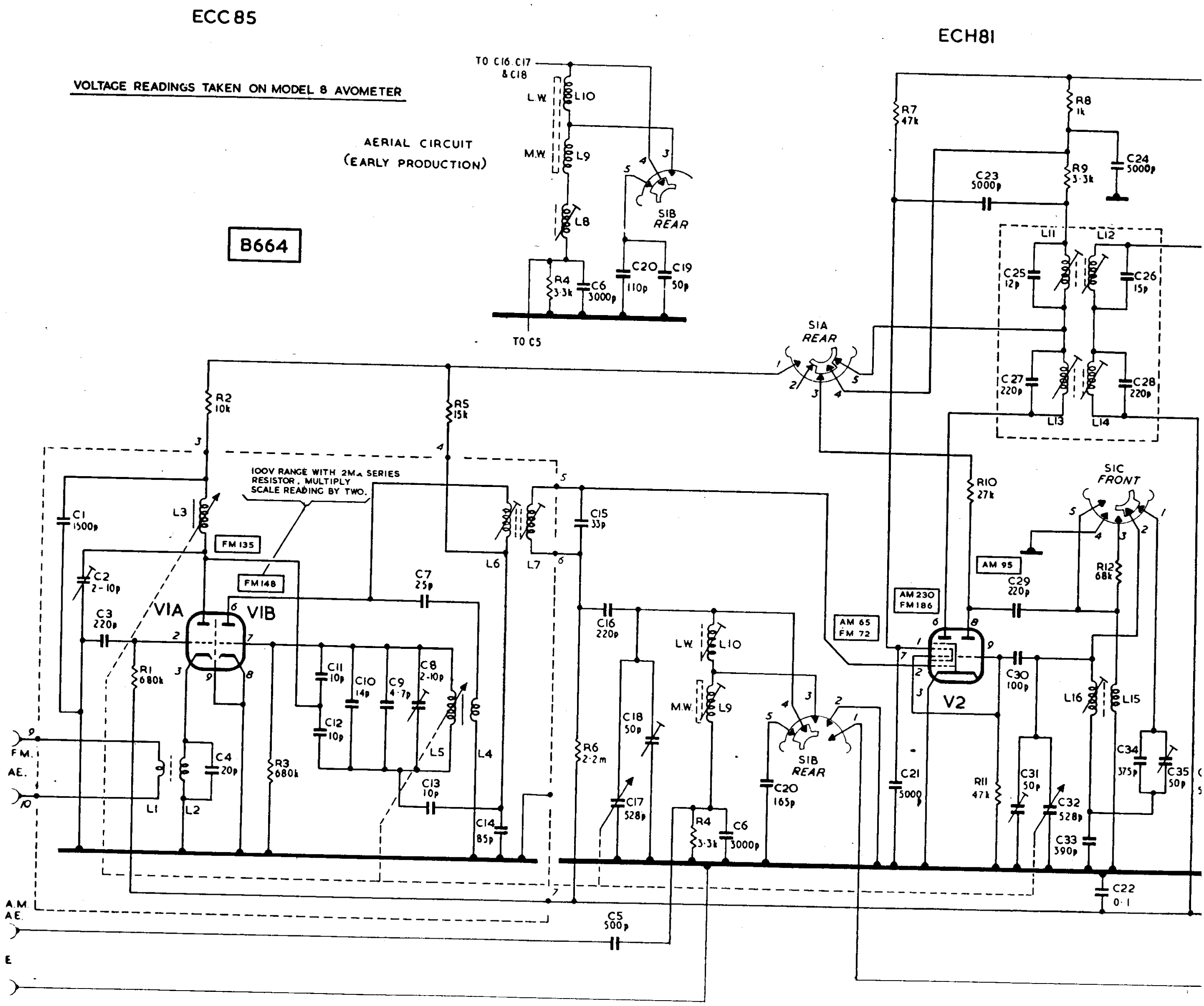
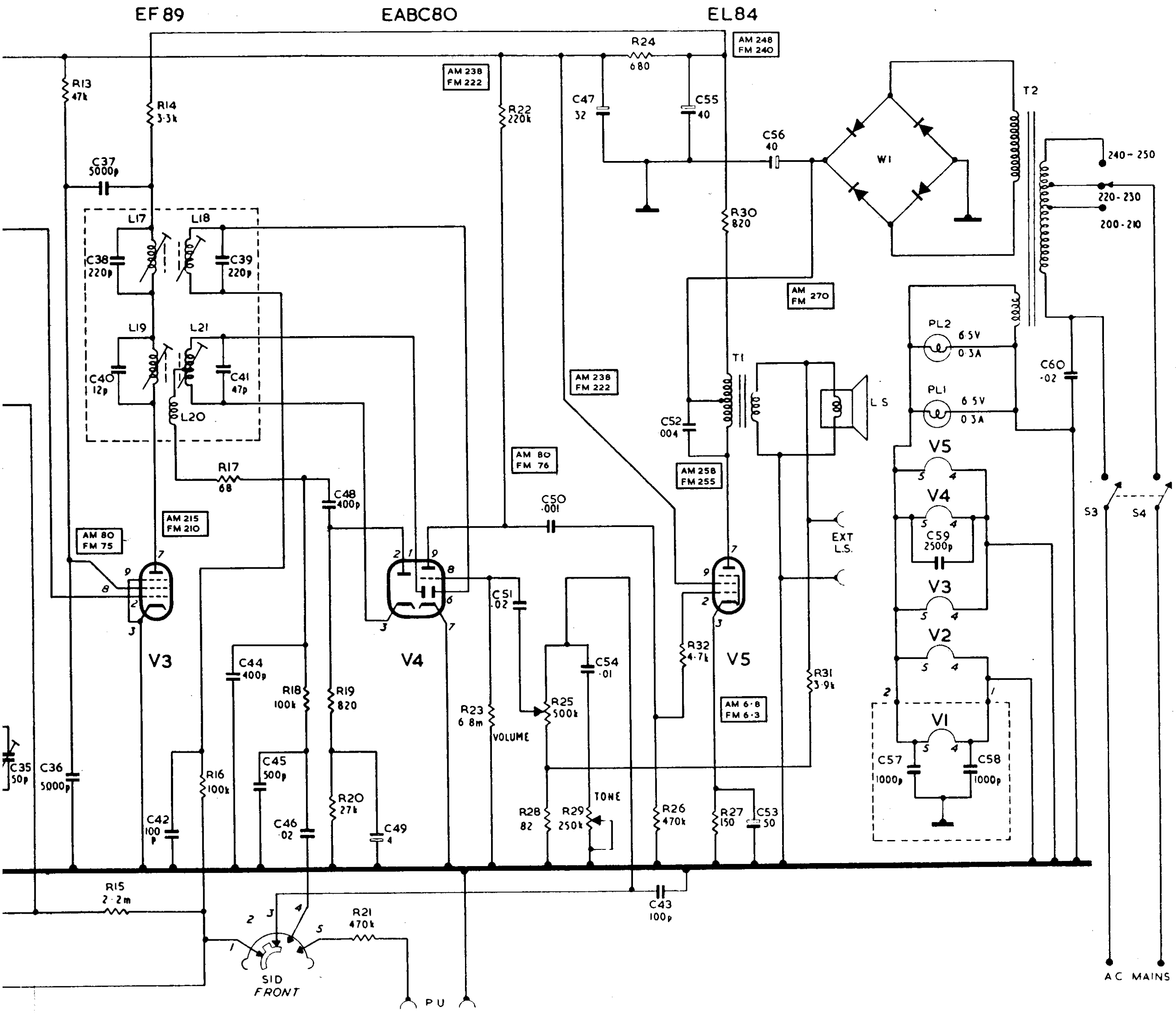


Fig. 6. Model 383 A (SCH.B) circuit diagram. Model 385 RG (SCH.B) is identical except that a switch for the internal loudspeaker is incorporated in the external loudspeaker socket. The AM. aerial circuit of SCH.A receivers, where different from SCH.B, is shown inset.

NOTES

1. The waverange switches are shown in the L.W. (fully anti-clockwise position) as viewed from the spindle end with the rear sections (S1A and S1B) as they would be seen "through" the wafer. Numbers against the contacts refer to the accompanying switch table which gives the switch operations for each waveband.
2. Numbers adjacent to the valves indicate the pin connections to the various electrodes.
3. The numbered connections to the V.H.F. Tuner correspond with the numbered tags shown in Fig. 4.

L10	(SCH.A)	6.5Ω
L10	(SCH.B)	15Ω
L13	—	5.5Ω
L14	—	5.5Ω
L16	—	2Ω
L17	—	5.5Ω
L18	—	5.5Ω
T 1	(pri.)	450Ω
T 2	Pri. (total)	28
	Sec. (H.T.)	100



SWITCH TABLE

Position	Contacts Closed			
	S1A	S1B	S1C	S1D
L.W.	3, 4, 5	4, 5	1, 2	1, 3
M.W.	3, 4, 5	3, 4	2, 3	1, 3
V.H.F.	1, 4	1, 2, 3, 4	2, 3, 4, 5	3, 4
GRAM.	—	1, 2	4, 5	3, 5

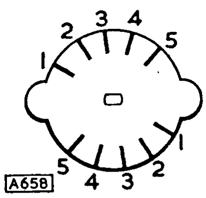
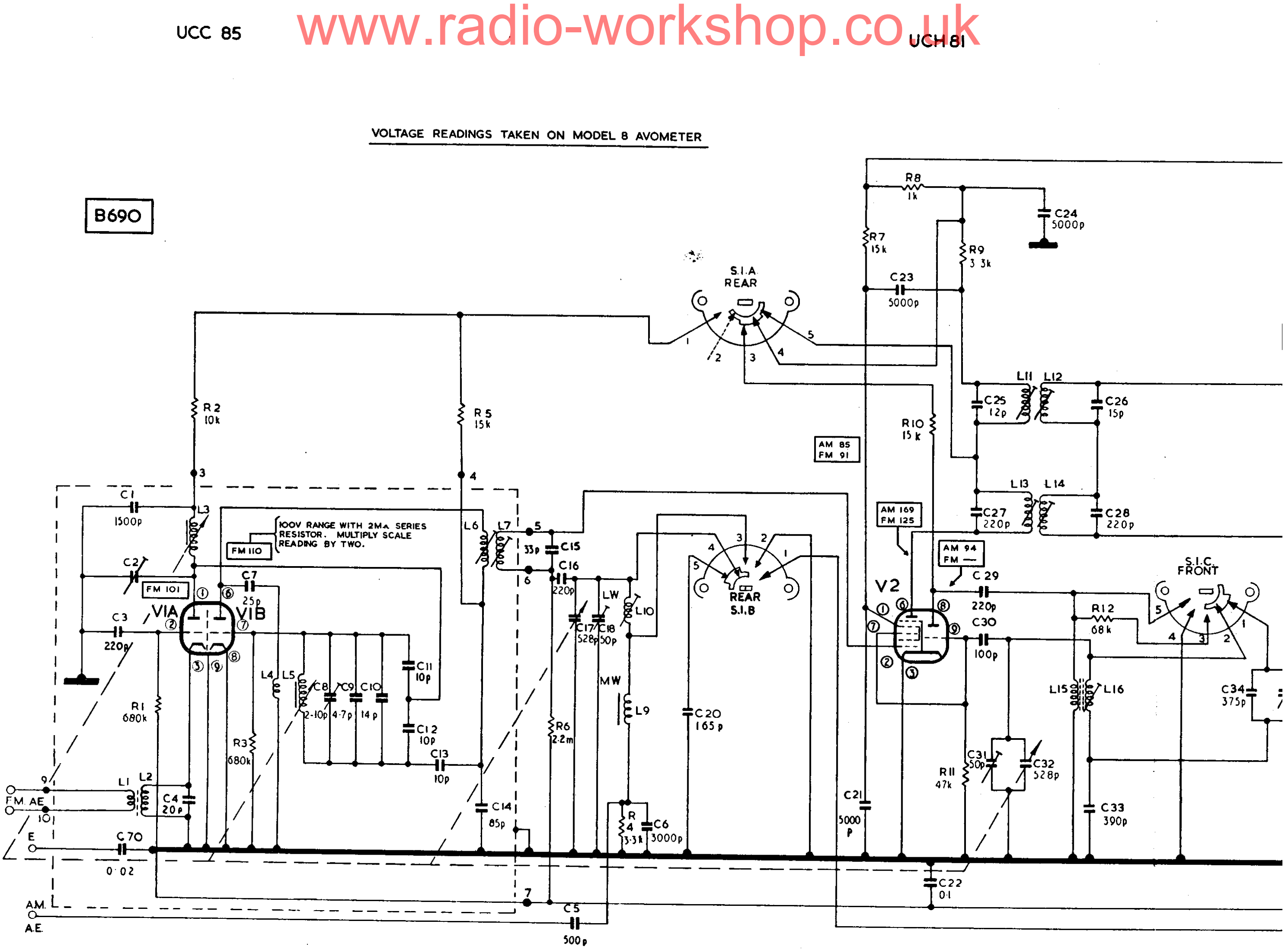


Fig. 7. Generalised view of switch wafer, showing relative positions of contacts.



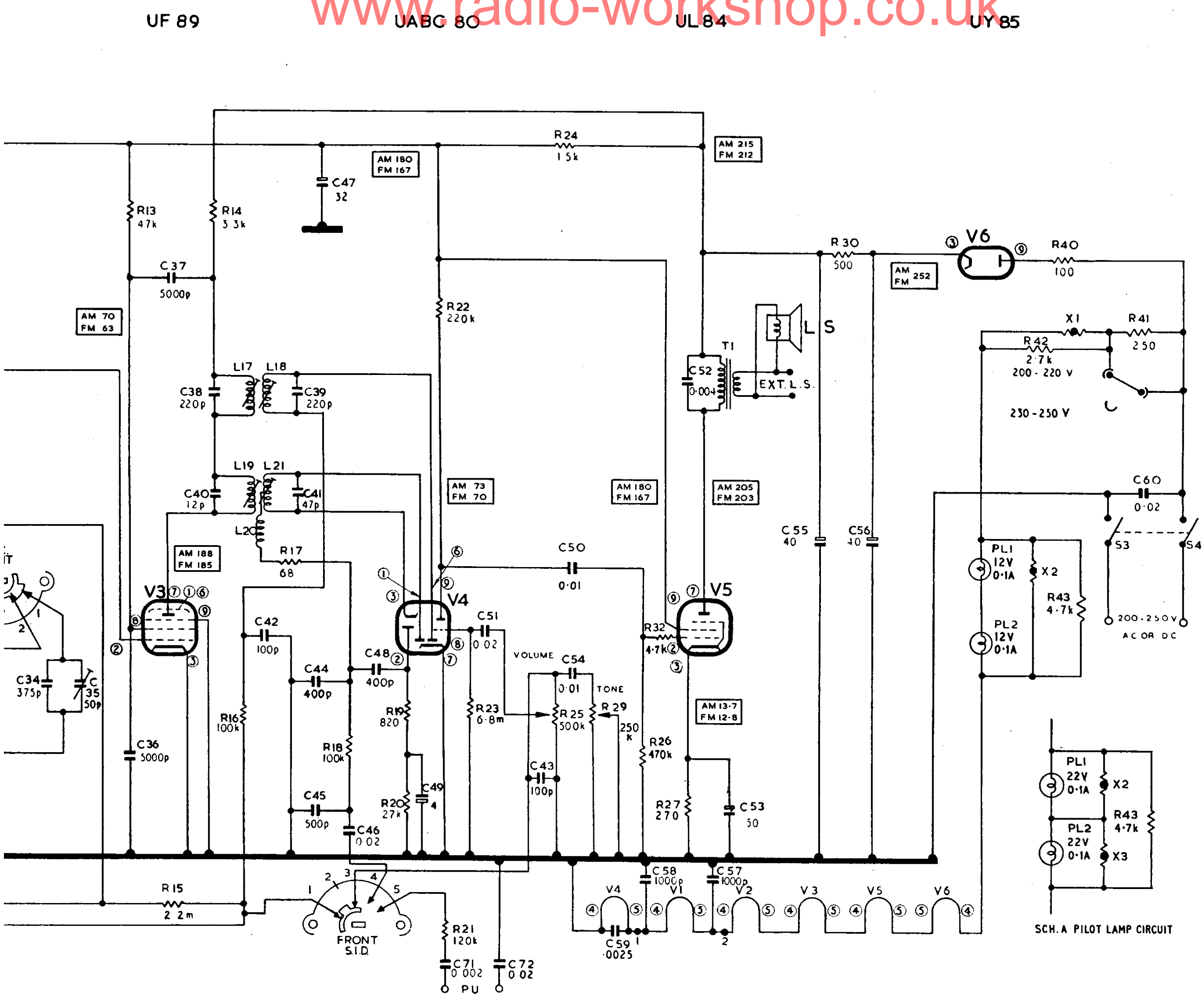
g. 8. Circuit diagram of Model 382U (SCH.B). In SCH.A receivers, the pilot lamps rating and circuit differed as shown inset.

NOTES

The waverange switches are shown in the L.W. (fully anti-clockwise position) as viewed from the spindle end with the rear sections S1A and S1B as they would be seen "through" the wafer. Numbers against the contacts refer to the Switch Table on Page 10 which gives the switch operations for each waveband.

Numbers in circles adjacent to the valves indicate the pin connections of the various electrodes.

The numbered connections to the V.H.F. tuner correspond with the numbered tags shown in Fig. 4.



L10 — 15Ω
L13 — 5.5Ω
L14 — 5.5Ω
L16 — 2Ω
L17 — 5.5Ω
L18 — 5.5Ω
T 1 (Pri.) 150Ω

SWITCH TABLE

Position	Contacts Closed			
	S1A	S1B	S1C	S1D
L.W.	3, 4, 5	4, 5	1, 2	1, 3
M.W.	3, 4, 5	3, 4	2, 3	1, 3
V.H.F.	1, 4	1, 2, 3, 4	2, 3, 4, 5	3, 4
GRAM.	—	1, 2	4, 5	3, 5

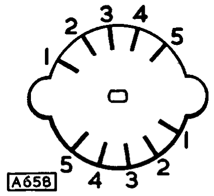


Fig. 9. Generalised view of switch wafer, showing relative positions of contacts.

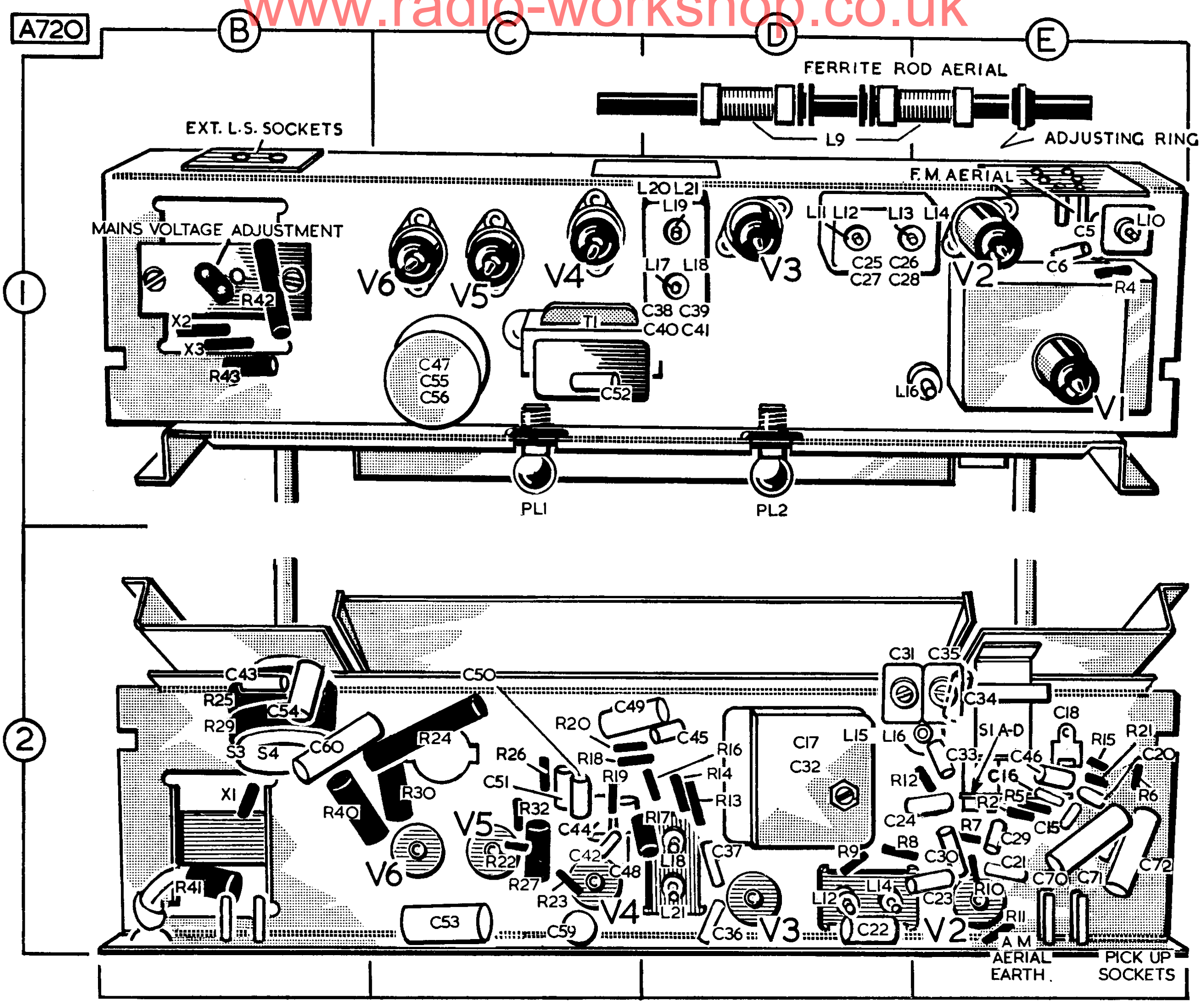


Fig. 10. Model 382U chassis, showing component locations.

C 5	E 1	C34	E 2	C54	B 2	R 2	E 2	R23	C 2	L 9	D 1
C 6	E 1	C35	E 2	C55	C 1	R 4	E 1	R24	C 2	L10	E 1
C15	E 2	C36	D 2	C56	C 1	R 5	E 2	R25	B 2	L11	
C16	E 2	C37	D 2	C59	C 2	R 6	E 2	R26	C 2	L12	D 1
C17	D 2	C38	D 1	C60	B 2	R 7	E 2	R27	C 2	L13	
C18	E 2	C39	D 1	C70	E 2	R 8	D 2	R29	B 2	L14	
C20	E 2	C40	D 1	C71	E 2	R 9	D 2	R30	C 2	L15	D 2
C21	E 2	C41	D 1	C72	E 2	R10	E 2	R32	C 2	L16	
C22	D 2	C42	C 2			R11	E 2	R40	B 2	L17	
C23	E 2	C43	B 2			R12	E 2	R41	B 2	L18	
C24	E 2	C44	C 2			R13	D 2	R42	B 1	L19	D 1
C25	D 1	C45	D 2			R14	D 2	R43	B 1	L20	
C26	D 1	C46	E 2			R15	E 2			L21	
C27	D 1	C47	C 1	PL 1	C 1	R16	D 2			T 1	C 1
C28	D 1	C48	D 2	PL 2	D 1	R17	C 2				
C29	E 2	C49	C 2	S1A-D	E 2	R18	C 2				
C30	E 2	C50	C 2	S3/S/4	B 2	R19	C 2				
C31	D 2	C51	C 2	X 1	B 2	R20	C 2				
C32	D 2	C52	C 1	X 2	B 1	R21	E 2				
C33	E 2	C53	C 2	X 3	B 1	R22	C 2				

3.3. MODIFICATIONS IN PRODUCTION

383A and 385RG only

Early receivers marked "SCH.A" or, with no schedule marking, differed from Schedule B production in the following respects.

1. The ferrite-rod aerial had a layer wound L.W. coil at one end and a single medium wave winding at the other. No adjusting ring to vary the permeability was provided. An additional coil was also wound on the rod. One end was connected to a small plate aerial and the other to chassis, the direction of the winding being such that the electrostatic pickup in the plate aerial tended to balance out any unwanted electrostatic pickup in the ferrite-rod aerial with a consequent improvement in directional characteristics.

   In the 383 A the plate aerial took the form of a strip of tin-foil glued inside the top of the cabinet and in the 385 RG the metal parts of the pneumatic lid stay were used as the plate aerial.

   NOTE: A very few early production 385 RG receivers did not include the additional interference balancing coil and plate aerial.

2. The L.W. loading coil used in SCH.B receivers was not fitted as the SCH.A aerial included a long wave winding. A smaller inductance, **L8,** with an adjustable core was connected in series with the M.W. aerial coil to provide a padding adjustment. This coil occupied the same position on the chassis as the L.W. loading coil in SCH.B receivers.

3. A 50pF pre-set capacitor was connected in parallel with **C20** and functioned as the L.W. trimmer. The value of **C20** was 110pF, 2%.

The differences in the aerial circuit of SCH.A receivers are shown on page 6, as an inset to the main circuit diagram. The alignment procedure for SCH.A receivers is similar to SCH.B except in the aerial circuit which is detailed in Alignment Procedure, page 13.

In addition to the differences listed above, in a few early receivers, **R21** was 120KΩ and **C43** was connected between chassis and the junction of **R15** and **R16.**

382U only

In "SCH.A" receivers, the pilot lamps were rated at 22V, 0.1A, and two Thermistors were fitted. In "SCH.B" receivers, 12V., 0.1A, pilot lamps and one Thermistor are fitted. Both arrangements are shown in the circuit diagram Fig. 8.

It is most important that 22V. lamps should not be fitted in "SCH.B" receivers, though 12V. lamps may be fitted in "SCH.A" receivers.

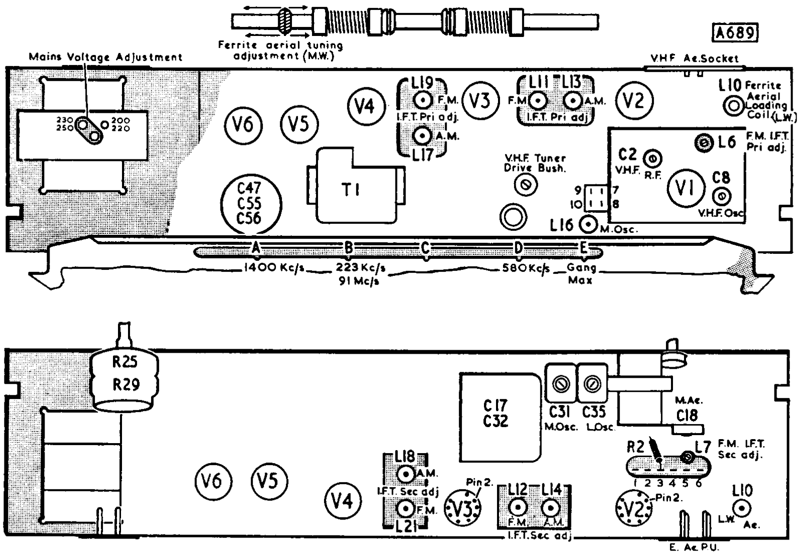


Fig. 11. Locations of trimming adjustments. The diagram shows the 382U chassis, but the layout of I.F. transformers, trimmers, etc., is the same in the 383 A and 385 RG.

4. ALIGNMENT DATA

Trimmer locations and calibration markers are shown in Fig. 11. As the chassis of Model 382 U is directly connected to one side of the mains, isolating capacitors of adequate working voltage should be used when connecting a signal generator into circuit.

*** Models 383 A and 385 RG (SCH.A)**

These receivers are fitted with the earlier type ferrite-rod aerials; adjust **L8** in place of the aerial adjustment and **C19** instead of **L10**. See Modifications in Production, page 12.

4.1 A.M. CIRCUITS

I.F. Alignment

Switch receiver to M.W., turn gang to minimum capacitance position and volume control to maximum. Inject a 470 Kc/s modulated signal through a 0.1 uF capacitor at the grid of **V2** (pin 2).

Adjust **L18, L17, L14** and **L13** for maximum output, adjusting input signal level to maintain peak output at approximately 50 mW.

R.F. Alignment

M.W. must be aligned first. Signals to be injected via a loop, loosely coupled inductively to the ferrite-rod aerial. Input level to be adjusted to maintain output at 50 mW.

1. With gang at maximum capacitance, set cursor to position **E.**
2. Switch to M.W., inject 1400 Kc/s signal, set cursor to position **A** and adjust **C31** and **C18** for maximum output.
3. Set cursor to position **D,** inject 580 Kc/s signal and adjust **L16** and the adjusting ring on the ferrite-rod aerial for maximum output.
4. Repeat 2 and 3 until no further improvement results.
5. Switch to L.W., inject 223 Kc/s signal, set cursor to position **B** and adjust **C35** and **L10** until no further improvement results.

4.2 F.M. CIRCUITS

The various trimming adjustments associated with the VHF/FM band must not be disturbed unless suitable equipment is available for re-alignment of the tuned circuits. Disturbance of the wiring or components in the V.H.F. tuner may impair its performance. In the event of component replacement in this unit, care must be taken to restore the wiring to its original position and to ensure that the lead lengths of the replacement part are the same as in that originally fitted.

The following alignment procedure is based on the use of an F.M. signal generator with I.F. and Band II coverage and of 75Ω output impedance. Carrier deviation should be set at 25 Kc/s and, throughout alignment, the signal input to the receiver should be adjusted to maintain an audio output of 100 mW. The stage by stage sequence given must be strictly observed.

I.F. Alignment

Allow the receiver to warm up for at least 10 minutes, switch to VHF/FM position and set volume control to maximum.

Adjustment	Signal Frequency	Point of Injection
L21, L19	10.7 Mc/s	**V3** control grid (Pin 2 via 0.01 uF)

With signal generator output of 20 mV, adjust core of **L21,** followed by **L19,** for maximum audio output. This should be approximately 100 mW.

Adjustment	Signal Frequency	Point of Injection
L12, L11	10.7 Mc/s	**V2** control grid (Pin 2 via 0.01 uF)

Adjust **L12** and **L11** for maximum audio output reducing input signal level as required so that the audio output does not exceed 100 mW.

Adjustment	Signal Frequency	Point of Injection
L7, L6	10.7 Mc/s	Junction **R2** and **L3** (Tag 3 VHF tuner via 500 pF)

Using non-metallic trimming tool, adjust **L7** and **L6** for maximum audio output reducing input level as necessary.

R.F. Alignment

1. Rotate tuning control until cursor locates at position **C.**
2. With main drive held in this position, slacken V.H.F. tuner drive bush fixing screw and rotate bush fully anti-clockwise. Check that free end of cord is under washer and that cord tension is maintained, then tighten fixing screw.
3. Rotate tuning control clockwise until cursor reaches position **E** (end stop).
4. Inject 91 Mc/s signal into aerial socket and, using a non-metallic trimming tool, adjust **C8** for maximum audio output. **No further adjustment of C8 should be made.**
5. Slacken V.H.F. tuner drive bush and rotate tuning control until cursor reaches position **B.** Re-adjust V.H.F. drive bush if necessary to bring in 91 Mc/s signal (during this operation, cord tension must be maintained) and tighten fixing screw.
6. Adjust **C2** for maximum audio output, reducing input signal level as required.

5. VOLTAGE AND CURRENT MEASUREMENTS

383/385
Input 225 V., 50 c.p.s.
Mains Tapping 220—230V.
Model 8 Avometer.

GENERAL MEASUREMENTS

	A.M.	F.M.
Total H.T. Current	62mA	73mA
H.T. Voltage (unsmoothed)	270V.	270V.
H.T. Voltage (1st section smoothing)	248V.	240V.
H.T. Voltage (2nd section smoothing)	238V.	222V.

VALVE MEASUREMENTS (A.M.)

Valve Ref.	Type		Anode Volts	Anode mA	Screen Volts	Screen mA	Cathode Volts
V1A	ECC85		—	—	—	—	—
V1B	ECC85		—	—	—	—	—
V2	ECH81	Heptode	230	1.9	65	3.5	—
		Triode	95	5	—	—	—
V3	EF89		215	9.7	80	3.5	—
V4	EABC80		80	0.7	—	—	—
V5	EL84		258	38	238	4.5	6.8

VALVE MEASUREMENTS (F.M.)

Valve Ref.	Type		Anode Volts	Anode mA	Screen Volts	Screen mA	Cathode Volts
V1A	ECC85		135	6.5	—	—	—
V1B	ECC85		148*	4.5	—	—	—
V2	ECH81	Heptode	186	5.2	72	3.1	—
		Triode	—	—	—	—	—
V3	EF89		210	9.7	75	3.3	—
V4	EABC80		76	0.7	—	—	—
V5	EL84		255	36	222	4	6.3

382
Input 240V., 50 c.p.s.
Mains Tapping 230—250V.
Model 8 Avometer.

GENERAL MEASUREMENTS

	A.M.	F.M.
Total H.T. Current	76mA.	78mA.
H.T. Voltage (unsmoothed)	252 V.	252 V.
H.T. Voltage (1st section smoothing)	215 V.	212 V.
H.T. Voltage (2nd section smoothing)	180 V.	167 V.

VALVE MEASUREMENTS (A.M.)

Valve Ref.	Type		Anode Volts	Anode mA	Screen Volts	Screen mA	Cathode Volts
V1A	UCC85		—	—	—	—	—
V1B	UCC85		—	—	—	—	—
V2	UCH81	Heptode	169	3.1	85	6.7	—
		Triode	94	5.3	—	—	—
V3	UF89		188	8.4	70	2.5	—
V4	UABC80		73	0.5	—	—	—
V5	UL84		205	47	180	2.4	13.7

VALVE MEASUREMENTS (F.M.)

Valve Ref.	Type		Anode Volts	Anode mA	Screen Volts	Screen mA	Cathode Volts
V1A	UCC85		101	5	—	—	—
V1B	UCC85		110*	3	—	—	—
V2	UCH81	Heptode	125	8	91	5.1	—
		Triode	—	—	—	—	—
V3	UF89		185	7.7	63	2.3	—
V4	UABC80		70	0.4	—	—	—
V5	UL84		203	44	167	2.1	12.8

* Connect meter (100 V. range) to V1B anode through a 2mΩ resistor and multiply scale reading by two.

6. MECHANICAL DETAILS

Note. Model 382 U only

The inner control knobs are secured by grub screws covered with wax. As the chassis in this model is connected to one side of the mains it is important that they are re-waxed, if necessary, before returning the receiver to the customer.

6.1. REMOVING THE CHASSIS

The tuning scale of the 383 A is attached to the cabinet and in this model, but not the 382 U or 385 RG, the front control knobs must be removed before releasing the chassis. Slacken off the grub screws in the two inner control knobs and draw the inner and outer knobs off their spindles.

Next free the ferrite-rod aerial from its mounting cradle. In some early 383 A and 385 RG SCH.A receivers, a connecting lead to the mounting bracket must also be unsoldered (see Modifications in Production, page 12). In the 385 RG the mains supply for the record changer motor must be disconnected.

The chassis fits into grooves in the cabinet and when the two 2.BA screws at the rear are removed, the chassis may be drawn out of the cabinet.

6.2. THE TUNING DRIVE CORDS

Two separate cord drives are employed in these receivers as well as a toothed gear reduction drive on the tuning gang. The main tuning drive is illustrated in Fig. 12. To replace the drive, allow about 4 ft. of nylon braided cord and proceed as follows :—

Turn the tuning gang to its fully closed position and tie a knot at one end of the cord. Secure the end in the notch at the bottom of the moulded drive drum, wind the cord 1½ turns round the drum in an anti-clockwise direction and continue as shown in the diagram.

When winding the final turns round the drum, ensure that the floating pulley at the left-hand end of the scale backing plate is exerting tension on the cord. When the winding is completed, the free end must be secured round the lug moulded into the top of the drum. A little cellulose adhesive should be applied to this point.

Fit the cursor so that it registers with the " gang max." marker and the tip rides within the guide loop.

The F.M. tuner unit drive cord is also shown in Fig. 12. Due to the need for accuracy in fitting the two tuning slugs to the length of cord, replacement of the cord alone should not be attempted. The complete cord assembly with the slugs already fitted can be ordered from Service Department under the part number Z17223.

To fit a new slug assembly, slacken off the screws securing the unit to the main chassis and take off the end cap. The two small pulleys over which the cord runs are carried in a plastic moulding covered by adhesive paper. When the paper is removed, the cores may be slipped out and the new assembly inserted. Care, however, should be taken to insert them, as shown in the diagram, with the closed end of the core showing in the centre coil former and the open end in the outer former (viewed from the rear).

The ends of the cord are wound round the F.M. drive drum as shown in the diagram applying a slight tension to the cord to prevent any backlash in the tuning. The free end, 'B' should be secured under the washer as shown.

The unit must then be re-aligned as described in Circuit Alignment, page 13.

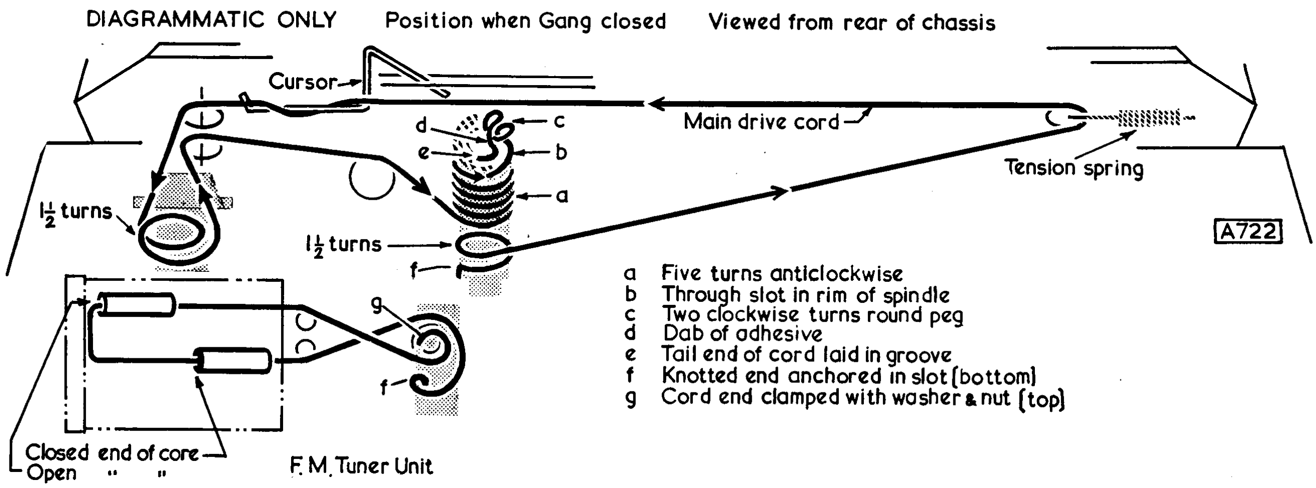


Fig. 12. The tuning drive cords.

7. SPARE PARTS LIST (MECHANICAL)

Part Description	Part No.
Cabinet (382)	V10404
Cabinet (383)	V10500
Cabinet (385)	V10532
Cabinet Back (382)	W10442
Cabinet Back (383)	X17231
Cabinet Back (385)	Z10525
Control Knobs :	
Tone/On-Off	X10520
Tuning	Y10519
Volume	Y10521
Wavechange	X10518
Wavechange Gear	Z10254
Control Knob Springs :	
Tone/On-Off	37332
Tuning and Volume	37302
Wavechange Gear	37309
Cursor	Z10455
Drive Drum, Brass (F.M.)	Z10491
Drive Drum, Plastic (A.M./F.M.)	Z10483
Drive Drum Plastic, Spring Clip	37309
Ferrite Aerial Bracket Mounting	Y10453
Pilot Lamp Holder	Z13308
Pilot Lamp Holder Grommet	33655
Scale (382)	W10461
Scale (383)	X10469
Scale (385)	X10536

The manufacturers reserve the right to vary specifications or use alternative materials as may be deemed necessary or desirable at any time.