"His Master's Voice"

SERVICE MANUAL

MODEL 1373

GENERAL SPECIFICATION

Mains Supply

A.C. or D.C. mains, 200—250 Volts (50—60 cps. A.C.).

Power consumption approximately 40 Watts.

Waveranges

Medium: 187—555 Metres (540—1,600 Kc/s.)

Long: 1,083—1,910 Metres (157—277 Kc/s.)

Valves

V1	UCH81	Frequency changer.
V2	UBF89	I.F. amplifier and detector.
V3	UCL83	Audio amplifier and output.
V4	UY85	H.T. rectifier.

Output Power

1 Watt.

Loudspeaker

Permanent magnet unit, 5 ins. diameter, 3Ω speech coil.

Cabinet Dimensions

13½ ins. wide by 9 ins. high by 7 ins. deep.

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

INSTALLATION

The only adjustment necessary on installation is the selection of the correct mains voltage tapping on the ballast resistor. Tappings are provided for 200—220 Volts and 230—250 Volts and are shown in Fig. 3.

MECHANICAL DETAILS

Dismantling

1. Draw control knobs off spindles.

2. Remove cabinet back panel (four self-tapping screws).

3. Release aerial and earth panel (two self-tapping screws) and disconnect speaker leads.

4. Remove two self-tapping screws at rear flange of chassis and swing aside clamp at top of scale backing plate.

The chassis, with scale attached, may then be withdrawn from the cabinet.

Tuning Drive

The arrangement of the cord is clearly shown in Fig. 1.

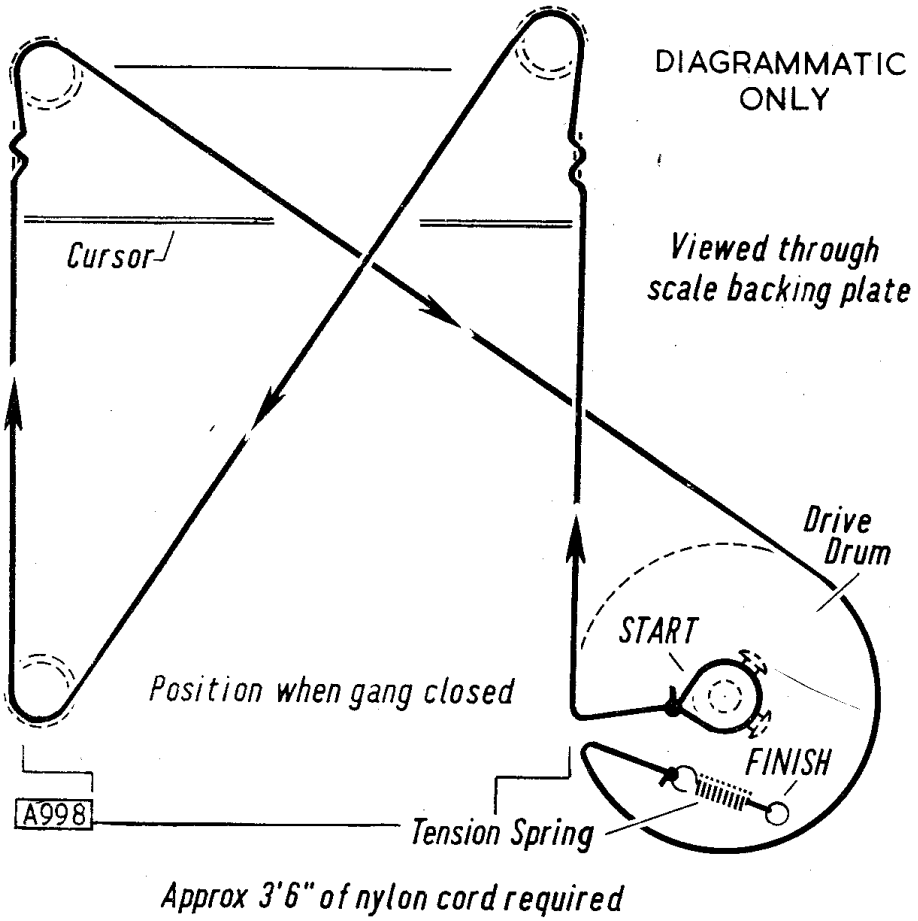

Fig. 1. The tuning drive.

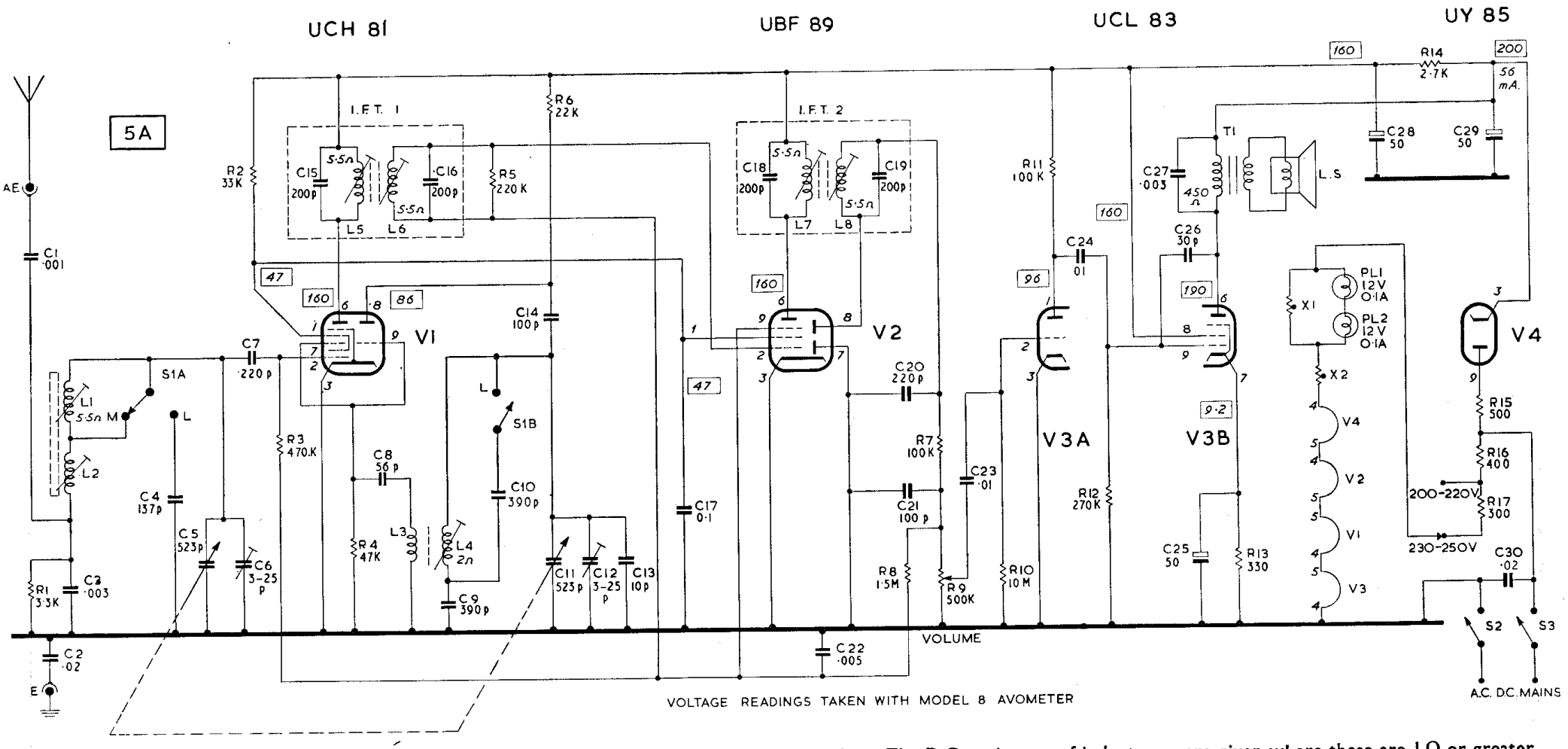

Fig. 2. Circuit diagram. Voltage readings taken with a 20,000 Ω/Volt meter are shown in rectangles. The D.C. resistance of inductances are given where these are 1 Ω or greater.

CIRCUIT DESCRIPTION

With the receiver switched to M.W., **S1A** short-circuits the long wave winding **L1** on the ferrite-rod aerial, and the medium wave winding **L2** is tuned by **C5** with trimmer **C6**. On the L.W. band, **L1** and **L2** are used in series and the additional tuning capacitor **C4** is switched into circuit. Signal voltages developed in the aerial tuned circuit are applied through the capacitor **C7** to the control grid of **V1** (UCH81) the frequency changer. When an external aerial is used, **C3** provides the coupling to the tuned circuit and is shunted by **R1** to limit the circuit impedance as a precaution against modulation hum.

A tuned-anode oscillator circuit is employed, with **L4** the anode coil and **L3** the feedback coupling to the oscillator grid circuit. On M.W., **L4** is tuned by **C11** with trimmer **C12** and fixed capacitor **C13;** on L.W., the additional capacitor **C10** is switched across **L4.**

V2 (UBF89) functions as the I.F. amplifier and detector, only one of the two diode sections being used. Tuned transformer couplings (I.F.T.1 and I.F.T.2) are used. The rectified signal is developed across the volume control **R9;** the I.F. component is filtered by **R7, C20, C21,** and the audio component is coupled by **C23** to the audio amplifier **V3A** (triode section UCL83). The D.C. potential developed across **R9,** due to the rectified signal, is fed through the decoupling circuit **R8, C22,** to the grid circuits of **V1** and **V2,** where it serves as A.G.C. bias.

The anode circuit of **V3A** is resistance-capacitance coupled to **V3B** (pentode section UCL83) the output valve. Tone correction is effected by **C27** across the output transformer primary and by the inclusion of **C26** between **V3B** anode and control grid to provide a measure of high-frequency negative feedback.

ALIGNMENT

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 0·1μF. capacitor at the control grid of V1 (pin 2).

Adjust L8, L7, L6 and L5 in that order for maximum output, reducing the input voltage as required to keep the output level as low as possible.

R.F. Alignment

Check that with the gang closed, the cursor lies $\frac{1}{8}$-inch below the horizontal lines at the top of the scale.

Sufficient signal voltage for alignment purposes can be

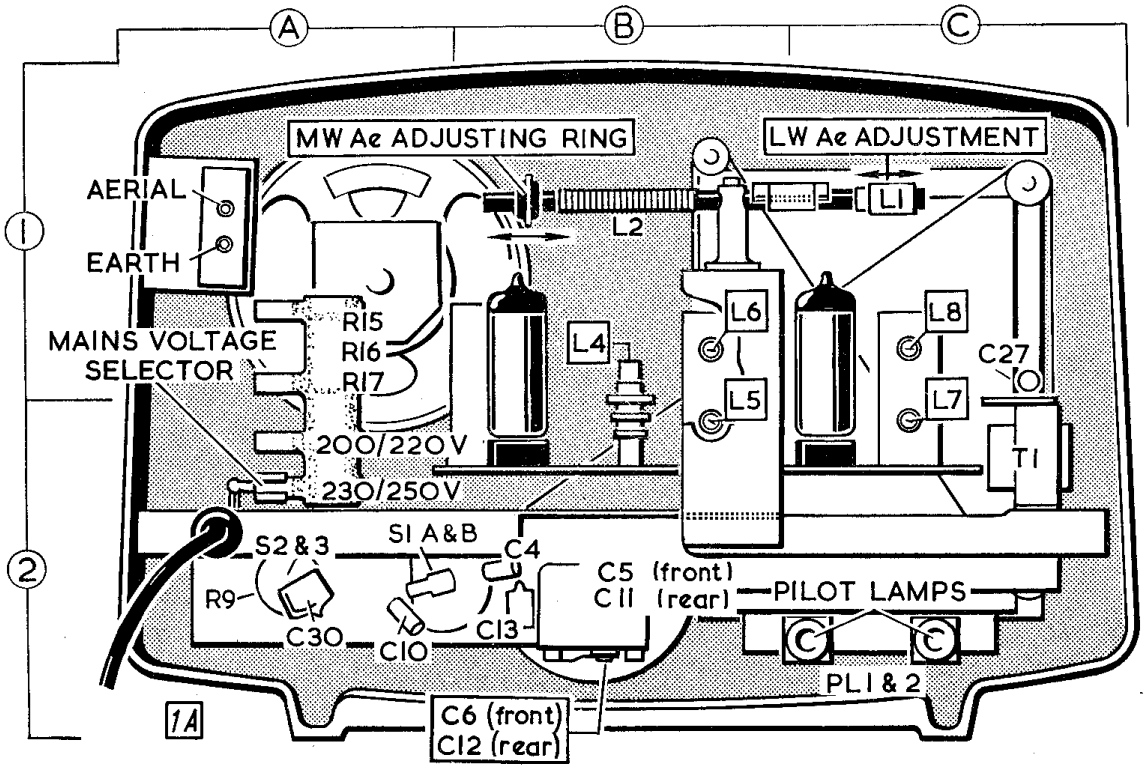

Fig. 3. Rear view of receiver showing trimming adjustments and components not mounted on printed wiring board.

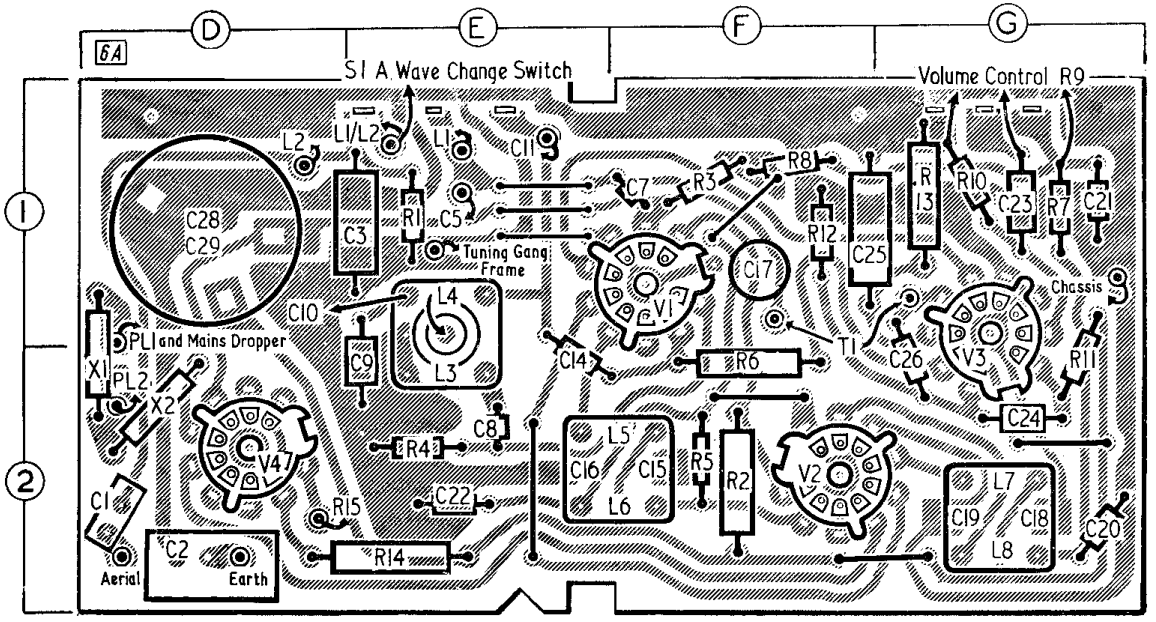

Fig. 4. Printed wiring board viewed from components side.

induced in the aerial circuit if the signal generator is terminated in a closed loop in close proximity to the receiver. Alternatively, the generator may be connected to the aerial socket through a series capacitor of 30 to 100 pF.

The medium waveband must be aligned first

1. Switch to M.W. and tune receiver to approximately 517 Metres (exact cursor position is shown by small dot on **L.W.** scale). Inject a 580 Kc/s signal and adjust L4 and the aerial adjusting ring for maximum output.
2. Tune to approximately 205 Metres (marker dot on **L.W.** scale) inject 1,460 Kc/s signal and adjust C12 and C6 for maximum output.
3. Repeat 1 and 2 until no further improvement results.
4. Switch to L.W., inject 210 Kc/s signal and rotate tuning control until signal is received (at approximately 1,430 Metres). Adjust the position of the L.W. coil L1 on the aerial rod for maximum output.

COMPONENT LOCATIONS

Ref.	Loc.
R1	E1
R2	F2
R3	F1
R4	E2
R5	F2
R6	F2
R7	G1
R8	F1
R9	A2
R10	G1
R11	G2
R12	F1
R13	G1
R14	E2
R15	A1 & A2
R16	A1 & A2
R17	A1 & A2
C1	D2
C2	D2
C3	E1
C4	B2
C5	B2
C6	B2
C7	F1
C8	E2
C9	E2
C10	A2
C11	B2
C12	B2
C13	B2
C14	E2
C15	F2
C16	F2
C17	F1
C18	G2
C19	G2
C20	G2
C21	G1
C22	E2
C23	G1
C24	G2
C25	F1
C26	G2
C27	C1
C28	D1
C29	D1
C30	A2
L1	C1
L2	B1
L3	E1 & E2
L4	E1 & E2
L5	F2
L6	F2
L7	G2
L8	G2
V1	F1
V2	F2
V3	G1
V4	D1
T1	C2
S1	B2
S2	A2
S3	A2
X1	D2
X2	D2

SERVICE NOTES

When servicing is necessary on the printed circuit panel, it must be remembered that excessive heat can loosen the bond between the copper conducting circuits and the insulating board; consequently, particular care is necessary if any connections must be soldered to the 'wiring' side of the panel. For this reason, when replacing a resistor or capacitor, cut out the faulty component so that as much as possible of the original lead-out wires remain for connecting the new component, soldering to the ends of the wires instead of to the printed conductors. Use a small low-consumption iron and do not apply the bit for longer than is necessary to produce a sound joint.

The heavier components are secured on the board by clip lugs which also make electrical connections to the panel. To remove these, use a heavier type iron and apply heat and pressure to the lug—not the printed circuit—so that when the solder melts, the lug is pressed clear of the connecting point. In some cases a small stiff-haired brush will assist in breaking the connection.

If a section of printed conductor is damaged or fused, scrape off the damaged portion and restore the connection with a jumper wire on the component side of the panel. Should it become necessary, however, to solder directly to a printed conductor, use a 60/40 resin cored solder and, with a low-consumption iron, make the joint quickly to avoid overheating. **Do not use a corrosive type flux.**

Part numbers of special components are given in the following lists:—

RESISTORS

All carbon type unless otherwise stated. Where no tolerance or power rating is given for fixed resistors, these should be taken as ± 20 per cent. and ¼-watt. respectively.

Ref.	Value	Tol.	Rating	Function and Part No.
R 1	3·3K Ω			External aerial shunt
R 2	33K Ω		½ W.	V1 S.G. H.T. feed
R 3	470K Ω			V1 heptode grid leak
R 4	47K Ω			V1 triode grid leak
R 5	220K Ω	10%		I.F.T.1 damping
R 6	22K Ω		½ W.	Oscillator H.T. feed
R 7	100K Ω			I.F. filter
R 8	1·5 M Ω			A.G.C. decoupling
R 9	500K Ω			Volume Control. Z10255/1
R10	10M Ω			V3A grid leak
R11	100K Ω			V3A anode load
R12	270K Ω			V3B grid leak
R13	330 Ω	10%	½ W.	V3B cathode bias
R14	2·7K Ω	10%	1 W.	H.T. smoothing
R15	500 Ω	Wire-wound		V4 current limiter and mains dropper. Z10854
R16	400 Ω			
R17	300 Ω			

INDUCTORS AND TRANSFORMERS

Ref.	Description	Part No.
L1	L.W. aerial tuning } Ferrite aerial	Y25722
L2	M.W. aerial tuning }	
L3	Oscillator feedback }	Y10876
L4	Oscillator tuning }	
L5	Primary } I.F.T.1 (includes C15, C16)	N10900
L6	Secondary }	
L7	Primary } I.F.T.2 (includes C18, C19)	N10899
L8	Secondary }	
T1	Output Transformer	Z10763

CAPACITORS

Electrolytics excepted, tolerance ± 20 per cent. unless otherwise stated. Where no working voltage is given, this should be taken as 350 volts D.C.

Ref.	Value	Tol.	Volts	Function and Part No.
C 1	0·001 μF		400 V. A.C.	Aerial isolating
C 2	0·02 μF		350 V. A.C.	Earth isolating
C 3	0·003 μF	2%		Ext. aerial coupling. Y302R35
C 4	137pF	2%		L.W. fixed aerial trimmer. 45755
C 5	523pF†	(variable)		Aerial tuning
C 6	3-25pF†	(trimmer)		M.W. aerial trimmer
C 7	220pF			V1 C.G. coupling
C 8	56pF			V1 osc. grid coupling
C 9	390pF	2%		Oscillator padder. Y391R35
C10	390pF	2%		L.W. fixed osc. trimmer. Y391R35
C11	523pF†	(variable)		Oscillator tuning
C12	3-25pF†	(trimmer)		M.W. osc. trimmer
C13	10pF	5%		
C14	100pF			V1 osc. anode coupling
C15*	200pF	2½%	125 V.	L5 tuning
C16*	200pF	2½%	125 V.	L6 tuning
C17	0·1 μF			V1/V2 S.G. decoupling
C18*	200pF	2½%	125 V.	L7 tuning
C19*	200pF	2½%	125 V.	L8 tuning
C20	220pF			I.F. filter
C21	100pF			
C22	0·005 μF			A.G.C. decoupling
C23	0·01 μF			V3A C.G. coupling
C24	0·01 μF			V3B C.G. coupling
C25	50 μF	electro.	12 V.	V3B cathode bypass. Z13210
C26	30pF			V3B neg. feedback
C27	0·003 μF		600 V.	Tone compensation
C28	50 μF	electro.	275 V.	H.T. smoothing } Z13200
C29	50 μF	electro.	275 V.	H.T. reservoir }
C30	0·02 μF		350 V. A.C.	Mains R.F. bypass

† Gang capacitor with trimmers. Z10851
* Incorporated in I.F.T.'s.

MISCELLANEOUS

Ref.	Description	Part No.
L.S.	P.M. speaker, 5 ins., 3 Ω speech coil	Z16001/5
PL1 } PL2 }	Pilot lamps, 12 V., 0·1A	33774
S1A & B	Wavechange switch	Z25702
S2 & 3	On-off switch (with R9)	Z10255/1
X1 & 2	Thermistor, type CZ2	Z4558/2

SPARE PARTS

Description	Part No.
Aerial Panel Assembly	Z29078
Fixing Screw	SA7K06
Fixing Clip	37311
Cabinet	V25306/1
Cabinet Back Panel	V25490/1
Fixing Screw	SJ7B08
Fixing Clip	37311
Chassis Fixing Screw	SY6B08/N
Control Knob:—	
Wavechange	Y25493/1
Tuning or Volume	Y25493
Spring	45931
Felt Washer	Z29106/1
Cursor	Z29099
Drive Drum	Z8314/2
Tension Spring	Z10486
Gang Mounting Bolt	Z8769
Grommet	43818
Lampholder	Z13304/2
Scale	X25507
Clip	37330
Scale/Cabinet Clamp	Z25497
Screw	SY6B08/N
Speaker Clamp	Z29095
Screw	SY6B08/N
Valveholder	Z13630

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