

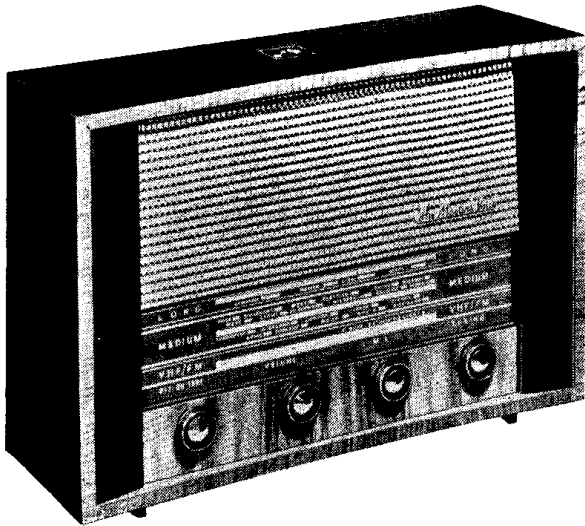


"His Master's Voice"

SERVICE MANUAL

Schedules A & B

MODEL 1376



All Service Enquiries to
THE BRITISH RADIO CORPORATION LTD.

SERVICE DIVISION

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SPECIFICATION

Description

Printed circuit AM/FM, table model receiver designed for AC/DC operation. A six-valve (including rectifier) superheterodyne circuit is employed covering Medium, Long and VHF waveranges. Rotary-type wavechange switching is employed and the receiver incorporates capacitance tuning on all waveranges with a combined AM/FM tuning control. Internal aerials are fitted with socket provision for an external FM aerial to be connected if required. The On-Off switch is combined with a continuously variable tone control.

Mains Supply

AC or DC mains, 200-250 volts (50-60 cycles per second AC).

Power consumption is approximately 50 watts.

Waverange Coverage

Medium : 188—550 Metres.

Long : 1100—1920 Metres.

VHF/FM : 88—100 Mc/s.

Valves

- V1 **UCC85**—FM RF amplifier and mixer
V2 **UCH81** { FM IF amplifier and FM audio amplifier
 { AM frequency changer
V3 **UF89**—AM/FM IF amplifier
V4 **UABC80**—AM/FM detector, AGC and audio amplifier
V5 **UL84**—Audio output
V6 **UY85**—Half-wave rectifier

Output Power

2 Watts.

Loudspeaker

Permanent magnet type, 8 in. x 5 in. elliptical. Speech coil impedance of 3Ω .

An extension speaker should have a speech coil impedance of 3Ω .

Cabinet

Walnut veneered, 19 in. wide x 13 in. high x 7 in. deep.

ALIGNMENT DATA

The chassis is directly connected to one side of the mains supply. When connecting a signal generator into circuit, isolating capacitors of adequate working voltage must be used.

AM CIRCUITS

IF Alignment

Switch the receiver to MW, turn tuning gang to minimum capacitance position and volume control to maximum. Inject a 470 Kc/s modulated signal through a 0.1uF capacitor at the grid of V2 (tags 8 and 9 on printed board, see Fig. 1) and adjust L17, L16, L15 and L14 for maximum output.

RF Alignment

MW must be aligned first. Signals to be injected via a loop loosely coupled to the ferrite-rod aerial. With the tuning gang at maximum, set cursor to the right-hand edge of the scale lining. Pad and Trim markers are provided on MW and a Calibration check point on LW.

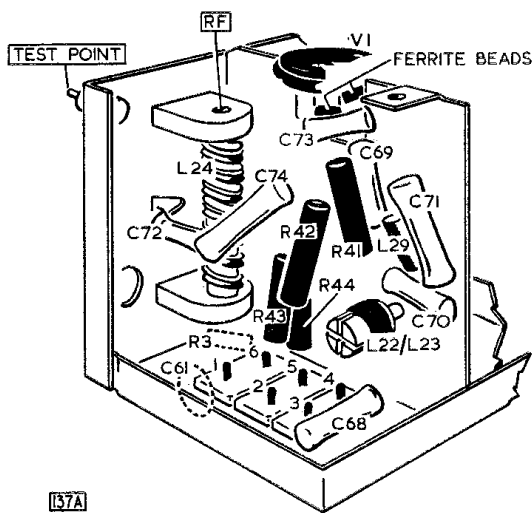
Range	Frequency	Cursor Position	Adjust
MW	580 Kc/s	Pad Marker	L10, L8*
	1400 Kc/s	Trim Marker	C32, C19

* Adjust by sliding RING along aerial rod.

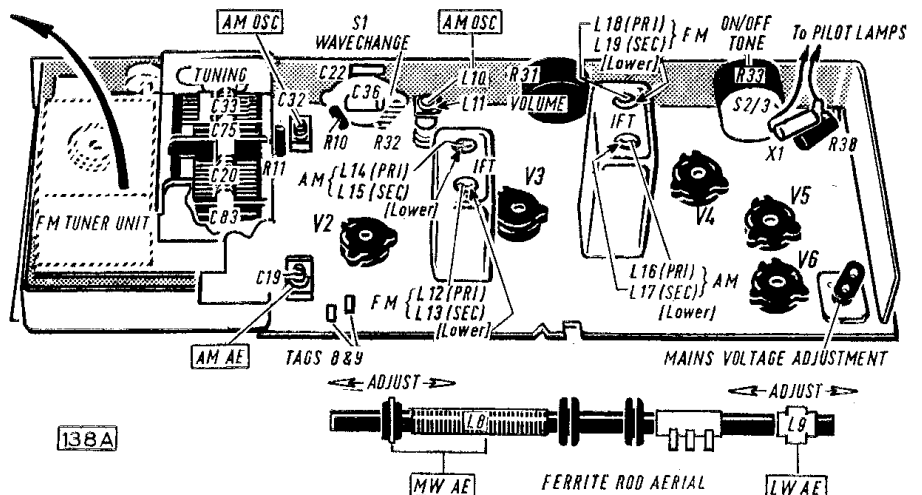
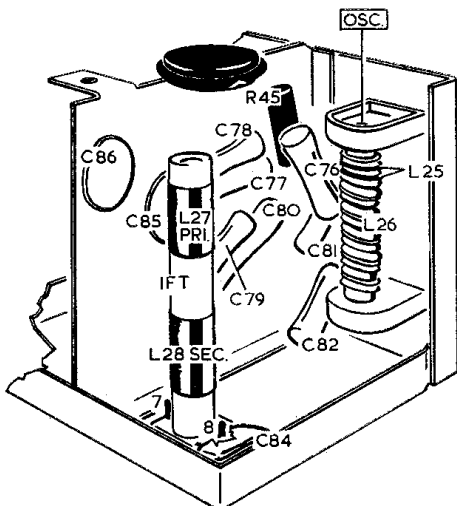
LW	220 Kc/s	Tune to Signal Check Calibration	C88,** L9†
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† Adjust by sliding COIL FORMER along aerial rod.

** Schedule B only, and located on the lampholder bracket support.



137A



138A

FM CIRCUITS

IF Alignment

The following procedure is based on the use of a signal generator providing Band II coverage, also 10.7 Mc/s AM (30% modulated) and 10.7 Mc/s FM (25 Kc/s deviation) signals, at an output impedance of 75Ω. Throughout alignment the signal input to the receiver should be adjusted to maintain an audio output of about 100mW.

- Switch the receiver to VHF and allow to warm up for at least ten minutes. Set the Volume control 90° back from maximum and the Tone control to maximum treble.
- Inject 10.7 Mc/s FM signal via 400pF capacitor to V2 grid (Tags 8 and 9 on printed board) and adjust L18, L19, L13 and L12 for maximum output.
- AM Rejection Check
 - Switch generator to 10.7 Mc/s AM and tune L19 for minimum output.
 - Switch generator to 10.7 Mc/s FM and check that FM output has been retained.

Note: If maximum AM rejection does not coincide with maximum FM output, L19 should be tuned for maximum rejection at the expense of a slight reduction in FM output.
- Unscrew the core of L28 in the VHF tuner unit so that it protrudes from the former by approximately 3/8 in. This can be seen with unit cover in position.
- Inject 10.7 Mc/s FM signal to the tuner TEST POINT (see Fig. 1). Adjust L27 for maximum output and then peak L28.

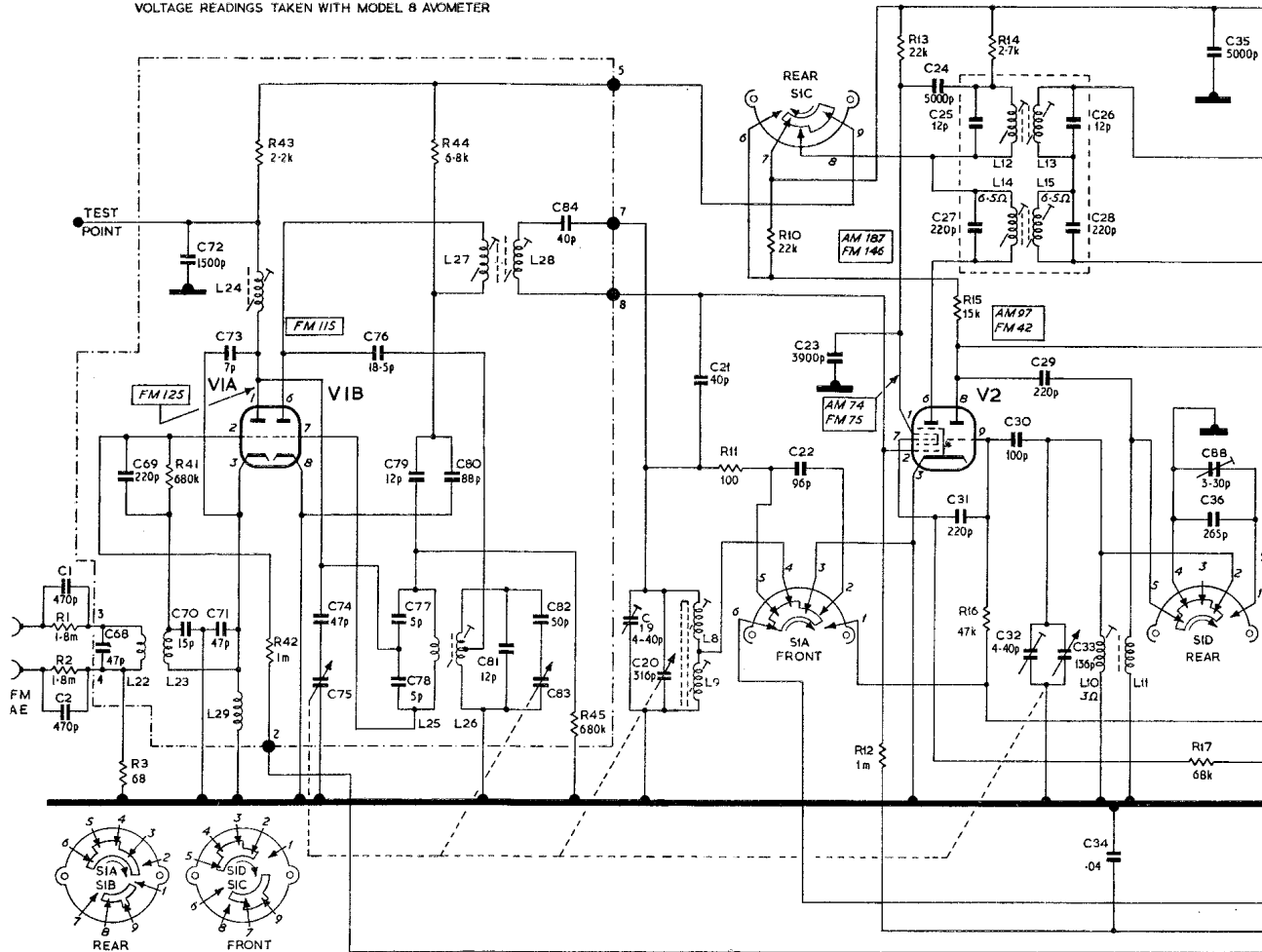
RF Alignment

Check that the cursor coincides with the right-hand end of the scale lining with the tuning gang at maximum.

- Adjust tuning control to set cursor to 91 Mc/s on scale.
- Inject 91 Mc/s FM signal at the aerial sockets and tune in signal by adjusting L26. If two peaks occur within the tuning range, that obtained with the core nearest the coupling winding L25 at the top end of the former must be chosen.
- Adjust L24 for maximum audio output with core towards bottom of coil former.
- Check calibration over range.

Fig. 1. VHF Tuner Unit and rear view of main chassis, showing trimming adjustments, etc., required for Alignment. For easy reference, RF alignment positions are shown in rectangles. Where practicable, components not shown in Fig. 4 are also indicated.

VOLTAGE READINGS TAKEN WITH MODEL 8 AVOMETER



NOTE:- ALTERNATIVE SWITCH. THIS SWITCH MAY BE FITTED TO SOME RECEIVERS. VIEW SHOWN FROM REAR OF CHASSIS. CONTACT NUMBERING CORRESPONDS WITH THAT ON CIRCUIT DIAGRAM.

Fig. 2. CIRCUIT DIAGRAM OF MODEL 1376 Sch. B. Schedule A receivers do not incorporate C88 and the value of C36 (nominally 277pF) may be 270pF or 285pF to accommodate slight variations in tuning gang capacitance. (C88 is positioned between SID (pin 1) and chassis.)

CIRCUIT NOTES

V2 TRIODE SECTION

FM, operating as audio amplifier: FM audio feed from C47 through R16 to triode grid. C29 in anode circuit is earthed, short circuiting oscillator feedback coil L11 through SID (Contacts 5 and 4), and functions as an RF bypass. The audio voltage developed across R10 in series with R15, which comprise the anode load, is applied through R19, C37, SIB (Contacts 9 and 8) to volume control R31.

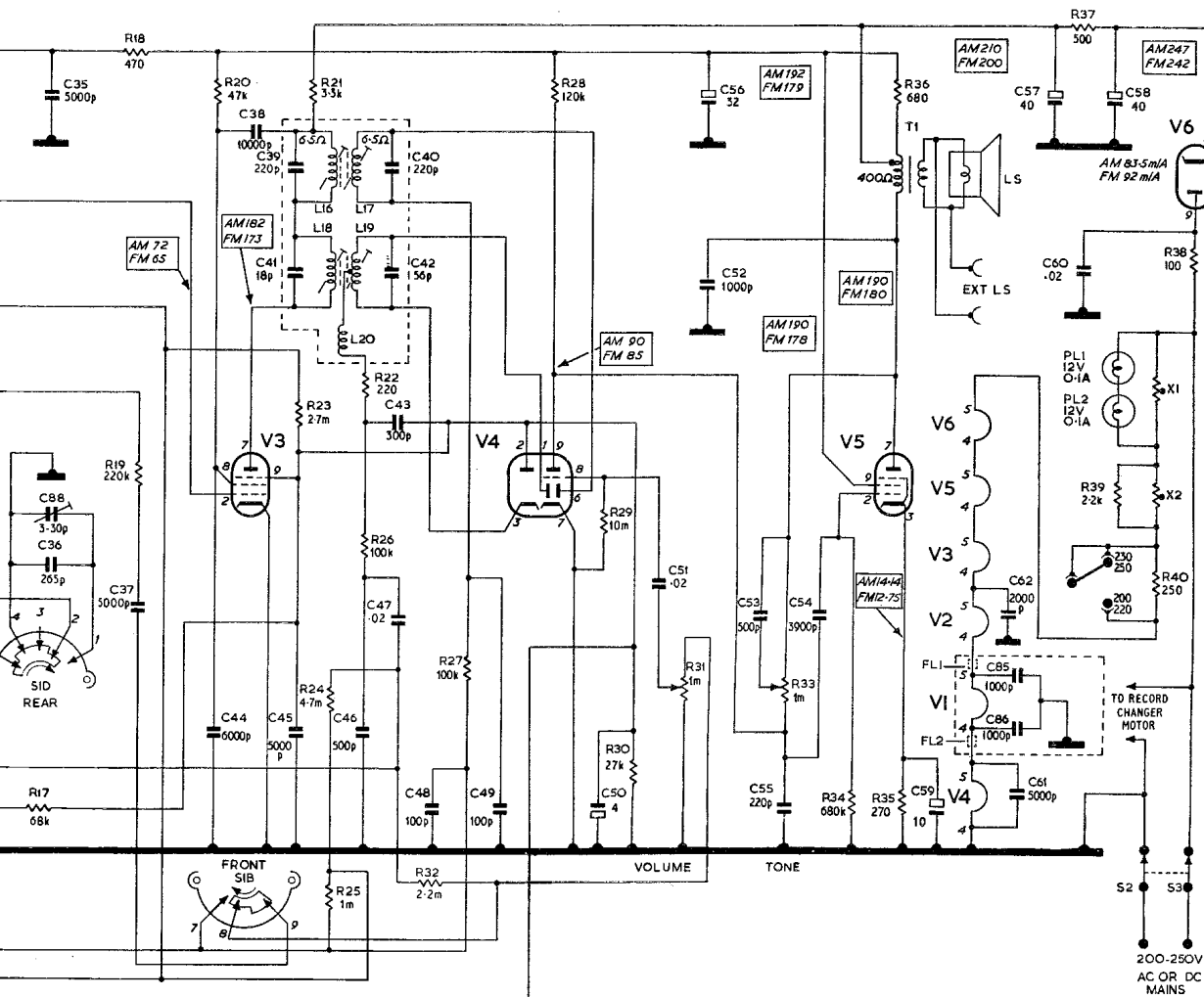
AM, operating as a tuned grid oscillator: Oscillator grid leak R16 is earthed through SIA (Contacts 1 and 3). R10 is shorted out by SIC (Contacts 7 and 6) and HT is fed through R15 to oscillator anode. As SID (Contacts 4 and 5) are open circuited, feedback coil L11 is coupled to the oscillator anode by C29. C37 is disconnected from R31 (volume control) by SIB (Contacts 9 and 8) and R31

connected through SIB (Contacts 7 and 8) into the AM detector circuit.

AUTOMATIC GAIN CONTROL

FM-AM AGC line is shorted out by SIA (Contacts 6 and 3) connecting R25 to earth in parallel with C34. This provides grid current bias to V2 and V3 control grids. To improve control, the voltage across stabilising capacitor C50 of the ratio detector circuit is also applied to VIA via R42, V2 injector grid (pin 7) through R17 and direct to V3 suppressor grid (pin 9). A fraction of this voltage is also applied to V2 and V3 control grids by R23.

AM-Conventional system from diode load R31 (volume control) through R25, R12.



WAVERANGE SWITCHES SHOWN IN FM POSITION
(SWITCHES VIEWED FROM REAR)

Figures adjacent to the valve electrodes denote pin connections. Those in rectangles indicate voltages measured with a 20,000 Ω/volt meter. DC resistance readings are shown against inductances where these are 1Ω or greater.

DRIVE CORD REPLACEMENT

Take approximately 60 inches of nylon braided cord and knot one end. Thread cord through hole in rear of drive drum, feeding through from front until the knot anchors. Take end through slot in rear rim and wind as shown in diagram.

To finish: wind two turns clockwise round drum and take cord through slot. Slip cord round one end of the tension spring and peg the other end of spring to the drum. Ensure that the spring is exerting tension before knotting cord. Finally, fit cursor as shown in diagram.

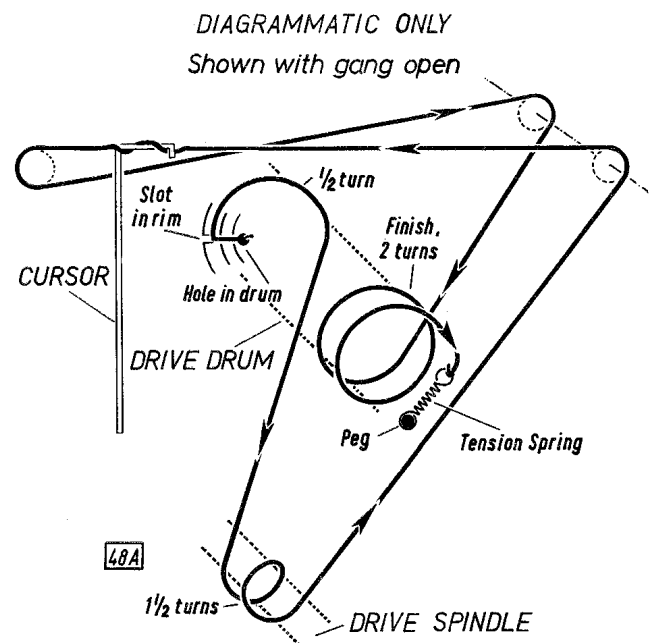


Fig. 3. The arrangement of the Tuning Drive Cord.

SERVICE NOTES

Chassis Removal

1. Pull off four control knobs.
2. Loosen two 4BA nuts securing each chassis side-runner clamp.
3. Loosen wood screws and swing aside scale support clamps on loudspeaker baffle.
4. Remove printed panel support by freeing wood screw. The support is centrally positioned at the rear of the cabinet.

The foregoing procedure will enable most servicing work to be accomplished, but for greater manoeuvrability it is recommended that the FM aerial socket panel is also removed from the cabinet edge by freeing two wood screws. The loudspeaker leads may also be disconnected.

Loudspeaker Leads

Connections to LS transformer are as follows:—

- Top : Blue lead
- Tapping : Yellow lead.
- Lower : Red lead.

Loudspeaker Removal

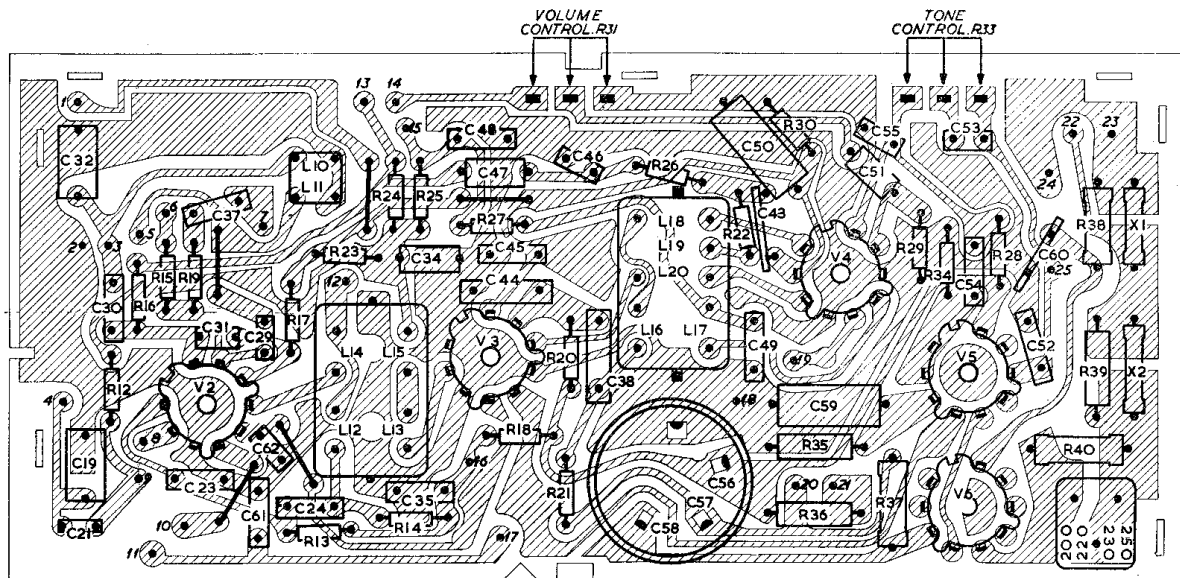
1. Loosen and swing aside four clamps around loudspeaker perimeter.
2. Remove extension loudspeaker socket panel from cabinet edge by freeing two wood screws.

Printed Panel Servicing

When servicing the printed circuit panel, it must be remembered that excessive heat can loosen the bond between the copper conducting circuits and the insulating board. Special care must be exercised when soldering connection to the "wiring" side of the panel. When replacing a resistor or capacitor, cut out the faulty component so that as much as possible of the original lead-out wires remain so that these may be used as connections to the new component, thus avoiding whenever possible, soldering 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 electrolytic C56/C57/C58 is secured on the panel by means of clip lugs which also make electrical connections to the printed circuit. Use a heavier type iron to remove this component, applying heat and pressure to the lugs and not to the printed circuit so that when the solder melts, the lugs are pressed clear of their connecting points. A small stiff-haired brush will sometimes assist in breaking these connections.

If a section of the printed conductor becomes damaged or fused, scrape off the damaged portion and restore the connection with a jumper wire on the component side of the panel. Whenever the necessity arises, however, to solder directly to a printed conductor, use a 60:40 resin-cored solder and make the joint as quickly as possible to avoid overheating. **Do not use a corrosive type flux.**



- | | | |
|--|---|---|
| 1. AVC to UCC B5 through R6 | 10. To pin 4 on V1 UCC B5 | 19. Connected to 17 |
| 2. To Contact 4 SID Wave-Change switch | 11. To pin 5 on V1 UCC B5 | 20. HT to tapping on output transformer primary |
| 3. To Contact 2 SID and C33 Ganged Condenser | 12. To Contact 8 SIC Wave-Change switch | 21. HT to output transformer primary |
| 4. To C20 Ganged Condenser and L5 | 13. To Contact 1 SIA Wave-Change switch | 22. } To pilot lamps |
| 5. To Contact 5 SID Wave-Change switch | 14. To Contact 8 SIB Wave-Change switch | 23. } |
| 6. To Contact 6 SIC Wave-Change switch | 15. To Contact 7 SIB Wave-Change switch | 24. To Mains switch |
| 7. To Contact 9 SIB Wave-Change switch | 16. To Contact 7 SIC Wave-Change switch | 25. To output transformer primary |
| 8. Connected to 9 | 17. Connected to 19 | |
| 9. Through C15 to L5 | 18. To Mains switch | |

9A

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

CAPACITORS

All 350 Volt working, 20% tolerance unless otherwise stated.

Ref.	Value	Rating	Function and Part No.
C 1	470pF	400V AC	} FM aerial isolating
C 2	470pF	400V AC	
C19	4—40pF	Pre-set	MW aerial tuning—Z25547
C20	316pF	Variable	Aerial tuning—Y25703
C21	40pF	5%	Part L28 tuning
C22	96pF	2%	LW aerial tuning—Y960R12
C23	3900pF		V2 SG decoupling
C24	5000pF		V2 heptode neutralising
C25	12pF	5%	L12 tuning
C26	12pF	5%	L13 tuning
C27	220pF	5%	L14 tuning
C28	220pF	5%	L15 tuning
C29	220pF	5%	V2 oscillator anode coupling
C30	100pF	2.5%	V2 oscillator grid coupling
C31	220pF	5%	V2 oscillator output coupling
C32	4—40pF	Pre-set	MW oscillator trimmer—Z25547
C33	136pF	Variable	AM oscillator tuning—Y25703
C34	.04uF		AM AGC decoupling— FM limiting
C35	5000pF		V1, V2 HT decoupling
C36	265pF*	2%	LW oscillator tuning—45775
C37	5000pF		V2 triode output coupling (audio)
C38	10,000pF		V3 neutralising
C39	220pF	5%	L16 tuning
C40	220pF	5%	L17 tuning
C41	18pF	5%	L18 tuning
C42	56pF	5%	L19 tuning
C43	300pF		FM IF bypass
C44	6000pF	500V	V3 SG decoupling
C45	5000pF		V3 suppressor grid decoupling
C46	500pF		FM IF bypass and de-emphasis
C47	.02uF	150V	Audio coupling to V2 (FM)
C48	100pF		} AM IF filter
C49	100pF		
C50	4uF	Electro. 100V	Ratio detector stabilising— Z13210
C51	.02uF	150V	V4 grid coupling
C52	1000pF		Tone correction and RF bypass
C53	500pF		Part tone control
C54	3900pF		V5 grid coupling
C55	220pF		Part tone control
C56	32uF		} HT smoothing
C57	40uF	Electro. 275V	
C58	40uF		HT reservoir
C59	10uF	Electro. .25V	V5 cathode bypass—Y13222/6
C60	.02uF		Mains RF bypass
C61	5000pF	500V	} Heater RF bypass
C62	2000pF	500V	
C68	47pF	5%	L22 tuning
C69	220pF		V1A grid coupling
C70	15pF	5%	} L23 tuning and part V1A neutralising
C71	47pF	5%	
C72	1500pF		V1A HT decoupling
C73	7pF	±0.5pF	Part V1A neutralising— C070H35
C74	47pF	5%	VHF amplifier padder
C75	6—15pF	Variable	VHF amplifier tuning—Y5703
C76	18.5pF	±2.5pF	Oscillator feedback coupling—C185XH35
C77	5pF	±0.5pF	} Oscillator/mixer signal injection—C050H35
C78	5pF	±0.5pF	
C79	12pF	2.5%	} V1B IF/mixer feedback
C80	8pF	2.5%	
C81	12pF	2.5%	Part oscillator tuning
C82	50pF	5%	Oscillator padder
C83	6—15pF	Variable	Oscillator tuning—Y25703
C84	40pF	5%	Part L23 tuning—P400G35
C85	1000pF		} V1 heater decoupling
C86	1000pF		
C88**	3—30pF		LW oscillator trimmer—Z13937

* May also be 270pF or 285pF in some Sch. A receivers to accommodate slight variations in tuning gang capacitance.

** Schedule B receivers only.

MISCELLANEOUS

Ref.	Part No.
FL1/FL2	Ferrite beads 34759
S1A-D	Wavechange switch Y25455
S2-S3	Mains On-Off switch Z25560
LS	Elliptical, 8" x 5", 3Ω impedance Y16012/6
PL1/2	Pilot lamps 12V, 0.1A 33774
X1/X2	Thermistors, Varite 1010 Z4558/7

RESISTORS

All 20%, ¼ watt carbon unless otherwise stated.

Ref.	Value	Tol.	Watts	Function and Part No.
R 1	1.8MΩ		}	Aerial discharge
R 2	1.8MΩ			
R 3	68Ω			
R10	22KΩ	10%	1W	FM aerial load Part V2 triode anode load (FM)
R11	100Ω			RF damping
R12	1MΩ			V2 heptode grid leak
R13	22KΩ	10%		V2 SG feed
R14	2.7KΩ	10%	½W	V2 neutralising
R15	15KΩ	10%		V2 triode anode load
R16	47KΩ	10%		Oscillator grid leak (AM) and grid stopper (FM)
R17	68KΩ	10%		V2 heptode AGC feed (FM)
R18	470Ω			V1/V2 HT feed
R19	220KΩ			V2 triode audio coupling (FM)
R20	47K	10%		V3 SG feed
R21	3.3KΩ			V3 neutralising
R22	220Ω	10%		Ratio det. tertiary series
R23	2.7MΩ			V3 FM AGC feed
R24	4.7MΩ			Part FM AGC
R25	1MΩ			AM AGC feed
R26	100KΩ			FM IF filter
R27	50KΩ			AM IF filter
R28	120KΩ	10%		V4 triode anode load
R29	10MΩ	10%		V4 grid leak
R30	27KΩ	10%		Ratio detector load
R31	1MΩ	Log. Pot.		Volume control Z25559
R32	2.2MΩ			V2B neg. feedback (FM only)
R33	1MΩ	Inverse log. Pot.		Tone control Z25560
R34	620KΩ			V5 grid leak
R35	270Ω	10%	½W	} V5 cathode bias
R36	680Ω	10%	½W	
R37	500Ω	5%	3W	} HT smoothing
R38	100Ω	5%	3W	
R39	2.7KΩ	10%	½W	} HT surge limiter
R40	250Ω	5%	3W	
R41	680KΩ	10%		X2 shunt
R42	1MΩ	10%		Mains dropper
R43	2.2KΩ			V1A grid leak
R44	6.8KΩ			V1A AGC feed
R45	680KΩ	10%		V1A HT feed
				V1B HT feed
				V1B grid leak

INDUCTORS AND TRANSFORMERS

Ref.	Function	Part No.
L 8	MW	} Ferrite-rod aerial
L 9	LW	
L10	MW and LW oscillator tuning	} Y25829
L11	MW and LW oscillator feedback	
L12	} 2nd FM IF transformer	} X25834
L13		
L14		
L15	1st AM IF transformer	} X25810
L16		
L17	2nd AM IF transformer	} X25810
L18		
L19	Ratio detector transformer	} X25810
L20		
L22	VHF aerial input transformer	Y29232
L23	VHF amplifier tuning	Y25835
L24	VHF oscillator feedback	} Y29230
L25	VHF oscillator tuning	
L26	VHF oscillator tuning	} Y29233
L27	1st FM IF transformer	
L28	RF choke	Y29280
L29	Audio output transformer	Z25486

SPARE PARTS LIST

Description	Part No.
Cabinet	V29625
Cabinet back	W29626
Control knobs:—	
Tone, Volume and Tuning	Y25800/6
Wavechange	Y25800/7
Control knob clip	45931
Cursor	Z29814
Drive drum (tuning)	Z25147
Drive tension spring	Z3194
Lampholder	Z13305/2
Mains voltage selector plug	Y25960/1
Mains voltage selector socket	Y25960
Tuning scale	N29624
Tuning scale reflector	Y29813
Tuning scale retaining clip	Z25480/1