

Marconiphone

SERVICE MANUAL



Price One Shilling

REGISTERED TRADEMARK OF
THE MARCONIPHONE CO LTD

"Marconiphone" products are made to a standard of design and quality approved by The Marconiphone Company Limited, registered proprietor of the trade mark

SERVICE NOTES

RECORD CHANGER REMOVAL

1. Remove wooden channelling from underside of cabinet (2 screws). Take out one screw and slide out removable cover in bottom of cabinet: disconnect pickup lead from tag strip on right-hand side of main chassis, also disconnect motor mains lead from connecting block on the receiver compartment floor.
2. Before attempting to move the record changer, ensure that both transit screws are screwed right down. With access from underside of cabinet, pivot clips on transit screws to enable them to pass through the motor board, then lift changer clear of cabinet.

LOUDSPEAKER REMOVAL

1. Remove cabinet back panel.
2. Unsolder the leads from the loudspeaker tag panel.
3. Remove four 4BA plastic push-on nuts and washers securing loudspeaker to cabinet, then lift off speaker.

CHASSIS REMOVAL

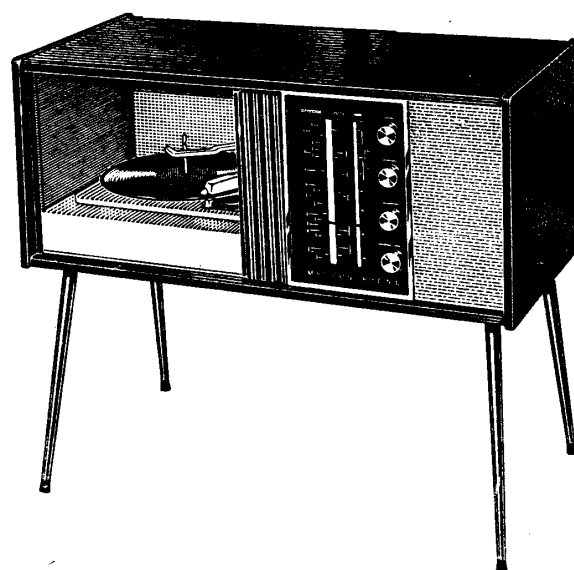
1. Pull off control knobs. This is best done by using a length of stout cord wound around behind the knob and used as a "puller". To avoid risk of breaking the nylon coupling spindle it is essential to pull in a forward direction only.
 2. Remove cabinet back panel (six screws) and disconnect FM aerial plug from socket on main chassis.
 3. Uncouple the gram-motor mains supply and disconnect the pickup as described in "Record Changer Removal".
- NOTE** :—The core of the screened lead is connected to the tag nearest to the edge of the printed board.
4. Remove the two fixing bolts located in similar positions at rear of the cabinet. Pull chassis clear of locating studs, then withdraw from cabinet. When refitting, the locating lugs must engage in the corresponding holes in the front of the chassis before the rear fixing screws can be inserted.

WARNING. When withdrawing or refitting chassis, take care to avoid scraping the scale backing paint with the control spindles.

VALVES

- | | | |
|----|--------|---|
| V1 | UCC85 | FM RF amplifier, mixer oscillator |
| 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 |

SPECIFICATION



Waveranges—Medium: 187-556 Metres (1604-540 Kc/s).
Long: 1135-1970 Metres (264-152 Kc/s).
VHF/FM: 88-101 Mc/s.

Record Changer—Garrard 4-speed "Autoslim" fitted with turnover monaural cartridge type GC2 with sapphire styl GC2-3 (78) and GC2-1 (LP).

Output Power—2.5 watts.

Loudspeaker—8 inch x 5 inch elliptical, high sensitivity PM. Speech coil impedance 3 ohms.

Aerials—8 inch ferrite rod for MW and LW. Internal dipole for VHF/FM.

External Sockets—AM aerial, VHF/FM dipole and extension loudspeaker.

Mains Voltage Range—200-250 volts 50 c/s.

Power Consumption—Radio: 50 watts. Gram: 65 watts.

Cabinet Dimensions—34½ inches wide x 30 inches high (including legs) x 15½ inches deep.

ALIGNMENT DATA

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

AM CIRCUITS

Remove chassis from cabinet as described in "Chassis Removal." An alignment scale is printed along the bottom edge of the scale reflector.

IF Alignment

Switch the receiver to MW, turn tuning gang to minimum capacity and volume control to maximum. Inject a 470 Kc/s modulated signal via a 0.1 μ F capacitor between the grid of V2 (link 7-8 on printed board) and earth line (chassis) 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 "Set Cursor" position.

Range	Frequency	Cursor Position	Adjust
MW	600 Kc/s	Pad Marker	L10 L8*
	1500 Kc/s	Trim Marker	C36 C23

* Adjust by sliding RING along aerial rod

LW	220 Kc/s	{Tune to Signal Check Calibration	C38 L9†
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† Adjust by sliding COIL FORMER along aerial rod

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 75 Ω . Throughout alignment the signal input to the receiver should be adjusted to maintain an audio output of about 100mW.

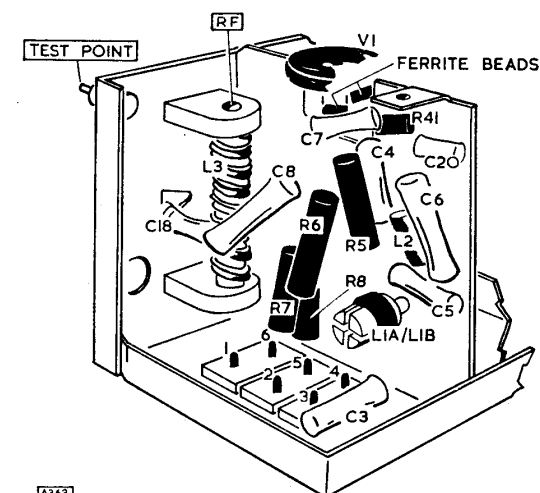
- Switch the receiver to VHF and allow to warm up for at least ten minutes. Set the Volume control 90° back from maximum and the Tone control to maximum treble.
- Inject 10.7 Mc/s FM signal via 400 pF capacitor between V2 grid (link 7-8 on printed board) and earth line (chassis) and adjust L18, L19, 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.

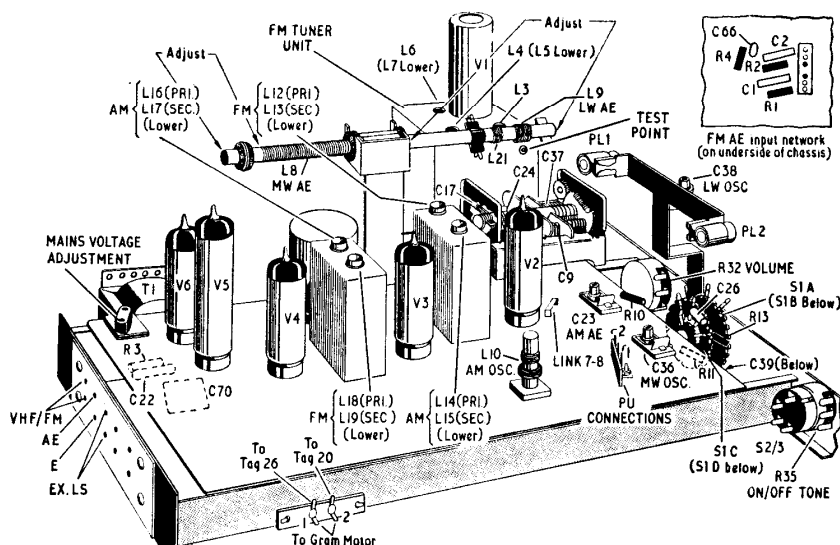
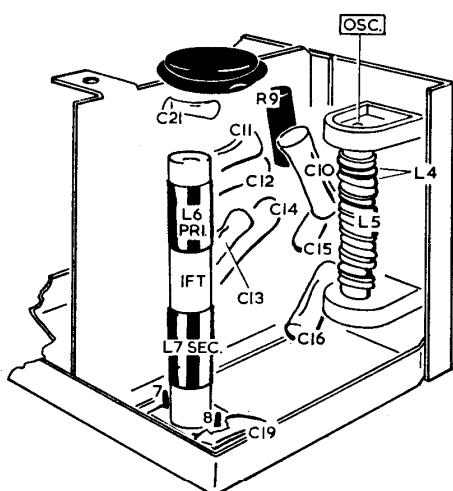
- Unscrew the core of L7 in the VHF tuner so that it protrudes from the former by approximately $\frac{3}{8}$ in. This can be seen with unit cover in position.
- Inject 10.7 Mc/s FM signal to the tuner TEST POINT. Adjust L6 for maximum output and then peak L7.

RF Alignment

- Adjust tuning control to position cursor at 92 Mc/s.
- Inject 92 Mc/s FM signal at the aerial sockets and tune in signal by adjusting L5. If two peaks occur within the tuning range, that obtained with the core nearest the coupling winding L4 at the top end of the former must be chosen.
- Adjust L3 for maximum audio output with core towards bottom of coil former.
- Check calibration over range.

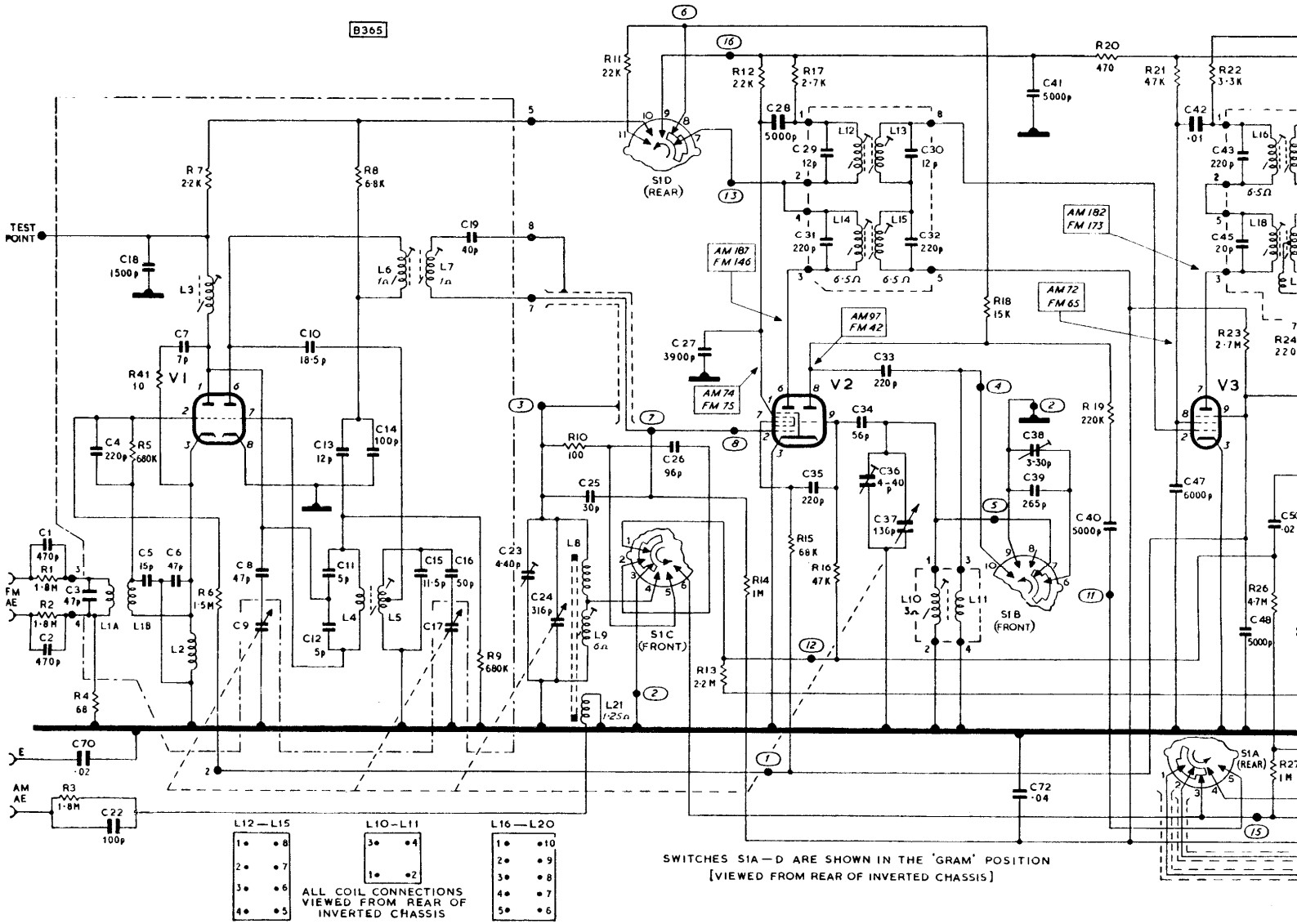


A363



B375

VHF/FM Tuner Unit and Main Chassis, showing trimming adjustments, etc., required for alignment, and where practicable, components not shown on printed board



CIRCUIT DIAGRAM

Figures adjacent to valve electrodes denote valve pin connections.

Ringed figures show printed board connecting points.

Note: Wire wrap tag 2 connects tag 9 S1B and tag 3 S1C to chassis.

Figures 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.

Components shown within the dash/dot lines are contained in the FM tuner unit.

PRINTED BOARD COMPONENT LOCATIONS

R	R26	A2	C	C41	B2	C55	A2
R12	B2	R27	A2	C23	B1	C56	A3
R14	B1	R28	A2	C25	B1	C57	A4
R15	A2	R29	A4	C27	B1	C58	A4
R16	A1	R30	A4	C28	B2	C59	B4
R17	B2	R31	A3	C29	B2	C60	B3
R18	A1	R33	B3	C30	B2	C61	B3
R19	A1	R34	A4	C31	B2	C62	B3
R20	B2	R36	B3	C32	B2	C63	A4
R21	B2	R37	B4	C33	B1	C64	B3
R22	B2	R38	A4	C34	A1	C65	B1
R23	A2	R39	B4	C35	B1	C72	A2
R24	A3	R40	B4	C36	A1	C73	A3
R25	A3			C40	A1	C74	B4
				C42	B3		
				C43	B3		
				C44	B3		
				C45	A3		
				C46	A3		
				C47	A2		
				C48	A2		
				C49	A3		
				C50	A2		
				C51	A3		
				C52	A2		
				C53	B3		
				C54	A3		

CIRCUIT NOTES

V2 TRIODE SECTION

FM, operating as audio amplifier :

FM audio is fed from C50 through R16 to triode grid. C33 in anode circuit is earthed, short-circuiting oscillator feed-back coil L11 through S1B (contacts 10 and 9) and functions as an RF bypass. The audio voltage developed across R11 in series with R18 which comprise the anode load, is applied through R19, C40, S1A (contacts 5 and 2) to volume control R32.

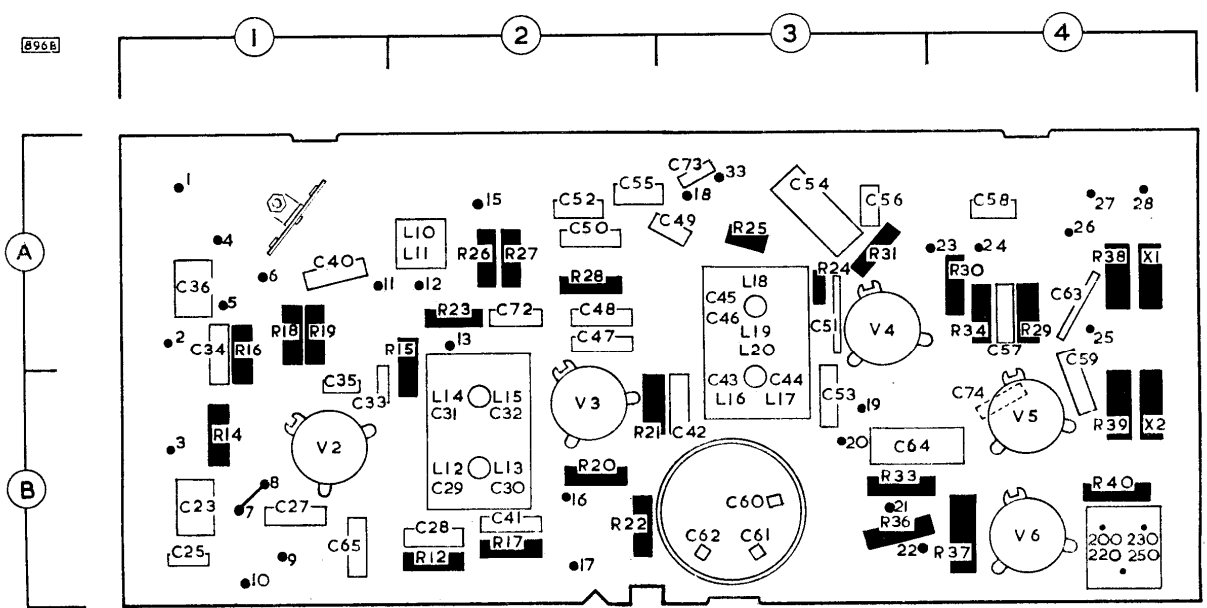
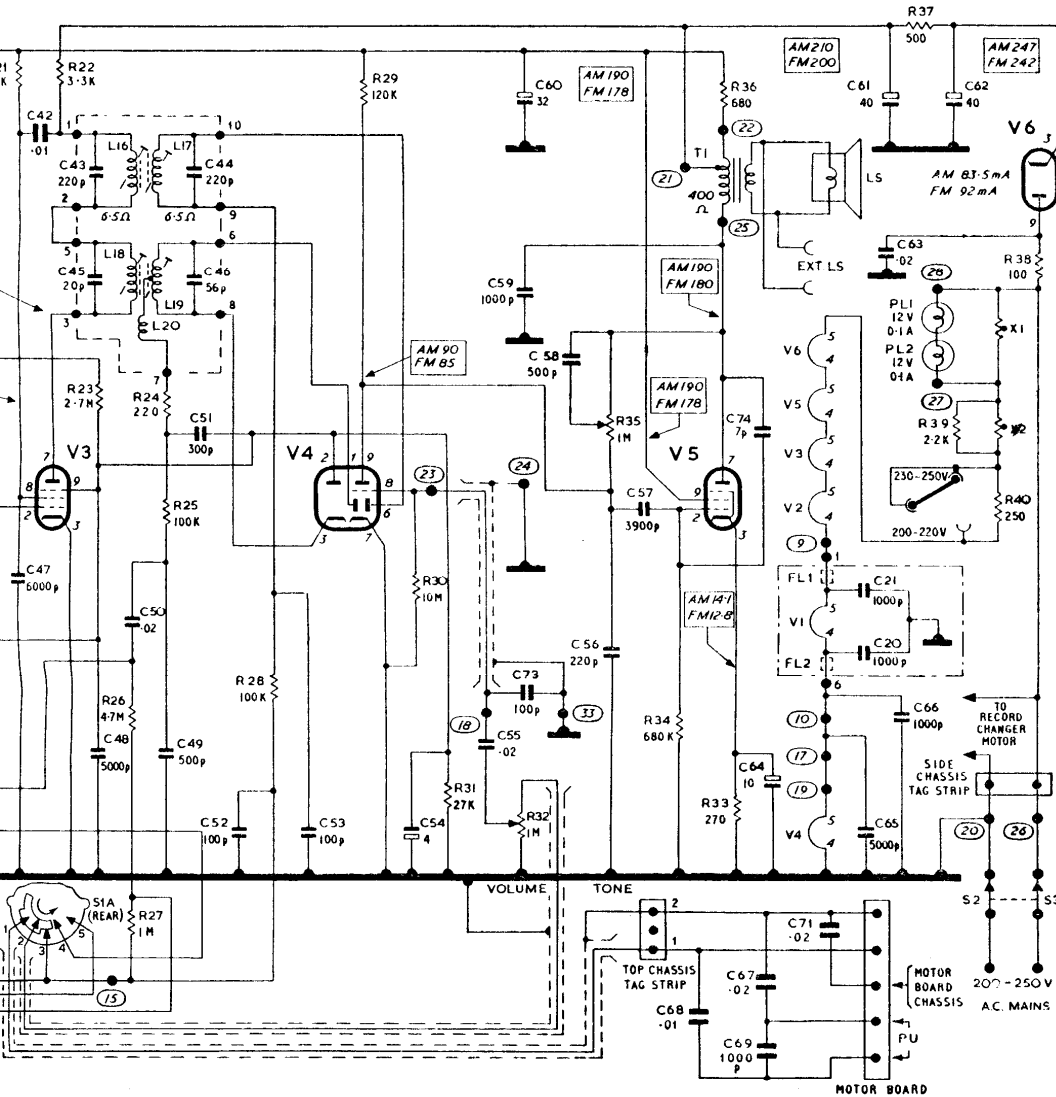
AM, operating as a tuned grid oscillator :

Oscillator grid leak R16 is earthed through S1C (contacts 1 and 3) and HT is fed via S1D (contacts 9 and 8) through R18 to oscillator anode. As S1B (contacts 10 and 9) are open circuited, feedback coil L11 is coupled to the oscillator anode by C33. C40 is disconnected from R32 (volume control) by S1A (contacts 5 and 2) and R32 connected through S1A (contacts 2 and 3) into AM detector circuit.

AGC

FM-AM AGC line is shorted out by S1C (contacts 6 and 3) connecting R27 to earth in parallel with C72. This provides grid current bias to V2 and V3 control grids. To improve control, the voltage across stabilizing capacitor C54 of the ratio detector circuit is also applied to V1A via R6, V2 injector grid (pin 7) through R15 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 R32 (volume control) through S1A (contacts 2 and 3), R27 and R14.



REPLACEMENT PARTS LIST

When ordering replacement components, please quote Model number and include the description or function given with the part number.

Cabinet Assembly

Items prefixed with a number, refer to the cabinet illustration

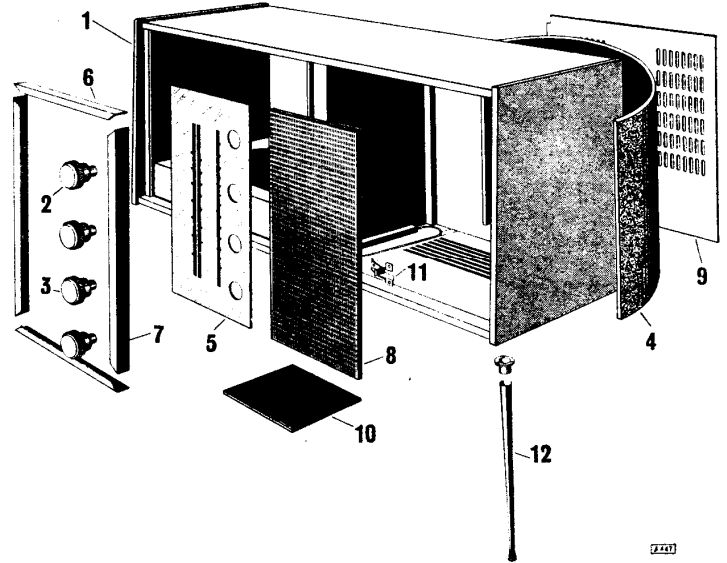
(1) Cabinet	...	...	...	...	V3A0009
(2) Tuning, Volume and On/Off control knob (clip N3L3051)	...	...	...	...	Y31278/1
(3) Waverange knob (clip N3L3051)	...	...	...	...	Y31278/2
(4) Tambour door	...	...	...	...	3A0009/D
(5) Scale	...	...	...	...	N3A7015
(6) Top and bottom scale glass trim	...	...	...	...	V3A0009/A
(7) Left-hand and right-hand scale glass trim	...	...	...	...	V3A0009/B
(8) Speaker baffle including covering	...	...	...	...	3A0009/E
(9) Chassis compartment back (screw SA8P16/F; special washer 9046)	...	...	...	...	X3A1009
Back turn-clip	...	...	...	...	V3A0009/C
Back clip	...	...	...	...	N3L2014
(10) Cabinet base cover (screw SA8P16/7, special washer 9046)	...	...	...	...	Y3A1010
(11) Chassis front mounting bracket	...	...	...	...	Z3M1024
Fixing nut for above	...	...	...	...	NF4
Special washer for above	...	...	...	...	WS4
(12) Leg with fixings	...	...	...	...	X55705/4
Plug fixed to base of leg	...	...	...	...	X55705/4A
Leg fixing 1/4 in. Whitworth "T" nut	...	...	...	...	S0056
Terminal block flexible 2 way	...	...	...	...	Z3F3-020
2 pin plug fixed to internal dipole aerial	...	...	...	...	Z9291
2BA "T" nut chassis fixing	...	...	...	...	S0109

Printed Board Assembly

Printed board	...	...	...	...	PC26
Valve holder	...	...	...	...	3F2002
Printed board retaining clips	...	...	...	...	3L2028

VHF Tuner Unit

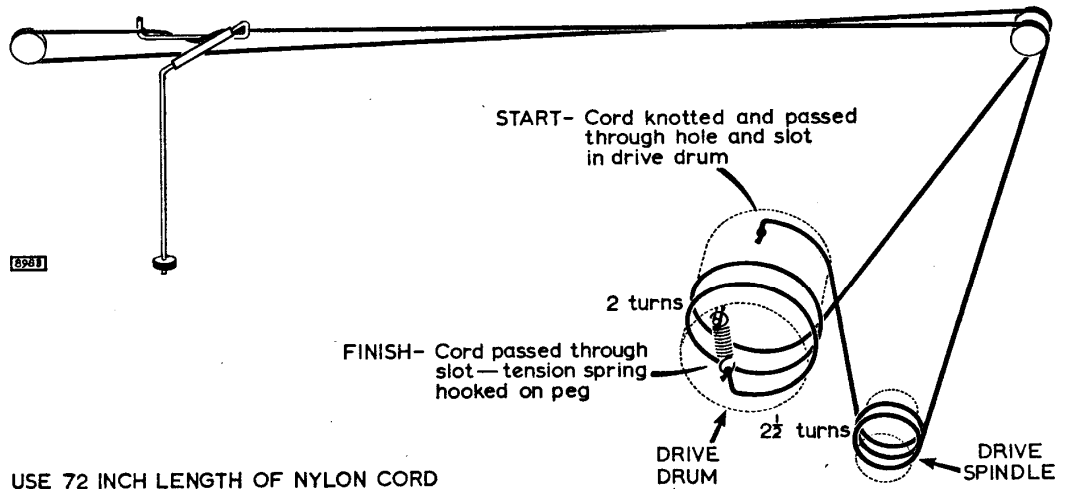
Tuner unit TU/4	...	...	...	...	3M4022
Tuner unit cover	...	...	...	...	29155
Valve holder	...	...	...	...	13666
Valve screening can	...	...	...	...	3B6-008/1
Lead through insulator	...	...	...	...	29337
Ferrite bead (2)	...	...	...	...	34759



Miscellaneous

Mains Lead	...	...	...	...	3H1002
Waverange Switch	...	...	...	...	3E2005/2
Pilot Lamp	...	...	...	...	3E6001
Voltage Selector (Shorting Plug 3F6019/1)	...	...	...	...	3F6019
Rod Aerial Assembly	...	...	...	...	3F0004
Loudspeaker (Plastic nut 3L6008, washer WS2)	...	...	...	...	3E3003
Lampholder	...	...	...	...	3F6013
Scale Diffuser (Retaining Spring 3B5005)	...	...	...	...	3B4008/1
Cursor Assembly	...	...	...	...	3M3049
Drive Assembly	...	...	...	...	3M4017
Drive Cord Tension Spring	...	...	...	...	3B5004
Drive Drum (Clip 3L3027)	...	...	...	...	3F5003
Chassis Side Rivetted Assembly—RH	...	...	...	...	3M1010
Chassis Front Rivetted Assembly	...	...	...	...	3M1009
Chassis Rear Socket Assembly	...	...	...	...	3M1022
Chassis Side Rivetted Assembly—LH	...	...	...	...	3B1019
Pulley Rivetted Assembly—RH	...	...	...	...	3M1012
Pulley Rivetted Assembly—LH	...	...	...	...	3M1013
Insulated Extension Spindle (4) (Clip 3L3027)	...	...	...	...	3B6006
Chassis Cross Member	...	...	...	...	3B3021
Tuner Sub-Chassis (Gang Bolts 3L6010)	...	...	...	...	3B0004
Tuner Mounting Frame Assembly	...	...	...	...	3M1019
Tuner Assembly Mounting Bolts	...	...	...	...	SB4C03
Washer (for above)	...	...	...	...	WS4
Thermistor (X1, X2)	...	...	...	...	4558/7

DRIVE CORD REPLACEMENT



COMPONENT DETAILS

RESISTORS

All 20%, 1/4 watt carbon unless otherwise stated

Ref.	Value	Tol.	Rating	Function	Part No.
R1	1.8MΩ			} FM aerial discharge {	6A20
R2	1.8MΩ				6A20
R3	1.8MΩ				6A20
R4	68Ω			FM aerial load	6A21
R5	680KΩ	10%		V1 grid leak	6A22
R6	1.5MΩ	10%		V1 AGC feed	6A23
R7	2.2KΩ			} V1 HT feed {	6A24
R8	6.8KΩ				6A25
R9	680KΩ	10%			V1 grid leak	6A22
R10	100Ω			RF damping	6A26
R11	22KΩ	10%		Part V2 triode anode load (FM)	6A27
R12	22KΩ	10%		V2 SG feed	4A97
R13	2.2MΩ	10%		V2 neg. feedback (FM only)	2A68
R14	1MΩ			V2 heptode grid leak	5A92
R15	68KΩ	10%		V2 heptode AGC feed (FM)	5A25
R16	47KΩ	10%		Oscillator grid leak (AM) and grid stopper (FM)	5A13
R17	2.7KΩ	10%		V2 neutralizing	6A29
R18	15KΩ	10%		V2 triode anode load	6A30
R19	220KΩ			V2 triode anode coupling (FM)	5A60
R20	470Ω			V1/V2 HT feed	6A31
R21	47KΩ	10%		V3 SG feed	5A13
R22	3.3KΩ			V3 neutralizing	6A32
R23	2.7MΩ			V3 FM AGC feed	6A33
R24	220Ω	10%		Ratio det. tertiary series	3A07
R25	100KΩ			FM IF filter	6A34
R26	4.7MΩ			Part FM AGC	6A35
R27	1MΩ			AM AGC feed	5A92
R28	100KΩ			AM IF filter	6A34
R29	120KΩ	10%		V4 triode anode load	5A43
R30	10MΩ			V4 grid leak	6A14
R31	27KΩ			Ratio detector load	5A01
R32	1MΩ	Log. Pot.		Volume control	3E1007/1
R33	270Ω	10%	1/4W	V5 cathode bias	6A36
R34	680KΩ			V5 grid leak	6A22
R35	1MΩ	Reverse Log. Pot.		Tone control	3E1007
R36	680Ω	10%	1/4W	} HT smoothing {	6A37
R37	500Ω	5%	3/4W		6A38
R38	100Ω	5%	5W		6A39
R39	2.2KΩ	10%	1W	X2 shunt	6A40
R40	250Ω	5%	3W	Mains dropper	3A92
R41	10Ω	10%	1/10W	V1A stabilizer	2A52

INDUCTORS AND TRANSFORMERS

Ref.	Function	Part No.
L1A-B	VHF aerial input transformer	29232
L2	RF choke	29280
L3	VHF amplifier tuning	25835
L4	VHF oscillator feedback	} 29230
L5	VHF oscillator tuning	
L6-7	1st FM IF transformer	29233
L8	MW	} Ferrite rod aerial
L9	LW	
L10	MW and LW oscillator tuning	} 3D1025
L11	MW and LW oscillator feedback	
L12-13	2nd FM IF transformer	} 3D0019
L14-15	1st AM IF transformer	
L16-17	2nd AM IF transformer	
L18-19-20	Ratio detector transformer	} 3D0020
L21	AM aerial coupling (with L8-L9)	
T1	Audio output transformer	3D3003

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

CAPACITORS

All 350 volt working, 20% tolerance unless otherwise stated

Ref.	Value	Rating	Function	Part No.		
C1	470pF	400V AC	} FM aerial isolating {	2M09		
C2	470pF	400V AC		2M09		
C3	47pF	5%	L1A tuning	2M10		
C4	220pF		V1 grid coupling	2M11		
C5	15pF	5%	} L1B tuning & part {	2M12		
C6	47pF	5%		V1 neutralizing	2M10	
C7	7pF	±1/2pF	Part V1 neutralizing	2M13		
C8	47pF	5%	VHF amplifier padder	2M10		
C9	6-15pF		VHF amplifier tuning*			
C10	18.5pF	±1/2pF	Osc. feedback	2M14		
C11	5pF	±1/2pF	} Osc./mixer injection {	2M15		
C12	5pF	±1/2pF		2M15		
C13	12pF	2 1/2%		V1 IF/mixer feedback	2M16	
C14	88pF	2 1/2%	} feedback {	2M17		
C15	11.5pF	2 1/2%		Part oscillator tuning	2M18	
C16	50pF	5%	Oscillator padder	2M19		
C17	6-15pF		Oscillator tuning*			
C18	1500pF		V1 HT decoupling	2M20		
C19	40pF	5%	Part L7 tuning	2M21		
C20	1000pF	+80-20%	} V1 heater {	2M22		
C21	1000pF	+80-20%		decoupling	2M22	
C22	100pF		AM aerial isolating	2M23		
C23	4-40pF	Pre-set	MW aerial trimmer	3E4004		
C24	316pF		Aerial tuning*			
C25	30pF	5%	Part L7 tuning	2M24		
C26	96pF	2%	LW aerial tuning	2M25		
C27	3900pF	500V	V2 SG decoupling	2M26		
C28	5000pF	500V	V2 heptode neutralizing	2M27		
C29	12pF	5%	L12 tuning	2M28		
C30	12pF	5%	L13 tuning	2M28		
C31	220pF	2%	L14 tuning	2M29		
C32	20pF	2%	L15 tuning	2M29		
C33	220pF		V2 osc. anode coupling	2M30		
C34	56pF	500V	V2 osc. grid coupling	2M31		
C35	220pF		V2 osc. output coupling	2M30		
C36	4-40pF	Pre-set	MW oscillator trimmer	3E4004		
C37	136pF		AM oscillator tuning*			
C38	3-30pF	Pre-set	LW oscillator trimmer	3E4006		
C39	265pF	2%	LW oscillator tuning	45775		
C40	5000pF	500V	V2 triode output coupling			
C41	5000pF	500V	V1, V2 HT decoupling	2M27		
C42	.01μF	500V	V3 neutralizing	2M32		
C43	220pF	2%	L16 tuning	2M29		
C44	220pF	2%	L17 tuning	2M29		
C45	15pF	5%	L18 tuning	2M33		
C46	56pF	5%	L19 tuning	2M34		
C47	6000pF	500V	V3 SG decoupling	2M35		
C48	5000pF	500V	V3 suppressor grid decoupling	2M27		
C49	500pF		FM IF bypass and de-emphasis	2M36		
C50	.02μF	150V	Audio coupling to V2 (FM)	2M37		
C51	300pF	5%	FM IF bypass	2M38		
C52	100pF	500V	} AM IF filter {	2M39		
C53	100pF	500V		2M39		
C54	4μF	Elec	Ratio detector stabilizing	13210		
C55	.02μF	150V	V4 grid coupling	2M37		
C56	220pF		RF bypass	2M30		
C57	3900pF	500V	V5 grid coupling	2M26		
C58	500pF		Part tone control	2M36		
C59	1000pF	400V AC	Tone correction and RF bypass	2M32		
C60	32μF	} Elec	} HT smoothing†			
C61	40μF			} 275V	HT smoothing†	
C62	40μF				HT reservoir†	
C63	.02μF	350V AC	Mains RF bypass	2M40		
C64	10μF	25V	V5 cathode bypass	13222/6		
C65	5000pF	500V	} Heater RF bypass {	2M27		
C66	1000pF	+80-20%		2M41		
C67	.02μF	350V AC	PU isolating	2M42		
C68	.01μF	400V AC	PU isolating	2M43		
C69	1000pF		PU correction	2M44		
C70	.02μF	350V AC	Earth isolating	2M45		
C71	.02μF	350V AC	Motor earth isolating	2M42		
C72	.04μF	150V	AM AGC decoupling—FM limiting	2M46		
C73	100pF		IF bypass	2M47		
C74	7pF		V5 negative feedback	2M13		

* Tuning Gang Part No. 3E4007

† Part No. 13237/8

BRITISH RADIO CORPORATION LTD

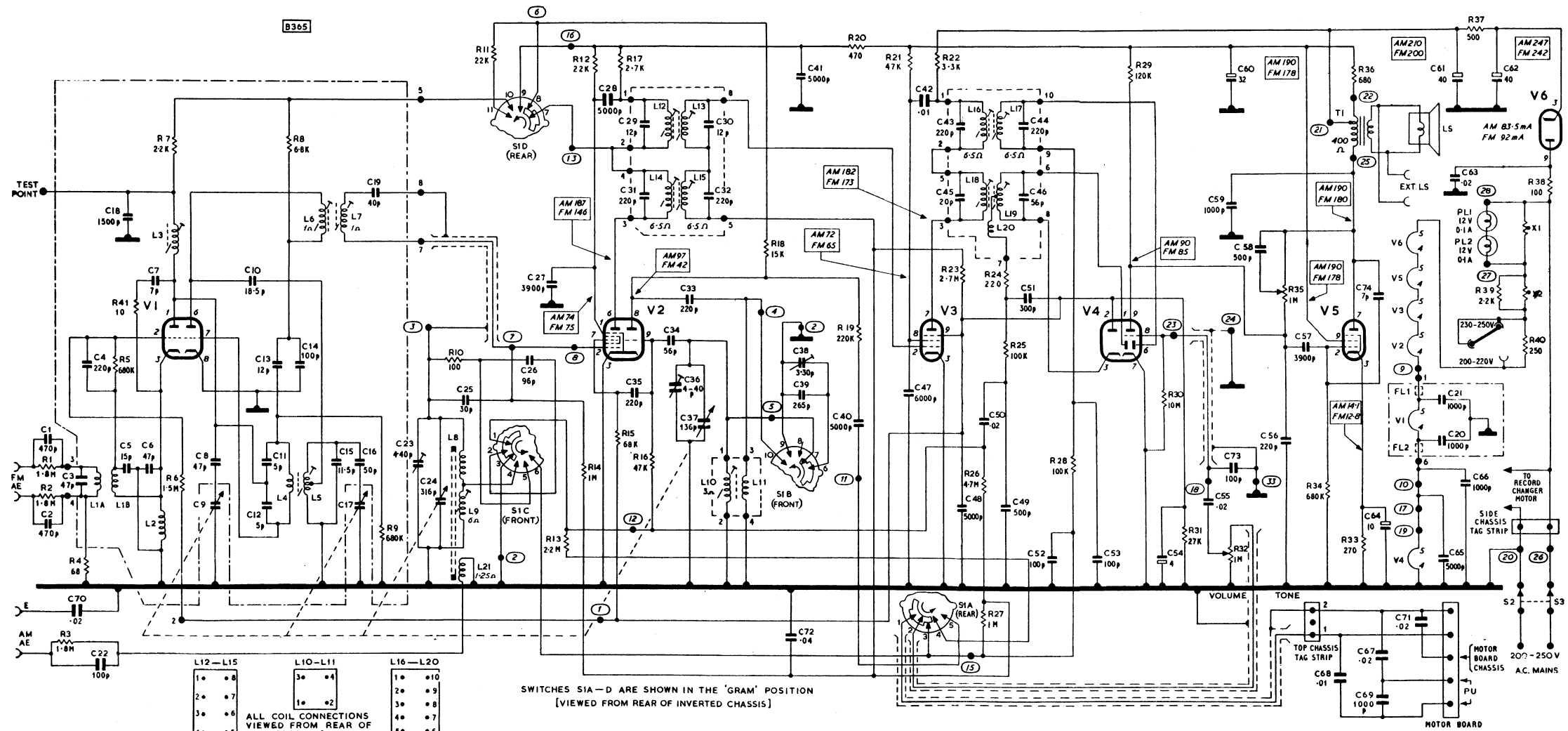
Service Depots

LONDON: Eley's Estate, Angel Road, Edmonton, N.18. Telephone: EDMonton 3060

BIRMINGHAM: 24 Sheepcote Street, 15. Telephone: Midland 5291

GLASGOW: 160-162 Battlefield Road, S.2. Telephone: Langside 9251-2-3-4

B365



L12-L15	L10-L11	L16-L20
1 • 8	3 • 4	1 • 10
2 • 7	4 • 2	2 • 9
3 • 6		3 • 8
4 • 5		4 • 7
		5 • 6

ALL COIL CONNECTIONS VIEWED FROM REAR OF INVERTED CHASSIS

SWITCHES S1A - D ARE SHOWN IN THE 'GRAM' POSITION [VIEWED FROM REAR OF INVERTED CHASSIS]

MOTOR BOARD

TO RECORD CHANGER MOTOR

SIDE CHASSIS TAG STRIP

TOP CHASSIS TAG STRIP

MOTOR BOARD CHASSIS

200-250V A.C. MAINS

PU