"His Master's Voice"

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STEREOPHONIC RADIOGRAMOPHONE **1635**

Service Manual

BRITISH RADIO CORPORATION LTD
21 CAVENDISH PLACE
LONDON W1

Price 2/-

Specification

GENERAL

An eight-valve (plus metal rectifier) superheterodyne radiogramophone covering VHF/FM, Long, Medium and Short waveranges. Two audio channels are provided for the reproduction of stereophonic or monaural recordings, and each feed separate loudspeaker systems housed in chambers forming part of the cabinet. Piano-key waverange switching and flywheel tuning on AM with a separate but concentric FM tuning control are also incorporated.

An external aerial socket is provided for SW reception and internal aerials are fitted for all other ranges. On Medium and Long waves only, a ferrite-rod aerial is rotatable from a front panel control which also incorporates a switch to connect the external aerial to these ranges. An earth socket is also provided and an external FM aerial may be connected if required. A tuning indicator is operative on all waveranges.

Volume controls, one on each channel, are concentric and incorporate a friction device to enable separate or combined adjustment of audio outputs. Tone Control of both channels is by means of a ganged potentiometer with a flag indicator on the scale to provide a visual guide to tone adjustment.

MAINS SUPPLY

AC Mains 200-250V, 50c/s. For operation on 60c/s mains, a special motor pulley may be obtained from the record-changer manufacturer.
Power Consumption: Radio - 69 Watts, Gram - 87.5 Watts.

OUTPUT POWER (each channel) 4 Watts.

LOUDSPEAKER UNITS (each channel)

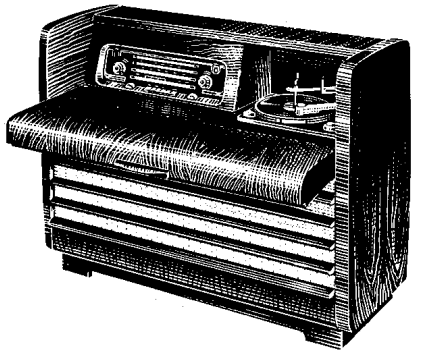
Low Frequency: 8in diameter, with a speech coil impedance of 15Ω.

High Frequency: 4in diameter, plastic cone, with a speech coil impedance of 15Ω.

External loudspeaker sockets are fitted with internal loudspeaker muting switches.

RECORD CHANGER

Garrard 4-speed record-changer fitted with a turnover monaural pick-up cartridge type GC8. A separate cartridge head, Garrard type GCS10 (or Acos GP71), is provided for stereophonic reproduction.



HIS MASTER'S VOICE MODEL 1635
Stereophonic AM/FM Radiogramophone

WAVEBAND COVERAGE

RANGE	WAVELENGTH	FREQUENCY
Long	1100-2015 Metres	149-273 Kc/s
Medium	191-570 Metres	525-1575 Kc/s
Short	17·2-54·5 Metres	5·5-17·5 Mc/s
VHF/FM	———	87-101 Mc/s

TAPE RECORDER FACILITIES

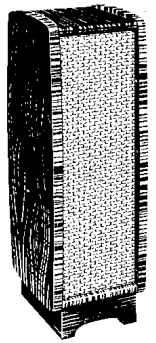
A switched input socket is provided for an ancillary tape recorder so that recorded tapes can be played back through both audio channels of the radiogramophone.

The socket also incorporates a suitable outlet to enable radio transmissions to be extracted for recording purposes.

EXTERNAL LOUDSPEAKER

A specially designed matching loudspeaker system (Type LS/35) is available, housed in a pillar-type cabinet. Similar high- and low-frequency units are fitted and the impedance of the system is 15Ω.

FUSE - A cartridge-type fuse, rated at 2 amps, is incorporated in the 1635.



LS35 LOUDSPEAKER SYSTEM
available as an ancillary when reproduction over a wider area is required

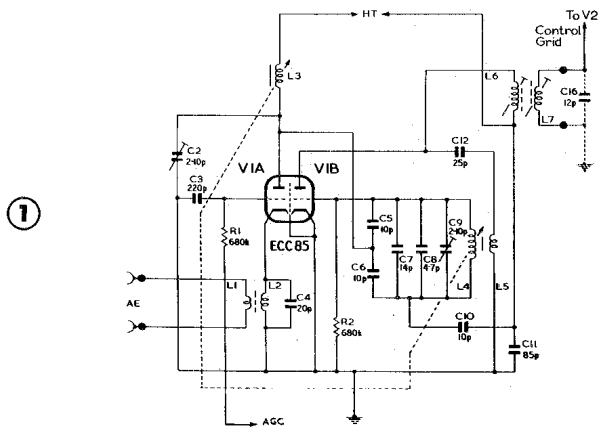
Circuit Notes

(1) FM TUNER

V1A functions as a grounded-grid RF amplifier and the 75Ω aerial feeder is coupled into the cathode circuit by L1-L2. The secondary L2 is broadly tuned by C4. V1A grid circuit is effectively earthed at RF by C3 and AGC is applied via R1 the grid leak. The anode load L3, trimmed by C2, is tuneable over the band by means of an adjustable aluminium core.

V1B operates as a self-oscillating mixer with inductive coupling between anode and grid circuits provided by L4 and L5. The grid winding, L4, is fitted with an aluminium core which is mechanically ganged with L3 providing continuous tuning over the range. The oscillator tuning capacitance comprises preset trimmer C9; C7 and C8 which have compensating temperature coefficients to reduce the possibility of oscillator drift; and C5-C6 in series. The junction of C5-C6 provides the injection point for the signal voltage developed across L3. Additive mixing takes place and the resulting 10.7 Mc/s IF is developed across L6 in V1B anode circuit. L6 is tuned to resonance by C12 which also functions as an anode coupling capacitor to the oscillator feedback coil L5. A small proportion of the IF output developed across C11 is fed back to V1B grid circuit to increase the impedance of the oscillator circuit shunting L6.

L6 and L7 (tuned by C16) form the first 10.7 Mc/s IF transformer which couples the output of the tuner unit to the heptode control grid of V2 operating as an IF amplifier when the receiver is switched for FM operation.

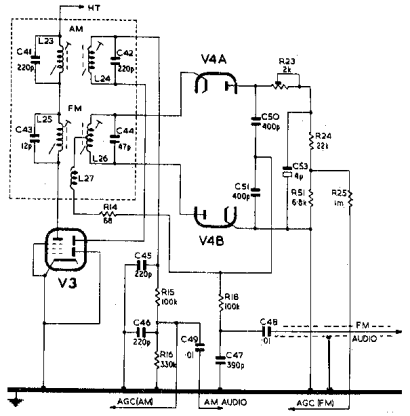


(2) DEMODULATION

FM: When the receiver is switched to FM, the 10.7 Mc/s IF signal is developed in the anode circuit of V3, EBF89, (the final IF amplifier) by the tuned transformer L25, C43 and L26, C44. A conventional ratio detector circuit of the unbalanced type is employed, utilising 'A' and 'B' diode sections of V4 (EB91). A tertiary winding L27 provides the coupling necessary to inject the primary voltage into the secondary circuit with the correct phase relationship, while matching the low impedance of the diodes to the high impedance of the IF amplifier. R14 is incorporated to improve AM rejection by modifying the peak diode currents. The input capacitance of V4A and V4B vary with diode current when an AM component is present in the input and C53 provides the means of obtaining a compensating unbalance to cancel this effect.

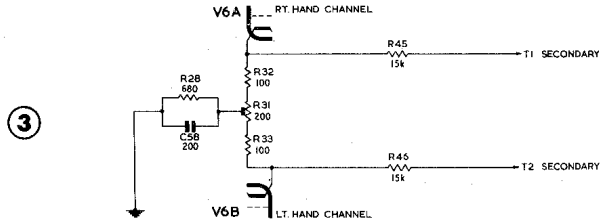
R24 and R51 comprise the detector load and a proportion of the voltage developed across the potential divider thus formed is tapped as AGC bias and also provides the control voltage for the tuning indicator. R53 is the stabilising reservoir capacitor. R18-C47 and the capacitance of the screened lead provide de-emphasis. Coupling to the audio amplifier is via C48.

AM: The pentode section of V3 (EBF89) operates as the IF amplifier and the 470 Kc/s IF signal is developed across L23, C41 and coupled by L24, C42 to one of the two diode sections of V3 operating as the AM detector. The unused diode section is strapped to cathode. R15 in conjunction with C45 and C46 provide the IF filter network. R16 is the diode load and the DC potential developed across the load is fed to the AM mixer and IF stages as AGC bias and also provides the control voltage for the tuning indicator. The audio signal developed across R16 is coupled via C49 to the audio amplifier.



(3) CHANNEL BALANCE (AMPLIFIER)

This is achieved by controlling the proportion of negative feedback applied to each audio channel. The feedback loops from T1 and T2 secondaries are taken through resistors R45 and R46 and injected into the cathode circuits of V6A and V6B across R32 and R33, the resistances of which are supplemented by the Balance Control Potentiometer R31. The common earth return of the stage is through the slider R31 enabling the effective cathode resistances of each section of V6 to be varied to each other. R28 bypassed by C58 provides cathode bias.



Voltage and Current Measurements

NOTES

The following readings were taken on a number of receivers with a Model 8 Avometer and the figures given are an average. Voltages were measured on the 1,000V, 250V and 10V ranges as applicable.

In each case the gang was fully open with no signal input and the mains adjustment set for 220-230V with a 225V, 50c/s supply. The AM readings were taken with the receivers switched to the Medium waverange.

GENERAL

	AM	FM
HT voltage unsmoothed	260	-
HT voltage at 8μF	225	218
HT voltage at 50μF	238	232
Heater voltage	6.3	6.3
AC supply current	305mA	-
Heater current	4.45mA	-
HT current at reservoir	125mA	131mA

	LW	MW	SW
AM oscillator grid current	225/360μA	220/335μA	180/290μA

VALVES

AM OPERATION

VALVES Ref.	Type	ANODE Volts	mA	SCREEN Volts	mA	CATHODE Volts
V1A	ECC85	-	-	-	-	-
V1B	ECC85	-	-	-	-	-
V2	ECH81 (heptode)	235	2.18	62.5	4.15	-
V2	ECH81 (triode)	103	5	-	-	-
V3	EBF89	203	12.5	97	3.8	-
V5	EM81	30	0.45	* 238	* 1.95	-
V6A	ECC83	103	0.62	-	-	† 0.7
V6B	ECC83	103	0.62	-	-	† 0.7
V7	EL84	240	41	238	4.8	6.65
V8	EL84	240	41	238	4.8	6.65

* Target anode

† Measured at R31 centre slider

FM OPERATION

VALVES Ref.	Type	ANODE Volts	mA	SCREEN Volts	mA	CATHODE Volts
V1A	ECC85	152.5	8	-	-	-
V1B	ECC85	160	4.8	-	-	-
V2	ECH81 (heptode)	217	6.67	72.5	3.76	-
V2	ECH81 (triode)	-	-	-	-	-
V3	EBF89	197	12.2	93	3.8	-
V5	EM81	30	0.44	* 232	* 1.9	-
V6A	ECC83	100	0.6	-	-	† 0.7
V6A	ECC83	100	0.6	-	-	† 0.7
V7	EL84	239	40.5	232	4.9	6.4
V8	EL84	239	40.5	232	4.9	6.4

* Target anode

† Measured at R31 centre slider.

Alignment

FM CIRCUITS

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, except where otherwise stated, an audio output of approximately 50mW with volume controls at maximum should not be exceeded.

IF ALIGNMENT Switch receiver to VHF and allow to warm up for at least 10 minutes. Input signal to be injected via a 500pF capacitor.

1. Unscrew the core of L26 to its fullest extent. Inject a 10.7 Mc/s 30% amplitude modulated signal of 20mV to V3 grid (pin 2) and adjust L25 for maximum output.

2. Switch generator to 10.7 Mc/s FM (25 Kc/s deviation) and tune L26 for maximum output. Switch generator to AM and adjust R23 (below chassis) for minimum output.

3. Switch generator to FM and inject 10.7 Mc/s signal to grid of V2 (pin 2) and adjust L15 and L14 for maximum output.

4. Transfer signal generator to Tag 3 of the tuner unit and with a non-metallic trimming tool adjust L7 and L6 for maximum output.

RF ALIGNMENT

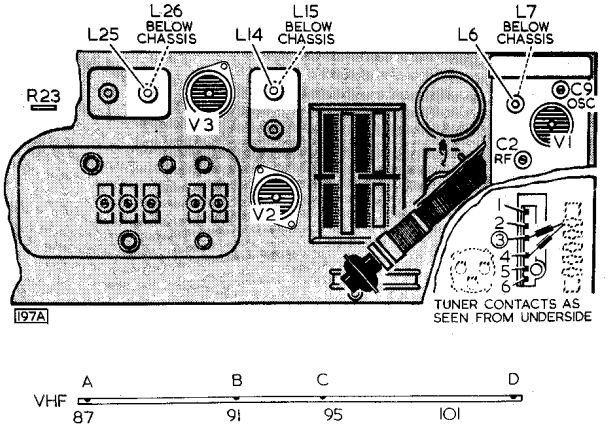
1. Loosen the FM drive drum locking screws. Rotate tuning control to bring the cursor to the low frequency end of the scale until the limiting stop is reached. Adjust cursor to align with VHF scale Marker 'A' (87 Mc/s).

2. Rotate tuning control until cursor coincides with Marker 'C'. Hold the main drive on this position and rotate the drive spindle in a clockwise direction until tuner unit cord 'A' is drawn out to its limit and then tighten up drive drum locking screws.

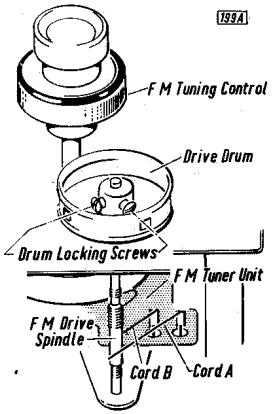
3. Rotate tuning control until cursor coincides with Marker 'D' at the high frequency end of the scale. Inject 91 Mc/s FM signal into aerial socket and adjust C9 for maximum audio output using a non-metallic trimming tool.

4. Loosen the FM drive drum locking screws and rotate the tuning control until the cursor coincides with Marker 'B' (91 Mc/s). Rotate drive drum spindle until the 91 Mc/s signal is received and tighten up the locking screws on the drive drum.

5. Adjust C2 for maximum output reducing input level to limit audio output.



Location of components requiring adjustment for FM Alignment. Also shown are scale markers referred to in 'RF Alignment'.



FM tuning drive showing mechanical details necessary for RF Alignment.

AM CIRCUITS

IF ALIGNMENT Switch the receiver to MW, turn gang to minimum capacitance position and volume controls to maximum. Rotate aerial control fully anti-clockwise (S2B closed). Inject a 470 Kc/s modulated signal through an 0.1μF capacitor to V2 grid (pin 2) and adjust L24, L23, L17, and L16 for maximum output. Reducing the input level to maintain output at approximately 50mW.

Transfer signal generator output to AM aerial socket and adjust L13 for minimum output.

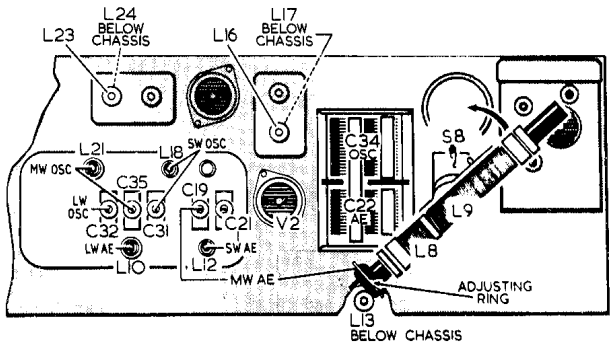
RF ALIGNMENT Medium waverange must be aligned first. Pad (low frequency) and trim (high frequency) points are indicated on the medium and short wave linings of the scale. On the long waverange an alignment marker is provided at approximately 1340 metres. The sequence of adjustments necessary are shown in Table A. Pad and Trim adjustments on each range should be repeated until no further improvements are obtained.

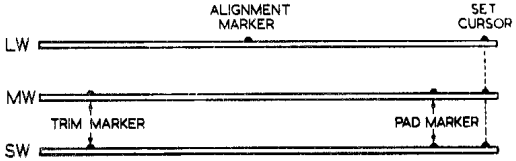
TABLE A

AM RF ALIGNMENT

Input level to be adjusted to maintain output at approximately 50mW with Receiver Volume Controls at maximum.

METHOD		FREQUENCY	CURSOR POSITION	ADJUST
Aerial Control fully clockwise (S2B open). Signals injected by means of a loop loosely coupled to ferrite rod aerial	MW	1470 Kc/s	Trim Marker	C35 C19
		570 Kc/s	Pad Marker	L21 L9*
	LW	223 Kc/s	Alignment Marker	C32 L10
* Adjust by sliding ring along ferrite rod aerial.				
Signals applied to External aerial sockets.	SW	16.05 Mc/s	Trim Marker	C31 C21
		5.9 Mc/s	Pad Marker	L18 L12





Location of components requiring adjustment for AM Alignment. Also shown are the positions of pad and trim points on the scales.

Component Locations

VHF TUNER UNIT

Ⓒ

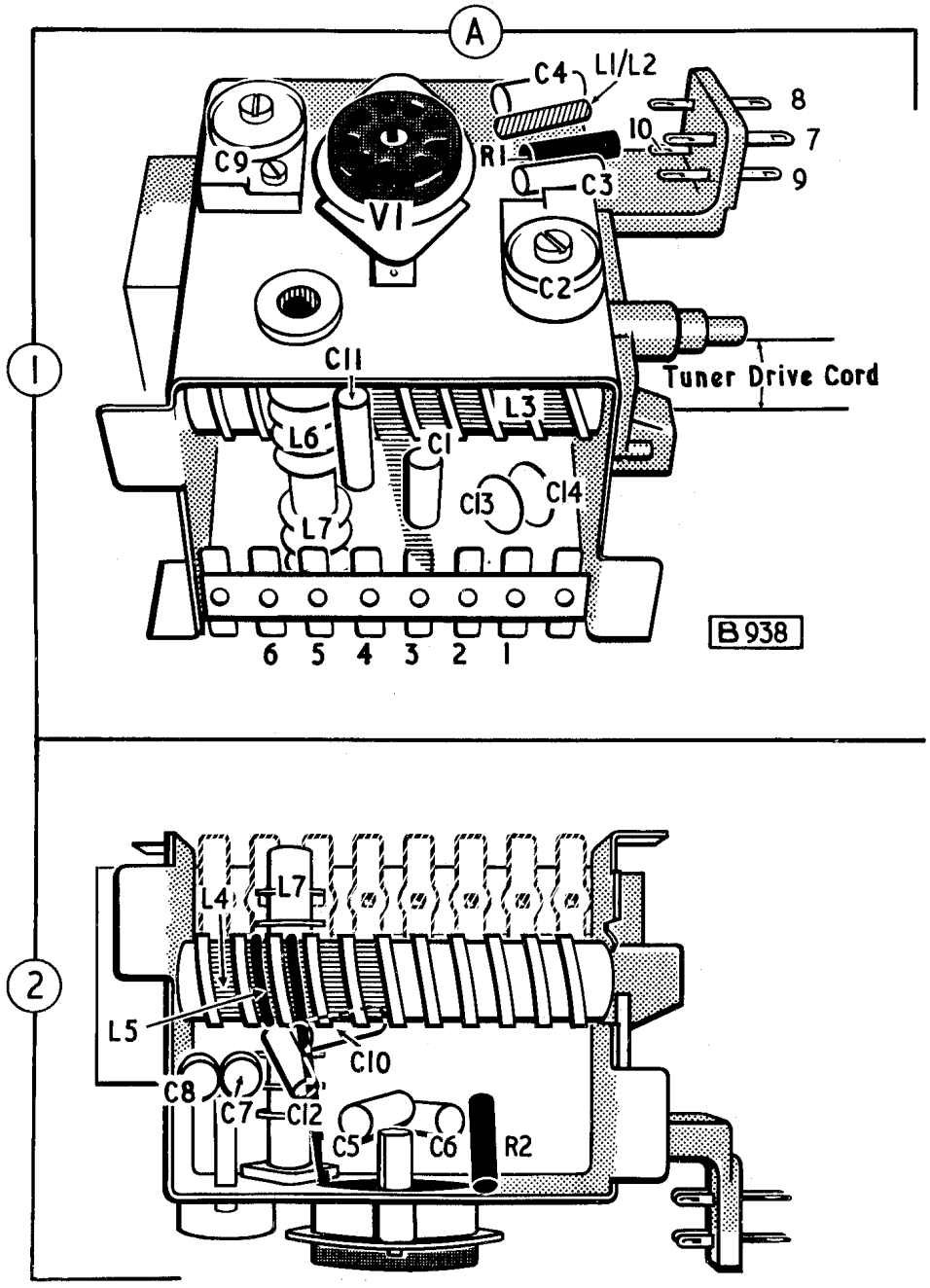
C1	–	–	–	A1
C2	–	–	–	A1
C3	–	–	–	A1
C4	–	–	–	A1
C5	–	–	–	A2
C6	–	–	–	A2
C7	–	–	–	A2
C8	–	–	–	A2
C9	–	–	–	A1
C10	–	–	–	A2
C11	–	–	–	A1
C12	–	–	–	A2
C13	–	–	–	A1
C14	–	–	–	A1

Ⓛ

L1	–	–	–	A1
L2	–	–	–	A1
L3	–	–	–	A1
L4	–	–	–	A2
L5	–	–	–	A2
L6	–	–	–	A1
L7	–	–	–	A1

Ⓡ

R1	–	–	–	A1
R2	–	–	–	A2



MAIN CHASSIS

C

C2	D1
C9	D1
C15	D2
C16	D2
C17	C2
C18	C2
C19	C1
C20	C2
C21	C1
C22	C1
C23	C2
C24	C2
C25	C1
C26	C1
C27	C1
C28	C1
C29	C2
C30	C2
C31	B1
C32	B1
C33	B2
C34	C1
C35	B1
C36	B2
C37	C2
C38	B2
C39	C2
C40	B2
C41	B1
C42	B1
C43	B1
C44	B1
C45	B2
C46	C2
C47	B2
C48	B2
C49	C2
C50	B2
C51	B2
C52	C2
C53	B2
C54	C2
C55	D2
C56	D2
C57	A2
C58	B2
C59	A2
C60	B2
C61	A2
C62	B1
C63	B2
C64	A1
C65	A2
C66	A2
C67	B2
C70	D2
C71	D2
C73	C2
C74	C2
C75	B2

L

L6	D1
L7	D2
L8	D1
L9	D1
L10	B1
L11	C1
L12	C1
L13	C2
L14	C1
L15	C1
L16	C1
L17	C1
L18	C1
L19	C1
L20	C1
L21	B1
L22	B1
L23	B1
L24	B1
L25	B1
L26	B2
L27	B1

P

PL1	A1
PL2	B1
PL3	C1
PL4	D1

R

R3	D2
R4	D2
R5	C2
R6	C2
R7	C2
R8	C2
R9	C2
R10	C2
R11	B2
R12	C2
R13	B2
R14	B2
R15	B2
R16	C2
R17	C2
R18	B2
R19	B2
R21	D2
R22	C2
R23	B2
R24	B2
R25	B2
R26	A2
R27	A2
R28	B2
R29	A2
R30	A2
R31	B2
R32	A2
R33	B2
R34	A2
R35	B2
R36	B2
R37	A2
R38	A2
R39	B2
R40	B1
R41	B2
R42	B2
R43	A1
R44	A2
R45	B2
R46	A2
R51	B2

S

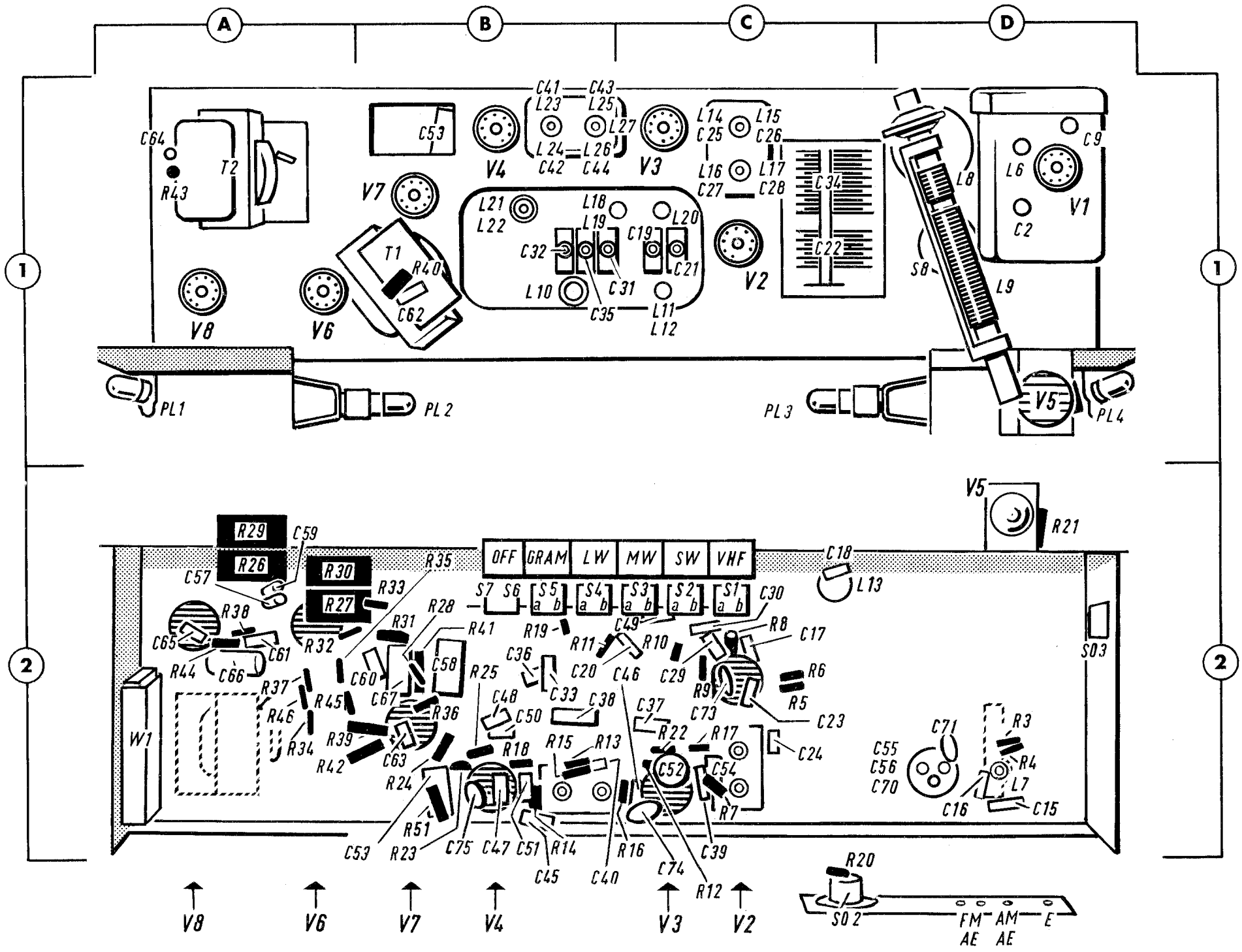
S1-S3	C2
S4-S7	B2
S8	D1
S03	D2

T

T1	B1
T2	A1

W

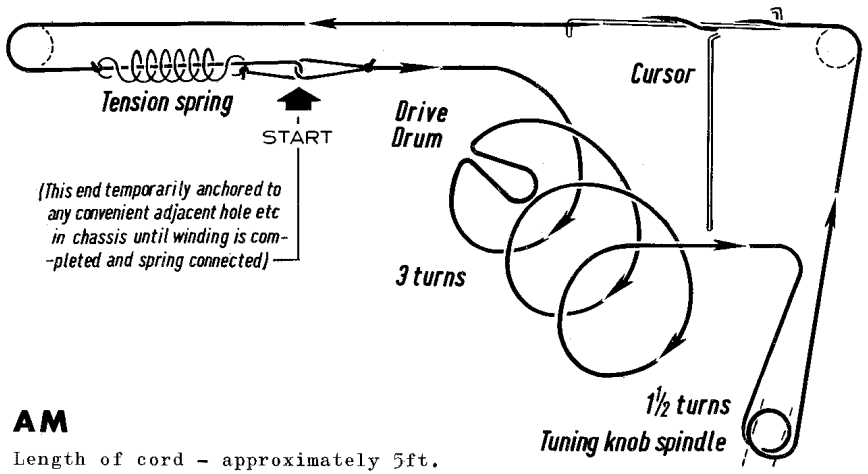
W1	A2


A
B
C
D
1
2
C64
T2
R43
C53
C41
C43
L23
L25
L27
L24
L26
C42
C44
V4
V3
L14
L15
C25
C26
L16
L17
C27
C28
C34
C22
L8
L6
C9
V1
C2
V7
T1
R40
C62
L21
L22
L18
L19
C19
L20
C32
C21
L10
C31
C35
L11
L12
V2
S8
L9
V8
V6
PL1
PL2
PL3
V5
PL4
R29
R26
R30
R27
C59
C57
C9
R35
R33
R28
R31
R32
R38
C65
C61
R44
C66
C60
C67
C58
R37
R45
R46
R34
R39
R42
C63
R36
R24
R25
C48
C50
C36
C33
C38
R18
R15
R13
R51
C53
R23
C75
C47
C51
R14
C45
R16
C40
C74
C39
R12
V8
V6
V7
V4
V3
V2
W1
OFF
GRAM
LW
MW
SW
VHF
S7
S6
S5
S4
S3
S2
S1
a
b
R41
R19
C49
C30
R8
C17
R11
R10
C20
C46
C29
R9
C73
R6
R5
C23
C24
C37
R22
R17
C52
C54
R7
V5
R21
C18
L13
SO3
C71
R3
C55
C56
C70
R4
L7
C16
C15
R20
SO2
FM
AE
AM
AE
E

Service Notes

CHASSIS REMOVAL

1. Remove cabinet backs.
2. Unplug pickup lead on right of chassis and unsolder loudspeaker leads from both output transformers.
3. Release the mains lead from its cleat and unplug supply cable from chassis.
4. Remove screws securing tape and aerial socket panel to rear of cabinet.
5. The chassis is retained by four bolts - one located at each corner. When these are unscrewed, the chassis is free to be withdrawn.



AM

Length of cord - approximately 5ft.

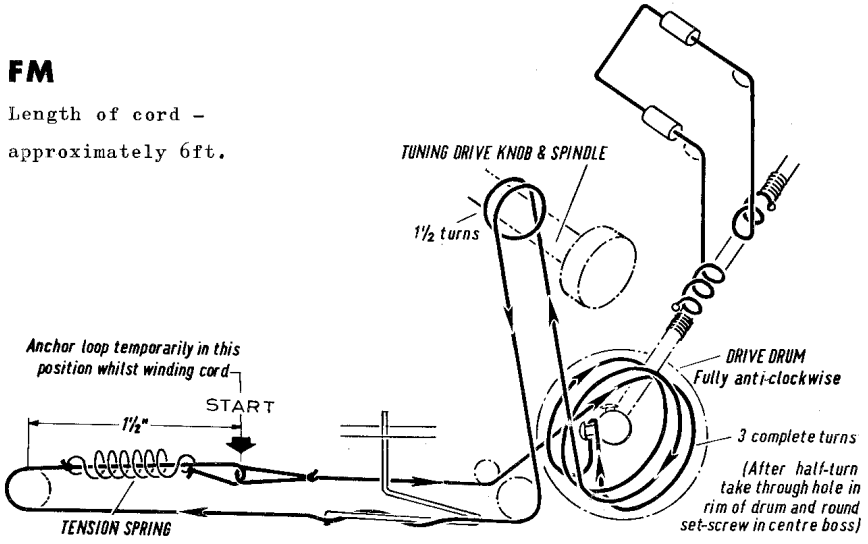
Tuner Unit Drive. Replace with cord/slug assembly (Part No. Z.17223). The tuner unit must then be re-aligned as described in 'FM/RF Alignment'.

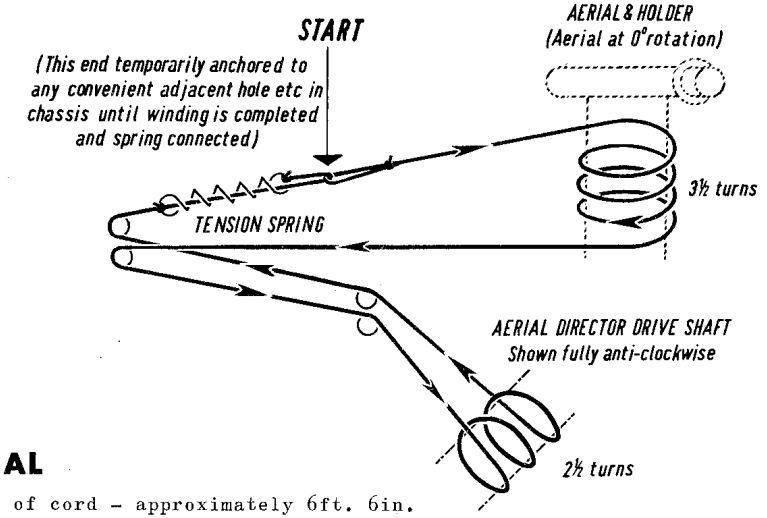
Drive Cords

DIAGRAMMATIC ONLY

FM

Length of cord - approximately 6ft.





AERIAL

Length of cord - approximately 6ft. 6in.

COMPONENT TABLES

RESISTORS

All ¼ Watt carbon 20% tolerance unless otherwise stated

Ref.	Value	Rating	Function and Part No.
R1	680KΩ		V1A grid leak and AGC
R2	680KΩ		V1B grid leak
R3	10KΩ	10%	V1A anode feed
R4	15KΩ	10%	V1B anode feed
R5	1MΩ		V2 heptode grid leak and AGC feed
R6	47KΩ	10%	V2 SG feed
R7	2.7KΩ		V2 heptode anode feed
R8	27KΩ	10% ½W	AM oscillator anode load
R9	47KΩ		AM oscillator grid leak
R10	100Ω	10%	AM oscillator feedback limiter
R11	2.7KΩ		AM oscillator damping
R12	39KΩ	10%	V3 SG feed
R13	3.3KΩ		V3 anode feed
R14	68Ω	10%	Ratio detector tertiary resistor
R15	100KΩ		AM part IF filter
R16	330KΩ		AM detector load
R17	2.2MΩ		AGC feed
R18	100KΩ		FM de-emphasis
R19 R20	1MΩ 47KΩ		Tape out attenuator
R21	470KΩ		V5 anode load
R22	2.2MΩ		V5 grid decoupling
R23	2KΩ	Pre-set	Ratio detector balance Z13007/2
R24	22KΩ		Part ratio detector load
R25	1MΩ		Tuning indicator feed (FM)
R26*	1MΩ	Log.pot.	RH Volume control Y13096
R27†	1MΩ	Lin.pot.	Tone control RH channel Y13097
R28	680Ω	10%	V6 cathode bias
R29*	1MΩ	Log.pot.	LH Volume control Y13096
R30†	1MΩ	Lin.pot.	Tone control LH channel Y13097
R31	200Ω	Pre-set	Balance control Z13007/4
R32 R33	100Ω 100Ω	10%	Balance control limiter
R34	10KΩ		V6 HT feed
R35	220KΩ		V6A anode load
R36	220KΩ		V7 grid leak
R37	220KΩ		V6B anode load
R38	220KΩ		V8 grid leak
R39	1KΩ	½W	HT Smoothing
R40	10KΩ		V7 Phase correction
R41	140Ω	10% ½W	V7 cathode bias
R42	1KΩ	½W	HT Smoothing
R43	10KΩ		V8 Phase correction
R44	140Ω	10% ½W	V8 cathode bias

CAPACITORS

All 350 V working 20% tolerance unless otherwise stated

Ref.	Value	Rating	Function and Part No.
C1	1500pF		V1A HT decoupling
C2	2-10pF	Pre-set	L3 tuning Z13903
C3	220pF		V1A grid coupling
C4	20pF	5%	L2 tuning
C5 C6	10pF 10pF	±½pF ±½pF } P100	Oscillator mixer signal injection C100H75/F13
C7 C8 C9	14pF 4.7pF 2-10pF	±10% P100 ±½pF N750 Pre-set	L4 tuning C140S75/F13 C47XH75/F14 Z13903
C10	10pF	±½pF P100	Oscillator balancing C100H75/F13
C11	85pF	2.5%	Mixer IF feedback Y850R35/SU4
C12	25pF	5%	V1B anode coupling and L6 tuning
C13 C14	1000pF	-20 + 80%	Heater RF bypass
C15	.001μF	300V AC	AM aerial isolating
C16	12pF	10%	L7 tuning
C17	200pF		V2 heptode CG coupling
C18	68pF	10%	L13 tuning
C19	40pF	Pre-set	M and LW aerial trimmer Z13924
C20	100pF	5%	LW aerial trimmer
C21	40pF	Pre-set	SW aerial trimmer Z13924
C22	511pF	Variable	AM aerial tuning Y17554
C23	2000pF	10% 750V	V2 SG decoupling
C24	.003μF	400V	V2 heptode neutralising
C25	5.6pF	5%	L14 tuning
C26	15pF	5%	L15 tuning
C27	220pF	2%	L16 tuning
C28	220pF	2%	L17 tuning
C29	200pF		AM Oscillator anode coupling
C30	50pF		AM Oscillator grid coupling
C31	40pF	Pre-set	SW AM Oscillator trimmer Z13924
C32	80pF	Pre-set	LW AM Oscillator trimmer Z13924/2

RESISTORS continued

R45	15KΩ	10%	V6A NFB series
R46	15KΩ	10%	V6B NFB series
R47	27Ω		LS crossover filter 270WC02
R48	27Ω		
R51	6.8KΩ		Part ratio detector load

* Concentric † Ganged

CAPACITORS continued

Ref.	Value	Rating	Function and Part No.
C33	400pF	5%	LW AM Oscillator trimmer
C34	511pF	Variable	AM Oscillator tuning Y17554
C35	80pF	Pre-set	MW AM Oscillator trimmer Z13924/2
C36	500pF	2%	M & LW AM Oscillator padder Y501R35
C37	150pF	5%	L20 tuning Y151G35
C38	4700pF	5% 125V	SW AM Oscillator padder Y472G12
C39	3900pF	10% 750V DC	V3 SG decoupling C392S75
C40	.003μF	400V DC	V3 neutralising T302W40
C41	220pF	2%	L23 tuning
C42	220pF	2%	L24 tuning
C43	12pF	5%	L25 tuning
C44	47pF	5%	L26 tuning
C45 C46	220pF	30%	AM IF filter
C47	390pF	10%	FM de-emphasis
C48	.01μF	150V	FM AF coupling
C49	.01μF	150V DC	Audio coupling
C50 C51	400pF		FM IF filter
C52	.0025μF	750V DC	V5 grid decoupling
C53	4μF	Elec.100V DC	Ratio detector stabiliser Y13210/1
C54	.04μF	150V	AGC time constant
C55 C56	50μF 8μF	Elec.275V DC Elec.275V DC	HT smoothing Y13239/5
C57	.001μF	150V DC	Part tone control (R.H.)
C58	200μF	Elec. 6V DC	V6 cathode bypass Y13229/4X
C59	.001μF	150V DC	Part tone control (L.H.)
C60	.01μF	400V DC	V7 grid coupling
C61	.01μF	400V DC	V8 grid coupling
C62	.001μF	400V DC	Phase correction
C63	7pF	±½pF	NFB phase correction C070H75
C64	.001μF	400V DC	Phase correction
C65	7pF	±½pF	NFB phase correction C070H75
C66	50μF	Elec. 12V DC	V8 cathode bypass Y13210/2
C67	50μF	Elec. 12V DC	V7 cathode bypass Y13210/2
C68	2μF	Elec. 12V DC	LS 1 & 3 crossover Y13220/2X
C69	2μF	Elec. 12V DC	LS 2 & 4 crossover Y13220/2X
C70	100μF	Elec.275V DC	HT reservoir Y13239/5
C71	2500pF	-20 +80%	HT RF bypass
C72	.01μF	300V AC	Mains RF bypass
C73	.0025μF	-20 +80%	V2 Heater RF bypass
C74	.01μF	-20 +80%	V3 Heater RF bypass
C75	.0025μF	-20 +80%	V4 Heater RF bypass
C78 C79	.002μF .002μF	150V DC 150V DC	Pick-up sensitivity correction T102W40

Component Tables
Continued

INDUCTORS AND TRANSFORMERS

DC resistance not given if less than 1 ohm

Ref.	Function	Resistance	Part No.
L1, L2	VHF aerial input transformer		Z10475
L3	VHF amplifier tuning		
L4	VHF oscillator tuning		
L5	VHF oscillator feedback		
L6, L7	1st FM IF transformer		Y10474
L8	M & LW aerial coupling		Y17541*
L9	MW aerial tuning		
L10	LW aerial loading		
L11	SW aerial coupling		Y17588
L12	SW aerial tuning		
L13	IF rejector		Y26133
L14, L15	2nd FM IF transformer		X10509/1
L16, L17	1st AM IF transformer		
L18	SW oscillator tuning		Y17590
L19	SW oscillator feedback		
L20	SW Booster		Y17591
L21	M & LW oscillator tuning		Y17589
L22	M & LW oscillator feedback		
L23, L24	2nd AM IF transformer		X17017
L25, L26, L27	Ratio detector transformer		
T1	RH channel output transformer		Y26157
T2	LH channel output transformer		Y26157
T3	Mains transformer		18243

* Ferrite-rod aerial

MISCELLANEOUS

Ref.	Function and Description	Part No.
S1 - S7	Piano-key switch assembly	W17211/6
S8	AM aerial switch	17584
PL1, PL2, PL3, PL4	Pilot lamps -6.5V 0.3A (MES)	Y17561
W1	Bridge rectifier, Westinghouse 18RD-2-2-8-1	Z17467/1
LS1, LS2	8in diameter speech coil	Y16023/1
LS3, LS4	4in diameter speech coil	Y16020/3
F1	2A fuse	Z12612/7

SPARE PARTS

Description	Part No.
Cabinet	V18304
Cabinet back (top)	W17968
Cabinet back (bottom)	W17969
Control knob:	
Volume, AM tuning	Z10520/3
Clip	37332
Volume, FM tuning	X10521/4
Clip	37302
Tone, Aerial	X17373/1
Clip	45931
Cursor AM	Y17585
Cursor FM	Y17586
Drive cord tension spring	Z9528
Drive drum AM	Z17572
Drive drum FM	Z17572/1
Ferrite-rod aerial drum carrier	17544
FM cord anchor spring	Z17667
FM rotation stop spring	Z17665
FM torsion spring	Z17668
Indicator flag	Z17574
Indicator flag spring	Z17557
Indicator reflector	Z17583
Pygmy lamp 15W	33772
Scale clip	37330
Scale reflector	Y17575
Tuning scale	Y17560/3

VALVES

Ref.	Type	Description
V1A, V1B	ECC 85	VHF Amplifier and Mixer
V2	ECH 81	AM Frequency Changer FM IF Amplifier
V3	EBF 89	AM-FM IF Amplifier AM Detector and AGC
V4A, V4B	EB 91	FM Ratio Detector
V5	EM 81	Tuning Indicator
V6A, V6B	ECC 83	R.H. Channel AF Amp. L.H. Channel AF Amp.
V7	EL 84	R.H. Channel Output
V8	EL 84	L.H. Channel Output

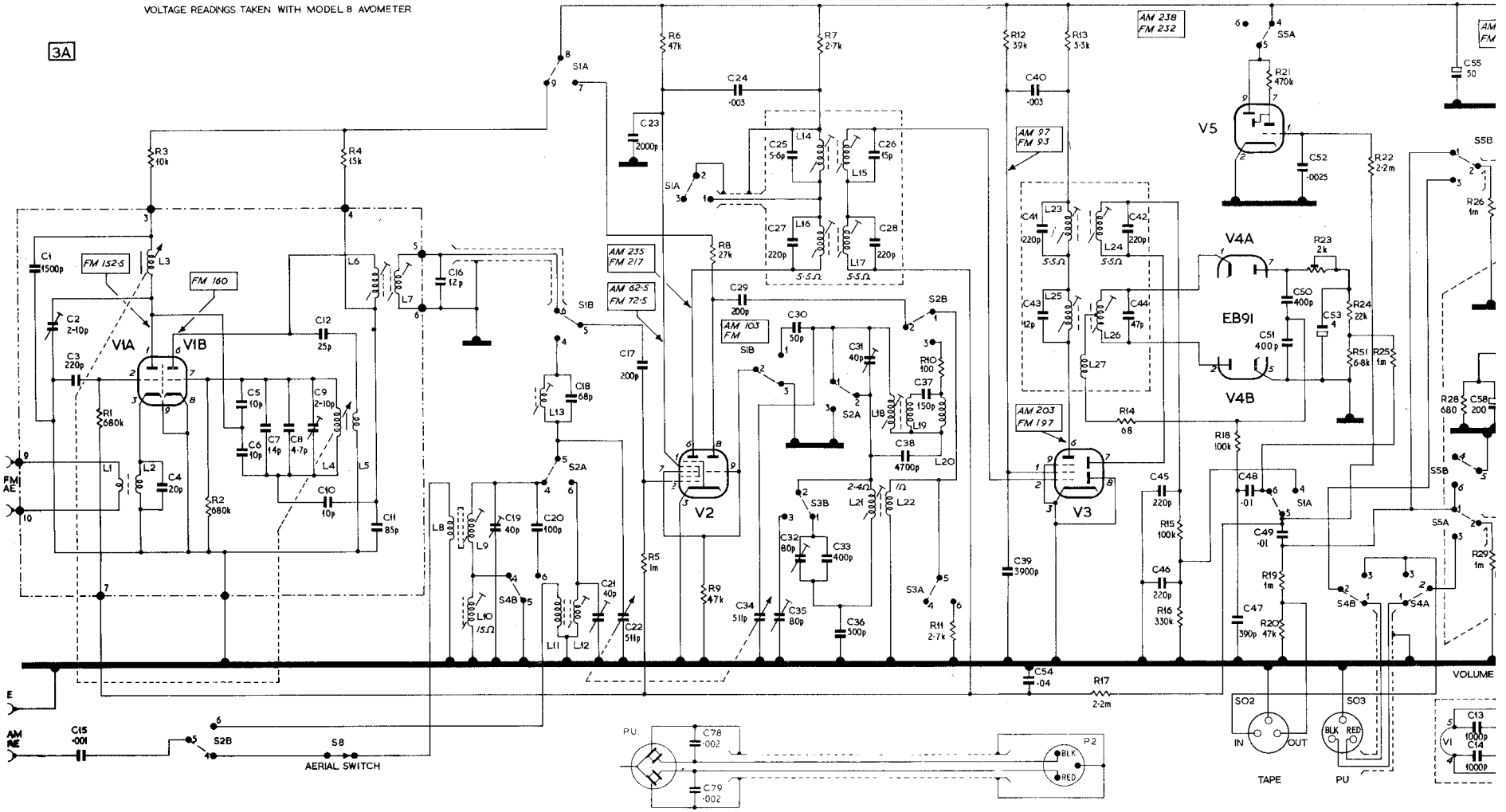
MODIFICATIONS IN PRODUCTION

In early production receivers (Schedule A) C78 and C79 were not fitted. A 33KΩ resistor, shunted by a 0.1μF capacitor was connected between T1 secondary and R43 in the RH channel NFB loop. Similar correction was also incorporated in the LH channel between T2 secondary and R46.

In some Schedule B production, R24 was 27KΩ and R51 (6.9KΩ) was not fitted. Reason for change: to improve FM fringe area AGC action.

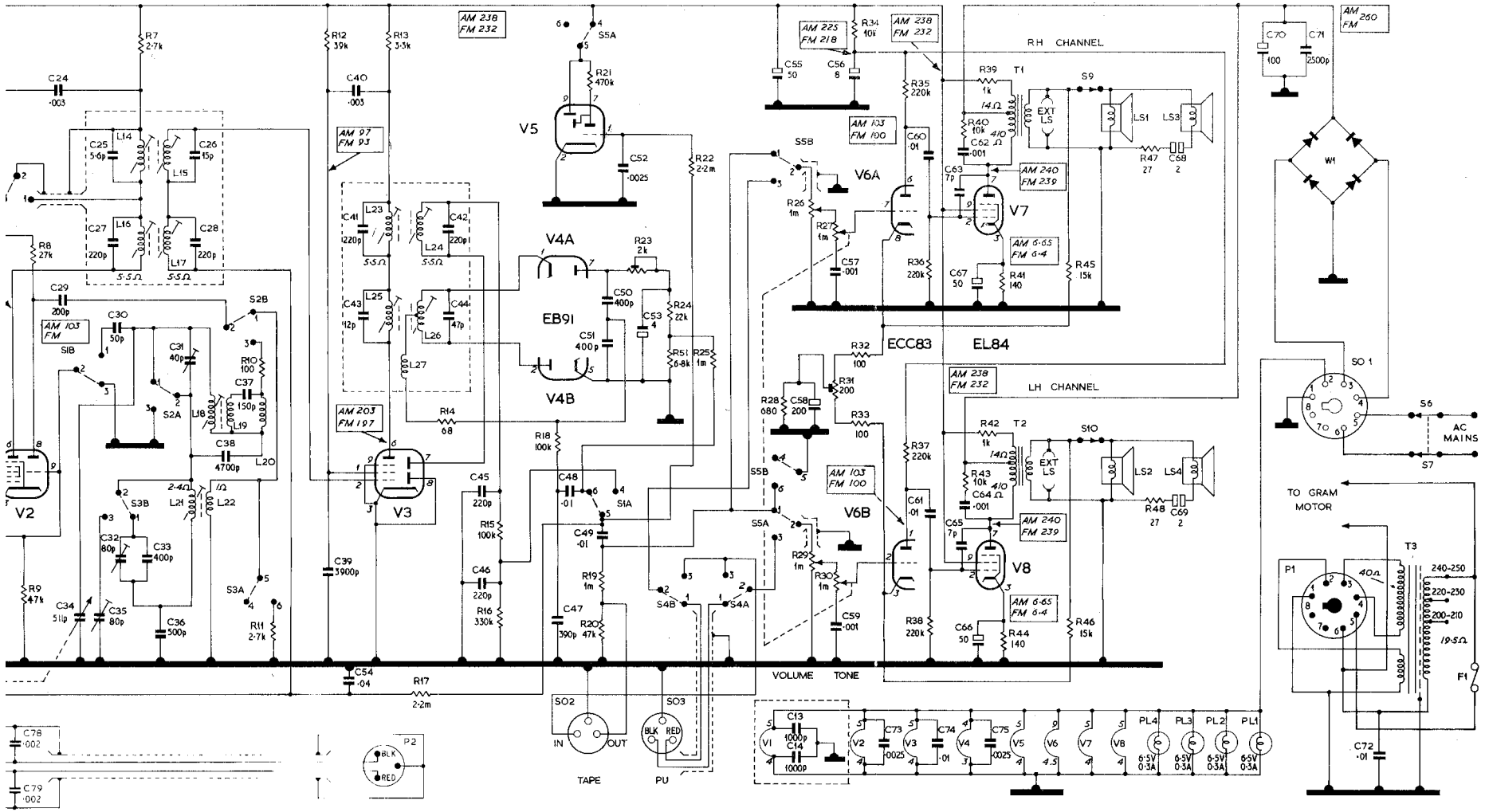
Also, in some receivers, the values of the EL84 grid leaks R36 and R38 were 1MΩ. These were changed to 220KΩ to improve output stage overload characteristics.

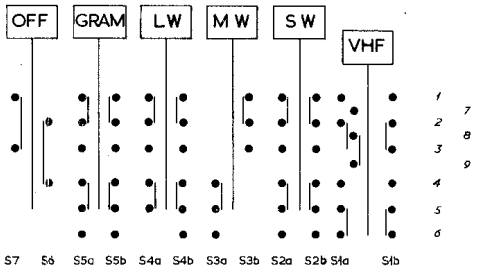
ECC85 ECH81 EBF89 EM81



CIRCUIT DIAGRAM - MODEL 1635 SCH B

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.





SWITCH SHOWN IN VHF-FM POSITION AND VIEWED FROM REAR OF INVERTED CHASSIS

M – MODEL 1635 SCH B

he valve electrodes denote pin
rectangles indicate voltages measured
meter. DC resistance readings are shown
here these are 1Ω or greater.