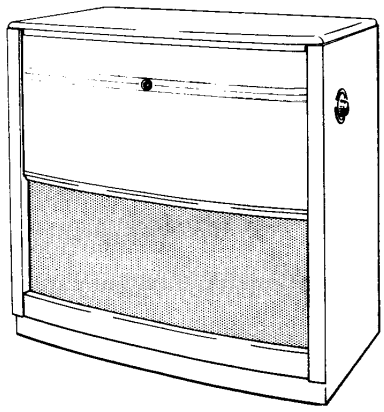
"HIS MASTER'S VOICE"

SERVICE MANUAL

9 VALVE A.M./F.M.
3 SPEED AUTO-RADIOGRAM
FOR A.C. MAINS



MODEL 1626

INDEX

Part No. 95094 Issue 1

March, 1957

SPECIFICATION

Physical

Height	34⅝ inches	(88.26 cms)	Approx.
Width	35½ inches	(90.17 cms)	over-
Depth	19 inches	(48.26 cms)	all.
Weight	156 lbs	(70.82 kgs)	

Mains Supply

195-215, 216-235 and 236-255 volts, 50 cycles A.C. only.

Consumption

Radio	100 watts	Approx.
Gram	100 watts	

Rated Output

12 watts maximum.

Intermediate Frequencies

A.M.	470 kc/s
F.M.	10.7 Mc/s

Wave Ranges

L.W.	900 - 2,000 metres
M.W.	187.5 - 574.6 metres
S.W.1	51.7 - 185 metres
S.W.2	16.3 - 51.7 metres
F.M.	87.5 - 100 Mc/s

Lamps

LP1, LP2, LP3	6.8V	0.3 amp Tubular Scale Lamps.
LP4	230V	15 watt B.C. Combined flood-light and front Indicator Lamp.

Valves

V1	ECC85	V.H.F. Amplifier and Frequency Changer (F.M.)
V2	ECH81	I.F. Amplifier (F.M.) Frequency Changer (A.M.)
V3	EF89	I.F. Amplifier (A.M. and F.M.)
V4	EABC80	Ratio Detector (F.M.) Detector and AGC Rectifier (A.M.) and A.F. Amplifier (A.M. and F.M.)
V5	EM34	Tuning Indicator
V6	ECC83	Paraphase Amplifier
V7, V8	EL84	Push-Pull Output Pentodes
V9	EZ81	Full-Wave H.T. Rectifier

Loudspeakers

LS1, LS2	Two	2½ inch Dynamic Tweeters.
LS3, LS4	Two	10½ inch Elliptical Loudspeakers specially matched for resonance.

Extension Speaker

An external loudspeaker may be connected at the rear of the instrument. It should have an impedance of approximately 5 ohms. A three-position loudspeaker selector switch is provided.

Auto-Mechanism

Three-speed auto-mechanism type 48540S, capable of handling up to eight 10-inch or 12-inch 78 r.p.m. records, up to eight 10-inch or 12-inch 33 1/3 r.p.m. records, or up to eight 7-inch 45 r.p.m. records.

For full information see Service Manual for 3-speed Automatic Record Changer. Basic type 48540.

Pick-Up

High impedance crystal reversible type.

Styli

"H.M.V." type RS3 Standard stylus for 78 r.p.m. records.

"H.M.V." type RS3 Microgroove stylus for 33⅓/45 r.p.m. records.

Motor

No.2. Squirrel cage shaded pole induction type.

INSTALLATION

A.M. Aerial

Although the model will operate satisfactorily on an indoor aerial, a high outdoor aerial is essential for the best reception. Erect 60 to 80 feet (including lead-in) as far as possible from buildings and trees.

F.M. Aerial

General - In the majority of cases, for the best performance from this model, either an outdoor or indoor dipole with co-axial feeder cable should be installed.

In high signal strength and/or low interference areas, satisfactory results may be obtained by utilising a simple dipole. This can be made from a length of twin moulded mains lead with one end opened apart so that arms of 2ft-6ins each are formed. This 'T' shaped arrangement should be installed with 'T' arms horizontal, at right angles to the direction of the transmitter and attached to a picture rail or skirting board.

Re-siting and/or tilting may be necessary for best results. In VERY high signal strength areas, the internal F.M. aerial will prove satisfactory.

Local conditions may greatly affect V.H.F./F.M. reception, i.e., height above sea level, type of building in which the aerial is installed, local surroundings, etc., and these must be considered on installation.

Internal F.M. Aerial

The internal F.M. aerial is permanently connected.

Earth

An earth terminal is fitted adjacent to the A.M. aerial socket at the rear of the model and this should be connected to an efficient earth. A copper plate or rod buried about three feet deep in moist ground provides the best earth. Do not use a telephone earth, gas pipe or hot water pipe as an earth

Transit Packing

The Pick-up Head is secured in the P.U. arm and the P.U. arm secured by tape to the switch pedestal. These tapes must be removed.

Remove the four red-headed screws and washers from the corners of the mechanism plate and replace with the chrome-headed screws and leather washers contained in the linen bag which will be found attached to the inside of the cabinet.

This bag will contain the A.M. and F.M. aerial plugs, earth eyelets and envelopes containing the cranked spindle, Tampion and Adaptor screw.

Remove the two split rubber washers between the pusher tube and the turntable.

Unscrew the red-headed transit screw in the centre of the turntable and remove the chromium retaining ring. Remove the two remaining screws securing the turntable.

Remove the three red-headed motor transit screws.

Replace the turntable and the two pulley screws. Replace the retaining ring and secure in position with the adaptor screw contained in the envelope.

Place the cranked spindle in the pusher tube and the Tampion into the parking hole at the rear of the mechanism plate.

NOTE: The Tampion may be fitted in the pusher tube after removing the cranked spindle when it is desired to play a single record.

The transit packing should be kept in case the model is transported on some future occasion.

CIRCUIT DESCRIPTION

V.H.F. Amplifier and Frequency Changer (F.M.)

V1 (ECC85) is a double triode valve, one triode (V1A) operates as a V.H.F. Amplifier, the F.M. aerial being coupled to the grid circuit via transformer L1/L2. A tuned circuit L3/VC1 fed from the anode of V1A passes the signal to the grid of the other triode section V1B. This circuit operates as a self-oscillating frequency changer, the oscillatory circuit being tuned by L5/VC2. V1B section is coupled to the control grid of V2 by the first I.F. Transformer (IFT1) and SW1 Card 5.

When the receiver is switched to any position other than F.M. the H.T. supply to V1B anode is disconnected (SW1 Card 4) and the F.M. output from IFT1 to the grid of V2 is also disconnected. The A.M. aerial is earthed in the F.M. position.

I.F. Amplifier (F.M.) and Frequency Changer (A.M.)

V2 (ECH81) is a triode-heptode valve which amplifies at the intermediate frequencies of 10.7 Mc/s for F.M. reception and 470 kc/s for A.M. reception.

On F.M. GRAM and AUX. positions of the wavechange switch, the triode section is made inoperative by disconnecting the anode supply (SW1 Card 2).

For A.M. reception, the valve operates as a conventional frequency changer. The grid of the mixer section being connected via SW1 Card 5 to the A.M. aerial coils, thence via SW1 Card 6 to the A.M. aerial. Tuning is by VC3 and VC4.

I.F. Amplifier (A.M. and F.M.)

The I.F. output from V2 is coupled by IFT2 (A.M.) or IFT3 (F.M.) to V3 (EF89) grid via SW1 Card 2. This valve amplifies at I.F. frequencies of 470 kc/s or 10.7 Mc/s. Both V2 and V3 have series connected IFTs with switched secondary connections.

Ratio Detector (F.M.), Detector and A.G.C. Rectifier (A.M.) and A.F. Amplifier (A.M. and F.M.)

V4 (EABC80) a triple-diode-triode, operates as a ratio detector and A.F. amplifier on F.M. and as a conventional detector, A.G.C. rectifier and A.F. amplifier on A.M.

The F.M. discriminator is a ratio detector of the unbalanced variety, R33 being the D.C. load resistor and C49 the stabilising capacitor.

R22 and C46 form the de-emphasis circuit (to compensate for treble boost applied at the transmitter). The output from the ratio detector is passed via SW1 Card 1 to the top of the volume control RV1 and thence to the grid of V4 via C47.

The third diode on V4 is used for the demodulation of A.M. signals from IFT4. The load resistor on A.M. is R24 with filtering

by R23, C43 and C44. The A.F. signals are fed via SW1 card 1 to the volume control RV1.

From pin 3 of IFT4 is taken the A.G.C. which also operates the Tuning Indicator V5 via R28.

The A.M. form of A.G.C. is not operative on F.M. but grid limiting effects a certain amount of A.G.C. due to the action of C49. In this condition the signal to the Tuning Indicator is fed via R32. A.F. signals appearing at V4 anode are fed via C50 to the Treble control network RV2, C54, R36 and Bass control network RV3, R37, C56, C57, R38, and then to the grid of V6.

Phase-Splitter

V6 is a double triode valve operating as a Paraphase Amplifier, R40 and R41 being the two anode loads.

The anti-phase signals appearing at the anodes of V6 are coupled via C58 and C59 to the grids of push-pull output valves V7 and V8 respectively.

Push-Pull Output Stage

V7 (EL84) and V8 (EL84) are connected to TR1 primary in an ultra-linear circuit. Tappings 2 and 4 on TR1 primary feed the screens of V8 and V7 respectively. R47 and R48 are incorporated in V7 and V8 grid circuits to prevent parasitic oscillation. Auto-bias for these valves is obtained by R51, R52, decoupled by C62 and C63.

The signal appearing at the secondary of TR1 is fed via SK6/PL6 to the loudspeaker switch SW2.

Negative feedback is taken from the secondary of TR1 and is fed via R49 to the cathode (pin 8) of V6.

Loudspeaker Switch

The loudspeaker switch (SW2) has three positions, i.e., INT/BOTH/EXT. When SW2 is in the 'INT' position the output from TR1 is connected to two 10½ inch elliptical speakers (LS3, LS4) in parallel and two 2½ inch Dymanic Tweeters (LS1, LS2) in series. Also in series with LS1, LS2 is capacitor C64. This capacitor prevents LS1 and LS2 operating at frequencies below 8 kc/s.

When SW2 is in the "EXT" position, the output from TR1 is taken direct to the extension loudspeaker sockets which are bridged via contact 10 on SW2, by two resistors R53 and R54. These resistors act as a dummy load if the extension loudspeaker is not connected or is accidentally disconnected and ensures correct matching for a 5 ohm external loudspeaker.

When SW2 is in the "BOTH" position, the output from TR1 is fed simultaneously to both internal and external loudspeakers.

Auxiliary Socket

By connecting a suitable co-axial cable terminated with the correct plug to the auxiliary socket at the rear of the model, full advantage may be taken of its linear amplification and 12-watt output to reproduce tape player or other recordings. A microphone may also be connected to this socket for announcements, etc..

To use these facilities, set wavechange switch to 'A'.

H.T. and Heater Supplies

H.T. is supplied from the full-wave rectifier V9 (EZ81), and is smoothed by R55, C65. C66 is the reservoir capacitor. Heater supplies to V1-V8 are taken from a separate secondary winding on TR2. This winding also supplies voltages for LP1, LP2 and LP3. A filter network comprising L32, C52, C53 is incorporated between V1 and the following valves.

DISMANTLING

Removal of AM/FM Chassis

To remove the chassis, proceed as follows :-

1. Unscrew screws securing Tuning, Wave-change, Bass, Treble and Volume control knobs, and remove knobs.
2. Remove the two countersunk woodscrews securing the radio panel. These are situated just under the left-hand edge of the radio panel.
3. Carefully lift out radio panel and disconnect the valveholder of Tuning Indicator.
4. Disconnect PL5 from SK5 on the Power Amplifier.
5. Disconnect switch leads (mauve) and mains lead (orange) on TR2 voltage adjustment panel.
6. Disconnect leads from SK1, SK2, SK3, and SK4.
7. Remove the two hexagonal screws securing the chassis to the right hand cabinet side wall.
8. Remove chassis.

Removal of Power Amplifier Chassis

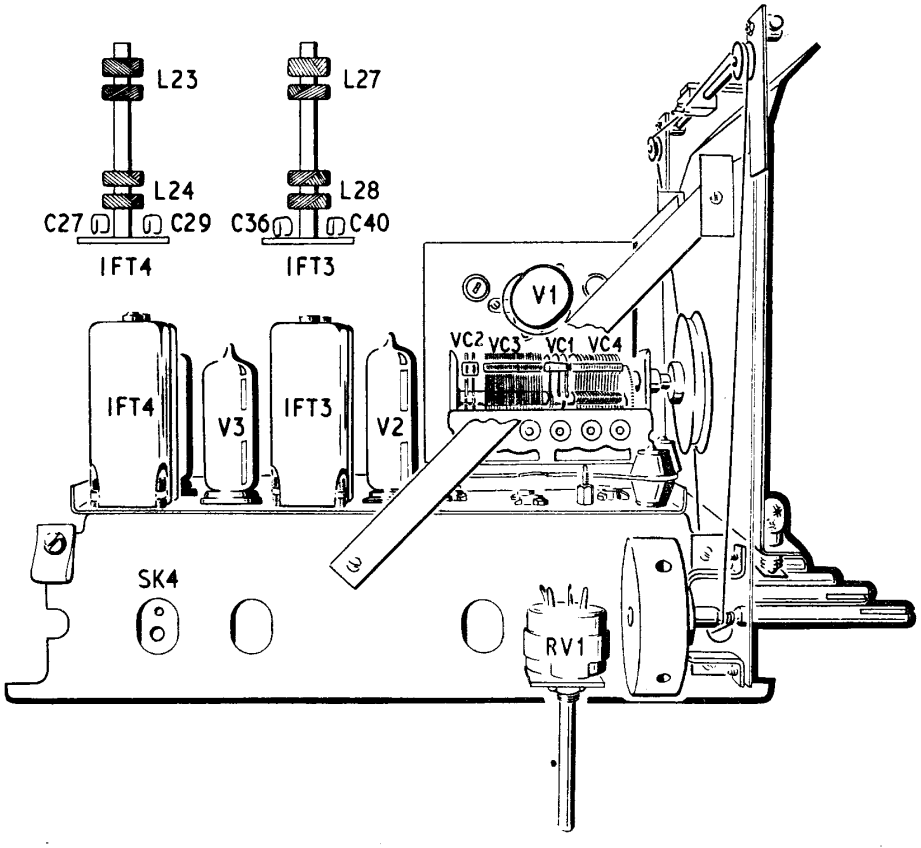
1. Remove loudspeaker leads from SK6.
2. Remove Auto-mechanism and floodlight leads (blue) from TR2 voltage adjustment panel.
3. Remove the four hexagonal-headed screws securing the power amplifier chassis to the cabinet.

Removal of Auto-Mechanism

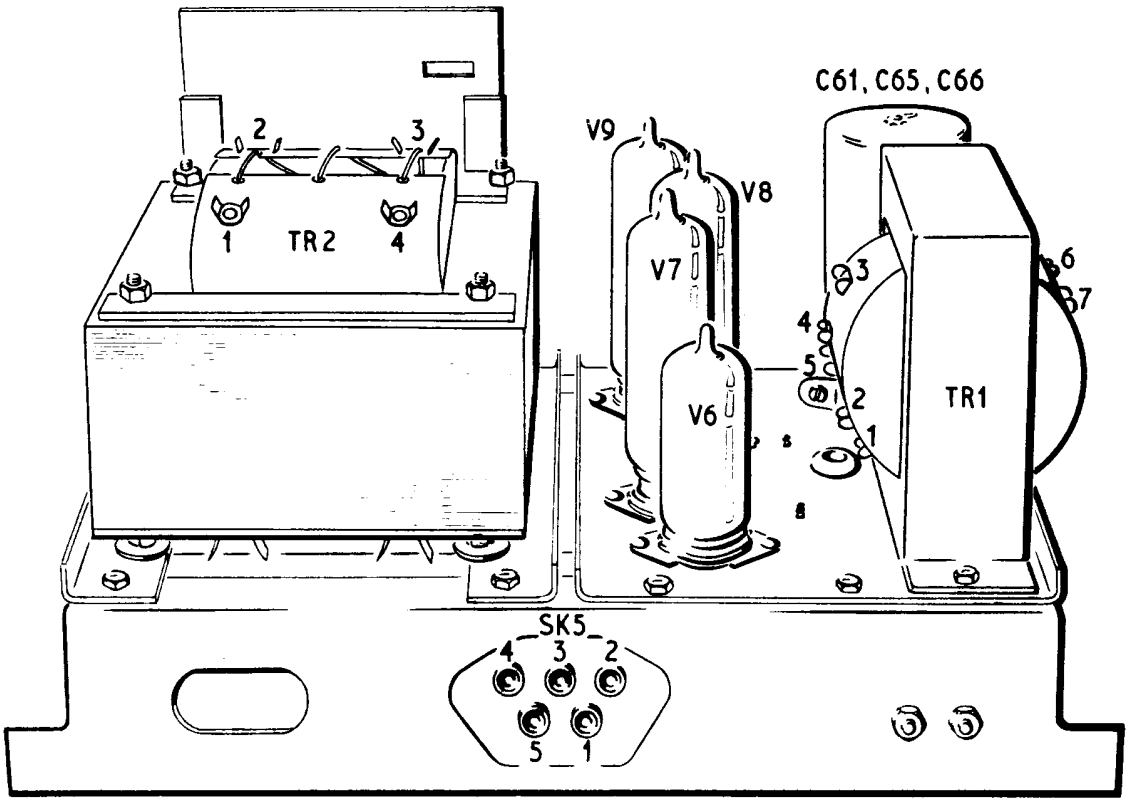
1. Remove the four chrome-headed screws situated in each corner of the mechanism base-plate.
2. Lift out mechanism.

Removal of Floodlamp

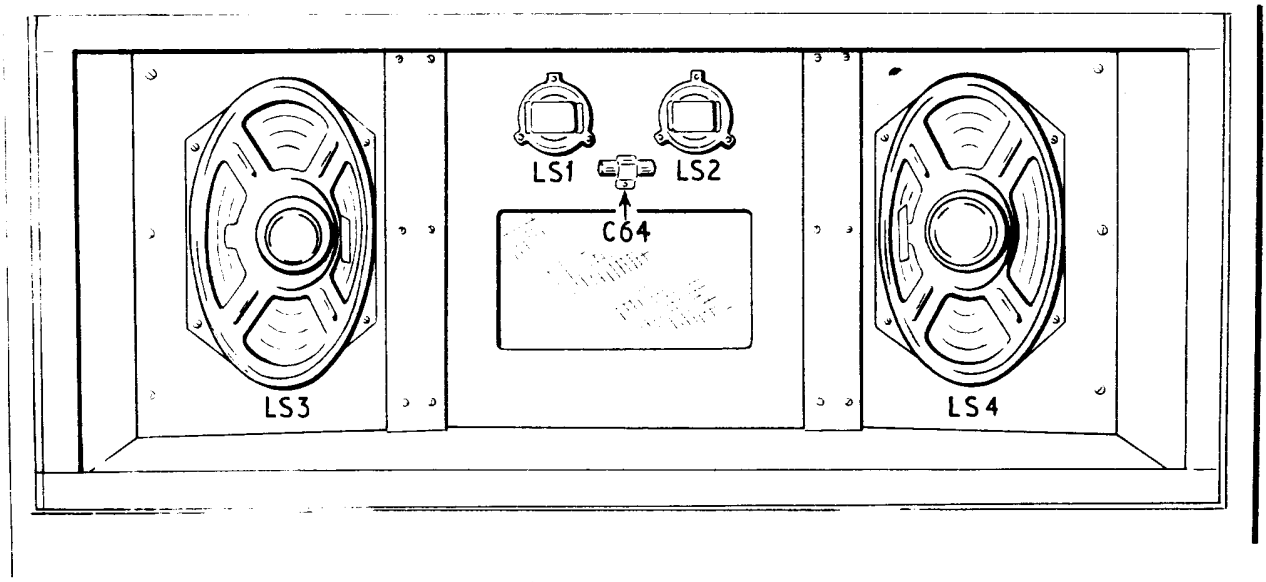
1. Remove the two countersunk wood-screws situated behind the rear edge of the front of the cabinet.
2. Carefully ease out wooden panel from the right-hand side and disengage from the opaque screen.
3. Remove floodlamp.



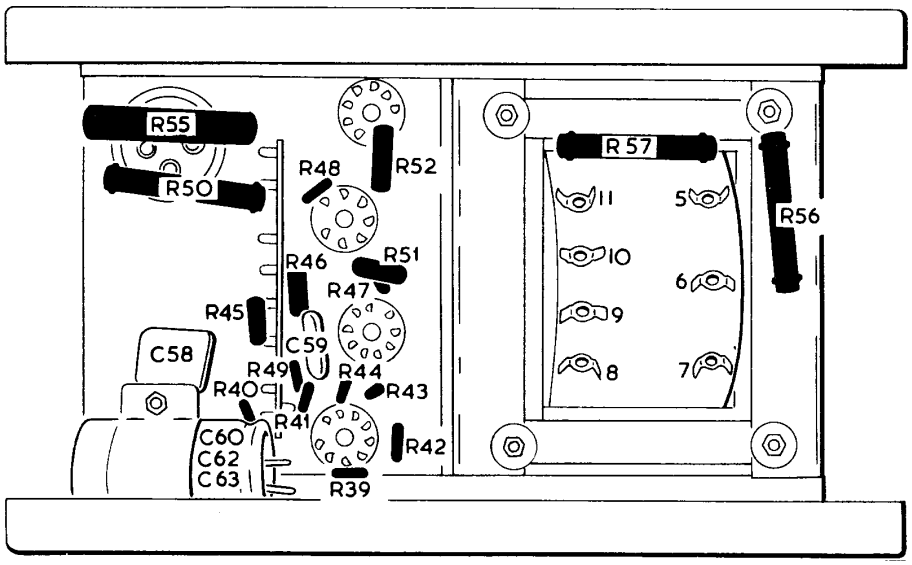
L.H. SIDE VIEW OF AM/FM CHASSIS



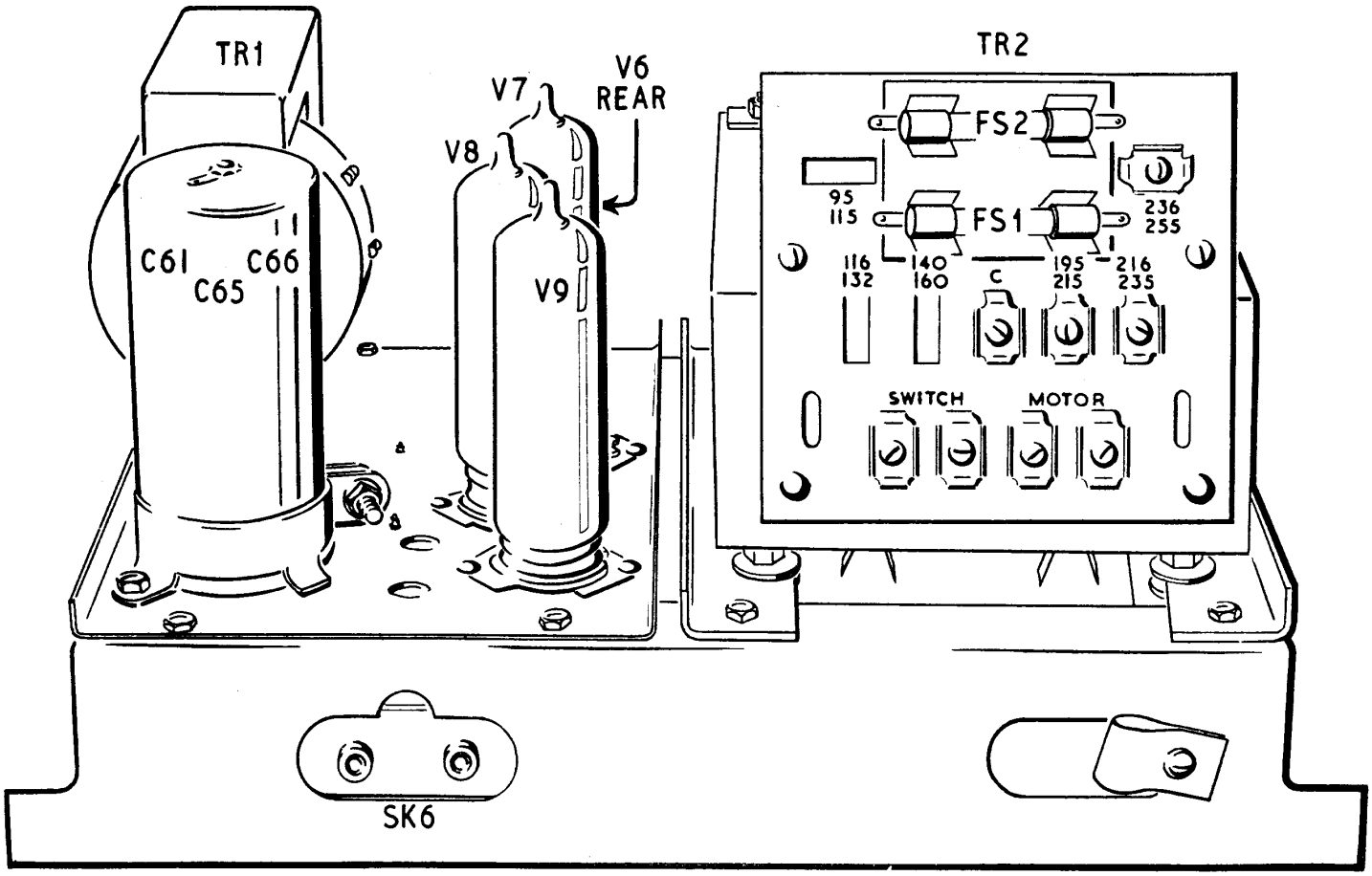
REAR VIEW OF POWER AMFLIFIER CHASSIS



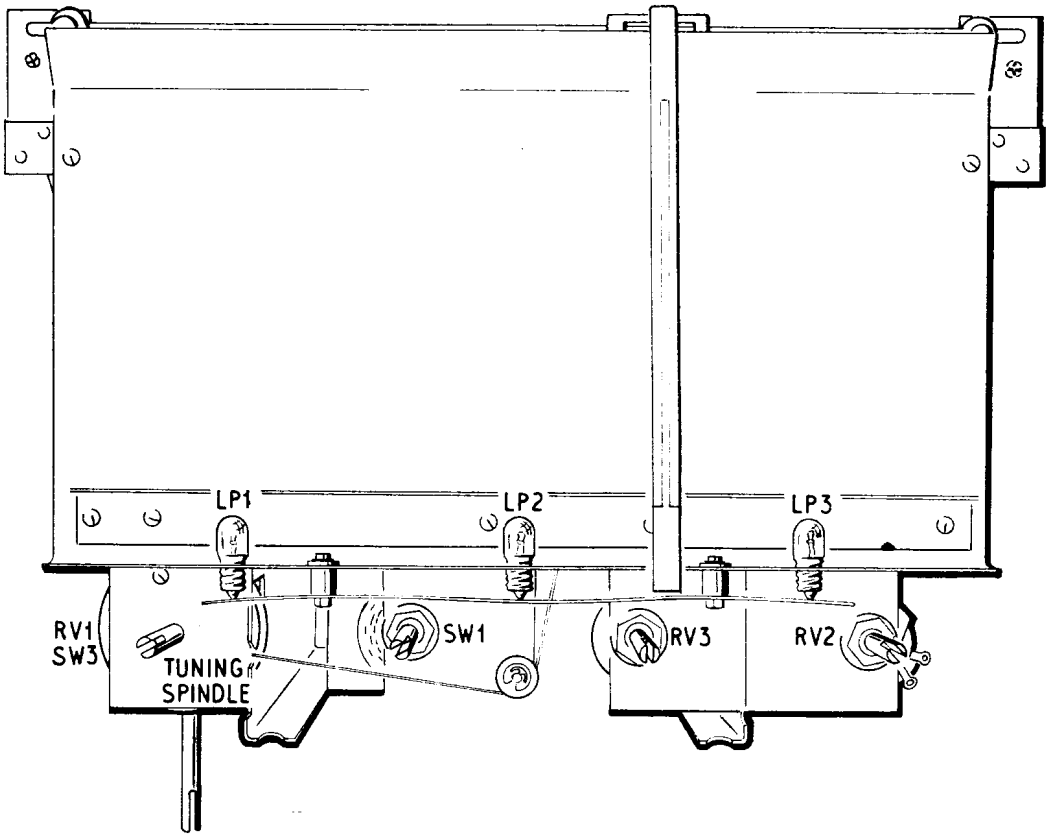
LAYOUT OF LOUDSPEAKER UNITS



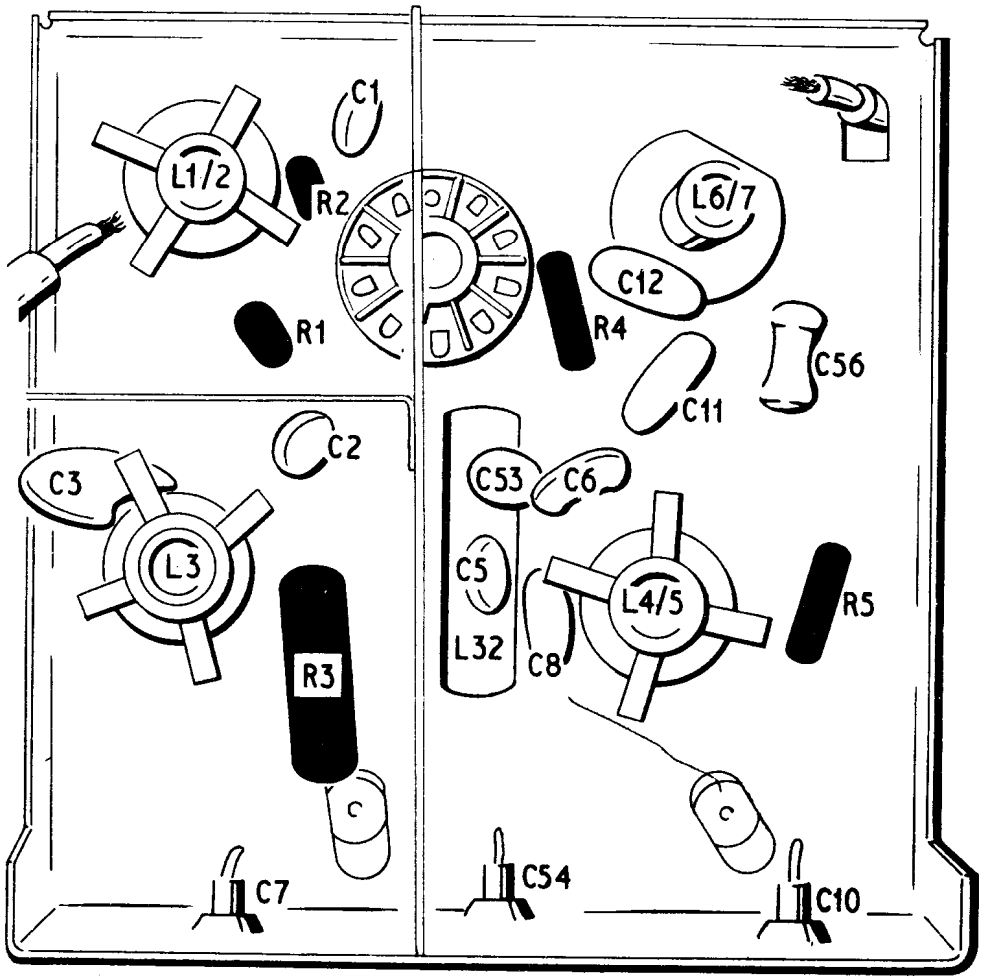
UNDERSIDE VIEW OF POWER AMPLIFIER CHASSIS



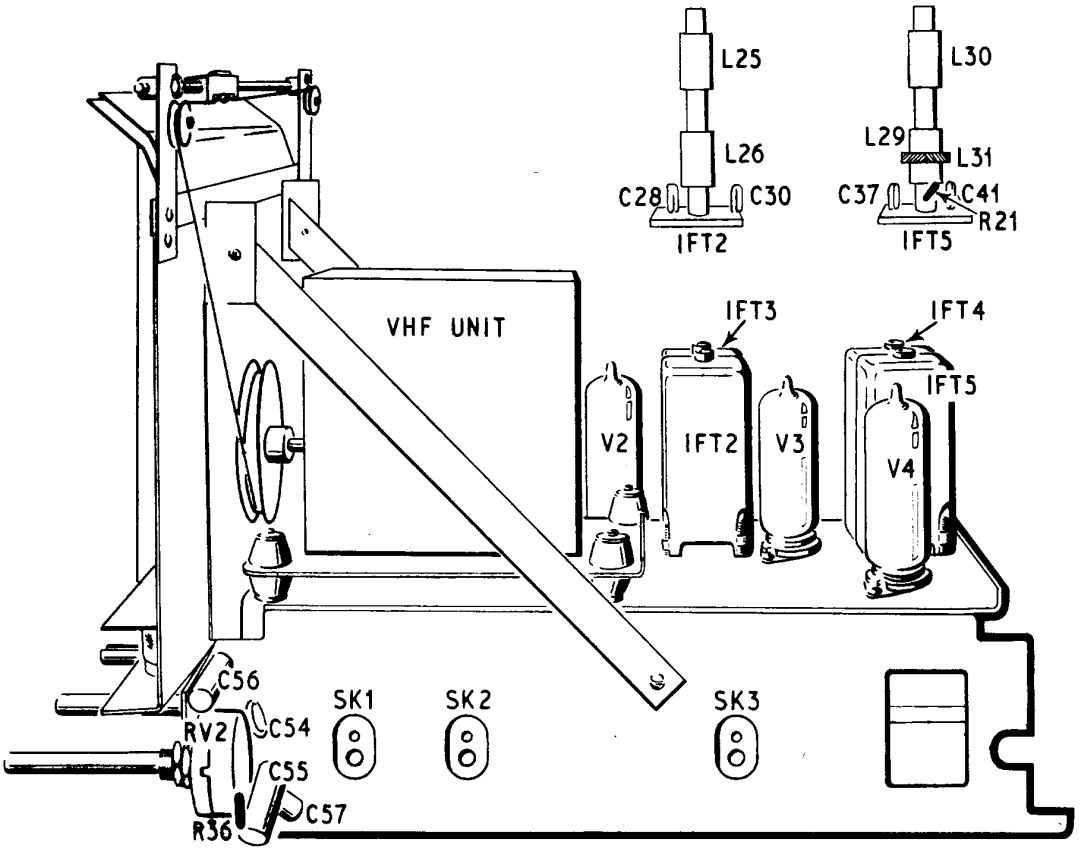
FRONT VIEW OF POWER AMPLIFIER CHASSIS



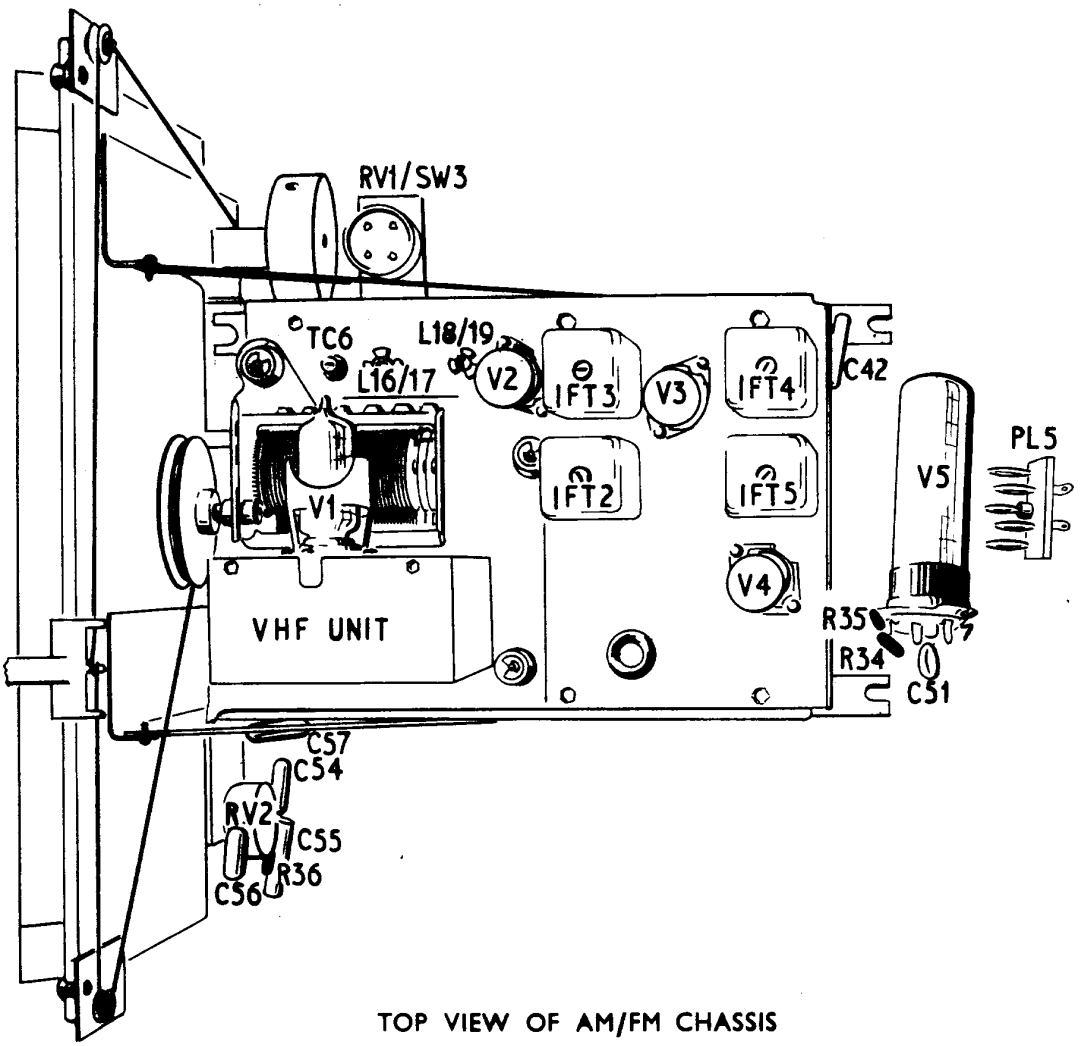
FRONT VIEW OF AM/FM CHASSIS



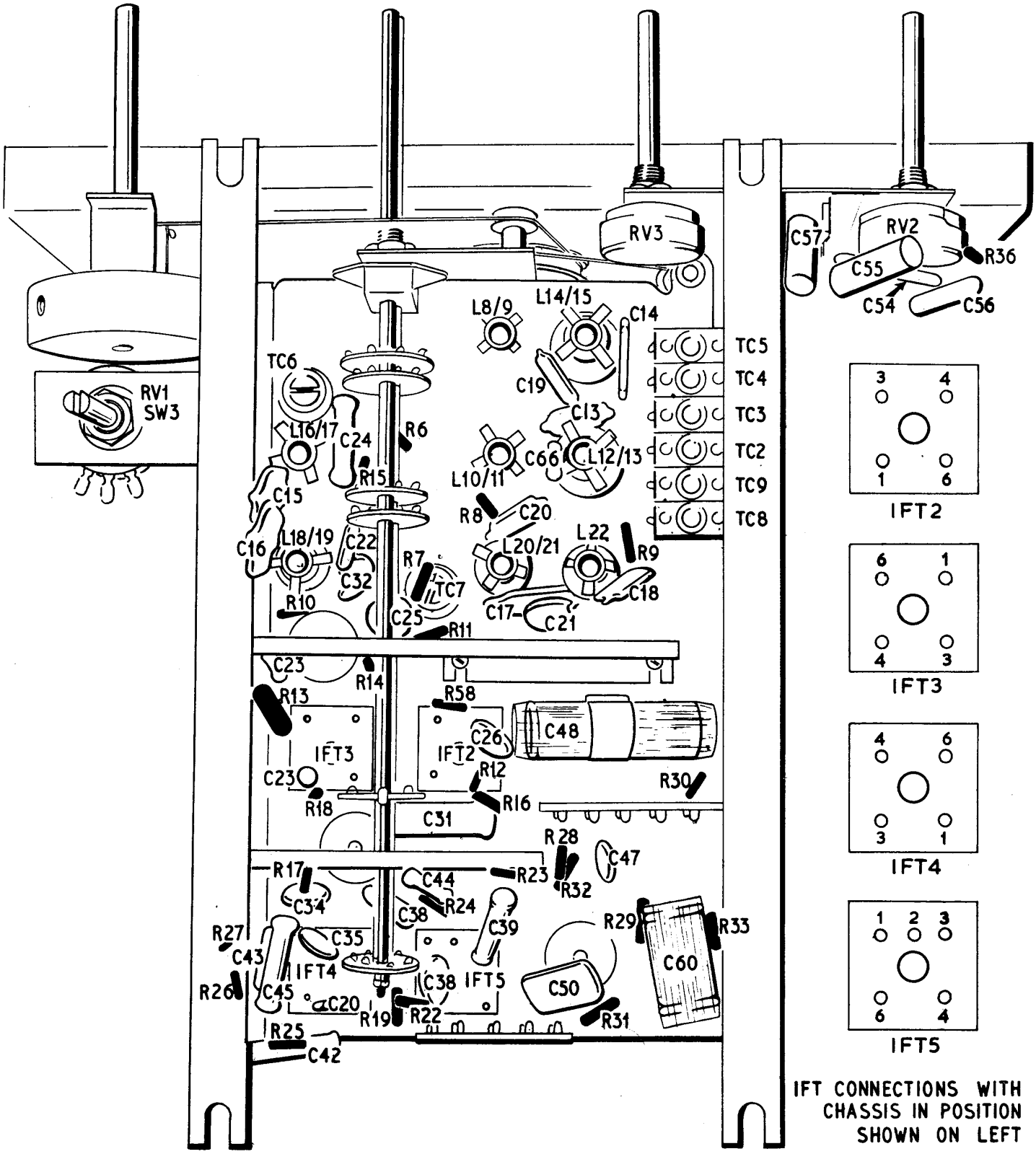
PLAN VIEW (UNDER) OF V.H.F. UNIT



R.H. SIDE VIEW OF AM/FM CHASSIS

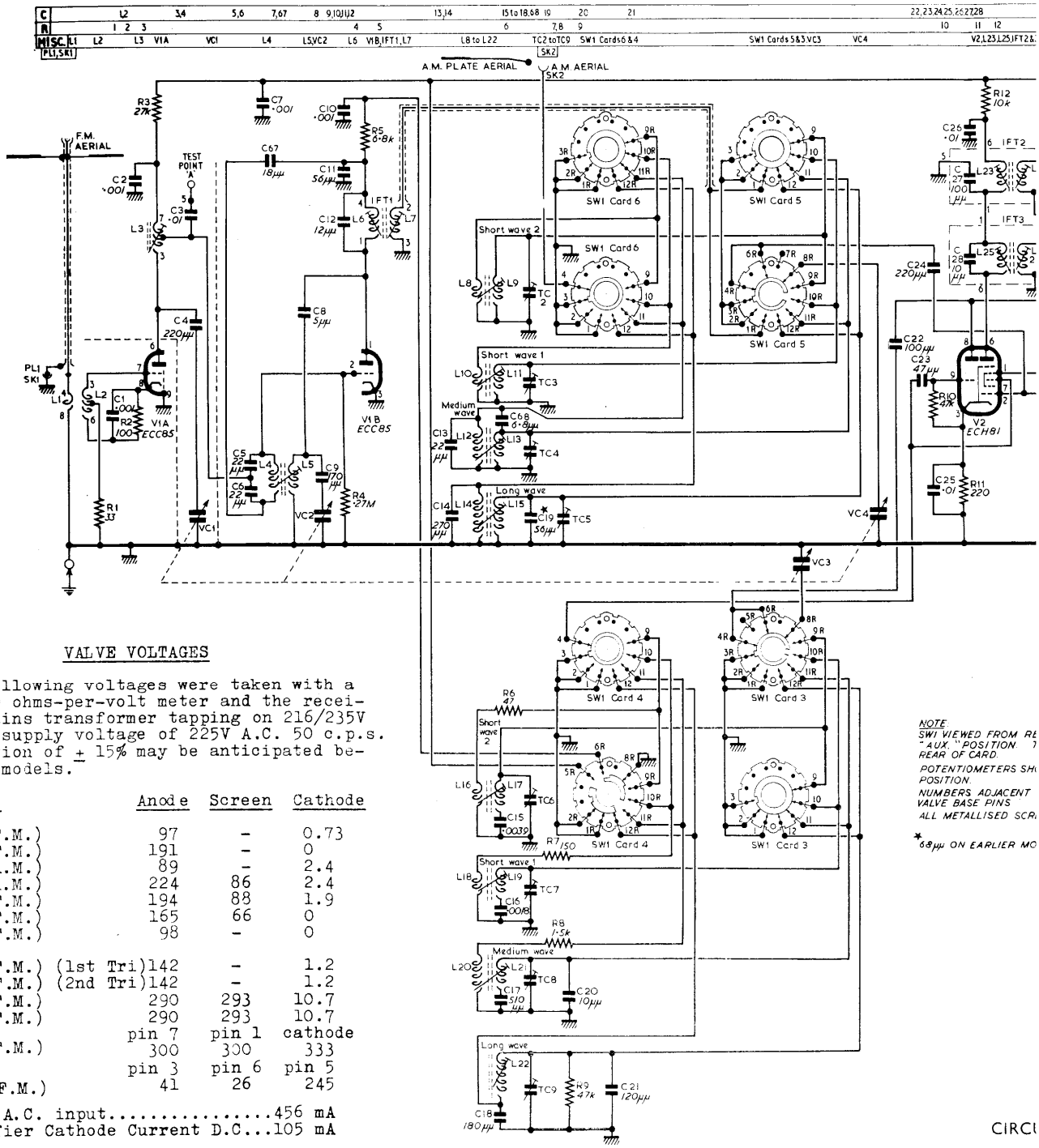


TOP VIEW OF AM/FM CHASSIS



IFT CONNECTIONS WITH CHASSIS IN POSITION SHOWN ON LEFT

PLAN VIEW (UNDER) OF AM/FM CHASSIS



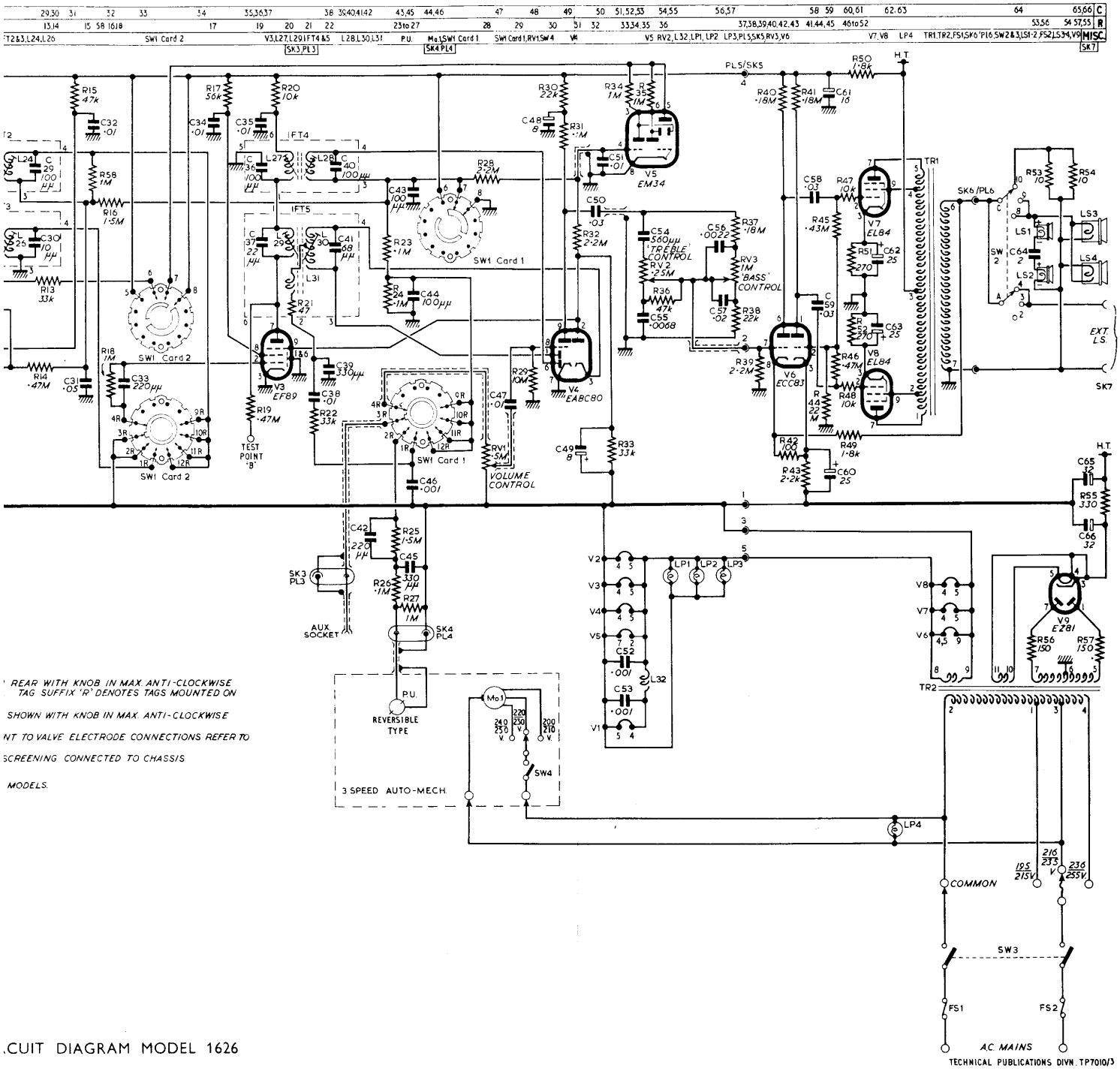
VALVE VOLTAGES

The following voltages were taken with a 20,000 ohms-per-volt meter and the receiver mains transformer tapping on 216/235V and a supply voltage of 225V A.C. 50 c.p.s. Variation of ± 15% may be anticipated between models.

Valves		Anode	Screen	Cathode
V1A	(F.M.)	97	-	0.73
V1B	(F.M.)	191	-	0
V2T	(A.M.)	89	-	2.4
V2P	(A.M.)	224	86	2.4
V2P	(F.M.)	194	88	1.9
V3	(F.M.)	165	66	0
V4T	(F.M.)	98	-	0
*V5				
V6	(F.M.) (1st Tri)	142	-	1.2
	(F.M.) (2nd Tri)	142	-	1.2
V7	(F.M.)	290	293	10.7
V8	(F.M.)	290	293	10.7
V9	(F.M.)	pin 7 300	pin 1 300	cathode 333
		pin 3	pin 6	pin 5
*V5	(F.M.)	41	26	245

Total A.C. input.....456 mA
Rectifier Cathode Current D.C...105 mA

CIRCU



.CUIT DIAGRAM MODEL 1626

TECHNICAL PUBLICATIONS DIVN. TP7010/3

F.M. and A.M. ALIGNMENT

I.F. and Ratio Detector Alignment (F.M.)

Apparatus required :-

Oscilloscope.

Sweep Generator.

Operation

1. Set gang capacitor to maximum (plates fully engaged), volume control fully clockwise and Bass and Treble controls in mid-position and connect a 2 to 3 ohm dummy load across SK6.

2. Connect oscilloscope (with gain at max.) to Test Point 'B' via a suitable diode probe (See Fig. 1).

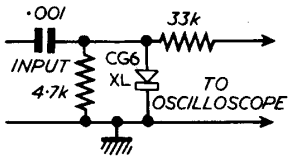


FIG. 1 DIODE PROBE

3. Inject a sweep of approximately 1 Mc/s centred on 10.7 Mc/s from Sweep Generator into the grid of V2 (pin 2).

4. Adjust cores of L25/L26 (IFT3) and L29 (lower core IFT5) until response curve similar to Fig.2 is obtained.

5. Connect oscilloscope directly to the junction of C50 and centre core of screened cable leading to R37, C54 (on tag panel underneath AM/FM chassis).

6. Adjust core of L30 (upper core IFT5) until a waveform similar to Fig.3 which is symmetrical around 10.7 Mc/s is obtained.

7. Re-connect probe to Test Point 'B'.

NOTE: L29 may afterwards need slight re-adjustment.

8. Connect Sweep Generator to Test Point 'A'.

9. Peak L6 (lower core IFT1) to give symmetrical response.

10. Adjust L7 (upper core IFT1) to give symmetrical response similar to Fig.4. This should not be less than 180 kc/s wide at 3 dB down.

R.F. Alignment (F.M.)

Apparatus :-

F.M. Signal Generator.

Output Meter.

Operation

1. Connect output meter across dummy load fitted to SK6.

2. Inject 87.5 Mc/s ± 15 kc/s deviation in the F.M. aerial socket and adjust L5 and L3 in that order for maximum output.

3. Set gang capacitor to minimum (plates fully disengaged) and tune in generator which should be approximately within ± ¼ Mc/s of 100 Mc/s.

4. Set generator to 94.5 Mc/s ± 15 kc/s deviation, tune in receiver and re-peak L3.

I.F. Alignment (A.M.)

1. Set the wavechange switch to M.W., the volume control fully clockwise, BASS and TREBLE controls in mid-position and the gang capacitor to minimum capacity (plates fully disengaged).

2. Connect an output meter across a dummy load of 2 - 3 ohms connected to SK6.

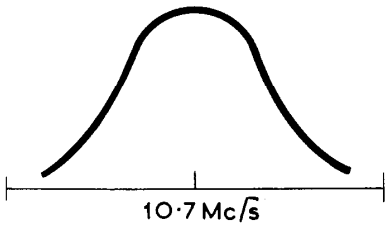


FIG 2.

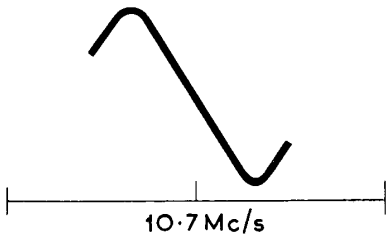


FIG 3.

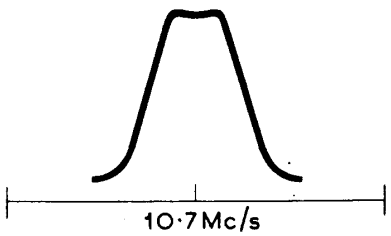


FIG 4.

(ALL CURVES MAY BE REVERSED DEPENDING ON TYPE OF SWEEP GENERATOR USED.)

ALIGNMENT CURVES

3. Inject a modulated signal of 470 kc/s into the control grid (pin 2) of V2 (ECH81).

4. Adjust cores of L28, L27, L24 and L23 in that order for maximum output.

R.F. Alignment (A.M.)

Inject signal into A.M. aerial and earth sockets.

Short Wave 2

Set wavechange switch to S.W.2., volume control fully clockwise and BASS and TREBLE controls in the mid-position.

OP. NO.	SET GANG.	SET GENERATOR Mc/s	OPERATION
1	Max. Capacity	5.8	Adjust L17 for Max. output
2	Min. Capacity	18.4	Adjust TC6 for Max. output
3	-	-	Repeat Operations 1 and 2
4	Tune in	6.0	Adjust L9 for Max. output
5	Tune in	17.8	Adjust TC2 for Max. output
6	-	-	Repeat operations 4 and 5

Short Wave 1

OP. NO.	SET GANG.	SET GENERATOR Mc/s	OPERATION
1	Max. Capacity	1.62	Adjust L19 for Max. Output
2	Min. Capacity	5.8	Adjust TC7 for Max. Output
3	-	-	Repeat Operations 1 and 2
4	Tune in	2.2	Adjust L11 for Max. Output
5	Tune in	5.5	Adjust TC3 for Max. Output
6	-	-	Repeat Operations 4 and 5

Medium Wave

Controls as before but Wavechange Switch to M.W.

OP. NO.	SET GANG.	SET GENERATOR kc/s	OPERATION
1	Max. Capacity	522	Adjust L21 for Max. Output
2	Min. Capacity	1602	Adjust TC8 for Max. Output
3	-	-	Repeat operations 1 and 2
4	Tune in	588	Adjust L13 for Max. Output
5	Tune in	1427	Adjust TC4 for Max. Output
6	-	-	Repeat Operations 4 and 5

Long Wave

Controls as before but Wavechange Switch to L.W.

OP. NO.	SET GANG.	SET GENERATOR kc/s	OPERATION
1	Max. Capacity	150	Adjust L22 for Max. Output
2	Min. Capacity	333	Adjust TC9 for Max. Output
3	-	-	Repeat operations 1 and 2
4	Tune in	162	Adjust L14/15 for Max. Output
5	Tune in	300	Adjust TC5 for Max. Output
6	-	-	Repeat Operations 4 and 5

See overleaf for (F.M.) Spot Frequency Alignment.

F.M. ALIGNMENT (SPOT FREQUENCY)

N.B.

It is preferable wherever possible to use the Sweep Generator method of alignment as given on page 10. The method outline below should be used when the equipment necessary for Sweep Generator alignment is not available.

Equipment

Signal Generator with output not less than 50 mV.
Two accurately matched 100 kΩ resistors.
Microammeter 0 - 50 or 0 - 100 μA.

Procedure

All cores in outer position. As the circuits are brought into line, the input should be adjusted such that the reading on the microammeter does not exceed 50-60 μA.

1. Remove all F.M. I.F. transformers bringing the cores half way out of the formers. Connect the two 100 kΩ resistors in series across C49. Connect meter between junction of resistors and earth.

2. Inject 10.7 Mc/s unmodulated signal into V3 grid (EF89 pin 2) and adjust L29 for maximum reading on meter.

3. Connect meter between junction of 100kΩ resistors and junction of C38, C39. Adjust L30 for zero reading on meter. This will occur mid-way between a positive and negative going peak.

4. Re-connect meter as (1) and repeat operation (2).

5. Inject signal into V2 grid (ECH81 Pin 2) and adjust L26 and L25 for maximum reading, repeating the adjustments until no improvement results. Re-adjust L29 for maximum reading.

6. Inject 10.7 Mc/s signal into test point 'A' on V.H.F. Unit. Adjust L7 and L6, in that order, for maximum reading on meter.

7. Set input level such that reading on meter is 50 μA. Check meter readings at input frequencies of 10.6 Mc/s and 10.8. Mc/s respectively. If the meter readings are not equal within 2-3 μA of each other, adjust L29 until they are within the limits stated. If the output at 10.6 Mc/s is greater than that at 10.8 Mc/s, the core of L29 will have to be unscrewed slightly and vice-versa.

8. Set generator at 10.7 Mc/s and repeat operation (3).

R.F. Alignment

Connect microammeter as in operation (1).

1. Set gang to maximum capacitance. Inject unmodulated signal of frequency 87.5 Mc/s into aerial socket and adjust L4/L5 for maximum reading on meter.

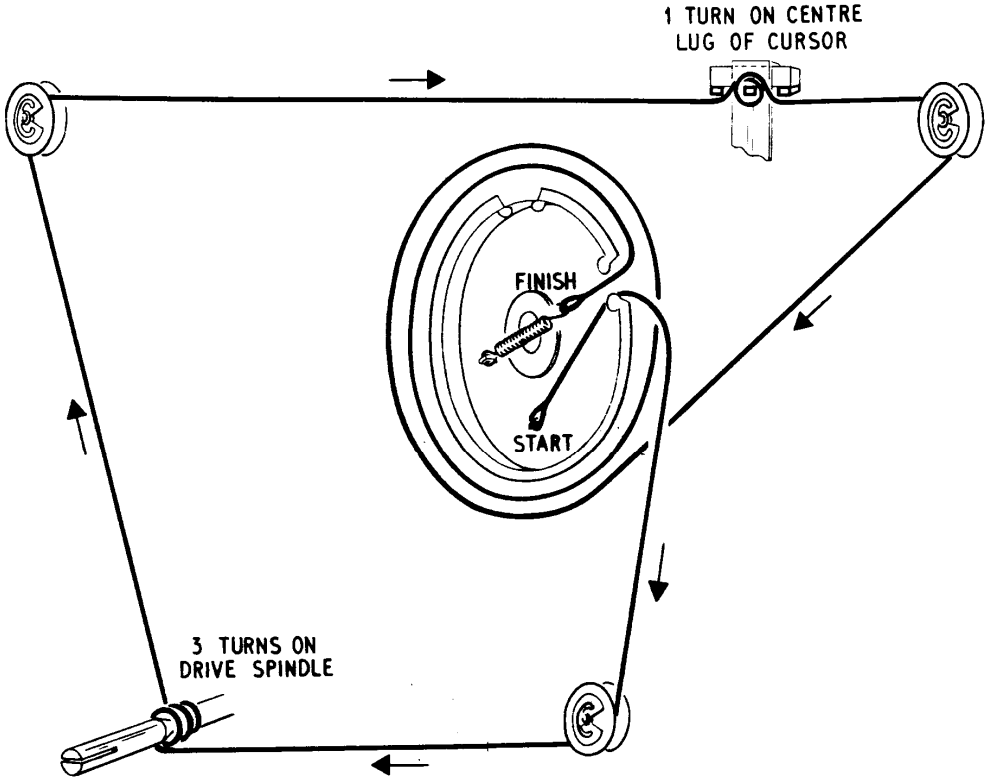
2. Set generator to 94.5 Mc/s, tune in receiver and adjust L3 for maximum reading on microammeter.

TUNING CAPACITOR CORD DRIVE

Use only the specified 6370 x 0012 nylon cord. Approx. 54 inches of cord is used.

To replace cord, proceed as follows:-

1. Set gang capacitor to minimum (plates fully disengaged).
2. Form a loop at one end of the cord.
3. Attach loop to "START" anchor pin and pass the other end through the outlet in the periphery of the drum.
4. Wind cord round pulleys and tuning spindle (3 turns) and one turn around the centre lug of the cursor which should be positioned approximately in line with No.9 on the calibration scale on the top of the scale back-plate.
5. Pass the cord through the same outlet in the periphery of the drum and attach it onto one end of the tension spring.
6. Attach free end of spring to the remaining anchor pin.



DRIVE CORD DETAILS

SPARE PARTS LIST

REF.	DESCRIPTION	PART No.
Resistors		
R1	33 Ω ± 20%	37802DD
R2	100 Ω ± 10%	33362BG
R3	27,000 Ω ± 10%	33363ND
R4	0.27 MΩ ± 10%	33362NE
R5	6,800 Ω ± 10%	33362BT
R6	47 Ω ± 10%	33362BE
R7	150 Ω ± 20%	33362DH
R8	1.5 kΩ ± 10%	33362BP
R9	47,000 Ω ± 20%	33362DY
R10	47,000 Ω ± 10%	33362BY
R11	220 Ω ± 10%	33362BJ
R12	10,000 Ω ± 10%	33362BU
R13	33,000 Ω ± 20%	33363DX
R14	0.47 MΩ ± 20%	33362EE
R15	47,000 Ω ± 10%	33362BY
R16	1.5 MΩ ± 20%	33362EH
R17	56,000 Ω ± 10%	33362JY
R18	1 MΩ ± 20%	33362EG
R19	0.47 MΩ ± 20%	33362EE
R20	10.000 Ω ± 10%	33362BU

REF.	DESCRIPTION	PART No.
Resistors (Continued)		
R21	47 Ω ± 10% (See IFT5)	33362BE
R22	33,000 Ω ± 20%	33362DX
R23	0.1 MΩ ± 20%	33362EA
R24	0.1 MΩ ± 20%	33362EA
R25	1.5 MΩ ± 10%	33362CH
R26	0.1 MΩ ± 10%	33362CA
R27	1 MΩ ± 10%	33362CG
R28	2.2 MΩ ± 20%	33362EJ
R29	10 MΩ ± 20%	33362EN
R30	22,000 Ω ± 10%	33362BW
R31	0.1 MΩ ± 10%	33362CA
R32	2.2 MΩ ± 20%	33362EJ
R33	33.000 Ω ± 10%	33362BX
R34	1 MΩ ± 20%	33362EG
R35	1 MΩ ± 20%	33362EG
R36	47,000 Ω ± 20%	33362DY
R37	0.18 MΩ ± 10%	33362PX
R38	22,000 Ω ± 10%	33362BW
R39	2.2 MΩ ± 20%	33362EJ
R40	0.18 MΩ ± 10%	33362PX
R41	0.18 MΩ ± 10%	33362PX
R42	100 Ω ± 10%	33362BG
R43	2,200 Ω ± 10%	33362BQ
R44	0.22 MΩ ± 20%	33362EC
R45	0.43 MΩ ± 5%	33360SL
R46	0.47 MΩ ± 5%	33360AE
R47	10.000 Ω ± 20%	33362DU
R48	10,000 Ω ± 20%	33362DU
R49	1,800 Ω ± 10%	33362NT
R50	1,800 Ω ± 10%	33377NT
R51	300 Ω ± 5%	33363AY
R52	300 Ω ± 5%	33363AY
R53	10 Ω ± 20%	33373DA
R54	10 Ω ± 20%	33373DA
R55	330 Ω ± 5%	37869K
R56	150 Ω ± 5%	33373H
R57	150 Ω ± 5%	33373H
R58	1 MΩ ± 20%	33362EG
Variable Resistors		
RV1	0.5 MΩ VOLUME Control with SW3	37940FP
RV2	0.25 MΩ TREBLE Control	37962R
RV3	1.0 MΩ BASS Control	37962S
Capacitors		
C1	1,000 µµF -20% + 80% 375V	38125B
C2	1,000 µµF -20% + 80% 375V	38125B
C3	0.01 µF -20% + 80% 500V	38109B
C4	220 µµF ± 2% 350V	38006VF
C5	22 µµF ± 2% 500V	38117ZB
C6	22 µµF ± 2% 500V	38117ZB
C7	1,000 µµF -20% + 80% 500V	38120D
C8	5 µµF ± 10% 750V	38117AR
C9	170 µµF ± 2% 350V	38006EX
C10	1,000 µµF -20% +80% 500V	38120D
C11	56 µµF ± 5%	38117RP
C12	12 µµF ± 10% 750V	38117JS
C13	22 µµF ± 2% 350V	38006ZB
C14	270 µµF ± 2% 350V	38000VH
C15	3,900 µµF ± 2% 350V	38002WF
C16	1,800 µµF ± 2% 350V	38002MC

REF.	DESCRIPTION	PART No.
C17	510 µµF ± 2% 350V	38001VQ
C18	180 µµF ± 2% 350V	38000VE
C19	56 µµF ± 5% 350V	38004RP
C20	10 µµF ± 10% 350V	38006BA
C21	120 µµF ± 2% 350V	38004TH
C22	100 µµF ± 20% 750V	38117DG
C23	47 µµF ± 20% 750V	38117DE
C24	220 µµF ± 20% 750V	38117DJ
C25	0.01 µF -20% +80% 300V	38109B
C26	0.01 µF -20% +80% 300V	38109B
C27	100 µµF ± 2% See IFT2	38006TF
C28	10 µµF ± 2% See IFT3	38006BA
C29	100 µµF ± 2% See IFT2	38006TF
C30	10 µµF ± 2% See IFT3	38006BA
C31	0.05 µF ± 20% 350V	38525NC
C32	0.01 µF -20% +80% 300V	38109B
C33	220 µµF ± 20% 750V	38117DJ
C34	0.01 µF -20% +80% 300V	38109B
C35	0.01 µF -20% +80% 300V	38109B
C36	100 µµF ± 2% See IFT4	38006TF
C37	22 µµF ± 2% See IFT5	38006ZB
C38	0.01 µF - 20% +80% 300V	38109B
C39	330 µµF ± 20% 750V	38117DK
C40	100 µµF ± 2% See IFT4	38006TF
C41	68 µµF ± 2% See IFT5	38006YC
C42	220 µµF ± 20% 750V	38117DJ
C43	100 µµF ± 20% 750V	38117DG
C44	100 µµF ± 20% 750V	38117DG
C45	330 µµF ± 20% 750V	38117DK
C46	0.001 µF ± 20% 350V	38479DN
C47	0.01 µF -20% +80% 300V	38109B
C48	8 µF 275V	38153AK
C49	8 µF 200V	38199A
C50	0.03 µF -20% +80% 500V	38137A
C51	0.01 µF -20% +80% 300V	38109B
C52	1,000 µµF -20%+80% 500V	38120D
C53	1,000 µµF -20% +80% 375V	38125B
C54	560 µµF ± 5%	38001RW
C55	6,800 µµF ± 5% 350V	38481T
C56	2,200 µµF ± 5% 350V	38480Q
C57	0.02 µF ± 20% 350V	38525GN
C58	0.03 µF -20% +80% 500V	38137A
C59	0.03 µF -20% +80% 500V	38137A
C60	25 µF 25V	38412A
C61	16 µF (with C65 & C66) 450V	38150X
C62	25 µF 25V	38412A
C63	25 µF 25V	38412A
C64	2 µF ± 25% 150V	38268R
C65	32 µF } with C61 450V	38150X
C66	32 µF } 450V	38150X
C67	18 µµF ± 2%	38113YZ
C68	6.8 µµF ± 5% 750V	38117YP
Variable Capacitors		
VC1 } VC2 } VC3 } VC4 }	Ganged Capacitor	93633A
TC2	3-30 µµF	39626F
TC3	3-30 µµF	39626F
TC4	3-30 µµF	39626F
TC5	3-30 µµF	39626F
TC6	3-30 µµF	35480B
TC7	3-30 µµF	95627B
TC8	3-30 µµF	39626F
TC9	3-30 µµF	39626F

REF.	DESCRIPTION	PART No.
	Transformers	
TR1	Output Transformer	92840G
TR2	Mains Transformer	92730C
IFT1	I.F. Transformer (F.M.)	46810BG
IFT2	I.F. Transformer (A.M.)	46551AV
IFT3	I.F. Transformer (F.M.)	46551AY
IFT4	I.F. Transformer (A.M.)	46551AV
IFT5	Ratio Detector Transformer (F.M.)	46551AW
	Coils	
L1, L2	F.M. Aerial Coil	46810BJ
L3	F.M. R.F. Coil	46810BH
L4, L5	F.M. Oscillator Coil	46810BF
L8, L9	S.W.2 Aerial Coil	40970T
L10, L11	S.W.1 Aerial Coil	40970BD
L12, L13	M.W. Aerial Coil	40970AL
L14, L15	L.W. Aerial Coil	40970AM
L16, L17	S.W.2 Oscillator Coil	40970CD
L18, L19	S.W.1 Oscillator Coil	40970AZ
L20, L21	M.W. Oscillator Coil	40970AJ
L22	L.W. Oscillator Coil	40970AU
L32	Heater Choke	92805H

REF.	DESCRIPTION	PART No.
	Valves	
V1	ECC85	
V2	ECH81	
V3	EF89	
V4	EABC80	
V5	EM34	
V6	ECC83	
V7	EL84	
V8	EL84	
V9	EZ81	
	Loudspeakers	
LS1	Tweeter Loudspeaker	95607A
LS2	Tweeter Loudspeaker	95607A
LS3	Medium Elliptical Loudspeaker	93870N
LS4	Medium Elliptical Loudspeaker	93870C
	Lamps	
LP1, LP2, LP3	6.8V 0.3 amp.	35421D
LP4	230V 15 watt	95939A
	Fuses	
FS1, FS2	3 amp.	38825F