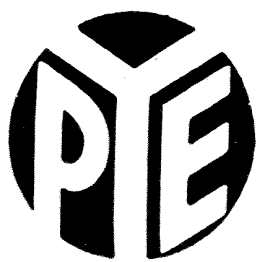


SERVICE SHEET FOR



FM-AM PIPER

MODEL P117



CIRCUIT ANALYSIS A.M.

	Valve	Mullard	Ea	Ia	Es	Is	Ek	Ik
V1A	Mixer	$\frac{1}{2}$ ECC85	190	2.3	—	—	2.4	2.3
V1B	Osc.	$\frac{1}{2}$ ECC85	150	4mA	—	—	—	4mA
V2	I.F. Amp. & Det. ...	EBF89	185	9.5mA	70	1.9	—	11.4
V5	Audio Amp. (Triode) ... Audio O/P. (Pentode)...	ECL82	60 225	0.5mA 28mA	— 195	— 5.8	— 14	0.5mA 34mA
V6	Rectifier	EZ80	222A.C.	—	—	—	245	58

Note.—All measurements taken on M.W. or F.M. with gang fully closed, mains input 210 volts into 220—225 V. tap. Measurements taken with AVO Model 8 instrument which has a resistance of 20,000 ohms per volt. V3 and V4 (OA79) are situated in the can of T5.

CIRCUIT ANALYSIS F.M.

	Valve	Mullard	Ea	Ia	Es	Is	Ek	Ik
V1A	R.F. & I.F. Amp. ...	$\frac{1}{2}$ ECC85	167	10	—	—	1	10
V1B	Mixer/Osc.	$\frac{1}{2}$ ECC85	138	5	—	—	—	5
V2	I.F. Amp. & Det. ...	EBF89	172	9.3	63	1.9	—	11.2
V5	Audio Amp. (Triode) ... Audio O/P. (Pentode)...	ECL82	57 220	0.5 26.3	— 182	— 5.2	— 13	0.5 31.5
V6	Rectifier	EZ80	222A.C.	—	—	—	237	65

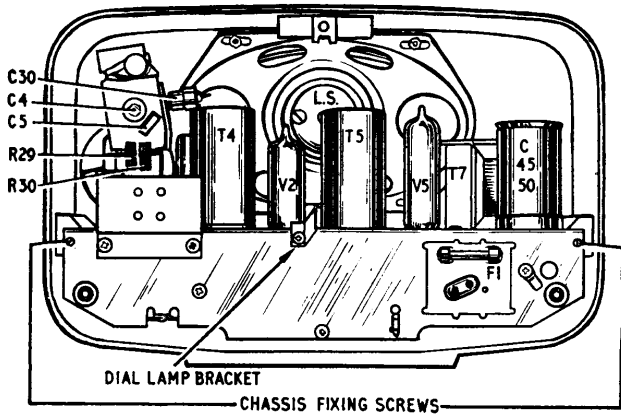


FIG. 1

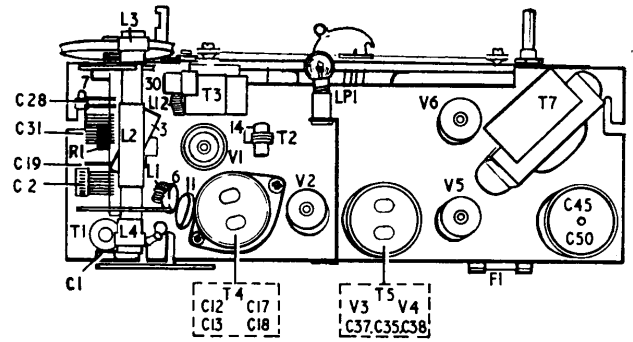


FIG. 2

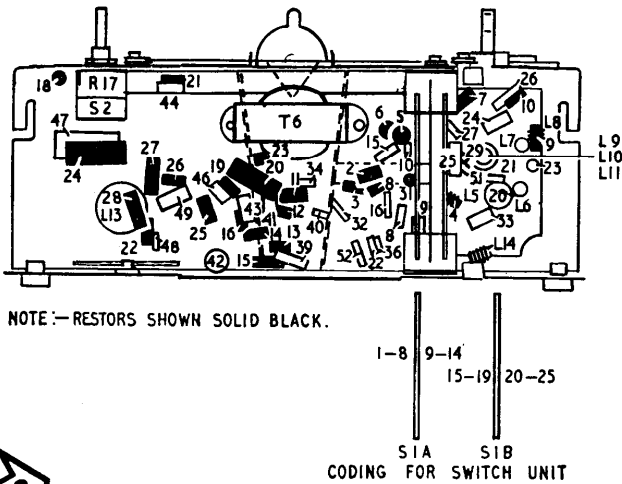


FIG. 3

DRIVE CORD VIEWED FRONT OF CHASSIS WITH GANG FULLY CLOSED.

DRIVE CORD SHOULD BE OF NYLON BRIADED GLASS YARN. LENGTH BETWEEN CENTRES OF LOOPS IS 30 INCHES.

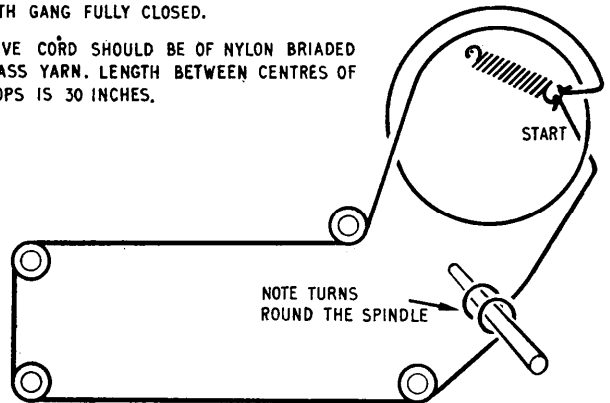
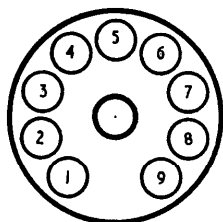


FIG. 4

VALVE BASE CONNECTIONS

	1	2	3	4	5	6	7	8	9
V1 ECC85	A"	G"	K"	H	H	A'	G'	K'	S
V2 EBF89	G2	G1	K.S	H	H	A	AD1	AD2	G3
V5 ECL82	GT	KP.G3.S	G1	H	H	AP	G2	KT	AT
V6 EZ80	A1	IC	K	H	H	IC	A2	IC	IC



VIEW LOOKING AT PINS

FIG. 5

Notes

- 1 Care must be taken not to disturb the positions of wiring and components beneath the chassis.
- 2 A Calibration Scale is printed separately on a piece of card and punched to locate on the control spindles. Before fitting in position; lift the scale pointer. The pointer should be lined up with the spots at the right hand end of the scale tracks.
- 3 To replace dial lamp, remove screw securing dial lamp bracket see Fig. 1. Replace with 6.5 v. 0.3 amp. lamp.
- 4 Make sure Mains Voltage Adjuster is in correct position to ensure maximum valve and component life.

TRIMMING PROCEDURE A.M.

Apply signal as below	Set Receiver Controls to	Adjust in order as below
(1) 470 kc/s between chassis and control grid of V1A.	Low frequency end of M.W. band.	Dust cores nearest to back of chassis in T5 and T4 for maximum output.
(2) 470 kc/s between Aerial and Earth Sockets.	Low frequency end of M.W. band.	Dust core of T1 to produce a dip in output.
(3) 600 kc/s between Aerial and Earth Sockets via a Standard Dummy Aerial.	M.W. 500 metres.	Dust core of L9, L10 and L11 for maximum output.
(4) 1,500 kc/s between Aerial and Earth Sockets.	M.W. 200 metres.	Trimmers C4 and C30 for maximum output.
(5) Repeat (3) and (4) until tracking and calibration are correct. Check that the tuning of the Rod Aerial L2 is correct by means of a small loop of wire and a piece of ferrite at 600 kc/s (500 metres).		
(6) 214 kc/s between Aerial and Earth Sockets.	L.W. Band tune to signal.	Check that Rod Aerial L3 is correctly tuned as in (5).

TRIMMING PROCEDURE F.M.

The equipment required is a F.M. Signal Generator with a frequency deviation of 75 kc/s and 15 kc/s, and an Audio Output Meter.		
Apply signal as below	Set receiver controls to	Adjust in order for maximum output
(1) I.F. (10.7 Mc/s with a deviation of 75 kc/s) between control grid (Pin 2) of V2 and chassis.	Low frequency end of F.M. band.	Dust cores of T5 nearest to front of chassis.
(2) I.F. (10.7 Mc/s with a deviation of 75 kc/s) between junction of L8 and C24 and chassis.	Low frequency end of F.M. band.	Dust cores of T4 nearest to front of chassis and dust cores of T3.
(3) (89 Mc/s with a deviation of 15 kc/s) between Aerial and Earth Sockets.	F.M. 89 Mc/s.	Dust cores of L7 and L6.
(4) (97 Mc/s with a deviation of 15 kc/s) between Aerial and Earth Sockets.	F.M. 97 Mc/s.	Trimmer C20.
Note: —When adjusting the dust cores of T3, T4 and T5 it will be found that two peaks can be obtained with each core. The outer peak is the correct one.		

TO REMOVE CHASSIS

1 Remove Mains Plug from wall socket. 2 Remove back of set. 3 Loosen grub screws and pull off knobs. 4 Withdraw all plugs from chassis. 5 Remove 2 chassis fixing screws from back of chassis. 6 Withdraw chassis.

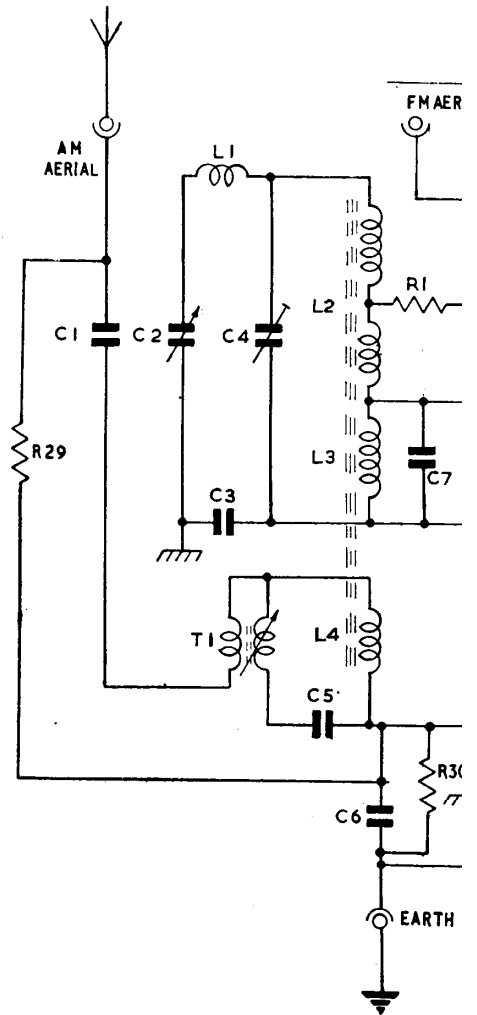
FITTING A NEW TUNING SCALE

1 Remove chassis. 2 Place scale plate centrally in cabinet aperture and screw the clips tightly in position. 3 Replace chassis in cabinet and reconnect all plugs in their original positions. 4 Adjust gang condenser to maximum position and line up the pointer with the calibration spots at the right-hand end of the scale tracks.

CONDENSERS

	Specification	Volts	±	Fig.	No.
C1	1800 ρF Ceramic Disc ...		+80 - 20%	2	660117
C2	320 ρF Gang Condenser (A.M.)			2	800368
C3	0.01 μF Tubular ...	150	10%		665579
C4	3-30 ρF Trimmer ...			1 & 2	800065
C5	50 ρF Tubular ...	150	2%	1	665574
C6	1800 ρF Ceramic Disc ...		+80 - 20%	2	660117
C7	150 ρF Tubular ...	150	2%	2	665577
C8	68 ρF Ceramic Tubular ...		10%	3	652670
C9	0.005 μF Ceramic Disc ...		+80 - 20%	3	660004
C10	150 ρF Ceramic Disc ...		20%	3	660436
C11	22 ρF Ceramic Disc ...		10%	2	660042
C12	800 ρF Tubular ...	150	2%	2	665576
C13	15 ρF Silver Mica ...		2%	2	660859
C14	5 ρF Ceramic Tubular ...		10%	2	652671
C15	0.005 μF Ceramic Disc ...		+80 - 20%	3	660004
C16	0.005 μF Ceramic Disc ...		+80 - 20%	3	660004
C17	180 ρF Tubular ...		2%	2	665533
C18	10 ρF Silver Mica ...		2%	2	660858
C19	5.2 ρF Gang Condenser (FM)			2	800368
C20	2.9 ρF Trimmer ...			3	800109
C21	15 ρF Ceramic Tubular ...		5%	3	652672
C22	100 ρF Ceramic Tubular ...		10%	3	650740
C23	47 ρF Ceramic Disc ...		10%	3	660432
C24	130 ρF Tubular ...	150	10%	3	665578
C25	1,200 ρF Tubular ...	350	10%	3	665581
C26	22 ρF Ceramic Tubular ...		5%	3	652673
C27	15 ρF Ceramic Tubular ...		5%	3	652672
C28	10.5 ρF Gang Condenser (FM)			2	800368
C29	47 ρF Ceramic Disc ...		10%	3	660432
C30	3-30 ρF Trimmer ...			1 & 2	800065
C31	136 ρF Gang Condenser (AM)			2	800368
C32	0.005 μF Ceramic Disc ...		+80 - 20%	3	660004
C33	300 ρF Tubular ...	150	2%	3	665575
C34	0.01 μF Tubular ...	150	25%	3	669082
C35	180 ρF Tubular ...		2%	2	665533
C36	0.04 μF Tubular ...	150	20%	3	669106
C37	300 ρF Tubular ...	150	2%	2	665575
C38	47 ρF Silver Mica ...		2%	2	660830
C39	2,500 ρF Tubular ...	150	10%	3	665580
C40	800 ρF Ceramic Disc ...		+40 - 20%	3	660437
C41	100 ρF Ceramic Tubular ...		10%	3	650740
C42	2 μF Electrolytic ...	150		3	667799
C43	0.002 μF Tubular ...	350	20%	3	665554
C44	0.01 μF Tubular ...	150	20%	3	669082
C45*	50 μF Electrolytic ...	350		1 & 2	667643
C46	0.03 μF Tubular ...	150	20%	3	669110
C47	25 μF Electrolytic ...	25		3	667762
C48	47 ρF Ceramic Disc ...		10%	3	660432
C49	0.002 μF Tubular ...	350	20%	3	665554
C50	100 μF Electrolytic ...	350		1 & 2	667643
C51	800 ρF Ceramic Disc ...		+40 - 20%	3	660437
C52	0.005 ρF Ceramic Disc ...		+80 - 20%	3	660004

Note: * in same can as C50



circuit diagram

of the



FM-AM

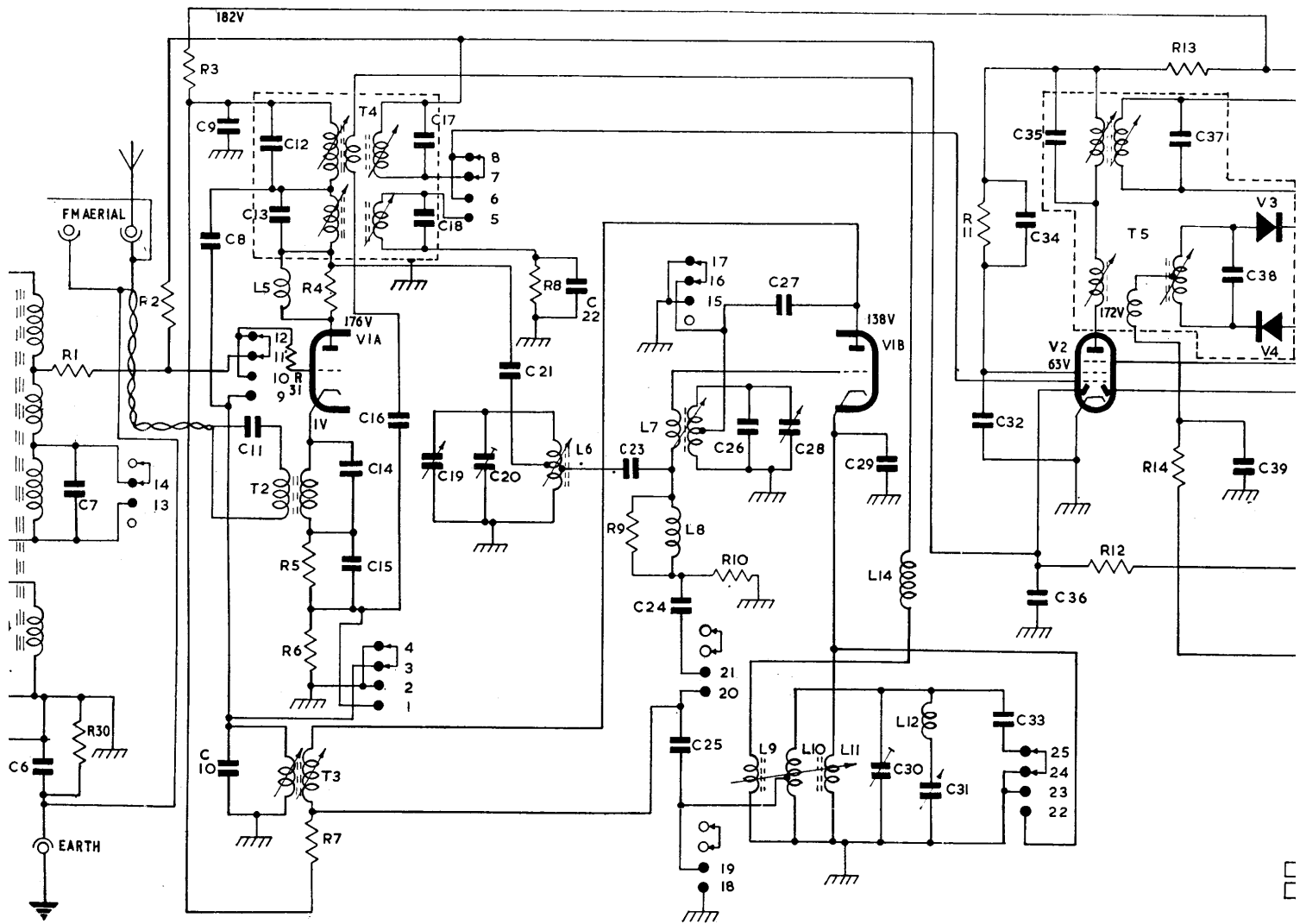
PIPER

MODEL P117

RESISTORS

	Ohms	Watts	±	Fig.	No.	
R1	2,200		10%	2	670522	L1
R2	470,000		20%	3	670408	L2†
R3	1,000		20%	3	670392	L3†
R4†	100		10%	3	670670	L4†
R5	100		10%	3	670506	L5
R6	1,000		10%	3	670518	L6
R7	10,000		10%	3	670530	L7
R8	2.2 meg.		20%	3	670412	L8
R9	1 meg.		20%	3	670410	L9
R10	220,000		10%	3	670546	L10
R11	56,000		10%	3	670539	L11
R12	2.2 meg.		20%	3	670412	L12
R13	1,000		20%	3	670392	L13
R14	270,000		10%	3	670547	L14
R15	47,000		10%	3	670538	
R16	47,000		20%	3	670402	
R17	1 meg., Volume Control			3	810972	
R18	470		10%	3	670514	
R19	33,000		10%	3	670536	
R20	2,000		5%	3	670799	
R21	10 meg.		20%	3	670416	
R22	220,000		10%	3	670546	
R23	3,900		10%	3	670525	
R24	390		10%	3	670707	
R25	1,000		20%	3	670392	
R26	270,000		10%	3	670547	
R27	120		10%	3	670431	
R28	120		10%	3	670431	
R29	2.2 meg.		20%	1	670412	
R30	2.2 meg.		20%	1	670412	
R31	10		10%	3	671817	
	Note: † Part of L5				781692	

T1 A
T2 F
T3 R
T4 1
T5 2
T6 S
T7 N



INDUCTANCES

	Specification	Ref.	Fig.	No.
L1	Anti-Resonance Choke		2	790441
L2†	M.W. Rod Aerial		2	781688
L3†	L.W. Rod Aerial		2	781689
L4†	Aerial Coupler Coil		2	781690
L5	Filter Coil		3	781692
L6	F.M. R.F. Anode Coil		3	781739
L7	F.M. Oscillator Coil		3	781740
L8	Mixer Grid Choke		3	790442
L9		3	
L10	A.M. Oscillator Coil		3	781737
L11		3	
L12	Anti-Resonance Choke		3	790441
L13	Mains Filter Coil		3	781738
L14	Neutralising Choke		3	790440
	Note: † Rod Aerial Assembly			781741

TRANSFORMERS

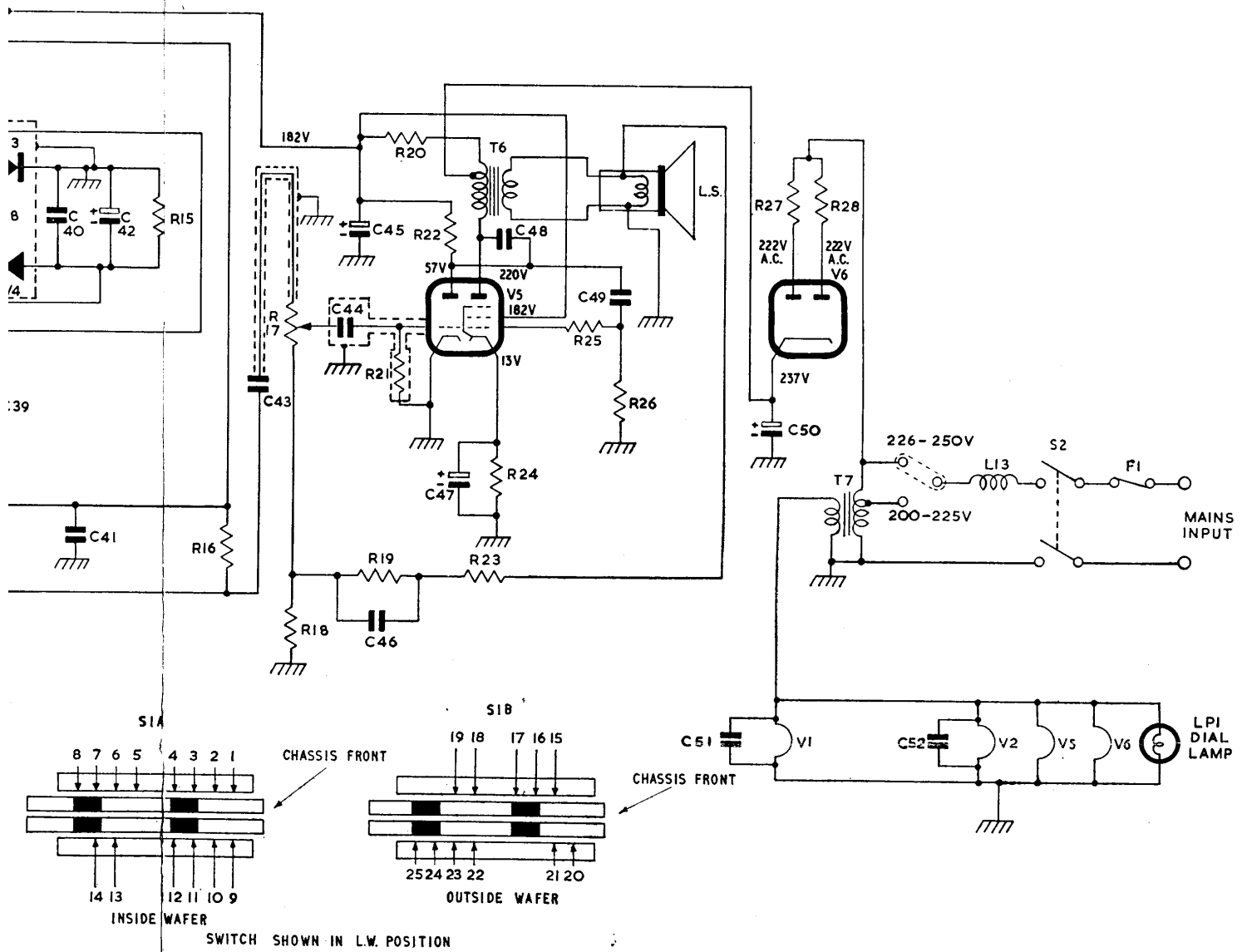
	Specification	Fig.	No.
T1	A.M. Aerial Transformer	2	771604
T2	F.M. Aerial Transformer	2	771605
T3	Reflex I.F. Transformer	2	771606
T4	1st F.M./A.M. I.F. Transformer	1	771607
	{ A.M. Prim. 2.5Ω ONLY Sec. 5.5Ω		
T5	2nd F.M./A.M. I.F. Transformer	1	771608
	{ A.M. Prim. 5.5Ω ONLY Sec. 4.0Ω		
T6	Sound output Transformer	3	771632
	{ Prim. Start to Tap 550Ω Prim. Start to Finish 600Ω		
T7	Mains Transformer	1	771631
	{ Pri. Start to Tap 180Ω Prim. Start to Finish 200Ω		

SWITCHES, LAMPS, ETC.

	Specification	Fig.	No.
S1A	Switch	3	830733
S1B	Switch	3	830734
S2	ON/OFF Switch on Volume Control	3	810972
LP1	Dial Lamp 6.3 V, 0.3 Amp.	2	700494
F1	Fuse 500 mA.	1 & 2	700487
LS	7 ins. by 4 ins. Elliptical	1	850147

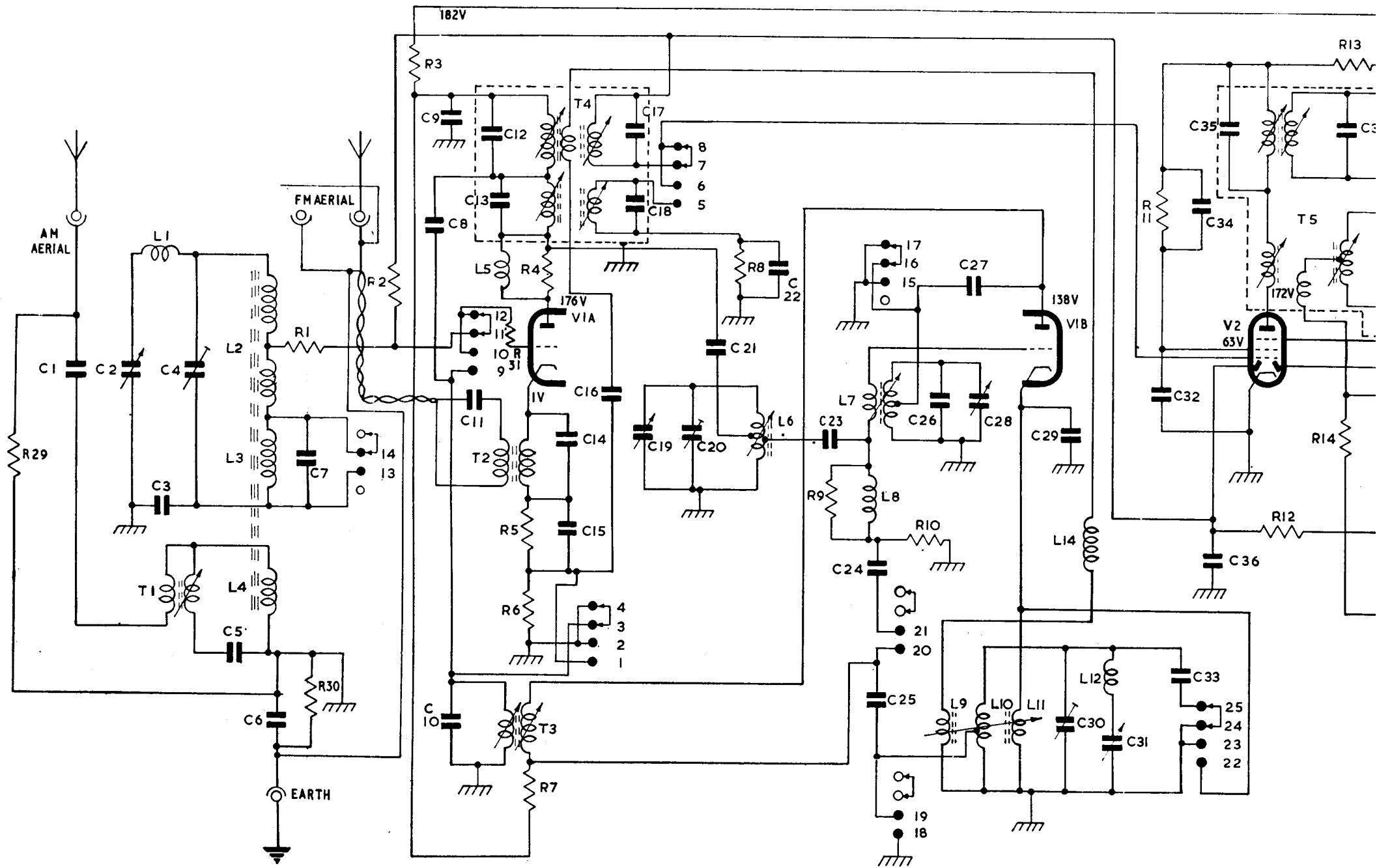
MISCELLANEOUS

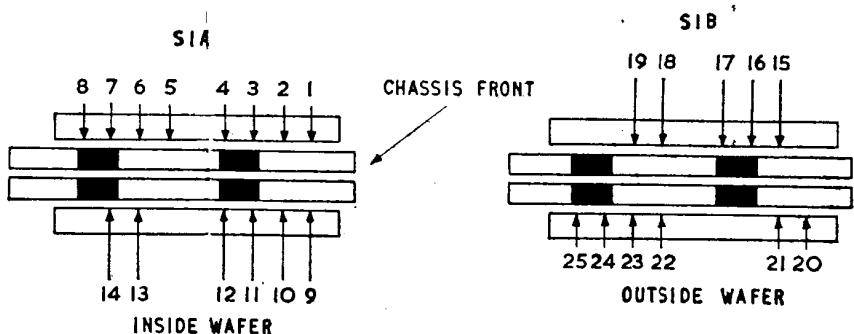
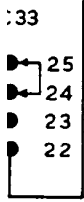
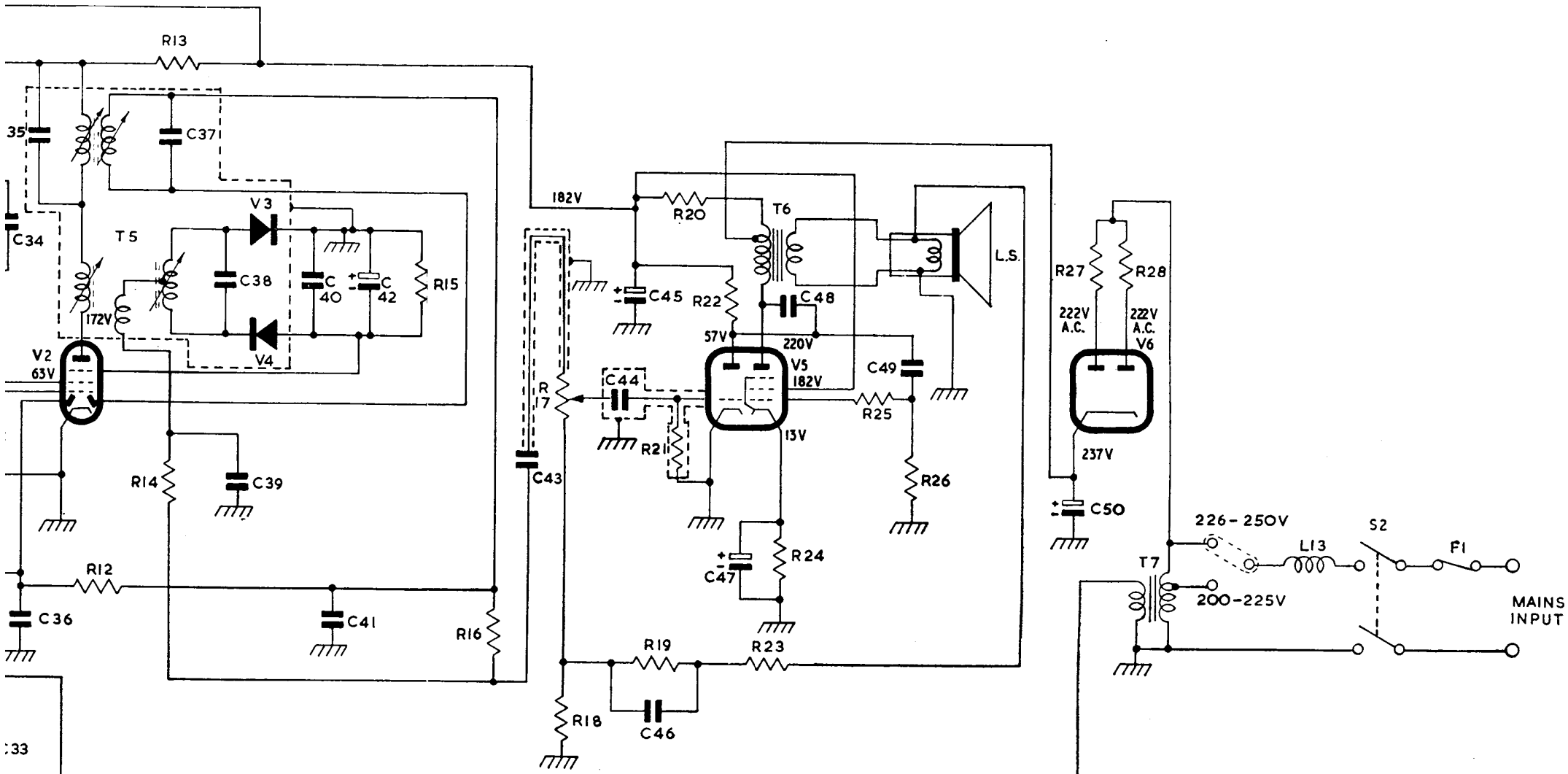
Item	No.
CABINET	
Cabinet Assembly	760049
Nut; Spire: For card back fixing	706028
Washer; Bakelite: For card back	702180
Screw; No. 6 x 1 in. S.T. Stl. Cad. Binding Hd.; For card back	388526/A
Screw; No. 8 x 3/8 in. S.T. Stl. Cad. Binding Hd.; For card back	
Card Back	388549/A
Scale	690825
Clip; Scale	704705
Screw; 4 B.A. x 1/4 in. CH. Hd. Stl. Cad.: For chassis fixing	402217
	392404/A



MISCELLANEOUS

CHASSIS	
Switch Operating Arm Assembly	741827
Comprising	
Bracket; Knob Mounting	426631
Arm; Switch Operating	426642
Spring; Click	426634
Post; Riveting	311359
Knob; Wavechange:	550735
Rivet; Shouldered	303665
Pin; Mills	706589
Clip; "E"	707439
Socket Plate Assembly	741828
KNOBS	
Knob Assembly: For Tuning or Volume ON/OFF	741831
Nut; Half; 4 B.A. Brass for knob	310383
Screw; Grub; 4 B.A. x 1/4 in. Cup End for knob ...	388762/A





SWITCH SHOWN IN L.W. POSITION