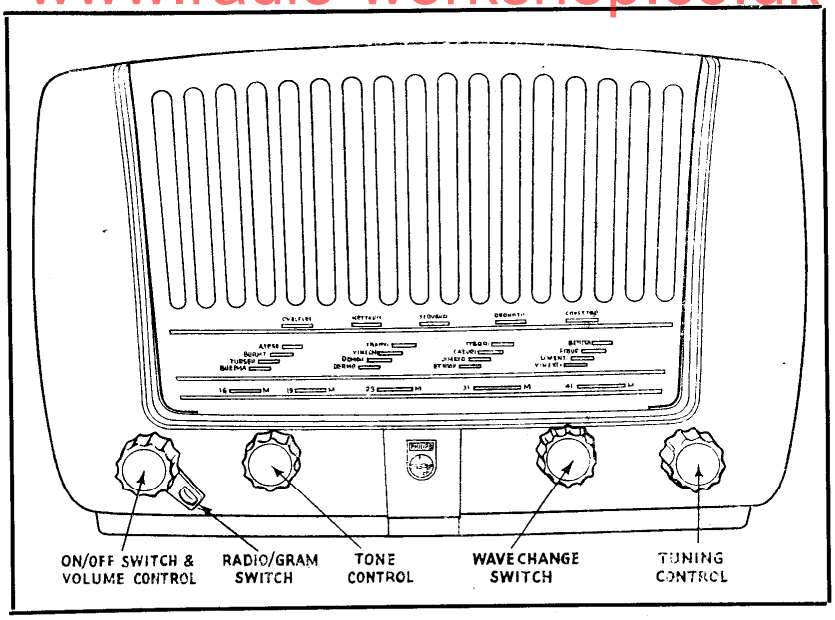
SERVICE MANUAL FOR

PHILIPS RECEIVER TYPE 310A



Front view of Receiver

VALVE COMBINATION

V1 ECH42.
V2 EAF42.
V3 EBC41.
V4 EL41.
V5 EZ40.

SCALE LAMP

Type 8028D-00.

WAVEBAND RANGES

S.W. 18.2 to 5.92 Mc/s.
M.W. 1622 to 517 Kc/s.
L.W. 285 to 152 Kc/s.

INTERMEDIATE FREQUENCY

~~470 Kc/s~~.

TRIMMING FREQUENCIES

S.W. 6.2 and 20.1 Mc/s.
M.W. 547 and 1630 Kc/s.
L.W. 159 Kc/s.

EXTENSION SPEAKER

5 to 7 ohms.

MAINS CONSUMPTION

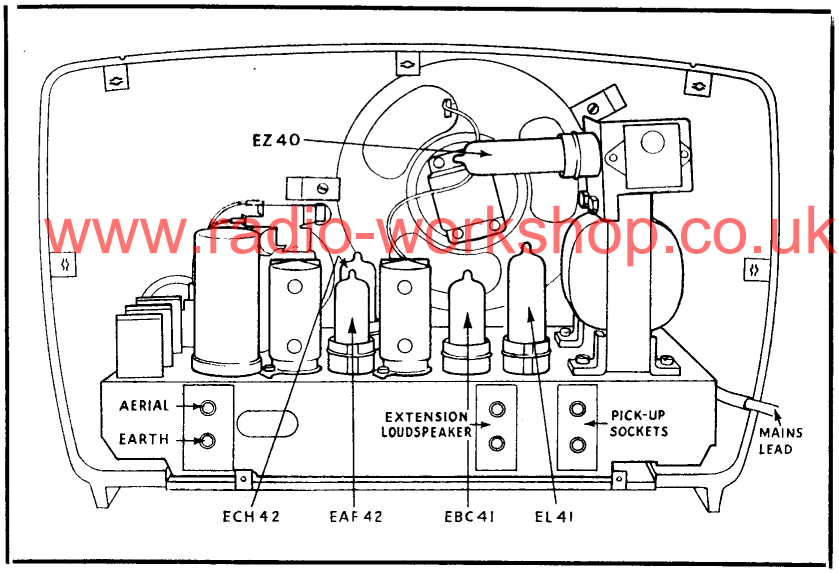
With 220 V. 50 c/s applied to the 220 V. tapping, consumption = 210 mA.
With 245 V. 50 c/s applied to the 245 V. tapping, consumption = 190 mA.

VOLTAGE RANGE

100—250 V. 50—100 c/s.

CABINET DIMENSIONS

Height 10″. Width 14½″. Depth 8″.



Back view of Receiver

SCALE REMOVAL

Pull the top of the scale away from the cabinet about 1" and lift upwards. When replacing, make sure that the two top projections are fully seated into the bushes in the cabinet.

REMOVING CHASSIS

Remove backplate (7 screws).

Remove baseplate (4 screws).

Remove knobs (pull off).

Remove chassis fixing bolts.

Remove the scale (see above).

Gently push the pointer through the slot in the cabinet, and withdraw the chassis.

When replacing, place the chassis partly in the cabinet, and gently push the pointer through the slot in the cabinet front.

POINTER DRIVE REPLACEMENT (Fig. 1)

Make up the cables to the dimensions shown. Turn gang to maximum capacitance. Fit the end of the shorter cable into the slot at 4 o'clock and wind on anti-clockwise, winding from front to back on the drum, as indicated. Pass the cable under pulley A, hook the end on to the spring and the spring on to any convenient anchorage point. Fit the end of the longer cable into the slot at 12 o'clock and wind clockwise as indicated, winding from back to front on the drum. Pass the cable round pulley B, and hook the end on to the spring.

CAPACITOR DRIVE REPLACEMENT (Fig. 2)

Make up the cord to the dimensions indicated on Fig. 2. Turn gang to minimum. Set the spring on the pointer cable to the right-hand end of its travel (viewed from the front). The slot in the small diameter section of the moulded drum will then be at 12 o'clock. Insert the collar on the cord into the slot in the drum, leading with the longer end of the cord.

Take the shorter end and pass it $\frac{1}{2}$ turn clockwise round the drum and down to the drive spindle. Wind $2\frac{3}{4}$ turns anti-clockwise round the spindle, winding from front to back on the spindle. Lead the cord up through the right-hand cable guide, and place the cable sheath in position. Lead the cord $\frac{3}{4}$ turn anti-clockwise round the capacitor drum, hook it on to the spring and hook the spring on to its anchorage point.

Now take the longer end of the cord, and wind on $2\frac{1}{4}$ turns anti-clockwise, winding from front to back of the drum. Lead the cord down to the tuning spindle, and wind on $2\frac{1}{2}$ turns clockwise, winding from back to front on the spindle. Lead the cord up through the left-hand guide, and fit the cable sheath in position. Hook the end of the cord on to the spring, and then pass the loop of the cord over the pulley.

The last operation is made easier if at the same time the spring is extended.

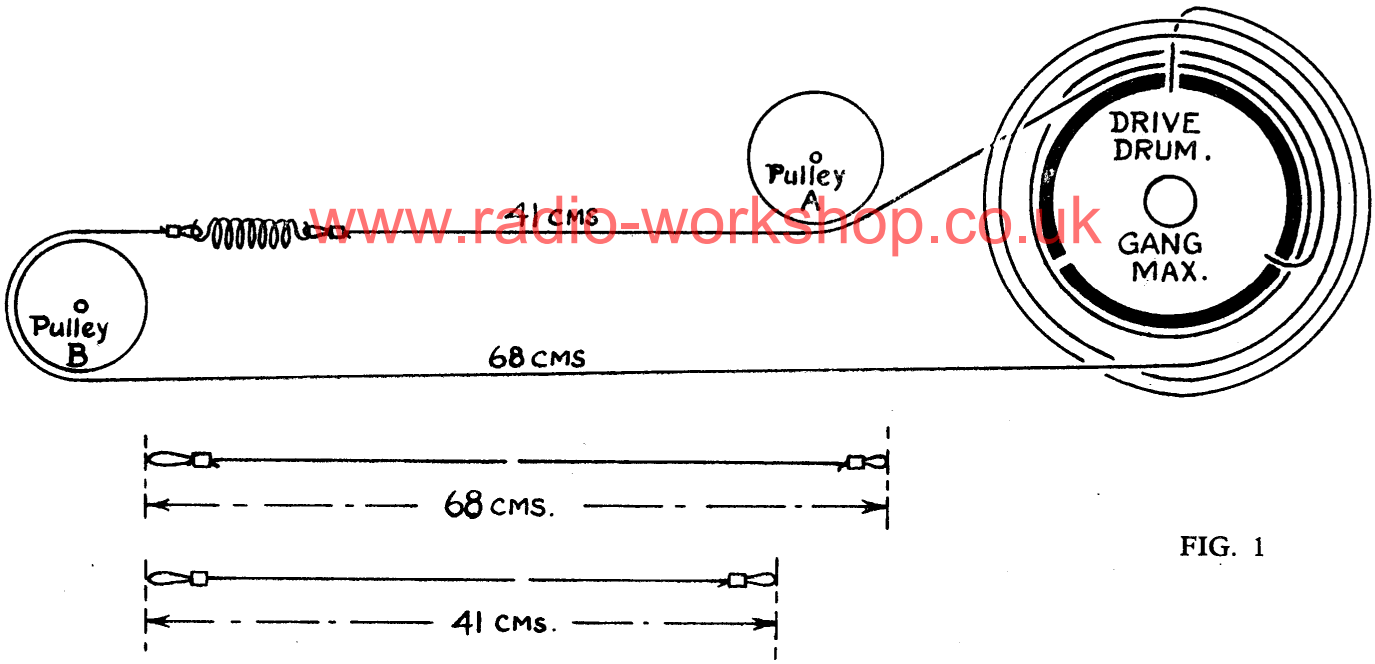
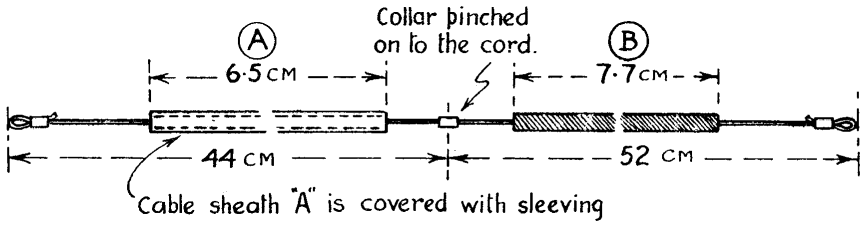


FIG. 1



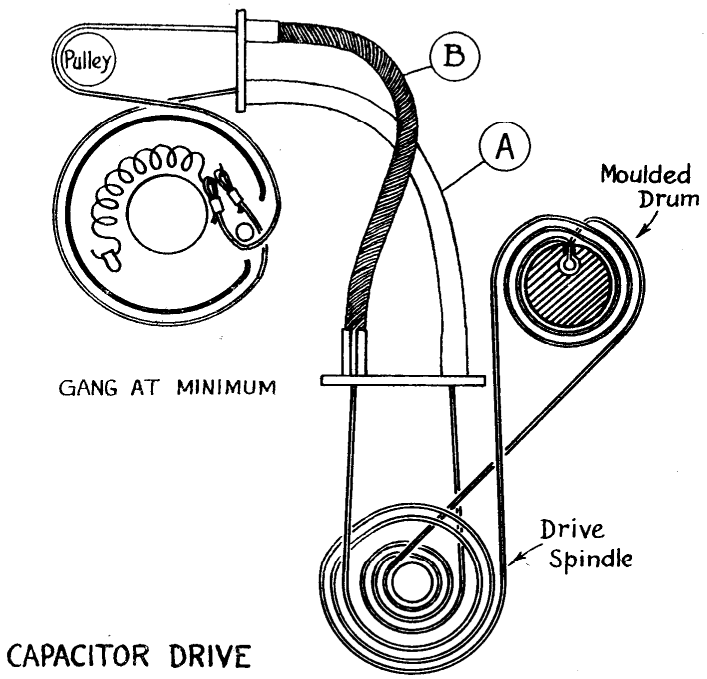


FIG. 2

PILOT LAMP REPLACEMENT

Remove the chassis baseplate. The lamp is then accessible. When replacing, check that the lamp is in the position to give best scale illumination. The fixing bracket has a slotted hole to allow for this adjustment.

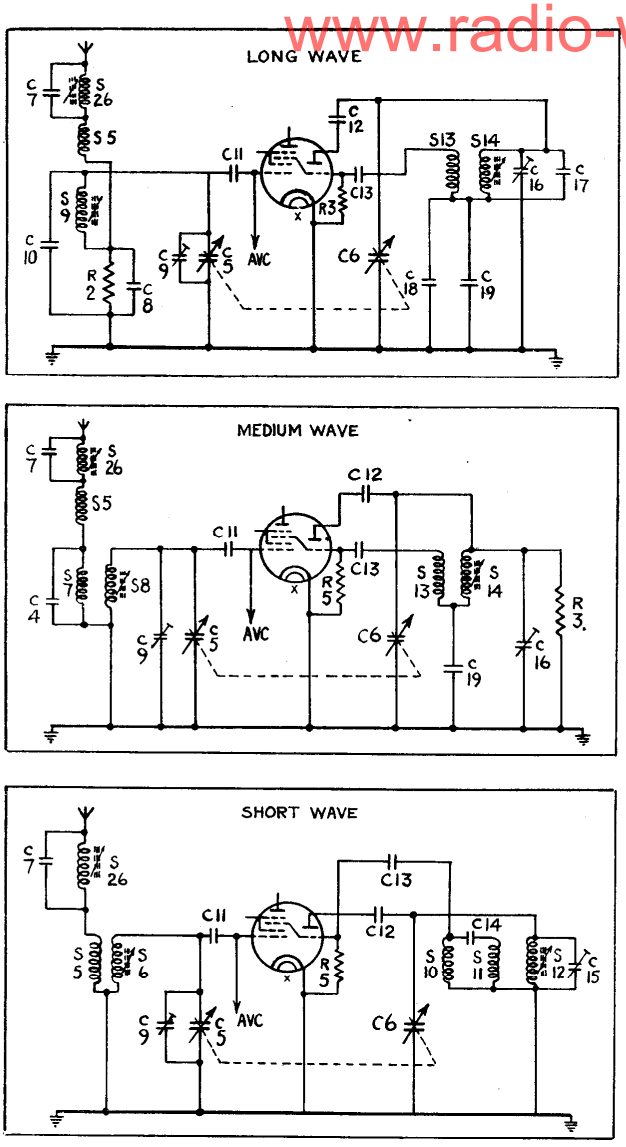


FIG. 3

CIRCUIT NOTES

The circuit in general follows conventional superhetrodyne practice. On L.W. the aerial coil consists of S5 and S9 in series, connected across C10 and the tuning capacitor C5. The capacitor C17 is connected in the oscillator circuit on L.W. The individual L.W., M.W. and S.W., R.F. circuits shown in fig. 3.

The diode in V2 acts as detector, and A.V.C. diode, A.V.C. being fed to the grids of V1 and V2 from the junction of R9/C26.

V3 acts as a triode L.F. amplifier, both diode being connected to cathode.

Variable feedback is applied to V3 and V4 from the secondary of the output transformer via R16. Decoupling capacitors are not used on the cathodes of V3 or V4, and this, together with the inclusion of R22, causes the feedback to be positive on V3 and negative on V4. The value of R22 and R15 are therefore critical.

TRIMMING

(a) I.F. Circuits

Switch to M.W., gram switch set to " radio," volume control to maximum, gang to minimum.

Unscrew the dust iron cores of all the I.F. transformers, apply a signal of 470 Kc/s to gl V1 via a capacitor of 47,000 pF, and trim for maximum output in the following order:—

4th I.F. coil S21/S22 (Bottom).
3rd I.F. coil S19/S20 (Top).
1st I.F. coil S15/S16 (Bottom).
2nd I.F. coil S17/S18 (Top).

(b) I.F. Filter

Apply a signal at the I.F. resonant frequency to the aerial socket. Trim S26 to minimum output, using the first minimum from the position of the screwed out core.

(c) R.F. Circuit (see table below)

Set gram switch to " radio," turn volume control to maximum. Trim in the order M.W., L.W., S.W. The H.F. trimming point is with the gang at minimum capacitance, at which point the scale pointer should line up with the letter " M " at the left-hand end of each wavechange scale.

Waverange	Set pointer to	Frequency	Trim to Maximum Output
M.W.	550m. " M "	545.5 Kc/s 1630 Kc/c	S14, S8 C16, C9 } Repeat as required
L.W.	1900m.	157.8 Kc/s (approx.)	Swing generator for maximum output, trim S9
S.W.	50m. " M "	6.0 Mc/s 20.1 Mc/s	S12, S6 C15 } Repeat as required

The above frequencies are accurate and those on page 1 are incorrect.

SPARE PARTS LIST—TYPE 310A

IMPORTANT. When ordering spare parts, the type number of the receiver and the code number of the part, as given in this manual, MUST be quoted to enable the order to correctly executed. When claiming free replacement under Guarantee the defective part should be returned and the type and serial number of the receiver, also the date of sale, should be quoted.

CABINET ASSEMBLY

CABINET less fittings (moulded)	MK.95357/BR.GP1
Philips emblem	23.654.14
Felt strip behind scale	A3.614.76
Rubber bushes for securing scale	A3.642.24
Spire clips for back plate	MK.076.11
Metallised Paper (700×40mm.)	06.595.13
CONTROL KNOBS—Volume, Tuning and Tone	23.952.88/BR.GP1
Control knob—Waveband ...	23.952.89/BR.GP1
Control lever—Gram switch	A3.369.65
Felt ring under above	A3.562.16
Felt ring for V/C knob	A3.562.17
Felt rings for other knobs	A3.561.58
Spring clips for knobs	28.753.01
BACKPLATE ASSEMBLY	A3.693.66
Rec. head fixing screws (No. 7 × 3/8") ...	G7.969.43
Valve position label	PG.001.82
Limited licence plate	PG.001.85
METALLISED BASEPLATE complete...	A3.385.98

SCALE ASSEMBLY

Station scale (plastic)	MK.703.47
Support springs for above	A3.649.40
Paxolin light screen	A3.386.71
POINTER ASSEMBLY	A3.693.16
Felt ring for above	A3.575.87
LOUDSPEAKER complete	MK.860.94
Speaker holding clamps	A3.446.20

CHASSIS ASSEMBLY

POINTER DRIVE ASSEMBLY

Bracket with pulley—200m. end	MK.826.18
Bracket with pulley—550m. end	MK.826.26
Pulley only	23.681.81
Pins for above	A3.599.26
Fixing bush for pulley	07.068.23
Drive cable only	33.403.04
Cable loop grips	MK.116.01
Tension spring	A3.646.14

TUNING UNIT

Gang capacitor with large drum	49.001.42
Small inner drum for above	A3.327.12
Circlip for above	A3.563.36
Bracket with brass pulley	MK.825.92
Brass pulley only	A3.322.40
Pin for above	A3.599.26
Fixing bush for pulley	07.068.23
Drive cord only	06.606.29
Cord loop grips	MK.908.99
Cord tension spring	A3.646.26
Outer casing for drive cord (A Fig. 2)	08.010.54/65mm.
Outer casing for drive cord (B Fig. 2)	08.010.54/78mm.
Ferrules for above	A3.303.63
Moulded drum	P4.095.01
Bracket with spindle for above	A3.343.32
Locking ring for drum	A1.756.55
Tuning spindle	MK.002.97
Bearing bracket for above...	A3.414.38
Presspahn washer for above	07.027.05
Locking ring for spindle	A1.756.55

WAVEBAND SWITCH ASSEMBLY

Switch section No. 1	A3.201.70
Switch section No. 2	A3.201.69
Retaining bracket for above	A3.191.93
Flat spindle	A3.194.33
WAVEBAND SPINDLE ASSEMBLY...	A3.662.23
Bearing bush for above	28.265 35
Locking ring for above	A1.756.56
Spring washer for above	07.043.07
Spacing ring for stop plate	A3.208.23
Steel ball 7/32"	89.205.05
PILOT LAMP HOLDER	A3.359.07
Spring for above	28.730.43
Bracket for lampholder	A3.455.30
TONE CONTROL	49.470.45
Control spindle	MK.002.94
Bearing bracket for above...	MK.035.84
VOLUME CONTROL & SWITCH ...	49.500.34
Volume control only	MK.810.07
Mains switch	08.529.38
Switch mounting screws	07.800.10
Insulator between switch and control ...	28.315.23
Control spindle ... (Up to S/N 19,000 approx. only) ...	A3.431.40
Distance pieces for V/c (Up to S/N 19,000 approx. only) ...	07.005.31
Control spindle ... (From S/N 19,001 approx. onwards) ...	MK.003.02
Distance pieces for V/c (From S/N 19,001 approx. onwards) ...	MK.116.25
Screws for above (3 × 30mm.)	07.803.30
Bearing plate for spindle	A3.615.12

SPARE PARTS LIST—TYPE 310A (Contd.)

GRAM SWITCH	A3.402.44
Distance pieces for above	07.005.22
Metal operating sleeve	A3.674.02
Circlip for above	A3.562.12
COMPONENT RACK FOR MOUNTING RESISTORS, etc.	MK.888.73

MISCELLANEOUS

Voltage adjustment plate	A3.228.39
Mounting bracket for above	A3.455.31
Voltage adjustment disc	A3.228.43
Cover plate for above	A3.438.72
Socket plate—Aerial/Earth	A3.381.10
Socket plate—Extension speaker	A1.340.42
Socket plate—Pick-up	A1.340.92
Single-pin plugs	08.281.72
Valve holders	49.232.02
Coil fixing clips	28.084.83
Mounting bracket for trimmers C15/C16...	MK.062.44
Mounting bracket for trimmer C9 ...	MK.062.43
Mains lead only	K3.976.78
Fixing clip for above	A3.469,42
Chassis fixing bolts (4 × 20mm.) ...	07.804.20
Rubber bushes for chassis	A3.327.14
Distance pieces for above	07.007.46
Plate washers for above	07.025.14
Spring washers for above	07.041.40
Type plate	A1.872.23
Rivet caps for above	07.067.06
"A6" licence plate	MK.699.15

GENERAL (Screws, Nuts, etc.)

CHEESEHEAD SCREWS

3 × 5mm. ...	07.803.05	4 × 6mm. ...	07.804.06
3 × 6mm. ...	07.803.06	4 × 8mm. ...	07.804.08
3 × 8mm. ...	07.803.08	4 × 10mm. ...	07.804.10
3 × 10mm. ...	07.803.10	4 × 20mm. ...	07.804.20

WASHERS

3mm. ...	07.035.30	4mm. ...	07.014.40

NUTS

3mm. ...	07.104.30	4mm. ...	07.014.40

VALVES AND PILOT LAMPS

V1 Valve	ECH42
V2 Valve	EAF42
V3 Valve	EBC41
V4 Valve	EL41
V5 Valve	EZ40
L1 Pilot Lamp	00.080.28D-00

FUSE

Z1	08.100.99

TRANSFORMERS AND COILS

S1/2 & S4	Mains transformer	MK.513.56
S5-8	Aerial coil S.W. & M.W. ...	MK.564.26
S10.14	Oscillator coil	MK.564.25
S9/S26	L.W. Aerial & I.F. Filter ...	MK.564.27
S15-18	1st I.F. coil	MK.564.56
S19-22	2nd I.F. coil	MK.564.56
S23/24 & S27	Speaker transformer ...	A3.152.18
S25	Loudspeaker	MK.860.94

CORES for S6, S12, S14	23.643.06
Core for S8	A3.367.33
Cores for S9/S26	A3.367.32
Cores for I.F. coils	23.644.67
WAX for air capacity trimmers ...	GBX.008.13/01
Wax for I.F. coils	GBX.009.47

SPARE PARTS LIST—TYPE 310A (Contd.)

CAPACITORS

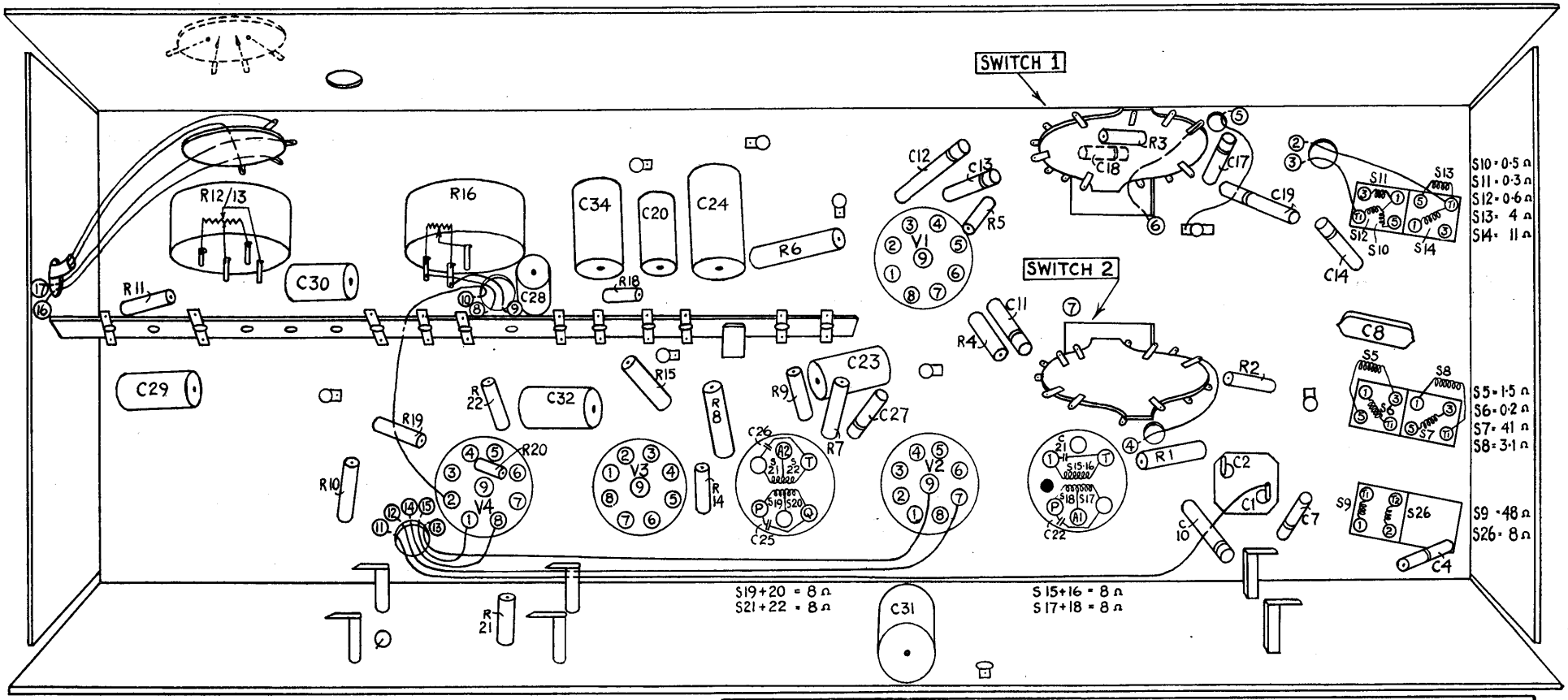
			Working Voltage	Permitted Tolerance	
C1/2	Electrolytic	50 + 50 uF	350V		MK.182.35/50+50
C4	Ceramic	39 pF		10%	48.406.10/39E
C5/6	Gang	11-500 pF			49.001.42
C7	Ceramic	270 pF		5%	48.406.05/270E
C8	Mica	1,780 pF		2%	MK.193.02/1K78
C9	Trimmer	3-30 pF			28.212.36
C10	Ceramic	72 pF		2%	48.406.02/72E
C11	Ceramic	220 pF		20%	48.406.10/220E
C12	Ceramic	470 pF		10%	48.406.10/470E
C13	Ceramic	56 pF		10%	48.406.10/56E
C14	Ceramic	68 pF		2%	48.406.02/68E
C15	Trimmer	3-30 pF			28.212.36
C16	Trimmer	3-30 pF			28.212.36
C17	Ceramic	370 pF		1%	48.406.01/370E
C18	Ceramic	47 pF		2%	48.406.02/47E
C19	Ceramic	415 pF		1%	48.406.01/415E
C20	Paper	1,800 pF	400V	20%	48.751.10/1K8
C21		115 pF			In 1st I.F. coil
C22		115 pF			
C23	Paper	47,000 pF	125V	20%	48.750.10/47K
C24	Paper	0.1 uF	400V	20%	48.751.10/100K
C25		115 pF			In 2nd I.F. coil
C26		115 pF			
C27	Ceramic	82 pF		10%	48.406.10/82E
C28	Paper	12,000 pF	125V	10%	48.750.10/12K
C29	Paper	15,000 pF	125V	20%	48.750.10/15K
C30	Paper	8,200 pF	125V	20%	48.750.10/8K2
C31	Paper	2,700 pF	400V	20%	48.751.10/2K7
C32	Paper	3,300 pF	400V	20%	48.751.10/3K3
C33	Paper	6,800 pF	1,000V	20%	48.758.20/6K8
C34	Paper	0.1 uF	400V	20%	48.751.10/100K

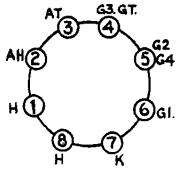
RESISTORS

N.B.—Wattage is based upon an ambient temperature of 70° C.

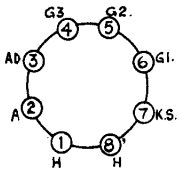
			Wattage	Permitted Tolerance	
R1		1,200 Ohm	1 watt	10%	48.427.10/1K2
R2		12,000 Ohm	½ watt	20%	48.426.10/12K
R3		8,200 Ohm	½ watt	10%	48.426.10/8K2
R4		0.82M Ohm	½ watt	10%	48.426.10/820K
R5		33,000 Ohm	½ watt	10%	48.426.10/33K
R6		33,000 Ohm	1 watt	10%	48.427.10/33K
R7		1.5M Ohm	½ watt	10%	48.426.10/1M5
R8		56,000 Ohm	1 watt	10%	48.427.10/56K
R9		47,000 Ohm	½ watt	10%	48.426.10/47K
R10		1.0M Ohm	½ watt	10%	48.426.10/1M
R11		27,000 Ohm	½ watt	10%	48.426.10/27K
R12/13	Potentiometer	0.05+0.45M Ohm	Log law		49.500.34
R14		1,800 Ohm	½ watt	10%	48.426.10/1K8
R15	High Stability	0.12M Ohm	½ watt	5%	MK.770.73
R16	Potentiometer	50,000 Ohm	Linear law		49.470.45
R18		0.1M Ohm	½ watt	10%	48.426.10/100K
R19		0.68M Ohm	½ watt	10%	48.426.10/680K
R20		1,000 Ohm	½ watt	20%	48.426.10/1K
R21		180 Ohm	½ watt	10%	48.426.10/180E
R22	High Stability	43,000 Ohm	¼ watt	5%	MK.771.07

S	21.22.19.20 — 15.16.18.17. — 9.12.11.10.5.6.26.7.8.14.13.
C	29. — 30. — 28. 32.34. 20. 24. 26.25. — 23.27.31.12. 13. 11. 21.22.18. — 10.17.2.1. 19.7.-14. 8. 4.
R	11. — 12.13. — 10. 19. 16.22.21.20. — 18. 15. 14.8. 9.6. 7. — 4. 5. — 3.1. 2.

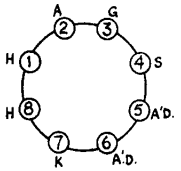




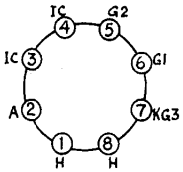
V1.
ECH42



V2.
EAF42



V3.
EBC41



V4.
EL41.

4 ECH81
in 34-1A.

CURRENTS AND VOLTAGES.

Conditions	V.1.		V.2.		V.3.		V.4.		V.5.	
220 v input to 220 v tap. M.W. Radio, gang at minimum, volume control at maximum, tone control at brilliant. No signal applied. Voltages are at valve sockets with respect to chassis, using a 20,000 Ω/V. Meter.	Vah	250 v dc	Va	250 v dc	Va	111 v dc	Va	244 v dc	Va1	251 v dc
	Vat	107 "	Vg2	54 "	Vk	1·3 "	Vg2	250 "	Va2	251 "
	Vg1+3	-0·5 "	Vg1	-0·4 "	Ia	0·6 mA	Vk	6·5 "	Vk	270 "
	Vg2+4	54 "	Ia	3·5 mA			Ia	35·0 mA		
	Vg1	-0·5 "	Ig2	1·0 mA			Ig2	4·5 mA		
	Iah	1·6 mA	A.V.C. VOLTAGE. With a signal (857 Kc/s - 350 m) of 150 mV applied to the aerial socket, the A.V.C. voltage at the junction of R7/C27 = -18·5 v, and at the junction of C11/R4 = -8 v. (Measured on a valve voltmeter.)						VC1	270 v dc
	Iat	4·2 mA							VC2	250 "
	Ig2+4	2·5 mA							I total	53·0 mA

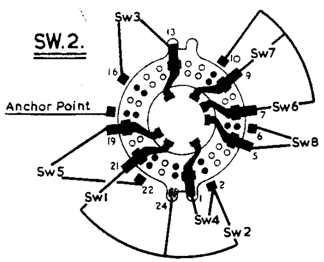
UNDER VIEW OF CHASSIS

S. 5, 9, 7, 26, 6, 8, 15, 16, 17, 18, 10, 11, 13, 12, 14, 19, 20, 21, 22, 23, 24, 27, 25, 4, 2, 1,

C. 10, 7, 4, 8, 9, 5, 11, 21, 22, 13, 18, 14, 15, 20, 17, 16, 12, 6, 24, 25, 23, 31, 26, 29, 27, 30, 34, 32, 28, 33, 2, 1,

R. 2, 4, 5, 3, 6, 8, 7, 9, 11, 13, 12, 10, 14, 18, 22, 15, 19, 20, 21, 16, 1,

SW. 2.

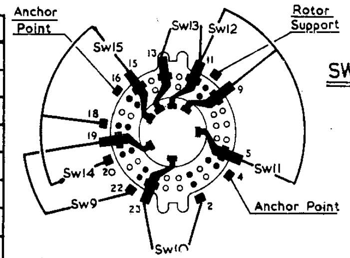


Sw. No.	SW	MW	LW
1	C	C	—
2	—	C	—
3	C	—	—
4	—	—	C
5	C	—	C
6	—	C	—
7	—	—	C
8	C	—	—

SWITCHES DRAWN AS SEEN FROM REAR OF AN INVERTED CHASSIS.

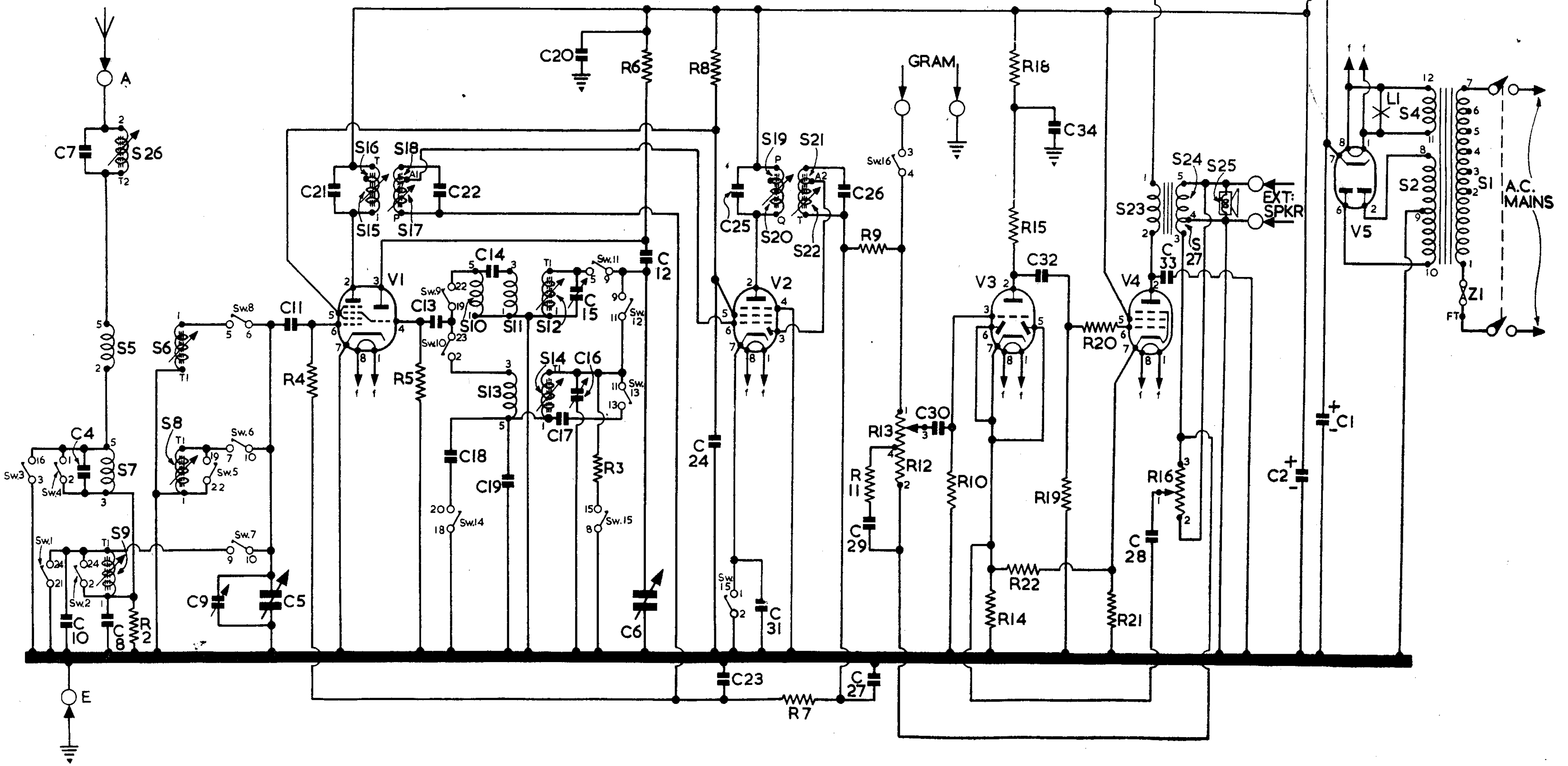
Sw. No.	SW	MW	LW
9	C	—	—
10	—	C	C
11	C	—	—
12	—	C	C
13	—	—	C
14	—	—	C
15	—	C	—

SW. 1.

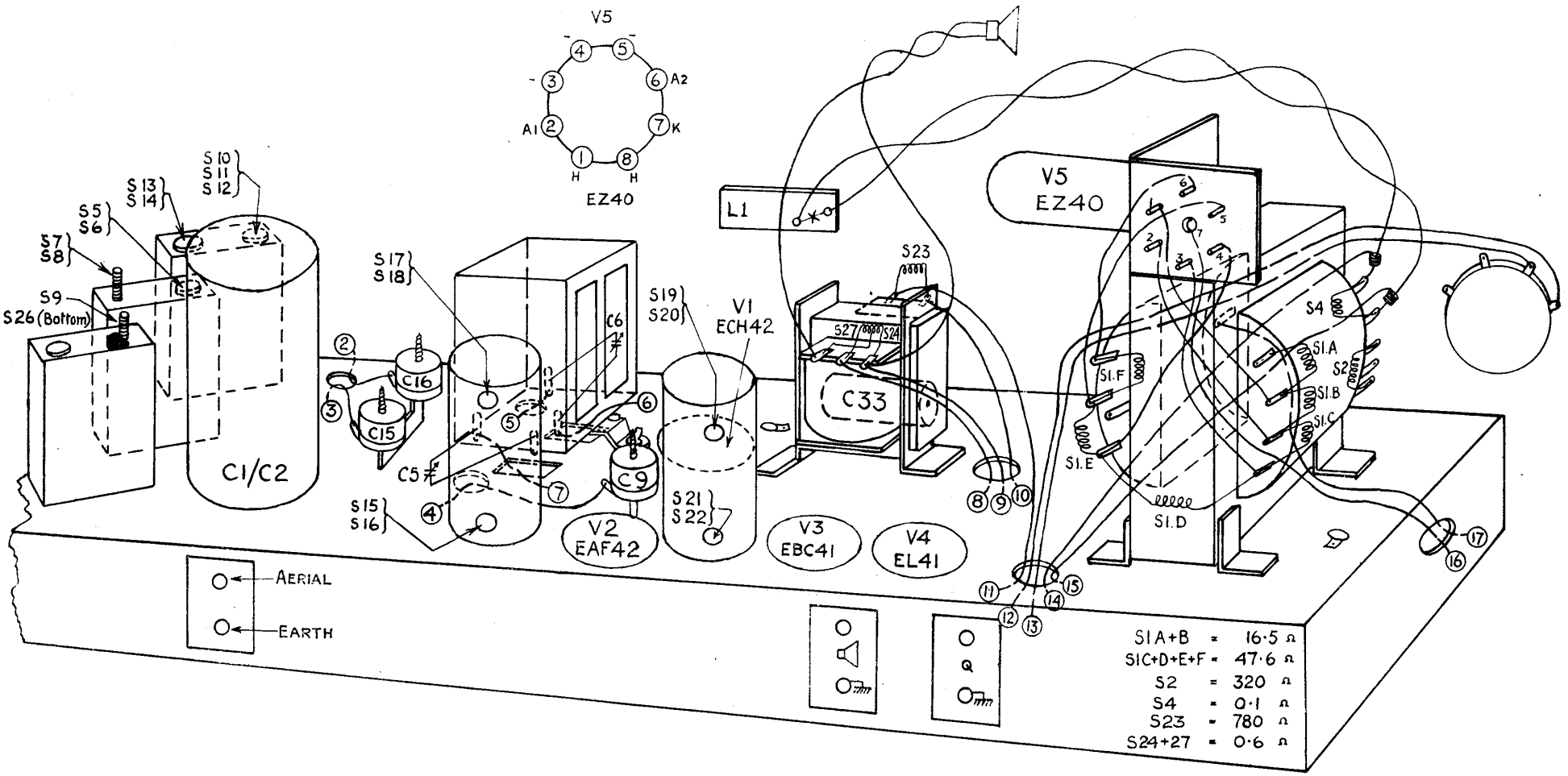


RADIO-GRAM SW:

Sw. No.	RADIO	GRAM
15	C	—
16	—	C



Circuit Diagram

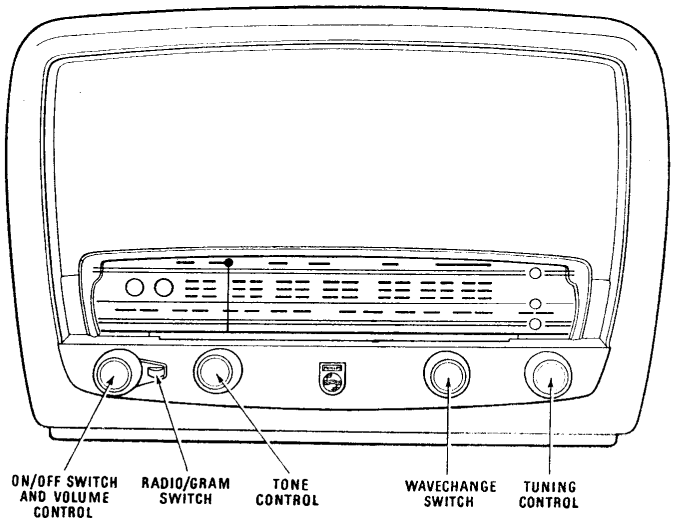


TOP VIEW OF CHASSIS

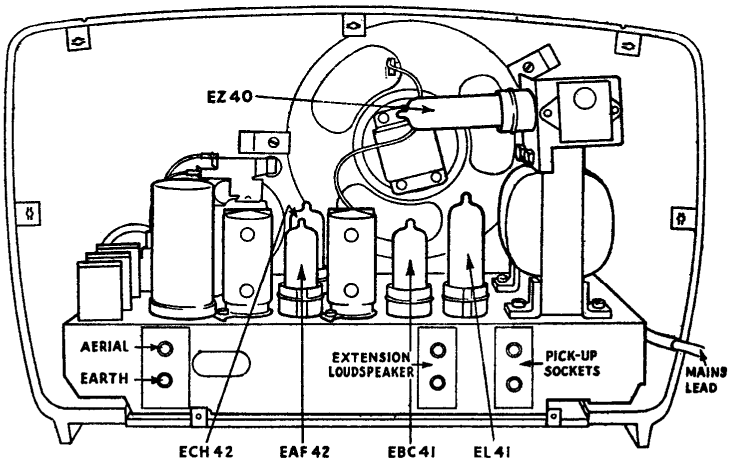
Servicing Information

FOR THE

PHILIPS RECEIVER TYPE 341A



Front view of Receiver



Rear view of Receiver

The 341A is similar to the 310A for which a Service Manual has been issued. The differences between the two receivers are as follows:—

The cabinet is different, and the dimensions are: Height 10¾", Width 16¼", Depth 8¼".

The length of the pointer drive cables are 45 cms. and 73.3 cms.

A number of minor mechanical differences exist, and a complete spares list is given below.

Please note also, the following corrections to the 310A Service Manual.

1. **Circuit Diagram (page 9)**

   " SW15 " should read " SW17 " both on the small table and on the circuit across C31.

   On " SW15 " (below R3), contact number " 8 " should read " 18."

   One side of the valve filaments should be shown connected to chassis.

2. **Under Chassis Diagram (page 8)**

   Coil S13 connects between tags 5 and 3, and not as shown between tags 5 and T1.

SPARE PARTS LIST—TYPE 341A

IMPORTANT. When ordering spare parts, the type number of the receiver and the code number of the part, as given in this manual, MUST be quoted to enable the order to be correctly executed. When claiming free replacement under guarantee the defective part should be returned and the type and serial number of the receiver, also the date of sale, should be quoted.

CABINET ASSEMBLY

Cabinet with fittings (moulded) ...	MK.976.28/MJ
Philips Emblem	MK.704.46
Fixing pins for above	A3.314.02
Spire clips for Backplate	MK.750.69
Metallised paper (800 × 40 mm.) ...	06.595.13

CONTROL KNOBS—VOLUME, TUNING & TONE A3.737.16/MJ

Control Knob—Waveband ...	A3.736.15/MJ
Control Lever—Gram Switch ...	A3.369.65/MJ
Small Felt Rings for knobs	25.440.14
Spring clips for knobs	MK.750.84
Ring assembly for Control knobs ...	MK.881.28

BACKPLATE ASSEMBLY MK.875.57

Fixing screws for above	MK.946.88
Valve position label	PG.001.82
Limited licence label	PG.006.09

METALLISED BASE PLATE complete MK.875.42

Fixing brackets to cabinet	MK.065.81
Fixing brackets to back plate	A3.458.47

SCALE ASSEMBLY

Station scale (plastic)	MK.704.44
Support clips for above	MK.750.91
Spire clips for above	MK.926.45
Light screen	MK.889.83
Felt discs for scale	MK.476.79

POINTER ASSEMBLY MK.875.47

Felt ring for above	A3.564.36

BAFFLE ASSEMBLY

Baffle board assembly less silk	HY.065.08
Spire clips for above	MK.926.45
Speaker silk (205 × 385 mm.) ...	K.300.ZZ/913

LOUDSPEAKER complete MK.860.94

Speaker holding clamps	A3.446.20

CHASSIS ASSEMBLY

POINTER DRIVE ASSEMBLY

Pulley only	23.681.81
Pins for above	A3.599.26
Fixing bush for pulley	07.068.23
Drive cable only	33.403.04
Cable loop grips	MK.116.01
Tension spring	A3.646.14

TUNING UNIT

Gang capacitor with large drum	49.001.42
Circlip for small inner drum	A3.563.36
Brass pulley only	A3.322.40
Pin for above	A3.599.26
Fixing bush for pulley	07.068.23
Drive cord only	06.606.29
Cord loop grips	MK.908.99
Cord tension spring	A3.646.26
Outer casing for drive cord	08.010.54/65mm.
Outer casing for drive cord	08.010.54/78mm.
Ferrules for above	A3.303.63
Drive drum	23.644.51
Locking ring for drum	A1.756.55
Tuning spindle	MK.003.48
Locking ring for spindle	A1.756.55

WAVEBAND SWITCH ASSEMBLY

Switch section No. 1	A3.201.70
Switch section No. 2	A3.201.69

WAVEBAND SPINDLE ASSEMBLY MK.889.69

Bearing bush for above	28.265.35
Locking ring for above	A1.756.56
Spring washer for above	07.043.07
Spacing ring for stop plate	A3.208.23
Steel ball 7/32"	89.205.05

PILOT LAMP HOLDER A3.360.01

TONE CONTROL 49.470.45

Control spindle	MK.003.51

VOLUME CONTROL & SWITCH ... 49.500.34

Volume control only	MK.810.07
Mains switch	08.529.38
Switch mounting screws	07.800.10
Insulator between switch & control ...	28.315.23
Control spindle	MK.003.49

GRAM. SWITCH A3.402.44

SPARE PARTS LIST—TYPE 341A (Contd.)

MISCELLANEOUS

Voltage adjustment plate	MK.875.51
Voltage adjustment disc	MK.854.61
Socket plates	MK.874.45
Valve holders	49.232.02
Coil fixing clips	28.084.83
Spring clips for coils	MK.730.23
Mains lead only	K3.975.00
Chassis fixing bolts (4 × 20 mm.)	07.804.20
Rubber bushes for chassis	A3.327.14
Distance pieces for above	MK.116.21
Plate washers for above	07.025.14
Spring washers for above	07.041.40

GENERAL (Screws, Nuts, etc.)

CHEESEHEAD SCREWS

3 × 5mm.	07.803.05	4 × 6mm.	07.804.06
3 × 6mm.	07.803.06	4 × 8mm.	07.804.08
3 × 8mm.	07.803.08	4 × 10mm.	07.804.10
3 × 10mm.	07.803.10	4 × 20mm.	07.804.20
3 × 0mm.	07.803.30		

WASHERS

3mm.	07.035.30	4mm.	07.014.40

NUTS

3mm.	07.104.30	4mm.	07.104.40

VALVES & PILOT LAMPS

V1	Valve	ECH42
V2	Valve	EAF42
V3	Valve	EBC41
V4	Valve	EL41
V5	Valve	EZ40
L1	Pilot lamp (6.5 V. 0.3 amp)	00.080.28D-00

TRANSFORMERS & COILS

S1/2 & S4	Mains Transformer	MK.513.56
S5–8	Aerial Coil S.W. & M.W.	MK.564.98
S10/14	Oscillator coil	MK.564.97
S9/26	L.W. Aerial & I.F. Filter	MK.564.99
S15–18	1st I.F. Coil	MK.564.56
S19–22	2nd I.F. Coil	MK.564.56
S23/24 & S27	Speaker Transformer	A3.152.18
S25	Loudspeaker	MK.860.94

FUSE

Z1	08.100.99

CORES for S6, S12, S14	23.643.06
Core for S8	A3.367.33
Cores for S9/S26	A3.367.32
Cores for I.F. Coils	23.644.67

WAX for air capacity trimmers	GBX.008.13/01
Wax for I.F. Coils	GBX.009.47

SPARE PARTS LIST—TYPE 341A (Contd.)

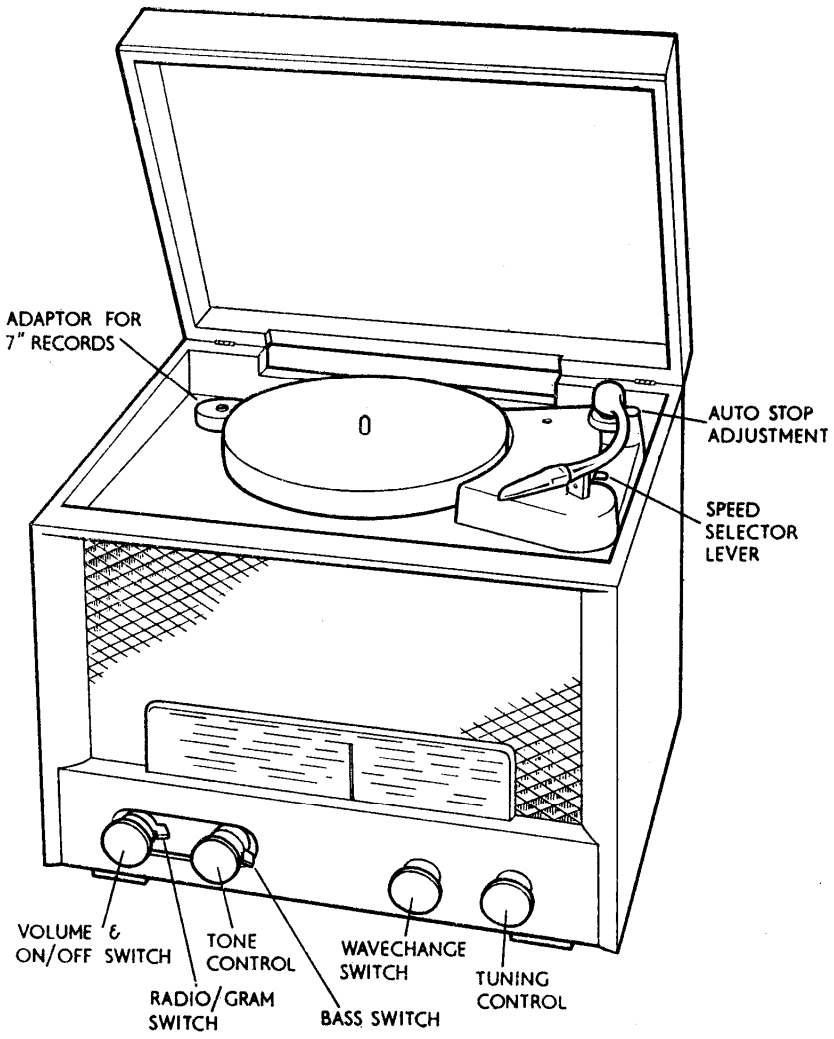
CAPACITORS			Working Voltage	Permitted Tolerance	
C1/2	Electrolytic	50 + 50 uF	350V		MK.182.35/50 + 50
C4	Ceramic	39 pF		10%	48.406.10/39E
C5/6	Gang	11–500 pF			49.001.42
C7	Ceramic	270 pF		5%	48.406.05/270E
C8	Paper	1,800 pF	400V	10%	48.751.10/1K8
C9	Trimmer	3–30 pF			28.212.36
C10	Ceramic	72 pF		2%	48.406.02/72E
C11	Ceramic	220 pF		20%	48.406.10/220E
C12	Ceramic	470 pF		10%	48.406.10/470E
C13	Ceramic	56 pF		10%	48.406.10/56E
C14	Ceramic	68 pF		2%	48.406.02/68E
C15	Trimmer	3–30 pF			28.212.36
C16	Trimmer	3–30 pF			28.212.36
C17	Ceramic	370 pF		1%	48.406.01/370E
C18	Ceramic	47 pF		2%	48.406.02/47E
C19	Ceramic	415 pF		1%	48.406.01/415E
C20	Paper	1,800 pF	400V	20%	48.751.10/1K8
C21		115 pF			In 1st I.F. Coil
C22		115 pF			
C23	Paper	47,000 pF	125V	20%	48.750.10/47K
C24	Paper	0.1 uF	400V	20%	48.751.10/100K
C25		115 pF			In 2nd I.F. Coil
C26		115 pF			
C27	Ceramic	82 pF		10%	48.406.10/82E
C28	Paper	12,000 pF	125V	10%	48.750.10/12K
C29	Paper	15,000 pF	125V	20%	48.750.10/15K
C30	Paper	8,200 pF	125V	20%	48.750.10/8K2
C31	Paper	2,700 pF	400V	20%	48.751.10/2K7
C32	Paper	3,300 pF	400V	20%	48.751.10/3K3
C33	Paper	6,800 pF	1,000V	20%	48.758.20/6K8
C34	Paper	0.1 uF	400V	20%	48.751.10/100K

RESISTORS				Permitted	
N.B.—Wattage is based upon an ambient temperature of 70° C.			Wattage	Tolerance	
R1		1,200 Ohm	1 watt	10%	48.427.10/1K2
R2		12,000 Ohm	½ watt	20%	48.426.10/12K
R3		8,200 Ohm	½ watt	10%	48.426.10/8K2
R4		0.82M Ohm	½ watt	10%	48.426.10/820K
R5		33,000 Ohm	½ watt	10%	48.426.10/33K
R6		33,000 Ohm	1 watt	10%	48.427.10/33K
R7		1.5M Ohm	½ watt	10%	48.426.10/1M5
R8		56,000 Ohm	1 watt	10%	48.427.10/56K
R9		47,000 Ohm	½ watt	10%	48.426.10/47K
R10		1.0M Ohm	½ watt	10%	48.426.10/1M
R11		27,000 Ohm	½ watt	10%	48.426.10/27K
R12/13	Potentiometer	0.05 + 0.45M Ohm	Log law		49.500.34
R14		1,800 Ohm	½ watt	10%	48.426.10/1K8
R15	High Stability	0.12M Ohm	½ watt	5%	GH.552.05/120K
R16	Potentiometer	50,000 Ohm	Linear law		49.470.45
R18		0.1M Ohm	½ watt	10%	48.426.10/100K
R19		0.68M Ohm	½ watt	10%	48.426.10/680K
R20		1,000 Ohm	½ watt	20%	48.426.10/1K
R21		180 Ohm	½ watt	10%	48.426.10/180E
R22	High Stability	43,000 Ohm	¼ watt	5%	GH.550.05/43K

SERVICING INFORMATION FOR

PHILIPS TABLE RADIOGRAM

TYPE 522A



Front view of Radiogram.

GENERAL NOTE

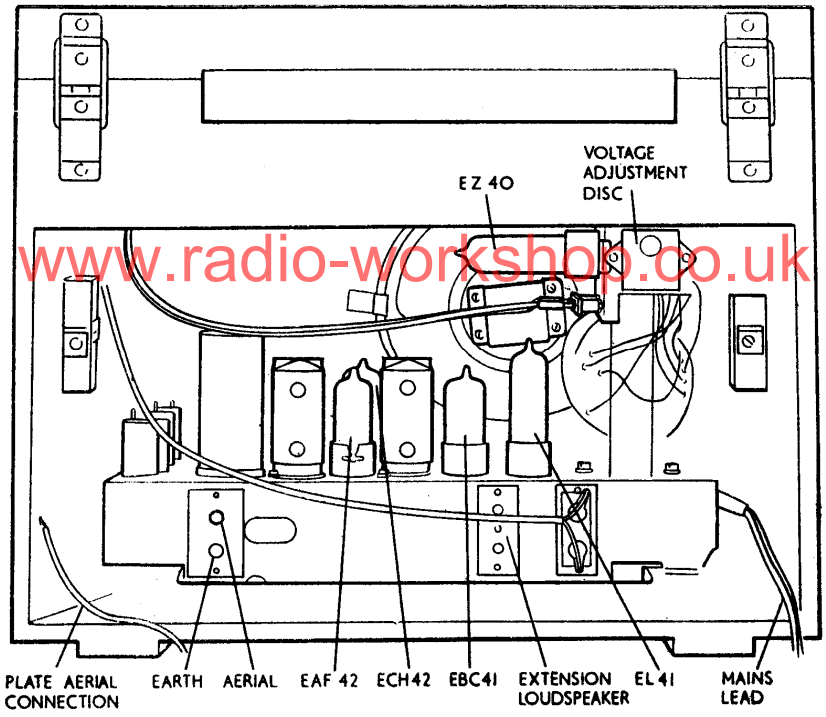
This table radiogram consists basically of a 424A type record player unit (i.e., the "Disc Jockey" unit) used in conjunction with a slightly modified 310A receiver chassis. The Service Manuals for the above types should therefore be consulted having in mind the following differences.

(A) RADIO SECTION

310A Manual page 1

(i) **Consumption**

Consumption of the 522A on "gram" is approximately 250 mA and 225 mA with 220 V. and 245 V. inputs respectively.



Back view of Radiogram.

(ii) **Cabinet Dimensions**

Height 12¾". Width 15½". Depth 12½".

310A Manual page 2

(i) **Scale Removal**

The scale lifts out directly upwards.

(ii) **Removing the Chassis**

Remove the backplate (4 woodscrews) and baseplate (6 woodscrews).
Unplug the pick-up and motor leads.
Remove knobs (pull off).
Release the pointer from the drive cable (3mm. screw).
Remove the four chassis fixing bolts.
The chassis may now be removed.
When replacing, the pointer should line up with the "M" on the scale when the gang is at minimum.
Check that the earth wire is connected to the underside of the baseplate.

310A Manual pages 5, 6 and 7

A new Spare Parts List is supplied herewith. Do not use the list in the 310A Manual as some components have been changed in value.

310A Manual page 8

The bass switch is mounted next to the mains switch, with C60 mounted on it.

More tags are fitted to the tag strip. R42 is connected between tags 6 and 8 (counting from the left), R43 between tags 4 and 9, R32 between tags 4 and 6, and C61 between tag 4 and chassis.

310A Manual page 9

The circuit diagram is modified as shown in Fig. 1, the additional electrical components being C60, C61, R32, R42, R43 and the bass switch.

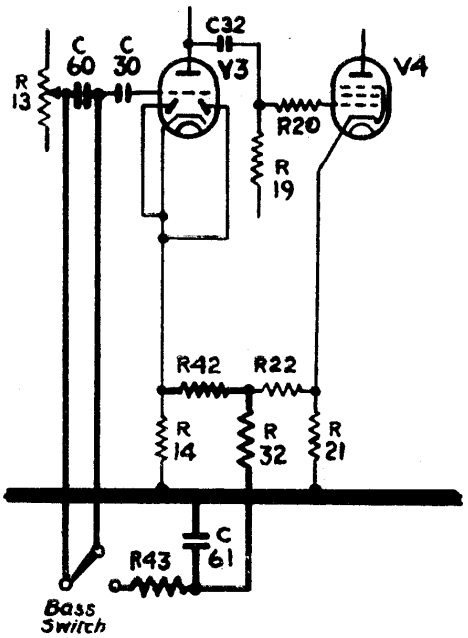


FIG. 1

310A Manual page 9 continued.

A filter circuit is incorporated in the pick-up lead, composed of C.71, C.72, R.51 and R.52. This filter is situated on the underside of the player unit. The circuit diagram is indicated in Fig. 2.

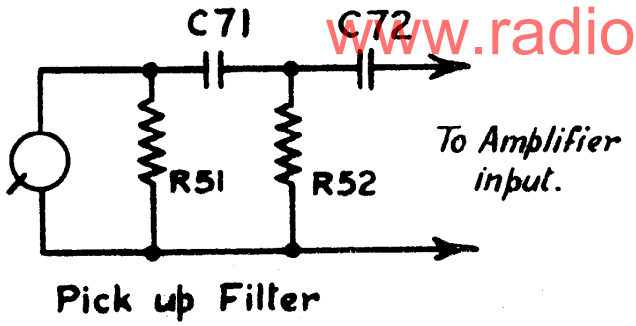


FIG. 2

310A Manual page 10

A socket connected to the 110 V. tapping on the primary of the mains transformer, is mounted on top of the transformer, into which the motor lead is plugged.

310A Manual. General Amendments

Page 8 S13 connects between tags 5 and 3, and not between 5 and T1.

Page 9 One side of the valve filaments are connected to chassis. On the radio/gram switch table, for " 15 " read " 17."

The switch across C31 should be " SW17 " not " SW15." On switch 15 (below R3), for contact 8 read 18.

(B) PLAYER UNIT SECTION

424A/426A Manual page 1

(i) **General Notes**

These apply, apart from the reference to the cabinet.

(ii) **Operating Voltage**

The unit is operated from the 110 V. tapping on the mains transformer primary.

(iii) **Cabinet Dimensions**

This does not apply, see above.

424A/426A Manual page 2
Circuit and Fig. 1

No voltage adjustment carousel is provided.

424A/426A

(i) **Removing the Unit from the Case**

Unplug the motor and pick-up leads. The unit is held to the cabinet by three bolts.

SPARE PARTS LIST—TYPE 522A

CABINET ASSEMBLY

Cabinet with fittings (Wood)	MK.975.26
Philips emblem	A3.357.11
Securing pins for above	A3.314.02
Hinges for cabinet	HY.096.35
Felt feet for cabinet	A1.806.64

CONTROL KNOBS—Volume, Tuning and Tone

MK.261.42/BRGP1

Control knob—Waveband	MK.854.22/BRGP1
Control levers—Gram and Base response switch	MK.956.01
Felt rings for knobs	A3.562.17
Spring clips for knobs	28.753.01

BACKPLATE only — MK.399.09

Valve position label	PG.001.82
Limited licence plate	PG.003.88

METALLISED BASEPLATE complete — MK.873.91

BAFFLE ASSEMBLY

Baffle board only	MK.399.08
Speaker fabric (385 × 245mm.)	K.300.ZZ/915
Screen plate for pilot lamp	MK.827.17
Support bracket for Gram. Motor board	MK.065.35

SCALE ASSEMBLY

Station scale (plastic)	MK.704.07
Spring clips for above	MK.750.75
Scale backplate	MK.033.09

POINTER ASSEMBLY — MK.873.89

Felt ring for above	A3.575.87
Clamp plate for cable	A3.517.87
Pointer carrier rod	MK.003.29
Hexagonal nut for rod	MK.926.67

CHASSIS ASSEMBLY

POINTER DRIVE ASSEMBLY

Moulded pulley	23.681.81
Fixing bush for pulley	07.068.23
Drive cable only	33.403.04
Cable loop grips	MK.116.01
Tension spring	A3.646.14

TUNING UNIT

Gang capacitor with large drum	49.001.42
Circlip for small inner drum	A3.563.36
Brass pulley	A3.322.40
Fixing bush for above	07.068.23
Drive cord only	G6.606.28
Card loop grips	MK.908.99
Cord tension spring	A3.646.26
Outer casing for drive cord	08.010.54/65mm.
Outer casing for drive cord	08.010.54/78mm.
Ferrules for above	A3.303.63
Moulded drum	P4.095.01
Locking ring for above	A1.756.55
Tuning spindle	MK.002.97
Locking ring for above	A1.756.55

WAVEBAND SWITCH ASSEMBLY

Switch section No. 1	A3.201.70
Switch section No. 2	A3.201.69

WAVEBAND SPINDLE ASSEMBLY — A3.662.23

Bearing bush for above	28.265.35
Locking ring for above	A1.756.56
Spring washer for above	07.043.07
Spacing ring for stop plate	A3.208.23
Steel ball 7/32"	89.205.05

PILOT LAMPHOLDER — A3.360.01

TONE CONTROL — 49.470.45

Control spindle	MK.003.02

VOLUME CONTROL AND SWITCH — 49.500.34

Volume control only	MK.810.07
Mains switch	08.529.38
Switch mounting screws	07.800.10
Insulator between switch and control	28.315.23
Control spindle	MK.003.02

SPARE PARTS LIST—TYPE 522A—(Contd.)

RADIO/GRAMOPHONE SWITCH AND BASE RESPONSE SWITCH ...	A3.402.44
Metal operating sleeve—Gram switch ...	A3.674.60
Metal operating sleeve—Base response switch	A3.674.59
Circlips for above	A3.562.12
Tension spring between metal sleeves ...	A3.646.70
COMPONENT RACK FOR MOUNTING RESISTORS, etc. ...	HY.072.71
MAINS CONNECTION FOR RECORD PLAYER	
Two-pin plate	MK.872.86
Contact sockets for record player lead ...	49.313.04
RECORD PLAYER UNIT complete ...	49.279.71
Mounting brackets for above	MK.046.89
Rubber bushes for above	A3.642.01
Distance pieces	49.935.79
Fixing screws (3 × 20mm.)	07.803.20
TURNTABLE ASSEMBLY	49.927.91
Bearing spindle for above	49.935.16
Lock washer for above	G7.045.43
Nut for above	07.075.16
45 R.P.M. adaptor	AG.7001
Holding bush for above	MK.116.95
MOTOR ASSEMBLY complete ...	49.266.24
Fixing screws for above	07.803.20
Distance pieces for above	49.937.79
Rubber bushes	49.936.00
Perspex washers	49.936.01
Mounting springs	49.935.30
Cap discs	49.935.31
Stator coil assembly	49.927.02
Threaded distance pieces for above ...	49.920.92
Rotor assembly	49.924.78
Bearing assembly—top	49.927.04
Bearing assembly—bottom	49.927.05
Steel ball $\frac{1}{8}$"	89.205.02
Stepped spindle	49.938.79
Grub screw for above	49.937.15
SPEED SELECTOR	
Operating lever with spindle	HY.110.15
Knob for lever	P4.525.13/Cream
Locating pins for spindle	07.593.37
Locking spring for above	49.938.02
Rivets for above (2 × 5mm.)	07.136.12
Selector plate	49.938.03
Stop plate for above	49.938.55
Pressure spring	49.938.07
Circlip for above	MK.448.23
Circlip bottom of spindle	07.891.83
Drive wheel	49.928.79
Circlip for above	07.891.83
Presspahn washers for drive wheel ...	49.938.15
Tension spring	49.938.54
Bracket for above	49.921.17
MOULDED COVER PLATE	49.928.80
Fixing screws for above (3 × 25mm.) ...	07.687.22
Philips emblem	23.654.14
PICK-UP ARM ASSEMBLY	49.945.35
Spring for swivel	49.938.12
Pick-up shaft	49.938.10
Grub screw for above	07.852.05
Circlip for base of spindle	49.939.26
Washer for above	07.014.52
Lead	49.948.80
Pick-up Head complete	AG.3010
SWITCH UNIT	A3.186.59
Frame assembly	HY.088.21
Switch contact (moving)	HY.072.68
Switch contact (fixed)	HY.072.69
Paxolin retaining plate for above	A3.661.53
Insulated spacer for above	A3.661.72
Moulded stop pin	A3.661.61
Contact plunger assembly	23.951.33
Release plate for above	A3.661.59
Operating swivel	A3.661.56
Set screw for above	49.936.06
Spring	A3.661.57
Pin for above	A3.661.58
Moulded operating lever for switch unit ...	23.690.85
PICK-UP FILTER UNIT	
Terminal plate	MK.874.76
Two-pin plate	MK.873.92
Lead	K3.985.24
Fixing Clip for above	25.038.30
MISCELLANEOUS	
Voltage adjustment plate only	A3.228.39
Voltage adjustment disc	A3.228.43
Compression spring for above	28.730.15
Retaining bush for spring	07.068.00
Washer behind spring	07.030.37
Cover plate for adjustment disc	A3.428.72
Socket plate—Aerial/Earth	A3.381.10
Socket plate—Extension Speaker ...	A1.340.42
Socket plate—pick-up	A1.340.92
Two-pin plug plate for above	MK.873.92

SPARE PARTS LIST—TYPE 522A—(Contd.)

Single pin plugs—red	MK.870.23
Single pin plugs—black	08.281.72
Speaker holding clamps	MK.046.86
Valveholders	49.232.02
Coil fixing clips	28.084.83
Coil fixing springs	A3.652.58
Mains lead only	K3.975.00
Fixing clip for above	A3.469.42
Chassis fixing bolts (4 × 25mm.) ...	07.804.25
Rubber bushes for chassis	A3.642.15
Distance pieces for above	MK.116.88
Plate washers for above	MK.446.63
Spring washers for above	07.041.40

GENERAL (Screws, Nuts, etc.)

CHEESEHEAD SCREWS

2.6 × 4mm.	07.802.04	3 × 18mm. ...	07.803.18
3 × 5mm.	07.803.05	3 × 20mm. ...	07.803.20
3 × 6mm.	07.803.06	3 × 30mm. ...	07.803.30
3 × 8mm.	07.803.08	3 × 35mm. ...	07.803.35
3 × 10mm.	07.803.10	4 × 6mm. ...	07.804.06
3 × 12mm.	07.803.12	4 × 10mm. ...	07.804.10
3 × 15mm.	07.803.15	4 × 25mm. ...	07.804.25

WASHERS

3mm.	07.035.30	4mm. ...	07.014.40

NUTS

3mm.	07.104.30	4mm. ...	07.104.40
4 BA	G7.098.44		

VALVES AND PILOT LAMP

V1	Valve	ECH42
V2	Valve	EAF42
V3	Valve	EBC41
V4	Valve	EL41
V5	Valve	EZ40
V6	Valve	EM34
L1	Pilot lamp (6.5 V. 0.3 amp)	00.080.28D-00

TRANSFORMERS AND COILS

S1/2 & S4	Mains transformer ...		MK.513.56
S5-8	Aerial coils SW & MW	Bracket Fixing	MK.564.26
S10-14	Oscillator coil		MK.564.25
S9/S26	L.W. Aerial & I.F. Filter		MK.564.27
S5-8	Aerial coils SW & MW	Spring Fixing	MK.564.98
S10-14	Oscillator coil		MK.564.97
S9/S26	L.W. Aerial & I.F. Filter		MK.564.99
S15-18	1st I.F. Coil		MK.564.56
S19-22	2nd I.F. Coil		MK.564.56
S23/S24 & S27	Speaker Transformer ...		A3.152.18
S25	Loudspeaker		MK.860.94

CORES for S6, S12, S14	23.643.06
Core for S8	A3.367.33
Cores for S9/S26	A3.367.32
Cores for I.F. coils	23.644.67

WAX for air capacity trimmers ...	GBX.008.13/01
Wax for I.F. Coils	GBX.009.47

SPARE PARTS LIST—TYPE 522A—(Contd.)

CAPACITORS

			Working Voltage	Permitted Tolerance	
C1/2	Electrolytic	50 + 50 uF	350V		MK.182.35/50 + 50
C4	Ceramic	39 pF		10%	48.406.10/39E
C5/6	Gang	11-500 pF			49.001.42
C7	Ceramic	270 pF		5%	48.406.05/270E
C8	Paper	1,800 pF	400V	10%	48.751.10/1K8
C9	Trimmer	3-30 pF			28.212.36
C10	Ceramic	72 pF		2%	48.406.02/72E
C11	Ceramic	220 pF		20%	48.406.10/220E
C12	Ceramic	470 pF		10%	48.406.10/470E
C13	Ceramic	56 pF		10%	48.406.10/56E
C14	Ceramic	68 pF		2%	48.406.02/68E
C15	Trimmer	3-30 pF			28.212.36
C16	Trimmer	3-30 pF			28.212.36
C17	Ceramic	370 pF		1%	48.406.01/370E
C18	Ceramic	47 pF		2%	48.406.02/47E
C19	Ceramic	415 pF		1%	48.406.01/415E
C20	Paper	1,800 pF	400V	20%	48.751.10/1K8
C21		115 pF			In 1st I.F. Coil
C22		115 pF			In 1st I.F. Coil
C23	Paper	47,000 pF	125V	20%	48.750.10/47K
C24	Paper	0.1 uF	400V	20%	48.751.10/100K
C25		115 pF			In 2nd I.F. Coil
C26		115 pF			In 2nd I.F. Coil
C27	Ceramic	82 pF		10%	48.406.10/82E
C28	Paper	12,000 pF	125V	10%	48.750.10/12K
C29	Paper	68,000 pF	125V	20%	48.750.10/68K
C30	Paper	8,200 pF	125V	20%	48.750.10/8K2
C31	Paper	2,700 pF	400V	20%	48.751.10/2K7
C32	Paper	10,000 pF	400V	20%	48.751.10/10K
C33	Paper	4,700 pF	1,000V	20%	48.758.20/4K7
C34	Paper	0.1 uF	400V	20%	48.751.10/100K
C60	Paper	680 pF	400V	20%	48.751.10/680E
C61	Paper	47,000 pF	125V	20%	48.750.10/47K
C71	Paper	6,800 pF	400V	20%	48.751.10/6K8
C72	Paper	6,800 pF	400V	20%	48.751.10/6K8

SPARE PARTS LIST—(Contd.)

RESISTORS

N.B.—Wattage is based upon an ambient temperature of 70° C.

			Wattage	Permitted Tolerance	
R1	... ...	1,200 Ohm ...	1 watt	10%	48.427.10/1K2
R2	... ...	12,000 Ohm ...	½ watt	20%	48.426.10/12K
R3	... ...	8,200 Ohm ...	½ watt	10%	48.426.10/8K2
R4	... ...	0.82M Ohm ...	½ watt	10%	48.426.10/820K
R5	... ...	33,000 Ohm ...	½ watt	10%	48.426.10/33K
R6	... ...	33,000 Ohm ...	1 watt	10%	48.427.10/33K
R7	... ...	1.5M Ohm ...	½ watt	10%	48.426.10/1M5
R8	... ...	56,000 Ohm ...	1 watt	10%	48.427.10/56K
R9	... ...	47,000 Ohm ...	½ watt	10%	48.426.10/47K
R10	... ...	1.0M Ohm ...	½ watt	10%	48.426.10/1M
R11	... ...	12,000 Ohm ...	½ watt	10%	48.426.10/12K
R12/13	Potentiometer	0.05 + 0.45M Ohm ...	Log Law		49.500.34
R14	... ...	1,800 Ohm ...	½ watt	10%	48.426.10/1K8
R15	High Stability	0.12M Ohm ...	½ watt	5%	GH.552.05/120K
R16	Potentiometer	50,000 Ohm ...	Linear Law		49.470.45
R18	... ...	0.1M Ohm ...	½ watt	10%	48.426.10/100K
R19	... ...	0.68M Ohm ...	½ watt	10%	48.426.10/680K
R20	... ...	1,000 Ohm ...	½ watt	20%	48.426.10/1K
R21	... ...	180 Ohm ...	½ watt	10%	48.426.10/180E
R22	High Stability	12,000 Ohm ...	¼ watt	5%	GH.550.05/12K
R32	... ...	4,700 Ohm ...	½ watt	10%	48.426.10/4K7
R42	High Stability	27,000 Ohm ...	¼ watt	5%	GH.550.05/27K
R43	... ...	5.6M Ohm ...	½ watt	10%	48.426.10/5M6
R51	... ...	0.47M Ohm ...	½ watt	10%	48.426.10/470K
R52	... ...	0.47M Ohm ...	½ watt	10%	48.426.10/470K

Servicing Information

FOR

PHILIPS RADIOGRAM

TYPE 532A

This radiogram is similar to the radiogram type 522A. There are certain cabinet differences which are outlined in the spares list below, but apart from this the Service Manual for the 522A applies.

SPARE PARTS LIST—TYPE 532A

IMPORTANT. When ordering spare parts, the type number of the receiver and the code number of the part, as given in this manual, MUST be quoted to enable the order to be correctly executed. When claiming free replacement under guarantee the defective part should be returned and the type and serial number of the receiver, also the date of sale, should be quoted.

The 532A is identical to the 522A with the exception of the following:—

CABINET ASSEMBLY
Cabinet with fittings (wood) MK.975.86

CONTROL KNOBS—Volume, Tuning and Tone MK.261.42/Br.1
Control knob—Waveband ... MK.854.22/Br.1
Control lever—Gram. and base response switches MK.956.17
Spring clips for knobs MK.750.84

BACKPLATE MK.874.80
Limited licence label PG.005.19

BAFFLE ASSEMBLY
Baffle board only MK.399.34
Speaker silk (395 × 245mm.) K.300.ZZ/920
Screws for speaker MK.888.20
Speaker holding clamps MK.036.04

SCALE ASSEMBLY
Station scale (plastic) MK.704.33
Scale backplate MK.033.39

RECORD PLAYER UNIT complete ... MK.875.45
Rubber bushes MK.725.67
Distance pieces MK.117.06

TURNTABLE ASSEMBLY MK.890.29

MISCELLANEOUS
Socket plate—Aerial/Earth MK.874.45
Socket plate—Extension speaker ... MK.874.45
Plate washers for chassis bolts 07.025.02

Delete
Single-pin plug—red MK.870.23
Speaker holding clamps MK.046.86

GENERAL (Screws, Nuts, etc.)
CHEESEHEAD SCREWS

Add
4 × 20mm. 07.804.20

TRANSFORMERS AND COILS

Delete
S5-8 Aerial Coil M.W. & S.W. } Bracket Fixing { MK.564.26
S10-14 Oscillator coil } { MK.564.25
S9/S26 L.W. Aerial & I.F. Filter } { MK.564.27