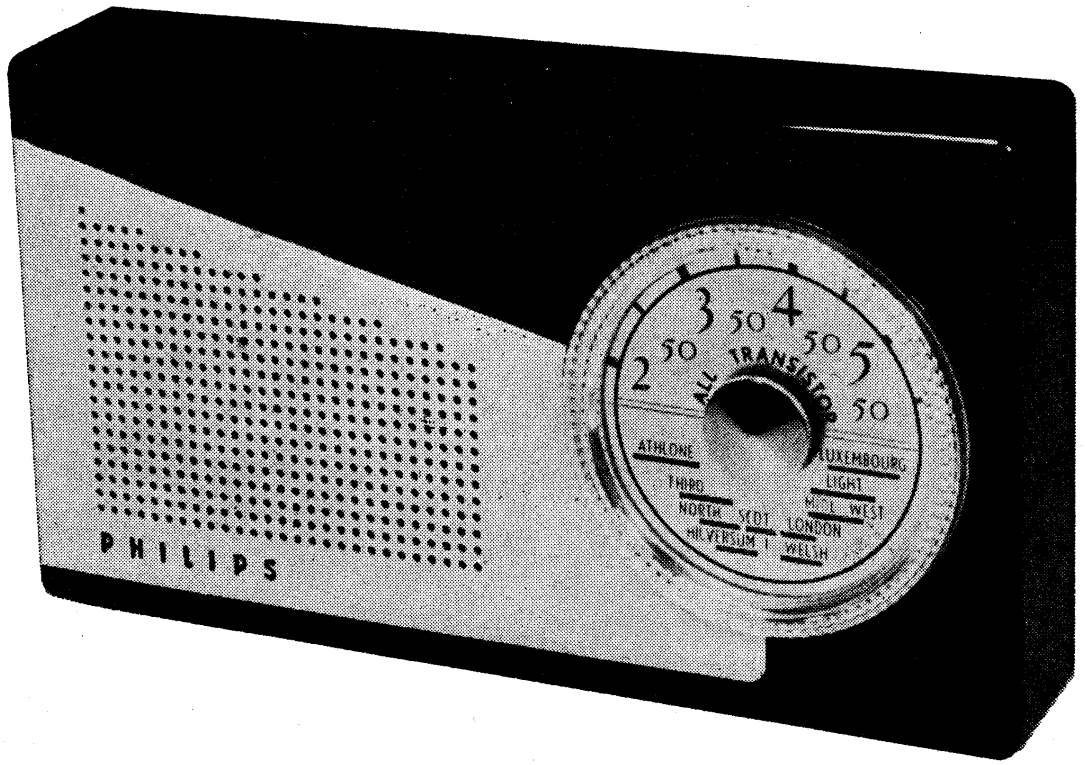
SERVICE MANUAL

PHILIPS

"PERSONIC"



Radio Receiver Type L1G75T

SERVICE DEPARTMENT
WADDON FACTORY ESTATE
CROYDON . SURREY

Telephone . . . CROydon 7722
Grams . Philiserve Croydon

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SERVICE MANUAL FOR THE

PHILIPS RADIO RECEIVER
TYPE L1G75T

INTRODUCTION

The L1G75T is a transistor operated pocket portable receiver. All components, together with batteries and loudspeaker are mounted on a paxolin plate (conventionally wired) and sockets for the connection of high impedance headphones are included.

Tr.1	OC44	Frequency Changer.
Tr.2	OC45	1st I.F. Amplifier.
Tr.3	OC45	2nd I.F. Amplifier.
Tr.4	OC71	1st A.F. Amplifier.
Tr.5	OC71	2nd A.F. Amplifier.
Tr.6 } Tr.7 }	OC72	(Matched pair) Output.
X1	OA95	Detector.

SUPPLY VOLTAGE

6 V.

CONSUMPTION

6—9 mA. (No signal.)

BATTERIES

Four 1.5 V. batteries of any of the following types are required:—

Ever Ready D14	Vidor V0030
Ever Ready U12	Vidor V0028

WAVEBAND RANGE

Medium Wave 185—580 metres.

TRIMMING FREQUENCIES

I.F. 470 Kc/s.
R.F. 512 Kc/s, 1,630 Kc/s, 600 Kc/s, 1,500 Kc/s.

HEADPHONE

Type AS 9110.

CABINET DIMENSIONS

Height 3½". Width 6¼". Depth 1⅜".

REMOVING THE CASE

Remove the rear panel (coin slotted screws).
Remove the knurled screw in the centre of the scale, the tuning knob, spring washer, felt washer and scale.
Remove the three countersunk fixing screws under the scale and slide the receiver out of the case.

PRECAUTIONARY NOTES

Information concerning the use of transistors has been published in various technical journals and books. For engineers who are not yet familiar with the technique involved, the following notes may be of assistance. It will be evident that certain methods of fault-finding, measurements, etc., hitherto regarded as "normal" can cause damage to equipment using transistors.

1. Transistors are temperature conscious. The current which flows between base and collector (with emitter disconnected) is approximately doubled for every 7° C. temperature rise. This current is multiplied by the amplification factor when the emitter is grounded. There is a maximum working temperature above which the current will increase until the transistor is destroyed.
   Apart from working conditions, heat alone is detrimental and they should not be subjected to temperatures above 60° C. in storage, etc.
2. A temperature rise of about 1° C. is produced by a dissipation of about 2.5 mW. in a transistor. For this reason the output transistors are equipped with cooling fins which must always be fitted when the receiver is operative.

3. The output transistors (Tr.6, Tr.7) are supplied as a matched pair. If either one or both transistors require replacement a replacement pair must be used.

4. When a resistance meter is being used for fault-finding, care must be taken to ensure that the voltage applied from the meter battery does not exceed the normal circuit potential at the point being measured. Due to current flow through the transistors caused by the meter battery, false readings will be observed, when making resistance checks on some parts of the circuit. In these instances it will be necessary to disconnect the component under test.

5. Voltage surges can cause damage. Although low voltages are involved, it is essential to switch the apparatus off before replacing transistors and components. Soldering to the transistor leads must be done rapidly with the aid of a heat shunt (i.e., grip the leads with a pair of pliers).

6. Transistors are photo-electric. Glass cased units are painted black. This paint must not be scratched or chipped. Whilst exposure to light does no harm, it will modulate the transistor current (e.g., such a transistor operating under a fluorescent light will produce hum).

7. Transistors are adversely affected by humidity. The glass cased units are fragile, and a crack may not be conspicuous. Ingress of moisture will cause the unit to deteriorate at a rate depending on the size of the flaw. Care must, therefore, be exercised in handling and storage.

TRIMMING INSTRUCTIONS

General

(a) Sound output should be observed by disconnecting the loudspeaker and connecting an output meter, in parallel with a 5 Ω load resistor across the loudspeaker leads. An output level of 50 mW. should be used when trimming.

(b) If a suitable trimming tool is not available for trimming the cores of the I.F. and oscillator coils, one can easily be made by cutting a slot in the end of an insulated No. 10 knitting needle.

I.F. Trimming

Turn the volume control to maximum and the tuning gang to minimum.

Apply a modulated signal of 470 Kc/s to the base of Tr.1 via a 470 KpF capacitor.

Trim the following cores for maximum output:—

S8, S6, S4.

R.F. Trimming

When trimming the R.F. section of the receiver the applied signal is loosely coupled to the internal " Ferroceptor " aerial. This can be conveniently done by winding two or three turns of wire round the " Ferroceptor " rod and connecting the generator output lead to one end of the wire.

(a) **Oscillator Trimming**

Turn the volume control and turning gang to maximum.

Adjust the generator frequency to 512 Kc/s and trim S2 for maximum output.

Turn the gang to minimum, adjust the generator frequency to 1,630 Kc/s and trim C23 for maximum output.

Repeat as necessary.

(b) **Aerial Trimming**

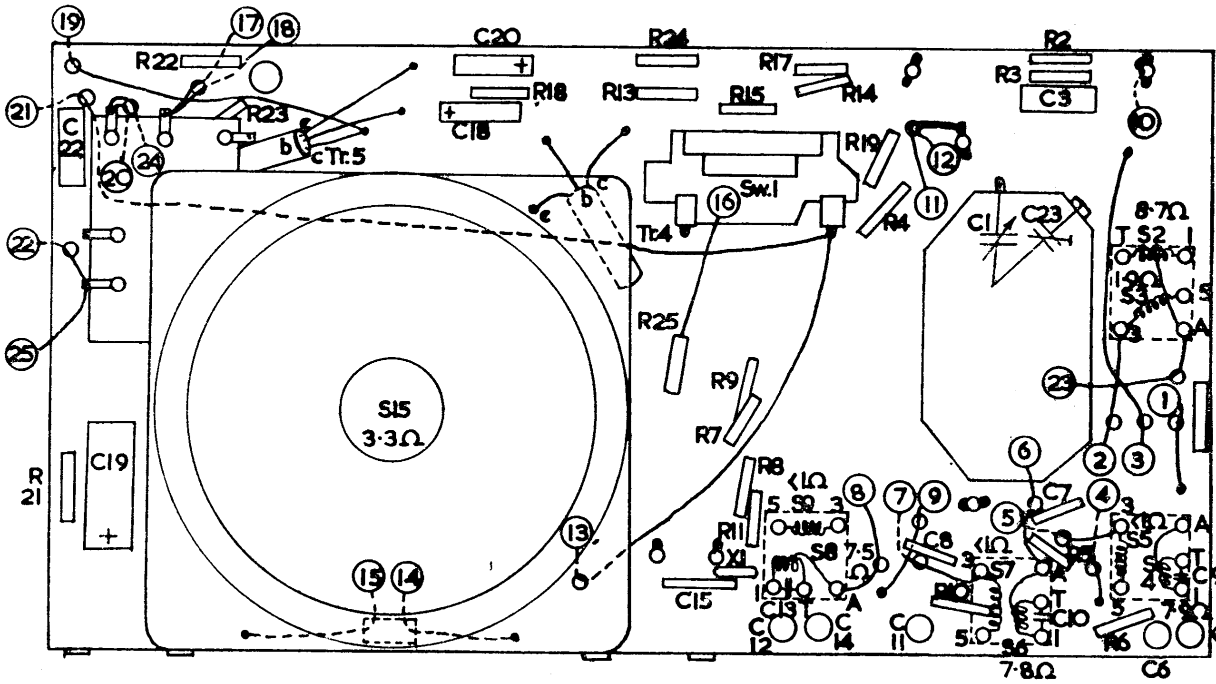
Set the generator to 600 Kc/s.

By rotating the gang, tune the receiver to this frequency, and adjust S1/S1a for maximum output.

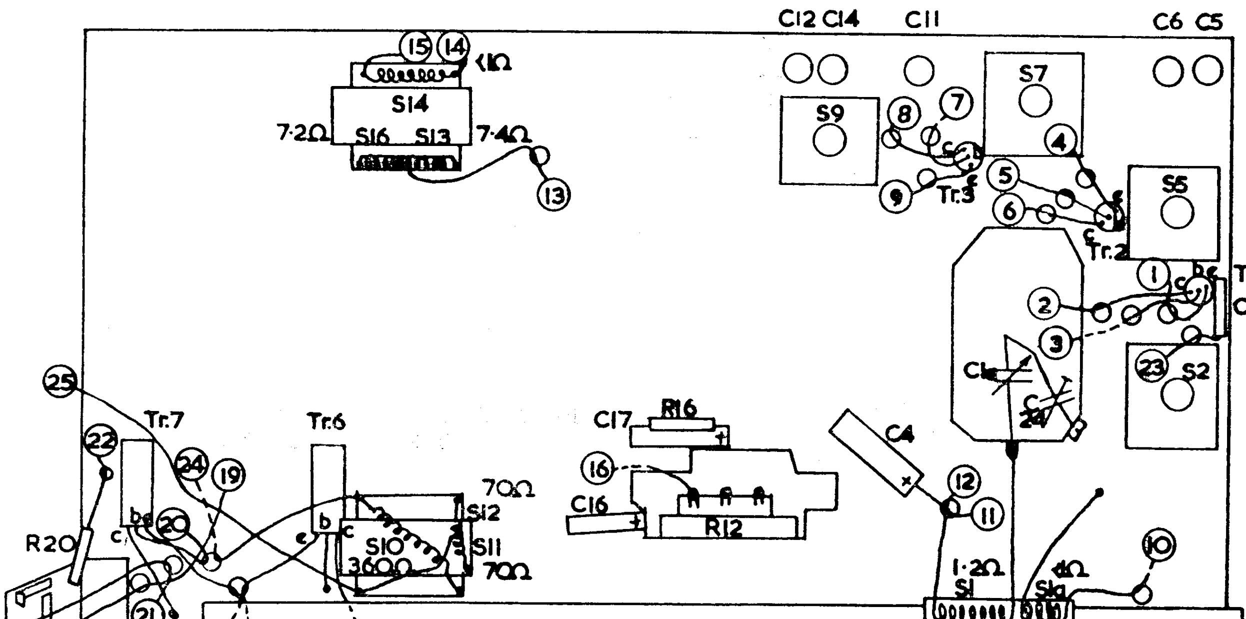
Set the generator to 1,500 Kc/s.

By rotating the gang, tune the receiver to this frequency and trim C24 for maximum output.
Repeat as necessary.

S	15. 8.9. 7.6. 5.4.2.3.
C	22.19. 20. 18. 15. 13.12. 14. 11.8. 10.7. 1.3.23. 6.9.5.
R	21. 22.23. 18. 25.24.19. 15.9.7.8.11.17.14. 19.4. 10. 5.2.3. 6. 1.



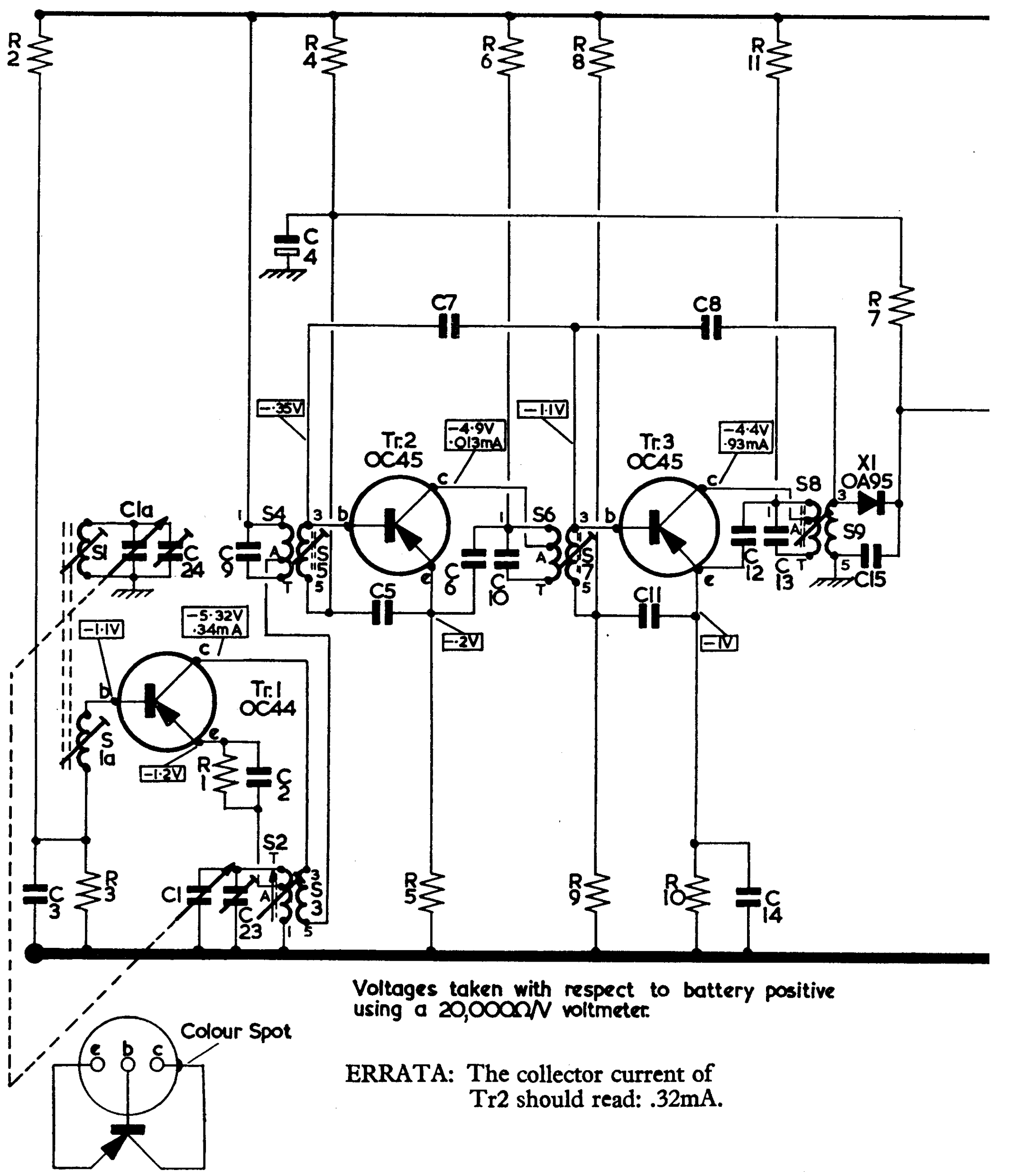
S	16.14.13.10.11.12. 9. 1. 7. 1a. 5.2.
C	16.17. 12. 14. 4. 11. 1a. 24. 6. 5.2.
R	20. 16. 12.



CAPACITORS

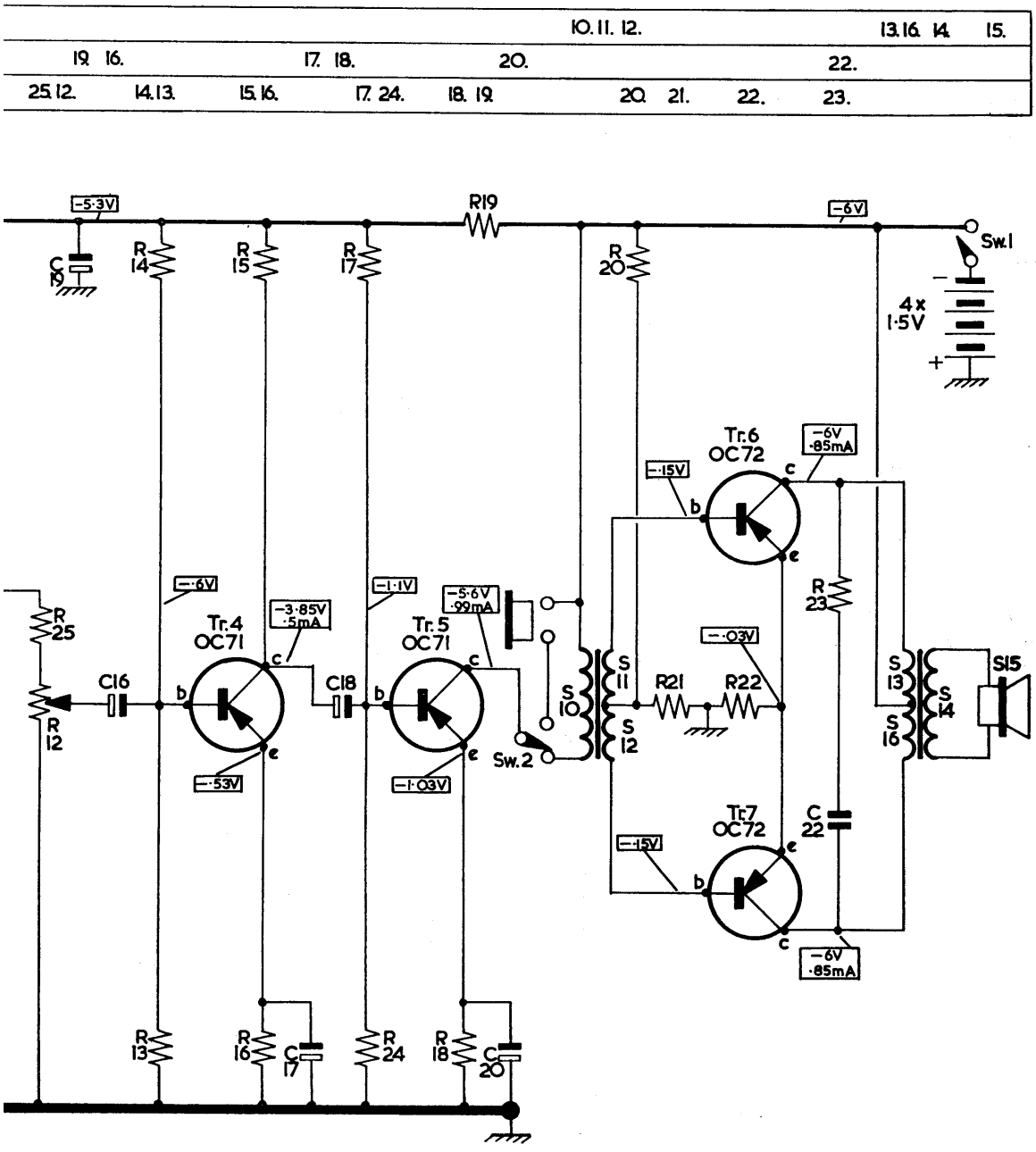
C1-1A	
C2	3,300 pF
C3	47,000 pF
C4	25 uF
C5	47,000 pF
C6	47,000 pF
C7	54 pF
C8	18 pF
C9	91 pF
C10	91 pF
C11	47,000 pF
C12	47,000 pF
C13	91 pF
C14	47,000 pF
C15	4,700 pF
C16	8 uF
C17	8 uF
C18	8 uF
C19	80 uF
C20	8 uF
C22	47,000 pF
C23	
C24	

S	1. 1a. 4.3.2.5. 6. 7 8. 9.
C	3. 1a. 24. 1. 23. 9. 2. 4. 5. 7. 6. 10. 11. 8. 12.14. 13. 15.
R	2. 3. 1. 4. 5. 6. 8. 9. 10. 11. 7



Voltages taken with respect to battery positive using a 20,000Ω/V voltmeter.

ERRATA: The collector current of Tr2 should read: .32mA.



RESISTORS

R1	3,300 Ohm
R2	12,000 Ohm
R3	3,300 Ohm
R4	0.18M Ohm
R5	560 Ohm
R6	1,000 Ohm
R7	15,000 Ohm
R8	15,000 Ohm
R9	4,700 Ohm
R10	1,000 Ohm
R11	1,000 Ohm
R12	10,000 Ohm
R13	3,300 Ohm
R14	22,000 Ohm
R15	2,700 Ohm
R16	1,000 Ohm
R17	12,000 Ohm
R18	1,000 Ohm
R19	220 Ohm
R20	3,600 Ohm
R21	100 Ohm
R22	10 Ohm
R23	270 Ohm
R24	3,300 Ohm
R25	680 Ohm

CIRCUIT DIAGRAM

SPARE PARTS LIST—TYPE L1G75T

CASE ASSEMBLY

Front moulding complete—Black	A3.779.64
Front moulding complete—Blue	A3.781.85
Sponge pad for speaker	P7.060.10/319
Rear cover plate—Black	P5.190.04/350HA
Rear cover plate—Blue	P5.190.04/350HC

TUNING KNOB ASSEMBLY A3.772.61

STATION SCALE A3.955.34

CHASSIS ASSEMBLY

VOLUME CONTROL KNOB	A3.772.57
Fixing screw	B.054.ED/1.7×3

MISCELLANEOUS

Rod for aerial coils	56.682.32/4B
Aerial retaining clip (2)	A3.711.42
Rubber grommet for aerial (2) ...	P7.060.08/514
Screw (2 mm.) for battery contact and socket plate replacement ...	B.054.ED/2×5
Nut for above	993/M2

*HEADPHONE ... ... AS 9110

TRANSISTORS

Tr.1	... ...	OC44
Tr.2	... ...	OC45
Tr.3	... ...	OC45
Tr.4	... ...	OC71
Tr.5	... ...	OC71
Tr.6/7	Matched pair	A9.868.25

GERMANIUM DIODE

X1	... ...	OA95

TRANSFORMERS AND COILS

S1–1A	Aerial coils	A3.803.62
S2–3	Oscillator coil	A3.128.65
S4–5	1st I.F. coil	A3.128.66
S6–7	2nd I.F. coil	A3.128.66
S8–9	Detector	A3.128.67
S10–12	Driver transformer	A3.162.03
S13–14/16	Output transformer	A3.153.90
S15	Loudspeaker	AD.2200Z

*Orders for this item must be placed with our E.L.A. Department.

CAPACITORS

			Working Voltage	Permitted Tolerance %	
C1–1A	Gang	...			49.002.22
C2	Ceramic	3,300 pF ...		−20 +50	C.301.AA/H3K3
C3	Polyester	47,000 pF ...	125	10	B1.658.73
C4	Electrolytic	25 uF ...	6		AC.5711/25
C5	Polyester	47,000 pF ...	125	10	B1.658.73
C6	Polyester	47,000 pF ...	125	10	B1.658.73
C7	Ceramic	54 pF ...		±2	C.302.AC/C54E
C8	Ceramic	18 pF ...		±1	C.302.AB/M18E
C9	... ...	91 pF ...			In 1st I.F. coil
C10	... ...	91 pF ...			In 2nd I.F. coil
C11	Polyester	47,000 pF ...	125	10	B1.658.73
C12	Polyester	47,000 pF ...	125	10	B1.658.73
C13	... ...	91 pF ...			In Detector coil
C14	Polyester	47,000 pF ...	125	10	B1.658.73
C15	Ceramic	4,700 pF ...		−20 +50	C.301.AA/H4K7
C16	Electrolytic	8 uF ...	6		AC.5711/8
C17	Electrolytic	8 uF ...	6		AC.5711/8
C18	Electrolytic	8 uF ...	6		AC.5711/8
C19	Electrolytic	80 uF ...	6		AC.5711/80
C20	Electrolytic	8 uF ...	6		AC.5711/8
C22	Polyester	47,000 pF ...	125	10	B1.658.73
C23					In Gang Capacitor
C24					

SPARE PARTS LIST—TYPE L1G75T—(Contd.)

RESISTORS

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

		Ohms	Wattage	Permitted Tolerance %	
R1		3,300	¼	5	48.426.05/3K3
R2		12,000	¼	5	48.426.10/12K
R3		3,300	¼	5	48.426.10/3K3
R4		0.18M	¼	10	48.426.10/180K
R5		560	¼	5	48.426.10/560E
R6		1,000	¼	10	48.426.10/1K
R7		15,000	¼	10	48.426.10/15K
R8		15,000	¼	5	48.426.10/15K
R9		4,700	¼	5	48.426.10/4K7
R10		1,000	¼	5	48.426.10/1K
R11		1,000	¼	10	48.426.10/1K
R12	Potentiometer	10,000	Log Law		B1.514.06
R13		3,300	¼	10	48.426.10/3K3
R14		22,000	¼	10	48.426.10/22K
R15		2,700	¼	10	48.426.10/2K7
R16		1,000	¼	5	48.426.10/1K
R17		12,000	¼	10	48.426.10/12K
R18		1,000	¼	5	48.426.10/1K
R19		220	¼	10	48.426.10/220E
R20		3,600	¼	5	B8.305.05B/3K6
R21		100	¼	5	48.426.10/100E
R22		10	¼	5	48.426.10/10E
R23		270	¼	10	48.426.10/270E
R24		3,300	¼	10	48.426.10/3K3
R25		680	¼	10	48.426.10/680E

PHILIPS SERVICE INSTRUMENTS

The following instruments are of interest to Service Engineers engaged in maintaining radio, television, tape-recording and similar equipment:—

GM. 2308 B.F. Oscillator.
GM. 2314 Pulse Generator.
GM. 2315 R.C. Generator.
GM. 2317 Wide Band R.C. Generator.
GM. 2675 Sweep Generator.
GM. 2886 Radio Type Sweep Generator.
GM. 4144 R.C. Measuring Bridge.
GM. 4575 Signal Tracing Probe for GM. 5655.
GM. 4579 E.H.T. Probe for GM. 6009.
GM. 5650 T.V. Service Oscilloscope.
GM. 5654 H.F. Oscilloscope.
GM. 5655 Radio Service Oscilloscope.
GM. 6009 Electronic Test Meter.
GM. 6012 Millivolt Meter.
GM. 6014 H.F. Millivolt Meter.
GM. 7628 Signal Tracer.