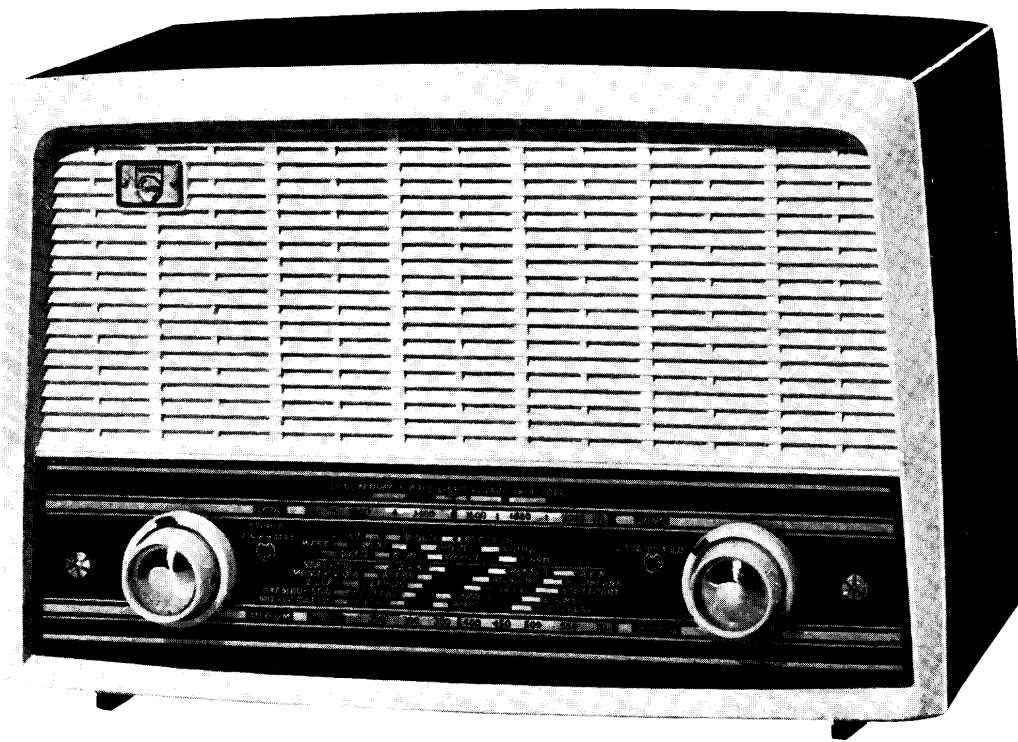


SERVICE MANUAL

PHILIPS RECEIVER TYPE 161U



VALVE COMBINATION

V1	UCH81	Frequency changer.
V2	UF89	I.F. Amplifier.
V3	UBF80	Detector, A.G.C., A.F. amplifier.
V4	UL84	Power Output.
V5	UY85	Mains rectifier.

PILOT LAMP

Type 8097D-00.

WAVE BAND RANGES

M.W.	1622—517 Kc/s.
L.W.	261—150 Kc/s.

TRIMMING FREQUENCIES

I.F.	470 Kc/s.
M.W.	510 Kc/s. 1640 Kc/s.
L.W.	170 Kc/s.

MAINS CONSUMPTION

With 245 V. applied to the 220/250 V. tapping:

Current (approx.)	= 207 mA.
Power (approx.)	= 49 W.

MAINS VOLTAGE

200 to 250 V. d.c. or 50 c/s a.c.

DIMENSIONS OF CABINET

Height 8 $\frac{3}{8}$ ". Width 12". Depth 6 $\frac{3}{4}$ ".

SERVICING NOTES

This receiver utilises the printed circuit technique. The chassis consists of a plastic board, on which is mounted copper foil strips, which form the wiring of the chassis. The chassis is pierced with holes through which pass the tags of the various components. The components are soldered in either by their lead out wires, or by twisted tags.

It is recommended that "60/40" Resin Cored Solder be used for any repairs. On no account must ordinary flux be used as this will lead to oxidation of metal parts, and a lowering of the insulation resistance between the copper foil strips. In addition it will attack the moulded chassis material.

The soldering iron used should be such as to enable joints to be quickly made, without overheating the chassis. A bit diameter of about 6 m.m. is recommended. In addition a small stiff brush (e.g., a stiff tooth brush) will be of assistance in removing melted solder from contact points.

To replace components held by their lugs (valve holders, coils, etc.), heat the lugs, and remove the solder with the brush. Release the lugs one by one by gently prising them inwards using a small screwdriver. When replacing, first ensure that the soldering iron bit and the tags are tinned.

To replace components held by their own wire ends (capacitors, resistors, etc.), cut the wires to the faulty component as close to the body of the component as possible. Fit the replacement component to the wire ends left projecting from the chassis, using solder springs. The solder springs should lie against the chassis plate in order to prevent "loosening" of the printed "wiring."

A break in the printed wiring can be repaired by bridging it with a small piece of wire.

REMOVING THE CHASSIS

Remove knobs (set screws).

Remove back and base plates.

Remove the mains selector panel assembly (3 screws).

Remove the chassis fixing bolts (4).

Gently pull the pointer from the scale diffusion screen, and lift the chassis out.

REPLACING THE VOLUME CONTROL

Remove the chassis.

Release the front girder which supports the mains switch, pilot lamp holder, etc. It is held by four bolts, and in addition, the bolt holding the earth lead (mains switch end) must be removed. The girder may be pulled away from the chassis (about 2") without disturbing the drive cord.

The lugs (6) by which the potentiometer is held are now accessible, and may be unsoldered and released as described above.

REPLACING THE DRIVE CORD

Make up the cord to the dimensions indicated.

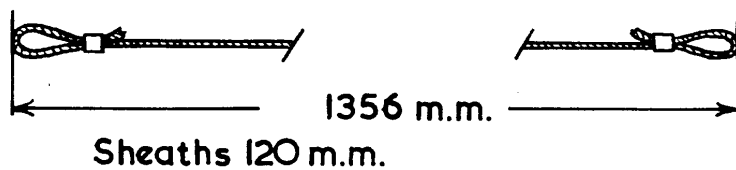
Turn the gang to maximum capacitance.

Hook one end of the cord to the spring, and hook the spring to its anchorage point in the drive drum. Pass the cord clockwise round the larger of the two lugs on the drum, and wind it $1\frac{1}{4}$ turns clockwise round the edge of the drum. (If required, the cord may be temporarily fixed to the drum using wax.) Fit the cable sheath, and wind the cord 2 turns clockwise round the drive spindle, winding toward the chassis. Lead the cord over the support pillar, across to and clockwise round the pulley and back to the drive spindle. Wind on 2 turns clockwise winding towards the chassis. Fit the second cable sheath and pass the cord round the pulley above the capacitor drive drum. Pass the cord $\frac{3}{4}$ -turn clockwise round the drum, over the smaller stud on the drum, and hook it onto the spring.

TRIMMING INSTRUCTIONS

(a) I.F. Circuits

Switch to Medium Wave, set gang capacitor to its mid-position and turn the volume control to maximum.



Cord length = 53.4".
Sheath length = 4.7".

Unscrew the cores of the I.F. transformers a few turns. Apply a modulated signal of 470 Kc/s via a capacitor of 47 pK to g1V1 (or to junction C5/C10). Trim in the following order for maximum output:—

S18, S17, S16 and S15.

(b) Aerial and Oscillator Circuits

Signal to be applied between the aerial and the chassis side of C34.

(i) Oscillator Circuit

Trimmed on medium wave. Short circuit S5.

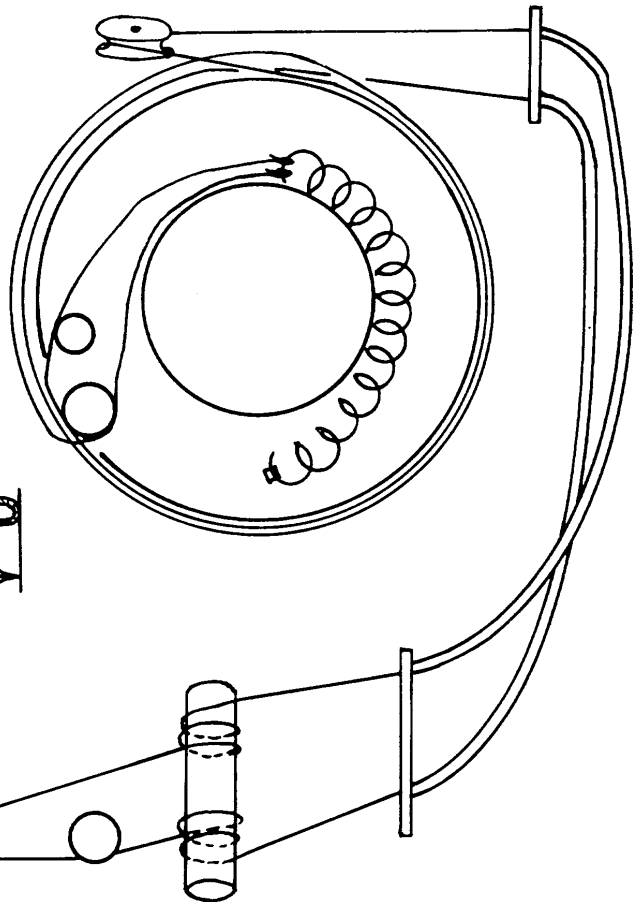
With gang at maximum, apply a signal of 510 Kc/s, and trim S12 for a maximum output. With gang at minimum, apply a signal of 1,640 Kc/s, and trim C17 for maximum output. Repeat as necessary.

(ii) Aerial Circuit

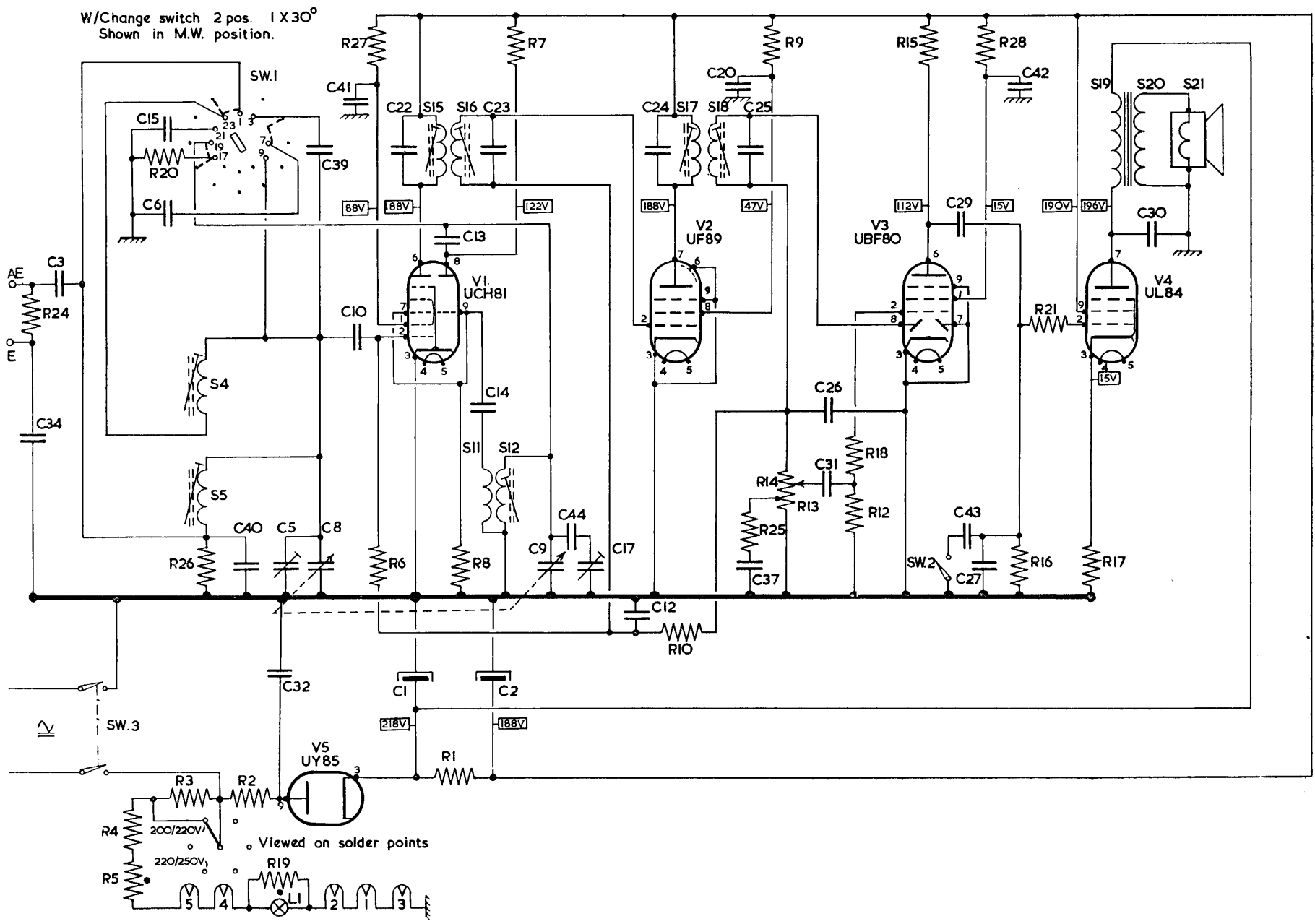
Switch to long wave and short circuit S5. Apply a signal of 170 Kc/s, and tune the receiver for maximum output. Remove the short circuit from S5, and then trim S5 for maximum output.

Switch to Medium Wave. Turn the gang to maximum and apply a signal of 510 Kc/s. Trim S4 for maximum output. Turn the gang to minimum and apply a signal of 1,640 Kc/s. Trim C5 for maximum output.

Repeat as necessary.



S	4. 5.	15. 16. 11. 12.	17. 18.	19. 20. 21.
C	3. 15. 6. 40.	5. 39. 8. 41. 10. 22. 1. 13. 23. 14. 2. 9. 44. 17. 12. 24.	20. 25. 37. 26. 31.	29. 43. 27. 42. 30.
R	24. 4. 5. 20. 3. 26.	2. 19. 27. 6. 8. 1. 7	10. 25. 9. 14. 13. 18. 12. 15.	28. 16. 21. 17.



SPARE PARTS LIST—TYPE 161U

CABINET ASSEMBLY

Moulded Cabinet	MK.977.80
Philips emblem	MK.705.08
Fixing pins for above	A3.314.02
Clips for backplate and Aerial Panel (7) ...	MK.750.69

CONTROL KNOBS—VOLUME
AND TUNING

... ..	MK.854.93/Crm
Felt rings for above	MK.449.03
Control knobs—Tone and Waveband ...	MK.854.92/Crm
Felt rings for above	MK.449.02
Moulded coupling piece for tone switch ...	MK.922.17
Moulded coupling piece for waveband ...	HY.072.94
Grub screws for knobs	A3.324.16

BACKPLATE

... ..	MK.400.40
Fixing screws for above	MK.946.88
Valve position label	PG.009.10

BASEPLATE ASSEMBLY

... ..	MK.876.95
Fixing brackets—backplate/baseplate ...	MK.065.90

STATION SCALE (Plastic)

... ..	MK.705.13
Ornamental screws (2)	A3.713.10
Washers for above	MK.449.17
Diffusion screen	MK.876.72
Phosphor bronze springs for above (2) ...	MK.751.08
Screen securing hooks (4)	A3.310.22

POINTER ASSEMBLY

... ..	MK.877.19
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CHASSIS ASSEMBLY

... ..	MK.977.82
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TUNING UNIT

Gang capacitor	49.001.96
Drive drum	A3.417.42
Inner drum for above	MK.906.26
Cord tension spring	A3.646.57
Moulded pulley	A3.322.40
Fixing pin for above	MK.616.18
Tuning spindle	MK.003.81
Retaining ring for above	07.891.86

POINTER DRIVE ASSEMBLY

Brass pulley	MK.931.12
Distance piece for above	MK.448.70
Fixing pin for above	MK.616.08
Cord guide—small	A3.600.42
Cord guide—large	MK.145.96
Drive cord	K.803.ZZ/900
Cord loop grips	MK.908.99
Outer casing for drive cord	08.010.54/280MM
Moulded ferrules for above	MK.135.52

WAVEBAND ASSEMBLY

Waveband switch section	MK.881.33
Rotor guides (3)	28.082.87
Clip and spoons (8)	MK.950.16
Steel ball $\frac{3}{16}$ "	89.205.79

LAMPHOLDER ASSEMBLY

... ..	A3.359.07
Insulated spacer for above	MK.117.22

TONE SWITCH

... ..	A3.401.79
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MISCELLANEOUS

Voltage adjustment plate	MK.875.51
Voltage adjustment disc	MK.854.64
Socket plate—Aerial/Earth	MK.877.18
Insulated caps for above	MK.251.30
Valveholders—B9A	MK.225.79
Mains lead	K3.975.00
Clamp for mains lead	28.682.21
Chassis support pillars (4)	MK.645.97
Speaker holding brackets (2)	A3.446.20
Chassis fixing screws (4 × 8 mm.) (4) ...	07.804.08

GENERAL (Screws, Washers, etc.)

CHEESEHEAD SCREWS

3 × 5 mm.	07.803.05
3 × 6 mm.	07.803.06
3 × 8 mm.	07.803.08
3 × 12 mm.	07.803.12
3 × 15 mm.	07.803.15
3 × 25 mm.	07.803.25
4 × 6 mm.	07.804.06
4 × 8 mm.	07.804.08
4 × 10 mm.	07.804.10

WASHERS

3 mm.	07.014.30
4 mm.	07.014.40

VALVES AND PILOT LAMP

V1	UCH81
V2	UF89
V3	UBF80
V4	UL84
V5	UY85
L1 Pilot lamp (19 V. 0.097 amp)	00.080.97D-00

TRANSFORMER AND COILS

S4-5 Ferrocube aerial MW/LW	MK.820.16
S11-12 Oscillator coil MW/LW	MK.567.34
S15-16 1st I.F. coil	MK.567.35
S17-18 2nd I.F. coil	MK.567.36
S19-20 Speaker Transformer	MK.514.68
S21 Loudspeaker	MK.860.93

CORES for Coils S12

... ..	MK.955.03
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S15, 16, 17 and 18	A3.738.96
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SPARE PARTS LIST—TYPE 161U—(Contd.)

CAPACITORS

						Working Voltage	Permitted Tolerance	
C1-2	Electrolytic	...	...	...	50 + 50 uF	275V		MK.184.27/50 + 50
C3	Ceramic	...	...	...	1,000 pF		+100%	MK.205.94
C5	Trimmer	...	...	...	3-30 pF			28.212.36
C6	Ceramic	...	...	...	130 pF		1%	48.406.01/130E
C8-9	Gang	...	...	...				49.001.96
C10	Ceramic	...	...	...	100 pF		20%	48.406.10/100E
C12	Ceramic	...	...	...	18,000 pF		-20% +50%	48.207.50/18K
C13	Ceramic	...	...	...	470 pF		20%	48.406.10/470E
C14	Ceramic	...	...	...	56 pF		20%	48.406.10/56E
C15	Ceramic	...	...	...	419 pF		1%	48.406.01/419E
C17	Trimmer	...	...	...	3-30 pF			28.212.36
C20	Ceramic	...	...	...	18,000 pF		-20% +50%	48.207.50/18K
C22		...	...	...				} In 1st I.F. Coil
C23		...	...	...	
C24		...	...	...	
C25					
C26	Ceramic	...	...	...	100 pF		10%	48.406.10/100E
C27	Ceramic	...	...	...	820 pF		-20% +50%	48.206.50/820E
C29	Ceramic	...	...	...	10,000 pF		-20% +50%	48.207.50/10K
C30	Ceramic	...	...	...	10,000 pF		+100%	MK.205.91
C31	High Potential	...	...	...	2,200 pF		20%	MK.205.92
C32	Ceramic	...	...	...	10,000 pF		+100%	MK.205.91
C34	Ceramic	...	...	...	4,700 pF		+100%	MK.205.93
C37	Ceramic	...	...	...	15,000 pF		-20% +50%	48.207.50/15K
C39	Ceramic	...	...	...	3.3 pF		20%	48.406.99/3E3
C40	Suflex	...	...	...	3,000 pF		5%	MK.205.84
C41	Ceramic	...	...	...	18,000 pF		-20% +50%	48.207.50/18K
C42	Ceramic	...	...	...	22,000 pF		-20% +50%	48.207.50/22K
C43	Ceramic	...	...	...	4,700 pF		-20% +50%	48.207.50/4K7
C44	Ceramic	...	...	...	50 pF		20%	MK.205.96

SPARE PARTS LIST—TYPE 161U—(Contd.)

RESISTORS

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

						Wattage	Permitted Tolerance	
R1	...	...	...	...	1,000 Ohm	1 watt	10%	48.427.10/1K
R2	} Wirewound	...	...	...	240 Ohm	6 watts	5%	} MK.791.59
R3					250 Ohm	3 watts	10%	
R4					390 Ohm	6 watts	10%	
R5					Varite	
R6	...	...	...	...	0.68M Ohm	$\frac{1}{2}$ watt	20%	48.426.10/680K
R7	...	...	...	...	15,000 Ohm	1 watt	10%	48.427.10/15K
R8	...	...	...	...	33,000 Ohm	$\frac{1}{2}$ watt	10%	48.426.10/33K
R9	...	...	...	...	0.1M Ohm	$\frac{1}{2}$ watt	10%	48.426.10/100K
R10	...	...	...	...	1.5M Ohm	$\frac{1}{2}$ watt	20%	48.426.10/1M5
R12	...	...	...	...	4.7M Ohm	$\frac{1}{2}$ watt	20%	48.426.10/4M7
R13-14	Volume control	...	0.05 +	0.45M Ohm	...	Log Law		MK.811.14
R15	...	...	...	...	0.22M Ohm	$\frac{1}{2}$ watt	10%	48.426.10/220K
R16	...	...	...	...	0.33M Ohm	$\frac{1}{2}$ watt	10%	48.426.10/330K
R17	...	...	...	...	270 Ohm	1 watt	10%	48.427.10/270E
R18	...	...	...	...	1,000 Ohm	$\frac{1}{2}$ watt	20%	48.426.10/1K
R19	Varite	...	...	...	...	...	...	49.379.67
R20	...	...	...	...	33,000 Ohm	$\frac{1}{2}$ watt	10%	48.426.10/33K
R21	...	...	...	...	1,000 Ohm	$\frac{1}{2}$ watt	20%	48.426.10/1K
R24	...	...	...	...	1.0M Ohm	$\frac{1}{2}$ watt	20%	48.426.10/1M
R25	...	...	...	...	15,000 Ohm	$\frac{1}{2}$ watt	10%	48.426.10/15K
R26	...	...	...	...	33,000 Ohm	$\frac{1}{2}$ watt	10%	48.426.10/33K
R27	...	...	...	...	15,000 Ohm	$\frac{1}{2}$ watt	10%	48.426.10/15K
R28	...	...	...	...	1.0M Ohm	$\frac{1}{2}$ watt	10%	48.426.10/1M