



PHILCO



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Model U.429

TYPE CIRCUIT: Four-valve reflexed Superheterodyne Midget Receiver with permeability tuned coils and Pentode Output (2.5 watts), for Automatic Push-button Tuning operation on Medium and Long Wave stations. A.V.C. is incorporated in the circuit, and provision is made by means of a jack for connecting an external speaker having a high impedance (7,000 ohms), or a speaker having a different impedance may be used in conjunction with a suitable matching transformer. By reason of special design and temperature drift compensation, the receiver has a very high degree of frequency stability.

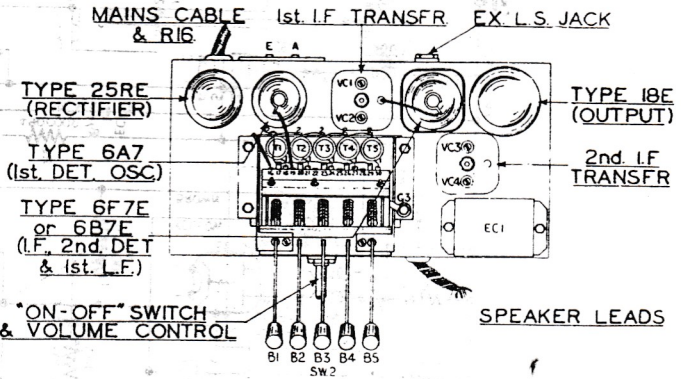
POWER SUPPLY: The circuit is so arranged that connection may be made to either A.C. or D.C. mains from 200-250 volts without discrimination or adjustment, and on A.C. mains the circuit is independent of periodicity between the limits of 40-100 cycles. A type 25RE rectifying valve is employed in the receiver and is used as a half-wave rectifier on A.C., and as a resistance on D.C. The mains voltage dropping resistor for the valve heaters is incorporated in the mains lead and it is a normal function for this lead to become slightly warm in use.

TUNING: Five push-buttons affording three alternative Medium wave programmes and two alternative Long wave programmes, are provided. Above the buttons is an escutcheon carrying the name-tabs of the stations to which the buttons have been adjusted. Before despatch from the Factory, the five buttons are set up with the names of stations most generally received, but a kit of alternative station name-tabs and a special insulated adjuster are provided with the receiver so that the adjustment corresponding to any or all of the buttons may be changed to suit individual requirements.

LOUD SPEAKER: The 5 in. diameter fully energised moving coil speaker used, gives the highest efficiency audio output. This speaker is silenced automatically when an extension speaker is plugged into circuit. If subdued or localised reception is desired, the Rothermal "Hush-a-tone" Unit is recommended; this enables reception to be obtained by one person without being audible to others in the same room. It is not an ordinary headphone.

INTERMEDIATE FREQUENCY: 475 Kc.

POWER CONSUMPTION: 70 watts approx.



TOP CHASSIS DIAGRAM.

TABLE 1 — VOLTAGES.

Valve socket readings to chassis taken with an 065, 077 or J3 Philco Set Tester, using the 250, 10 and 5-volts ranges. Volume control at minimum, no aerial connected and one of the tuning buttons pressed in. A.C. line 220 volts, 50 cycles. NOTE.—Figures in parenthesis are voltages measured on D.C. line 220 volts.

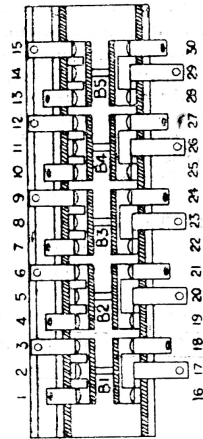
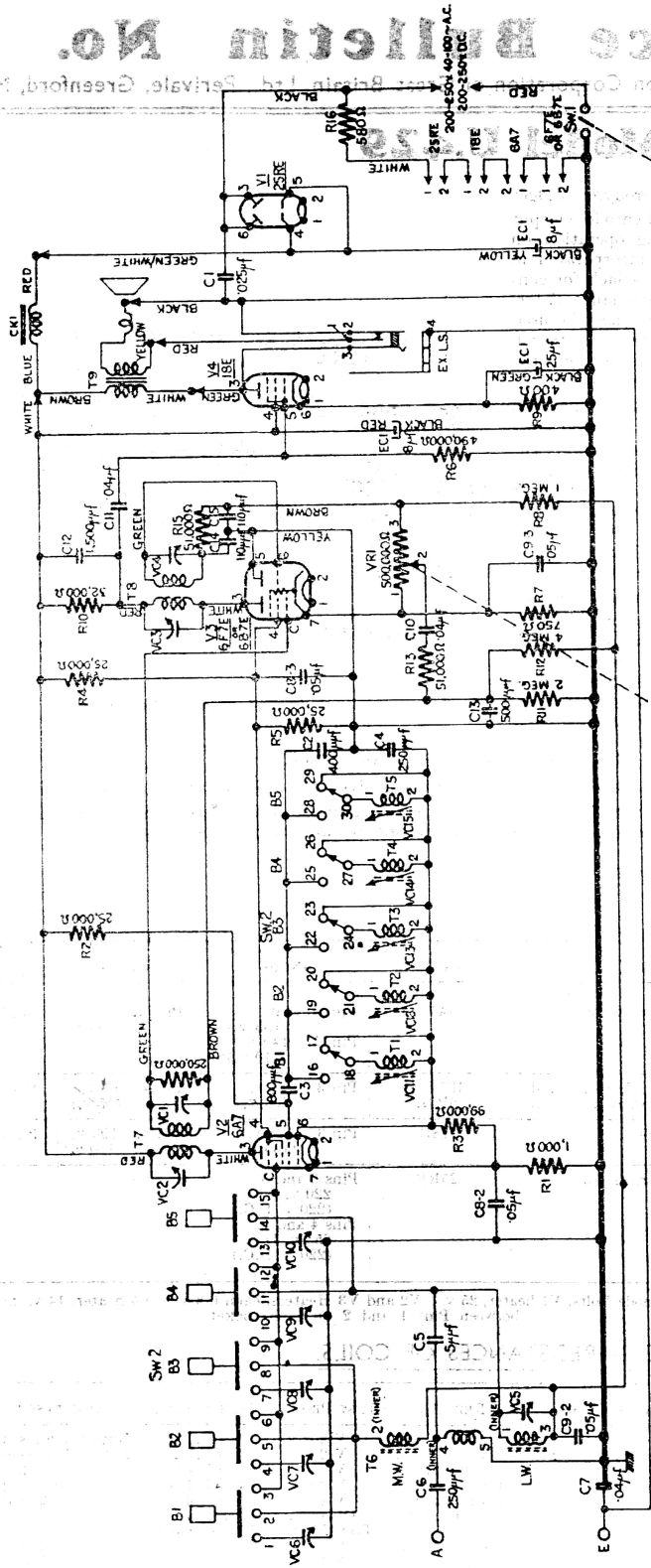
POSITION	VALVE	ANODE	SCREEN	BIAS
1st Detector and Oscillator, S2 ...	6A7	Pin. 3. 190 v. (155 v.) Pin. 5. 140 v.* (110 v.)*	Pin. 4. 65 v. (55 v.)	Pin 7. 4.3 v. (3.6 v.)
I.F. Amplifier, 2nd Detector and 1st L.F. Amplifier, S3 ...	6F7E or 6B7E	Pin 3. 70 v. (60 v.)	Pin 4. 65 v. (55 v.)	Pin 7. 3 v. (2.3 v.)
Pentode Output, S4 ...	18E	Pin 3. 185 v. (155 v.)	Pin 4. 190 v. (160 v.)	Pin 6. 12 v. (9 v.)
Half-wave Rectifier, S1 ...	25RE	Pins 3 and 6. 220 v. A.C. (220 v. D.C.) Pins 4 and 5. 255 v. D.C. (220 v. D.C.)	—	—

* Oscillator Anode Volts. V1 heater, 25 v.; V2 and V3 Heaters, each 6.3 v.; V4 heater, 14 v., measured between Pins 1 and 2 on each socket.

TABLE 2—RESISTANCES OF COILS.

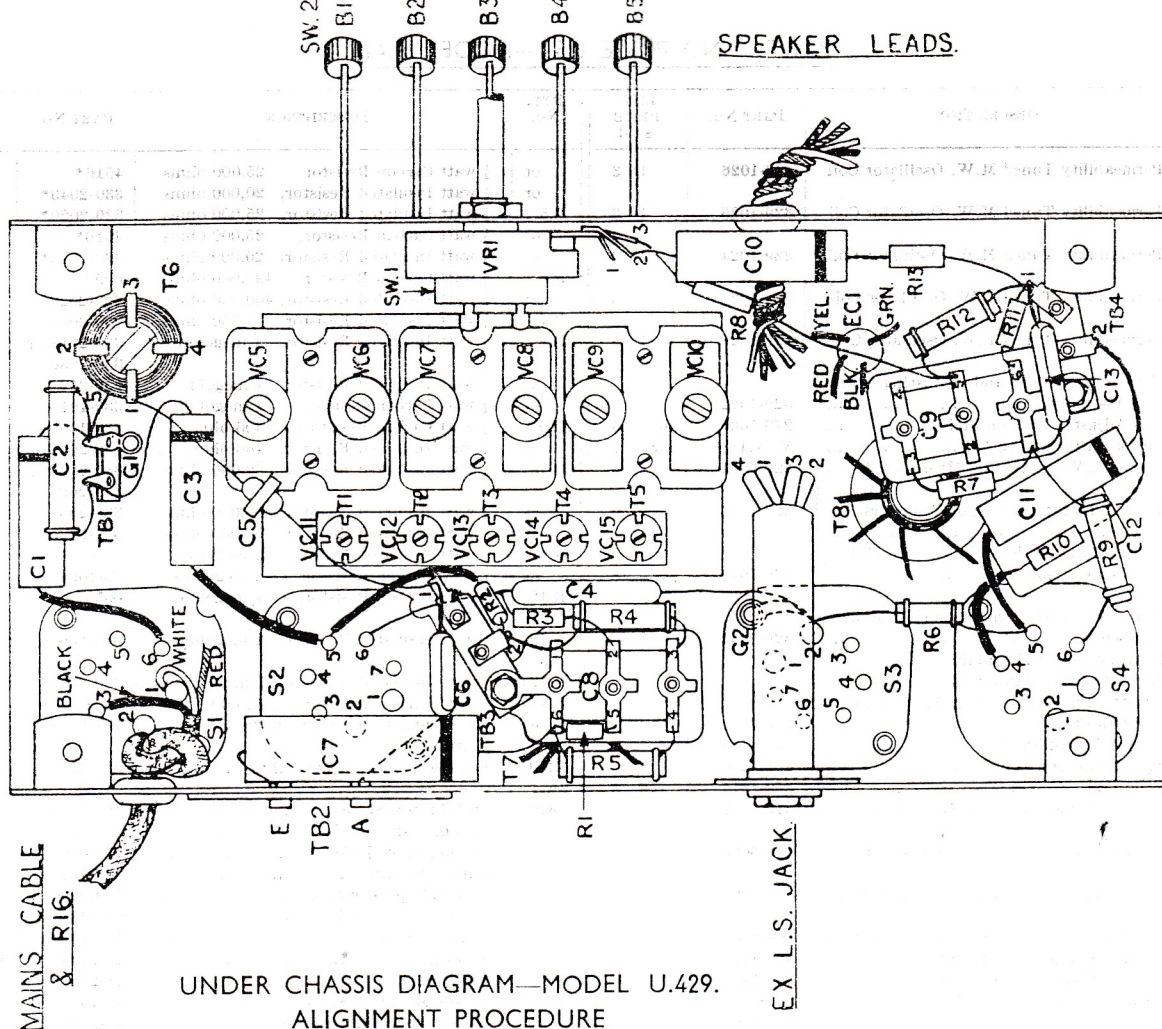
REF. NO.	TEST PROD. 1	TEST PROD. 2	RESISTANCE (OHMS)	REF. NO.	TEST PROD. 1	TEST PROD. 2	RESISTANCE (OHMS)
T.6 Primary	TB.3/1	Chassis	20	T.4 ...	V.2/6	TB.1/1	Button 4 pressed in—10
T.6 ...	V.2 Cap	C.9/2	Button 1, 2 or 3 pressed in—3.5	T.5 ...	V.2/6	TB.1/1	Button 5 pressed in—10
			Button 4 or 5 pressed in—12	T.8 Primary	V.3/3	TB.4/2	12
				T.8 Secondary	V.3/6	VR.1/3	51,000 approx.
T.7 Primary	V.2/3	TB.3/2	8	T.9 Primary	V.4/3	V.4/4	230 approx.
T.7 Secondary	V.3 Cap	TB.4/1	12	Output Transformer	Output Transformer	Output Transformer	0.5†
T.1 ...	V.2/6	TB.1/1	Button 1 pressed in—2.5	Speech Coil ...	Lead 1	Lead 2	2.5†
T.2 ...	V.2/6	TB.1/1	Button 2 pressed in—3.5	C.K.1... ..	V.4/4	V.1/4	1,500
T.3 ...	V.2/6	TB.1/1	Button 3 pressed in—4.5				

† Resistance of T.9 Secondary alone and Speech Coil alone (taken when disconnected). NOTE: Reference numbers for valves should be read in conjunction with the socket numbers, e.g., V.1—S.1.



UNDERSIDE VIEW OF SW.2. VIEWED FROM FRONT OF CHASSIS.
NOTE - FIXING NUT OF PHOSPHOR BRONZE SPRING BLADE IS ON FACE OF SW.2 WHEN MOUNTED & VIEWED FROM FRONT OF CHASSIS.

SCHEMATIC DIAGRAM - MODEL U.429.



UNDER CHASSIS DIAGRAM—MODEL U.429.
ALIGNMENT PROCEDURE

Before leaving the Factory, all Philco Receivers are accurately aligned, but if misalignment is suspected through damage, no alteration must be made without instruction in the correct adjustment of the trimming and padding condensers. It should be carried out only with the aid of an accurately calibrated Signal Generator, and for this purpose the PHILCO ALL-PURPOSE SET TESTER, MODEL 077 or 077E is recommended. Connect the Output Meter across the Primary of the Output Transformer, i.e., green and white leads. Turn Volume Control fully clockwise.

INTERMEDIATE FREQUENCY: The I.F. trimmers (VC's 1, 2, 3 and 4) must first be carefully adjusted by feeding in a 475 Kc. signal from the Signal Generator via a Standard Dummy to the grid cap of the 6A7 valve (with grid lead connected) and the Signal Generator earthed to the Receiver Earth Socket. Adjust the Signal Generator Attenuator to give a half-scale reading on the Output Meter. The I.F. trimmers must then be adjusted for maximum output.

WAVE-TRAP: Transfer Signal Generator lead via the Standard Dummy to the Aerial socket. Press in any one of the M.W. buttons (1, 2 or 3), feed in a signal of 475 Kc., and adjust VC.5 for *minimum* output.

MEDIUM WAVES:

BUTTON	RANGE	OSCILLATOR TRIMMER	AERIAL TRIMMER
1	180—280 metres (1,666.6—1,071.4 Kilocycles)	VC.11	VC.6
2	230—420 metres (1,304.3—714.2 Kilocycles)	VC.12	VC.7
3	300—550 metres (1,000—545.4 Kilocycles)	VC.13	VC.8

LONG WAVES:

BUTTON	RANGE	OSCILLATOR TRIMMER	AERIAL TRIMMER
4	1,000—1,800 metres (300—166.6 Kilocycles)	VC.14	VC.9
5	1,200—2,000 metres (250—150 Kilocycles)	VC.15	VC.10

ADJUSTMENT OF AUTOMATIC TUNING BUTTONS: Press the button which it is desired to adjust. Ascertain whether the wave-length, in metres, of the required station is higher or lower than that of the station to which the button was set. If higher, the oscillator trimmer will need to be turned counter-clockwise, and the aerial trimmer clockwise, when re-adjusting. Conversely; if lower, the oscillator trimmer will need to be turned clockwise, and the aerial trimmer counter clockwise, when re-adjusting.

Re-connect Signal Generator lead via the Standard Dummy to the grid cap of the 6A7 valve (with grid lead connected). Feed in a signal of corresponding wave-length or frequency to the desired station and turn the oscillator trimmer associated with the button which is being adjusted, in the required direction (see above) until maximum output is obtained.

Transfer Signal Generator lead via the Standard Dummy to the Aerial socket. With the same signal injected, turn the aerial trimmer associated with the button which is being adjusted in the required direction (see above) until maximum output is obtained. Re-adjust oscillator and aerial trimmers in that order until no further improvement is obtainable.

To ensure that the Receiver is not tuned to an image signal, rotate Signal Generator tuning knob through whole of M.W., and L.W. bands; only one signal should be obtainable for each button adjustment. In doing this test, care must be taken that the Signal Generator output is kept as low as possible.

NOTE: For best results it is advisable to make a final adjustment of the trimmers when the Receiver is connected to the aerial which it is proposed to use. This may be carried out on the actual station transmission or on a corresponding signal radiated from the Signal Generator by means of a short length of wire attached to the Signal Generator lead. No direct connection from this lead must be made to the Receiver.

PARTS AND PRICE LIST—MODEL U.429.

REF. No.	DESCRIPTION	PART No.	LIST PRICE s. d.	REF. No.	DESCRIPTION	PART No.	LIST PRICE s. d.
T.1	Permeability Tuned M.W. Oscillator Coil	329-1026	1 3	or	½ watt Carbon Resistor, 25,000 ohms	4516*	8
VC.11				or	½ watt Insulated Resistor, 20,000 ohms	330-2049*	8
T.2	Permeability Tuned M.W. Oscillator Coil	329-1025	1 3	R.5	½ watt Insulated Resistor, 25,000 ohms	339-2020*	8
VC.12				or	½ watt Carbon Resistor, 25,000 ohms	4516*	8
T.3	Permeability Tuned M.W. Oscillator Coil	329-1024	1 3	or	½ watt Insulated Resistor, 20,000 ohms	330-2049*	8
VC.13				or	½ watt Carbon Resistor, 490,000 ohms	6097	8
T.4	Permeability Tuned L.W. Oscillator Coil	329-1023	1 3	R.6	½ watt Insulated Resistor, 400,000 ohms	339-2026	8
VC.14				or	½ watt Insulated Resistor, 750 ohms	330-2063	8
T.5	Permeability Tuned L.W. Oscillator Coil	329-1023	1 3	R.7	½ watt Insulated Resistor, 1 megohm	330-2018 or	8
VC.15				or	½ watt Insulated Resistor, 1 megohm	330-2039	8
	Former, Iron Core and Adjusting Screw Assembly	329-1022	1 0	or	½ watt Carbon Resistor, 1 megohm	339-2023	8
				or	½ watt Carbon Resistor, 400 ohms ...	330-1018	8
	Coil Adjuster Friction Strip	279-7060	doz. 5	R.9	½ watt Carbon Resistor, 400 ohms ...	330-1003	8
	Coil Adjuster Spring Nut	W.N.413	doz. 7	or	½ watt Insulated Resistor, 400 ohms ...	339-2011	8
T.6	M. and L.W. Aerial Coil (Iron Cored)	329-1021	4 0	R.10	½ watt Insulated Resistor, 32,000 ohms	330-2021 or	8
T.7				or	½ watt Insulated Resistor, 32,000 ohms	330-2025	8
VC.1	1st I.F. Transformer and Trimmers Assembly	329-1051	9 0	or	½ watt Insulated Resistor, 85,000 ohms	330-2051	8
VC.2				or	½ watt Insulated Resistor, 25,000 ohms	339-2020	8
R.14	½ watt Insulated Resistor 250,000 ohms	279-7011	doz. 8	R.11	½ watt Insulated Resistor, 2 megohms	330-2000	8
				or	½ watt Carbon Resistor, 2 megohms	33-1025	8
T.8	2nd I.F. Transformer and Trimmers Assembly	329-1052	8 0	R.12	½ watt Carbon Resistor, 4 megohms	6010	8
VC.3				or	½ watt Insulated Resistor, 2 megohms	330-2000	8
VC.4	Mica Condenser 110 mmfd.	279-7011	doz. 8	R.12A	½ watt Insulated Resistor, 2 megohms	330-2000	8
C.14				and	½ watt Carbon Resistor, 51,000 ohms	6098	8
C.15	Mica Condenser 110 mmfd.	279-7011	doz. 8	R.13	½ watt Carbon Resistor, 51,000 ohms	6098	8
R.15				or	Wirewound Resistor, 580 ohms	LO-1078	8 0
	½ watt Insulated Resistor, 51,000 ohms	279-7011	doz. 8	R.16	Wirewound Resistor, 580 ohms	LO-1078	8 0
				or	Mains Cable		
T.9	Output Transformer	Complete		VR.1	Volume Control, 500,000 ohms	331-5208/1	4 0
	Speech Coil and Cone	Complete		Sw.1	On-off Switch		
CK.1	Field Coil	369-1014	19 0	Sw.2	Push-button Switch	429-1008	10 0
VC.5	Double Padder, 13-95 + 13-95 mmfd.	319-6002	1 6		7-prong Valve Holder	27-6037	1 0
VC.6	Double Padder, 35-250 + 55-340 mmfd.	319-6003	2 3		6-prong Valve Holder	27-6036	1 0
VC.7				or	Rubber Grommet	270-7341	1
VC.8	Double Padder, 35-250 + 55-340 mmfd.	319-6003	2 3		External Speaker Jack	359-3000	2 6
VC.9				or	External Speaker Jack Insulators	27-8484	doz. 3
VC.10	Electrolytic Condenser, 8 + 8 + 25 mfd.	309-2007	6 0		Speaker Cable	LO-1079	3 0
EC.1				or	Grid Clip	28-2214	doz. 6
C.1	Tubular Condenser, .025 mfd.	309-4120	7		Valve Shield	28-2726	3
C.2	Ceramic Condenser, 400 mmfd. (special)	309-1131	10		Chassis Mounting Screws	W-1345	1
C.3	Mica Condenser, 800 mmfd.	5878 or	1 0		Chassis Mounting Washers	29-2089	doz. 2
	Mica Condenser, 760 mmfd.	300-1005	10		Rubber Mounting Cups	270-7374	2
or				or	Push-button and Spring Assembly (Walnut)	279-4021	3
or	Mica Condenser, 700 mmfd.	300-1001	9	or	Push-button and Spring Assembly (Ivory)	279-4023	3
or	Mica Condenser, 650 mmfd.	309-1012	6		Push-button Spring	289-1106	
C.4	Silvered Mica Condenser, 250 mmfd. (Special)	309-1510	10		Brown Knob, Grubscrew and Spring Assembly	270-4189	8
C.5	Ceramic Condenser, 4 mmfd.	300-1075	9	or	Ivory Knob, Grubscrew and Spring Assembly	279-4025	8
or	Ceramic Condenser, 5 mmfd.	300-1074	1 0		Knob Spring	280-5262	doz. 4
C.6	Mica Condenser, 240 mmfd.	300-1216			Knob Grubscrew	WB-346	doz. 4
or	Mica Condenser, 250 mmfd.	309-1010	4		Knob Locknut	WN-301	1
C.7	Tubular Condenser, .04 mfd.	309-4221	1 0	or	Escutcheon (Brown)	289-1081	10
C.8	Moulded Condenser, .05 + .05 mfd.	3615 D.G.	1 10		Escutcheon (Ivory)	289-1105	10
C.9	Moulded Condenser, .05 + .05 mfd.	3615 D.G.	1 10	or	Station Names Kit (5 names)	409-5008	10
C.10	Tubular Condenser, .04 mfd.	309-4021	9		Station Names Kit (Alternative Names)	409-5009	1 6
C.11	Tubular Condenser, .04 mfd.	309-4021	9		Aerial Wire (12 feet)	360711-N	yd. 2
C.12	Mica Condenser, 1,400 mmfd.	300-1225	1 0		Red Wander Plug	380-5087	doz. 3 0
or	Mica Condenser, 1,500 mmfd.	300-1026	1 0		Black Wander Plug	380-5015	doz. 3 0
C.13	Mica Condenser, 410 mmfd.	300-1011	10	V.1	Type 25RE Rectifier Valve	34-2035	9 0
or	Mica Condenser, 500 mmfd.	300-1006	10	V.2	Type 6A7 Variable-mu Heptode Valve	34-2002	11 6
or	Mica Condenser, 600 mmfd.	300-1220		V.3	Type 6F7E Triode H.F. Pentode Valve	34-2027-E	11 6
or	Mica Condenser, 650 mmfd.	309-1012	6	or	Type 6B7E Double Diode H.F. Pentode Valve	34-2011-E	11 6
R.1	½ watt Insulated Resistor, 1,000 ohms	339-2013	8	V.4	Type 18E Pentode Output Valve	7209-E	10 6
R.2	½ watt Insulated Resistor, 25,000 ohms	339-2020	8		Instruction Manual	399-3094	1
or	½ watt Carbon Resistor, 25,000 ohms	4516	8		Trimmers Adjuster	279-7062	2
or	½ watt Insulated Resistor, 20,000 ohms	330-2049	8				
R.3	½ watt Carbon Resistor, 99,000 ohms	6099	8				
or	½ watt Carbon Resistor, 99,000 ohms	33-1165	8				
or	½ watt Insulated Resistor, 99,000 ohms	330-2012	8				
or	½ watt Insulated Resistor, 100,000 ohms	339-2023	8				
R.4	½ watt Insulated Resistor, 25,000 ohms	339-1120*	8				

* R.4 and R.5 must be identical in value, i.e., both 20,000 ohms or both 25,000 ohms.

ABOVE PRICES DO NOT APPLY IN EIRE.