PHILCO

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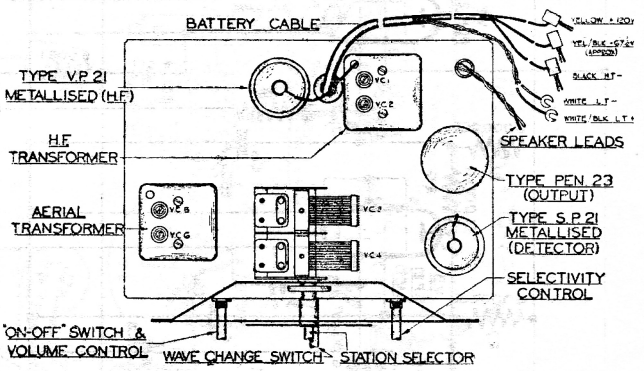
Model P-322.

TYPE CIRCUIT : Three-valve battery T.R.F. Receiver with Pentode output (0.5 watt) for operation on Long and Medium Wavebands. Droitwich wavetrap and highly selective iron dust-core coils which give selectivity comparable with that of a normal superhet.

POWER SUPPLY : Low Tension Accumulator, 2 volts, size $3\frac{1}{4}$" × 3" × $6\frac{3}{4}$" height. High Tension Battery, 120 volts minimum (tapped at 67.5 volts approx.), size $8\frac{1}{2}$" × $7\frac{1}{2}$" × $3\frac{1}{8}$". Suitable types are Exide Type OCG3 Accumulator and Exide Type H.1051 (120 volts) or Type H.1131 (135 volts) H.T. Battery or other good quality makes of similar size and type.

No bias battery is needed, as the circuit employs an automatic bias arrangement.



TOP CHASSIS DIAGRAM.

WAVEBANDS : COVERAGE : Two ; (*a*) Long, 2,000-1,000 metres (150-130 kilocycles) ; (*b*) Medium, 550-200 metres (545.4-1,500 kilocycles).

TUNING DRIVE : Geared 6 : 1 ratio for smooth and accurate tuning.

LOUDSPEAKER : An 8" diameter permanent magnet moving-coil speaker employing the latest nickel-aluminium alloy is used. This speaker gives the highest efficiency audio output, and greater bass response is obtained due to the large baffle.

POWER CONSUMPTION : L.T. current, 0.45 amp. ; H.T. current, 8.5 milliamps.

TABLE 1 — VOLTAGES

Valve socket readings to chassis taken with an 065 or 077 Philco Set Tester, using the 250- and 10-volts ranges. Volume and selectivity controls at minimum, wave-change switch in M.W. position and no aerial connected.

Position	Valve	Anode	Screen	Bias
H.F. Amplifier, S.1 ...	VP.21 (Met.)	Cap. 120 v.	Pin 7. 67.5 v. approx.	Pin. 2. —16 v. (—1 v. at max. volume)
Detector, S.3 ...	SP.21 (Met.)	Cap. 16 v.	Pin 7. 35 v.	—
Pentode Output, S.2	PEN.23	Pin 1. 120 v.	Pin 5. 120 v.	—2.25 v. †

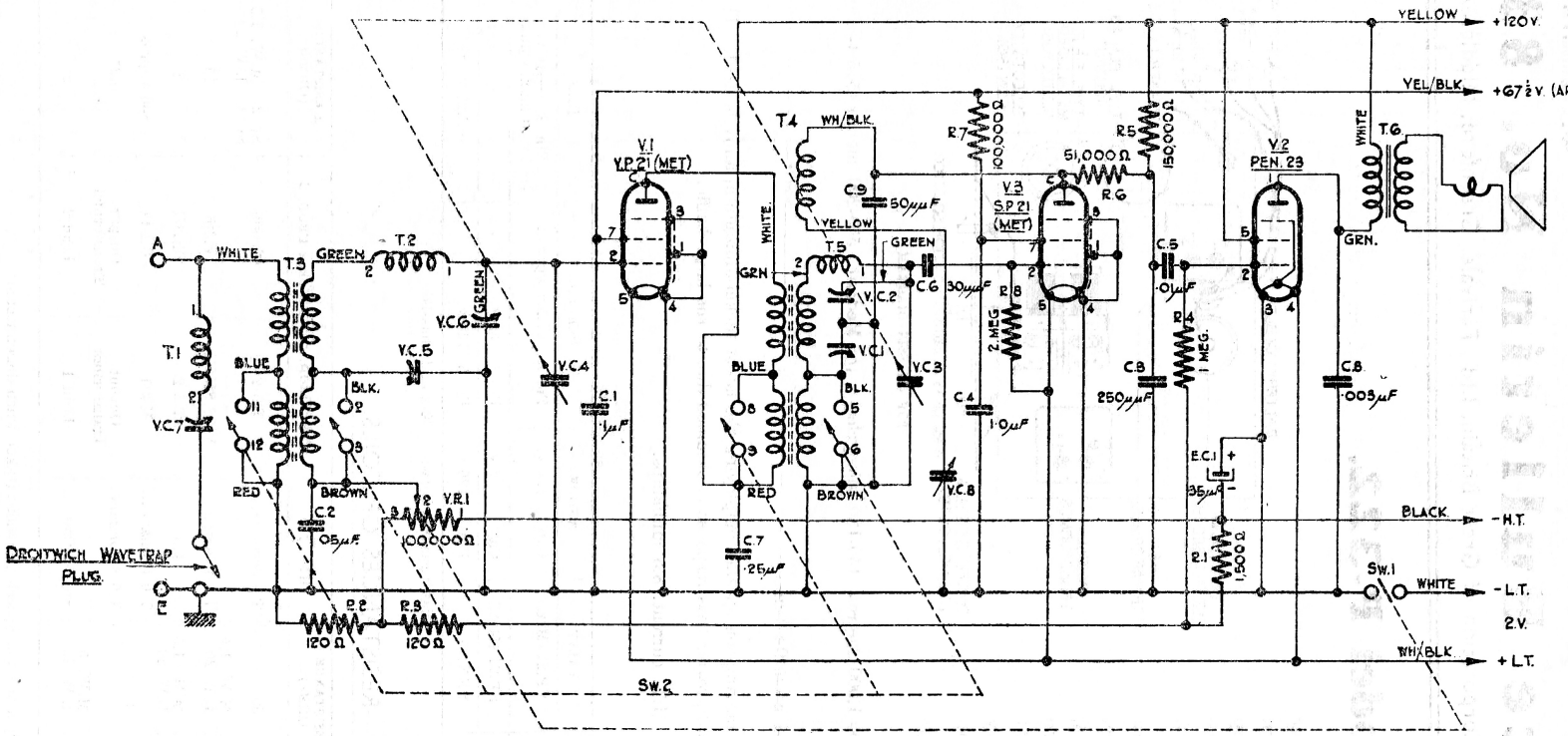
† Bias measured between C2/2 and chassis.

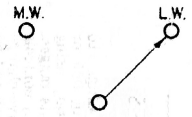
TABLE 2—RESISTANCES OF COILS.

Ref. No.	Test Prod. 1	Test Prod. 2	Resistance (Ohms)	Ref. No.	Test Prod. 1	Test Prod. 2	Resistance (Ohms)
T.1	TB.1 Socket "A"	T.1/2	50	T.4 Secondary	T.5/2	Chassis	Sw.2. M.W. 1.5 Sw.2. L.W. 20
T.3 Primary ...	TB.1 Socket "A"	Chassis	Sw.2. M.W. 1.5 Sw.2. L.W. 20	T.4 Reaction	VC.3 Stator	V.3/6	15
T.3 Secondary	T.2/2	C.2/3	Sw.2. M.W. 1.5 Sw.2. L.W. 20	T.5	T.5/2	TB.3/1	1
T.2	T.2/2	V.1/2	1	T.6 Primary ...	V.2/1	TB.4 tag	850 approx.
T.4 Primary ...	V.1 Cap	TB.4 tag	Sw.2. M.W. 5 Sw.2. L.W. 25	T.6 Secondary	Output Transformer	Output Transformer	0.2*
				Speech Coil ...	Lead 1	Lead 2	2*

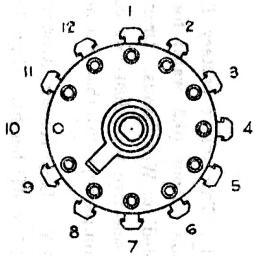
* Resistance of T.6 Secondary alone and Speech Coil alone (taken when disconnected).

NOTE : Reference numbers for valves should be read in conjunction with the socket numbers, *e.g.*, V.1-S.1.



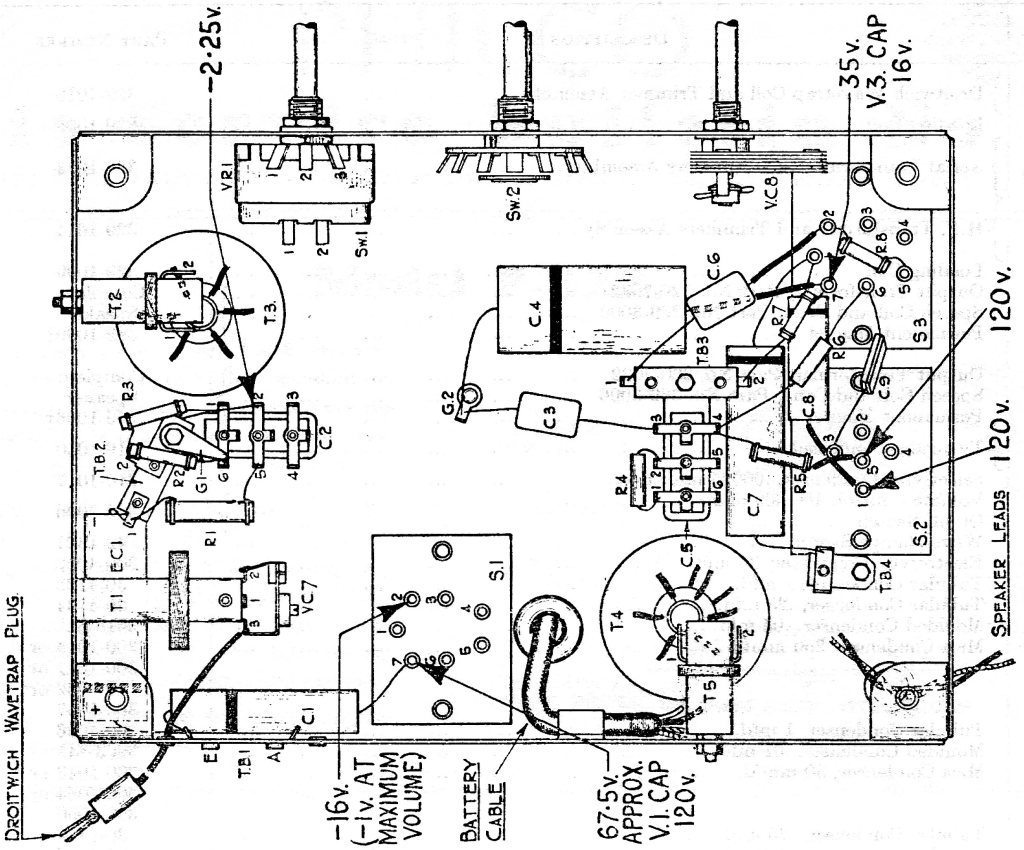


Sw.2 SHEWN IN L.W. POSITION



FRONT VIEW OF Sw.2.
CHASSIS BEING UPSIDE DOWN

SCHEMATIC DIAGRAM — MODEL P-322.



UNDER CHASSIS DIAGRAM — MODEL P-322.

ALIGNMENT PROCEDURE—MODEL P.322.

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 only be carried out with the aid of an accurately calibrated Signal Generator and for this purpose the PHILCO ALL-PURPOSE SET TESTER MODEL 077 is recommended.

Connect the Output Meter across the Primary of the Output Transformer, *i.e.*, green and white leads. With gang condenser fully open, check that pointer reads on index line. Set wave-change switch to M.W. position (counter-clockwise rotation), turn volume control (lower left-hand knob) fully clockwise and selectivity control (lower right-hand knob) fully counter-clockwise.

MEDIUM WAVES : Set pointer at 1,400 Kc. (214 metres on scale) and feed in a 1,400 Kc. signal from the Signal Generator through a Standard Dummy to the Aerial and Earth sockets of the Receiver. Adjust the Signal Generator Attenuator to give a half-scale reading on the Output Meter. Then adjust VC.'s 6 and 2 in that order for maximum output. This trimming must be carried out *at least three times* to obtain accurate alignment.

Increase selectivity control setting and re-trim VC.2, repeating the operation with increasing selectivity until oscillation is about to commence. This setting is very critical.

Check calibration and sensitivity at 600 Kc. (500 metres on scale).

LONG WAVES : With Droitwich wavetrap plug disconnected, turn wave-change switch to L.W. position (clockwise rotation) and selectivity control fully counter-clockwise. Set pointer at 240 Kc. (1,250 metres on scale) and inject a signal of 240 Kc. from the Signal Generator. Keep input signal as low as possible by means of the Attenuator and adjust VC.'s 5 and 1 in that order for maximum output. As in the case of Medium Waves, this operation must be repeated for accurate alignment.

Increase selectivity control setting and re-trim VC.1, repeating the operation with increasing selectivity until oscillation is about to commence. This setting is very critical.

Check calibration and sensitivity at 160 Kc. (1,875 metres on scale).

DROITWICH WAVETRAP : Insert Droitwich wavetrap plug in one of the corner sockets of TB.1. Feed in and tune a 200 Kc. (1,500 metres) signal and adjust VC.7 for *minimum* output.

PARTS AND PRICE LIST—MODEL P.322.

Ref. No.	Description	Part Number	List Price
			s. d.
T1 VC.7	Droitwich Wavetrap Coil and Trimmer Assembly	329-1010	
T2	Loading Coil	329-1009	
T3 VC.5 VC.6	Aerial Transformer and Trimmers Assembly	329-1013	
T4 VC.1 VC.2	H.F. Transformer and Trimmers Assembly	329-1014	
T5	Loading Coil	329-1009	
T6	Output Transformer, Part No. 320-7032 Speech Coil and Cone, Part No. 369-3000 Permanent Magnet	Complete Speaker 369-1000†	28 0
or			
T6	Output Transformer, Part No. 320-7032 Speech Coil and Cone, Part No. 369-3006 Permanent Magnet	Complete Speaker 369-1006†	
VC.3 VC.4	Two-gang Condenser	319-1000	
VC.8	Selectivity Condenser, .00025 mfd. max.	310-1017	2 6
VR1	Volume Control, 100,000 ohms	330-5006	4 0
Sw.1	On-off Switch		
Sw.2	Wave-change Switch	42-1321	2 6
EC.1	Electrolytic Condenser, 35 mfd.	300-4022	1 9
C.1	Tubular Condenser, 1 mfd.	30-4122	1 0
or	Tubular Condenser, .25 mfd.	30-4134	9
C.2	Moulded Condenser, .05 mfd.	3615-SU	1 0
C.3	Mica Condenser, 250 mmfd.	300-1014 or	9
		300-1041 or	9
		30-1032 or	1 0
		300-1057	9
C.4	Tubular Condenser, 1 mfd.	300-4006	1 9
C.5	Moulded Condenser, .01 mfd.	3903-SU	1 0
C.6	Mica Condenser, 30 mmfd.	300-1043 or	9
		300-1064 or	9
		300-1050	9
C.7	Tubular Condenser, .25 mfd.	30-4134	9
C.8	Tubular Condenser, .003 mfd.	30-4042	9
C.9	Mica Condenser, 50 mmfd.	300-1058	9
R.1	½ watt Carbon Resistor, 1,500 ohms	7951	9
R.2	¼ watt Carbon Resistor, 120 ohms	330-1032	9
R.3	¼ watt Carbon Resistor, 120 ohms	330-1032	9
R.4	¼ watt Carbon Resistor, 1 megohm	330-1018 or	9
		33-1096	9
R.5	¼ watt Carbon Resistor, 150,000 ohms	33-1183	9
R.6	¼ watt Carbon Resistor, 51,000 ohms	6098	9
or	½ watt Insulated Resistor, 51,000 ohms	330-2015	9
R.7	¼ watt Carbon Resistor, 100,000 ohms	33-1035	9
or	¼ watt Insulated Resistor, 100,000 ohms	339-2023	9
or	½ watt Insulated Resistor, 99,000 ohms	330-2012	9
R.8	½ watt Carbon Resistor, 2 megohms	33-1025	9
S.1	7-prong Valve Holder	270-6007	9
S.2	5-prong Valve Holder	270-6005	9
S.3	7-prong Valve Holder	270-6007	9
	Rubber Bush	270-7341	—
	Dial Scale Holder and Spring Assembly	389-5013	—
	Dial Scale	279-5002	—
	Pointer and Hub Assembly	380-5125	9
	Grubscrew	WB.308	—
	Battery Cable Clamp	28-2345	—
	Battery Cable, Part No. LO-1037 Yellow Plug, 120 volts, Part No. 380-5225 Black Plug, H.T., Part No. 380-5226 Brown Plug, 67½ volts, Part No. 380-5005 Spade Tag, Part No. 280-1012	Complete Assembly 410-3006	3 6
	Speaker Cable	LO-1041	6
	Grid Clip	28-2214	—
	Black Wander Plug	380-5015	—
	Red Wander Plug	380-5087	—
	Dial Screen	270-5105	2 0
	Large Tuning Knob and Spring	270-4054	7
	Volume Knob and Spring	270-4055	4
	Wave-change Knob and Spring	270-4056	4
	Small Plain Knob and Spring	270-4057	4
	Knob Spring	280-5262	—
V.1	Type VP.21 (Metallised) Variable-mu H.F. Pentode Valve	340-2002	—
V.2	Type PEN.23 Pentode Output Valve	340-2003	—
V.3	Type SP.21 (Metallised) H.F. Pentode Valve	340-2001	—
	Instruction Manual	399-3026	—

† When ordering Speaker parts, the letter which will be found in the part number of the Speaker must also be given.

ABOVE PRICES DO NOT APPLY IN EIRE.