



PHILCO

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Model 235. Runs 1 & 2.

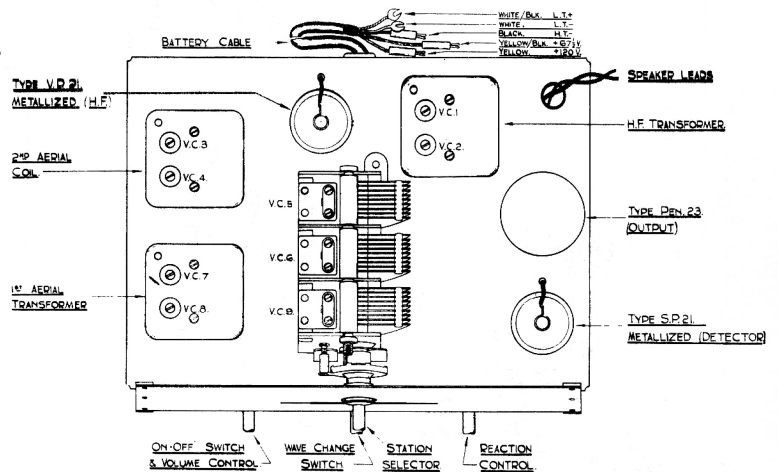
TYPE CIRCUIT: Three valve battery T.R.F. receiver with Pentode output (0.5 watt). Band pass circuit using highly selective iron dust-core coils which give selectivity comparable with that of a normal super-het.

POWER SUPPLY: Low tension accumulator, 2 volts; high tension battery, 120 volts, with tapping at 67.5 volts. Suitable types are Exide OCG.3 Accumulator and type H.1131 H.T. battery. No bias battery is needed, as the circuit employs an automatic bias arrangement.

WAVE-BANDS: COVERAGE: Two—(a) Medium, 550-1,750 Kc. (545.5-171.4 metres); (b) long, 150-320 Kc. (2,000-937.5 metres).

LOUDSPEAKER: A permanent magnet speaker employing the latest nickel-aluminium alloy, 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.



NOTE.—Gang condenser, Part No. 310-1019 (used in Run 2) shown. Part No. 310-1018 (used in Run 1) opens on left-hand side.

TOP CHASSIS DIAGRAM.

TABLE I — VOLTAGES.

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

POSITION	VALVE	ANODE	SCREEN	CONTROL GRID
H.F. Amplifier (S.1)	VP.21 (Met.)	Cap. 120 volts	Pin 7. 67.5 volts	Pin 2. —2.5 volts
Detector (S.3)	S.P.21 (Met.)	Cap. 12.5 volts	Pin 7. 40 volts	—
Pentode Output (S.2) ..	Pen.23	Pin 1. 120 volts	Pin 5. 120 volts	—6.5 volts†



† Bias measured between C.2 tag 2 and chassis.

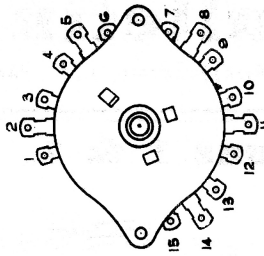
TABLE 2. — RESISTANCES OF COILS.

REF. NO.	TEST PROD 1	TEST PROD 2	RESISTANCE (Ohms)
T.2 Primary	VR.1/3	Chassis	SW.2. M.W. 1.5 SW.2. L.W. 20
T.2 Secondary	VC.9 Stator	C.2/4	SW.2. M.W. 1.5 SW.2. L.W. 20
T.1	V.1/2	C.2/4	SW.2. M.W. 1.5 SW.2. L.W. 20
T.3 Primary	V.1 Cap	TB.1A	S.W.2. M.W. 5 SW.2. L.W. 25
T.3 Secondary	TB.2/1	Chassis	SW.2. M.W. 1.5 SW.2. L.W. 20
T.3 Reaction	VC.10 Stator	V.3/6	10-15
T.4 Primary	V.2/1	TB.1A	850
T.4 Secondary	Output Transformer	Output Transformer	0.2*
Speech Coil	Lead 1	Lead 2	2*

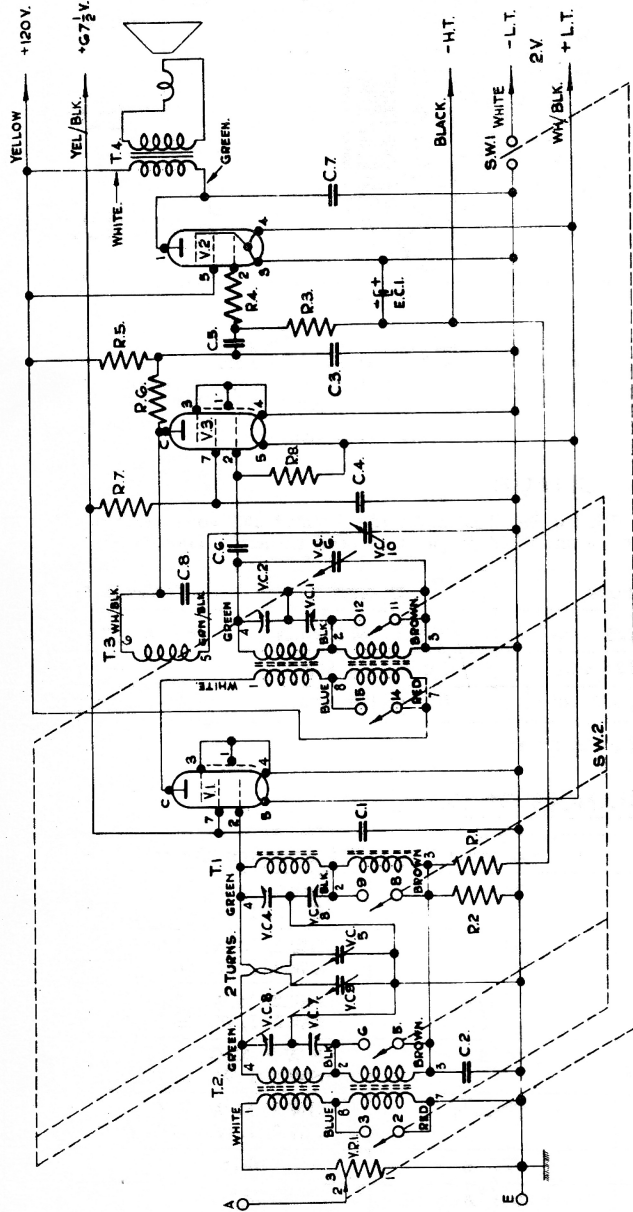
* Resistance of T.4 secondary alone and speech coil alone (taken when disconnected).

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

L.W.  M.W. 
 S.W.2 SHOWN
 IN 'L.W.' POSITION.

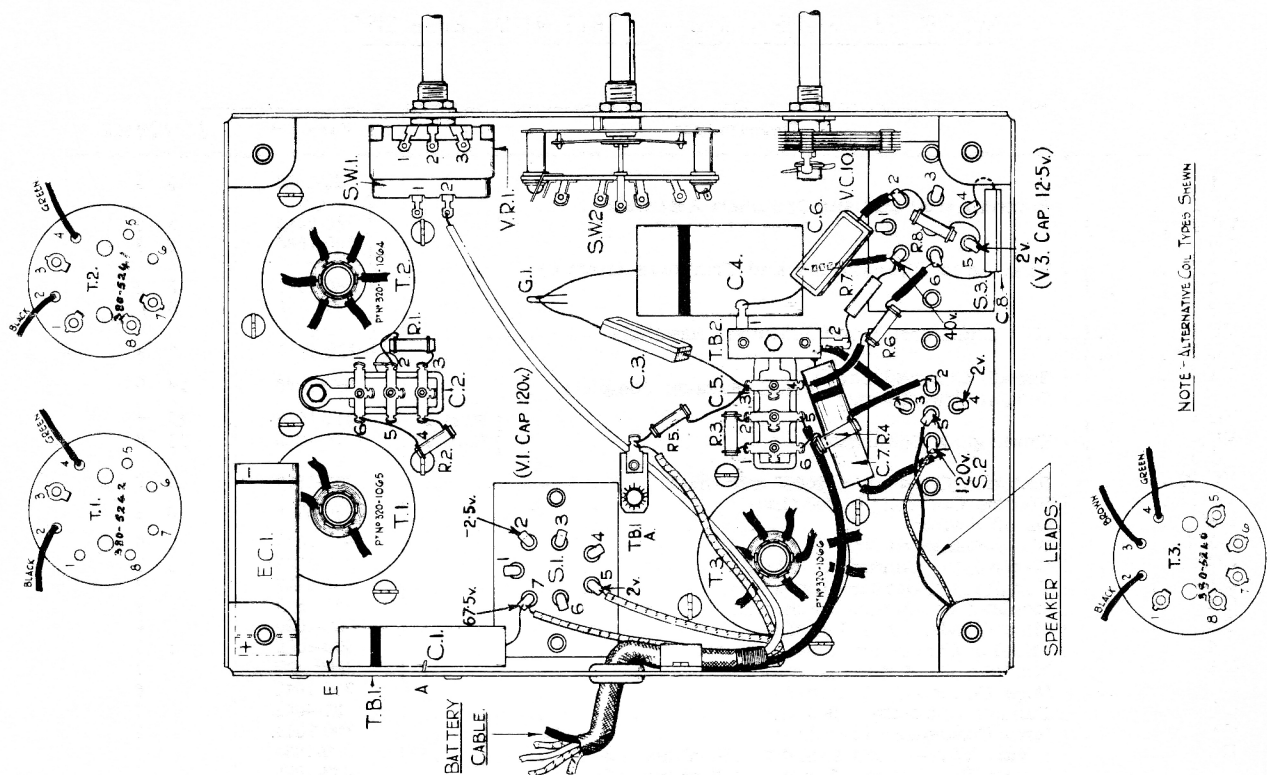


FRONT VIEW OF S.W.2
 CHASSIS BEING UPSIDE DOWN.



REF. NO.	DESCRIPTION	PART NO.	REF. NO.	DESCRIPTION	PART NO.
T.1	2 ND AERIAL COIL.		C.1	TUBULAR CONDENSER .01 MFD.	80-4122
V.C.3	L.W. TRIMMER	350-1065	C.2	MOULDED .05 MFD.	9618 S.G.
V.C.4	M.W. TRIMMER	OR 380-5242	C.3	MICA .10 MFD.	300-1020
T.2	1 ST AERIAL TRANSFORMER		C.4	TUBULAR .10 MFD.	800-1006
V.C.7	L.W. TRIMMER	320-1064	C.5	MOULDED .01 MFD.	2803 S.U.
V.C.8	M.W. TRIMMER	OR 380-5241	C.6	MICA .80 M.MFD.	500-1043
T.3	H.F. TRANSFORMER		C.7	TUBULAR .003 MFD.	90-4042
V.C.1	L.W. TRIMMER	250-1066	C.8	MICA .250 M.MFD.	300-1014
V.C.2	M.W. TRIMMER	OR 380-5240	R.1	1/4 WATT WIRE-WOUND RESISTOR. 180 OHMS ± 2 1/2 %	390-1025
T.4	OUTPUT TRANSF. SPEECH COIL & CONE. P.A. SPEAKER COMBINE.	360-1026	R.2	1/4 .120 OHMS ± 2 1/2 %	350-1026
V.C.7	1 ST AERIAL SECTION		R.3	1/4 .490,000 OHMS.	6097
V.C.8	H.F. SECTION	80-1018 OR 80-1019	R.4	1/4 .490,000 OHMS.	6097
V.C.10	REACTION CONDENSER	00025 MFD. MAX.	R.5	1/4 .180,000 OHMS.	33188
V.P.1	VOLUME CONTROL.	100,000 OHMS.	R.6	1/4 .51,000 OHMS	6098
S.W.1	ON - OFF SWITCH.	330-5006	R.7	1/4 .100,000 OHMS	89-1035
S.W.2	WAVE - CHANGE SWITCH.	420-1014	R.8	1/4 .2 MEGOHMS	89-1025
EC.1	ELECTROLYTIC CONDENSER. .35 MFD.	300-4022	V.1	TYPE VP 21 (MET) VAR-MU H.F. PENTODE VALVE.	340-2002
			V.2	TYPE SP 21 (MET) H.F. PENTODE VALVE	340-2003
			V.3		340-2001

SCHEMATIC DIAGRAM — MODEL 235.



UNDER CHASSIS DIAGRAM.

ALIGNMENT PROCEDURE FOR MODEL 235.

Before leaving the Factory all Philco receivers are accurately aligned, but if misalignment is suspected through damage, it should not be attempted without instruction in the correct adjustment of the trimming 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 or on letter "T" in word "Metres." Set wave-change switch to M.W. position (clockwise rotation), turn volume control (left-hand bottom knob) fully clockwise and reaction control (right-hand bottom knob) fully counter-clockwise.

MEDIUM WAVES: Set pointer at 1,400 Kc. 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 8, 4 and 2 in that order for maximum output. This trimming operation must be carried out *at least three times* to obtain accurate band-pass alignment.

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

NOTE: VC.s 8 and 4 must *not* be re-trimmed after VC.2 has been adjusted.
Check calibration and sensitivity at 600 Kc.

LONG WAVES: Turn wave-change switch to L.W. position (counter-clockwise) and reaction control fully counter-clockwise. Set pointer at 290 Kc. and inject a signal of 290 Kc. from the Signal Generator. Keep input signal as low as possible by means of the attenuator and adjust VC's 7, 3 and 1 in that order for maximum output. As in the case of medium waves, this operation must be repeated for accurate alignment.

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

NOTE: VC's 7 and 3 must not be re-trimmed after VC.1 has been adjusted.
Check calibration and sensitivity at 160 Kc.

NOTE - ALTERNATIVE CON. TYPES SHOWN

MODEL 235, RUNS 1 & 2 — PARTS AND PRICE LIST.

REF. NO.	DESCRIPTION	PART NO.	LIST PRICE	
T.1 }	Second Aerial Coil and Trimmers Assembly	320-1065	9 9	
VC.3 }		or		
VC.4 }		380-5242	6 6	
T.2 }	First Aerial Transformer and Trimmers Assembly	320-1064	6 3	
VC.7 }		or		
VC.8 }		380-5241	5 9	
T.3 }	H.F. Transformer and Trimmers Assembly	320-1066	5 9	
VC.1 }		or		
VC.2 }		380-5240	7 9	
T.4 }	Speech Coil and Cone } P.M. Speaker complete	360-1026	24 0	
VC.5 }				Output Transformer
VC.6 }	Three-gang Condenser	{ Run 1	310-1018	12 6
VC.9 }		{ Run 2	310-1019	13 6
VC.10 }	Reaction Condenser, .00025 mfd. max.	310-1017	2 0	
VR.1 }	Volume Control, 100,000 ohms	330-5006	3 6	
SW.1 }	On-off Switch			
SW.2 }	Wave-change Switch	420-1014	3 0	
EC.1 }	Electrolytic Condenser, 35 mfd.	300-4022	1 3	
C.1 }	Tubular Condenser, .1 mfd.	30-4122	6	
C.2 }	Moulded Condenser, .05 mfd.	3615 SG.	9	
C.3 }	Mica Condenser, 110 mmfd.	300-1020	8	
C.4 }	Tubular Condenser, 1 mfd.	300-4006	1 9	
C.5 }	Moulded Condenser, .01 mfd.	3903 SU.	7	
C.6 }	Mica Condenser, 30 mmfd.	300-1043	6	
C.7 }	Tubular Condenser, .003 mfd.	30-4042	7	
C.8 }	Mica Condenser, 250 mmfd.	300-1014	6	
R.1 }	¼ watt Wire-wound Resistor, 180 ohms ± 2½%	330-1025	9	
R.2 }	¼ watt Wire-wound Resistor, 120 ohms ± 2½%	330-1026	9	
R.3 }	¼ watt Carbon Resistor, 490,000 ohms	6097	9	
R.4 }	¼ watt Carbon Resistor, 490,000 ohms	6097	9	
R.5 }	¼ watt Carbon Resistor, 150,000 ohms or	33-1183	9	
	¼ watt Carbon Resistor, 160,000 ohms	5331	9	
R.6 }	¼ watt Carbon Resistor, 51,000 ohms	6098	9	
R.7 }	¼ watt Carbon Resistor, 100,000 ohms	33-1035	9	
R.8 }	¼ watt Carbon Resistor, 2 megohms	33-1025	9	
S.1 }	7-Prong Socket	270-6007	5	
S.2 }	5-Prong Socket	270-6005	3	
S.3 }	7-Prong Socket	270-6007	5	
	Rubber Bush	4126	1	
	Dial Scale	270-5041	1 9	
		{ Run 2	270-5049	1 9
	Dial Scale Stiffener	280-1218	2	
	Battery Cable Clamp	28-2345	doz. 5	
	Pointer and Hub Assembly	380-5228	3	
	Hub Sleeve	280-6017	2	
	Grubscrew	WB.324	doz. 4	
	Pointer and Hub Assembly	380-5228	3	
	Grubscrew	WB.316	doz. 4	
	Battery Cable LO.1037			
	Yellow Plug, 120 volts, 380-5225	{ Complete Assembly	3 0	
	Black Plug, H.T.—, 380-5226			
	Brown Plug, 67½ volts, 380-5005			
	Spade Tag, 280-1012	410-3006		
	Speaker Cable	LO.1041	7	
	Grid Clip	28-2214	doz. 5	
	Celluloid Window	270-5042	1 1	
	Large Tuning Knob and Grubscrew	270-4051	5	
	Small Knobs and Grubscrews	270-4052	3	
	Large Tuning Knob and Spring	270-4041	9	
	"Volume" Knob and Spring	270-4037	5	
	"Wave-change" Knob and Spring	270-4038	5	
	Small Plain Knob and Spring	270-4036	5	
	Knob Spring	280-5262	doz. 2	
V.1 }	Type V.P.21 (Metallized) Variable-mu H.F. Pentode Valve	340-2002	11 0	
V.2 }	Type Pen.23 Pentode Output Valve	340-2003	16 6	
V.3 }	Type S.P.21 (Metallized) H.F. Pentode Valve	340-2001	11 0	
	Black Wander Plug	380-5015	doz. 1 6	
	Red Wander Plug	380-5087	2	