



# PHILCO

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## Radio Service Bulletin No. 36

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### MODEL 282

**TYPE CIRCUIT:** The Model 282 is a five valve All-wave Super-heterodyne Receiver with Pentode output (3 watts) designed for operation on Long, Medium and Short wave-bands. Built-in connections for Philco All-wave Aerial—aerial selector built into and operated by the wave-band switch. Shadow meter tuning and built-in connections for separate speaker.

**VALVES USED:** 1 type 6A7, 1st detector and oscillator; 1 type 78E, I.F.; 1 type 75, 2nd Detector, A.V.C. and 1st L.F.; 1 type 42E, output; 1 type 80, full wave rectifier.

**WAVE-BAND COVERAGE:** L.W. 150-320 Kc. (2,000-937 metres), M.W. 530-1,500 Kc. (566-200 metres) and S.W. 5.7-18 megacycles (52.6-16.7 metres).

**TUNING DRIVE:** Two-speed gear drive—ratios 10-1 and 50-1 for slow and accurate tuning.

**TONE CONTROL:** Continuously variable, enabling a fine degree of tone between mellow and brilliant to be obtained.

**INTERMEDIATE FREQUENCY:** 451 Kc.

**AUTOMATIC VOLUME CONTROL:** Full A.V.C. is obtained by feeding back the D.C. voltage developed across the Diode load (after filtering free of the L.F. signal and H.F. currents) into the signal input grids of the 6A7 and 78E valves.

**GRAMOPHONE PICK-UP:** Built-in connections for a pick-up, which is brought into operation by means of the wave-change switch.

**POWER CONSUMPTION:** 60 watts.

#### TABLE I. VOLTAGES.

A.C. line 230 volts 50 cycles.

Valve socket readings to chassis, taken on an 025 or 099 Philco Set Tester, using 300, 30 and 10 volt ranges. Volume control at minimum, no aerial connected and tone control at fully brilliant.

Valve	Anode	Screen	Bias
6A7	195 180*	70	—
78E	205	69	2.9
75	122	—	—
42E	278	270	16.5
80	300-0-300v. A.C.	—	—

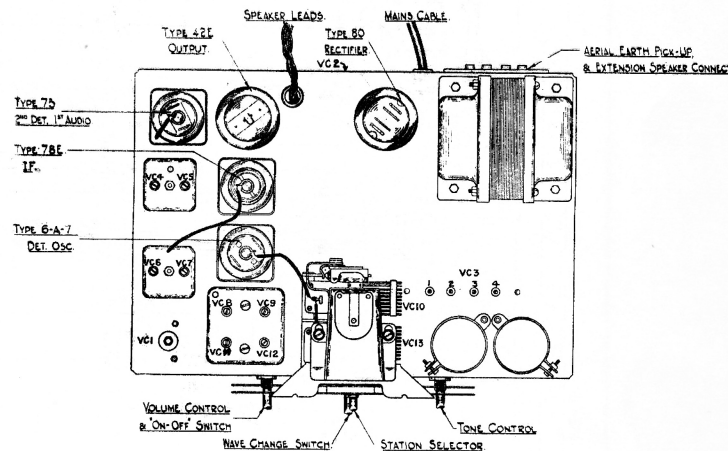
\* Osc. anode. Total smoothed H.T.—292 volts D.C.

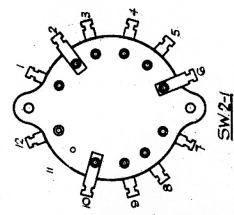
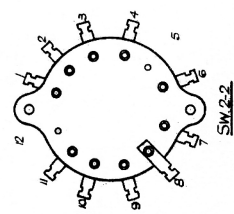
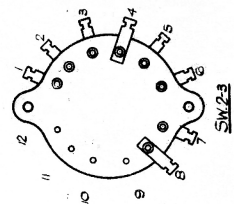
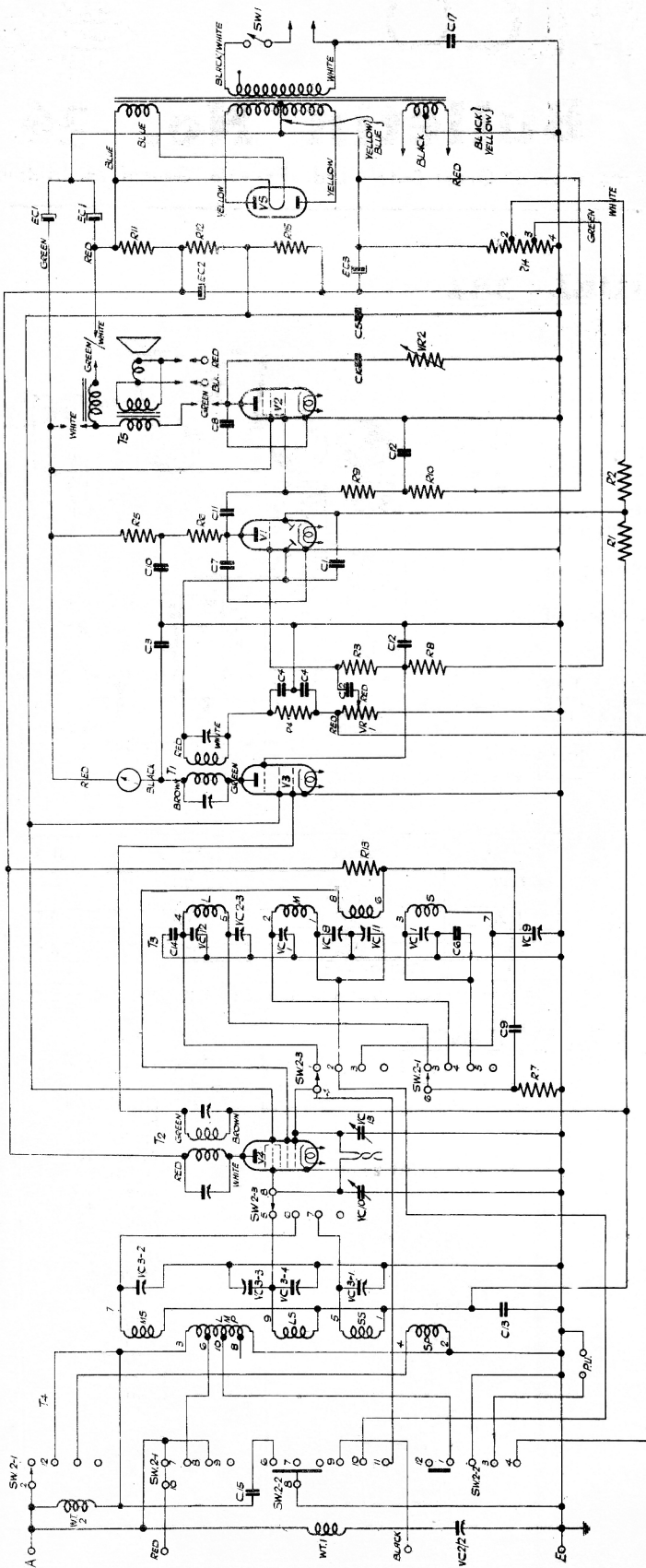
#### TABLE 2. COIL RESISTANCES.

Part	Prod 1	Prod 2	Resistance (Ohms)
T 4	Aerial	Earth	SW. Gram. 150 S.W. 0.4 M.W. 30 L.W. 150
	T 4/1	V 4 cap or SW.23/8	Gram. — S.W. 0.2 M.W. 4 L.W. 15
T 3	V 4/6	SW 21/6	Gram. — S.W. 0.1 M.W. 2 L.W. 6
T 2 (Primary)	V 4/3	EC 2/1	10
(Secondary)	T 4/1	V 3 cap	10
T 1 (Primary)	V 3/3	TB 1/1	10
(Secondary)	C 4/5	V 1/4	10
S.M.	TB 1/1	EC 1/2	2,500 approx.
L.S. Field	EC 2/1	EC 1/2	1,140
T 5 (Primary)	V 2/3	EC 1/2	220
(Secondary)	Output Transformer	Output Transformer	2 †
Speech coil	Lead 1	Lead 2	0.4 †
P.T. (Primary)	White	White black (245 v.)	33
	White	Green (220 v.)	29
H.T. Secondary	R 14/1	V 5/3	220
(Secondary)	R 14/1	V 5/4	240
Rectifier L.T.	V 5/1	V 5/2	0.1*
Heaters	V 3/1	V 3/2	0.1*

† Resistance of T.6 secondary and speech coil taken when disconnected.

\* Resistance of L.T. windings taken with all valves removed.





SCHEMATIC DIAGRAM. Model 282

VIEWS OF SWITCHES FROM FRONT  
CROSS BENS UP/BE DOWN



## ALIGNMENT PROCEDURE.

Before leaving the Factory all PHILCO receivers are accurately aligned and no further alignment should be attempted without instruction in the correct adjustment of the compensating condensers. This should only be carried out with the aid of an accurately calibrated Signal Generator, covering Long, Medium and Short wave frequencies, and for this purpose the PHILCO ALL-PURPOSE SET TESTER, MODEL 099, is recommended.

Connect the Output Meter across the Primary of the output transformer, e.g., green and white leads. Set the wave-change switch to M.W. (2nd position, left hand) and turn gang open to fullest extent. Check that indicator reads on index line (above 1,500 Kc.). Turn volume control to maximum and tone control to brilliant position.

The I.F. Padders (VC's 6, 7, 4 and 5) should first be adjusted by feeding in a 451 Kc. signal from the Signal Generator to the grid cap of the 6A7 valve (with grid lead disconnected). Adjust the Signal Generator attenuator to give a half scale reading on the Output Meter.

Transfer Signal Generator lead *via* a standard Dummy to aerial socket, and feed in a signal of 451 Kc. Pad screw of VC.2 for minimum reading.

Turn wave-band switch to L.W. (1st position, left hand) and set dial at 290 Kc. Feed in a signal of 290 Kc. and adjust padder VC.12 for maximum response. If two points give maximum response, use the one produced by minimum capacity. Now adjust padders VC.3/3 and VC.3/4 for maximum response. Feed in and tune a signal of 160 Kc. and adjust nut of VC.2 for maximum response. Recheck at 290 Kc. and pad to compensate for any shift in oscillator frequency.

Turn wave-band switch to M.W. position. Set dial at 1,400 Kc. Feed in a 1,400 Kc. signal and adjust VC's 8 and 11 for maximum response. If two peaks are obtained, use the one of minimum capacity. Adjust VC.3/2 for maximum response. Feed in and tune a 600 Kc. signal and adjust screw of VC.1 until maximum response is obtained. Recheck at 1,400 Kc.

Turn wave-band switch to S.W. (3rd position, left hand). Substitute standard Dummy by a 400 ohms resistor. Set dial at 18 Mc., and feed in an 18 Mc. signal across aerial and earth. Connect a 21 plate variable condenser across VC.13 and, using the second harmonic of the oscillator, adjust VC.3/1 for maximum response. Now disconnect external condenser and pad VC.9 carefully for maximum response. Two peaks are obtainable, and the one having minimum capacity should be used. Feed in and tune a 6 Mc. signal and adjust nut of VC.1 for maximum response. Recheck at 18 Mc. Check calibration.

### TABLE 3. PARTS LIST.

Ref. No.	Description	Part No.	Ref. No.	Description	Part No.	
T.4	Aerial Coil Assembly ... ..	32-1980	R.5	$\frac{1}{4}$ watt Carbon Resistance, 51,000 ohms	6098	
T.3	Oscillator Coil Assembly ... ..	32-1893	R.6	$\frac{1}{4}$ watt Carbon Resistance, 190,000 ohms	33-1116	
VC.8			R.7	$\frac{1}{4}$ watt Carbon Resistance, 51,000 ohms	6098	
VC.9			R.8	$\frac{1}{4}$ watt Carbon Resistance, 490,000 ohms	6097	
VC.11			R.9	$\frac{1}{4}$ watt Carbon Resistance, 490,000 ohms	6097	
VC.12			R.10	$\frac{1}{4}$ watt Carbon Resistance, 490,000 ohms	6097	
T.2	1st I.F. Coil Assembly... ..	32-1705	R.11	1 watt Carbon Resistance, 10,000 ohms	5324	
VC.6			R.12	1 watt Carbon Resistance, 25,000 ohms	3656	
VC.7			R.13	$\frac{1}{2}$ watt Carbon Resistance, 32,000 ohms	5279	
T.1	2nd I.F. Coil Assembly ... ..	32-1706	R.14	Candohm Wire Wound Resistance, 225 plus 25 plus 25 ohms ... ..	33-3234	
VC.4			R.15	$\frac{1}{4}$ watt Carbon Resistance, 51,000 ohms	4518	
VC.5			VR.1	Volume Control, 350,000 ohms	33-5140	
WT.1	I.F. Trap Coil ... ..	38-6851	SW.1	On-Off Switch		
WT.2	Trap Coil (Image Rejector) ... ..	320-1028	SW.21	Wavechange Switch, 4-way... ..	42-1148	
VC.10	Twin Gang Condenser ... ..	31-1679	SW.22			
VC.13			SW.23			
VC.1	Twin Padding Condenser, 1,500 plus 600 mmfd. ... ..	31-6027	VR.2	Tone Control Resistor, 125,000 ohms ...	330-5001	
VC.2	Twin Padding Condenser, 235 plus 50 mmfd. ... ..	31-6074	T.6	Output Transformer } Speech Coil } Field Coil }	360-1010	
VC.3	Quadruple Padding Condenser ... ..	31-6047	PT.	Mains Transformer, 200-260 v., 40-100 cycles ... ..		320-7007
C.1	Mica Condenser, 110mmfd. ... ..	300-1012	SM.	Shadow Meter ... ..	450-2001 P.	
C.2	Moulded Condenser, .015mfd. ... ..	3793 SU.	S.1	6 Prong Valve Holder ... ..	27-6036	
C.3	Tubular Condenser, 1mfd. ... ..	30-4170	S.2	6 Prong Valve Holder ... ..	27-6036	
C.4	Moulded Condenser, .00011mfd. ... ..	8035 DG.	S.3	6 Prong Valve Holder ... ..	27-6036	
C.5	Tubular Condenser, 25mfd. ... ..	30-4146	S.4	7 Prong Valve Holder ... ..	27-6037	
C.6	Mica Condenser, 2250mmfd. ... ..	300-1021	S.5	4 Prong Valve Holder ... ..	27-6034	
C.7	Mica Condenser, 110mmfd. ... ..	300-1012		Valve Shield ... ..	28-2726	
C.8	Mica Condenser, 1,000mmfd. ... ..	300-1016		Tuning Dial Scale ... ..	270-5023	
C.9	Mica Condenser, 250mmfd. ... ..	300-1019		Pilot Bulb ... ..	34-2064	
C.10	Tubular Condenser, 25mfd. ... ..	30-4134		Grip Clip ... ..	28-2214	
C.11	Moulded Condenser, .015mfd. ... ..	3793 S.G.		Escutcheon Complete ... ..	400-5007	
C.12	Moulded Condenser, 15mfd. ... ..	6287 DG.		Chassis Mounting Rubbers... ..	5189	
C.13	Tubular Condenser, .05mfd. ... ..	30-4020		<b>Brown Knobs—Coarse</b> ... ..	270-4022	
C.14	Mica Condenser, 70mmfd. ... ..	300-1022		Fine ... ..	270-4021	
C.15	Mica Condenser, 50mmfd. ... ..	300-1003		Volume Control ... ..	270-4023	
C.16	Moulded Condenser, .015mfd. ... ..	3793 SU.		Wavechange ... ..	270-4024	
C.17	Moulded Condenser, .015mfd. ... ..	3793 SG.		Tone Control ... ..	270-4025	
EC.1	Electrolytic Condenser, 8 plus 8 mfd. ...	30-2146		Knob Spring ... ..	280-5262	
EC.2	Electrolytic Condenser, 16mfd. ... ..	30-2118 T.	V.1	Type 75 Double Diode Triode Valve ...	8002	
EC.3	Electrolytic Condenser, 12mfd. ... ..	30-2002	V.2	Type 42E, Pentode Output Valve ...	6447	
R.1	$\frac{1}{4}$ watt Carbon Resistance, 1 megohm. ...	33-1096	V.3	Type 78E, Variable-Mu H.F. Pentode Valve ... ..	8315 E.	
R.2	$\frac{1}{4}$ watt Carbon Resistance, 1 megohm. ...	33-1096	V.4	Type 6A7, Variable-Mu Heptode Valve	34-2002 E.	
R.3	$\frac{1}{4}$ watt Carbon Resistance, 1 megohm. ...	33-1096	V.5	Type 80 Full Wave Rectifier Valve ...	3148	
R.4	$\frac{1}{4}$ watt Carbon Resistance, 51,000 ohms	6098				