



# PHILCO

## Radio Service Bulletin No. 63

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**TYPE CIRCUIT:** Five-valve Superheterodyne Unit-constructed Receiver with full delayed A.V.C. and Pentode Output (3 watts) for operation on Short, Medium and Long Wave-bands. Built-in connections for Philco All-Wave Noise-Reducing Aerial, automatic bridge balanced aerial selector and alternative link connections—"B" for ordinary aerial and "C" for Philco All-Wave Noise-Reducing Aerial. Provision is made for connecting a pick-up which may be left permanently connected to the receiver if desired, as the gramophone operation is controlled by the extreme clockwise rotation of the wave-change switch. Provision is also made for connecting an external speaker of the permanent-magnet moving-coil type having an impedance of 2-3 ohms.

**POWER SUPPLY:** Alternating current mains of 200-230 volts or 231-260 volts, 50-100 cycles, when the voltage adjusting plug is fully screwed into the correct socket on the rear-of-cabinet panel.

**WAVEBANDS: COVERAGE:** Three: (a) Long, 320-150 Kc. (937.5-2,000 metres); (b) Medium, 1,700-550 Kc. (176.4-545.4 metres); (c) Short, 18-5.7 Mc. (16.6-52.6 metres).

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

**TONE CONTROL:** This is continuously variable, enabling a fine degree of tone between brilliant and mellow to be obtained. The on/off switch is combined with this control, thus allowing a particular setting of the separate volume control to be maintained.

**LOUDSPEAKER:** An 8-inch diameter fully energised moving-coil speaker is used, which gives the highest efficiency audio output, and greater bass response is obtained due to the large baffle.

**INTERMEDIATE FREQUENCY:** 451 Kc.

**POWER CONSUMPTION:** 60 watts approx.

### TABLE 1 — VOLTAGES

Valve socket readings to chassis taken with an 065 or 077 Philco Set Tester, using the 500, 250 and 10 volts ranges. Volume control at minimum, tone control fully brilliant, wave - change switch in M.W. position, and no aerial connected. A.C. line 230 volts, 50 cycles.

POSITION.	VALVE.	ANODE.	SCREEN.	BIAS.
1st Detector and Oscillator, S.3 ..	6A7	Pin 3. 175 v. Pin 5. 130 v.*	Pin 4. 100 v.	—
I.F. Amplifier, S.5 .. .. .	78E	Pin 3. 255 v.	Pin 4. 100 v.	Pin 5. -2 v.
2nd Detector, A.V.C. and 1st L.F. Amplifier, S.4 .. .. .	75	Pin 3. 75 v.	—	—
Pentode Output, S.2 .. .. .	42E	Pin 3. 250 v.	Pin 4. 255 v.	-15 v. †
Full Wave Rectifier, S.1 .. ..	80	Pin 3. 320 v. A.C. Pin 4. 320 v. A.C.	—	—

\* Oscillator Anode Volts. † Bias measured between R.1/1 and chassis.  
Total D.C. 335 volts measured between S.1/1 and R.1/1. V.1 filament, 5 volts A.C.; V.2, 3, 4, 5 and L.P.1 filaments, each 6.3 volts A.C., measured between Pins 1 and 2 on each socket.

### TABLE 2 — RESISTANCES OF COILS.

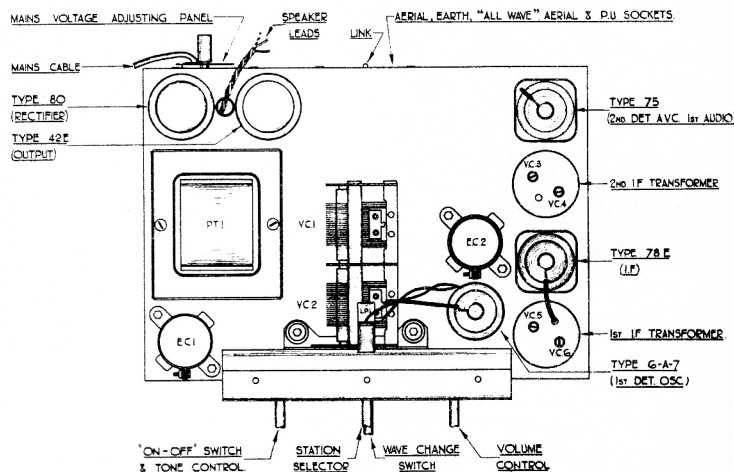
(Link on TB.3 to be in Socket "B.")

REF. NO.	TEST PROD 1.	TEST PROD 2.	RESISTANCE (OHMS)	REF. NO.	TEST PROD 1.	TEST PROD 2.	RESISTANCE (OHMS)
CK.2 .. .. .	TB.3 Socket "A"	Chassis	17.5	T.5 .. .. .	V.3/6	Joint of C.12 and C.13	SW.2 S.W. 0.1 .. Gram. Infinity
T.1 Primary .. ..	T.1/1	T.1/4	5	T.5 Reaction .. ..	V.3/5	TB.9	Less than 0.1
T.1 Primary tapping	T.1/1	Chassis	2.5	T.6 Primary .. ..	V.5/3	TB.12/1	12
T.1 Secondary .. ..	T.1/3	Chassis	16.5	T.6 Secondary .. ..	V.4/5	TB.11/1	51,000 approx.
T.2 Primary No. 1 (with T.1 Primary in series) .. .. .	TB.3 Socket "Red"	TB.3 Socket "Blk"	5.5	T.8 Primary .. ..	V.2/3	V.2/4	240
T.2 Primary No. 2 ..	TB.4/2	TB.6	Less than 0.1	T.8 Secondary .. ..	Output Transformer	Output Transformer	0.2*
T.2 Secondary .. ..	V.3 Cap	TB.6	SW.2 S.W. 0.1 .. Gram. Infinity	Speech Coil .. ..	Lead 1	Lead 2	2*
T.3 Primary .. ..	TB.8/1	TB.8/2	0.5	CK.1 .. .. .	EC.1/1	EC.1/2	1,140
T.3 Secondary .. ..	V.3 Cap	TB.6	SW.2 L.W. 25 .. M.W. 2.5	P.T.1 Primary .. ..	C.2/2	200-230v. tap	SW.1. ON 17.5 SW.1. ON 20 SW.1. Off Infinity
T.7 Primary .. ..	V.3/3	TB.2/1	8	" .. .. .	C.2/2	231-260v. tap	
T.7 Secondary .. ..	V.5 Cap	C.15/3	12	H.T. Secondary .. ..	V.1/3	R.1/1	240
T.4 .. .. .	V.3/6	SW.2/5	SW.2 L.W. 16.5 .. M.W. 2.5	" .. .. .	V.1/4	R.1/1	240
				Rectifier L.T. Secondary	V.1/1	V.1/2	0.1 †
				Heater L.T. Secondary	V.2/1	V.2/2	0.2 †

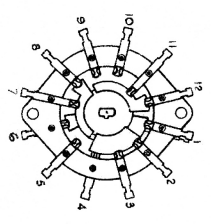
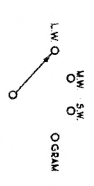
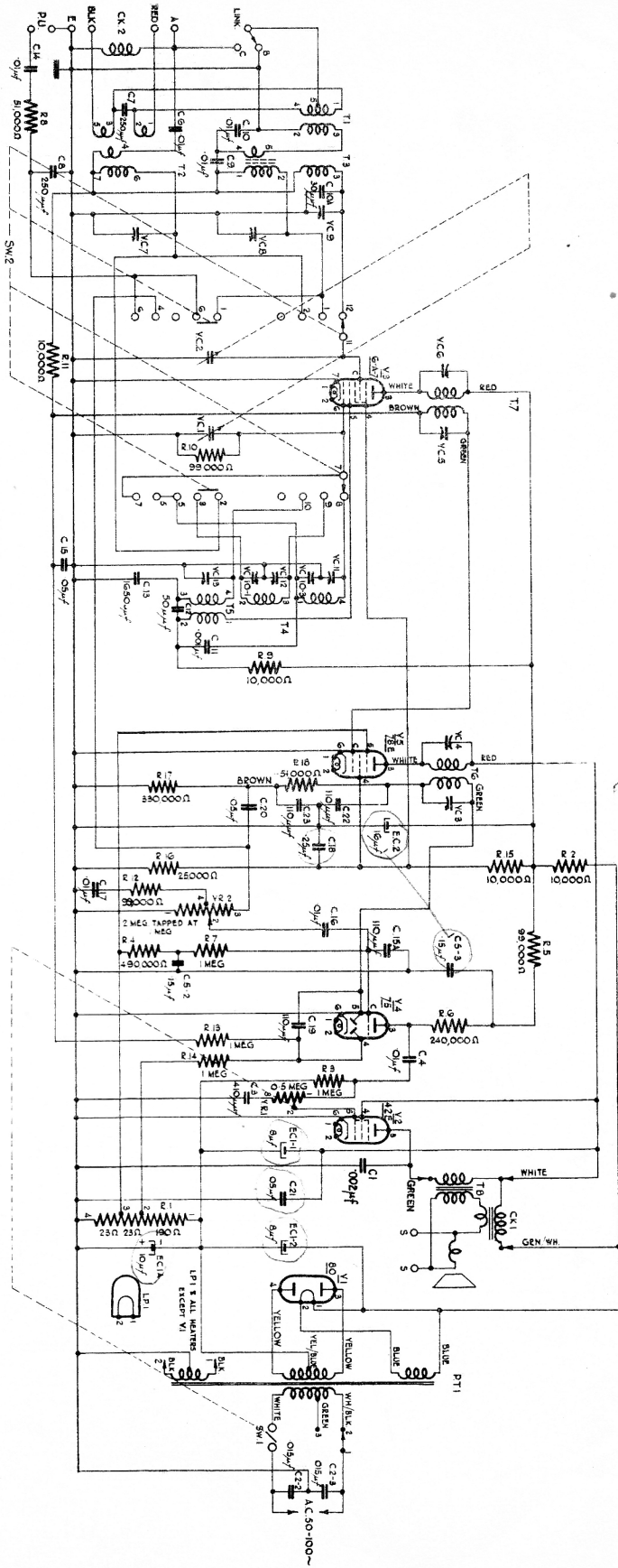
\* Resistance of T.8 Secondary alone and Speech Coil alone (taken when disconnected).  
† Resistance of L.T. windings taken with all valves removed.

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

### Model A-537

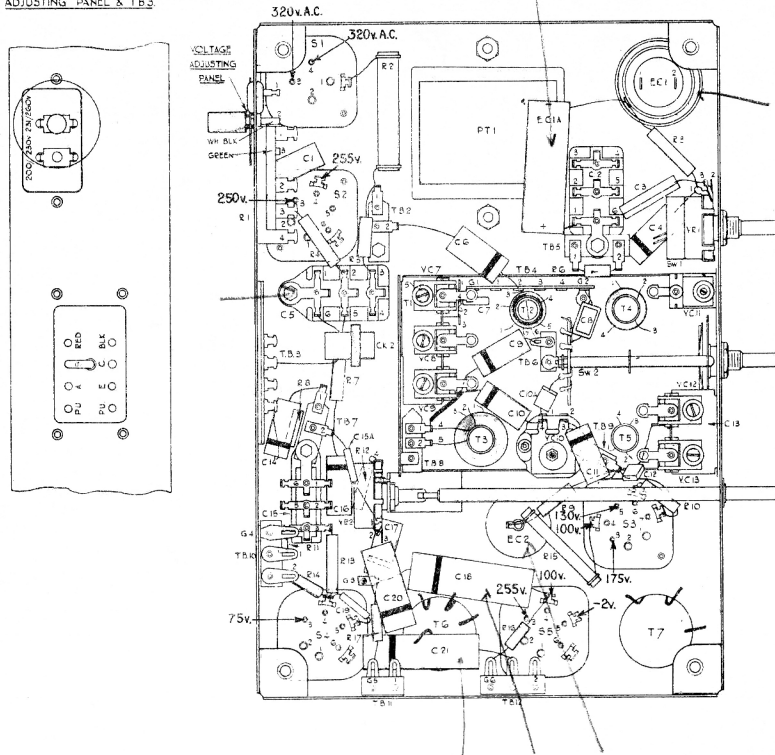


TOP CHASSIS DIAGRAM.



SCHEMATIC DIAGRAM - MODEL A-537.

DETAILS OF VOLTAGE  
ADJUSTING PANEL & TB3



UNDER CHASSIS DIAGRAM - MODEL A-537.

ALIGNMENT PROCEDURE.

Before leaving the Factory, all Philco Receivers are accurately aligned, but if mis-alignment is suspected through damage, it should not be attempted 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 indicator reads on index line (beyond 1,700 Kc.). Set wave-change switch in second position from left (M.W.) and turn volume control fully clockwise, and tone control as far counter clockwise as possible without switching off.

NOTE.—The link on TB3 must be placed in socket "B."

INTERMEDIATE FREQUENCY.—The I.F. trimmers (VC's 3, 4, 5 and 6) should first be carefully adjusted by feeding in a 451 Kc. signal from the Signal Generator to the grid cap of the 6A7 valve (with grid lead connected) and the Signal Generator earthed to the receiver chassis. 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.

Transfer signal generator lead via a Standard Dummy to the aerial socket.

NOTE.—It is important that the following order of alignment be followed.

LONG WAVES.—Turn wave-change switch to L.W. position (fully counter-clockwise rotation) and set gang at 290 Kc. Feed in a 290 Kc. signal and trim VC's 11 and 9 underneath chassis in that order for maximum output.

Feed in and tune a 160 Kc. signal. Rock gang and pad VC.10 (nut) for maximum output. Readjust VC.11 at 290 Kc. Repeat the above operation until no further improvement is obtainable.

MEDIUM WAVES.—Turn wave-change switch to second position clockwise (M.W.) and set gang at 1,400 Kc. Feed in a signal of 1,400 Kc. and trim VC's 12 and 8 underneath chassis in that order for maximum output.

Feed in and tune a signal of 600 Kc. Rock gang and pad VC.10 (screw) for maximum output. Readjust VC.12 at 1,400 Kc. Repeat the above operation until no further improvement results.

SHORT WAVES.—Turn wave-change switch to third position clockwise (S.W.). Substitute a 400 ohms resistor for the Standard Dummy and feed in an 18 Mc. signal. Set gang at 18 Mc. and adjust VC.13 underneath chassis for the second signal heard from tight (care is necessary as the two peaks are narrowly spaced).

NOTE.—Due to the very small difference between the pre-selector and oscillator frequencies, the adjustment of VC.7 will have a tendency to "pull" or change the frequency of the oscillator. By shunting a 21-plate variable condenser (approx. .00035 mfd.) across the oscillator section of the gang and tuning it so that the second harmonic instead of the fundamental beats with the incoming signal, this "pull" can be minimised.

Connect the shunt condenser between VC.13 tag and chassis and tune it (about half open) for signal at 18 Mc. Trim VC.7 underneath chassis for maximum output. Disconnect shunt condenser and retrim VC.13.

Check that the 18 Mc. image is obtained at approximately 17.1 Mc.

Feed in and tune a signal of 6 Mc. and check for correct reading on scale. It should not be necessary to adjust the semi-fixed tracker (C13) but if sensitivity is found to be low at 6 Mc., very slight adjustment only may be made while rocking the gang. Finally retrim VC.13 at 18 Mc.

Check calibration.

PARTS AND PRICE LIST — MODEL A-537.

REF. No.	DESCRIPTION,	PART No.	LIST PRICE s. d.	REF. No.	DESCRIPTION,	PART No.	LIST PRICE s. d.	
CK.2	Aerial Choke	320-1189	6	R.4	½ watt Insulated Resistor,			
T.1	Aerial Coupler Coil	32-2490 or	1 3		490,000 ohms	330-2010	9	
		320-1145	1 3	R.5	½ watt Insulated Resistor,			
T.2	S.W. Aerial Transformer	32-2485 or	3 6		99,000 ohms	330-2012	9	
		320-1146	3 6	R.6	½ watt Insulated Resistor,			
T.3	M. and L.W. Aerial Transformer	32-2504 or	4 9		240,000 ohms	330-2002	9	
		320-1142	4 9	R.7	½ watt Insulated Resistor,			
T.4	M. and L.W. Oscillator Coil	32-2513 or	2 6		1 megohm	330-2018	9	
		320-1136	2 6	R.8	½ watt Insulated Resistor,			
T.5	S.W. Oscillator Coil	32-2509 or	2 3		51,000 ohms	330-2015	9	
		320-1133	2 3	R.9	½ watt Insulated Resistor,			
T.6	2nd I.F. Transformer and Trimmers Assembly				10,000 ohms	330-2014	9	
VC.3				R.10	½ watt Insulated Resistor,			
VC.4					99,000 ohms	330-2012	9	
C.22				R.11	½ watt Insulated Resistor,			
C.23	Mica Condenser, 110 mmfd.	320-1126 or	7 6		10,000 ohms	330-2014	9	
R.18	¼ watt Insulated Resistor,	320-1155	7 6	R.12	½ watt Insulated Resistor,			
	51,000 ohms				99,000 ohms	330-2012	9	
T.7	1st I.F. Transformer and Trimmers Assembly	32-2101 or	7 6	R.13	½ watt Insulated Resistor,			
VC.5			7 6		1 megohm	330-2018	9	
VC.6			7 6	R.14	½ watt Insulated Resistor,			
VC.1	Two-gang Condenser	310-1024	13 0	R.15	1 watt Carbon Resistor,			
VC.2					10,000 ohms	3524	9	
VC.7	Triple Padder, 35+35+35 mmfd...	310-6020	1 3	R.16	½ watt Insulated Resistor,			
VC.8					25,000 ohms	330-2007	9	
VC.9				R.17	½ watt Insulated Resistor,			
VC.10	Double Padder, 125+375 mmfd. . .	310-6028	1 6		330,000 ohms	330-2017	9	
VC.11	Single Padder, 60—110 mmfd. . .	31-6176	8	VR.1	Tone Control, 500,000 ohms			
VC.12	Double Padder, 35+35 mmfd. . .	310-6018	1 0	SW.1	On/Off Switch	33-5200	3 0	
VC.13	Output Transformer,	Part No. 320-7036	360-1114 †	SW.2	Wave-change Switch	42-1302	4 0	
T.8				Speech Coil and Cone,	Complete	VR.2	Volume Control, 2 megohms	
	Part No. 360-4002	Speaker	20 0		(tapped at 1 megohm)	33-5158	2 6	
CK.1	Field Coil			S.1	4-prong Valve Holder	27-6044	4	
EC.1A	Electrolytic Condenser, 10 mfd. . .	300-4031	1 2	S.2	6-prong Valve Holder	27-6036	5	
EC.1	Electrolytic Condenser, 8+8 mfd. . .	30-2079	13 9	S.3	7-prong Valve Holder	27-6037	5	
	Insulator for EC.1	27-7194	1	S.4	6-prong Valve Holder	27-6036	5	
	Lug for EC.1	28-1022	doz. 3	S.5	6-prong Valve Holder	27-6036	5	
EC.2	Electrolytic Condenser, 16 mfd. . .	30-2126 or	4 3	P.T.1	Power Transformer, 50-100 cycles	320-7029	16 3	
		30-2128	4 3		Power Transformer,			
C.1	Tubular Condenser, .002 mfd. . .	30-4177	7		40-100 cycles (special)	320-7007	17 0	
C.2	Moulded Condenser,			L.P.1	Power Transformer, 25 cycles	320-7040	24 0	
	.015+.015 mfd.	3793-D.G.	1 0		Pilot Bulb	34-2064 or	1 4	
C.3	Mica Condenser, 410 mmfd. . .	300-1063	9		34-2141	1 4		
C.4	Tubular Condenser, .01 mfd. . .	30-4124	6		28-2726	2		
C.5	Moulded Condenser, .15+.15 mfd.	6287-D.G.	1 7		28-2214	doz. 5		
C.6	Tubular Condenser, .01 mfd. . .	30-4124	6		Rubber Bush	270-7264	1	
C.7	Mica Condenser, 250 mmfd. . .	300-1057	8		Mains Cable	LO-1009	1 7	
C.8	Mica Condenser, 250 mmfd. . .	300-1057	8		Speaker Cable	LO-1004	10	
C.9	Tubular Condenser, .01 mfd. . .	30-4124	6		Mains Voltage Adjusting Panel	380-5342	1 6	
C.10	Tubular Condenser, .01 mfd. . .	30-4124	6		Mains Voltage Adjusting Plug	380-5340	1 0	
C.10A	Mica Condenser, 30 mmfd. . .	300-1064	6		Dial Scale	270-5074	3 4	
C.11	Tubular Condenser, .001 mfd. . .	30-4201	6		Dial Scale Holder Assembly	380-5351	1 8	
C.12	Mica Condenser, 50 mmfd. . .	300-1058	8		Pointer and Hub Assembly	380-5352	9	
C.13	Mica Condenser, 1,650 mmfd. . .	31-6178	2 0		Wave-band Indicator	2 0-5073	5	
C.14	Tubular Condenser, .01 mfd. . .	30-4124	6		Large Tuning Knob and Spring	270-4035	8	
C.15	Moulded Condenser, .05 mfd. . .	3615-S.G.	9		Small Tuning Knob and Spring	270-4036	5	
C.15A	Mica Condenser, 110 mmfd. . .	300-1040	6		Knob (Volume) and Spring	270-4037	5	
C.16	Tubular Condenser, .01 mfd. . .	30-4124	6		Knob (Wave-change) and Spring	270-4038	5	
C.17	Tubular Condenser, .01 mfd. . .	30-4124	6		Knob (Tone) and Spring	270-4039	5	
C.18	Tubular Condenser, .25 mfd. . .	30-4446	10		Knob Spring for Large Knob	28-1738	doz. 3	
C.19	Mica Condenser, 110 mmfd. . .	300-1040	6		Knob Spring for Small Knob	280-5262	doz. 2	
C.20	Tubular Condenser, .05 mfd. . .	30-4020	7		Red Wander Plug	380-5087	2	
C.21	Tubular Condenser, .05 mfd. . .	30-4123	9	V.1	Black Wander Plug	380-5015	2	
R.1	Candohm Wire-wound Resistor,	33-3312	1 4	V.2	Type 80 Full Wave Rectifier Valve	3149	8 0	
	23+23+190 ohms			V.3	Type 42E Pentode Output Valve	6447-E	13 6	
R.2	2 watt Carbon Resistor,	33-1024	1 6	V.4	Type 6A7 Variable-mu Heptode	Valve	34-2002	15 0
	10,000 ohms			V.5	Type 75 Double Diode Triode Valve	8002	12 6	
R.3	½ watt Insulated Resistor,	330-2018	9		Type 78E Variable-mu			
	1 megohm				H.F. Pentode Valve	8315-E	12 6	

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

Above prices are not applicable in I.F.S.