



PHILCO



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Model 450 - Runs 1 & 2

TYPE CIRCUIT: Four valve Superheterodyne Unit-constructed Receiver with full A.V.C. and Quiescent Pentode Output (0.75 watt undistorted) for operation on Short, Medium and Long Wavebands. Built-in connections for Philco All-Wave Aerial—aerial selector built into and operated by the wave-change switch. 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.

POWER SUPPLY: Low Tension, Accumulator 2 volts, size 3 15/16 in. by 3 15/16 in. by 7 1/2 in. height; combined High Tension 135 volts tapped at 90 volts approx. and Grid Bias 9 volts in 1.5 volt steps, size 10 1/2 in. by 6 13/16 in. by 3 5/16 in. Suitable types are Exide 2v. Accumulator, type DKG and Exide type H.1138 or Siemens "Full-c-Power" type 11.9 or "Britannia" type 111 H.T. and G.B. Battery.

WAVE-BANDS: COVERAGE: Three: (a) Long, 150-360 Kc. (2,000-833-3 metres); (b) Medium, 530-1,750 Kc. (566-171.4 metres); (c) Short, 5.75-18 Mc. (52-16.6 metres).

TUNING DRIVE: Two-speed gear drive—ratios 8-1 and 40-1 for slow and accurate tuning. Glowing beam station indicator and new spread band 270 degrees scale.

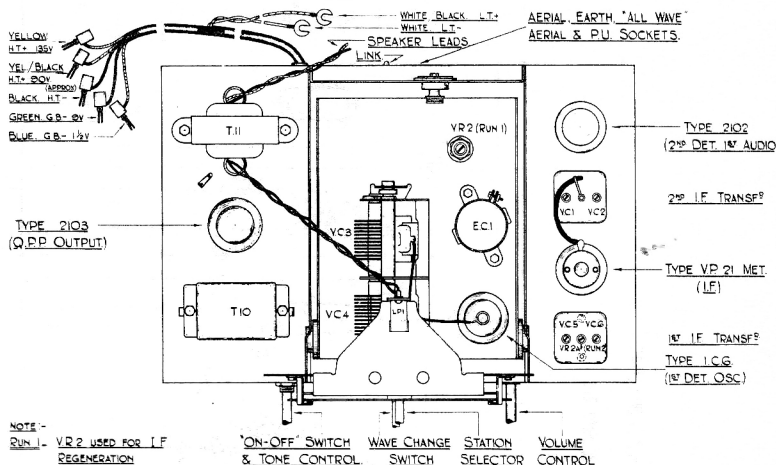
TOPE CONTROL: This is continuously variable, enabling a fine degree of tone between brilliant and mellow to be obtained. The on-off switch is combined with this control, thus allowing a particular setting of the separate volume control to be maintained.

LOUDSPEAKER: An 8 in. diameter permanent magnet moving coil speaker employing the latest nickel aluminium alloy is used, which, in conjunction with the Philco system of "audio degeneration," gives the highest efficiency audio output and greater bass response is obtained due to the large baffle.

INTERMEDIATE FREQUENCY: 451 Kc.

I.F. REGENERATION: A control is incorporated for varying the amount of I.F. gain. This adjustment is pre-set and should only require very slight alteration (if necessary) when a new I.F. valve (VP.21) is fitted.

POWER CONSUMPTION: L.T. current, 0.65 amp.; H.T. current, 13 milliamps quiescent, 14 milliamps average and 19 milliamps on maximum signal.



NOTE:
 RUN 1 - VR 2 USED FOR I.F. REGENERATION
 RUN 2 - VR 2 REMOVED & VR 2A ADDED

TOP CHASSIS DIAGRAM.

TABLE 1—VOLTAGES.

Valve socket readings to chassis taken with an 065 or 077 Philco Set Tester, using the 250 and 100 volts ranges. Volume control at minimum, tone control fully brilliant, wave-change switch in M.W. position and no aerial connected.

POSITION.	VALVE.	ANODE.	SCREEN.
1st Detector and Oscillator S.2 ..	10.6	Pin 3. 135 v. " 4. 100 v.*	Pin 6. 50 v.
I.F. Amplifier, S.4	VP.21	Cap. 135 v.	Pin 7. 40 v. approx.
2nd Detector, A.V.C. and 1st L.F. Amplifier, S.3	2102	Pin 3. 90 v.	—
Quiescent Pentode Output, S.1 ..	2103	Pin 3. 135 v. " 7. 135 v.	Pin 5. 135 v.

* Oscillator Anode Volts.
 Filament voltage for each valve and L.P.1, 2 volts.

TABLE 2.—RESISTANCES OF COILS.

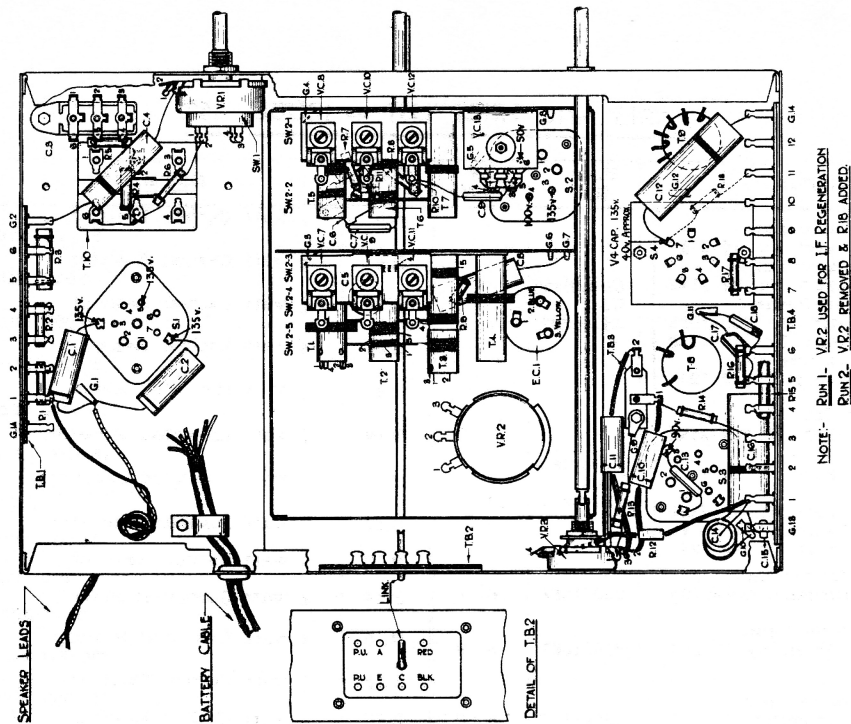
(Link on TB.2 to be in socket "B".)

REF. NO.	TEST PROD 1.	TEST PROD 2.	RESISTANCE (OHMS)
T.1 Primary ..	TB.2 Socket "A"	Chassis	SW.2. L.W. 80
T.1 Primary, Tapping 2 ..	TB.2 Socket "Red"	"	" " 10
T.1 Primary, Tapping 3 ..	TB.2 Socket "C"	"	" " 5
T.1 Secondary ..	SW.2/4 tag 8	TB.4/8	" " 5
T.1 Secondary with T.5 in series	V.2 Cap	"	" " 25
T.3 Primary ..	TB.2 Socket "A"	Chassis	" M.W. 2
T.3 Primary Tapping ..	TB.2 Socket "C"	"	" " 1
T.3 Secondary ..	V.2 Cap	TB.4/8	" " 5
T.2 Primary ..	TB.2 Socket "A"	Chassis	" S.W. 0.2 " Gram.Infinity
T.2 Primary Tapping ..	TB.2 Socket "C"	"	" S.W. 0.1 " Gram.Infinity
T.2 Secondary ..	V.2 Cap	TB.4/8	" S.W. 0.1 " Gram. Zero

REF. NO.	TEST PROD 1.	TEST PROD 2.	RESISTANCE (OHMS)
T.9 Primary ..	V.2/3	TB.4/11	8
T.9 Secondary ..	TB.4/8	V.4/2	12
T.9 Reaction ..	V.4/3	Chassis	0.1
T.7	V.2/5	SW.2/2 tag 7	S.W.2. L.W. 16.5
T.6	"	"	" M.W. 8
T.5	"	"	" S.W. 0.1 " Gram. 32,000 approx.
T.5 Reaction ..	V.3/4	SW.2/2 tag 4	0.5
T.8 Primary ..	V.4 Cap	TB.4/11	12
T.8 Secondary ..	V.3/5	TB.4/6	8
T.10 Primary ..	C.3/1	T.10/5	650 approx.
T.10 Secondary ..	V.1/4 V.1/6	T.10/2 T.10/2	3,000 3,000
T.11 Primary ..	V.1/3 V.1/7	TB.4/11 "	250 250
T.11 Secondary ..	TB.1/2	Chassis	0.2*
L.S.	Tag 1	Tag 2	2*

* Resistance of T.11 Secondary alone and L.S. alone (taken when disconnected).

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



UNDER CHASSIS DIAGRAM.

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., V 1/3 and V 1/7. With gang condenser fully open, check that indicator reads on index line (above 1,750 Kc.). Set wave-change switch in second position from left (M.W.), turn volume control fully clockwise and tone control as far counter clockwise as possible without switching off.

NOTE.—The link on TB.2 must be placed in socket "B."

INTERMEDIATE FREQUENCY.—The I.F. trimmers (V.C's 1, 2, 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 1C6 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. If instability is present, turn the I.F. Regeneration control (VR2 on Run 1 Models or VR2A on Run 2 Models) counter clockwise until stability is obtained and then trim. Adjust VR2 or VR2A for maximum sensitivity without instability and retrim V.C's 1, 2, 5 and 6.

NOTE.—VR2 or VR2A should not be readjusted after final trimming V.C's 1, 2, 5 and 6. Transfer Signal Generator lead via a Standard Dummy to the Aerial socket.

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 V.C's 12 and 11 underneath chassis in that order for maximum output.

Feed in and tune a 160 Kc. signal. Rock gang and pad V.C.13 (nut) for maximum output. Readjust trimming at 290 Kc. and padding at 160 Kc. until no further improvement is obtainable.

MEDIUM WAVES.—Turn wave-change switch to second position clockwise (M.W.) and set gang at 1,750 Kc. Feed in a signal of 1,750 Kc. and trim V.C's 10 and 9 underneath the chassis in that order for maximum output.

Feed in and tune a signal of 600 Kc. Rock gang and pad V.C.13 (screw) for maximum output. Readjust trimming at 1,750 Kc. and padding at 600 Kc. 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 V.C.8 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 V.C.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 V.C. 8 tag and chassis and tune it (about half open) for signal at 18 Mc. Trim V.C. 7 underneath chassis for maximum output. Disconnect shunt condenser and retrim V.C. 8.

Check that the 18 Mc. image is obtained at approximately 17.5 Mc.

Feed in and tune a signal of 6 Mc. and check for correct reading on scale. (There is no tracker adjustment for 6 Mc.)

Check calibration.

PARTS AND PRICE LIST — MODEL 450.

REF. No.	DESCRIPTION.	PART No.	LIST PRICE.	REF. No.	DESCRIPTION.	PART No.	LIST PRICE.
T.1	L.W. Aerial Transformer, Part No. 32-2187	Complete Unit 380-5222	17 0	R.5	¼ watt Carbon Resistor, 51,000 ohms	380-1019	9
T.2	S.W. Aerial Transformer, Part No. 32-2142			R.6	¼ watt Carbon Resistor, 1,000 ohms	380-2019	9
T.3	M.W. Aerial Transformer, Part No. 320-1063			R.7	¼ watt Carbon Resistor, 10,000 ohms	33-1000	9
T.4	Rejector Coil Part No. 32-2188			R.8	¼ watt Carbon Resistor, 32,000 ohms	33-1208	9
SW.2-3 } SW.2-4 } SW.2-5 }	Wave-change Switch (Aerial Section) Part No. 42-1235			R.9	¼ watt Insulated Resistor, 490,000 ohms	330-2001	9
T.5	S.W. Oscillator Coil, Part No. 32-2143	Complete Unit 380-5223	12 0	R.10	¼ watt Insulated Resistor, 160,000 ohms	330-2024	9
T.6	M.W. Oscillator Coil, Part No. 32-2120			R.11	¼ watt Insulated Resistor, 51,000 ohms ± 5%	330-2027	9
T.7	L.W. Oscillator Coil, Part No. 32-2189			R.12	¼ watt Insulated Resistor, 51,000 ohms	330-2004	9
SW.2-1 } SW.2-2 }	Wave-change Switch (Oscillator Section), Part No. 42-1236			R.13	¼ watt Carbon Resistor, 200 ohms	330-1030	9
T.8	2nd I.F. Transformer and Trimmers Assembly			R.14	¼ watt Carbon Resistor, 1 megohm	330-1018	9
VC.1 } VC.2 }		320-1088	6 6	R.15	½ watt Insulated Resistor, 330,000 ohms	330-2017	9
T.9	1st I.F. Transformer and Trimmers Assembly, Run 1			320-1087	6 9	R.16	¼ watt Carbon Resistor, 51,000 ohms
VC.5 } VC.6 }		320-1107	6 0			R.17	¼ watt Carbon Resistor, 1 megohm
T.9	1st I.F. Transformer and Trimmers Assembly, Run 2			320-1107	6 0	R.18	¼ watt Carbon Resistor, 240,000 ohms (Run 2 only)
VC.5 } VC.6 }		320-7043	8 9			VR.1	Tone Control 100,000 ohms } On-off Switch (4 point) ... }
VR.2A	Intervalve Transformer ...			320-7042	2 9	VR.2	
T.10	Output Transformer ...	320-7042	2 9	VR.3	Volume Control ...	33-5166	2 6
LS.	Speech Coil and Cone, Part No. 360-3030	360-1039	18 3	S.1	7-Prong Valve Holder ...	27-6037	5
VC.3 } VC.4 }	Two-gang Condenser ...	31-1821	13 6	S.2	6-Prong Valve Holder ...	27-6036	5
VC.7 } VC.9 }				310-6020	1 3	S.3	6-Prong Valve Holder ...
VC.11 } VC.8 }	Triple Padder 35+35+35 mmfd.	310-6020	1 3			S.4	7-Prong Valve Holder (English type)
VC.10 } VC.12 }				Triple Padder 35+35+35 mmfd.	310-6020	1 3	LP.1
VC.13 } EC.1 }	Double Padder 375+600 mmfd. Electrolytic Condenser 2+4+2 mfd.	31-6060	2 0				
C.1				Tubular Condenser .002 mfd. ...	30-4177	3 6	
C.2	Tubular Condenser .002 mfd. ...	30-4177	7		Dial Scale and Hub Assembly ...	380-5214	2 10
C.3	Moulded Condenser .09 mfd. ...	4989-SU	9		Dial Scale Mask ...	270-5047	6
C.4	Tubular Condenser .03 mfd. ...	30-4025	7		Dial Scale Guard ...	27-8324	2
C.5	Tubular Condenser .05 mfd. ...	30-4020	7		Grid Clip ...	28-2214	doz. 5
C.6	Mica Condenser, Fixed Tracker 3,500 mmfd.	31-6097	1 10		Rubber Bush ...	4126	1
C.7	Mica Condenser 250 mmfd. ...	300-1057	8		Rubber Buffers ...	270-7189	1
C.8	Tubular Condenser .03 mfd. ...	30-4025	7		Chassis Mounting Rubbers ...	5189	1
C.9	Mica Condenser 50 mmfd. ...	300-1045	6		Chassis Mounting Washers ..	29-2089	doz. 2
C.10	Tubular Condenser .01 mfd. ...	30-4124	6		Chassis Mounting Bolts ...	W-1345A	1
C.11	Tubular Condenser .01 mfd. ...	30-4124	6		Speaker Cable ...	LO-1041	7
C.12	Tubular Condenser .1 mfd. ...	30-4122	6		Battery Cable LO-1048 ...		
C.13	Mica Condenser 110 mmfd. ...	300-1040	6		Spade Tags 280-1012 ...		
C.14	Tubular Condenser .01 mfd. ...	30-4145	7		Yellow Plug H.T.+135v. 380-5004	Complete Assembly 410-3008	4 6
C.15	Mica Condenser 110 mmfd. ...	300-1040	6		Brown Plug H.T.+90v. 380-5272		
C.16	Tubular Condenser .25 mfd. ...	30-4146	10		Black Plug H.T.— 380-5226		
C.17	Mica Condenser 110 mmfd. ...	300-1040	6		Blue Plug G.B.—1½v. 380-5020		
C.18	Mica Condenser 110 mmfd. ...	300-1040	6		Green Plug G.B.—9v. 380-5021		
R.1	¼ watt Carbon Resistor, 2,000 ohms	33-1029	9	V.1	Type 2103 Quiescent Pentode Output Valve }	34-2067	17 6
R.2	¼ watt Carbon Resistor, 2,000 ohms	33-1029	9	V.2	Type IC6 Variable-mu Heptode Valve	34-2033	14 0
R.3	½ watt Carbon Resistor, 45,000 ohms	330-1027	9	V.3	Type 2102 Double Diode Triode Valve	34-2066	13 0
R.4	¼ watt Carbon Resistor, 160,000 ohms	33-1191	9	V.4	Type VP.21 (Metallized) Variable-mu H.F. Pentode Valve }	340-2002	11 0