

Circuit diagram of the Philco U427 A.C./D.C. People's Set. This shows the Run 2 model. Modifications for Runs 1, 3 and 4 are given under "Chassis Divergencies."

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1, V2 fixed G.B. resistance	200
R2	V1 osc. C.G. resistance	51,000
R3	V1 osc. anode resistance	10,000
R4	V1, V2 S.G.'s H.T. feed	25,000
R5	V1, V2 A.V.C. line decoupling	2,000,000
R6	I.F. stopper	51,000
R7	V3 signal diode load; vol. control	350,000
R8	V3 pentode C.G. I.F. stopper	99,000
R9	V3 pentode C.G. resistance	240,000
R10	V3 pentode C.G. decoupling	240,000
R11	V3 pentode S.G. H.T. feed	5,000
R12	V3 G.B. and A.V.C. delay	160
R13	voltage resistances	140
R14	V3 A.V.C. diode load	330,000
R15		490,000
R16	Speaker field series resistance	1,800

CONDENSERS		Values (μF)
C1	Part of aerial I.F. filter tuning	0.00025
C2	Earth blocking condenser	0.01
C3	Aerial coupling condenser	0.00025
C4	V1 tetrode C.G. decoupling	0.05
C5	V1, V2 cathode by-pass	0.25
C6	V1 osc. anode coupling	0.0008
C7	V1, V2 S.G.'s by-pass	0.05
C8	Coupling to V3 A.V.C. diode	0.00011
C9	I.F. by-passes	0.00012
C10		0.00012
C11	A.F. coupling to V3 pentode	0.01
C12	V3 pentode C.G. decoupling	0.01
C13	Tone corrector	0.01
C14	V3 S.G. by-pass	1.0
C15*		8.0
C16*		8.0
C17*	H.T. smoothing	8.0
C18*		8.0
C19	V4 anode-cathode by-pass	0.1
C20	Mains R.F. by-pass	0.01
C21†	Aerial I.F. filter tuning	—
C22†	Aerial circuit L.W. trimmer	0.00008
C23†	Aerial circuit tuning	—
C24†	Aerial circuit trimmer	—
C25†	Oscillator circuit tuning	—
C26†	Oscillator circuit M.W. trimmer	—
C27†	Oscillator circuit L.W. trimmer	—
C28†	Oscillator circuit M.W. tracker	—
C29†	Oscillator circuit L.W. tracker	—
C30†	1st I.F. trans. pri. tuning	—
C31†	1st I.F. trans. sec. tuning	—
C32†	2nd I.F. trans. pri. tuning	0.00008

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial I.F. filter coil	14.0
L2	Aerial M.W. coupling coil	23.5
L3	Aerial M.W. tuning coil	25.0
L4	Aerial L.W. coupling coil	120.0
L5	Aerial L.W. tuning coil	44.0
L6	Oscillator M.W. tuning coil	2.75
L7	Oscillator L.W. tuning coil	18.0
L8	1st I.F. trans.	Pri. 8.0
L9		Sec. 12.0
L10	2nd I.F. trans.	Pri. 30.0
L11		Sec. 80.0
L12	Speaker speech coil	2.0
L13	Speaker field coil	3,300.0
L14	H.T. smoothing choke	270.0
T1	Speaker input	460.0
	trans. Pri. Sec.	0.4
X	Small couplings	—
Y		—
S1-8	Waveband switches	—
S9	Mains switch, ganged R7	—
F1	Mains circuit fuse, 1.0 A	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on A.C. mains of 230 V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6A7E*	200	4.6	100	2.5
V2 78E	200	6.0	100	1.3
V3 Pen/DD	2530	—	—	—
V4 35RE†	190	26.0	170	5.8

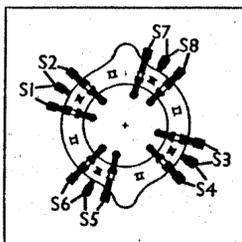
* Oscillator anode (G2) 155V, 3.8 mA.

† Cathode to chassis, 230 V D.C.

GENERAL NOTES

Switches.—S1-S8 are the waveband switches, in a single rotary unit beneath the chassis. This is indicated in our under-chassis view, and shown in detail in the diagram below, as seen looking from the rear of the underside of the chassis. S1, S3, S5 and S7 are closed on the M.W. band, and open on the L.W. band, while S2, S4, S6 and S8 are open on the M.W. band and closed on the L.W. band.

The switch unit, looking from the rear of the underside of the chassis.



S9 is the Q.M.B. mains switch, ganged with the volume control, R7.

Coils.—Most of the coils are unscreened, on cylindrical formers, disposed at various points beneath the chassis. The only screened unit is the first I.F. transformer, which is mounted on the chassis deck, and includes the two trimmers. The second I.F. transformer, beneath the chassis, has an untuned secondary, the primary being tuned by C32, reached through a hole in the rear of the chassis.

Scale Lamp.—This is a Tung-Sol miniature bayonet cap type, rated at 6.3 V, 0.35 A (Philco Part No. 34-2141).

CIRCUIT ALIGNMENT

Connect an output meter across the primary of T1 or to the Ext. I.S. sockets. See that the receiver scale pointer is in line with the index arrow when the gang is at minimum.

I.F. Stages.—Switch receiver to M.W., and turn volume control to maximum. Connect signal generator to control grid (top cap) of V1 (leaving existing lead connected), and receiver earth socket (not chassis). Feed in a 451 KC/S signal, and adjust C32, C31 and C30 for maximum output. Repeat several times, and take particular care with C32.

I.F. Filter.—Remove generator lead from top cap of V1 and transfer (via dummy aerial) to A socket. Feed in a 451 KC/S signal, and adjust C21 (screw) for minimum output.

R.F. and Oscillator Stages.—Switch set to M.W., tune to 1,400 KC/S on scale. Feed a 1,400 KC/S signal into A and E sockets, and adjust C26 and C24 for maximum output, in that order. Feed in a 600 KC/S signal, tune it in, and adjust C28 (screw) for maximum output while rocking the gang for optimum results. Re-adjust C26 and C24 at 1,400 KC/S and C28 at 600 KC/S until no further improvement results.

Switch set to L.W., tune to 290 KC/S on scale, feed in a 290 KC/S signal and adjust C27 (nut) and C22 for maximum output. Feed in a 160 KC/S signal, tune it in, and adjust C29 (nut) for maximum output while rocking the gang. Re-adjust C27 and C22 at 290 KC/S and C29 at 160 KC/S until no further improvement results.

CHASSIS DIVERGENCIES

Modifications in the chassis have been made in each successive run up to the present. This Service Sheet was produced on a Run 2 model.

Run 1.—Instead of the single Q.M.B. mains switch, S9, there was apparently a double pole type. Slight differences in the position and wiring of components may be noted.

Run 3.—The Candohm resistor R16 is replaced by a 10-15 W vitreous 1,800 Ω resistor. The positions of C14 and R11 are altered.

Run 4.—The energised speaker is replaced by a permanent magnet type. L13 (speaker field) and R16 are therefore not present.