

Circuit diagram of the Philco P337 3-band battery receiver. L5 and L6 are small couplings formed by twisted wires.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	Aerial circuit potentiometer	100,000
R2	V1 anode H.T. feed	10,000
R3	Reaction circuit damping	180
R4	V2 grid leak	1,000,000
R5	V2 anode R.F. stopper	15,000
R6	V2 anode H.T. feed	51,000
R7	Automatic G.B. potentiometer	400
R8	resistances	120

CONDENSERS		Values (μF)
C1	V1 C.G. decoupling	0.05
C2	V1 S.G. decoupling	0.09
C3	V1 anode decoupling	0.09
C4	V2 anode M.W. and L.W. R.F. by-pass	0.00025
C5	V2 C.G. condenser	0.00003
C6	V2 anode decoupling	0.5
C7*	Automatic G.B. circuit by-pass	35.0
C8	H.T. reservoir	1.0
C9	V3 anode tone corrector	0.003
C10†	Band-pass primary M.W. trimmer	—
C11†	Band-pass primary L.W. trimmer	—
C12†	Band-pass primary tuning	—
C13†	Band-pass secondary and S.W. aerial tuning	—
C14†	Band-pass secondary M.W. trimmer	—
C15†	Band-pass secondary L.W. trimmer	—
C16†	Aerial circuit S.W. trimmer	0.00003
C17†	Reaction control	—
C18†	R.F. trans. sec. S.W. trimmer	0.00003
C19†	R.F. trans. sec. M.W. trimmer	—
C20†	R.F. trans. sec. L.W. trimmer	—
C21†	R.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial M.W. coupling coil	1.25
L2	Band-pass M.W. primary	1.5
L3	Aerial L.W. coupling coil	17.0
L4	Band-pass L.W. primary	18.5
L5	Band-pass coupling coils	Very low
L6	Band-pass coupling coils	Very low
L7	Aerial S.W. coupling coil	0.5
L8	Aerial S.W. tuning coil	0.05
L9	Band-pass M.W. secondary	1.5
L10	Band-pass L.W. secondary	20.0
L11	R.F. trans. S.W. primary	0.1
L12	R.F. trans. M.W. primary	5.0
L13	R.F. trans. L.W. primary	15.0
L14	M.W. and L.W. reaction coil	10.0
L15	S.W. reaction coil	0.1
L16	R.F. trans. S.W. secondary	0.05
L17	R.F. trans. M.W. secondary	1.75
L18	R.F. trans. L.W. secondary	18.0
L19	Speaker speech coil	2.25
T1	Intervale trans. Pri.	1,250.0
	Sec.	10,000.0
T2	Speaker input trans. Pri.	725.0
	Sec.	0.3
S1-S16	Waveband switches	—
S17	H.T. circuit switch	—
S18	L.T. circuit switch	—

S.W.—Switch set to S.W. and return reaction to minimum. Use a 400 Ω resistance in place of the dummy aerial, and feed in an 18 MC/S (16.7 m.) signal. Tune to 17.8 MC/S on scale, then adjust C18 and C16 for maximum output. Check with the signal that is received at 18 MC/S on scale when reaction is advanced to a point just short of oscillation. Check also at 6 MC/S.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an H.T. battery reading 150 V on load. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. 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 SP21	122	1.6	134	0.5
V2 HL2	65	1.0	—	—
V3 OP22	138	5.8	143	1.1

GENERAL NOTES

Switches.—S1-S16 are the waveband switches, ganged in two rotary units beneath the chassis. The units are indicated in our under-chassis view, and are shown in detail in the diagrams on page iv, where the units are seen looking from the rear of the underside of the chassis.

The table (page iv) gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C closed.

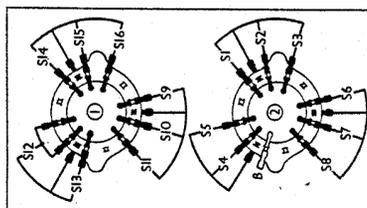
S17 and S18 are the H.T. and L.T. circuit switches, of the Q.M.B. type, in a single unit ganged with the volume control (aerial circuit potentiometer) R1.

Coils.—L1-L4; L9, L10; and L12, L13, L14, L17, L18 are in three screened units on the chassis deck. L5, L6 are small couplings formed of twisted wires, indicated in our plan chassis view where they pass through a hole in the chassis deck. L7, L8 and L11, L15, L16 are in two unscreened tubular units beneath the chassis, indicated in our under-chassis view.

External Speaker.—Two sockets are provided on the internal speaker input transformer terminal panel for a low impedance (2-3 Ω) external speaker.

Condenser C1.—This is a Philco black moulded unit, of which the two outer tags form the condenser connections. The centre tag is merely a bearer (marked "b" in our under-chassis view).

Condensers C2, C3.—These are in a single black moulded unit, the end tag which is connected to chassis by the fixing bolt being common to both condensers.



Chassis Divergencies.—C6 may have been 0.01 μF or 0.05 μF in early chassis. It is 0.5 μF in our chassis, and should be increased to this value in early models. R3 was not included in the makers' diagram, but is in our chassis. V2 is shown as a T2 triode, but is actually a Philco HL2.

Batteries.—Suggested types are: L.T., 2 V 45 AH accumulator cell, such as the Exide DFG or Ever Ready GS45. H.T., 150 V dry battery, such as the Exide H1081A, Ever Ready Portable 37 or Siemens Full-o'-Power 1317. Grid bias is automatic.

Battery Leads and Voltages.—White lead, spade tag, L.T. negative; black/white lead, spade tag, L.T. positive 2 V; black lead and plug, H.T. negative; yellow/black lead, brown plug, H.T. positive 1, +140V; yellow lead and plug, H.T. positive 2, +150 V.

CIRCUIT ALIGNMENT

With gang condenser at minimum (fully out of mesh), pointer should cover index line just above "M.W." at higher frequency end of scale. Turn volume control to maximum, and reaction to minimum.

L.W.—Switch set to L.W., set pointer to 290 KC/S on scale, feed in a 290 KC/S (1,034.5 m.) signal via a dummy aerial to A and E sockets. Adjust C11, C15 and C20 in that order, for maximum output. Repeat this several times, then increase reaction to a point just short of oscillation and re-adjust C20, but do not alter C11 and C15. Check at 160 KC/S.

M.W.—Switch set to M.W. and return reaction to minimum. Tune to 1,400 KC/S on scale, and feed in a 1,400 KC/S (214.3 m.) signal. Adjust C10, C14 and

SWITCH TABLE

Switch	L.W.	M.W.	S.W.
S1	O	O	C
S2	O	O	O
S3	C	C	O
S4	O	C	O
S5	C	O	O
S6	O	O	C
S7	O	O	O
S8	C	O	O
S9	O	O	C
S10	O	C	O
S11	C	O	O
S12	O	C	O
S13	O	O	C
S14	O	O	C
S15	O	O	O
S16	C	O	O

C19 for maximum output in turn. Repeat several times, then increase reaction to a point just short of oscillation and re-adjust C19 only. Check at 600 KC/S.