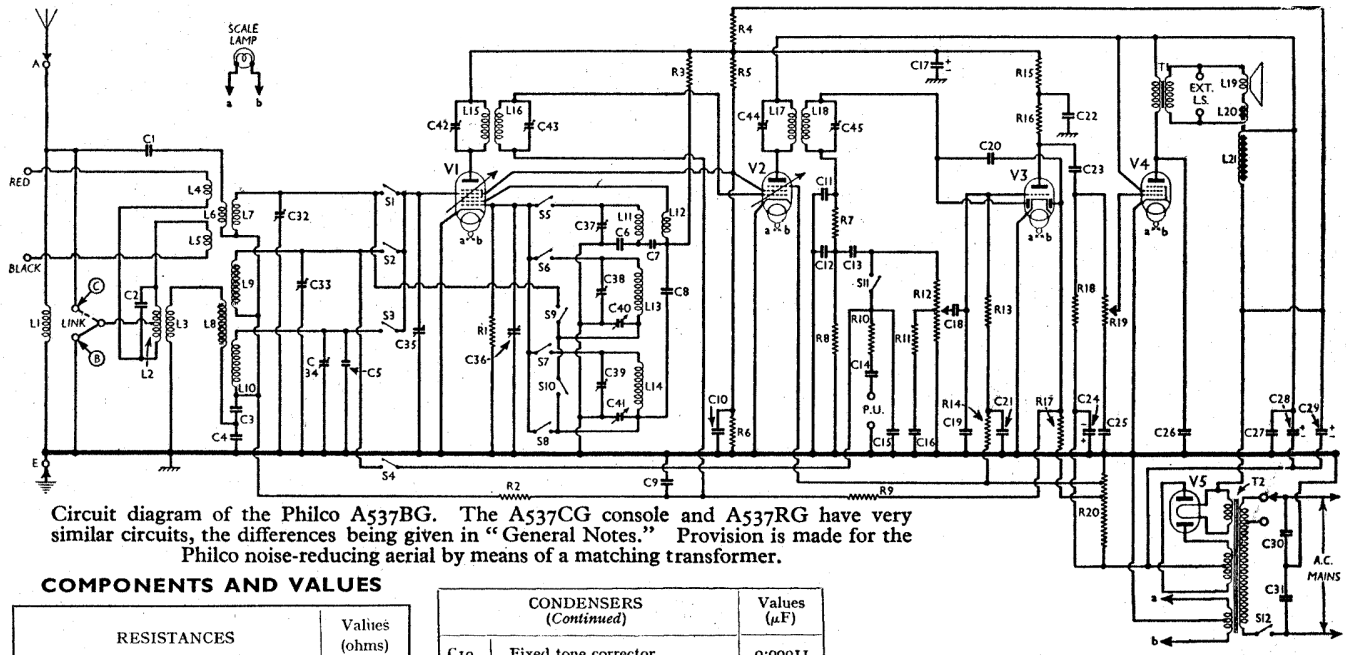
PHILCO - A537BG & A537CG & A537RG



Circuit diagram of the Philco A537BG. The A537CG console and A537RG have very similar circuits, the differences being given in "General Notes." Provision is made for the Philco noise-reducing aerial by means of a matching transformer.

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 osc. C.G. resistance ..	99,000
R2	V1 C.G. decoupling	10,000
R3	V1 osc. anode H.T. feed ..	10,000
R4	V1, V2 S.G., V1, V3 anode H.T. feed	10,000
R5	V1, V2 S.G. H.T. potential divider	10,000
R6		25,000
R7	I.F. stopper	51,000
R8	V3 signal diode load	330,000
R9	A.V.C. line decoupling ..	1,000,000
R10	Part P.U. input circuit tone filter	51,000
R11	Part of bass boosting circuit	99,000
R12*	Manual volume control ..	2,000,000
R13	V3 triode C.G. resistance ..	1,000,000
R14	V3 triode C.G. decoupling ..	490,000
R15	V3 triode anode decoupling ..	99,000
R16	V3 triode anode load	240,000
R17	V3 A.V.C. diode load	1,000,000
R18	V4 C.G. resistance	1,000,000
R19	Variable tone control	500,000
R20†	Automatic G.B. potential divider	236

* Tapped at 1,000,000 O.
† Tapped (from chassis) at 23 O, 23 O and 190 O.

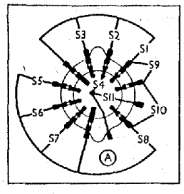
	CONDENSERS	Values (μF)
C1	Aerial series condenser ..	0·01
C2	Matching transformer pri. tuning	0·00025
C3	Parts of aerial coupling and impedance matching circuit on M.W. and L.W.	0·01
C4		0·01
C5	Aerial circuit L.W. fixed trimmer	0·00003
C6	Osc. circuit S.W. tracker ..	0·00165
C7	Additional osc. anode S.W. coupling	0·00005
C8	Osc. anode coupling on M.W. and L.W.	0·001
C9	A.V.C. line decoupling ..	0·05
C10	V1, V2 S.G. decoupling ..	0·25
C11	I.F. by-pass condensers	0·00011
C12		0·00011
C13	A.F. coupling to R12	0·05
C14	Parts of P.U. input circuit tone filter	0·01
C15		0·00025
C16	Part of bass boosting circuit..	0·01
C17*	V1, V3 H.T. circuit decoupling	16·0
C18	A.F. coupling to V3 triode ..	0·01

	CONDENSERS (*Continued*)	Values (μF)
C19	Fixed tone corrector	0·00011
C20	V3 A.V.C. diode feed condenser	0·00011
C21	V3 C.G. decoupling	0·15
C22	V3 triode anode decoupling ..	0·15
C23	V3 triode to V4 A.F. coupling	0·01
C24*	V4 C.G. decoupling	10·0
C25	Part of T.C. circuit	0·00041
C26	V4 anode fixed tone corrector	0·002
C27	H.T. circuit R.F. by-pass ..	0·05
C28*	H.T. smoothing ..	8·0
C29*		8·0
C30	Mains R.F. by-passes	0·015
C31		0·015
C32‡	Aerial circuit S.W. trimmer ..	0·000035
C33‡	Aerial circuit M.W. trimmer ..	0·000035
C34‡	Aerial circuit L.W. trimmer ..	0·000035
C35†	Aerial circuit tuning	—
C36†	Oscillator circuit tuning ..	—
C37‡	Osc. circuit S.W. trimmer ..	0·000035
C38‡	Osc. circuit M.W. trimmer ..	0·000035
C39‡	Osc. circuit L.W. trimmer ..	0·00011
C40‡	Osc. circuit M.W. tracker ..	0·000125
C41‡	Osc. circuit L.W. tracker ..	0·000375
C42‡	1st I.F. trans. pri. tuning ..	—
C43‡	1st I.F. trans. sec. tuning ..	—
C44‡	2nd I.F. trans. pri. tuning ..	—
C45‡	2nd I.F. trans. sec. tuning ..	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Mod. hum rejector and anti-break through choke ..	17·0
L2	M.W. and L.W. coupling transformer	6·0
L3		17·0
L4	Transmission line input coils	0·2
L5		0·2
L6	Aerial coupling coil	0·8
L7	Aerial S.W. tuning coil ..	0·1
L8	M.W. and L.W. coupling coil	0·5
L9	Aerial M.W. tuning coil ..	3·2
L10	Aerial L.W. tuning coil ..	36·0
L11	Oscillator S.W. tuning coil ..	0·1
L12	Oscillator S.W. reaction coil ..	0·45
L13	Oscillator M.W. tuning coil ..	2·5
L14	Oscillator L.W. tuning coil ..	17·5
L15	1st I.F. trans. Pri.	10·0
L16	Sec.	12·0
L17	2nd I.F. trans. Pri.	12·0
L18	Sec.	10·0
L19	Speaker speech coil	2·2
L20	Hum neutralising coil.. ..	0·2
L21	Speaker field coil	1,140·0
T1	Speaker input trans. Pri. ..	215·0
	Sec. ..	0·3
T2	Mains trans. Pri., total ..	20·0
	Heater sec. ..	0·2
	Rect. heat. sec.	0·2
	H.T. sec., total	380·0
S1-S10	Waveband switches	—
S11	Radiogram change switch ..	—
S12	Mains switch, ganged R19 ..	—

Switch diagram, looking from the front of the underside of the chassis.



Switch	L.W.	M.W.	S.W.	Gram.
S1	—	—	C	—
S2	—	C	—	—
S3	C	—	—	—
S4	C	—	—	—
S5	—	—	C	—
S6	—	C	—	—
S7	C	—	—	—
S8	—	—	—	C
S9	C	—	—	—
S10	—	C	—	—
S11	—	—	—	C

VALVE ANALYSIS

Valve voltages and currents given in the table (col. 3) are those measured in our receiver when it was operating on mains of 230 V, using the 200-230 V tapping on the mains transformer. 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 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6A7E* ..	165	3·4	85	2·6
V2 78E ..	265	4·9	85	1·2
V3 75 ..	65	0·2	—	—
V4 42E ..	255‡	38·0	265	8·3
V5 80 ..	335†	—	—	—

* Oscillator anode 110 V, 4·2 mA.
† Each anode, A.C.

GENERAL NOTES

Switches.—**S1-S10** are the wavechange switches, and **S11** the radiogram switch, ganged in a single 4-position rotary unit beneath the chassis, which is indicated in our under-chassis view by the letter A in a circle and an arrow. The arrow shows the direction in which the unit is viewed in the diagram on page VIII.

The table (p. VIII) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

S12 is the Q.M.B. mains switch, ganged with the variable tone control, **R19.**

Coils.—All the R.F. and oscillator coils are beneath the chassis, in unscreened units. **L1** is on its own near the rear member. **L2, L3**; **L4-L7**; **L8-L10**; **L11, L12** and **L13, L14** are in five tubular units, their associated trimmers being close to them in each case.

The I.F. transformers **L15, L16** and **L17, L18** are in two screened units on the chassis deck, with their trimmers. Note that the **L17, L18** unit also contains **R7, C11** and **C12.**

Scale Lamp.—This is a Tung Sol miniature bayonet cap type, rated at 6·3 V, 0·35 A (Philco part No. 34-2064 or 34-2141).

CIRCUIT ALIGNMENT

With gang at minimum, pointer should cover index line, beyond 1,700 KC/S, just above the words "Medium Wave." Switch set to M.W., turn volume-control to maximum, and tone control fully anti-clockwise (without operating mains switch, of course). The link at rear of chassis should be in socket **B.**

I.F. Stages.—Feed a 451 KC/S signal to top cap of **V1** and chassis, leaving existing connection in place. Adjust **C45, C44, C43** and **C42** in turn for maximum output.

R.F. and Oscillator Stages.—Connect signal generator to **A** (via dummy aerial) and **E** sockets. Align in following order.

L.W.—Switch set to L.W., feed in a 290 KC/S signal, tune to 290 KC/S on scale, and adjust **C39,** then **C34,** for maximum output. Feed in a 160 KC/S signal, tune it in, and adjust **C41** (nut) for maximum output, whilst rocking the gang for optimum results. Re-adjust **C39** at 290 KC/S and **C41** at 160 KC/S until no further improvement results.

M.W.—Switch set to M.W., feed in a 1,500 KC/S signal, tune to 1,400 KC/S on scale, and adjust **C38,** then **C33,** for maximum output. Feed in a 600 KC/S signal, tune it in, and adjust **C40** (screw) for maximum output, whilst rocking the gang. Re-adjust **C38** at 1,400 KC/S and **C40** at 600 KC/S, until no further improvement results.

S.W.—Switch set to S.W., use a 400 O resistance as dummy aerial, and feed in an 18 MC/S signal. Tune to 18 MC/S on scale, and adjust **C37** for maximum output. The correct peak is the second obtained when unscrewing **C37** from the maximum position

The adjustment of **C32** may have a tendency to "pull" the frequency of the oscillator section of the receiver. This may be minimised by shunting a 0·00035 μF variable condenser across **C36,** and tuning it so that the second harmonic instead of the fundamental beats with the incoming signal. Connect the shunt condenser between the tag of **C37** and chassis, and tune it (about half open) for the signal from 18 MC/S input. Then adjust **C32** for maximum output. Disconnect shunt condenser and re-adjust **C37** for maximum output.

Check that the 18 MC/S image is obtained at about 17·1 MC/S.

Feed in a 6 MC/S signal, tune it in, and check for correct reading on scale. It should not be necessary to adjust **C6** (which we show as a fixed condenser), but if sensitivity is low at 6 MC/S, re-adjust **C6** very slightly only, whilst rocking the gang. Then re-adjust **C37** at 18 MC/S.