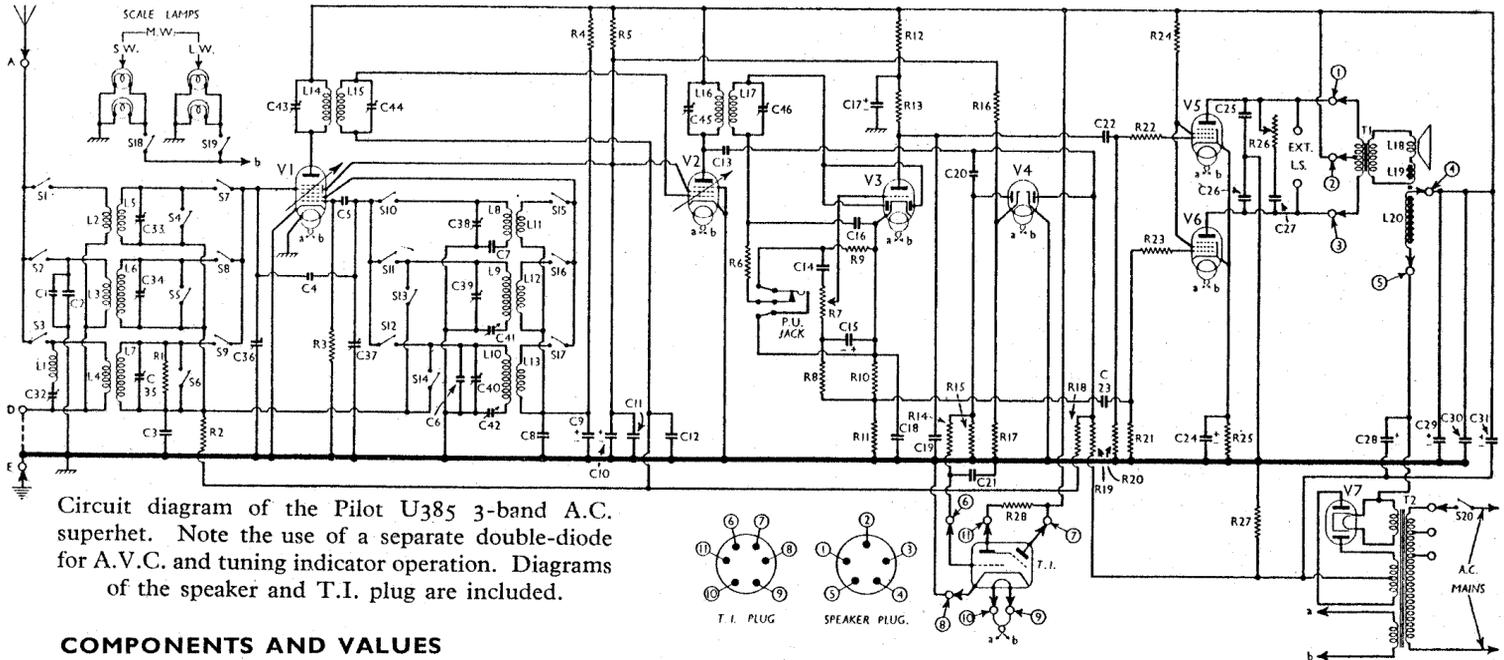


PILOT - U385 & CU385 & ...



Circuit diagram of the Pilot U385 3-band A.C. superhet. Note the use of a separate double-diode for A.V.C. and tuning indicator operation. Diagrams of the speaker and T.I. plug are included.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	Aerial circuit L.W. damping ..	500,000
R2	V1 tetrode C.G. decoupling ..	100,000
R3	V1 osc. C.G. resistance ..	50,000
R4	V1 osc. anode H.T. feed ..	6,000
R5	V1, V2 S.G. H.T. feed and part V4 G.B. pot. ..	10,000
R6	I.F. stopper ..	30,000
R7	Manual volume control ..	750,000
R8	V3 triode C.G. decoupling ..	250,000
R9	V3 signal diode load ..	250,000
R10	V3 triode G.B. resistance ..	2,500
R11	V3 triode cathode load ..	100,000
R12	V3 triode anode decoupling ..	20,000

RESISTANCES (Continued)		Values (ohms)
R13	V3 triode anode load ..	100,000
R14	T.I. feed decoupling ..	1,000,000
R15	V4 T.I. diode load resistance ..	1,000,000
R16	V4 G.B. potential divider (T.I. section)	15,000
R17	A.V.C. line decoupling ..	250
R18	V4 A.V.C. diode load resistances ..	2,000,000
R19	V4 A.V.C. diode load resistances ..	2,000,000
R20	V5 C.G. resistance ..	500,000
R21	V6 C.G. resistance ..	500,000
R22	V5 grid stopper ..	400
R23	V6 grid stopper ..	400
R24	V5, V6 S.G.'s H.T. feed ..	1,000
R25	V5, V6 G.B. resistance ..	200
R26	Variable tone control ..	100,000
R27	A.V.C. delay voltage resistance ..	23
R28	T.I. anode H.T. feed ..	1,000,000

CONDENSERS		Values (μF)
C1	M.W. aerial circuit shunt	0.00005
C2	V1 tetrode C.G. decoupling ..	0.0001
C3	Small coupling ..	Very low
C4	V1 osc. C.G. condenser ..	0.00005
C5	Osc. circuit L.W. fixed trimmer ..	0.000025
C6	Osc. circuit S.W. fixed tracker ..	0.006
C7	V1 osc. anode R.F. by-pass ..	0.05
C8	V1 osc. anode decoupling ..	4.0
C9*	V1, V2 S.G.'s decoupling ..	8.0
C10*	V1, V2 S.G.'s R.F. by-pass ..	0.05

CONDENSERS (Continued)		Values (μF)
C12	V2 C.G. decoupling ..	0.02
C13	Coupling to V4 diodes ..	0.000025
C14	A.F. coupling to V3 triode ..	0.05
C15*	V3 triode C.G. decoupling ..	10.0
C16	I.F. by-pass ..	0.0001
C17*	V3 triode anode decoupling ..	4.0
C18	V3 cathode I.F. by-pass ..	0.0001
C19	V3 triode anode I.F. by-pass ..	0.0001
C20	Coupling to V4 T.I. diode ..	0.000025
C21	T.I. feed decoupling ..	0.05
C22	V3 triode anode to V5 A.F. coupling ..	0.02
C23	V3 triode cathode to V6 A.F. coupling ..	0.02
C24*	V5, V6 cathodes by-pass ..	10.0
C25	Fixed tone correctors ..	0.005
C26		0.005
C27	Part of tone control circuit ..	0.02
C28*	H.T. smoothing ..	16.0
C29*		8.0
C30	H.T. circuit R.F. by-pass ..	0.1
C31*	H.T. smoothing ..	8.0
C32†	Aerial 261 m. filter tuning ..	0.00015
C33†	Aerial circuit S.W. trimmer ..	—
C34†	Aerial circuit M.W. trimmer ..	—
C35†	Aerial circuit L.W. trimmer ..	—
C36†	Aerial circuit tuning ..	0.000425
C37†	Oscillator circuit tuning ..	0.000425
C38†	Osc. circuit S.W. trimmer ..	—
C39†	Osc. circuit M.W. trimmer ..	—
C40†	Osc. circuit L.W. trimmer ..	—
C41†	Osc. circuit M.W. tracker ..	0.0006
C42†	Osc. circuit L.W. tracker ..	0.00015
C43†	1st I.F. trans. pri. tuning ..	—
C44†	1st I.F. trans. sec. tuning ..	—
C45†	2nd I.F. trans. pri. tuning ..	—
C46†	2nd I.F. trans. sec. tuning ..	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)	
L1	L.W. aerial 261 m. filter coil	1.8	
L2	Aerial S.W. coupling coil ..	1.2	
L3	Aerial M.W. coupling coil ..	23.0	
L4	Aerial L.W. coupling coil ..	80.0	
L5	Aerial S.W. tuning coil ..	0.05	
L6	Aerial M.W. tuning coil ..	3.25	
L7	Aerial L.W. tuning coil ..	20.0	
L8	Oscillator S.W. tuning coil ..	0.1	
L9	Oscillator M.W. tuning coil ..	6.6	
L10	Oscillator L.W. tuning coil ..	15.0	
L11	Oscillator S.W. reaction ..	0.2	
L12	Oscillator M.W. reaction ..	2.2	
L13	Oscillator L.W. reaction ..	5.5	
L14	1st I.F. trans. { Pri. ..	7.25	
L15		{ Sec. ..	7.25
L16	2nd I.F. trans. { Pri. ..	11.0	
L17		{ Sec. ..	11.0
L18	Speaker speech coil ..	1.7	
L19	Hum neutralising coil ..	0.1	
L20	Speaker field coil ..	800.0	
T1	Speaker input trans. { Pri., total ..	700.0	
	{ Sec. ..	0.3	
	{ Pri., total ..	14.0	
T2	Mains trans. { Heater sec. ..	0.1	
		{ Rect. heat. sec. ..	0.1
		{ H.T. sec., total ..	220.0
S1-S17	Waveband switches ..	—	
S18, S19	Scale lamp switches ..	—	
S20	Mains switch, ganged R7 ..	—	

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 227 V, using the 225 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 6A8G* ..	253	4.1	107	3.8
V2 6U7G ..	253	12.0	107	2.5
V3 6Q7G ..	132	0.7	—	—
V4 6H6G ..	—	—	—	—
V5 6F6G ..	240	35.0	240	5.9
V6 6F6G ..	240	30.0	240	5.1
V7 5Z4G ..	335‡	—	—	—

*Oscillator anode (G2) 212 V, 7.2 mA.
‡Each anode, A.C.

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GENERAL NOTES

Switches.—S1-S17 are the waveband switches and S18, S19 the scale lamp switches, in two rotary units beneath the chassis. They are indicated in our under-chassis view, and shown in detail in the diagrams on page IV, where they are seen looking from the front of the underside of the chassis.

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

S20 is the Q.M.B. mains switch, ganged with the manual volume control, R7. There is also a pick-up jack switch at the rear of the chassis, which is shown in the circuit in diagrammatic form. When a pick-up is inserted the bottom of R6 is disconnected from C14, thus muting radio.

Coils.—L1 is mounted on a bracket attached to the gang condenser, with C32. L2-L7; L14, L15 and L16, L17 are in three screened units on the chassis deck. The first of these also contains R1 and the trimmers C33-C35, which are numbered in our plan chassis view from top to bottom. The other two units contain their associated trimmers. The oscillator unit, L8-L13 is unscreened, and is on a tubular former beneath the chassis.

Scale Lamps.—These are four miniature bayonet cap types, rated at 7.3 V, 0.25 A. They are switched in or out of circuit by S18 and S19 in the main switch assembly.

External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (10,000 Ω) external speaker.

Condensers C9, C10, C17, C29.—These are four dry electrolytics in a single tubular metal cased unit on the chassis deck. The case forms the common negative connection. Four leads emerge from the unit beneath the chassis, two black, one red and one green. The red lead is the positive of C29 (8 μ F) and the green the positive of C10 (8 μ F). The black lead to R4 and C8 is the positive of C9 (4 μ F) and the black lead to R12 and R13 is the positive of C17 (4 μ F).

Condensers C28, C31.—These are two dry electrolytics in a further tubular metal case on the chassis deck, the case being isolated in this instance. Of the three leads emerging from the bottom of the unit, the black one is the common negative. The green lead is the positive of C31 (8 μ F) and the red the positive of C28 (16 μ F).

Condenser C4.—This is a very small fixed condenser, formed of two tags riveted to a fibre strip, and connected across two tags on one of the switch units.

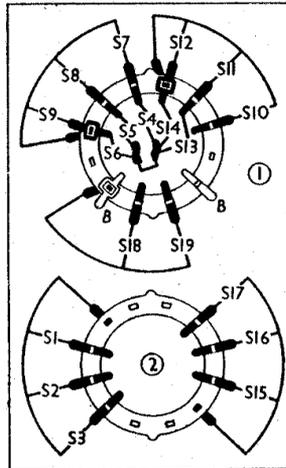
Trackers C41, C42.—These form a dual unit, beneath the chassis, roughly in its centre.

Speaker Connections.—A 5-pin plug and socket is used for connecting the speaker to the chassis. The plugs and sockets are indicated by numbered arrows and circles in the circuit diagram, at the bottom of which a diagram of the plug, looking from the free ends of the pins, is given.

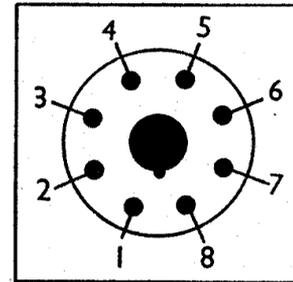
T.I. Connections.—The tuning indicator fits into an American 6-pin socket, the connections of its base being given in the diagram on this page. The socket is connected via six coloured leads to a special 6-pin

Chassis Divergencies.—Ours was an early chassis. In later models R1 may be 1,000,000 Ω , and the trimmers shown by us returned to C3 may actually go to chassis.

VALVE	PIN								TOP CAP
	1	2	3	4	5	6	7	8	
6A8G	B	H	A	G ₃ , G ₅	G ₁	G ₂	H	C	G ₄
6U7G	B	H	A	G ₂	G ₃	—	H	C	G ₁
6H6G	B	H	D ₂	C ₂	D ₁	—	H	C ₁	—
6Q7G	B	H	A	D ₁	D ₂	—	H	C	G
6F6G	B	H	A	G ₂	G ₁	—	H	C	—
5Z4G	B	H	—	A ₁	—	A ₂	—	H, C	—



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



Radiogram Models.—These have a similar chassis but the pick-up jack is replaced by a single-pole changeover switch, fitted on the motor board.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., and turn gang to maximum. Connect signal generator to control grid (top cap) of V2 through a 0.1 μ F condenser, and to chassis. Feed in a 456 KC/S signal, and adjust C45 and C46 for maximum output. Transfer signal generator to top cap of V1, and similarly adjust C43 and C44. Repeat the adjustment of all trimmers with the signal generator connected to V1 top cap.

R.F. and Oscillator Stages.—Connect signal generator to A and E through a 0.0002 μ F condenser. Switch set to M.W., and tune to 200 m. on scale. Feed in a 200 m. signal, and adjust C39, then C34, for maximum output. Fixed tracking is used on this band, so there is no adjustment at the top of the band. Switch set to S.W., tune to 16.6 m. on scale, feed in a 16.6 m. (18 MC/S) signal and adjust C38 and C33 for maximum output. Repeat the adjustment of all trimmers with the signal generator connected to V1 top cap.

Switch set to S.W., tune to 16.6 m. on scale, feed in a 16.6 m. (18 MC/S) signal and adjust C38 and C33 for maximum output. Fixed tracking is used on this band, so there is no adjustment at the top of the band.

Switch set to L.W., tune to 800 m. on scale, feed in an 800 m. signal, and adjust C40 and C35 for maximum output. Feed in a 2,000 m. signal, tune it in, and adjust C42 for maximum output, rocking the gang for optimum results. Repeat the 800 m. adjustments.

261 m. Filter.—This is used to eliminate a whistle on Luxembourg, due to London National, which is sometimes encountered. It is best to adjust C32 when listening to the actual whistle, if this is present.

Switch	L.W.	M.W.	S.W.
S1	—	—	C
S2	—	C	—
S3	C	—	—
S4	C	C	—
S5	C	—	C
S6	—	C	—
S7	—	—	C
S8	—	C	—
S9	C	—	—
S10	—	—	C
S11	—	C	—
S12	C	—	—
S13	—	—	C
S14	—	C	C
S15	—	—	C
S16	—	C	—
S17	C	—	—
S18	—	C	C
S19	C	C	—

plug which fits into the corresponding socket at the front of the chassis. The corresponding plugs and sockets are indicated by arrows and circles numbered from 6 to 11 on the circuit diagram, and at the bottom of this is a diagram of the plug, looking from the free ends of the pins, and numbered to correspond.

Valve Bases.—Octal bases are used on the valves in this set, and a diagram showing the pins numbered in the usual way, looking at the underside of the base, is given on this page, together with a table of the electrode connections. B indicates a blank pin, and a dash, no pin.

Base connections of the tuning indicator, looking from the free ends of the pins.

