

# PHILIPS 805A, 805X

Four-valve, plus rectifier, three waveband superhet. A cathode-ray tuning indicator is incorporated and provision made for the connection of a pick-up and low impedance extra speaker. Model 805A is for operation from AC mains supply 100-260v, 50-60 cycles. Model 805X incorporates the same chassis, but is supplied with a Philips 7882C converter, and is suitable for DC mains of 100-145v and 200-250v. It is a simple matter to disconnect the converter so that the instrument may be operated from AC. Manufactured by Philips Lamps, Ltd., Service Department, 74-94, Cherry Orchard Road, Croydon.

AERIAL coupling coils, L1 (SW), L2 (MW) L3 (LW) transfer the signal input to the tuned grid coils L4, L5, L6 which feed the HF pentode V1. This valve is biased by R2 decoupled by C3 and is controlled from the AVC line. The screen derives its potential from a tapping on the potential divider network, R8, R9, R10.

V1 is HF transformer-coupled to the grid circuit of the triode-hexode frequency-changer V2. The primary coils L7, L8, L9 are untuned, but the secondaries L10, L11, L12 are tuned by the VC2 section of the ganged condenser.

C6 is the grid blocking condenser; R3 connects the grid of V2 to the AVC line. Standing bias for V2 is derived from R4, decoupled by C7.

The triode oscillator section of V2 has a tuned grid circuit comprising the coils, L13, L14, L15, with their various trimmers, across the VC3 section of the gang condenser. R5 and C8 are the grid leak and condenser. Anode reaction coils are L16, L17, L18.

An iron dust core IF transformer L19—L20 transfers the signal of V2 to the grid of the IF pentode V3, which is biased by R13, decoupled by C16. The screening grid of this valve connects to the HT potential divider through the resistance

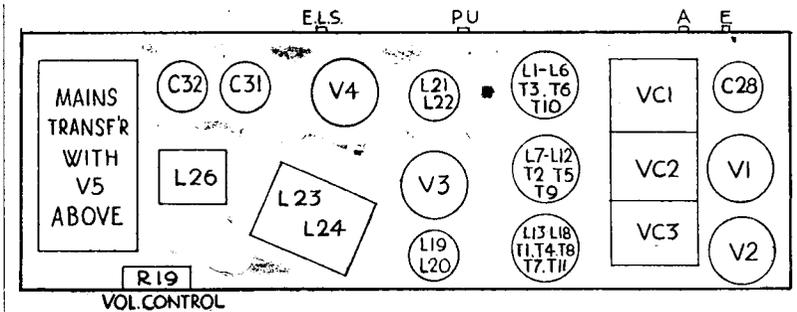
R14; this resistance acts as the LF load resistance when the pick-up circuit is required.

It will be seen from the circuit diagram that the pick-up feeds into the grid of V3, the screen being the anode with R14 the load resistance and C24 the coupling condenser to the volume control R19 and thence on to the output stage.

A second iron dust core IF transformer L21—L22, couples the IF signal from V3 to the signal diode of V4. R15 is the filter resistance, whilst R16, R17 comprise the LF load resistance from which the volume control R19 is fed.

The volume control is tapped and to this tapping is connected the bass boost network, R18, C20. The grid of the tuning indicator is fed from the junction of R16 and R17.

From the volume control, R19, the coupling condenser, C21, hands on the signal via the grid stopper R29, to the grid of the double-diode-pentode output valve V4. The cathode circuit of this valve includes resistances R23, R24, decoupled by C22. The pentode section of V4 is biased from the tapping between R23 and R24, while the full bias across both resistances is applied to the tuning indicator and AVC diode.

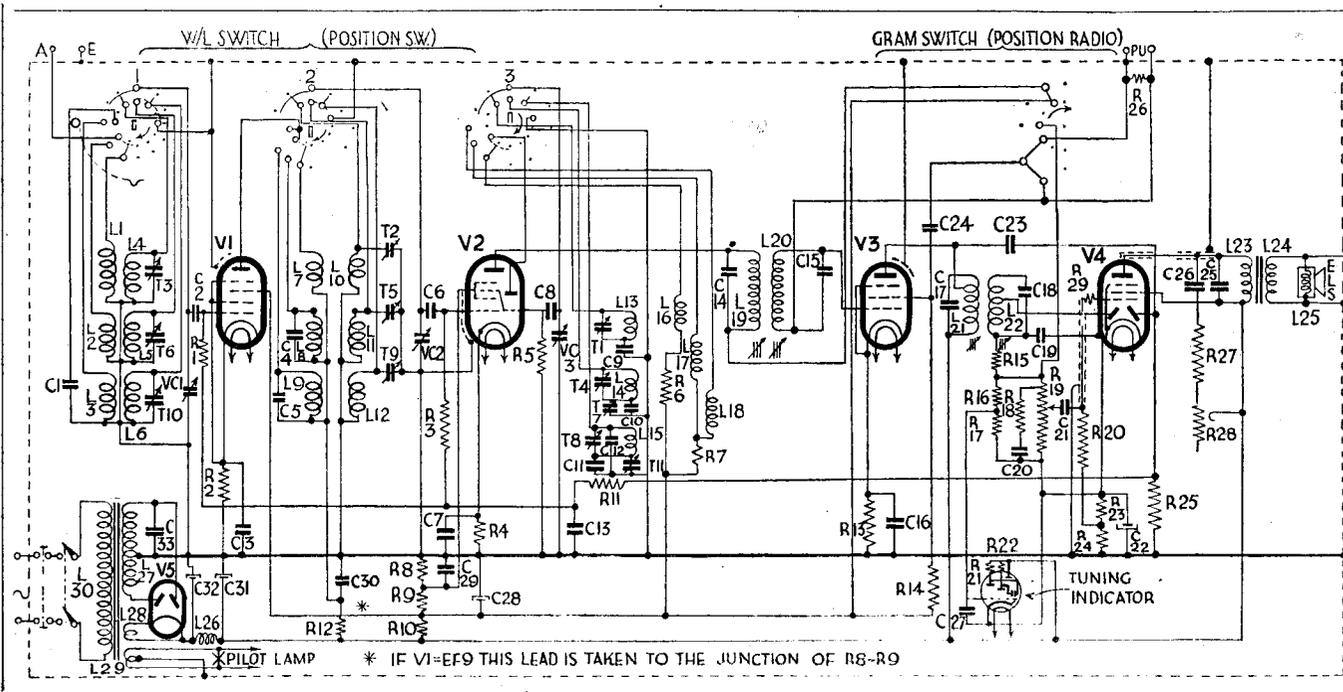


Layout diagram of the chassis showing where the valves and trimmers are located.

### VALVE READINGS

V	Type	Electrode	Volts	Mas
1	EF8 or EF9	Anode	260	4
		Screen	160	.65
2	ECH3	Cathode	1.6	—
		Anode	155	2.2
		Screen	95	3.2
3	EF9	Osc. anode	145	3.2
		Cathode	2.2	—
		Anode	275	5.5
4	EBL1	Screen	85	1.5
		Cathode	2.1	—
		Anode	235	35
5	AZ1 EM4	Screen	260	6
		Cathode	15	—
5	AZ1 EM4	Cathode	300	—
		—	—	—

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These Philips' sets employ a three-waveband, four-valve plus rectifier circuit.

### RESISTANCES

R	Ohms
1	820,000
2	390
3	820,000
4	220
5	47,000
6	68
7	1,800
8	33,000
9	10,000
10	8,200
11	1.2 meg
12	1,800
13	330
14	47,000
15	47,000
16	3.3 meg
17	2.2 meg
18	47,000
19	350,000
20	1 meg
21	1.5 meg
22	1.5 meg
23	150
24	220
25	680,000
26	470,000
27	100
28	50,000
29	1,000

### Tuning Indicator

### CONDENSERS

C	Mfds	C	Mfds
1	.000082	18	.000103
2	.0001	19	.000047
3	.1	20	.047
4	.000047	21	.022
5	.00027	22	.25
6	.0001	23	8.2 mfd
7	.1	24	.047
8	.000047	25	.022
9	.0045	26	.047
10	.0004	27	.047
11	.000136	28	.32
12	.000039	29	.1
13	.1	30	.047
14	.000091	31	.32
15	.000097	32	.28
16	.047	33	.022
17	.000103		

### WINDINGS

L	Ohms	L	Ohms
1	3.5	16	1
2	28	17	3.5
3	100	18	3.5
4	Very low	19	7.5
5	5	20	7.5
6	45	21	4.5+4.0
7	2.5	22	4.5+4.0
8	280	23	640
9	470	24	.6
10	Very low	25	4
11	5	26	280
12	45	27	400
13	Very low	28	Very low
14	8.5	29	Very low
15	19	30	—

# PILOT "TWIN MIRACLE"

Four-valve, plus rectifier, transportable superhet covering two wavebands and for operation from all-dry batteries or AC or DC mains. Made by Pilot Radio, Ltd., 31-33, Park Royal Road, London, NW 10.

**INTERNAL** frame aerials L2 (MW), L4, (LW) may be coupled to an external aerial, if desired, via C1 and coupling coils L1, L3, L2 and L4 are tuned by VC1 and the signal passed direct to the grid of the heptode frequency changer V1.

The oscillator section of this valve has a grid circuit L5 (MW), L6 (LW) tuned by VC2; L7 is the reaction winding fed from the oscillator anode by means of HF choke L8, and C4.

The IF transformer, L9—L10, couples the IF signals to the grid of the IF pentode amplifying valve V2. A second IF transformer L11—L12 hands on the signal to the single diode-triode valve V3.

The LF signal is coupled from the load resistances by C8 to the volume control R7 which feeds the triode section of V3. The DC potential across the load resistances is fed via R10 to the grid circuit of V1 and V2 as AVC.

V3 is resistance capacity coupled by R3, C10 and R8 to the pentode output valve V4. This is transformer coupled by L13—L14 to the permanent-magnet speaker in which L15 is the speech coil.

Fixed tone correction is effected by C12, while bias is derived from the resistances R11, R12 in the HT circuit (the latter on mains operation).

The power supply on battery operation is derived from the all-dry HT and LT combined battery which plugs into a socket and is left permanently connected. Switches S3 and S4 are ganged and when these are switched to the ON position the valve filaments are in parallel across the LT section of the dry battery.

If the mains lead is then plugged into a supply socket, current flowing through the relay winding L17 energises the relay magnet and pulls the contacts over for AC—DC operation.

The HT positive line is then switched over from the battery to the smoothing circuit comprising L16, C13, C14 which is fed from a tap on the line-cord R16. The rectifying valve V5 has its heater fed from

the mains via the line-cord R16, and the HT negative line from the anode is taken via the relay contacts through the indicator lamp, R14 to the chassis.

The grid circuit of V4 is connected to HT negative via R12 for additional biasing. The filament current is taken from the HT line, the current flowing through V4, V3 and V2 in parallel, through V1 and R13 in parallel, and so through the indicator lamp and R14 to the HT negative. The indicator lamp lights up on mains but not on battery.

## GANGING

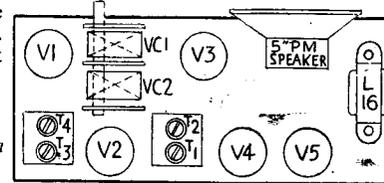
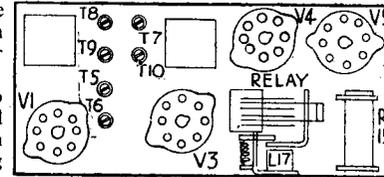
**IF Circuits.**—Inject a 451 kc signal via a .1 mfd condenser to the grid of V1. Adjust T1, T2, T3 and T4 in that order for maximum reading on output meter.

**MW Bands.**—Check that pointer is horizontal with gang at maximum. The output from the oscillator may be coupled to the aerials by a turn of wire round the outside of the cabinet.

The trimmers are accessible through the removable panel in the base of the cabinet with the battery removed; thus the receiver must be ganged when operating from the mains.

Switch to MW, tune receiver to 200m, and inject a 200m signal. Adjust T5 and T6 for maximum output.

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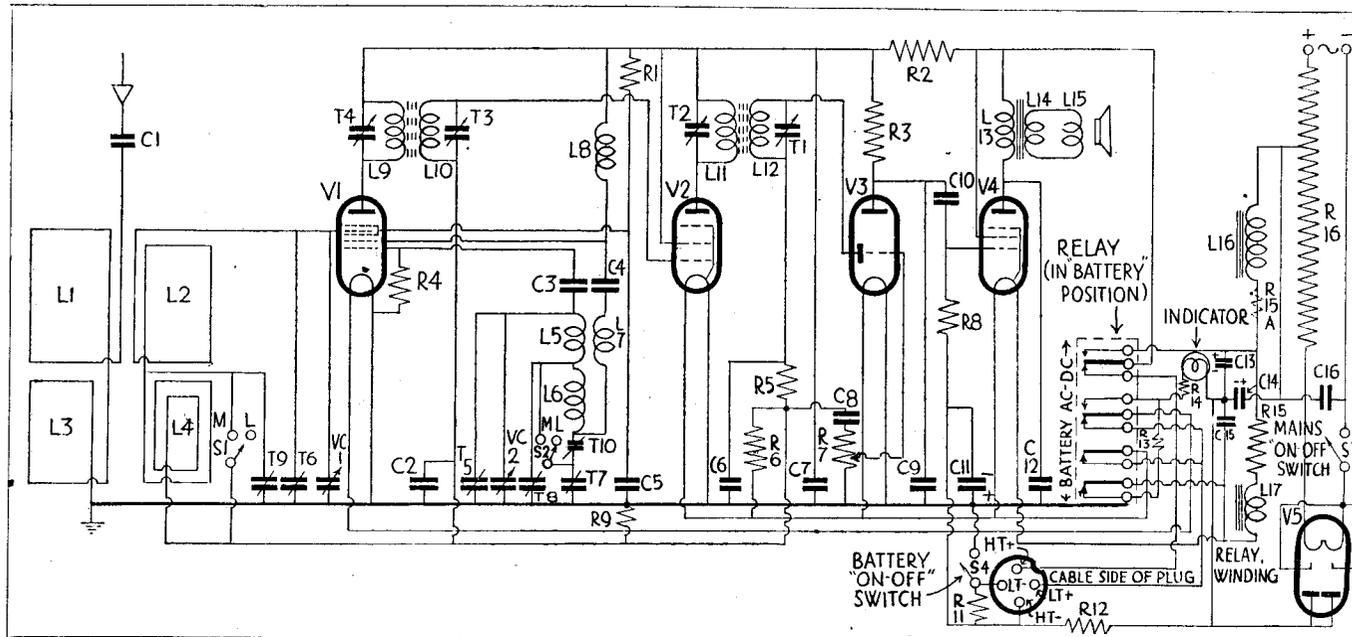


Two views of the Pilot chassis identifying the major components and showing trimmer positions.

## VALVE READINGS

V	Type	Electrode	Volts	Mas
1	1A7EG	Anode	75	.3
		Osc. anode	78	1.3
		Screen	37	.6
2	1N5G	Anode	75	.8
		Screen	75	.1
3	1H5G	Anode	15	.02
4	1C5EG	Anode	78	4.7
		Screen	80	2.0
5	25Z6G	—	—	—

Above figures refer to battery operation. Values are slightly higher on mains. Indicator Lamp: 6.3 v. .15 amp., M.B.C. Battery: Ever-Ready All-dry 3.



Feature of the circuit is the relay which automatically switches over to battery or mains according to which form of supply is connected.

## CONDENSERS

C	Mfd
1	.0003
2	.05
3	.00006
4	.0003
5	.01
6	.0003
7	.25
8	.01
9	.0001
10	.01
11	.25
12	.002
13	.40
14	.40
15	.25
16	.05

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**IF Circuits.**—The wavelength switch at MW, variable condenser at minimum and volume control at maximum, apply a signal of 470kc to control grid of the V2. Detune circuits by placing across them a 20,000 ohms resistance in series with an 0.1 mfd condenser and trim for maximum output as shown in the following table:—

Detune	Tune 4th	Detune	Tune 3rd	Detune	Tune 2nd	Detune	Tune 1st
L19	—	—	L20	—	—	—	L21
—	—	—	—	—	—	—	L22

Keep output low to avoid operating the AVC.

**SW Band.**—Set gang to a Philips 15° ig. Trim T1, T2, and T3 for maximum output at 17mc.

**MW Band.**—Set gang to the 15° jig. Trim T4, T5, and T6 for maximum output at 1,442kc.

Tune gang to 545kc. Trim T7 for maximum output on a 545kc signal.

Reset gang to 15° jig and retrim T4 for maximum output at 1,442kc.

**LW Band.**—Set gang to the 15° jig. Trim T8, T9, T10 at 405kc.

Tune variable to 160kc. Trim T11 for maximum output on a 160kc signal.

Reset gang to 15° jig and retrim T8 for maximum output at 405kc.

Continued from column 3

Inject and tune in a 500m signal and adjust T7, while rocking gang.

**LW Band.**—Switch to LW, tune receiver to 1,200m and feed in a 1,200m signal.

Adjust T8 and T9 for maximum output. Inject and tune in a 1,900m signal and adjust T10 for maximum output, while rocking gang.

## WINDINGS

L	Ohms	L	Ohms
1	.1	10	6.5
2	1.5	11	7.5
3	.2	12	4.5
4	21	13	430
5	3.5	14	.3
6	6.5	15	3
7	85	16	200
8	130	17	190
9	6.5		

## RESISTANCES

R	Ohms	R	Ohms
1	56,000	9	3.3 meg
2	2,200	10	3.3 meg
3	1 meg	11	1,200
4	220,000	12	2,200
5	47,000	13	25
6	2.2 meg	14	700
7	2 meg	15*	700
8	3.3 meg	16†	620

\* When 1D5 valve used, R15 and R15A = 1,500 ohms tapped at 700 ohms.  
† 910 ohms for 1D5 valve untapp ed.