

# PHILIPS 206 A

Three-valve, plus rectifier, three-waveband table model superhet. Suitable for operation on 100-260 v mains supply, 50-100 cycle AC. An internal aerial is provided for local reception. Marketed in 1940 by Philips Lamps, Ltd. (Service Department), 74-94, Cherry Orchard Road, Croydon, Surrey.

**Circuit.**—The aerial is coupled to the frequency changer grid circuit by coupling coils L1 (SW), L2 (MW), and L3 (LW). The corresponding grid coils are L4, L5 and L6.

L2 and L3 are shunted by C1 and C2, and L6 has C3 in parallel.

The metallic foil stuck to the underside of the top of the cabinet acts as an aerial for local and the more powerful distant transmissions and is permanently connected to the aerial socket.

Signals to the frequency changer V1 are fed via C4 and an IF filter comprising L7 and C5. This is in the control grid circuit and is adjusted by the dust core in the inductance. V1 is biased by R2, decoupled by C6, and is AVC controlled through R1 to the AVC line.

The oscillator section of V1 is tuned by VC2, L8 (SW), L9 (MW) and L10 (LW), which are fed from the anode circuit, while L11, L12, L13 are the oscillator grid coils.

The IF transformer in the anode circuit of V1 has fixed capacity and variable inductances L14 and L15. The secondary coil L15 feeds the grid of the IF amplifier V2, which is a variable-mu HF pentode.

Undelayed AVC for V2 is obtained from the potentiometer network R11 and R12 which are across the signal diode load R13 and R14.

The grid circuit is decoupled by R8 and

C13. Fixed bias for V2 is obtained from R9 which is decoupled by C14.

V2 is coupled to V3 the double diode output pentode by a second IF transformer with variable inductances which are tapped. The tapping on the primary L16 feeds the AVC diode of V3, R19 being the AVC load resistance with R20 and C26, the AVC live decoupling components.

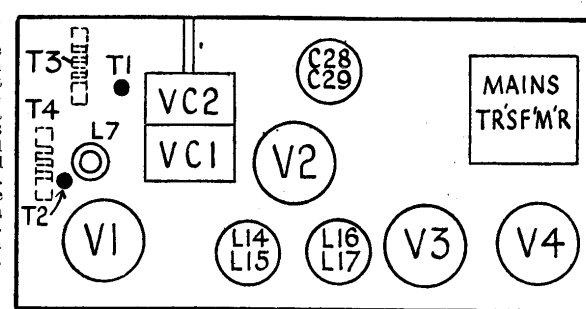
The tapping on L17 feeds the signal diode of V3. The LF signals developed across the volume control R14 which forms part of the AVC diode load with R13 are fed via C21 and the grid stopper R15 to the grid of the pentode section of the output valve.

Bias for V3 is obtained by the voltage drop across R17 and R18, the required potential being obtained from the junction of these two resistances. It will be seen that the cathode circuit is taken to chassis via the secondary winding of the output transformer. In this way negative feedback is obtained.

In some models the secondary winding L19 is tapped, and the cathode resistances are then connected to the tapping.

Fixed to correction is effected by C23.

No provision is made for the connection of an external loudspeaker, but if desired a low impedance speaker having a resistance of from 2 to 3 ohms may be connected across the internal speaker speech coil. Some models have speakers with a 5 ohm speech coil and extra loudspeakers must then match up to this value.



### GANGING

**IF Circuits.**—Set volume control to maximum and tune receiver to the bottom of the MW band. Inject a signal of 470 kc to the top cap of the frequency-changer via .032 mfd.

Detune L16 by connecting an 80 mmfd condenser across it. Adjust core of L17 for maximum reading on output meter.

Transfer detuning condenser to L17 and adjust L16 for maximum output. Detune L14 with 80 mmfd condenser and adjust L15 for maximum output. Transfer condenser to L15 and adjust L14. Remove condenser.

**MW Band.**—Set gang to 15° with Philips Jig Code No. 09.992.440. Connect service oscillator via dummy aerial to aerial and earth sockets. Switch to MW and inject 193.5 m. signal. Adjust T1 and then T2 and again T1 in that order for maximum output.

**LW Band.**—Retain jig in condenser gang, switch set to LW and inject a signal of 734 m. Adjust T3 for maximum output by varying the turns of wire which comprise the external "plate" of the condenser.

Connect a detector amplifier (type GM 2404) with output indicator to the anode of V1 and short circuit VC2. Inject a signal of 1875 m. and tune it in on the receiver for maximum output from the detector amplifier.

Disconnect the detector amplifier and remove the short circuit from VC2. Adjust T4 for maximum reading on the output meter. (It is recommended that before testing a quarter of the wire should be wound off T4).

Repeat the adjustment to T3 on the 734m signal. T4 may be adjusted whilst rocking the gang if no detector amplifier is available.

**IF Receptor Adjustment.**—Switch to MW and tune to maximum capacity of gang. Inject a strong signal of 470 kc and adjust core of L7 for minimum.

The Philips circuit and (above) the top-of-chassis layout. T3 and T4, wire-wound trimmers, are below deck.

### CONDENSERS

C	Mfds.
1	.000039
2	.000039
3*	.0000039
4	.00033
5	.000047
6	.047
7	.0001
8	.00047
9†	.000022
10	.0004355
11	.000103
12	.000097
13	.047
14	.047
15	.047
16	.1
17	.000103
18	.000103
19	.0000039
20	.000056
21	.022
22	.0001
23	.0047
24	.25
25	.047
26	.047
27	.047
28	.15
29	.50

\* Used only with brass vane gang.  
† .000018 with al. vane gang.

### VALVE READINGS

V	Type	Electrode	Volts	Ma.
1	ECH3	Anode	235	2.8
		Osc. Anode	105	4.0
		Screen	95	1.8
2	EF9	Anode	210	5.5
		Screen	106	1.6
		Grid	240	23
3	EBL1	Anode	220	3.4
		Screen	220	3.4
		Grid	-22	—
4	AZ1	Anode	250(AC)	—

Pilot Lamp Av. with L23 tapped; 6.3v. if winding is not tapped.

### WINDINGS

L	Ohms	L	Ohms
1	2	13	2.5
2	23	14	7
3	170	15	7
4	4	16	7
5	1	17	7
6	45	18	700
7	10	19	.3 or 3.2
8	.1	20	2.5 or 5.0
9	7	21	480
10	16	22	.1
11	1	23	.1
12	2	24	60

### RESISTANCES

R	Ohms	R	Ohms
1	470,000	12	2.7 meg.
2	270	13	47,000
3	47,000	14	500,000
4	33,000	15	1,000
5	39,000	16	1 meg.
6	27,000	17	220
7	150	18	470
8	1.8 meg.	19	1 meg.
9	1,200	20	1.5 meg.
10	68,000	21	1,800
11	2.7 meg.		

