PHILIPS 219B

Five-valve, battery operated, three-waveband superhet with separate triode oscillator and QPP output. Made by Philips Lamps, Ltd., Service Dept., 74/94, Cherry Orchard Road, Croydon, Surrey.

Circuit.—The aerial input on MW and LW is via coupling coils L2 and L3 to the band-pass filter coils, which employ the familiar Philips combined capacity and inductance band-pass coupling. IF filtering is carried out by L1 and T9 and image suppression by C2. On SW the aerial input is via transformer comprising L8 and L9 which is loaded by C3.

The switch indications in the circuit represent the actual construction of the wafers, the dots and circles being fixed contacts, and the radial lines the moving contacts. When arcs are attached to the radial lines these are shorting pieces which also move. The diagram is shown in the SW position.

Signals are fed to the control grid of V1 which is a pure mixer valve, the locally generated signal being fed to the mixing grid from the separate triode oscillator V2 and its associated circuits.

The oscillator employs a tuned anode circuit. The signal is fed to the screen of V1 via C8 and the IF signal is developed across the IF transformer L16 and L17. The signal is passed to the variable-mu HF pentode V3, which is in turn coupled by the second IF transformer L18, L19, to the double-diode triode V4.

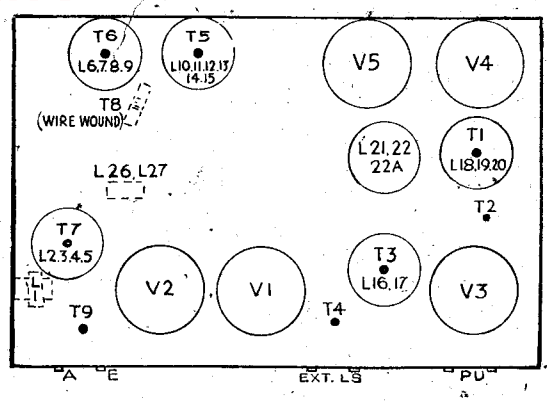
The signal diode of this valve is fed from a tapping on L19 and the volume control R13 comprises the diode load. The required signal is picked off the volume control and is passed via C19 and a filter network to the triode section of V4. Bias is obtained from R24—R25 network. Provision for a high-resistance pickup is made by two sockets which are connected one to the chassis and the other to the live end of the volume control.

The AVC diode of V4 is fed from the anode of V3 via C22, the AVC load resistance being R17, which is returned to a point on the automatic bias network R24—R25 to give the required delay voltage.

AVC is applied to the grid circuits of both V1 and V3 with filter circuits R1 and C6 for V1 and R9 and C14 for V3.

The LF signal is resistance-capacity coupled by R19 and C23 to the primary of the input push-pull transformer, the secondaries of which feed the two sections of the QPP valve V5. R21 and R22 are grid stoppers, and the centre-point of the secondary windings is connected via R23 to maximum negative bias.

The output transformer has tone compensating condensers across each portion of the primary winding, while the secondary is connected to the low impedance loudspeaker and to the extra loudspeaker terminals. An extension loudspeaker should have a resistance of approximately 3.5 ohms.



GANGING

IF Circuits.—With receiver tuned to the bottom of long waveband inject a 128 kc signal via a small capacity condenser to V1 grid.

Adjust T1 and T2 for maximum output.

Connect a 10,000 ohms resistance across L16 and trim T3.

Remove resistance and connect it in series with a .1 mfd condenser across L17 and trim T4.

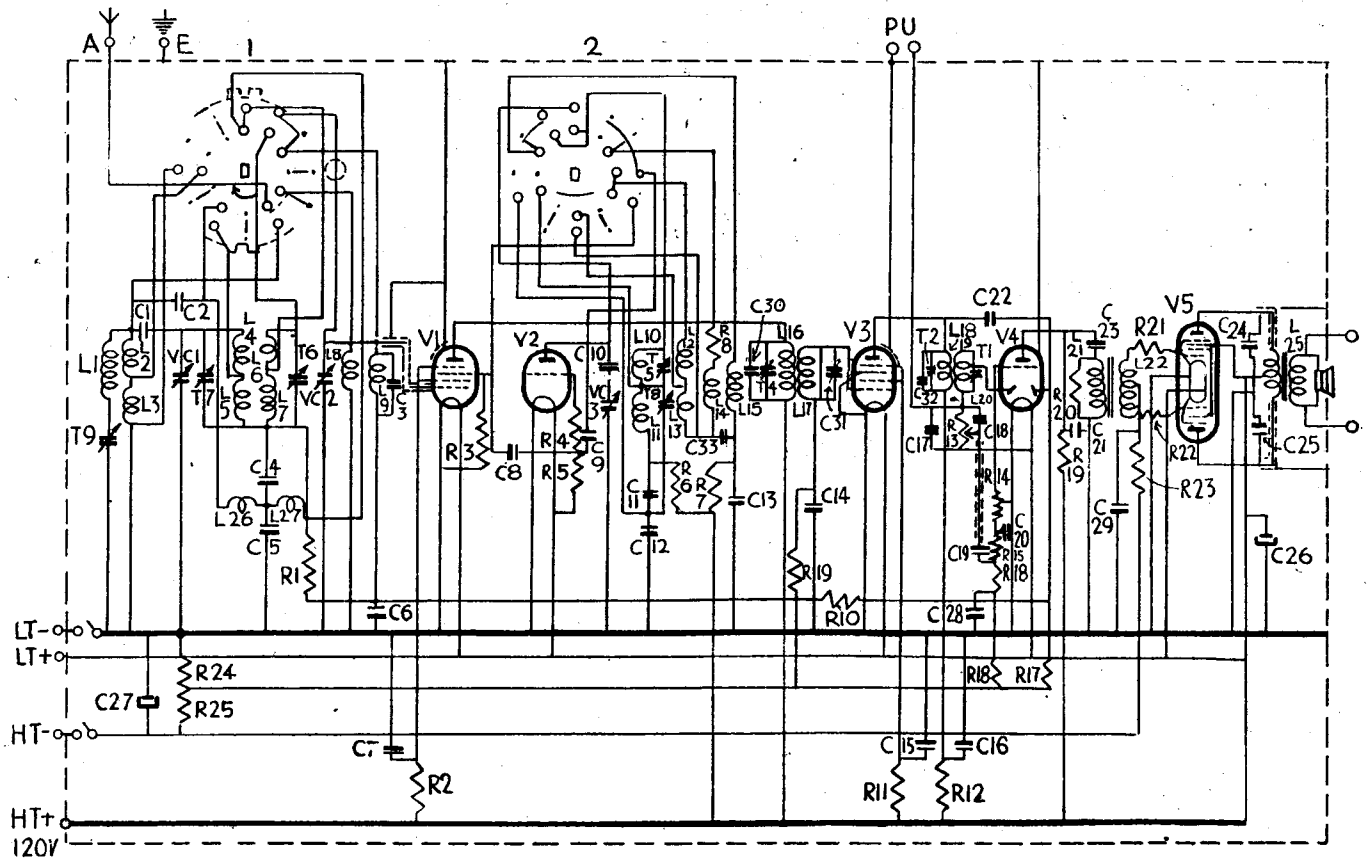
MW Band.—Connect a 10,000 ohm resistance across L17, inject and tune in a 1442 kc signal (208m) and adjust T5, T6 and T7 for maximum output.

LW Band.—Connect 10,000 ohm resistance across L11.

Inject and tune in a 396kc signal and adjust T8.

IF Filter.—Tune to top of LW, inject 128kc signal and adjust T9 for **minimum** output.

There are no adjustments for the SW Band.



A distinguishing feature is the use of a separate triode valve as oscillator. The output is QPP.

CONDENSERS

C	Mfds
1	.000015
2	.000039
3	.000027
4	.015
5	.027
6	.047
7	.047
8	.00047
9	.0001
10	.047
11	.000725
12	.001615
13	.0027
14	.047
15	.047
16	.01
17	.000047
18	.000047
19	.01
20	.0001
21	.00047
22	.00001
23	.22
24	.001
25	.001
26	8
27	50
28	.047
29	.1
30	.000056
31	.000064
32	.000047
33	.01

VALVE READINGS

Set switched to MW (with new 120 v. battery).

V	Type	Electrode	Volts	Ma
1	VP2B	Anode	110	.5
		Mixer Anode	32.5	.42
2	PM1HL	Anode	45	1.4
3	VP2B	Anode	104	1.32
		Screen	36.5	.48
4	TDD2A	Anode	70	.85
5	QP22B	Anodes	110	2
		Screens	111	.55

RESISTANCES

R	Ohms	R	Ohms
1	100,000	14	180,000
2	180,000	15	180,000
3	820,000	16	1
4	47	17	1
5	15,000	18	220,000
6	47,000	19	47,000
7	18,000	20	33,000
8	15	21	10,000
9	1 meg	22	10,000
10	1	23	100,000
11	150,000	24	50
12	4,700	25	1,000
13	500,000		

WINDINGS

L	Ohms	L	Ohms
1	125	16	130
2	30	17	130
3	100	18	130
4	4.5	19	40
5	45	20	90
6	4.5	21	700
7	45	22	1,200
8	2	22A	1,300
9	.5	23	800
10	10	23A	850
11	32	24	1
12	9	25	3.5
13	3.2	26	Very low
14	1.5	27	Very low
15	15		