

PHILIPS 229B

Four-valve, two-waveband, all-dry battery portable superhet. Separate HT and LT batteries are employed and provision is made for an external aerial and earth. Marketed 1940 by Philips Lamps, Ltd., Service Department, 79/94, Cherry Orchard Road, Croydon, Surrey.

THE internal frame aerials, L2 (MW) L3 (LW) are tuned by VC1 and connect direct to the control grid of the heptode frequency changer V1. A coupling winding L1 on the frame aerial assembly connects to the aerial socket. The screen of V1 is fed from the HT line via R2 decoupled by C3.

The oscillator section employs a tuned

grid circuit in which L4 (MW) and L5 (LW) are tuned by VC2 section of the gang condenser. The grid leak is R3 and the grid condenser C4. The oscillator anode reaction coils L6 (MW) and L7 (LW) connect via R4 to the HT line.

The IF output from V1 is transferred by the IF transformer comprising L8, L9 to the grid of the IF amplifying pentode valve V2. The IF transformers have adjustable iron dust cores for trimming. A second IF transformer L10, L11, couples V2 to the single diode triode valve V3. The diode is fed from a tapping on L11 and the LF signal is developed across the volume control R10 across which is the IF by-pass condenser C18.

A potential divider network R8, R9, is connected across R10, and from a tapping on this network AVC is applied to V1 and V2 via decoupling components R5, C2 and C11.

From the volume control R10 the LF signal is coupled via C19 to the grid circuit of V3 via filter network R11, R12, R13, C20.

Resistance capacity coupling via R14,

C22 and R15 is employed to couple V3 to the pentode output valve V4. A grid stopper R16 is included in the grid circuit which is returned via the automatic bias resistance R1 (decoupled by C1) to the LT negative line.

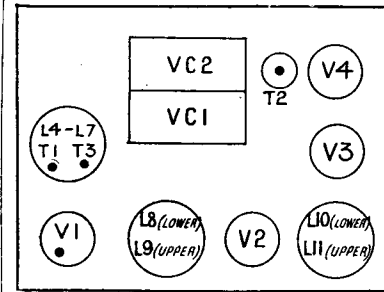
The output transformer L12, L13, couples V4 to the low impedance loud-speaker L14. C23 provides a permanent degree of tone correction.

GANGING

IF Circuits.—Remove control grid top cap connector of V1 and connect a 5,000-ohm resistance between the control grid and the AVC line. Switch to MW and tune receiver to the bottom end of the MW band. With volume control at maximum, inject a 470-kc signal via a .032-mfd condenser to the grid of V1.

Detune the primary or secondary circuits by connecting a 10,000-ohm resistance in series with a .1 mfd condenser between chassis and the anode or grid end of the coil and trim for maximum output as follows:—

Detune L10 and trim L11. Detune



The chassis layout of the Philips all-dry four-valve portable superhet. Trimmer positions are indicated, including those for the IF circuits—actually adjustable permeability cores.

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	DK1	Anode	79	.59
		Osc. anode	79	.88
		Screen	35	.74
2	DF1	Anode	77	1.1
		Screen	76	.28
3	DAC1	Anode	36	.032
		Anode	77	4.1
4	DL2	Anode	79	1.0
		Screen	79	1.0

RESISTANCES

R	Ohms	R	Ohms
1	1,000	9	1 meg
2	56,000	10	1 meg
3	100,000	11	100,000
4	1,000	12	100,000
5	100,000	13	2.2 meg
6	10,000	14	1 meg
7	2,200	15	2.2 meg
8	2.2 meg	16	100,000

WINDINGS

L	Ohms	L	Ohms
1	Very low	8	7
2	3	9	7
3	9.5	10	7
4	6.5	11	7
5	15	12	600
6	2.5	13	Very low
7	5	14	3

CONDENSERS

C	Mfd.	C	Mfd.
1 .. ..	.50	13 .. ..	.056
2 .. ..	.056	14 .. ..	.01
3 .. ..	.056	15 .. ..	.97 mmfd
4 .. ..	.00027	16	103 mmfd
5 .. ..	.33 mmfd	17	82 mmfd
6 .. ..	.00011	18 .. ..	.0001
7 .. ..	.00029	19 .. ..	.0056
8 .. ..	.00063	20 .. ..	.0001
9 .. ..	.97 mmfd	21 .. ..	.0001
10 .. ..	.91 mmfd	22 .. ..	.0056
11 .. ..	.056	23 .. ..	.0022
12 .. ..	.056	24	8

L11 and trim L10. In the case of L11 only, the damping resistance and condenser should be across L11 and not down to chassis.

Detune L8 and trim L9. Detune L9 and trim L8.

MW Band.—The manufacturers recommend the use of a 15-degree jig (Part No. 09.992.440) and an insulated trimming spanner (Part No. M646.565) for carrying out the following adjustments.

Set gang to the 15-degree jig and apply a signal of 1440 kc to the aerial socket. Trim T1 and T2 for maximum output.

LW Band.—Switch to LW and with the 15-degree jig still in position in gang condenser, trim T3 for maximum output on a 316-kc signal. Adjust pointer on cord to give tolerable calibration on both wavelength bands.

Oscillation and Low Volume

AN interesting although simple fault in a Philips' 638 receiver... The trouble was oscillation when tuning in stations and very low volume with a lack of the usual mains hum. It was found that the Pen4VA valve was low in emission and this was raising the HT voltage on the HF valves and causing these to oscillate. Replacing the valve effected a cure.

In the Philips' 582, the on-off switch sometimes sticks and will remain either "off" or "on." This is due to friction between the blades which prevents the spring from releasing or closing the contacts. I cured the trouble by putting just a trace of light oil on the spring blades.

A set being tested was inclined to give trouble with the wave-change switch, and switching the set from one band to another and back to the first again would bring on reception.

The trouble appeared in the switch, but remembering that the surge effect or the mechanical vibration, although small, sometimes cause a defective part to become right, the fault was not thought to be in the switch, and such proved the case. Either one or the other effect caused a defective valve to become temporarily right, but after a short time it broke down again.—F. DAY-LEWIS.

HUM is a "stock fault" in the Philco 280, and after testing the smoothing circuit I suspect the pilot lamp holder, which usually shorts the heater circuit to chassis. Changing the holder cures the hum.—T.P.

