PHILCO 580

Four-valve, plus rectifier, two-waveband superhet for AC or DC mains, from 190 to 260 v (40 to 100 cycles). Provision for pickup and external low-impedance speaker. Made by Philco Radio and Television Corporation (Great Britain), Ltd., Perivale, Greenford, Middlesex.

Circuit.—Aerial connections are provided for the Philco All-Purpose Aerial, the aerial selector being built into, and operated by, the wave-change switch. The connections for this aerial are to the red and black sockets on the terminal panel at the back of the chassis.

Normal aerial and earth systems should be connected to sockets A and E. The aerial input is fed to the aerial transformer of which L1 is the LW primary and L2 the MW primary, both coils being tapped. The secondary windings L3 (LW), L4 (MW) are tuned by VC1, and the signal is fed to the grid of the variable-mu heptode V1, *via* a fixed tuned IF rejector circuit L3, R1.

V1 is biased by R5 which is decoupled by C8. The oscillator anode is fed *via* R2 and R3, decoupled by C7. The oscillator grid circuit is tuned by L6 (LW), L7 (MW) and VC2. V1 and V2 screens are supplied from the potentiometer network R7 and R8, decoupled by C11.

The output of V1 is coupled to the grid of V2 by the IF transformer L8, L9. Standing bias for V2 is obtained from R9, decoupled by C12, and AVC is applied to both V1 and V2 grid circuits *via* R16 from the AVC load resistance R15.

The second IF transformer L10, L11 transfers the signal from V2 to the double diode triode V3. The AVC diode is fed from L11 through C31.

The signal diode load is R10 and R11 and the LF signal is passed *via* C15 to the volume control VR1. The control has a tapping point which is connected to the cathode of V3 through R12 and C17. This arrangement maintains the bass response at low volume levels. The LF signal is passed from the volume control to the grid of the triode section of V3 through C19.

The cathode of V3 is biased by a portion of the potential developed across R21 which provides the necessary delay voltage for the diodes, while the triode section is biased by connecting the grid circuit through R13 and R14 to the second tapping point on R21.

The output from V3 is resistance-capacity coupled by R17 and C24 to the grid of the pentode output valve V1, R19 being the grid circuit resistance. V4 is biased by the whole of R21, which is decoupled by C25. The output transformer L12, L13 couples the output valve and the low impedance PM speaker.

A permanent degree of tone correction for the pentode output is effected by C26 and R22, and a variable tone control circuit VR2 and C27 is connected across the primary of the output transformer. The tone control is ganged with the on-off switch.

Sockets for an external loudspeaker are provided across the speech coil of the internal loudspeaker and are suitable for connection to a low impedance speaker of about 2 ohms DC resistance.

HT supply is obtained through the series connected rectifier valve V5, with smoothing components L15, C28, and C29. The mains input is filtered by C30.

The valve heaters and the pilot lamp are all connected in series with the barretter across the mains supply and no adjustment is necessary for voltages within the range of the instrument.

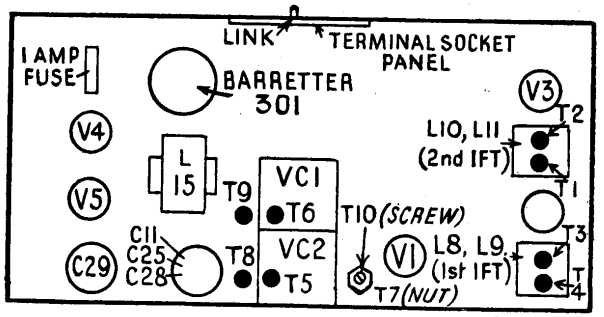
A high impedance pick-up may be connected to the sockets provided. These are isolated from the chassis by C20 and C21, and the pick-up circuit, which is controlled by the wavechange switch, is connected across the volume control VR1. On gram, the grid and oscillator coil circuits are broken by contacts on the wavechange switch.

GANGING

IF Circuits.—With gang at minimum capacity, check that indicator reads on index line (at 1750 kc). Switch to MW, turn volume control to maximum and tone control to "brilliant" position. Place link on aerial terminal panel in socket B.

Feed a signal of 451 kc to the grid cap of V1 with the grid lead disconnected. Remember that the chassis of the receiver may be "live" and, therefore, the earthy lead of the service oscillator should be connected to the chassis through an isolating condenser unless provision is made for this in the service oscillator.

Adjust the service oscillator attenuator to give half-scale reading on the output meter and then adjust T1, T2, T3 and T4 in that order for maximum output.



VALVE READINGS

(Taken on 230v AC mains, volume control at maximum, tone control fully brilliant. Set switched to MW with no aerial).

V	Type	Electrode	Volts	Ma
1	6A7	Anode	245	3.5
		Osc. Anode	150	—
		Screen	100	2.2
		Cathode	2.5	—
2	78E	Anode	250	10.5
		Screen	100	2.6
		Cathode	3.5	—
3	75	Anode	110	.4
		Cathode	8	—
4	18E	Anode	240	34
		Screen	250	—
		Cathode	15	—

Pilot lamp 6.3v, .3 amp.

LW Band.—Replace grid lead on V1 and connect oscillator *via* a dummy aerial to aerial socket. Switch to LW and tune in 290 kc. Inject a 290 signal and adjust T5 and T6 in that order for maximum output. These trimmers are underneath the chassis.

Inject and tune in 160 kc signal and adjust T7 (nut) for maximum output while rocking the gang. Repeat adjustments to T5 and T6 on 290 kc, and then T7 on 160 kc.

MW Band.—Switch to MW. Inject and tune in 1750 kc signal and adjust T8 and T9, beneath the chassis, for maximum output.

Inject and tune in a 600 kc signal. Adjust T10 (screw) for maximum output while rocking gang. Go over T8 and T9 adjustments on 1750 kc, and then T10 on 600 kc.

RESISTANCES

R		Ohms	R		Ohms
1	..	490,000	12	..	51,000
2	..	10,000	13	..	1 meg.
3	..	15,000	14	..	490,000
4	..	51,000	15	..	1 meg.
5	..	300	16	..	1 meg.
6	..	1,000	17	..	190,000
7	..	25,000	18	..	99,000
8	..	51,000	19	..	490,000
9	..	400	20	..	51,000
10	..	51,000	21	..	190+35+190
11	..	330,000	22	..	15,000

VR1 2 meg. VR2 100,000

CONDENSERS

C		Mfds	C		Mfds
1	..	.001	16	..	.05
2	..	.01	17	..	.01
3	..	.01	18	..	.1
4	..	.01	19	..	.01
5	..	.3	20	..	.01
6	..	.05	21	..	.01
7	..	.5	22	..	.1
8	..	.05	23	..	.00011
9	..	.00025	24	..	.015
10	..	.01	25	..	*
11	..	*	26	..	.03
12	..	.1	27	..	.05
13	..	.00011	28	..	*
14	..	.00011	29	..	16
15	..	.01	30	..	.1
			31	..	.00011

* Electrolytic Block 25+4+16 mfds.

WINDINGS

L		Ohms	L		Ohms
1	..	80	9	..	12
2	..	2	10	..	12
3	..	5	11	..	8
4	..	5	12	..	240
5	..	20	13	..	.2
6	..	16.5	14	..	2
7	..	8	15	..	150
8	..	8