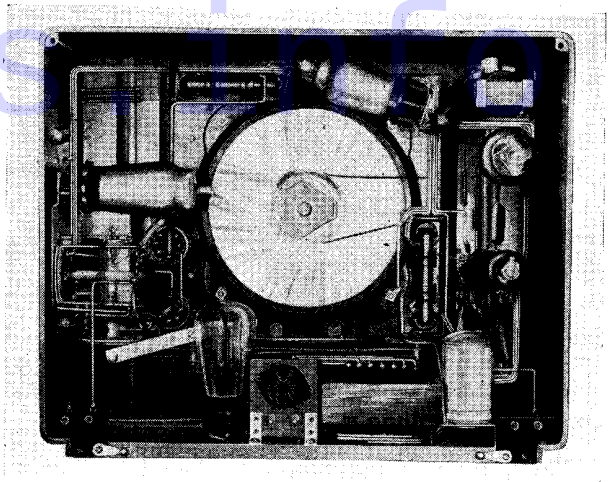
PHILIPS V5 A.C. SUPERHET



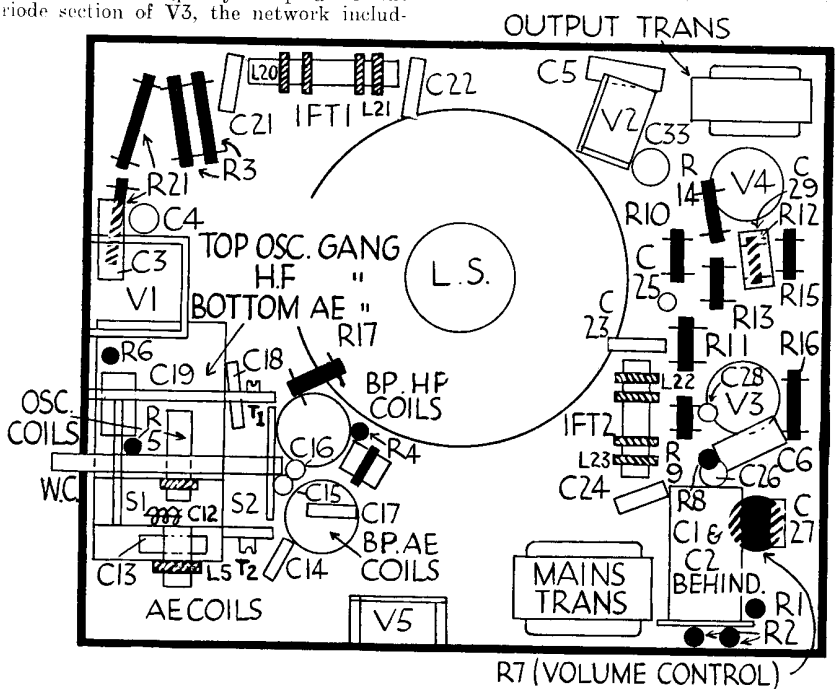
One of the most unorthodox receivers introduced for many years, the model V5 by Philips Lamps Ltd. has no chassis in the usual sense. As this picture shows the set comprises a number of sub-assemblies mounted direct on the inside of the moulded cabinet.

CIRCUIT.—A band-pass input circuit couples the aerial to V1, the frequency changer. The aerial is connected through a series condenser on long and medium waves and direct coupled on the short waveband.

Coupling to V2, an H.F. pentode, is an I.F. transformer tuned to 128 kc. A second I.F. transformer feeds the signal to V3, a double diode triode.

One diode of V3 is used for demodulation and the other, which is coupled to V2 by C25, supplies A.V.C. bias, which is fed to the preceding valves.

The output of the demodulator diode is resistance and capacity coupled to the triode section of V3, the network including the volume control. A further resistance and capacity stage connects the output pentode, V4, which drives the permanent-magnet speaker.



This diagram presents the same view as the above photograph and enables all the parts to be identified. Reference is aided by all resistances being indicated in solid black.

Mains equipment consists of a transformer and half wave rectifier. Smoothing is by a resistance, R1, in the negative return lead and the usual electrolytic condensers.

Special Notes.—The dial light is the usual Philips type 8042. The holder will be found screwed to the base of the cabinet behind the voltage adjustment panel The best way to remove it is to take out the rectifier, and then reach in and unscrew it from its holder.

Connections are provided for a gramophone pick-up. These are taken to the grid of V3 through the volume control. No switching position is provided, however, the connection of a pick-up being sufficient to render the diode inoperative.

This receiver does not employ a chassis in the usual sense of the word, the assembly taking the form of separate units bolted to the sides and front of the cabinet.

For all the usual service work there is no need to remove any of these units, the components being fully accessible, more so than in the majority of orthodox chassis. The coils are fixed into slots by pitch.

Switching Explanation.—As shown in the circuit diagram, the switches are in the short wave position. They work in a clockwise direction, the order of operation being short, medium, long waves. There is no gramophone switch position.

Small circles represent contact springs, and the short radial lines indicate shorting contacts on the rotor. These rotor contacts may be connected together, in which case solid arc lines are shown, or may link a number of stator contacts, in which case "dotted" arcs are given.

Circuit Alignment Notes

I.F. Circuits.—Reference to the circuit diagram will show that the I.F. transformers used in this receiver have fixed trimming condensers. It is unlikely that adjustment will become necessary, but in this event the self inductance between the I.F. coils is used for trimming.

Each coil assembly consists of two coils. When the distance between the two is adjusted the self inductance is altered and consequently the intermediate frequency. The outer coils only should be altered, as if the inner coils are adjusted in any way the band-width is altered considerably.

The small coils on the tube are fixed in position by means of wax and they must be released by means of a warm soldering iron. Adjustments may be carried out by hand, providing a rubber glove is worn.

When it is necessary to alter the coils, care should be taken to make sure that the wires do not break. If it is found that one of the coils should become open circuited, then it is desirable to refit a new coil assembly. When this is being done it is important to see that they are correctly placed in position, as otherwise it will be found that the band-width is too narrow and the volume insufficient.

C12 consists of a thick wire with a thin wire wound on it, and this assembly is fixed with wax.

When trimming the volume control must be placed at maximum and it is important that both the receiver and service oscillator should be correctly earthed.

(1) Inject a modulated 128 kc. signal to the grid of V2 through a 32,000 mmfd. condenser. First adjust the outer coil of L23, and after that the outer coil of L22.

(2) Apply a modulated signal of 128 kc. via a condenser of 32,000 mmfd. to the fourth grid of V1. Adjust the outer coils of L20 and L21.

(4) Apply a modulated signal of 128 kc. to the aerial socket via a condenser of 140 mmfd. Adjust the receiver to long waves and tune the variable condenser to its maximum capacity (2,000 metres). Heat L5 and trim until the

VALVE READINGS

No signal. Volume maximum. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	M.a.
1	FC4 met. (7) Mullard	Anode .. Screen .. Osc.anode	245 85 85	1.7 1.9 3.3
2	VP4B met. (7) Mullard.	Anode .. Screen ..	170 170	5.75 1.75
3	TDD4 met. (7) Mullard.	Anode	75	.47
4	Pen A4 (7) Mullard.	Anode .. Screen ..	260 240	36 4.4
5	1821 (4) Philips.	Filament	260	—

output indicator indicates a minimum value.

Medium Waves.—(1) Adjust the receiver to medium waveband and 200 metres.

(2) Rotate T1 completely and T2 approximately half.

(3) Apply a modulated signal of 1450 kc. via a condenser of 140 mmfd. to the aerial socket. Rotate the tuning condenser slightly until the first signal becomes audible from the minimum position, and adjust to largest output.

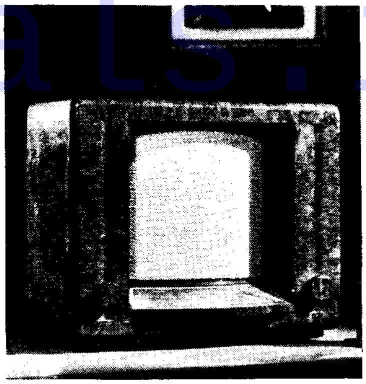
(4) Adjust T2 and T1 until the output indicator indicates the maximum output.

Long Waves.—(1) Leave the tuning condenser at its previous position and adjust the receiver for reception of long waves.

(2) Adjust the service oscillator to 411 kc. and adjust C12 to maximum output. If the capacity should be found to be too small an entirely new thin wire can be wound on the thicker wire.

CONDENSERS

C.	Purpose.	Mfds.
1	H.T. smoothing	32
2	H.T. smoothing	32
3	V1 heater by-pass	.01
4	V1 screen and osc. anode decoupling	.1
5	A.V.C. decoupling	.1
6	V3 grid decoupling	.25
13	Input shunt circuit (part)	.0001
14	Series aerial	.00002
15	V1 A.V.C. decoupling	.016
16	Band-pass coupling	.025
17	Band-pass coupling	.00005
18	Oscillator control	.000002
19	V1 osc. grid	.0007
20	V1 osc. grid	.00149
21	IFT 1 tuning	.00018
22	IFT 1 tuning	.00018
23	IFT 2 tuning	.00018
24	IFT 2 tuning	.00018
25	A.V.C. diode coupling	.000002
26	L.F. coupling	.01
27	H.F. by-pass	.001
28	H.F. by-pass	.000016
29	L.F. coupling	.01
33	V2 anode and screen decoupling	.1



RESISTANCES

R.	Purpose.	Ohms.
1	H.T. smoothing	40
2	H.T. decoupling	4,000
3	V1 and V2 H.T. decoupling	10,000
4	V1 A.V.C. decoupling	.1 meg.
5	V1 osc. anode decoupling	40
6	V1 osc. grid leak	50,000
7	Volume control	.5 meg.
8	V3 grid leak	.8 meg.
9	V3 grid bias decoupling	.25 meg.
10	A.V.C. decoupling	1 meg.
11	A.V.C. diode load	.5 meg.
12	V3 anode load	.32 meg.
13	V4 grid leak	.8 meg.
14	V4 grid stopper	.2 meg.
15	V4 cathode bias	125
16	Demodulator diode load	.2 meg.
17	V1 grid stabiliser	50
21	V1 screen and osc. anode decoupling	10,000 and 6,400 in series.

Philips V5 on Test

MODEL V5.—Standard model for 100-260 volt, 50-100 cycle A.C. mains. 8 gns.

DESCRIPTION.—A three-waveband, four-valve, plus rectifier, A.C. superhet table-type receiver.

FEATURES.—Walnut-tinted bakelite cabinet. Large full-vision station calibrated dial. Chassisless construction. Pick-up connection.

LOADING.—74 watts.

Sensitivity and Selectivity

SHORT WAVES (17-50 metres).—Gain good and no appreciable frequency drift. Under suitable conditions a number of programmes should be received.

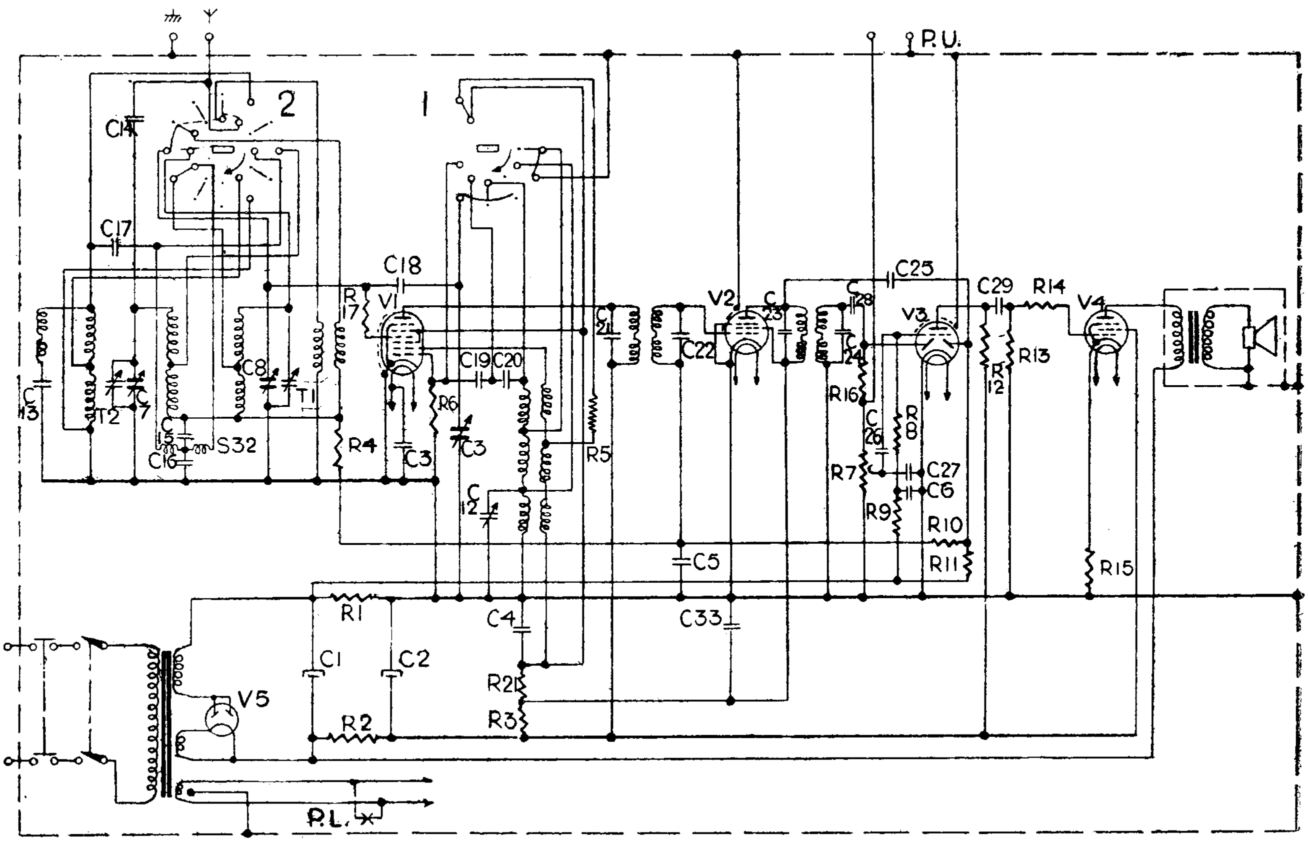
MEDIUM WAVES (180-600 metres).—All usual stations obtainable at excellent strength in daylight. Selectivity is such that there is only appreciable overlap on the local transmissions.

LONG WAVES (650-2,100 metres).—Good performance comparable to that on medium waves. Deutschlandsender receivable in swamp area with only slight overlap.

Acoustic Output

Tone is fairly well balanced, the upper frequencies do not predominate, and coloration on speech is very slight.

Background and hum low.



On the whole the circuit of the V5 follows the lines of any similar set constructed on orthodox lines. The I.F. transformers, however, are trimmed not by capacity but inductance. The switch diagrams are explained on the opposite page.