GENERAL ELECTRIC CO.'s "A.V.C.5" (Cont.)

The pilot lamps (3.5-volt .3-amp type) are connected in series with a 20 ohm resistance, one across each side of the 13-volt heater winding.

The sensitivity switch operates by decreasing the delay bias on the A.V.C. diode anode by means of short circuiting the resistances R21 and R25. As the delay bias decreases the sensitivity increases.

Quick Tests.—Between the following terminals on the L.S. transformer and chassis (note the polarity), counting from left to right of the leads to chassis :—

(1) Black, chassis.
(2) Orange, V4 anode, 245 volts.
(3) Red (to switch), 0 v. } L.S. transformer
(4) Grey (to switch), 0 v. } secondary.
(5) Black (to switch), 0 v. }
(6) Red, H.T.+ smoothed, 260 volts.
(7) Grey, H.T.−, 75 volts.

Removing Chassis.—Pull off the knobs, remove four screws underneath and lift chassis out.

General Notes.—To reach the components beside the first detector and I.F. valve-holders, the screen should be removed by undoing two screws at the end and one at each side of the chassis. In replacing the screws the two short ones should be at the end.

Switch contacts are towards the outside, and should be cleaned with a duster.

Replacing Chassis.—Lay chassis inside cabinet, replace holding screws and press the knobs on to the spindles.

PHILIPS 588A SIX-VALVE SUPERHET

Circuit.—The combined first detector oscillator FC4 (V1) is an octode. The aerial circuit consists of a band-pass aerial coupling with a special I.F. filter between the aerial and the first band-pass coil.

In the oscillator section the grid circuit is tuned. Coupling to the next valve is by band-pass I.F. transformer (frequency 115 K.C.). Bias is by cathode resistance and A.V.C.

The I.F. valve VP4A (V2) also employs cathode and A.V.C. bias, and is coupled to the next valve by a second band-pass I.F. transformer.

The second detector valve, 2D4 (V3) is a double diode valve without a triode section. L.F. impulses are taken from the low H.F. potential end of the secondary of IFT2 through an H.F. stopping resistance to the diode load potentiometer, which forms the volume control. The feed to the grid of the L.F. valve is through a condenser C29 with an additional H.F. by-pass condenser, C30.

In the first L.F. stage a SP4 (V4), H.F. pentode operating with fixed bias is employed. It is coupled to the output valve by a resistance capacity filter.

The A.V.C. line is also taken from the low potential end of the IFT2 secondary.

The output valve, PM24M (V5) is provided with tone compensation by fixed condenser and by a condenser in series with a variable resistance to form a tone control. The speaker is a Philips' permanent magnet type.

Mains equipment consists of transformer, full-wave 1821 rectifier, with a smoothing choke in the positive H.T. lead in conjunction with two 32-mfd. electrolytic condensers.

(*Continued on opposite page.*)

CONDENSERS

C.	Purpose.	Mfd.
1	H.T. smoothing	32 el.
2	H.T. smoothing	32 el.
3	By-pass from R4	.5
4	H.T. smoothing	1
5	V1 cathode	.05
6	V4 cathode	25 el.
7	Across V5 bias resistance	25 el.
8	Aerial series condenser	.000025
15	L.W. tracking on osc.	.00093
16	M.W. tracking on osc.	.00181
18	Band-pass coupling	.025
19	Band-pass coupling	.025
26	Decoupling A.V.C. line	.1
27	L.F. coupling V4 to V5	.01
28	Tone compensating V5 anode	.002
29	L.F. coupling V3 to V4	.01
30	H.F. by-pass	.0002
31	Diode condenser	.0001
32	V2 cathode	.1
34	Tone control circuit	.032

RESISTANCES

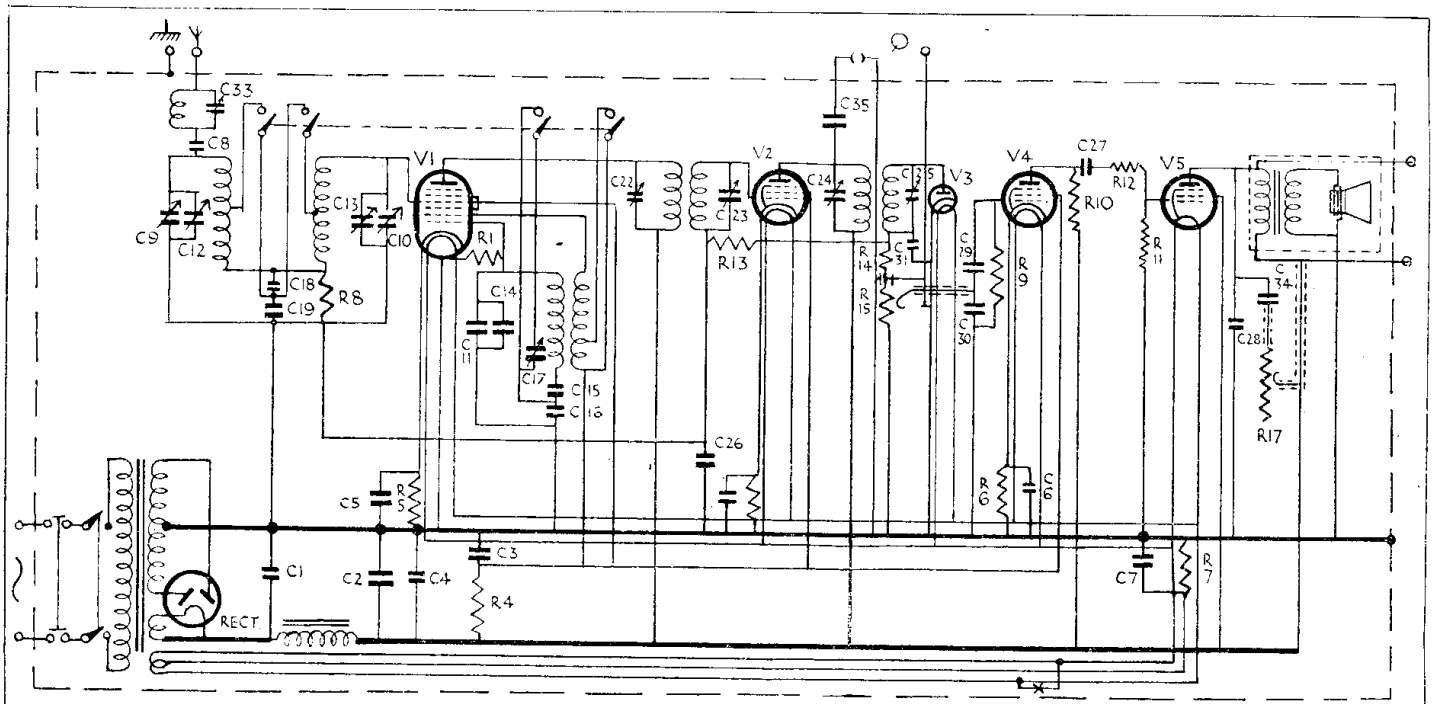
R.	Purpose.	Ohms.
1	Osc. grid leak	50,000
4	Voltage dropping to V1, V2 and V3 screens and Osc. anode	64,000+ 64,000
5	V1 cathode bias	200
6	V4 cathode bias	6,400
7	V5 bias resistance (see General Notes)	800
8	Decoupling V1 grid from A.V.C.	10,000
9	V4 grid leak	1 meg.
10	V4 anode coupling	.33 meg.
11	V5 grid leak	.5 meg.
12	H.F. stopper in V5 grid	.64 meg.
13	Decoupling A.V.C. line	1 meg.
14	H.F. stopper from diode	50,000
15	Diode load (V.C.)	.5 meg.
16	V2 cathode bias	640
17	Tone control (V5 anode circuit)	*50,000
	Smoothing choke	500
	Primary of output transformer	600
	*This may be 64,000 or 80,000	

VALVE READINGS

No signal.

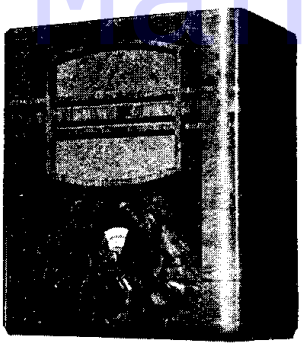
Valve	Type.	Electrode.	Volts.	Ma.
1	F.C.4 (met)	anode	245	.35
		aux. grid	66	
		osc. anode	66	
2	V.P.4A	anode	245	1.3
		aux. grid	66	
3	2D4	Diode valve	No H.T. readings	
4	S.P.4	anode	*160	.325
		aux. grid	67	
5	P.M.24M	anode	220	22
		aux. grid	228	4.2

* A high value of anode resistance causes a misleading voltage reading. Anode current is the important factor.



The circuit of the Philips 588A comprises an octode frequency-changer, an H.F. pentode I.F. amplifier, a diode second detector an H.F. pentode L.F. amplifier, an output pentode and a rectifier valve.

PHILIPS MODEL 588A SUPERHET (Cont.)



Like all receivers produced by Philips Lamps, Ltd., the model 588A—which is the first superhet marketed by the firm—has a number of interesting features. A large full-vision dial with changeable scales is fitted together with a concentric type of switch.

Special Notes.—Only one diode anode is used for rectification, the other being connected to cathode and chassis.

The biasing arrangement for the output valve (V5) is a resistance between the centre tap of the common filament winding and H.T.—. This resistance, R7, carries the current for the whole set, and the voltage drop across this exists in addition to the ordinary cathode bias between the cathodes and heaters of the preceding valves.

Quick Tests.—Between the terminals on the L.S. transformer and chassis :—

Top (red) H.T.+ smoothed, 228 volts.
Bottom (black), V5 anode, 220 volts.

Between the terminals on the smoothing choke (on top of the mains transformer) and chassis :—

Front, H.T.+ smoothed, 228 volts.
Back, H.T.+ unsmoothed, 245 volts.

Removing Chassis.—Remove the volume control, tone and tuning knobs (one grub screw each), and the wave-change switch knob (two grub screws), and lift the chassis out.

General Notes.—If occasion does arise when the set has to be reganged, the I.F. transformers must be set accurately to 115 KC before the oscillator is touched. The adjustment of each is very fine, and an accurate modulated oscillator must be used.

In handling the set take care that the switch lever and collar on the lever spindle are not lost.

The mechanism of the switching is easily followed when the chassis is removed.

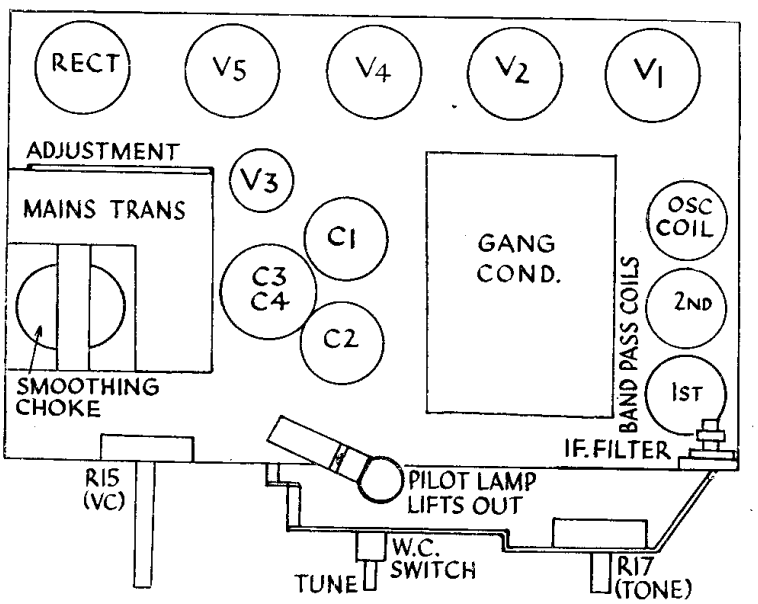
The mains plug is attached to the back of the cabinet, and can be undone by removing the two screws.

Replacing Chassis.—See that the switch lever is engaging in the grooved collar, and that the rubber supports are in position.

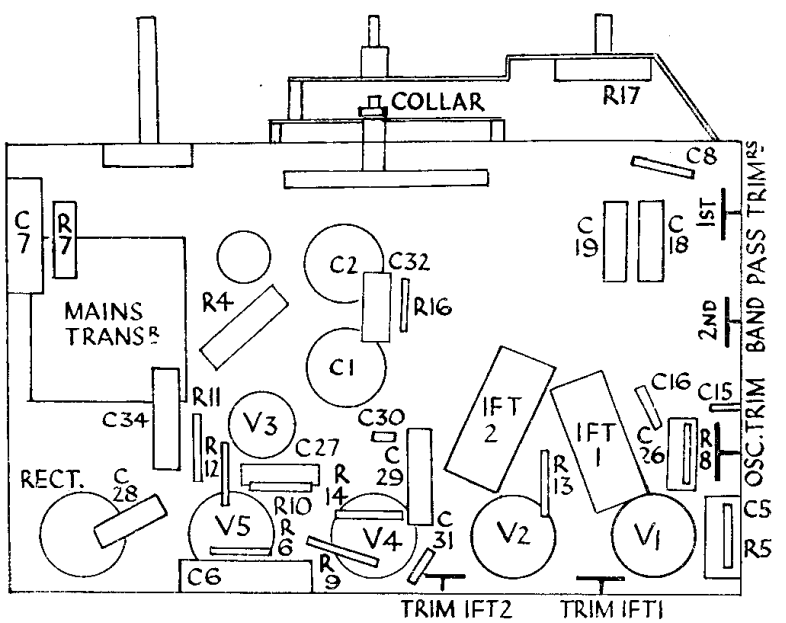
Lay the chassis inside the cabinet and replace the holding screws and the knobs.

The fact that the switch knob appears to be loose is not a fault, as the freedom allows the grub screws to be reached, and is limited when the tuning knob is replaced.

The chassis of the Philips 588A is extremely small for a 6-valve set. The gang condenser shown in the top "deck" layout on the right is a typical Philips miniature type, but the coils together take even less space.



Below is the diagram showing how the components are arranged below the chassis of the Philips 588A receiver. It will be noted that all the trimmers are accessibly placed round the edge of the chassis. These should not be touched, of course, unless an accurate oscillator is available.



RADIO MEASUREMENTS

Radio Receiver Measurements. Roy M. Barnard, B.Sc., A.M.I.R.E. Iliffe and Sons, Dorset House, Stamford Street, London, S.E.1. Price 4s. 6d. (post 4s. 9d.).

This book has been written as an encouragement and help to the service engineer who is sufficiently interested in his work to desire to leave the customer with a set that is giving the very best possible results in the way of both performance and quality of reproduction.

It deals extensively with equipment for radio measurements and gives practical hints on the ganging and aligning of the different types of receiver as well as the methods of combating the various forms of distortion.

Like most books on technical subjects, it is a compromise between the elementary and the highly technical, and frequently fails to differentiate between the practical limitations and the ideal of quality reception.

The details of design, however, are such that with their aid the service engineer will be able to bring a receiver to the "upper level" of standard limits instead of the lowest that will pass.

The book contains fifty-three illustrations and diagrams and gives much useful information in four appendices.