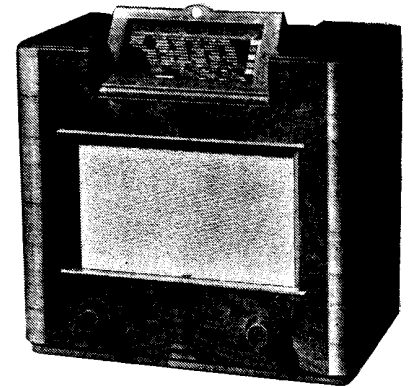


PHILIPS 748A A.C. SUPERHET FOUR



CIRCUIT.—An inductively and capacitively coupled band-pass filter couples the aerial to V1, the frequency changer. A mains aerial is brought into operation by a switch, which also prevents the connection of an external aerial.

Attention is drawn to R32, the purpose of which is to cut out any parasitic oscillation which might occur while the set is working on short waves.

Coupling to V2 is through an I.F. transformer tuned to 128 kc. V2 is an H.F. pentode and is in turn coupled by a second I.F. transformer to V3, a double diode triode.

One diode of V3 takes a small part of the I.F. signal from the anode of V2 through C36, and uses it to supply A.V.C. bias to the grid of the preceding valves in the orthodox manner. The other diode is used for demodulation, and is fed from a tap on the secondary of the second I.F. transformer.

The rectified output of the demodulator stage passes through a resistance and capacity stage, which incorporates the volume control, to the grid of the triode section.

Coupling between this valve and V4, the output pentode consists of a resistance and capacity stage.

Mains equipment consists of transformer, full-wave rectifier, electrolytic condensers and a smoothing choke.

Special Notes.—The dial light is a Philips type 8042. To remove it, pull the dial assembly upright and slacken

the bolts in each end of the lamp carrier, which will then pivot, making the lights easily accessible.

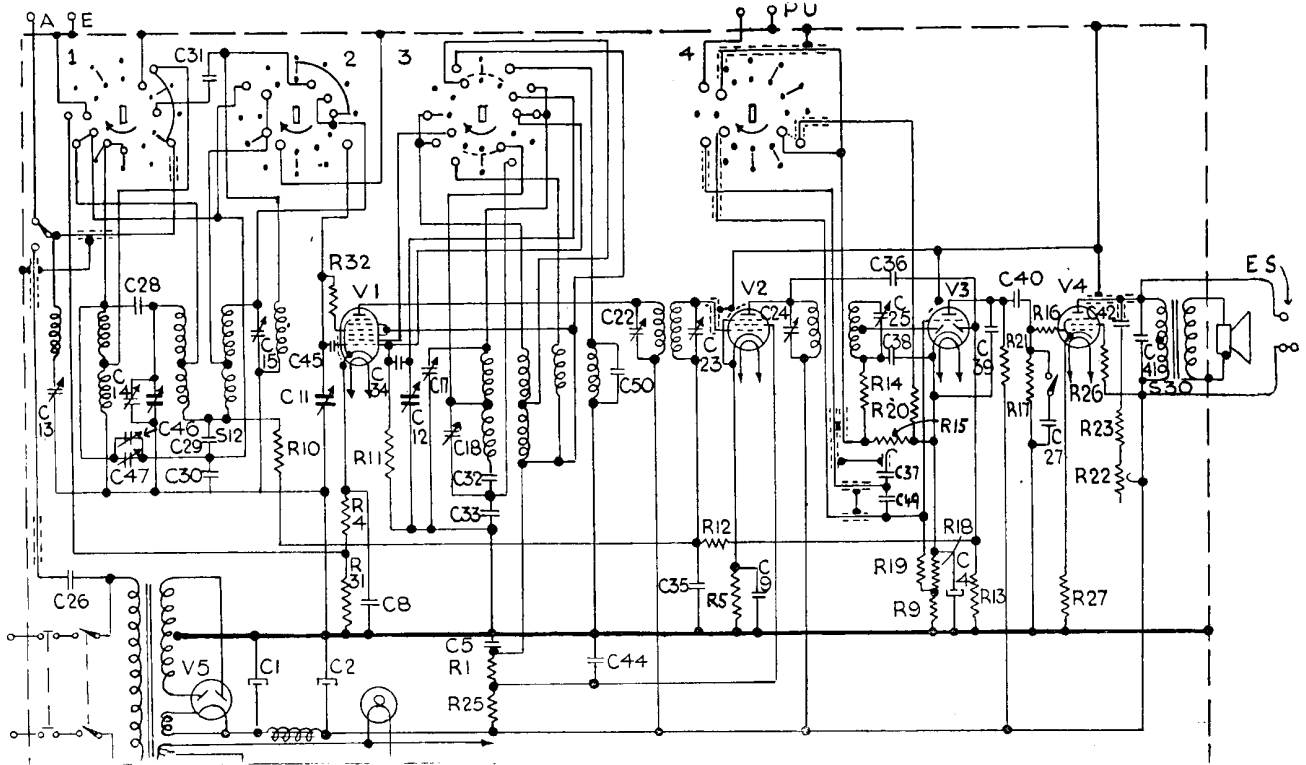
Connections are provided on the back of the chassis for a pick-up and an external speaker; the external speaker is connected on the primary of the output transformer, and should have its own matching transformer.

CONDENSERS

C.	Purpose.	Mfds.
1	H.T. smoothing	32
2	H.T. smoothing	32
4	V4 cathode bias shunt	50
5	V1 screen and osc. anode decoupling .. .. .	.1
8	V1 cathode bias shunt .. .. .	.05
9	V2 cathode bias shunt .. .. .	.1
26	Mains aerial .. .. .	.0005
27	Muting .. .. .	.1
28	Band pass coupling .. .. .	.00001
29	V1 A.V.C. decoupling .. .. .	.016
30	Band pass coupling .. .. .	.025
31	Short wave coupling .. .. .	.000016
32	Padding .. .. .	.0007
33	Padding .. .. .	.00149
34	V1 osc. grid .. .. .	.0001
35	V2 A.V.C. decoupling .. .. .	.1
36	A.V.C. diode coupling .. .. .	.0000064
37	L.F. coupling .. .. .	.01
38	H.F. filter .. .. .	.0001
39	V3 anode decoupling .. .. .	.00025
40	L.F. coupling .. .. .	.02
41	Pentode compensating .. .. .	.001
42	Tone control .. .. .	.05
44	V2 screen decoupling .. .. .	.1
45	Osc. regeneration control .. .. .	.000002
46	Image suppressor .. .. .	.00002
49	L.F. coupling .. .. .	.0008
50	S.W. osc. coil shunt .. .. .	.0000064

RESISTANCES

R.	Purpose.	Ohms.
1	V1 screen and osc. anode decoupling	20,000
4	V1 cathode bias (part)	250
5	V2 cathode bias (part)	250
9	V4 cathode bias (part)	3,200
10	V1 A.V.C. decoupling .. .. .	.1 meg.
11	V1 osc. grid leak	50,000
12	V2 A.V.C. decoupling	1 meg.
13	A.V.C. diode load .. .. .	.5 meg.
14	Demodulator diode load .. .. .	.4 meg.
15	Volume control .. .. .	.5 meg.
16	V4 grid stopper	40,000
17	V4 grid leak	1 meg.
18	V3 cathode bias (part)	3,200
19	V3 grid leak	1.6 meg.
20	Diode load shunt .. .. .	.1 meg.
21	V3 anode decoupling .. .. .	.2 meg.
22	Tone control	50,000
23	Tone control (fixed)	100
25	V2 screen decoupling	1,600
26	V4 screen decoupling	32
27	V4 cathode bias	160
31	V1 cathode bias (part)	10,000
32	V1 grid stabiliser	50



Circuit of the Philips 748A. The switch drawings are virtually pictures of the switch sections. A full explanation of the Philips switching arrangements is given on page 36 of volume 4 which describes the 704A.

A switching position is provided for the pick-up, so that it may be permanently wired in circuit. It is connected *via* the volume control to the grid of V3.

Removing Chassis.—Remove the four knobs from the front of the cabinet, by loosening the grub screws; then completely unscrew the adjusting screw and release the Bowden wire to the wave change indicator. Loosen the pointer set screw and take out the two wood screws in each of the brackets on either side of the dial. Undo the slotted nuts that hold the pressure plates in position.

Unsolder the leads to the speaker and the connecting link between the underchassis screen and the chassis. Finally remove the four bolts from underneath the cabinet.

It should be noted that this cabinet is fitted with a false fibre bottom, secured by four bolts, so that most of the work necessary may be done without removing the chassis.

Circuit Alignment Notes

I. F. Circuits.—Connect a modulated oscillator to the grid cap of V1 and an output meter across the external speaker terminals.

Shunt C24 with a 25,000 ohm resistance and set the selectivity control to maximum. Inject a signal of 128 kc., trim C25 for maximum reading on output meter. Remove the shunt.

Shunt C23 with a 10,000 ohm resistance and a .1 mfd. condenser in series. Trim C22 for maximum reading on the output meter. Remove the shunt.

Shunt C25 with a 25,000 ohm resistance. Trim C24 for maximum reading on the output meter. Remove the shunt.

Shunt C22 with a 10,000 ohm resistance. Trim C23 for maximum reading. Remove the shunt.

Medium Waves.—Inject a signal of 208 metres *via* a dummy aerial to the aerial and earth terminals, and tune it in. A template is available from the manufacturers, so that correct adjustment of the tuning condenser can be made.

Adjust C17, C14 and C15 for maximum. If the oscillator coils are badly out of gang, use should be made of an amplifier connected to the anode of V1, *via* a .00025 mfd. condenser, and to the chassis.

The amplifier may be the gramophone side of any reliable receiver, and care should be taken to see that the amplifier grid lead is taken to the anode of V1. The anode lead of V1 is bared, and can be reached through a hole in the chassis to the right of the valve.

Having satisfactorily connected the amplifier, the procedure is as follows: Shunt C22 with a 2,000 ohm resistance and a .1 mfd. condenser in series, and inject a strong signal of 545 metres to the aerial and earth terminals.

Tune the receiver until it is heard from the amplifier, remove the amplifier, and shunt and trim C20 for maximum reading on output meter.

The above should be repeated until the best results are obtained.

Long Waves.—Inject and tune in a signal of 760 metres (using template if available). Adjust C18 for maximum response.

Short Waves.—Inject and tune in a signal of 17.6 metres (using template if available) and trim C16 for maximum reading on output meter.

Aerial Filter.—Switch the receiver to long waves and tune the condenser to maximum. Apply a strong signal of 128 kcs. (the intermediate frequency) and trim C13 for minimum reading.

Image Filter.—Inject a signal of 403 metres and tune it in. Leaving the tuning condenser at this setting, inject a strong signal of 300 metres and adjust C46 for minimum reading on the output meter.

Replacement condensers for the 748A available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18, are: For C's 1 and 2, list 2989 (7s. 6d each); for C4, list 2915 (1s. 9d.).

Philips 748A on Test

MODEL 748A.—Standard model for A.C. mains operation, 200-250 volts, 40-100 cycle. Price 12½ gns.

DESCRIPTION.—Table model superhet, four valve plus rectifier, operating on three wavebands.

FEATURES.—Walnut cabinet, tilting full-vision scale calibrated in wavelengths and station names. Controls provide for range, tone, volume, and tuning.

LOADING.—62 watts.

Sensitivity and Selectivity

SHORT WAVES (16.7-51 metres).—Extremely good sensitivity and selectivity, giving good programme strength with an indifferent aerial. Tuning is easy and there is no appreciable drift. The calibration is quite accurate.

MEDIUM WAVES (200-285 metres).—Excellent performance with sufficient selectivity for all ordinary requirements. Overlap occurs only on channels adjacent to the local stations. Night performance gives practically any useful programme at good room strength.

LONG WAVES (725-2,000 metres).—General performance similar. Deutschlandsender received with very little interference. Ample volume from all the usual stations with easy separation.

Acoustic Output

Very good for a mains pentode, with a well-matched and balanced output. The tone control is quite effective and it is easy to find a good compromise position.

LAMP FAILURES

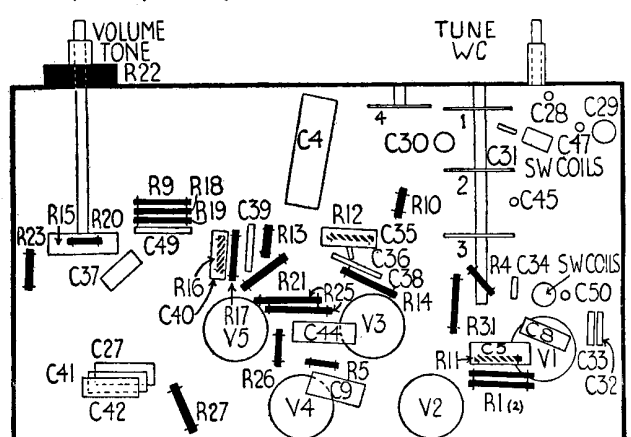
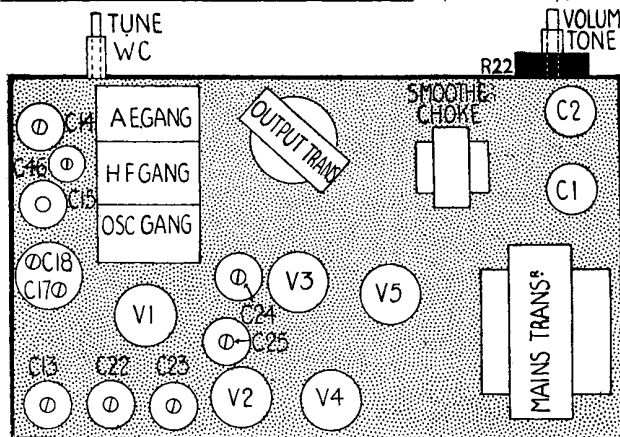
When a universal receiver has been operated for some time on D.C. mains and is then transferred to A.C., trouble is sometimes experienced with pilot lamp failures.

This is due to the heavier leakage current on rectified A.C. of electrolytic condensers that have been formed on D.C. The remedy is to replace the smoothing condensers or, more cheaply, to reduce the value of the pilot lamp shunt resistance to about two-thirds of the usual value.

VALVE READINGS

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

V.	Type.	Electrode.	Volts.	Ma.
1	FC4 met. (7)	Anode ..	245	2.5
		Screen ..	60	2
		Osc.anode	60	4.9
2	VP4B met. (7)	Anode ..	250	6.15
		Screen ..	135	2.3
3	TDD4 met. (7)	Anode ..	60	1.2
4	Pen A4 (7)	Anode ..	235	34
		Screen ..	245	4
5	The above are all Mullard. 1821 Philips (4)	Filament	270	—



Two views of the 748A chassis. Left is the top; right is the underside. All resistors are in solid black.