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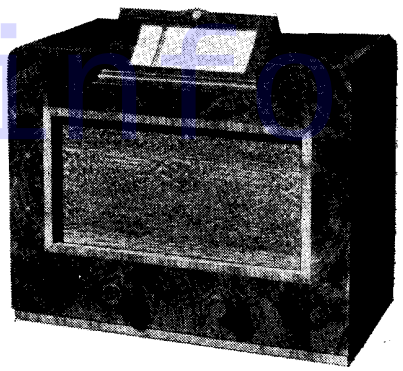
PHILIPS MODEL 714B BATTERY FIVE



The Philips 714B, a superhet all-wave battery five with Q.P.P. output.

CIRCUIT.—An inductively and capacitively coupled band-pass filter couples the aerial to V1, an H.F. pentode, on medium and long waves. On short waves a single inductively coupled tuned circuit is used. An image frequency filter consisting of CK1 and T5 is included in the aerial circuit.

A separate triode oscillator is employed with an orthodox coil circuit, injection being to the suppressor grid of V1.

The output of V1 is coupled via an I.F. transformer tuned to 128 kc. to V3, an H.F. pentode, which is in turn coupled through a second I.F. transformer to V4, a double diode triode.

The primary of the second I.F. transformer is centre tapped and is coupled through a small condenser, C31, to one diode of V4, which is used to supply A.V.C. bias to the grids of the preceding valves in the orthodox manner.

The other diode is used for demodulation, the L.F. output being fed through a resistance and capacity stage, which incorporates the volume control, to the grid of the triode section.

The grid circuit of V4 also includes a muting condenser, C38, which is brought into circuit by depression of the volume control knob.

Coupling to V5 the Q.P.P. output pentode is through a capacity coupled Q.P.P. transformer. Grid bias for this and the preceding valve V4 is obtained from the battery.

The amplified output of V5 is fed through a matching transformer to the moving-coil speaker.

H.T. and grid bias are obtained from a combined Ever-Ready "Portable 59" and L.T. from a 2-volt 20-amp. hour Oldham accumulator, type ZLG3.

Special Notes.—Sockets are provided on the back of the chassis for connecting an external speaker and a pick-up. The external speaker connections are taken from the primary of the output transformer and an extra speaker should therefore have its own matching transformer.

The pick-up connections are via the volume control to the grid of V4; a switching position is provided so that the pick-up may be permanently wired in circuit.

When the receiver is operating on short waves the oscillator frequency is 128 kc. lower than the frequency to which the H.F. circuits are tuned, the object being to prevent oscillator drift.

Special arrangements are made for correct matching of the two sections of the output valve, by means of letters etched on the glass bulb and corresponding to H.T. voltages.

The two sections of the valve are identified by means of the letters A and B stamped on the side of the base, above which will be found the battery voltage letters, these being as follow: T, 133.5 volts; S, 128 volts; R, 118.5 volts; Q, 111 volts; P, 103.5 volts.

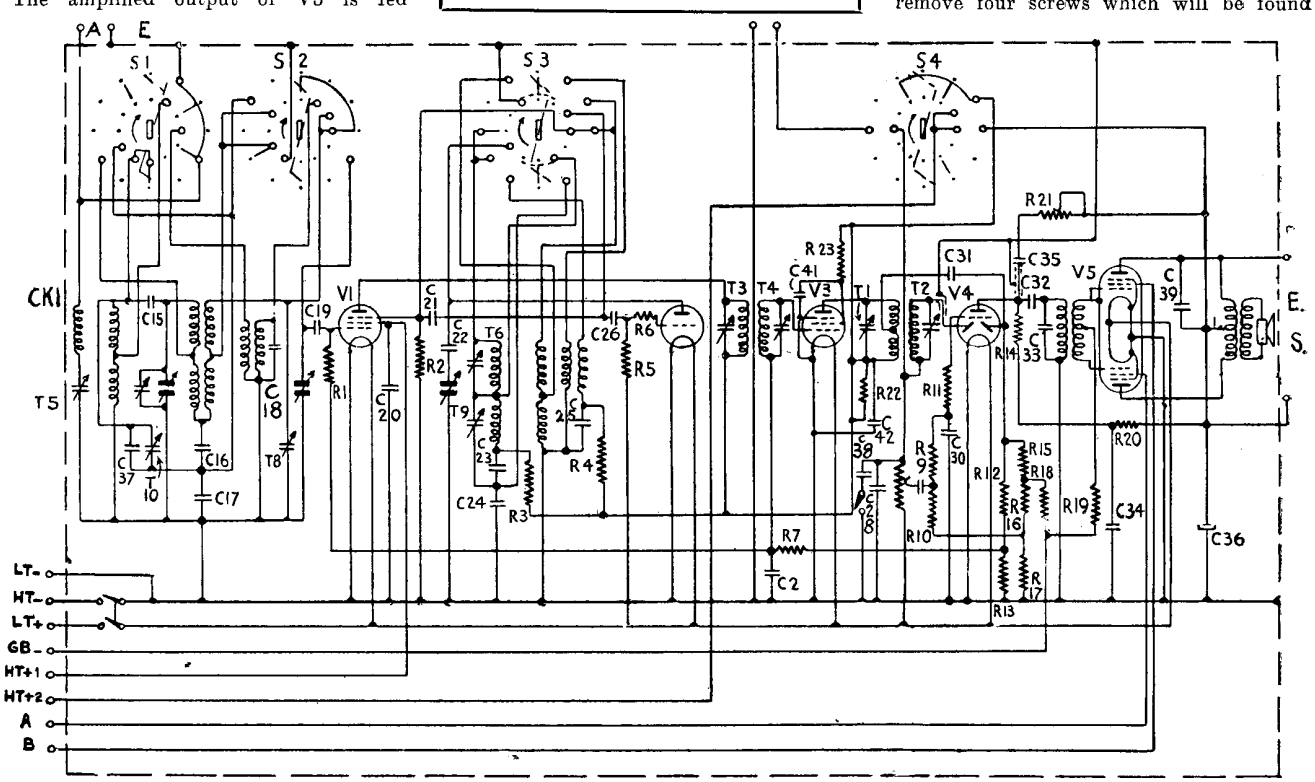
Removing Chassis.—Remove the four knobs from the front of the cabinet (grub screws) and unsolder the earth lead between the chassis and metallised paper base of the cabinet.

Undo the adjusting screw and release the Bowden cable from the wave-change indicator. Slacken the screw securing the pointer to the wire and the two slotted nuts, one on each side of the scale. Then remove four screws which will be found

VALVE READINGS

No signal. Volume maximum. New batteries

V.	Type.	Electrode.	Volts.	Ma.
	All Mullard.			
1	VP2 met. (7)	Anode ..	145	1.1
		Screen ..	115	.25
2	PM1HL met. (4)	Anode ..	70	1.75
3	VP2 met. (7)	Anode ..	135	1.55
		Screen ..	130	.3
4	TDD2A met. (5)	Anode ..	100	.8
5	QP22A (9) ..	Anode 1	145	1.1
		Screen 1	118	.09
		Anode 2	145	1.1
		Screen 2	118	.09



Valve arrangement of the 714B is H.F. pentode, triode oscillator, I.F. pentode, double-diode-triode and Q.P.P. output. The H.F. filter is band-pass on medium and long and a single circuit on short waves.

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in two brackets on either side of the scale, just above the adjusting screws for the tuning drive Bowden cables.

Finally, unsolder the speaker connecting leads and remove four bolts from underneath the cabinet and the chassis may be completely removed.

It should be noted that this cabinet is fitted with a removable fibre base plate which is held in place by four small bolts. Most of the work necessary may be done without removing the chassis.

Circuit Alignment Notes

All the trimming condenser adjusting screws are sealed with wax, which must be softened with a warm soldering iron. Great care should be taken when adjusting the trimmers, otherwise the wires soldered to the heads of the adjusting screws may be broken.

In the notes below mention is made of a 15 deg. template and an auxiliary amplifier. The template is for adjusting the gang condenser to a required capacity and may be obtained from Philips' service department. The amplifier will only be needed if the receiver is badly out of gang, and can be the gramophone side of any reliable radio set.

For I.F. trimming various shunt resistances and condensers are required, the procedure being to shunt the secondary of one transformer while trimming the primary and the primary while trimming the secondary.

I.F. Circuits.—Switch the receiver to long waves, tune the gang condenser to maximum capacity and short circuit the oscillator gang.

Connect a modulated oscillator tuned to 128 kc. to the grid of V3, via a .032 mfd. condenser, and an output meter across the external speaker terminals.

Use a .01 mfd. shunt condenser and trim T1 and T2 for maximum output.

Transfer the oscillator lead to the grid of V1, shunt the secondary of the first I.F.T. with a 10,000 ohm resistance and trim T3. Remove the shunt.

Shunt the primary with a 10,000 ohm resistance and a .1 mfd. condenser in series and trim T4 for maximum output. Remove the shunt and repeat the adjustment of T3 Then readjust T1.

I.F. Filter.—Transfer the oscillator, still tuned to 128 kc., to the aerial and earth terminals and adjust T5 for *minimum* output.

Medium Waves.—Place the 15 deg. template in position and adjust the gang condenser against it. If the template is not on hand, then tune the receiver to 208 metres (1,442 kc.), inject a signal of this wavelength to the aerial and earth terminals via a dummy aerial and adjust T6, T7 and T8 for maximum output.

Long Waves.—Tune the receiver to 760 metres (395 kc.) or adjust the condenser against the template. Inject a signal of 760 metres and adjust T9 for maximum output.

Image Filter.—Inject a strong signal of 300 metres (1,000 kc.), tune the receiver carefully to the second channel whistle on approximately 403 metres and trim T10 for *minimum* output.

Short Waves.—There are no short wave adjustments on this receiver, the circuits being permanently adjusted by the makers.

RESISTANCES

R.	Purpose.	Ohms.
1	V1 grid	1.25 meg.
2	V1 suppressor grid leak	50,000
3	V2 anode decoupling	32,000
4	V2 anode decoupling	32,000
5	V2 grid leak	16,000
6	V2 grid stabiliser	40
7	V1 and V3 A.V.C. decoupling	.5 meg.
8	Volume control	.5 meg.
9	V4 grid network part	.2 meg.
10	V4 grid network part	1 meg.
11	V4 grid network part	.2 meg.
12	A.V.C. diode load (part)	1 meg.
13	A.V.C. diode load (part)	.32 meg.
14	V4 anode load	25,000
15	Grid bias network (part)	1 meg.
16	Grid bias network (part)	20,000
17	Grid bias network (part)	5,000
18	Grid bias network (part)	10,000
19	V5 grid stabiliser	.2 meg.
20	V4 anode decoupling	8,000
21	Tone control	50,000
22	V3 anode decoupling	4,000
23	V3 screen decoupling	20,000

CONDENSERS

C.	Purpose.	Mfd.
15	Top band pass coupling	.00001
16	Band pass coupling	.016
17	Band pass coupling	.025
18	S.W. grid coil shunt	.00002
19	V1 grid isolating	.0001
20	V1 screen decoupling	.1
21	V1 suppressor grid coupling	.00002
22	Osc. gang series	.02
23	L.W. osc. padding	.000764
24	Osc. padding	.001615
25	S.W. osc padding	.02
26	V2 grid	.0001
27	A.V.C. decoupling	.1
28	H.F. filter	.0001
29	L.F. coupling	.001
30	L.F. filter	.0001
31	A.V.C. diode coupling	.0001
32	L.F. coupling	.05
33	L.F. transformer shunt	.001
34	V4 anode decoupling	.5
35	Tone control	.05
36	H.T. shunt	8
37	Image suppressor	.000025
38	Muting	.01
39	Pentode compensating	.001
40	Pentode compensating	.0000064
41	V3 screen decoupling	.008
42	V3 anode decoupling	.008

Philips 714B on Test

MODEL 714B.—Standard model for battery operation, using Ever Ready "Portable 50" H.T. battery and Oldham type ZLG3 L.T. battery. Price 14 gns.

DESCRIPTION.—Four-valve, plus oscillator, battery superhet table model with walnut-finished cabinet.

FEATURES. — Straight-line full-vision scale with name and wavelength calibration. Scale not illuminated. Variable selectivity control ganged with tone. Push action muting switch on tuning knob. Tone control concentric with band width control. Volume concentric with wave selection. Internal aerial selective by plug.

LOADING.—L.T., .95 amp.; H.T., 7.5 ma.

Sensitivity and Selectivity

SHORT WAVES (16.5-52 metres).—Gain and selectivity very good. Easy handling, no drift. gain well maintained over waveband.

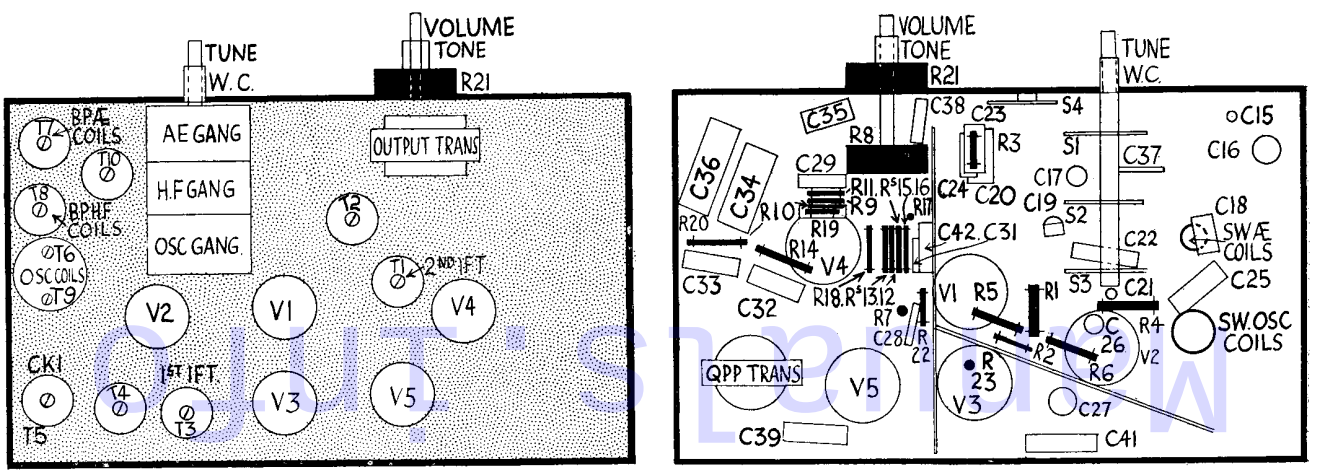
MEDIUM WAVES (190-585 metres). —Sensitivity and selectivity of very high order. In maximum position the band width gives excellent fidelity, whilst in minimum selectivity will separate adjacent channels. Overlap only present on local stations. Background quiet. Whistles very slight.

LONG WAVES (725-2,000).—Very high gain, selectivity sufficient to give Deutschlandsender with substantially no interference. Gain and selectivity well maintained over waveband.

Acoustic Output.

Very good for single high slope pentode, illustrating the value of tone-compensating circuits. Sufficient volume for medium room without overloading.

An exact replacement condenser for C36 in this Philips receiver is available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W. List number 3,472, it is priced at 2s. 9d.



Chassis layout of the Philips 714B. The tinted diagram (left) is the top; the right-hand diagram is the underside.

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