

PHILIPS 730A, 720A

Five-valve, plus rectifier, two-waveband TRF receiver incorporating three LF stages. Provision is made for a pick-up and a high impedance extra loudspeaker in the 730A. The 720A is in a moulded cabinet and has no internal loud-speaker or matching transformer. Suitable for operation from AC mains 100-260v, 40-100 cycles. Marketed in 1931 by Philips Lamps Ltd., Service Dept., Cherry Orchard Road, Croydon, Surrey.

Two aerial sockets are provided, A1 for very strong transmissions and A2 for normal reception. The capacity denoted by C1 is actually the condenser effect between the A1 and A2 aerial sockets.

From A2 the signals are fed via an aerial trimmer T7 to a tapping on the MW primary winding L1 of a band-pass filter unit comprising L1, L3 (MW) and L2, L4 (LW). The two sections of the filter are tuned by VC1 and VC2, which are ganged, and bandpass coupling is effected by C2 and C3.

From a tapping on L3 signals are fed to the grid of V1, which has a gain control R7 which varies the bias on the grid. Permanent cathode biasing is effected by R2 decoupled by C5.

Tuned anode coupling is used to transfer the signal from V1 to a second HF amplifier V2. L5 is the MW coil and L6 the LW coil, both tuned by VC3, which is ganged to VC1 and VC2. C9 is the blocking condenser with R9 the grid to cathode resistance of V2.

The signal is transferred from V2 to the triode detector V3 by aperiodic tuned anode choke L7 across which C13 is shunted on LW. C14 is a

blocking condenser operating also as a grid condenser, with R12 the gridleak for rectification. A high resistance pickup may be connected to the sockets provided and when this is done bias is applied to the grid of V3 from the voltage drop

RESISTANCES

R	Ohms	R	Ohms
1	1 meg	13	16,000
2	400	14	10,000
3	50,000	15	32,000
4	40,000	16	1 meg
5	50,000	17	500,000
6	64,000	18	20,000
7	6,200	19	32,000
8	16,000	20	80,000
9	1 meg	21	16,000
10	400	22	500,000
11	20,000	23	100
12	1 meg	24	100,000

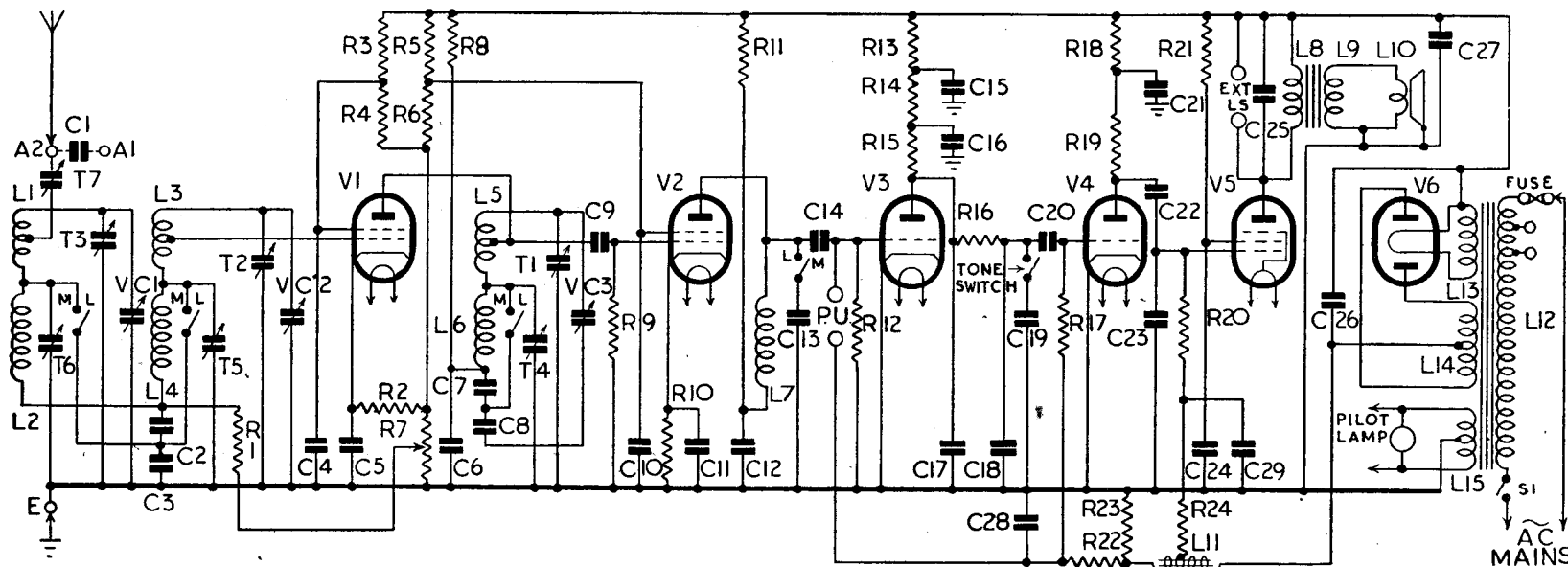
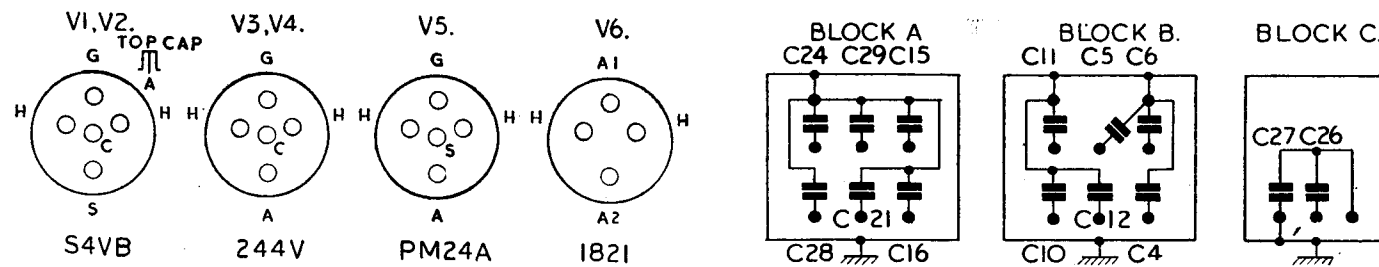
Many alternative values will be found in some chassis such as 12,500 for 10,000 ohms; 640,000 for 500,000 ohms; 80,000 for 100,000 ohms; 1.25 meg for 1 meg; etc.

WINDINGS

L	Ohms	L	Ohms
1	3	9*	1
2	15	10*†	24
3	3	11 (total)	1,350
4	3	12-12b (total)	38
5	15	13	1
6	37	14 (total)	560
7	15	15	.05
8*	200		

* Model 730A only.

† Normal low impedance in later models.

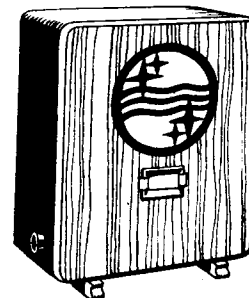


The 730A and 720A receivers were two of the few commercial sets made with two high-frequency stages. The circuit is tuned radio-frequency with bandpass preselection. To avoid four ganged stages, coupling between V2 and V3 is aperiodic.

across R23 in the HT negative line. Decoupling is effected by R22 and C28.

LF signals from V3 are resistance capacity coupled by R15 and C20 and R17 to the grid of the LF amplifier V4. This valve is biased from R23 and a tone control comprises C19 and switch which is located on the chassis deck at the rear. HF filtering is effected by C17, R16 and C18.

A second stage of resistance capacity coupling incorporating R19, C22 and R20



The 730A is an early Philips model employing a straight TRF circuit which was introduced under the name "Superinductance."

CONDENSERS

C	Mfd
1	very low
2	.05
3	.05
4	.05
5	.05
6	1.5
7*	.05
8	.05
9*	.00008
10	.05
11	.05
12	.05
13	.00064
14	.0001
15	1
16	1
17	.002
18	.00025
19	.002
20	.008
21	.05
22	.05
23	.0016
24	.05
25†	.0016
26	.05
27	.05
28	.05
29	.05

* May be .00064 mfd.

† May be .002 mfd. or .0025 mfd.

‡ May be .064 mfd.

PHILIPS 730A

Contd.

These two drawings identify all parts on the 730A chassis. Use of solid black for resistors speeds reference by distinguishing from condensers. Details of condenser blocks A, B and C are on page iii.

passes on the LF signals to the grid of the output pentode V5. This valve is biased by taking R20 via decoupling components R24 and C29 to a tapping on the smoothing choke L11 in the HT negative line, so that V5 bias is derived from the voltage drop across R23 and a part of L11.

A permanent degree of tone correction is effected by C25 and in the model 720A two sockets are provided in the anode circuit of V5 for the connection of a high impedance speaker. In the model 730A an internal speaker is provided, in which L8, L9 is the output transformer and L10 the speech coil. Sockets for an extra loudspeaker of the high impedance type are provided across L8.

The power supply is derived from the usual full-wave rectifier V6 with smoothing effected by a choke L11 in the negative lead and condensers C26 and C27.

GANGING

MW band.—Inject a 225m. signal into the aerial and earth sockets, using A1 socket unless the signal is very weak. Switch receiver to MW by pulling out the tuning knob and tune it to 225m. on the scale. Adjust T1, T2 and T3 for maximum output.

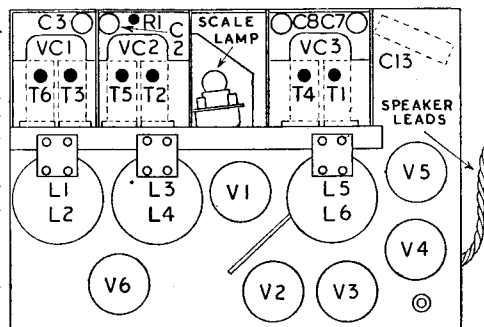
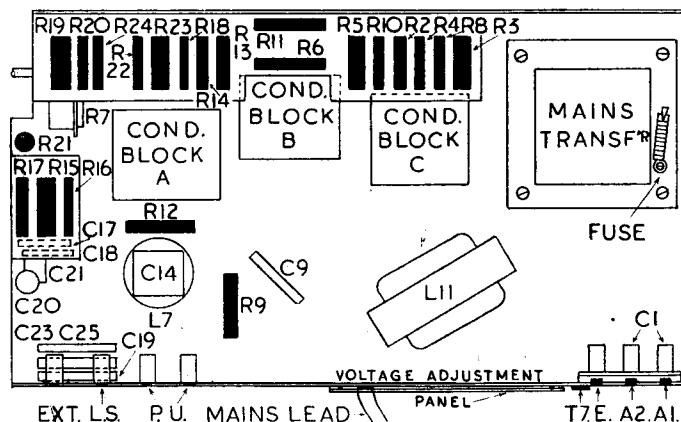
LW band.—Switch receiver to LW and tune to 900m. on the scale. Inject a signal of this wavelength as before and adjust T4, T5 and T6 for maximum output.

Aerial matching.—With the receiver connected to the aerial with which it is to operate, tune in a broadcast transmission at the lower end of the MW band and adjust T7 for maximum output.

VALVE READINGS

V	Type	Electrode	Volts	Ma.
1	S4VB (met)	Anode	175	3
	Mullard	Screen	95	.5
2	S4VB (met)	Anode	175	3.5
	Mullard	Screen	95	.5
3	244V (met)	Anode	60	3
	Mullard	—	—	—
4	244V (met)	Anode	100	2.5
	Mullard	—	—	—
5	PM24A	Anode	195	17
	Mullard	Screen	170	3
6	1821(Philips)	Heater to chassis	190	—

Pilot lamp; Philips type 8046, 6 volt, 3 watt S.B.C. with centre contact.



Instability in Pye Receivers

SOME of the Pye receivers type MP/44 become unstable after a time and the trouble appears to be due to slight changes occurring in the IF circuits. It is generally easily cured by alteration of the coupling between the IF coils.

The IF trimmers are fixed so far as capacity is concerned and the movement of the coils changes both the coupling and tuning slightly. It will effect a cure for the oscillation and when properly adjusted will not lower the sensitivity or affect the tone.—F.D.L.

Oscillation in Output Stage

AN Alba AC model 90 receiver was brought in for repair with the output valve, a Mullard PEN4DD, showing a bad cathode-heater leakage when hot. On changing the valve for a new one of the same type, and fitting a new bias electrolytic, the set became unstable and would not tune in any transmission on any waveband; the only sound was a loud hissing from the speaker.

Two more valves of similar type were tried with the same results, although all stages appeared to be operating correctly. Finally the removal of the C17 (Service Engineer Sheet) .005 mfd. pentode compensator condenser connected between the anode and cathode of the PEN4DD completely cured the fault.—S. CARTER.

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