

PHILIPS 735A 711A

Four-valve, plus rectifier, three waveband superhet with mechanical push-button tuning in table and radiogram (711A) models. For A.C. mains. Made by Philips Lamps, Ltd., Century House, London, W.C.2.

Circuit.—Band-pass circuits link the aerial to V1, the frequency-changer, on M. and L.W. On S.W. a simple coupled circuit is used. The tuned circuits are across the anode load of the oscillator section, an iron-cored coil being used on M.W. The first I.F. transformer has extra secondary turns which are switched for control of selectivity. V2 is a I.F. amplifier.

The primary of the second I.F. transformer has a tapping going to the A.V.C. diode in V4, a double-diode output pentode. A tapped secondary winding energises the demodulation diode, also in V4. The volume control taps off part of the rectified signal and applies it to the grid of the pentode section of V3 for L.F. amplification.

Through R13, R14 the D.C. component of the rectified signal is also applied to V3 and in amplified form is passed on, inside the valve, to the tuning indicator section.

Amplified I.F. signals are resistance-capacity fed to the pentode section of V4. A third winding on the output transformer provides tone-correction feed-back to V3.

V5 is a full-wave rectifier with resistances and condensers for smoothing.

Wavebands: 13.8-51, 175-585, 708-2,000 metres. Provision for P.U. and low-impedance extension speaker. Consumption: 51 watts.

In Model 711A, the motor is across a 110 v. tapping on the input transformer primary.

GANGING

I.F. CIRCUITS.—Tune to 180 m., volume maximum, selectivity minimum. Adjust I.F. trimmers at 128 kc.

A.W. BAND.—Tune to 180 m., inject 1,600 kc., adjust C17, C9, C6, C9, C17.

Take additional receiver, connect output meter to this, and connect aerial, through 25 mmfd. condenser, to hexode anode of V1.

Inject 546 kc. and adjust both sets for maximum. Disconnect extra set, return output meter to 735A, leave tuning of 735A alone and adjust C52 for maximum.

Retrim C17.

L.W. BAND.—Connect extra set as above and tune both sets for maximum at 400 kc. Disconnect extra set and adjust C19.

Connect extra set and adjust at 160 kc. Disconnect, and adjust C53. Repeat 400 kc. operation.

There are no S.W. adjustments.

I.F. FILTER.—Inject 128 kc. to aerial and adjust C35 for minimum.

PUSH KEYS

The gang condenser has a lateral instead of rotary movement. The amount of travel—that is, the station setting—is determined by a screw, set in each key, and bearing against a stop bar.

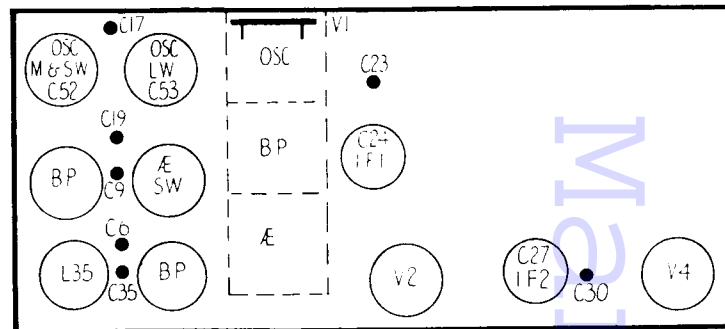
For wave switching the keys tilt rockers. On three keys, releasing a screw lets an arm fall. In the up position these arms push the L.W. rocker.

Station and button screws are adjusted with a tool provided through holes below the keys.

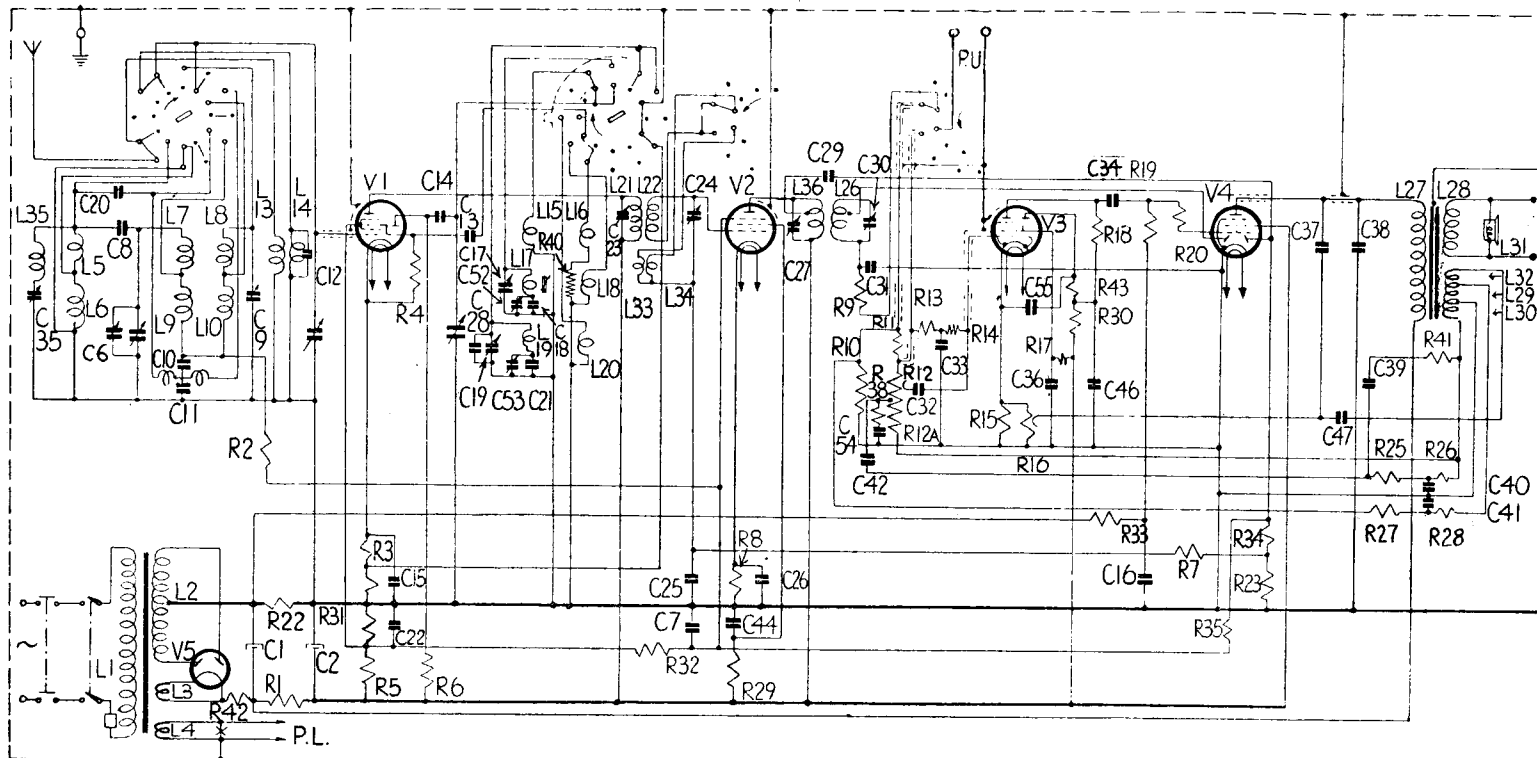
VALVE READINGS

V.	Type.	Electrode.	Volts.	Ma.
1	ECH3	Anode	230	.95
		Screen	70	1.5
		Osc. anode	125	4
2	EF9	Cathode	2.8	6.5
		Anode	230	5.5
		Screen	73	1.6
		Cathode	1.3	7.1

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The mechanical tuning system in the 735A does not involve any electrical features. The switch indications in the circuit represent the actual arrangement of contacts and shorting bars.



VALVE READINGS—Continued

V.	Type.	Electrode.	Volts.	Ma.
3	EFM1	Anode	105	.7
		Screen	35	.65
		Target	170	—
4	EBL1	Cathode	1.5	34
		Anode	250	4.5
		Screen	235	38.5
5	AZ1	Cathode	5.5	—
		(Across C1)	275	—
		(Across C2)	230	—

Pilot lamp, type 8091D-00.

RESISTANCES

R	Ohms.	R	Ohms.
1	1,500	20	1,000
2	.1 meg.	22	100
3	330	23	.47 meg.
4	47,000	24	150
5	47,000	25	4,700
6	27,000	26	1,500
7	1.8 meg.	27	.82 meg.
8	120	28	10,000
9	.22 meg.	29	.1 meg.
10	.68 meg.	30	39,000
11	.18 meg.	31	33,000
12	.65 meg.	32	2x4.7meg.
12a	50,000	33	.18 meg.
13	1.5 meg.	34	.47 meg.
14	1 meg.	35	1 meg.
15	1,000	38	22,000
16	50,000	40	15
17	.33 meg.	41	3,300
18	.12 meg.	42	100
19	.47 meg.	43	47,000

CONDENSERS

C	Mfds.	C	Mfds.
1	50	28	12 mmfds.
2	32	29	18 mmfds.
6	20 mmfds.	31	56 mmfds.
7	.1	32	.033
8	10 mmfds.	33	.068
9	20 mmfds.	34	.047
10	.012	36	.056
11	.039	37	330 mmfds.
12	2.2 mmfds.	38	.0047
13	47 mmfds.	39	.0022
14	470 mmfds.	40	.022
15	.047	41	.01
16	.22	42	.056
17	20 mmfds.	44	.047
18	1,382 mmfds.	46	.18
19	20 mmfds.	47	.0039
20	39 mmfds.	52	.0002
21	325 mmfds.	53	.0002
22	.047	54	.18
25	.068	55	.18
26	.047		

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FERGUSONIC 909, 908

"MAINS MINORS"

Four-valve, plus rectifier, A.C.-D.C. superhet "compact" covering short- and medium-wave bands. Model 908 covers medium and long bands. Made by Ferguson Radio, Ltd., Gt. Cambridge Road, Enfield, Middx.

Circuit.—(Model 909.) The aerial is coupled by transformer coils, both primaries and secondaries being switched,

to V1, the frequency-changer. Transformer coils are also used in the oscillator section, the anode coils being tuned. The S.W. grid coil remains in circuit on M.W.

Trimmer-tuned I.F. transformers lead to V2, the I.F. amplifier, and V3, the diode-diode triode. The demodulation and A.V.C. circuits are straightforward, A.V.C., being applied to V1 and V2 on both bands. V1, V2 and V3 have a common cathode return.

V3 is resistance-capacity coupled to V4, the output pentode. V5 is a half-wave rectifier with a series smoothing choke. All the valves are run in series and with a line cord resistance to break down the mains voltage.

MODEL 908.—This is identical to the 909 except for the variably tuned circuits, which cover M. and L. waves.

The aerial is connected through a condenser to a coil which acts as a choke on M.W. and a transformer primary on L.W. On L.W. an extra coupling coil with shunt condenser is switched in. On M.W., the L.W. grid coil acts as an aerial coupling coil and is condenser fed from the aerial choke.

The oscillator circuits are tuned grid, with a common coupling coil fed by condenser from the anode.

GANGING

I.F. CIRCUITS.—Tune to M.W. maximum. Inject 470 kc. and adjust I.F. trimmers.

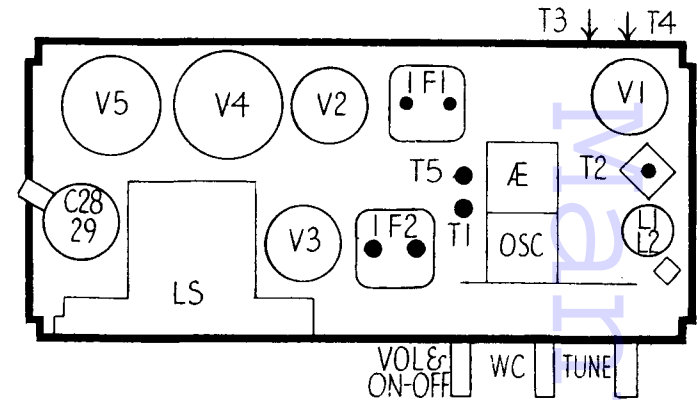
M.W. BAND.—Tune to 214 m., inject 1,400 kc. and adjust T3, T4. Pad with T5 at 500 m. (600 kc.), rocking gang slightly.

S.W. BAND.—Frim with T1 and T2 at convenient point at bottom of band. Padding is fixed.

L.W. BAND (Model 908).—Adjust osc. and aerial trimmers at 1,250 m. (240 kc.) and pad with series oscillator capacity at 2,000 m. (150 kc.).

RESISTANCES

R	Ohms.	R	Ohms.
1	.. 25,000	11	.. 150
2	.. 50,000	12	.. .5 meg.
3	.. 20	13	.. .5 meg.
4	.. .5 meg.	14	.. 1 meg.
5	.. 25,000	15	.. 100
6	.. .1 meg.	16	.. 100
7	.. .5 meg.	17	.. 655
8	.. .5 meg.	18	.. 50
9	.. 2 meg.	L1	.. 1,200
10	.. 50,000	L2	.. 650



Chassis layout of the Mains Minor. Models 909, 908 are similar except for the variably tuned circuits.

CONDENSERS

C	Mfd.	C	Mfd.
1	.. 500 mmfds.	19	.. .02
3	.. .1	20	.. .00025
7	.. .1	23	.. .25
8	.. 100 mmfds.	24	.. .0001
9	.. 100 mmfds.	25	.. .0005
12	.. .005	26	.. .02
13	.. .00065	27	.. .005
16	.. .1	28	.. .16
17	.. .1	29	.. .16
18	.. .00025	30	.. .02

VALVE READINGS

V	Type	Electrode	Volts	Ma.
1	ECH3	Anode	175	1.5
		Screen	85	2.5
2	EF9	Osc. anode	75	4
		Screen	85	1.5
3	EBC3	Anode	90	—
4	7D6	Anode	150	30
		Screen	175	5
5	1D5	Cathode	250	—

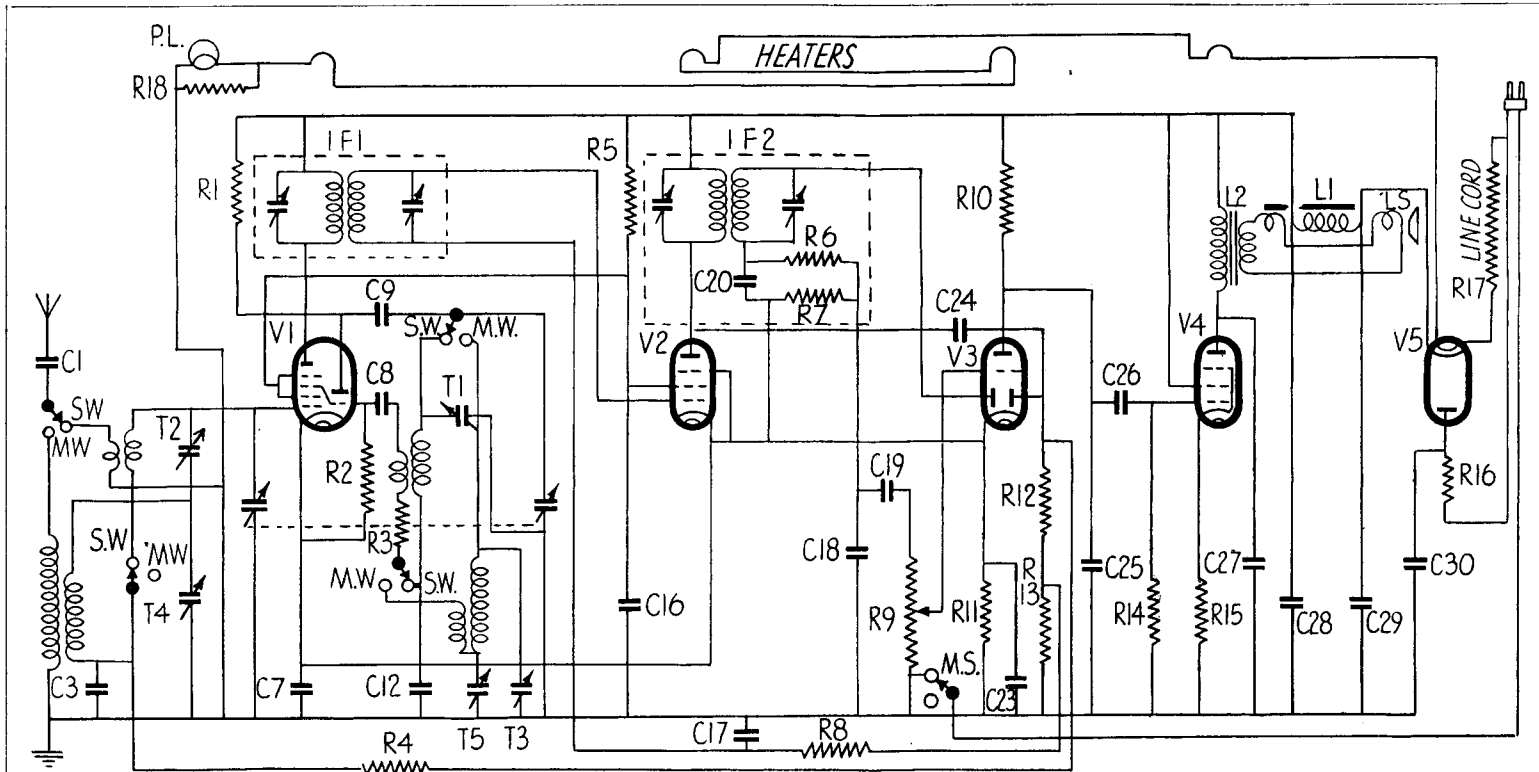
Pilot lamps, 6-8v., .2 amp.

PHILIPS MODEL 735A

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WINDINGS

L	Ohms.	L	Ohms.
2	.. 300	19	.. 32
3	.. less than .5	20	.. 8.5
4	.. less than .5	21	.. 125
5	.. 26	22	.. 125
6	.. 90	23	.. 40
7	.. 4.5	25	.. 45
8	.. 4.4	26	.. 90
9	.. 48	27	.. 800
10	.. 45	28	.. 1.5
11	.. .7	29	.. 28
12	.. .7	30	.. 28
13	.. 2	31	.. 3.5
14	.. less than .5	32	.. 800
15	.. less than .5	33	.. 23
16	.. 1	34	.. 23
17	.. 8	35	.. 110
18	.. 2		



The circuit of the 909, covering medium and short wavebands. Model 908 covers medium and long bands, but, except for the aerial and oscillator circuits, is the same as the 909.