PHILCO A9

Four-valve, plus rectifier, three waveband superhet in Baby Grand, Concert Grand and radiogram forms. Suitable for 200–250 v. A.C. mains. Made by Philco Radio and Television Corpn. of G.B., Ltd., Perivale, Middx.

Circuit.—The aerial is coupled to V1, the frequency-changer, by a simple transformer L2, L3, on S.W., A.V.C. being applied. On M. and L.W., a choke, L1, is put into the aerial circuit and L4, L5 are the grid coils. In the circuit diagram, the switches are in the long-wave position, the coils being drawn in L., M., S. order from top to bottom.

The oscillator section uses a tuned grid arrangement with an anode reaction coil on S.W. On M. and L.W. feed-back is obtained by the resistance and condenser circuit R13, C14, R16, instead of by the usual inductive coupling. The tuned circuits themselves are quite straightforward, T6 and T3 being the trimmers across the gang condenser, and T8, T5 being the usual padders between the lower ends of the coils and chassis.

Trimmer-tuned I.F. transformers link up V2, the I.F. amplifier, and V3, the double-diode-triode.

The demodulation arrangements include an H.F. filter comprising R18, C16, C17. The L.F. developed across R6 is fed to the volume control VR2, with which is associated a tone control circuit including VR1.

V3 is resistance-capacity coupled to V4, the output pentode. Bias for all stages is developed across the voltage divider network R7 and R8 in the negative H.T. line. V5 bias is 17 volts: delay bias, 3.8 volts.

H.T. is provided by a full-wave rectifier, V5, with the field, L17 and with the two units EC2 for smoothing.

WAVEBANDS.—16.6–54.5, 200–550, 1,000–1,900 metres. Provision for P.U. and 2–3 ohm extension speaker. Power consumption, 60 watts.

GANGING

I.F. CIRCUITS.—Adjust the four I.F. trimmers for maximum at 451 kcs.

S.W. BAND.—Inject an 18 mc. signal *via* a 400-ohm resistance. Set pointer to 18 mc. and adjust T1 to the last signal heard from tight.

Rocking gang slightly, adjust T2. Readjust T1 with pointer at 18 mc. Check that the 18 mc image is received at 17.1 mc.

Check dial calibration at 6 mc. There is no padding adjustment.

M.W. BAND.—Set pointer to 214 m., inject 1,400 kc. and adjust T3 and T4.

Inject 600 kc. and, rocking gang, adjust T5 (screw).

L.W. BAND.—Tune to 1,034.5 m. (under T in Tiffis), inject 290 kc. and adjust T6.

Tune to 1,304.3 m. (under 3 in 1,300), inject 230 kc. and adjust T7.

Inject 160 kc. and, rocking gang, adjust T8 (nut).

IMPORTANT.—Note that the S.W. trimmers are in circuit on all bands, and whole set must be re-aligned if these are altered.

VALVE VOLTAGES

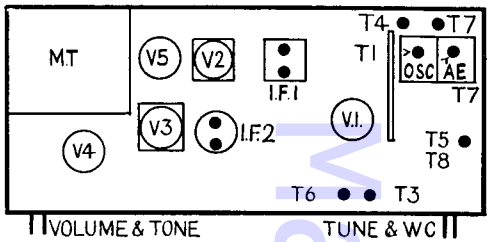
V.	Type.	Electrode.	Volts.
1	6A7	Anode	245
		Screen	75
		Osc. anode	135
2	78E	Anode	245
		Screen	75
3	75	Anode	46.5
4	42E	Anode	246
		Screen	260
5	80	Anodes	325 A.C.
		Cathode	380 D.C.

Pilot lamp and valve filaments operate at 6.3 v., except V5, which is 5 volt.

CONDENSERS

C.	Mfds.	C.	Mfds.
1	.015 + .015	11	.01
2	.004	12	4,000 mmfds.
3	.006 or .0065	13	.04
		14	240 mmfds. or 250 ,,
4	.065	15	35 ,,
5	140 mmfds.	16	100 ,,
6	140 ,,	17	100 ,,
7	.01	18	.01
7A	35 mmfds. or 50 ,,	19	35 mmfds.
8	.01	EC1	50
9	.09 + .09	EC2	16 + 8
10	.0046	EC3	8

The chassis is used in Baby Grand, Concert Grand and radiogram forms. The only unusual feature of the circuit is the tuning circuits; these are explained in the text.

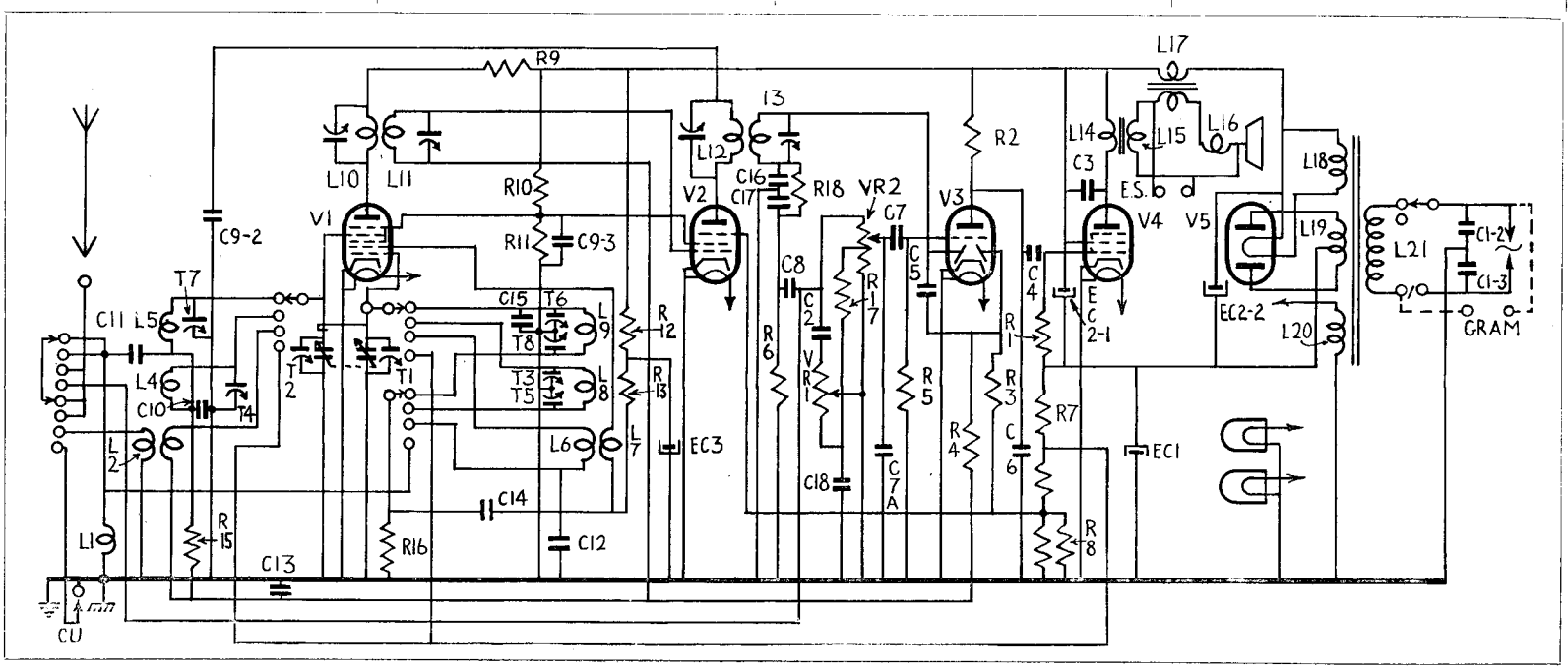


RESISTANCES

R.	Ohms.	R.	Ohms.
1	330,000 or 400,000 or 300,000	11	25,000
2	250,000	12	11,000 or 15,000
3	1 meg.	13	8,000 or 6,500
4	1 ,,	15	50,000 or 51,000 or 60,000
5	9 ,,	16	40,000
6	330,000 or 400,000 or 300,000	17	40,000
7	190 + 35 + 190	18	51,000 or 60,000 or 65,000
8	100 or 110 or 120	VR1	500,000
9	3,000	VR2	2 meg. tapped at 1 meg.
10	30,000 or 32,000		

WINDINGS

L.	Ohms.	L.	Ohms.
1	20	12	12
2, 3	less than .1	13 + R18	51,000
4	3	14	500–650
5	25	15	.2
6	less than .1	16	2
7	.5	17	1,140–1,500
8	2.5	18	.1
9	16.5	19	2 × 200
10	8	20	.2
11	12	21	30



Modulation Hum

MAINS hum which appears only when the receiver is tuned to stations is called modulation hum. It is usually due to H.F. being present in the mains wiring and being fed into the receiver circuits through the mains transformer and rectifier. Another cause is inadequate smoothing resulting in anode voltage variations modulating the currents in the H.F. stages.

The first form of the trouble is not found in sets with mains transformers having screened primaries. Where trouble arises make sure that any such screen is properly earthed. If a screen is not provided, a cure can usually be obtained by connecting condensers between each side of the mains transformer primary and earth.

The value of these condensers is not critical and can be of .001 to .01 mfd. [Their purpose must not be confused with that of filtering machine-made static, for which condensers of .1 mfd. or even more are sometimes fitted in this same position.] The condensers must, of course, be rated to work at the mains voltage.

Occasionally, the rectifier gives rise to modulation hum. This can be suppressed by .1 mfd. condensers connected between the rectifier anodes and the secondary winding centre tap. These condensers must be of high A.C. rating according to the actual operating conditions of the valve.