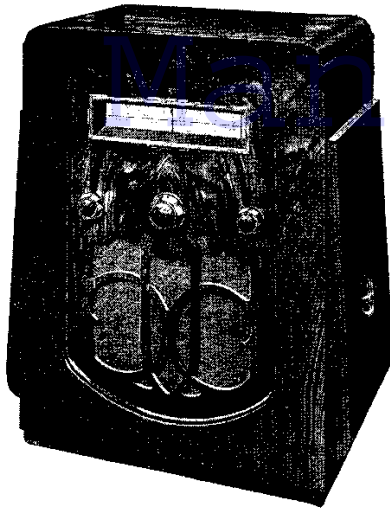


TELSEN'S MODEL 474



The 474 by the Telsen Electric Co. is a "straight" three valve mains receiver.

Circuit.—The H.F. valve, SP4(V1) follows a band-pass aerial coupler using dust core coils. The valve is a straight H.F. pentode operating with fixed bias. Volume is controlled by a differential aerial condenser.

Coupling to the next valve is by tuned secondary H.F. transformer with reaction. Both the anode and auxiliary grid circuits are decoupled from the H.T.

The detector valve, SP4(V2), operates as a leaky grid type. Reaction is applied to the H.F. transformer by a differential condenser, and the anode circuit is decoupled.

R.C. coupling is used to the output valve, AC2/Pen., which has a grid stabiliser (R11), and is tone compensated by a condenser (C.11).

Mains equipment consists of transformer, full wave, MU12, rectifier, and the speaker field in the positive H.T. lead.

An artificial centre of the set filament winding is obtained by means of an adjustable potentiometer to reduce hum.

Special Notes.—All the valves are of the 5-pin type. In some models a quarter megohm resistance, shown in the diagram of the underside of the upper deck as RX, may be found mounted on the wave-change switch. This is connected across the L.W. winding of the H.F. transformer.

R5 may be returned direct to earth instead of to the high potential end of the tuned circuit. The resistance may be mistaken for a condenser.

Quick Tests.—Practically every measurement can be taken without removing the chassis. It is advisable to use an insulated test prod. The difference in voltages between the upper and lower ends of the resistances give an indication of the condition of the

CONDENSERS

C.	Purpose.	Mfd.
1	Band-pass coupling	twisted wire
2	V1 cathode * ... ..	.1
3	V1 aux grid *	1
4	V1 anode decoupling ... ..	.1
5	V2 anode by-pass ... ..	.0002
6	V2 grid ... ..	.0001
7	V2 anode decoupling *	2
8	V2 aux grid *	2
9	L.F. coupling ... ..	.01
10	V3 cathode *	2
11	V3 tone compensating ... ..	.02
12	HT smoothing *	4
13	H.T. smoothing *	3
14	Mains aerial... ..	.005

* In condenser bank.

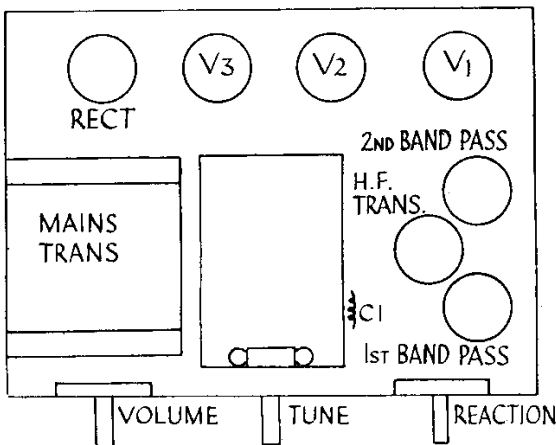
RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias	300
2	Lower part of V1 aux grid ptr	50,000
3	Upper part of V1 aux grid ptr	50,000
4	V1 anode decoupling	15,000
5	V2 grid leak ... ..	.5 or 1 meg.
6	V2 anode LF coupling ... ..	.25 meg.
7	V2 anode decoupling	50,000
8	Upper part of V2 aux grid ptr ... ..	.5 meg.
9	Lower part of V2 aux grid ptr ... ..	.1 meg.
10	V3 grid leak ... ..	.5 meg.
11	V3 grid stabiliser ... ..	.25 meg.
12	V3 cathode bias	150
13	Hum adjustment	30

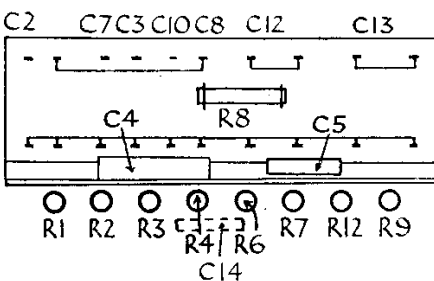
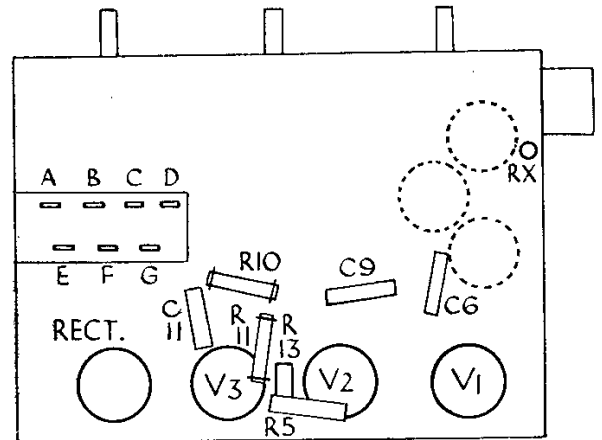
VALVE READINGS

Valve	Type.	Electrode.	Volts.	M.A.
V1	SP 4 met	anode ...	183	3.2
		aux grid ...	85	
V2	SP 4 met	anode ...	48*	.5
		aux grid ...	20*	
V3	AC/3/2/Pen	anode ...	222	30
		aux grid ...	243	7

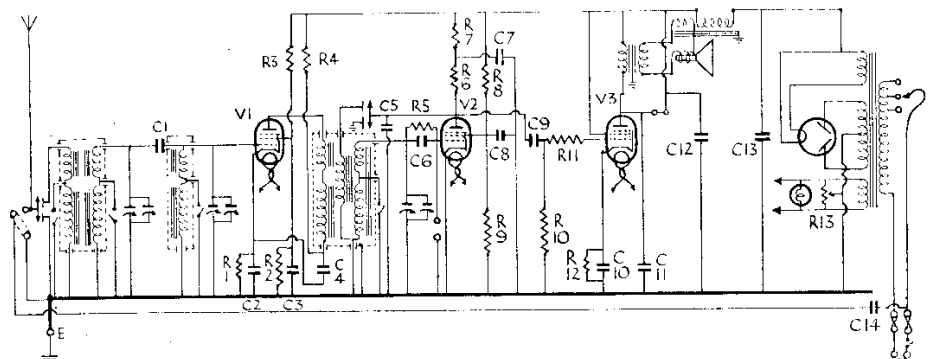
* As the circuit resistances are high, readings depend more on the meter than the valve. The current reading is the important factor



Straight-forward layout with the valves placed along the back is found in the 474. For mains transformer connections (A-G in sub-chassis layout on right) see "General Notes."



Use this diagram in conjunction with notes under "Quick Tests" heading.



Iron core coils and the use of two H.F. pentodes and an output pentode are interesting points in the 474 circuit.

TELSEN "STRAIGHT" 474 (Cont.)

set. With reference to the special diagram, these are :—

R 1	upper end	1.5 volts,	lower end	0 volts.
R 2	" "	85 "	" "	0 "
R 3	" "	85 "	" "	243 "
R 4	" "	187 "	" "	243 "
R 6	" "	48* "	" "	182 "
R 7	" "	243 "	" "	182 "
R 12	" "	5.5 "	" "	0 "
R 9	" "	20* "	" "	0 "

* These are only approximate owing to high values of resistances in circuit. Voltages between the following points and chassis (see diagram) :—

Terminal of C13, H.T. unsmoothed 365 volts. Side terminal on V3, H.T. smoothed 243 ,, Anode socket of V3 222 ,,

Removing Chassis.—Unscrew wave-change switch lever. Undo knobs (grub screw). Remove four screws underneath. Remove nuts holding dial to the back of the escutcheon and the six wood screws from the brackets at the back of the chassis.

General Notes.—The connections between the upper deck, the condenser block and the resistance panel are easily followed. In the block some of the condensers are formed by connecting two in parallel, these are C8, C12 and C13. The rear terminals are all at chassis potential.

Mains transformer connections are (see diagram) :—

A and B, rectifier filament; C and D, set filament; E and G, rectifier anodes; F, to chassis.

The five terminals on the speaker transformer are :—Three in front, speech coil and hum bucking coil; two at rear, primary.

The field coil terminals project at the other side of the speaker.

Replacing Chassis.—Lay chassis inside cabinet taking care that the rubber supports are in position. Replace the six screws on brackets and the dial with two nuts. Replace four screws underneath, the knobs and the switch lever.

PHILCO 263 UNIVERSAL SUPERHET

Circuit.—The combined oscillator-first detector valve 6A7 (V1) is a heptode. The aerial tuner is a band-pass coupler and oscillations are maintained in the oscillator section by tuned grid coupling to the oscillator anode coil. The tetrode anode is coupled to the I.F. valve by a band-pass I.F. transformer (frequency 125 kc.). Bias is obtained from the A.V.C. line.

The I.F. valve, 78E (V2) is also biased by A.V.C., and is coupled to the second detector by a tuned primary I.F. transformer.

The second detector and L.F. valve, 75 (V3), is a double diode triode. The diode anodes are in parallel, and the rectified D.C. is fed back to the grids of V1 and V2 through R3.

The L.F. is fed to the grid of the triode section from the diode load R4 (which forms the volume control), through an L.F. coupling condenser C9. Fixed bias is obtained from a potentiometer in the negative H.T. lead.

Coupling to the output valve is by straight

resistance capacity filter, both anode and grid circuits being decoupled.

The output valve, 18E (V4), is a pentode tone compensated by several condensers between the anode and H.T.—, giving different degrees of compensation. An energised speaker is fitted, and the field is connected across the H.T.

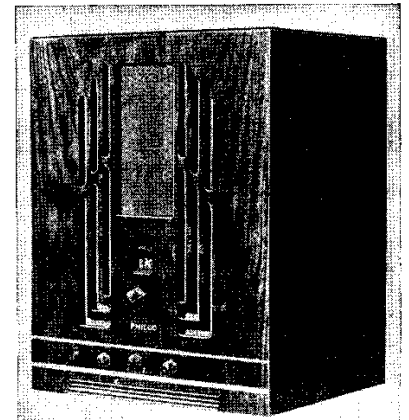
Mains equipment includes a 25RE with the anodes connected to form a half-wave rectifier for use on A.C. In the case of D.C., the valve acts as a resistance. The cathode is insulated from the filament, and is used for the H.T. + line. The filament, both on A.C. and D.C., is heated in series with the set filaments.

Smoothing consists of a smoothing choke in the positive lead, with two 8 mfd. electrolytic condensers.

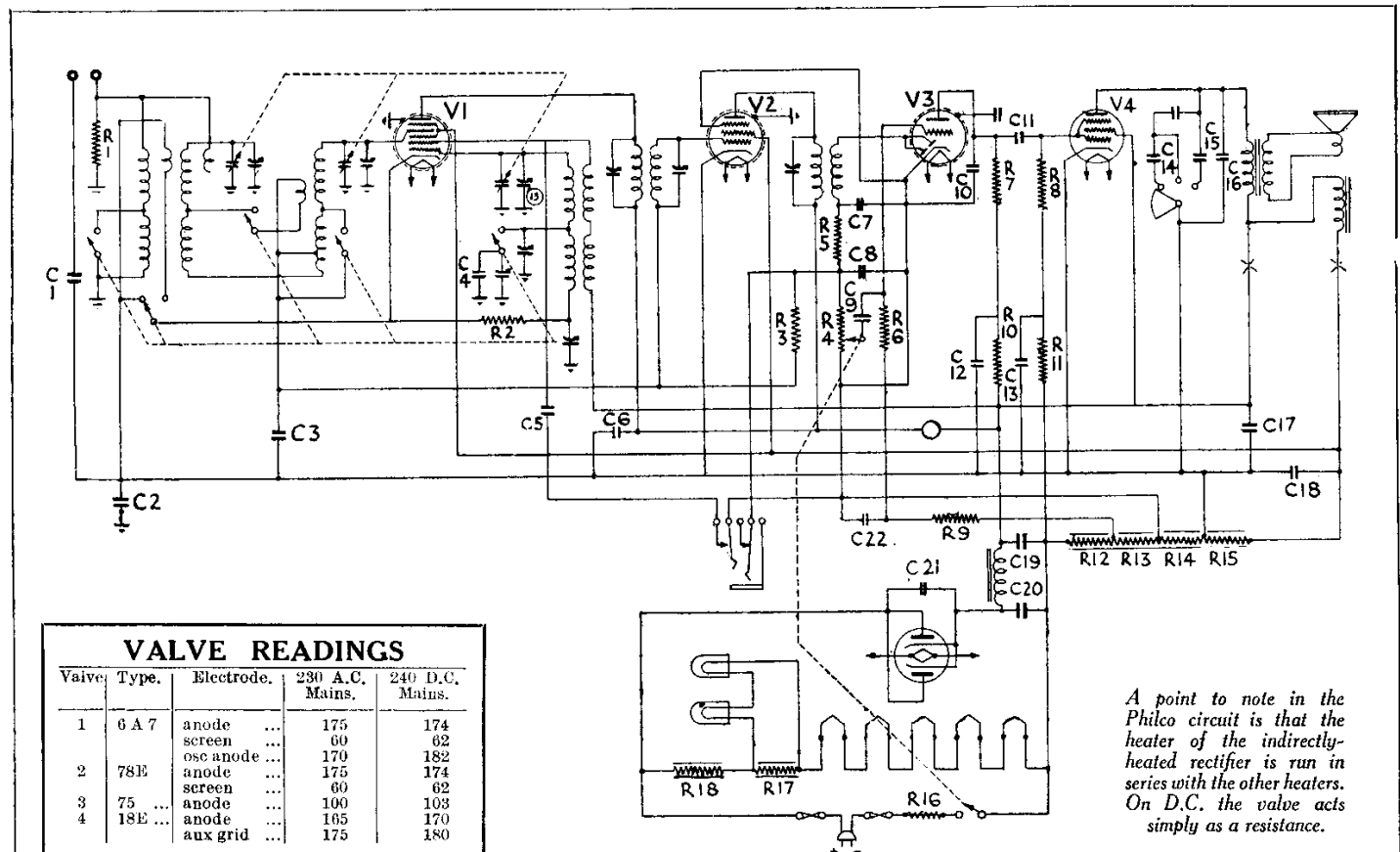
Special Notes.—The order of the series filament wiring is, from + on D.C., V4, V1, V2, Rect. V3.

The voltage stabilising resistance R18 is

Continued on opposite page.



Four valves and a rectifier are used in the Philco 263 receiver for either A.C. or D.C. mains.



A point to note in the Philco circuit is that the heater of the indirectly-heated rectifier is run in series with the other heaters. On D.C. the valve acts simply as a resistance.

VALVE READINGS

Valve	Type	Electrode	230 A.C. Mains.	240 D.C. Mains.
1	6A7	anode ...	175	174
		screen ...	60	62
		osc anode ...	170	182
2	78E	anode ...	175	174
		screen ...	60	62
3	75	anode ...	100	103
4	18E	anode ...	165	170
		aux grid ...	175	180