

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.

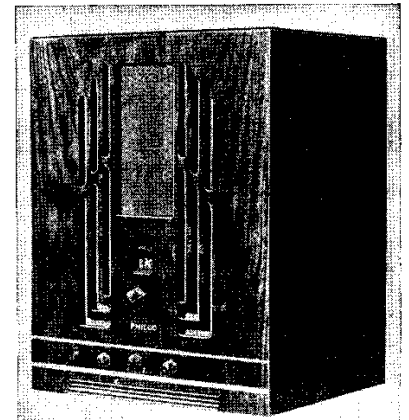
Mains equipment includes a 25RE with the anodes connected to form a half-wave rectifier for use on A.C. In the case of D.C., the valve acts as a resistance. The cathode is insulated from the filament, and is used for the H.T. + line. The filament, both on A.C. and D.C., is heated in series with the set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

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

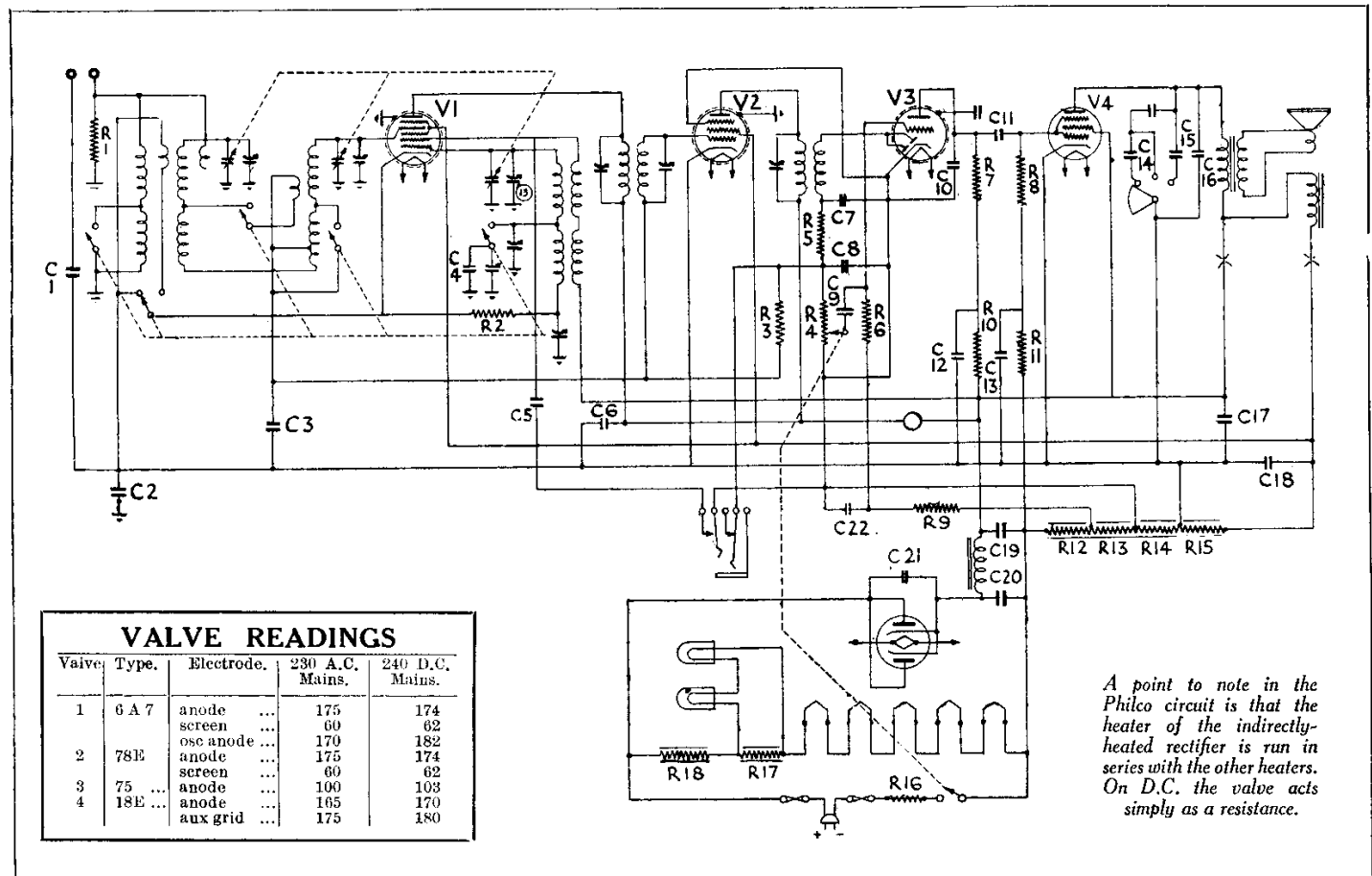
Special Notes.—The order of the series filament wiring is, from + on D.C., V4, V1, V2, Rect. V3.

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

PHILCO UNIVERSAL 263

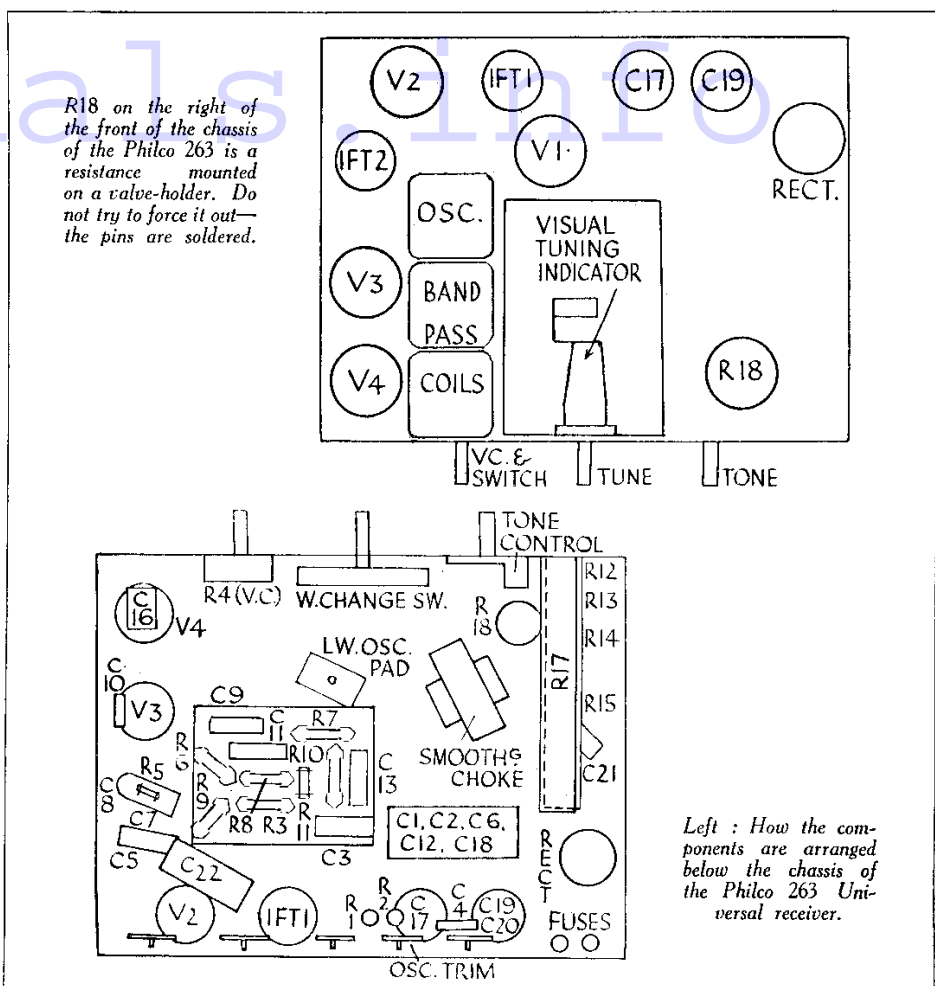
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different in the two models. In the 263E, for use on voltages between 200 and 245 v., it is 530 ohms, and in the 263F, for voltages between 230 and 260 v., an additional resistance R16, of 67 ohms, is included.

The pilot lamp and tuning indicator lamp are connected in series across the resistance R17. The tuning indicator is connected in the lead to the anodes of V1 and V2.

Precaution.—The resistance R18 is mounted inside a perforated container which fits into a valve-holder. Do not attempt to remove it by force, as the pins are soldered to the sockets underneath.

Quick Tests.—There is a condenser between H.T. — and chassis so that voltage measurements should be taken between the



RESISTANCES		
R.	Purpose.	Ohms.
1	Across aerial input...	10,000
2	Decoupling osc grid	51,000
3	Feed to AVC bias line	2 meg.
4	VC	350,000
5	HF stopper	51,000
6	V3 grid leak	490,000
7	V3 anode LF coupling resistance	160,000
8	V4 grid leak	490,000
9	Decoupling bias to V3	490,000
10	Decoupling V3 anode	70,000
11	Decoupling V4 grid	45,000
12		125
13	Bias ptr.	18
14		18
15		1,800
16	Additional resistance for 263 F.	67
17	Voltage drop for pilot lamps	65
18	Mains voltage stabiliser	530

CONDENSERS		
C.	Purpose.	Mfd.
1	Between E and H.T.	.2
2	Between HT and chassis	.5
3	Decoupling A.V.C. line	.05
4	Fixed part of LW pad on osc	.00041
5	Prevents oscillations for "Gram"	.01
6	H.F. by-pass from V1 and V2 anode feed	.15
7	H.F. by-pass from diode anode	.00025
8	H.F. by-pass from diode anode	.00025
9	L.F. coupling from diode	.01
10	V3 anode by-pass	.00025
11	L.F. coupling V3 to V4	.01
12	V3 anode decoupling	.5
13	V4 grid decoupling	.03
14		.01
15	tone compensating circuit	.91
16		.003
17	HT smoothing	12 el
18	Across R15	.25
19	HT smoothing	8 el
20	HT smoothing	8 el
21	By-pass from rect anode to cathode	.05
22	Decoupling V3 grid	

various points and the container of C17 (the smaller of the two electrolytic condensers).

Taken with 230-v. A.C. mains, between terminals on the speaker transformer and the case of C17, the voltages are:—

- Top two right-hand (looking from back) (green) V4 anode ... 165 volts
- Left (white) H.T. + smoothed ... 175 volts
- Lower terminal (green and white) screen potential ... 60 volts

General Notes.—Valve base connections, seen from underneath and counting clockwise from the large heater pins:—

V1 (6A7), H, H, anode, screen, oscillator anode, oscillator grid and cathode. Tetrode grid at top.

V2 (78E), H, H, anode, screen, suppressor grid. Cathode grid at top.

V3 (75), H, H, anode, diode, diode, cathode. Triode grid at top.

V4 (18E), H, H, anode, aux. grid, grid, cathode.

Rectifier, H, H, anode, cathode, cathode, anode.

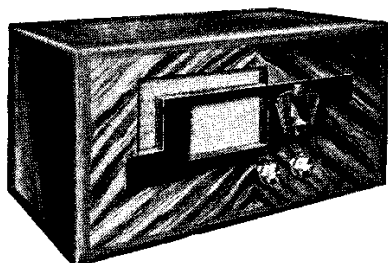
The two anodes of the rectifier are connected together, as are the cathodes.

The suppressor grid of the 78E is connected to the cathode of the 75.

In the 18E the suppressor grid is connected to the control grid (inside the valve) instead of to cathode.

Replacing Chassis.—Place rubber supports in position and lay chassis inside cabinet. Replace holding screws and knobs.

LISSEN SEVEN-VALVE SKYSCRAPER



First issued as a kit, the Skyscraper was afterwards produced in assembled form by Lissen, Ltd.

Circuit.—The first detector valve, SG215 (V1), is preceded by a band-pass aerial coupling and its bias is controlled by the A.V.C.

The oscillator valve, HL2 (V2), operates with a tuned anode coil. The anodes of V1 and V2 are coupled by the primary of the first intermediate frequency transformer (I.F. 126 kc., fixed).

The I.F. valve, SG215 (V3), is also controlled by A.V.C. and is coupled to the second detector by a second I.F. transformer.

A single diode H.F. pentode forms the second detector valve, AVC2 (V4). The grid of the pentode section is used for detection

and the amplified I.F. frequency is fed back from the anode to the single diode-anode, from which the rectified D.C. potential is applied to the controlled valves through de-coupling resistances with by-pass condensers.

Coupling to the driver valve is by transformer connected in the normal manner, and volume is controlled by a variable resistance across the primary. The anode circuit is de-coupled from H.T.

The driver valve, L2 (V5), is followed by a Lissen driver transformer.

The output stage consists of two separate valves working in class B push-pull. The

(Continued on next page.)