

PHILCO UNIVERSAL 263

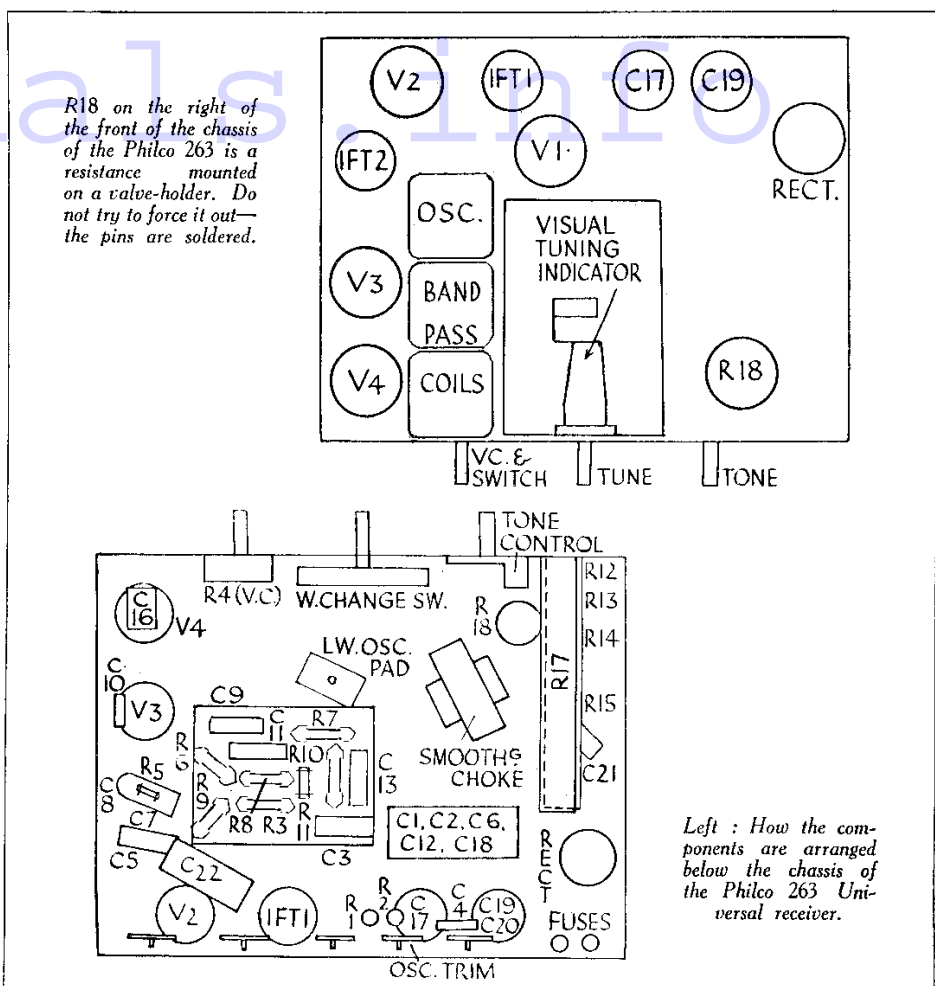
(Cont.)

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.

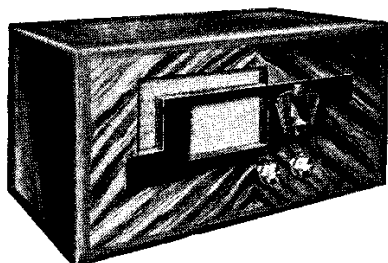
The two anodes of the rectifier are connected together, as are the cathodes.

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 decoupling 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 decoupled 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.)

LISSEN SKYSCRAPER SEVEN (Cont.)

anode circuits are stabilised by condensers between the anodes and H.T.—

A permanent magnet speaker with class B transformer completes the set.

Special Notes.—This set was originally marketed as a kit but is now obtainable as a complete receiver. Standard Lissen components are used, including the valves.

The A.V.C.2 (V4) valve has peculiar connections which are:—Top of bulb—pentode grid; usual grid pin, diode anode; anode pin, pentode anode. Looking from underneath valve on the grid side, the terminal on the right side is the auxiliary grid and that on the left is the suppressor grid.

In the set the pentode anode is towards the front and the auxiliary grid is on the inside (black lead) while the suppressor grid is on the outside (yellow lead) and is connected to H.T.—

Quick Tests.—In this set these are best

CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial	.0004
2	Band pass coupling	.02
3	Decoupling screening grids	.1
4	Decoupling A.V.C. to V1	.1
5	Decoupling V1 and V2 anodes from H.T.	.1
6	Decoupling V2 grid	.001
7	Across H.T. battery +2 lead	1
8	V4 grid lead	.0003
9	IF feed to A.V.C. diode anode	.0001
10	V4 anode by-pass	.002
11	Decoupling V4 anode	.1
12	Stabilising anode of V5	.003
13	Stabilising anode of V6	.003

RESISTANCES

R.	Purpose.	Ohms.
1	Decoupling A.V.C. to V1	30,000
2	V2 grid return	15,000
3	Decoupling V1 and V2 from HT	5,000
4	Decoupling A.V.C. to V1 and V3	1 meg.
5	A.V.C. diode anode load	1 meg.
6	V4 grid return	1 meg.
7	Var. volume control	40,000
8	Decoupling V4 anode	10,000
—	LF transformer 1 primary	1,200
—	LF transformer 1 secondary	11,000
—	LF transformer 2 (driver) primary	475
—	LF transformer 2 (driver) secondary	190 + 190
—	Output transformer primary*	660

* A universal transformer is used. Connections for class "B" are: Black, anode; Red, HT+; Blue, anode. Reading is taken between black and blue.

performed by noting the responses in the speaker when testing the valves.

Removing Chassis.—Remove control knobs (grub screw) and switch knob. Remove four holding screws underneath and lift the chassis out by sliding backwards for about an inch and then to the right to allow the switch spindle to clear the cabinet. Release speaker earthing lead from IFT 2.

General Notes.—The band-pass I.F. transformers are not provided with trimmers. Leads to them are kept short and should not be disturbed more than is necessary. The only adjustments possible are on the ganged condenser and the long-wave pad situated on the back of the chassis under V5.

Replacing Chassis.—Lay chassis inside cabinet, connect L.S. earthing lead under IFT2 screw.

Place rubber distance piece on tuning spindle and slide chassis into position. Replace screws and knobs.

VALVE READINGS

New battery and no signal.

Valve.	Type.	Electrode.	Volts.	M.A.
1	SG 215	anode	100	1.5
		screen	72	—
2	HL 2	anode	100	3.0
		anode	120	1.8
3	SG 215	anode	72	—
		screen	72	—
4	AVC 2	anode	75	3.6
		aux. grid	72	—
5	L 2	anode	120	1.2
6	B 2	anode	120	.85
		anode	120	.85

Battery voltages and leads. Special battery type LN 2009. White plug into 0. Black into 3v. Pink plug into 72v. Red into 120v. (Black is HT—of set, and white is GP—to V5.)

AUGUST "SERVICE ENGINEER"

The August issue of SERVICE ENGINEER will contain reviews of the following receivers:—

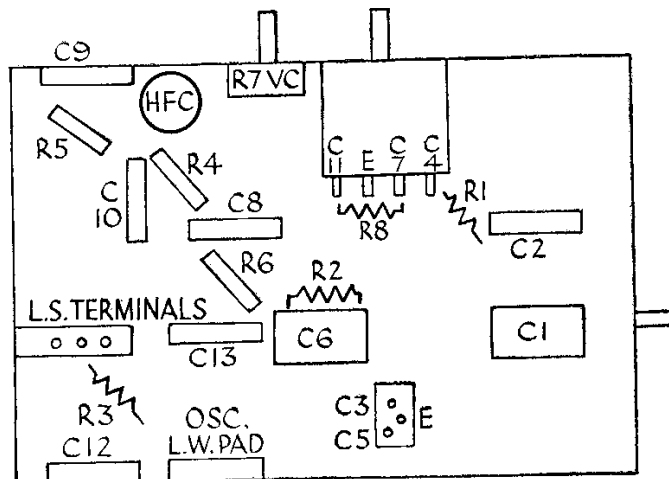
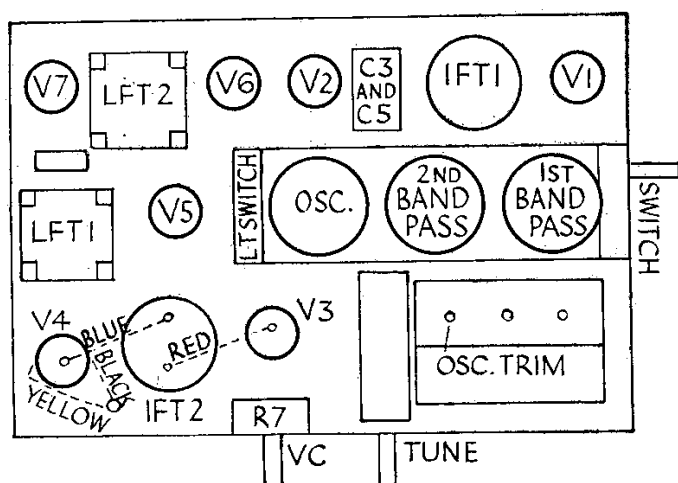
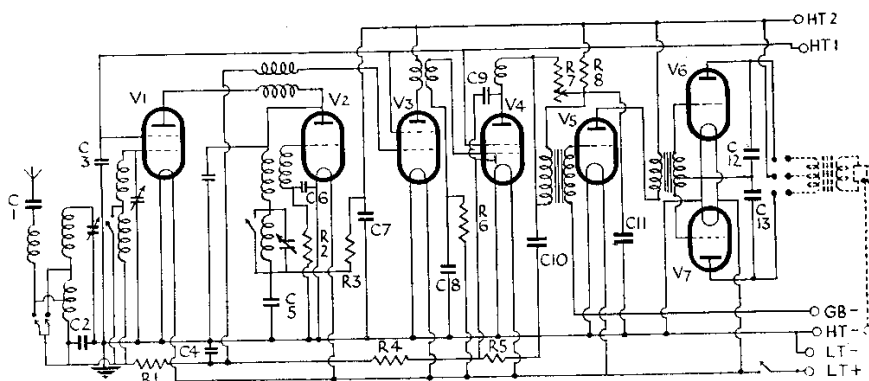
- Alba—A.C.52.
- Burgoyne—De Luxe Class B.
- Cossor—3468 3-valve A.C.
- Ferranti—Arcadia.
- G.E.C.—A.C.-D.C. Three.
- Marconiphone—254.
- McMichael—Duplex S.M.C. Portable.
- Philips—834B.
- Portadyne—B.72 5-valve Battery Set.
- Ultra—Battery Tiger.

The next article in W. MacLanachan's series on service will deal with the detector stage in detail, and describe how circuits using double diode triode, screen-grid, pentode and triode valves should be tested.

All correspondence relating to SERVICE ENGINEER should be addressed to BROADCASTER AND WIRELESS RETAILER, 29, Bedford Street, Strand, London, W.C.2. 'Phone No.: Temple Bar 2468.

Ekco Model S.H.25

In the article describing the Ekco model S.H. 25 in the May SERVICE ENGINEER, it was stated that the I.F. valve was an M.M. 4 V. This should have read V.M. 4 V. The volume is controlled by shunting the aerial in addition to varying the bias. Ekco inform us the trap filter in the aerial lead is a 110 kc. rejector to prevent break through.



Above is the circuit and below are the chassis layouts of the seven-valve superhet battery Skyscraper receiver produced by Lissen Ltd.