ATLAS 758 A.C. MAINS SUPERHET (Cont.)

pivots which allow the cord to pass through the centre of rotation. The cord connection is straightforward—each end goes half round the drum, one end being attached to the coil spring.

The pointer is clipped on to the cord and can be reached from the front by undoing the two screws at the sides of the plated surround. In replacing this remember the two distance pieces round the screws. The pilot lamp holder lifts upwards.

Underneath the chassis the components are well spaced and connections to the assemblies should be easy to follow.

Switch contacts are towards the underside, and can be cleaned easily with a cloth. (Do not use any gritty material).

Replacing Chassis.—See that dial is in the position nearest to horizontal, and then lay chassis inside cabinet. Replace holding screws and knobs.

Make sure that the L.S. field plugs have not been pulled from the sockets.

VALVE READINGS

No signal

Valve	Type	Electrode.	Volts	M.a.
1	FC4 ...	anode ...	234	.9
		aux. grid ...	65	
		osc. anode ...	65	1.9
2	VP4 ...	anode ...	138	4.8
		aux. grid ...	108	
3	TDD4 ...	Tri. anode ...	114	1.4
4	ACO44 ...	anode ...	230	43

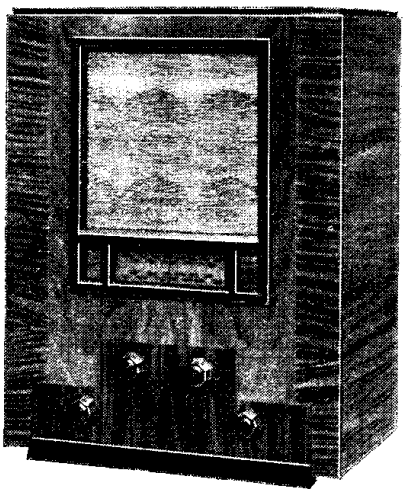
RESISTANCES

R	Purpose.	Ohms.
1	V1 grid leak	2 meg.
2	V1 cathode bias...	250
3	V1 osc. grid leak	20,000
4	H.T. potentiometer	6,000
5		7,000
6		4,000
7		30,000
8	V2 cathode bias...	250
9	V3 grid leak	2 meg.
10	V3 cathode bias on radio ...	2,000
11	V3 cathode bias on gram (series with R10)	5,000
12	Decoupling A.V.C. line... ...	2 meg.
13	V3 anode L.F. coupling ...	75,000
14	AVC diode load	1 meg.
15	V4 grid leak	1 meg.
16	V4 grid stabiliser	.25 meg.
17	V4 bias	500
	Field coil	1,125

CONDENSERS

C	Purpose.	Mfd.
1	V1 pentode grid...	.0001
2	V1 cathode	.1
3	V1 osc. grid	.001
4	Var. L.W. tracking on osc. ...	variable
5	Osc. anode decoupling	.25
6	V2 aux. grid	.1
7	V2 cathode	.1
8	L.F. coupling to V3 grid ...	.01
9	H.F. by-pass from diode anode	.0002
10	Decoupling A.V.C. line... ...	.05
11	V3 cathode	.5
12	I.F. feed to A.V.C. diode anode	.0002
13	L.F. coupling V3 to V4 ...	.01
14	Tone control circuit V4 anode	.25
15	H.T. smoothing	6 el.
16	" "	10 el.
17	Across V4 bias resistance ...	25 el.

HALCYON UNIVERSAL 4501



The 4501 A.C./D.C. receiver by Halcyon Radio, Ltd., can be serviced without taking out the chassis.

Circuit.—The combined first detector-oscillator FC13 met. (V1), has a band-pass aerial coupling.

Bias is partly fixed by cathode resistance and partly derived from the A.V.C. line. Coupling to the next valve is by band-pass I.F. transformer (frequency 110 k.c.).

The I.F. valve VP13A (V2) is biased from a separate A.V.C. line and also by cathode resistance. This valve is followed by a second band-pass I.F. transformer.

A WM26 Westector is the second detector, and the positive side of the elements is maintained at a positive potential by being connected to the resistance R10 in the cathode lead to V2 (part of H.T. ptr.).

The L.F. coupling to the next valve is through R14, an H.F. stopper, and C14, while R12 and C13 form the diode load and reservoir condenser respectively. The I.F. feed for V1 A.V.C. is taken through a condenser, C9, from the anode of V2 and has R9 as the D.C. load resistance.

The L.F. valve HL1320 met. (V3) is a triode. Volume is controlled both on radio and gram by having the grid leak as a variable potentiometer. Bias is obtained by cathode resistance, and the coupling to the output valve is by resistance-capacity filter. The anode circuit is properly decoupled.

The Pen. 3520 output valve (V4) uses cathode bias and is tone-compensated by a condenser, C24, across the primary of the output transformer. Tone control is provided by connecting the condensers C22 and C23 in paralled with C24 by means of a stud switch.

Mains equipment consists of half-wave, B27, metal rectifier for rectification on A.C. with a choke in the positive lead for smoothing, with two 24-mfd. electrolytic condensers. The B27 rectifier acts as a pure resistance on D.C. The L.S field is connected across the unsmoothed H.T.

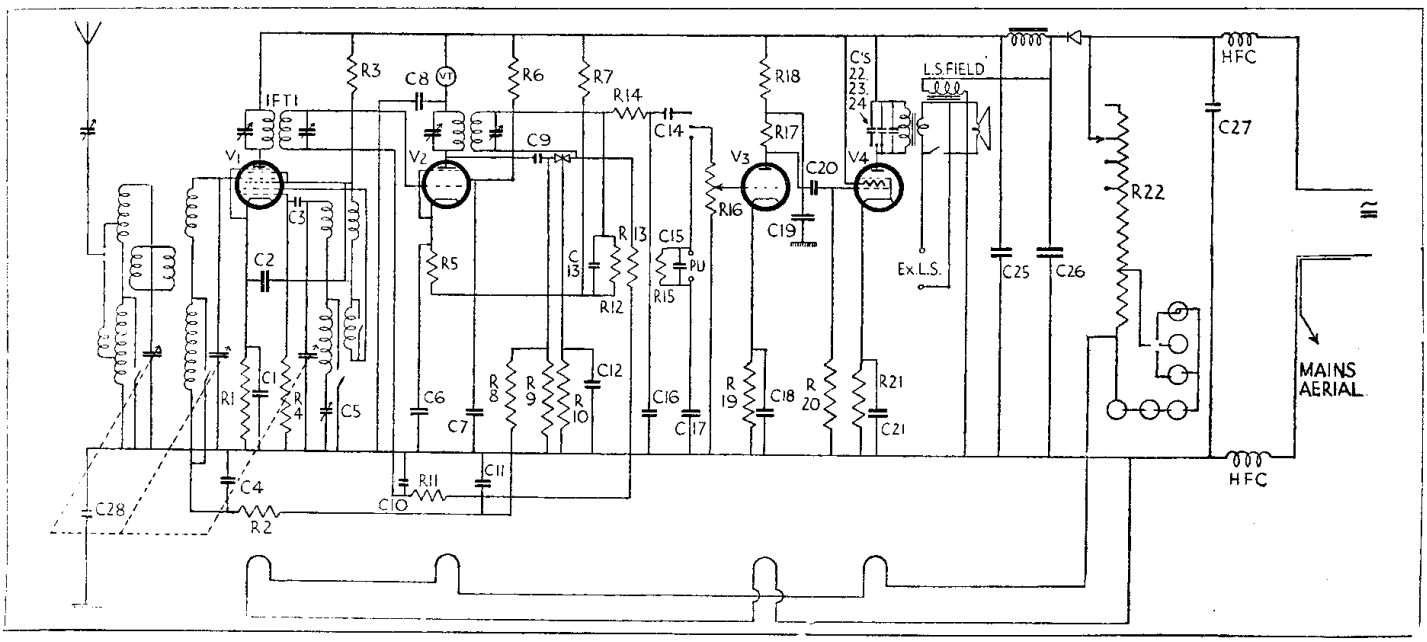
Both mains leads have H.F. chokes and by-pass condensers to act as interference suppressors.

Special Notes.—The valves are the 13-volt type, consuming .2 amp. The order of wiring from the resistance R22 is :—V4, V2, V1, V3.

The valve holders vary according to the type of valve. V1 and V2 have Mullard universal bases, while V3 and V4 have ordinary 7-pin bases.

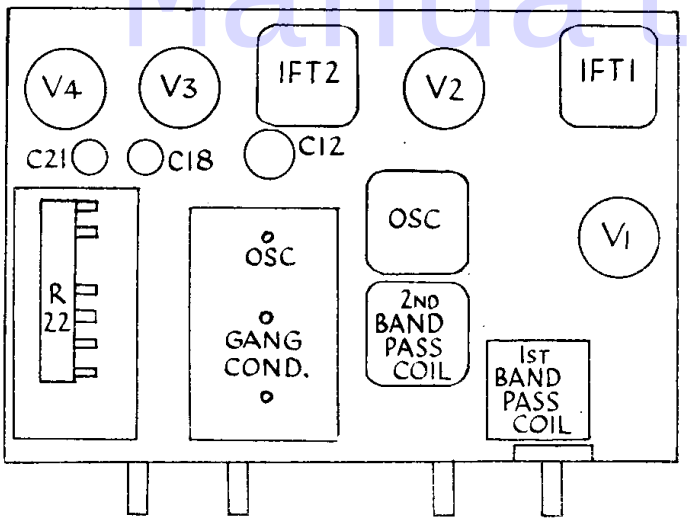
In the Mullard universal base there are

(Continued on next page.)

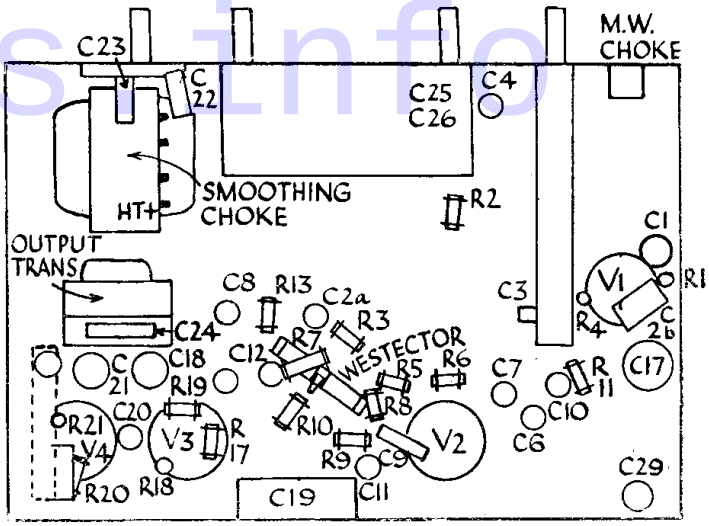


A Westector forms the second detector in the Halcyon 4501 and is arranged to provide automatic volume control. Half-wave rectification, provided by a metal rectifier, is used on A.C. supplies.

HALCYON MODEL 4501 UNIVERSAL SUPERHET (Continued)



The voltage-dropping resistance in series with the filaments is situated on the top of the chassis of the Halcyon 4501 A.C./D.C. receiver.



The underside of the Halcyon chassis is made accessible simply by removing the base of the cabinet, which is specially designed for the purpose.

VALVE READINGS

No signal.

V.	Type.	Electrode.	Volts.	M.A.
1	FC13 met.	anode ...	222	3.8
		aux. grid	100	4.2
		osc. anode	100	1.9
2	VP13A met.	anode ...	210	4.8
		aux. grid	125	1.8
3	HL1320 met.	anode ...	90	2.4
4	Pen 3520 ...	anode ...	214	38
		aux. grid	223	6.7

RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias	300
2	V1 grid decoupling from A.V.C.	.25 meg.
3	Voltage dropping to V1 screen and osc. anode	20,000
4	Osc. grid leak	30,000
5	V2 cathode bias	300
6	Voltage dropping to V2 aux. grid	50,000
7	Part of delay bias ftr.	60,000
8	Decouping A.V.C.	.25 meg.
9	A.V.C. diode load	.5 neg.
10	Common delay bias ftr. ...	2,200
11	Decoupling V2 grid	.25 meg.
12	Rect. diode load	.5 meg.
13	In series with R11	.25 meg.
14	H.F. stopper from Westector to V3	.25 meg.
15	Across P.V.	20,000
16	Var. volume control V3 grid ...	.25 meg.
17	V3 anode L.F. coupling ...	30,000
18	V3 anode decoupling	20,000 or 9,000
19	V3 cathode bias	650
20	V4 grid leak	.25 meg.
21	V4 cathode bias	165
22	Voltage dropping to filaments, cold	825

CONDENSERS

C.	Purpose.	Mfd.
1	V1 cathode	.1
2	V1 aux. grid	.1
3	V1 osc. grid	.001
4	V1 grid decoupling	.1
5	Osc. tracking	.0018
6	V2 cathode	.1
7	V2 aux. grid	.1
8	V2 anode decoupling from meter	.1
9	Coupling V2 anode to A.V.C. diode	.0002
10	Decoupling V2 grid	.1
11	Decoupling A.V.C. to V1 ...	.1
12	By-pass from Westector... ...	45 el.
13	H.F. by-pass from rect. output	.0001
14	L.F coupling to V3 grid ...	.02
15	Across P.V. connections... ...	.01
16	H.F. filter from rect. output ...	.0003
17	Series with P.V. lead	1
18	V3 cathode	45
19	V3 anode decoupling	1
20	L.F. coupling V3 to V4	.05
21	V4 cathode	45
22	Tone compensating V4 anode ...	.02
23	Tone compensating V4 anode ...	.01
24	Tone compensating V4 anode ...	.005
25	H.T. smoothing	24 el.
26	H.T. smoothing	24 el.
27	H.F. by-pass from mains ...	.01
28	Earth connection	.02

(*Continued from previous page.*)

four connections close together; of these the two in the middle are heaters.

Looking at the underside of the valve socket and counting *clockwise* from the heater contacts:—V1 (FC13), 3 and 2 heaters, (1) metallising, (8) anode, (7) screen, (6) osc. grid (5) osc. anode (4) cathode. Control grid is at the top. V2 (VP13A) in same order; heaters, (1) metallising, (8) anode, (7) suppressor grid, (6) blank, (5) screen and (4) cathode.

The 7-pin triode HL1320 has the ordinary 7-pin base (counted clockwise from heaters): Heaters, cathode, anode, metallising, blank, blank. The control grid is at the top of the bulb.

Quick Tests.—Between top terminal on L.S. panel and chassis: 250 volts.

Examining Chassis.—To reach the components under the chassis there is no need to remove the chassis from the cabinet. Undo four screws holding the wooden board underneath and all the components are revealed.

General Notes.—There are both mains and H.T. fuses in this set.

The trimmers of the I.F. transformers are on the tops of their respective cans.

In tracing out the components round the Westector the best method is to follow the ramifications of the H.T. lead from the smoothing choke (see diagram). In our Model R18 was 19,000 ohms.

The two positive terminals on the block electrolytic condenser are at the end nearer the choke, and the one at the other end is common negative. It is immaterial which positive lead is connected to either of the H.T. terminals on the choke.

To close set, replace board underneath and replace the back. Do not leave the back off in the customer's house.

Automatic Volume Control Circuits

(*Continued from page* 111.)

A.V.C. anode could be maintained positive with relation to the cathode, and there would be a constant large bias applied to the A.V.C. line. To counteract this and to make the bias dependent on the signal the cathode is connected through a fairly high value of resistance (usually between 30,000 and 100,000 ohms depending on the mutual conductance of the valve) to a point on the smoothing choke or field that is negative to the chassis, and the A.V.C. diode anode is connected to the chassis through a decoupling resistance.

How it Works

In Fig. 2 the cathode resistance is R4 and the A.V.C. decoupling resistance is R7. The circuit of the A.V.C. diode consists of R7, speaker field, and R4.

The relative potentials in these are balanced as follows: With no signal and, consequently, no bias on the triode grid the greater current through R4 causes the point C to be positive with relation to A, and B is positive with relation to A by the voltage drop across the L.S. field.

In practice the value of R4 is such that the voltage drop across it with no signal is slightly greater than the voltage drop across the choke; a resistance in the common H.T. negative lead to the previous valves causes these to be biased with an initial bias which acts as a "delay" on the action of the A.V.C. diode.

No Signal

Under no signal conditions the A.V.C. diode is negative with relation to cathode, but whenever a signal is applied to the diode A1 the triode is biased and less current flows through R4. Whenever this causes a voltage drop less than that across the speaker field the A.V.C. anode becomes positive with relation to the cathode and current flows in the circuit R7, making the point D negative with relation to B.

This voltage is considerably greater than the initial D.C. voltage applied to the grid of the triode section or of any that could be produced from the direct rectification of the I.F. or H.F. signal. The value of R4 in relation to the choke is chosen so that when the correct bias for good reproduction is applied to the triode the full A.V.C. voltage is applied to the control valves.