

MULLARD MU35 (Contd.)

on the speaker transformer and chassis (the two underneath the winding) :-

Front (red), V5 anode, 154 volts.

Back (black), H.T. and smoothed, 182 volts.

Removing Chassis.—Undo the knobs grub screw, two in large switch knob. Remove the cleats from the cables and, after removing the insulating covers on the holding screws, remove the latter and lift the chassis clear.

General Notes.—In handling this chassis take care that the bare connecting wires are not displaced.

The band-pass coupling condenser C44 consists of a piece of sistoflex covered wire bent round another bare wire; this must not be disturbed.

The trimmers of the band-pass I.F. transformers are in two sections, those on the outside are the primary trimmers, while the

secondary trimmers are on the inside. The adjustments of these are extremely critical.

Replacing Chassis.—Lay the chassis inside the cabinet, replace holding screws (fitting the earthing piece under the left hand rear screw) so that it makes contact with the metallic screen.

Cover the screw heads and clip the leads. Replace the knobs (two grub screws in the large one).



The Mullard MU 35.

VALVE READINGS

Valve.	Type.	Electrode.	Volts.	M.A.
1	FC13 met. (8) ..	anode ..	177	.5
		aux.grid ..	68	
		osc.anode ..	68	
2	VP13A (8) ..	anode ..	177	1.4
		aux.grid ..	68	
3	2D13A (5) ..	diode ..		
4	H.L. 13 ..	anode ..	80	.46
5	Pen. 26..	anode ..	154	42
		aux.grid ..	86	5.7

Voltagcs will be dependent on the mains. The above are comparative readings.

LISSEN MODELS 8111, 8116 AND 8117

Circuit.—The combined first detector-oscillator valve, A/80/A met. (V1), is preceded by a band-pass aerial coupling. Bias for the H.F. pentode section is by cathode resistance (variable) and A.V.C. and coupling to the next valve is by band-pass I.F. transformer (frequency 127 kc.). The oscillator tuning is in the grid circuit.

The I.F. valve, A/50/N met. (V2) is also biased by A.V.C. and cathode resistance, and is followed by a second band-pass I.F. transformer.

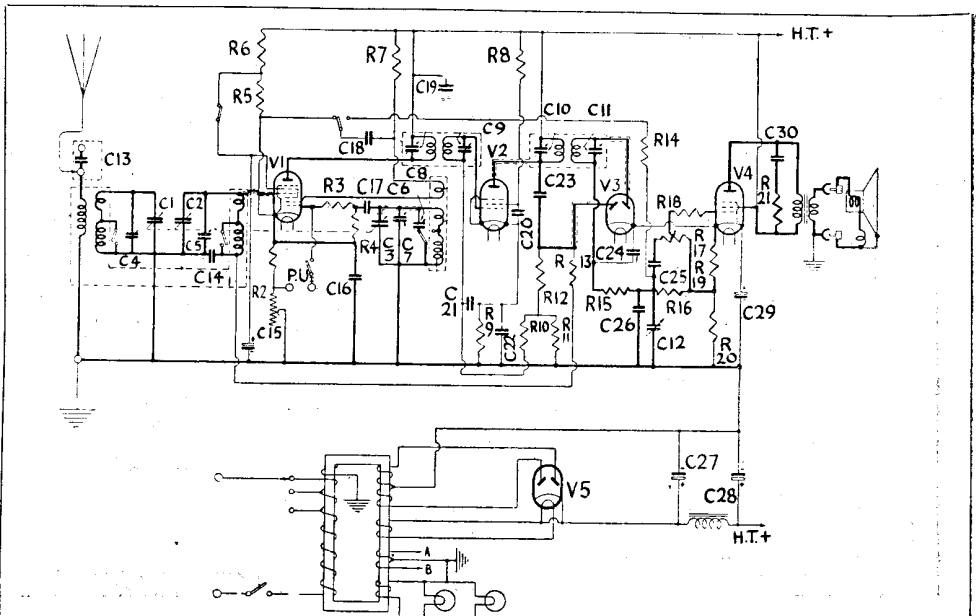
The second detector valve, A/20/B met. (V3), is a double diode. The A.V.C. diode anode is fed from the primary of I.F.T.I. and the load resistance is in two sections, R12 and R11.

Delay is applied by connecting the cathode

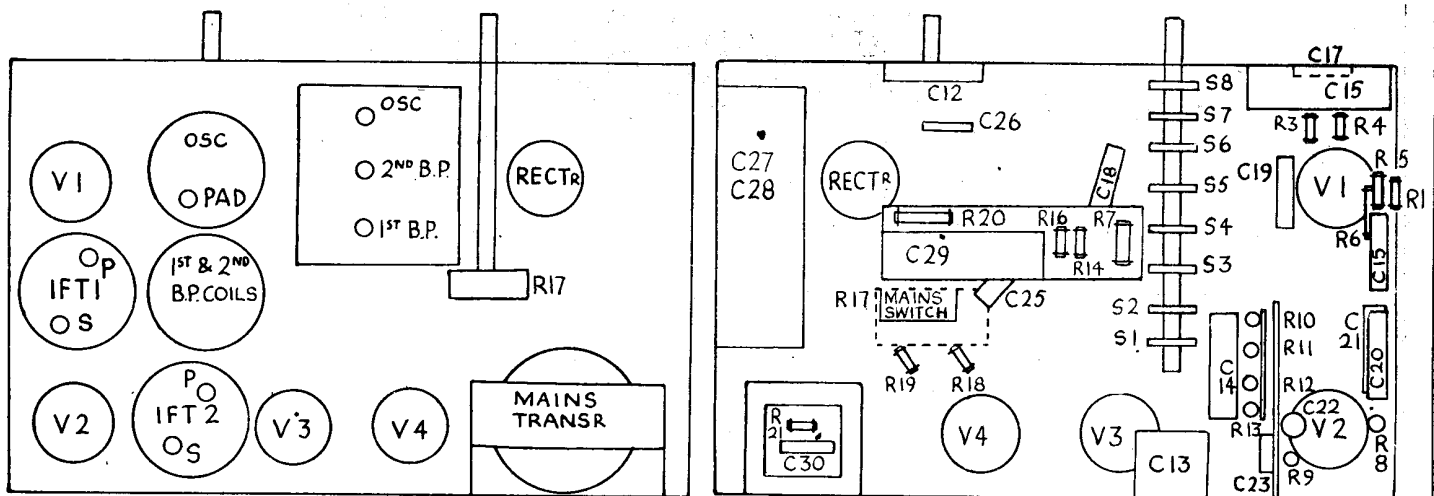
VALVE READINGS

Ever Ready valves. No signal.

Valve.	Type.	Electrode.	Volts.	Ma.
1	A/80/A met.(7)	anode ..	275	1.2
		aux.grid ..	72	
		osc.anode ..	77	
2	A/50/N met. ..	anode ..	275	6
		aux.grid ..	105	
3	A/20/B met.(5)	diode ..	258	27
4	A/70/C ..	anode ..	258	3.1
		aux.grid ..	275	



The circuit of the Lissen 8111, 8116 and 8117 receivers includes a very interesting way of using V1 for pick-up amplification.



The long-wave oscillator padding trimmer is on top of the oscillator coil. All components below the chassis (right) are easily accessible.



The Lissen 8111 table model superhet A.C. "four."

CONDENSERS

C.	Purpose.	Mfd.
13	Series aerial	.000015
14	Decoupling V1 grid	.25 (350)
15	V1 aux. grid by-pass	2 (300)
16	V1 cathode by-pass	.1 (350)
17	V1 osc. grid reservoir	.001 (350)
18	Gram. feed from V1 to V4	.1 (350)
19	V1 anode decoupling	.1 (350)
20	V2 screen by-pass	.1 (350)
21	V2 grid decoupling	.1 (350)
22	V2 cathode by-pass	.1 (350)
23	I.F. feed to A.V.C. diode	.0001(350)
24	H.F. by-pass from diode	.0001(350)
25	L.F. coupling	.05 (350)
26	H.F. by-pass from diode	.0001(350)
27	H.T. smoothing	el. 8 (450)
28	H.T. smoothing	el. 8 (450)
29	V4 cathode by-pass	el. 20 (30)
30	Part of tone compensating circuit	.01 (450)

Bracketed figures denote D.C. working voltages.

RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias	300 (±)
2	Sensitivity control	var. 2,000
3	V1 osc. grid harmonic suppressor	1,000 (±)
4	V1 osc. grid leak	100,000(±)
5	V1 aux. grid ptr.	40,000 (±)
6	V1 aux. grid ptr.	40,000 (1)
7	V1 osc. anode decoupling	100,000(±)
8	Voltage dropping to V2 aux.grid	80,000 (±)
9	V2 cathode bias	200 (±)
10	Decoupling V2 grid	510,000(±)
11	A.V.C. load ptr.	510,000(±)
12	A.V.C. load ptr.	510,000(±)
13	Decoupling A.V.C. to V1	510,000(±)
14	H.F. stopper in gram. feed	100,000(±)
15	H.F. stopper from diode	100,000(±)
16	Diode load	260,000(±)
17	V.C.	500,000
18	V4 grid stabiliser	25,000 (±)
19	V4 cathode bias	150 (±)
20	Providing relay bias for A.V.C.	500 (1)
21	Tone compensating V4 anode	10,000 (±)
	Speaker field	3,000ohms

Bracketed figures denote voltage rating.

to that of V4, and the L.F. coupling is a resistance capacity filter. Tone control is provided by a variable condenser, C12, across the diode output.

The output pentode, A/70/C (V4), has a grid stabilising resistance and is tone compensated by a condenser in series with a resistance across the primary of the output transformer.

Mains equipment consists of transformer, full-wave A/11/B rectifier, the speaker field in the positive H.T. lead for smoothing, and two electrolytic condensers.

Special Notes.—Pilot lamp is a 3.5 volt .3 amp. flash-lamp bulb.

The variable resistance R2 is at the back of the chassis and provides a certain amount of control over inter-station "noise."

An extra speaker should be used without a transformer and should have an impedance of between 3 and 5 ohms.

Quick Tests.—Between the right-hand terminals on the speaker and chassis:—

Outside, 450 volts, H.T. unsmoothed,

Inside, 275 volts, H.T. smoothed.

Removing Chassis.—There is no need to remove the knobs. Simply undo the screws holding the fibre cover on the bottom of the cabinet to reveal all the under-chassis components.

When the chassis must be removed, undo

the four holding bolts, pull off the knobs and free the speaker lead from the clip.

General Notes.—The condensers C27 and C28 are of identical value and working voltage.

The oscillator section of V1 is converted into an L.F. amplifier for gram. by switching the decoupling condenser C18 over to the grid circuit of V4. The connection of the pick-up prevents V1 oscillating.

Replacing Chassis.—Lay the chassis inside the cabinet, replace the bolts, the cover underneath, and the knobs (springs opposite rounded sides of spindles).

PHILIPS 585U SUPERHET "FIVE"

Circuit.—The octode frequency changer, FC13 met. (V1), has a band-pass aerial coupling with special coils and includes an I.F. filter. Oscillator tuning is in the grid circuit. Bias for the oscillator section is from a cathode potentiometer, while that for the pentode section is by A.V.C. and cathode resistance.

Coupling to the next valve is by band-pass I.F. transformer (frequency 115 kc.). The I.F. valve, VP13A met. (V2), is biased in a special manner to provide muting and amplification of the A.V.C. by having the grid return taken to a positive tapping on an H.T. potentiometer, the actual biasing potential being controlled by the difference in voltage drop across R4 and R10.

Coupling to the next valve is by another band-pass I.F. transformer.

The second detector, 2D13A (V3), uses the second anode for A.V.C., and the negative bias for noise suppression is obtained on the first anode by the potentiometer R11 (mounted on the back of the cabinet top).

Coupling to the L.F. valve is by resistance-capacity filter.

This valve, HL13 (V4), is a triode with a tone correction circuit in the cathode lead. It is also coupled to the output valve by another resistance-capacity filter.

The output pentode, Pen.26 (V5), is stabilised by grid resistance, and tone control is by condenser and variable resistance. The speaker is a permanent magnet model.

Mains equipment consists of H.F. mains chokes in each lead, barretter lamp for the heater supplies, half-wave rectifier, a choke in the positive H.T. lead, and electrolytic condensers.

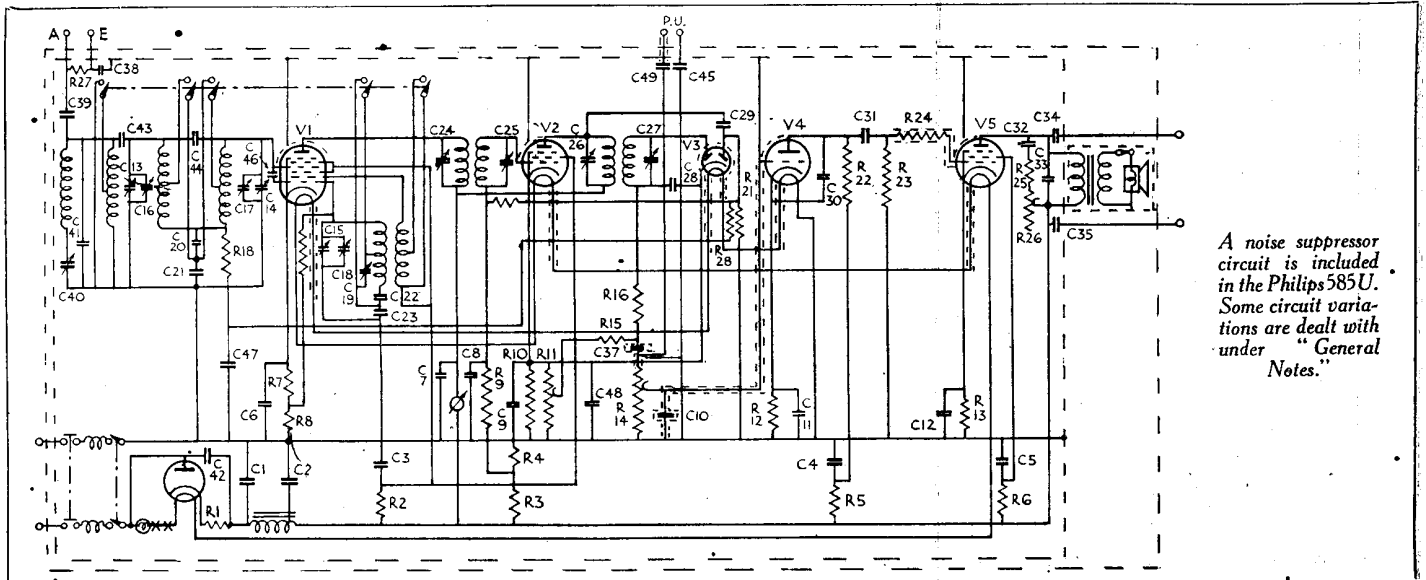
Special Notes.—To remove the pilot lamps (No.8070) undo the screw and lift out.

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VALVE READINGS

13 volt "Universal" valves.

Valve.	Type.	Electrode.	Volts.	M.A.
1	F.C.13 met.	anode	190	.7
		aux.grid	65	
		osc.anode	65	
2	V.P. 13A	anode	180	1.5
		aux.grid	60	
		diode	—	
3	2D 13A..	—	—	—
4	H.L.13 ..	anode	140	.75
5	Pen. 26..	anode	167	40
		aux.grid	90	5.5



A noise suppressor circuit is included in the Philips 585U. Some circuit variations are dealt with under "General Notes."