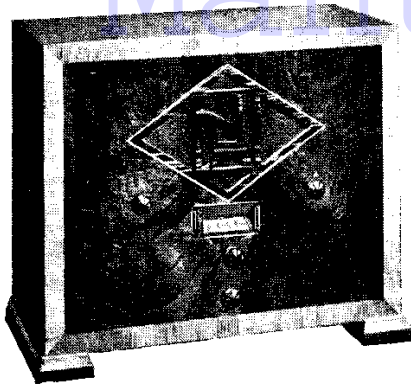


ULTRA PANTHER SUPERHET (Cont.)



The Panther 6-valve plus rectifier superhet by Ultra Electric, Ltd.

(V5) a double diode triode, only one of the diode anodes is utilised. The L.F. feed is taken from the low H.F. potential end of the I.F.T.3 secondary through the L.F. coupling condenser C.9 to the grid of the triode section. The circuit includes another H.F. choke (H.F.C.3) to prevent I.F. impulses from reaching the L.F. section. In addition an extra H.F. by-pass condenser may be found connected as shown at C.b.

Coupling to the output valve is by resistance capacity filter. The valve, an AC/Pen. (7-pin), (V6) has another H.F. stopper in its grid circuit (R15), and tone control is provided by connecting a condenser C.12 across a variable part of the grid leak potentiometer.

Tone compensation is provided by a resistance and condenser in series across the primary of the output transformer, as well as by a fixed condenser between the anode and chassis.

Mains equipment consists of transformer, and a metal rectifier used on the voltage doubler principle with electrolytic condensers. The speaker field is in the negative H.T. lead with two 8 mfd. condensers for smoothing.

Quick Tests.—The terminals on the output transformer are inaccessible, as they are inside the chassis.

Volts between the following points and chassis with V.C. max. (note the polarity relative to the chassis) :—

End (red) terminal on speaker (negative), 100 v. (the on outer terminals are L.S. field.)

Case of C.16 (negative), 100 v. (i.e., voltage drop across L.S. field)

Removing Chassis.—Pull off the tuning knob and remove the others by undoing grub screws. Remove six screws underneath and pull out L.S. speech coil leads.

General Notes.—The majority of the small components are mounted on six assem-

blies placed close to their corresponding valves. These are numbered in the lay-out diagram, and the components mounted on them are, counting from inside of chassis :—

- (1) R7, C1, R2, R1 with C4 on the front side.
- (2) R3, C2, R18, C5.
- (3) C6, C3, R5, R4.
- (4) Cb, C11, R12.
- (5) R17, C14, C15, R18.
- (6) R14, R10, R11, with C8 on rear side.

The seven-pin valve connections, counting from the two heater pins together at one end, are :—

- AC/HL/DD, H, H, cathode, anode, diode anode 1, blank, blank.
- AC/Pen., H, H, cathode, anode, blank, grid, aux. grid.

The output transformer is mounted on the chassis, and the three terminals in front, counting from the rectifier side, are :—

- (1) H.T. +; (2) blank; (3) V6 anode.
- The two on the other side are the ends of the secondary.

As the L.S. field is in the negative lead, the cases of C16, C17 and C18 are insulated from the chassis. If one of these requires replacement the insulating washers must be replaced.

Mains transformer connections (counting from outside) :—

- Two projecting wires at outside, valve filaments.
- Front, (1) to tap on rectifier.
- " (2) C.T. of filament to chassis.
- " (3) to C17 and C18
- Rear, (1) 230-250 volt tapping.
- " (2) 200-230 volt tapping
- " (3) Mains 0 to switch.

Replacing Chassis.—See that screening plate is in correct position on base of cabinet. Lay chassis inside, insert speaker plugs and replace holding screws and knobs.

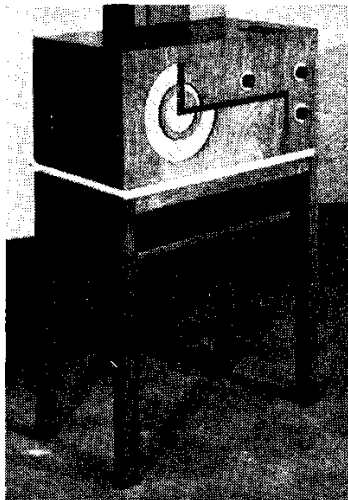
VALVE READINGS

V.C. max.

Valve	Type.	Electrode.	Volts	M.A.
1	AC/SG/V.M	anode ...	265	1.1
		screen ...	92	
2	AC/HL ...	anode ...	180	*
		anode ...	265	*
3	AC/SG/V.M	screen ...	92	
		anode ...	265	*
4	AC/SG/V.M	screen ...	92	
		anode ...	265	*
5	AC/HL/DD	triode anode	143	2.3
		anode ...	270	29
6	AC/Pen ...	anode ...	270	5
		aux grid ...	260	

* Inclusion of meter leads to take current readings causes instability.

MURPHY MODEL A.8 FOR A.C. MAINS



Eight valves plus a rectifier valve are utilised in the superhet circuit of Murphy Radio's A.8 receiver.

Circuit.—The H.F. valve, VMS4 plain (V1), is preceded by a single tuned aerial circuit. For use with pick-up the aerial is short-circuited to earth. Bias is partly fixed by a potentiometer common to the H.F. and I.F. valves, and partly variable from the A.V.C. line.

Coupling to the first detector is by a band-pass tuner, of which the first unit is a tuned secondary H.F. transformer.

The separate oscillator valve, A.C./H.L. met. (V2), operates with a tuned coil in the anode circuit coupled to a coil in series with the cathode return lead of the first detector.

This valve, an A.C./S.I./V.M. met. (V3), is coupled to the first I.F. valve by a band-pass I.F. transformer (frequency 120 K.C.). Bias is fixed.

The first I.F. valve, A.C./S.I./V.M. met (V4), is biased as V1 and is coupled to the second I.F. valve by a second band-pass I.F. transformer. The second I.F. valve, A.C./S.I./V.M. met. (V5), is biased from a different A.V.C. point, and is coupled to the second detector by the third I.F. band-pass transformer.

A simple double diode, A.C./D.D. met. (V6), forms the second detector, and is operated as a full-wave rectifier, with the L.F. (and A.V.C.) coupling taken from the centre tap of the H.F. transformer secondary. The D.C. voltage for A.V.C. is developed across the potentiometer formed by R. 15 and R. 16, and the L.F. component is fed through C. 30 to the grid potentiometer of V7.

The L.F. valve, V.M.S. 4 met. (V7), has its grid leak in the form of a volume-control

potentiometer. Bias is obtained from a potentiometer across the L.S. field.

R.C. coupling is employed to the output valve, A.C./Pen. (V8), which is tone compensated by a condenser (C. 34) and resistance (R. 24) between the anode and chassis. Optional degrees of compensation are provided by a switch across R. 24 (at back of chassis).

Mains equipment consists of transformer and full-wave 1807 rectifier. H.T. smoothing consists of a choke in the positive lead with electrolytic condenser and the field coil in the negative lead with an extra electrolytic condenser.

Special Notes.—There are two set filament windings, and it should be noted that the oscillator (V2) and the I.F. valves (V4 and V5) are on a different circuit from that of the remaining valves.

There are two definite voltage lines in the set; a 200-volt supply to the anodes of all the valves and the aux. grid of the pentode and a 50-volt supply to the screening grids of all but that of the L.F. valve, which takes its supply from a different tapping on the same potential divider.

Quick Tests.—Between the following terminals on speaker transformer, looking from rear and counting from the left, and chassis (note the polarity) :—

- (1) 0 to chassis.
- (2) 200 v. positive (H.T. smoothed).
- (3) 182 v. positive (V8 anode).
- (4) 70 v. negative (voltage drop across L.S. field).

These readings were taken with no signal and 235 v. mains in 233-250 volt tapping.

Note that the cases of C. 35 and C. 36 are at tag 4 potential, and are insulated from the chassis.

(Continued on next page.)

VALVE READINGS

No signal. 235 v. mains on 233-250 volt tapping.

Valve	Type.	Electrode.	Volts.	M.A.
1	VMS4 plain ...	anode ...	200	4
		screen ...	50	
2	AC/HL met ...	anode ...	60	2.5
		anode ...	200	4
3	ACSIVM met... screen ...	anode ...	200	4
		screen ...	50	
4	ACSIVM met... screen ...	anode ...	200	4
		screen ...	50	
5	ACSIVM met... screen ...	anode ...	200	4
		screen ...	50	
6	AC/DD met ...	anode ...	*	*
		screen ...	110	2
7	VMS4 met ...	anode ...	110	2
		screen ...	40	
8	AC/Pen ...	anode ...	180	25
		aux grid ...	200	4

* No H.T. voltage in this valve.

MURPHY RADIO'S A 8 SUPERHET (Cont.)

Removing Chassis.—Remove knobs and remove the six hexagonal screws underneath (box spanners are necessary for both types). Ease chassis out.

One convenient method of testing lies in standing the chassis on speaker end with cardboard under the electrolytic condensers.

General Notes.—The voltages between the potential divider mounted on the junction of the two chassis (R. 17, R. 18, R. 19 and R. 20) should be approximately (counting from front) :—

- (1) 0v (to chassis); (2) and (3) .7 v.; (4) 40 v.; (5) 50 v.; (6) 200 v.

The terminals of C. 30 both project from the double condenser block, but as one side of C. 24 is at chassis potential it is connected to the case inside.

Connections to mains transformer (see diagram) :—

- (1) Mains 0 to switch; (2) to set side of switch; (3) and (4) Z filaments; (5) and (6) X filaments.

The rectifier leads project from underneath the transformer. Two heavy copper wires are rectifier filament and two yellow flexible wires are anodes. Mains tappings are :—From out-

side 200 volt, 215 volt and 233 volt sockets respectively.

The resistances and condensers on the two assemblies are (counting from those nearest looker) :—

- Assembly (1) : R 2, R 1, R 8, R 11, R 14, R 15, R 16.
- Assembly (2) : R 25, R 26, R 27, R 23, R 22, C 38, C 32.

The connections to these are easily reached.

Replacing Chassis.—First see that the coil cans are securely inserted into their holders, and that the yellow lead from C 30,

which passes underneath the coils, is kept as far forward as possible.

Lay chassis inside cabinet and, with alternate corners projecting over the edge of the bench insert the four corner screws. Stand set on end and insert remaining two. Replace knobs.

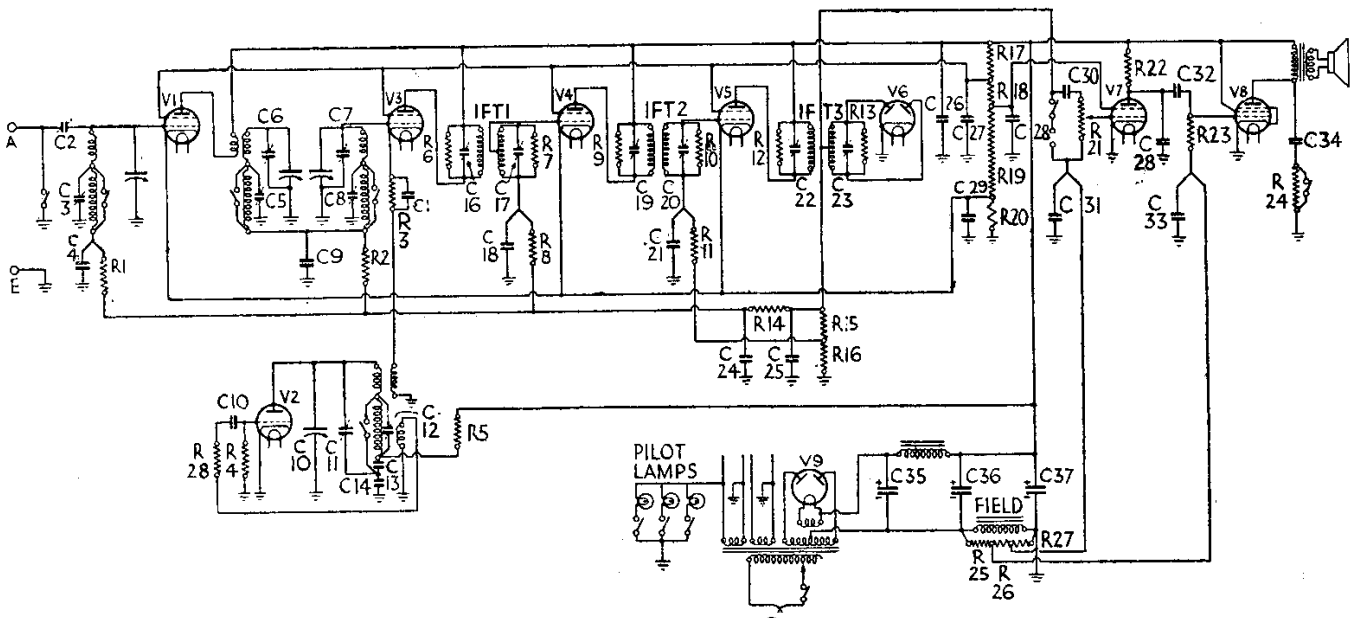
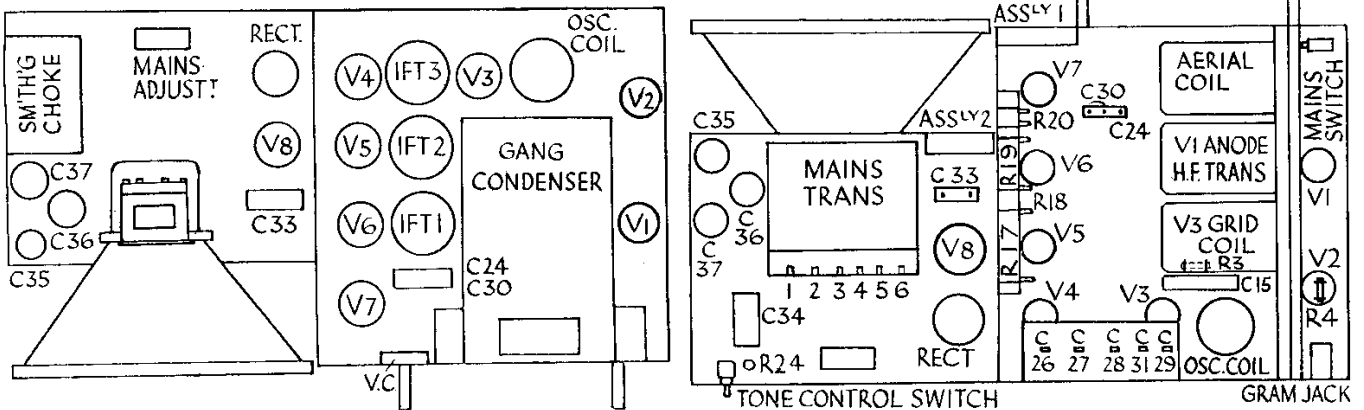
CONDENSERS

C.	Purpose.	Mfd.
4	Decoupling V1 grid from A.V.C.	.025
9	Band-pass coupling	.025
10	V2 grid	.0002
15	V3 cathode	.2
18	Decoupling V4 grid from A.V.C.	.01
21	Decoupling V5 grid from A.V.C.	.01
24	HF and LF filter for A.V.C. line	.0003
25	By-pass from 200 volt lead	1
26	By-pass from 50 volt lead	1
27	V7 screen	1
28	Decoupling fixed bias for V1, V4 and V5	.2
30	LF coupling V6 to V7	.05
31	Decoupling V7 grid	1
32	LF coupling V7 to V8	.01
33	Decoupling V8 grid	1
34	Tone compensating circuit V8	.035
35	HT smoothing	4 el
36	HT smoothing	8 el
37	HT smoothing	8 el
38	V7 anode by-pass	.0002

RESISTANCES

No.	Purpose.	Ohms.
1	Decoupling V1 grid from AVC	.5 meg.
2	Decoupling V3 grid from AVC	.5 meg.
3	V3 cathode bias	2,500
4	V2 grid leak	100,000
5	V2 anode decoupling	50,000
6	Across IFT1 primary	.25 meg.
7	Across IFT1 secondary	.25 meg.
8	Decoupling V4 grid	.5 meg.
9	Across IFT2 primary	.25 meg.
10	Across IFT2 secondary	.25 meg.
11	Decoupling V5 grid	.5 meg.
12	Across IFT3 primary	80,000
13	Across IFT3 secondary	.25 meg.
14	Smoothing AVC	.25 meg.
15	AVC ptr. (diode load)	.4 meg.
16		.12 meg.
17		9,000
18	Potential divider for screen and bias	1,860
19		3,000
20		25
21	V7 grid leak (V.C.)	.5 meg.
22	V7 anode resistance	50,000
23	V8 grid leak	100,000
24	Tone compensating circuit	15,000
25		2 meg.
26	Bias ptr across LS field	.25 meg.
27		50,000
28	V2 grid stabiliser	1,800
	LS field coil	1,000
	P of output transformer	680

The layouts below show how the speaker is centred among the mains apparatus in the Murphy A8.



H.F., first detector, oscillator, two I.F., second detector, L.F., output and rectifier valves form the basis of the circuit of the Murphy A8