



# 10-MINUTE FAULT-FINDER

# DECCA AWS

### Power Test

Voltages : V5 cathode, 360; HT line, 275.  
Resistance : L17, 1,250 ohms.  
Total feed =  $360 - 275 \div 1,250 = 68$  ma.  
Mains loading : 68 watts.

### Output Stage, V4

Inject 2 volts AF at V4 grid. If defective, check :—  
Voltages : Anode, 240; screen, 275; cathode, 14.  
Resistances : Anode—HT, 440; grid—chassis, 250,000; cathode—chassis, 250 ohms.

### AF Stage, V3

Inject .5 volt AF at grid. If defective, check :—

Voltages : Anode, 175; cathode, 2.2.  
Resistances : Anode—HT, 125,000; grid—chassis, 500,000; cathode—chassis, 3,000 ohms.

### Demodulation, V3

Inject modulated 465-kc. signal at V2 anode. If defective, check :—  
Resistances : L12, 6; L14, 4; diode—chassis, 373,000 ohms.

### IF Stage, V2

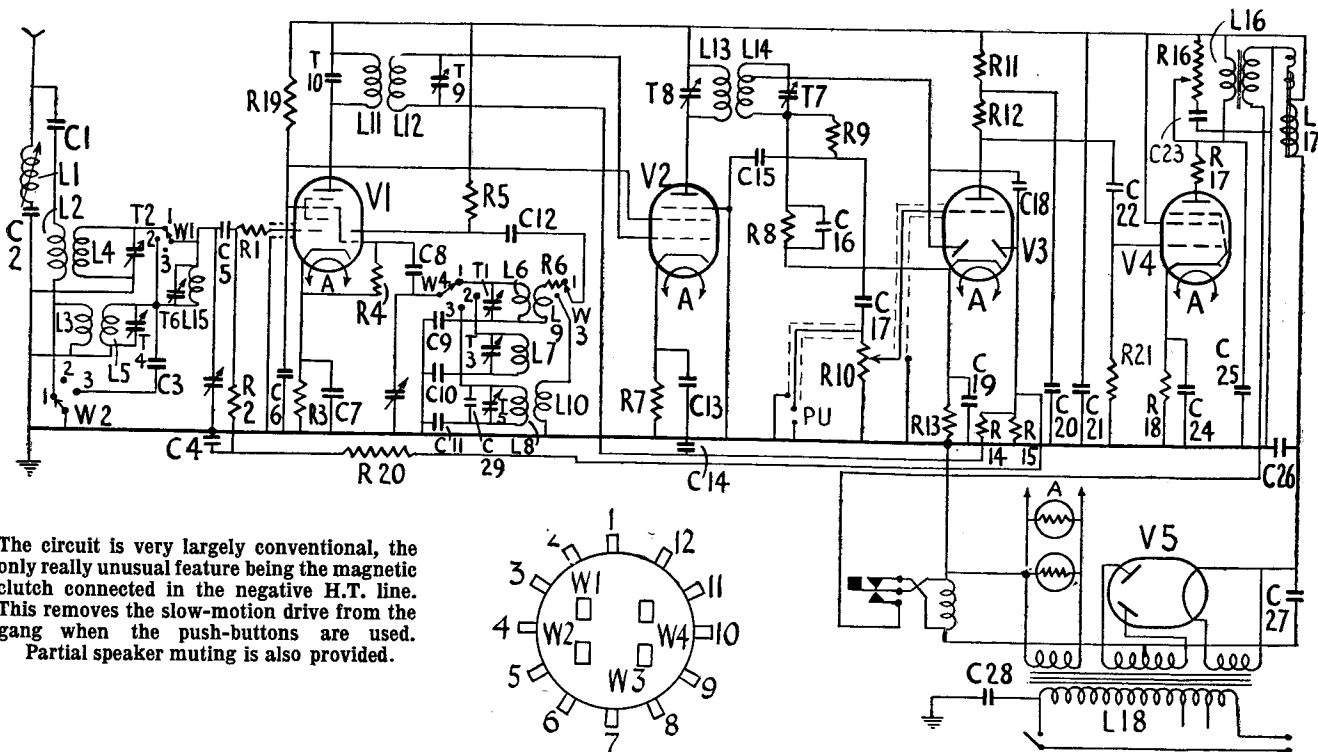
Inject modulated 465-kc. signal at V2 grid. If defective, check :—  
Voltages : Anode, 275; screen, 120; cathode, 3.2.  
Resistances : Screen—HT, 35,000 ohms; grid—chassis, 1 megohm; cathode—chassis, 250 ohms.

### Mixer Stage, V1

Inject modulated 465-kc. signal at V1. grid. If defective, check :—  
Voltages : Anode, 275; screen, 120; cathode, 2.7.  
Resistances : Screen—HT, 35,000 ohms; grid—chassis, 1.5 megohms; cathode—chassis, 250 ohms.

### Oscillator Test

Tune to local station and inject that frequency plus 465 kc. at oscillator grid. If no signals, check :—  
Voltages : Osc. anode, 110.  
Resistances : Osc. anode—HT, 35,000; osc. grid—chassis, 50,250 ohms.  
If signals are still absent, check input coils and switches.



The circuit is very largely conventional, the only really unusual feature being the magnetic clutch connected in the negative H.T. line. This removes the slow-motion drive from the gang when the push-buttons are used. Partial speaker muting is also provided.

### Windings (continued)

10	..	1	..	LW	..	C12 and chassis.
11	..	6	..	—	..	V1 anode and HT.
12	..	6	..	—	..	V2 grid and C14.
13	..	6	..	—	..	V2 anode and HT.
14	..	4	..	—	..	Diode and R9.
15	..	20	..	LW	..	C5 and L5.
16	..	340	..	—	..	On leads.
17	..	1,250	..	—	..	C21 and C26.
18	..	24	..	—	..	Mains plug.

### Resistances (continued)

13	..	V3 cathode bias	..	..	3,000
14	..	V2 AVC decouple	..	..	500,000
15	..	AVC diode load	..	..	500,000
16	..	Tone control	..	..	50,000
17	..	V4 anode stabiliser	..	..	100
18	..	V4 cathode bias	..	..	250
19	..	V1 and V2 screen decouple	..	..	35,000
20	..	V1 AVC decouple	..	..	500,000
21	..	V4 grid leak	..	..	250,000

### Condensers (continued)

13	..	V2 cathode shunt	..	..	.1
14	..	V2 AVC decouple	..	..	.02
15	..	IF filter	..	..	.0001
16	..	IF filter	..	..	.0001
17	..	AF couple	..	..	.02
18	..	AVC couple	..	..	.0001
19	..	V3 AVC couple	..	..	.02
20	..	V3 cathode shunt	..	..	50
21	..	V3 anode decouple	..	..	4
22	..	HT smoothing	..	..	10
23	..	V4 grid couple	..	..	.02
24	..	Tone control	..	..	.04
25	..	V4 cathode shunt	..	..	50
26	..	HT anode shunt	..	..	.006
27	..	HT smoothing	..	..	10
28	..	Mains filter	..	..	8
29	..	LW osc. trimmer	..	..	.00045

### RESISTANCES

	Ohms.
1	.. V1 grid stopper .. 40
2	.. V1 grid return .. 500,000
3	.. V1 cathode bias .. 250
4	.. Osc. grid leak .. 50,000
5	.. Osc. anode load .. 35,000
6	.. Heterodyne volt control .. 75
7	.. V2 cathode bias .. 250
8	.. Signal diode load .. 300,000
9	.. IF filter .. 70,000
10	.. Volume control .. 500,000
11	.. V3 anode decouple .. 25,000
12	.. V3 anode load .. 100,000

### CONDENSERS

	Mfd.s.
1	.. Aerial coupling .. .004
2	.. Aerial filter .. .0006
3	.. LW input tune .. .00125
4	.. V1 AVC decouple .. .02
5	.. V1 grid couple .. .0001
6	.. V1 screen decouple .. .1
7	.. V1 cathode shunt .. .001
8	.. Osc. grid .. .003
9	.. SW padder .. .000385
10	.. MW padder .. .00018
11	.. LW padder .. .0002
12	.. Osc. anode .. .0002

**Replacement Condensers.**—Exact replacement electrolytic condensers are available from A. H. Hunt, Ltd., Garratt Lane, Wadsworth, London, S.W.18, who make some of the units in the original set. For either C19 or C24 there is unit 3531, 1s. 10d.; for C27, unit 3625 5s. 6d. and for the C21 + C26 unit, Minipack type 440, 7s. 6d.

# Ultra Model 500

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tive groups of coils. The first wafer carries W1 and W2, controlling the tuned and untuned aerial circuits. In addition, there is an earthing wipe, W3.

The second wafer is similar to the first, carrying W4, W5 and W6, and controls the HF coils. The third wafer, carrying W7, W8 and W9, controls the tuned and untuned oscillator coils as well as switching the oscillator anode and grid circuits for the pick-up amplifier.

The fourth wafer, mounted behind the tuning pack, has a single wipe which changes over the audio valve grid from the diode load to the pick-up amplifier, and a further wipe which controls the four pilot lamps.

### Special Notes

**T**HERE are several modifications compared with some early models. Certain decoupling condensers of .01 are now increased to .035. This is the case with C9 and C19, the object of the alteration being to change the time constant of the AVC network.

In our chassis C18 was found to be .004 and not .003 and the resistance R13 was 20,000 ohms instead of 10,000 ohms. Some early models had a muting switch associated with the PB mechanism.

It is important to note that separate trimmers are not used on aerial and HF circuits, and, accordingly, it is essential to gang the SW band first. When this is correct the MW and LW circuits are automatically adjusted to the correct values.

### Chassis Removal

First of all remove the control knobs which are of the spring pull-off type. Next remove the screws which hold the top of the tuning scale against the inside of the cabinet. Remove the pilot lamp which illuminates the push-button scale.

Release the speaker by unscrewing the holding nuts and take off the clips and remove the speaker from the cabinet. The speaker will still be attached to the chassis by the multiple cable. Finally, remove the chassis retaining bolts.

## Alignment

### IF Circuits (470 kc.).

Connect output meter to receiver and generator to V2 grid.

Tune generator to 470 kc. and adjust the cores of the second IFT and then the first IFT for maximum output.

Use a small input below the AVC value.

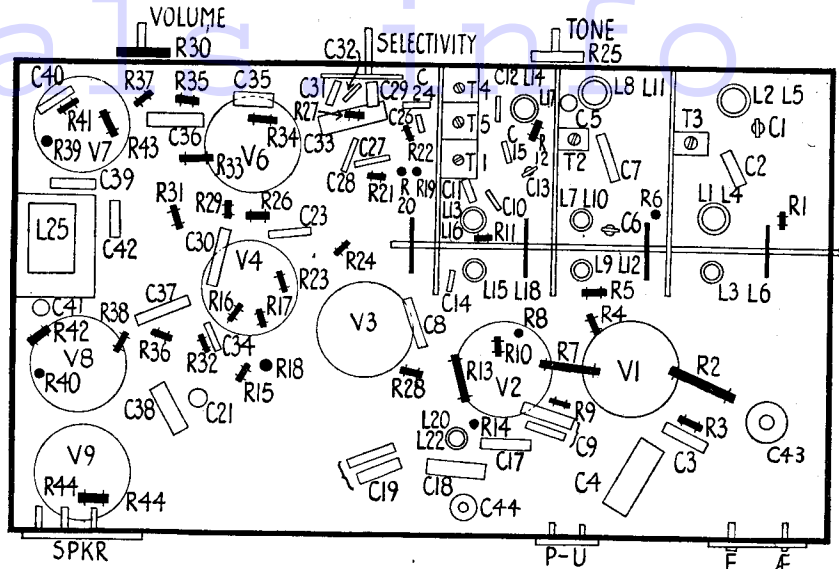
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the control knobs, which are all held by grub-screws.

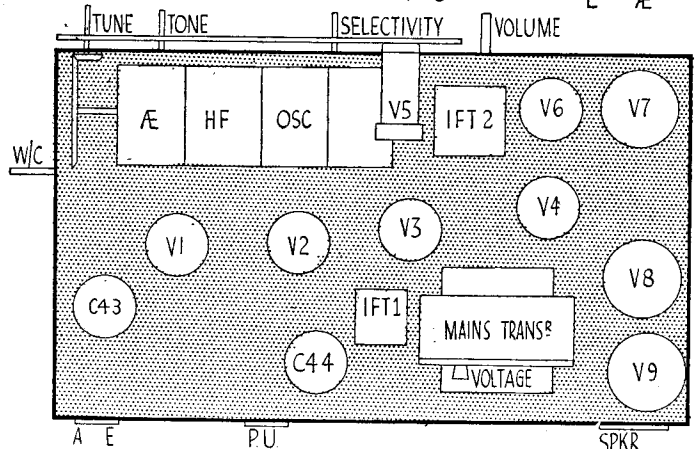
Slip the two pilot-lamps off the holders and take out the chassis retaining bolts from the bottom of the cabinet. The chassis can then be pulled out of the cabinet.

For complete removal, disconnection of the speaker is necessary. There are two sets of leads. The first has two cores with a red and black wire which go to the muting switch on the back of the press-button unit.

The other leads are on the speaker strip, and the connections, reading from the top downwards, are as follows: Blue, black, vacant, red, vacant.



All the components, valves and trimmers are easily identified by these chassis diagrams. Note that resistors are in solid black, condensers in outline.



### Short Waves (16.5 to 51 metres)

Connect the generator through dummy aerial to the aerial and earth terminals, and tune set and generator to 15.8 megacycles (19 metres) and adjust T1, T2 and T3 for maximum. Check the calibration at 50 metres.

This operation must be carried out in the third selectivity position and also before the other bands are trimmed.

### Medium Waves (200 to 550 metres)

Tune set and generator to 200 metres (1,500 kc.) and adjust T4 for maximum.

There is no padding operation, but the calibration should be checked at 500 metres.

### Long Waves (900 to 2,000 metres)

Tune set and generator to 1,000 metres

(300 kc.) and adjust T5 for maximum and check the calibration at 1,750 metres.

### Press-button Adjustment

Tune in a desired station accurately by hand. Unscrew the knob of the button.

Depress the button fully and tighten the knob.

Manually detune the station and then as a check retune by depressing the button.

Exact replacement condensers are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18. For C43 there is unit 3058, 9s. 6d.; for C44, unit 3056, 7s. 6d.; C38, 2964, 1s. 10d., and C4, 2546, 2s. 3d.

## Alignment

### IF Circuits (465 kc.)

Connect the output meter to the set and the generator to the grid of V1.

Tune the generator to 465 kc. and adjust T7, T8, T9 and T10 for maximum.

Use a low input below the AVC level.

### Short Waves (16 to 50 metres)

Connect the generator to the aerial and earth through a dummy aerial.

Tune set and generator to 17 metres (17.65 mc.) and adjust T1 and T2 for maximum.

### Medium Waves (200 to 550 metres)

Tune set and generator to 220 metres (1,362 kc.) and adjust T3 and T4 for maximum.

### Long Waves (1,000 to 2,300 metres)

Tune set and generator to 1,200 metres

(250 kc.) and adjust T5 and T6 for maximum.

## Press-Button Adjustment

Tune in manually a desired station and then select the button on which it is to appear.

Slacken the knob and depress the button fully. Then retighten the knob, while still depressed, and check the accuracy of the adjustment.

It should be noted that if the set has been correctly aligned, Midland Regional and Luxembourg will appear on the same button simply by changing the wave switch.

A similar adjustment is possible with London Regional and Droitwich.