

EKCO UAW78 A.C.-D.C. 3-BAND SUPER

CIRCUIT.—The aerial is inductively coupled to V1, the triode-pentode frequency changer. A dipole aerial connection is provided by terminals A and DA, which are taken to condensers C8 and 9. Resistors R1 and 2 are connected across A and DA and from their centre-point a wire is taken to the earth terminal. A switch in the aerial circuit has to be unscrewed for dipole use and screwed in for a normal aerial.

As the receiver is for A.C. or D.C., the earth is connected to the chassis through C10.

There are padding trimmers across both medium and long wave aerial grid coils. A.V.C. is applied through R3 to the "earthy" end of the grid coils and decoupled by CB.

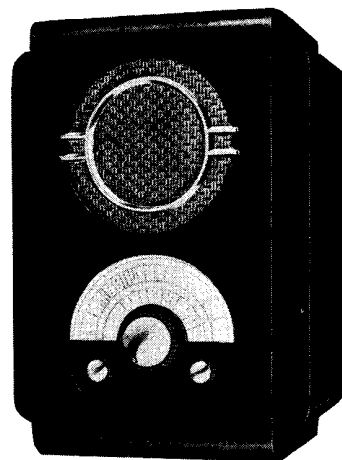
The oscillator anode is fed through the

oscillator anode coil and R4, a resistor, which is in series with R5, which supplies the screen grid of V1.

An I.F. transformer tuned to 460 kc. couples V1 to V2, an H.F. pentode I.F. amplifier. A second transformer leads to V3, a double diode triode. One diode rectifies the signal and passes it through a resistance-capacity network, which includes the volume control, to the triode grid of V3.

The second diode is fed from the anode of V2 and provides A.V.C. for V1 and V2 in the usual manner.

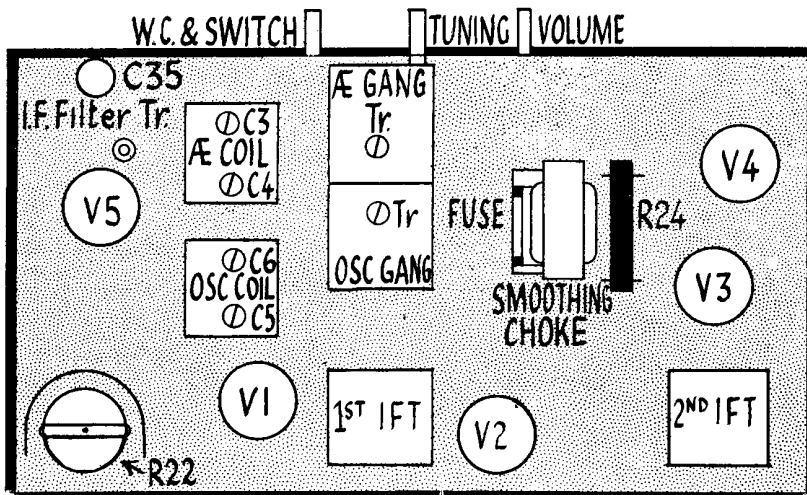
Resistance capacity coupling is employed between V3 and V4, the output pentode. This is an indirectly heated valve, biased by a cathode resistor. A third winding on the output transformer is coupled back to the grid circuit of V4.



The Ekco model UAW78 is an all-wave, four valve and rectifier superhet for A.C. or D.C. operation.

RESISTANCES

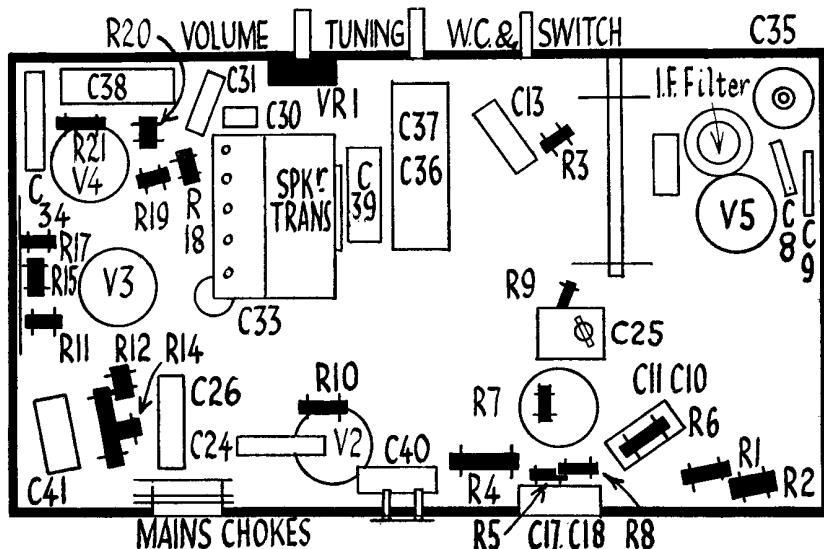
R.	Purpose.	Ohms.
1	Dipole aerial potentiometer ..	50,000
2	Diode aerial potentiometer ..	50,000
3	V1 A.V.C. decoupling ..	250,000
4	V1 screen and oscillator plate decoupling ..	2,500
5	V1 screen decoupling (part) ..	10,000
6	V1 screen decoupling pot. ..	25,000
7	Oscillator grid leak ..	100,000
8	V1 cathode bias ..	300
9	Regeneration modifier ..	150
10	V2 cathode bias ..	400
11	V1 and V2 A.V.C. decoupling ..	1 meg.
12	A.V.C. diode load ..	750,000
13	Demodulator diode load (part) ..	100,000
14	Demodulator diode load (part) ..	1 meg.
15	V3 anode decoupling ..	10,000
17	V3 anode load ..	50,000
18	V3 grid stopper ..	15,000
19	V3 cathode bias ..	2,000
20	V4 grid leak ..	250,000
21	V4 cathode bias ..	160
22	Mains voltage adjustment ..	
23	Pilot lamp shunt ..	50
24	Safety resistance ..	100
25	V3 grid stopper ..	250,000
VR1	Volume control ..	



These two diagrams show the layout of components on the chassis of the Ekco UAW78 superhet. Above is the top view of the chassis; below is the appearance of the underside.

CONDENSERS

C.	Purpose.	Mfds.
8	Series aerial ..	.0015
9	Series aerial ..	.0015
10	Chassis isolating ..	.1
11	V1 screen decoupling ..	.1
12	L.W. aerial input shunt ..	.00005
13	V1 A.V.C. decoupling ..	.04
16	I.F. filter ..	.00004
17	V1 cathode bias shunt ..	.1
18	Oscillator anode decoupling ..	.1
19	M.W. osc. padder ..	.00062
20	L.W. osc. padder ..	.000305
21	Osc. padder ..	.005
22	L.W. osc. shunt ..	.00015
24	V2 A.V.C. bias decoupling ..	.04
25	Oscillator grid ..	.000025
26	V2 cathode shunt ..	.1
27	A.V.C. coupling ..	15 cms.
28	H.F. by-pass ..	.0001
30	H.T. by-pass ..	.0001
31	L.F. coupling ..	.01
33	L.F. coupling ..	.1
34	Pentode compensator ..	.01
35	H.T. smoothing ..	8
36	H.T. smoothing ..	24
37	V3 anode decoupling ..	10
38	V4 cathode bias shunt ..	50
39	V3 cathode bias shunt ..	50
40	Mains interference suppressor ..	.1
41	H.T. shunt ..	.1



The output transformer provides for the connection of an extra speaker across the secondary.

Mains equipment consists of a series-connected rectifier, V5, with a limiting resistance, R24, H.F. chokes, a smoothing choke and smoothing condensers.

Special Notes.—The dial light is rated at 6.2 volts .3 amp., and is of the screw-in type and is made by Mazda. It is mounted on the wavelength pointer, and is surrounded by a slotted screen, through which a line of light illuminates the dial.

To remove the bulb, slide the screen off the bracket, and the bulb can now be taken out. Sockets are provided for an external speaker, which should have a low impedance—that is, no matching transformer being necessary.

C12 is inside the aerial coil can, C19, C20 and C22 are inside the oscillator coil can, and C27, C28 and R13 are in the second I.F. coil can. R25 is incorporated in the lead to the grid of V3.

In the model examined V2 was an Ekco VPU1 valve, not a Mullard VP13C, as given in the data.

Removing Chassis.—First remove the three knobs from the front of the set. These are held by grub screws. Also remove the on-off switch from the side of the cabinet by taking off the fixing nut.

Next remove the four bolts holding the chassis to the bottom of the cabinet. The

VALVE READINGS

No signal. Volume maximum. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	TH21C met. (7) Mullard.	Anode ..	148	2.1
		Screen ..	107	6.0
		Osc. anode ..	112	3.5
2	VPU1 met. (7) Ekco.	Anode ..	148	inaccessi- ble
		Screen ..	149	
3	TDD13C met. (7) Mullard.	Anode ..	77	1.2
4	Pen 36L (7) Mullard.	Anode ..	140	28
		Screen ..	149	4.6
5	UR1C (5) Mullard.	Cathode ..	165	—

chassis can then be removed to the extent of the speaker leads.

If necessary, the speaker can be removed by undoing the four bolts holding the baffle to the front of the cabinet.

Circuit Alignment Notes

I.F. Circuit.—Adjustments are made by screwing iron cores along the lateral axes of the coils. The cores are sealed, and the wax must be melted with a soldering iron. Do not force with a screw-driver. The slots in the cores are made to fit $\frac{1}{8}$ -in. non-metallic screw-driver.

Connect a modulated oscillator to the top grid cap of V1 through a .0002 mfd. condenser. Tune the set to the bottom of the long waveband and the modulated oscillator to 460 kc.

Adjust I.F. cores for maximum deflection on an output meter connected to the external speaker sockets. Use the minimum oscillator signal that gives a reliable meter reading.

Calibration.—When the gang condenser is at maximum capacity the pointer should be on the 2,100 metre mark.

Short Waves.—Tune the oscillator and set to 15 megacycles (20 metres). Connect the oscillator to "A" socket through a 400-ohm non-inductive resistance. Close the dipole switch. Adjust the oscillator gang trimmer and aerial gang trimmer for maximum reading on the meter.

Ekco UAW78 on Test

MODEL UAW78.—Standard model for A.C. or D.C. mains. 200-250 volts, 40-100 cycles. Price 10½ gns. (Black and chromium, 7s. 6d. extra.)

DESCRIPTION.—Three-waveband, four-valve plus rectifier, table model universal superhet.

FEATURES.—Bakelite cabinet. Large tuning controls. Semi-circular full-vision scale calibrated in names and wavelengths. Extension speaker sockets. No pick-up connection.

LOADING.—60 watts.

Sensitivity and Selectivity

SHORT WAVES (15.5-52 metres).—Very good sensitivity and usual selectivity. Tuning ratio very suitable. No noticeable drift. Very easily handled.

MEDIUM WAVES (200-550 metres).—Representative performance as regards sensitivity and selectivity for the valve combination. Local stations spread on adjacent channels only. Gain well maintained.

LONG WAVES (950-2,000 metres).—Similar performance to medium waves. Good programme strength on all main stations. Little overlap on Deutschlandsender.

Acoustic Output

Ample volume for an ordinary room, with well-balanced pentode output. No undue accentuation or over-correction and very little noticeable colouration on speech.

Medium Waves.—Tune the set and the oscillator to 250 metres (1,200 kc.). Adjust medium-wave oscillator trimmer, C5, and medium-wave aerial trimmer, C3, for maximum.

Long Waves.—Tune the set and oscillator to 1,100 metres (275 kc.). Adjust long-wave oscillator trimmer, C6, and long-wave aerial trimmer, C4, for maximum.

Recheck at 7 megacycles for calibration. **B.1—Short Wave.**—This must be aligned very carefully if maximum results are to be obtained.

Tune the receiver to 18 megacycles and inject a signal of 18 megacycles. Adjust TC9 for maximum output.

Tune the receiver to 21 megacycles and inject a corresponding signal. Tune TC1 for maximum output.

If the 21 megacycle signal is out of calibration, adjust P1 until calibration is obtained; then line up TC5 and TC1 for maximum. While TC5 and TC1 are being brought into line the gang condenser should be rocked until the loudest signal is obtained during adjustment.

Check for calibration by tuning the receiver to 9 megacycles and injecting a 9 megacycle signal. If out of calibration, move wire connecting the oscillator section of the gang condenser, nearest the back of the chassis, either up or down according to the position of 9 megacycle signal, until the required adjustment is obtained.

Recheck at 18 megacycles and 21 megacycles.

CIRCUIT

NO circuit diagram is given with this review because E. K. Cole, Ltd., do not permit the circuits of their receivers to be published.

A particularly long description of the circuit is given in this review, however, and the component tables, in conjunction with the chassis diagrams, will enable you to understand the receiver sufficiently for all ordinary fault-finding.

Nothing in the general design should cause confusion; there are no unusual features.

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Signal Circuits.—Connect the oscillator via a dummy aerial to the aerial sockets A1 and E, making sure that the shorting clip is fixed between A2 and E.

Long Waves.—Tune the receiver to 1,000 metres (300 kc.), and inject a modulated 1,000-metre signal. Adjust TC12, TC8, and TC4 respectively for maximum output.

Check for calibration by tuning the receiver to 1,875 metres (160 kc.) and inject a signal of this wavelength. Adjust P1 on top of chassis for loudest signal.

Check again at 1,000 metres.

Medium Waves.—Tune the receiver to 214 metres (140 kc.), inject a signal of 214 metres and adjust TC11 and TC7 and TC3 for maximum.

Check for calibration at 522 metres (574 kc.) by tuning the receiver to 522 metres and injecting an oscillator signal of this wavelength. Adjust P3 for maximum output.

Recheck for calibration at 214 metres. If out, adjust with TC11 and bring TC7 and TC3 into line for maximum output.

Further check for calibration on National and London Regional, which are to be heard at audible strength for checking without aerial.

B.2—Short Wave.—Tune the receiver to 7 megacycles and inject a signal of this wavelength. Adjust TC10, TC6 and TC2 for maximum response.

Check for proper peak on oscillator trimmer by tuning the receiver to six megacycles and injecting a 6 megacycle signal. This should fall on 6 or 6.1 mc. on the wavelength dial.

Tune the receiver to 3 megacycles, inject a 3 megacycle signal, and adjust P2 for maximum.

QUICK TESTS

Quick tests are available on this receiver on the speaker transformer. Volts measured between this and the chassis should be:—

- Red lead, 218 volts.
- Blue, 350 volts, unsmoothed.
- Yellow, 240 volts.