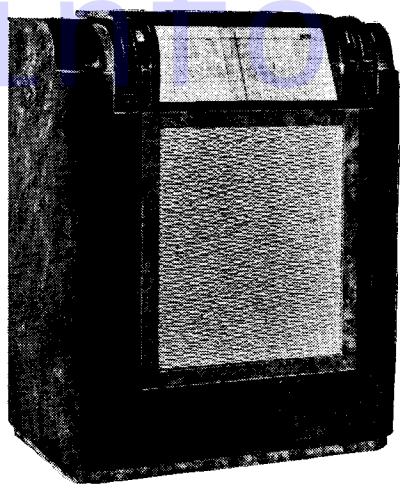
EKCO A.W. 88 A.C. SUPERHET FIVE



Four valves and a rectifier are used in the Ekco A.W.88 four-band A.C. superhet. Edge-operated controls and Spin-wheel tuning are features.

CIRCUIT.—The aerial is coupled to the grid of V1, a triode hexode frequency changer, by a set of band-pass coils on the medium and long bands. On the short waves the input is by a coupling coil and single tuned circuit on each band.

Arrangements are made for the connection of an anti-interference aerial of the all-wave type providing a proper transformer is used. The anti-interference aerial should be connected to the A-socket and the unmarked socket directly beneath it.

With regard to the oscillator coils the long and medium wave coils are trimmed in the usual manner, but the padding compensations are effected by adjusting the iron cores of the coils.

Converted to the I.F. the signal passes via an I.F. transformer to V2, an H.F. pentode. Another I.F. transformer leads to an I.F. filter network consisting of an I.F. stopper resistance R8, which is by-passed by two condensers C12 and C13.

The rectified impulses are taken from the demodulating diode load R9 to the grid of the triode section of V3 by a manual volume control (shunted by a high note compensator condenser) and tone control. The other diode of V3 provides a D.C. potential utilised for A.V.C.

The anode of V3 is coupled to the grid circuit of V4, the output valve, via an H.F. stopper R15 and L.F. coupling condenser C16. The grid circuit of V4 consists of four resistances connected in series. R21, which is shunted by C19, is adjacent to the grid of V4 and reverse feed back voltages are produced across this resistance by means of a tertiary winding on the output transformer, the voltage being fed through R19.

R12 is connected to the second switch-bank, and, according to the waveband on which the set operates, alters the ratio between R21 and the other three resistances and thereby varies the amount of negative feed back. The speech coil is connected to the output via a standard type of "pi" low-pass filter that prevents whistle interference.

Mains equipment consists of a full-wave rectifying valve V5, a mains transformer, electrolytic smoothing condensers and smoothing choke consisting of the field coil of the speaker.

Chassis Removal.—Unsolder the leads to the speaker panel, or alternatively slacken the four clamps and remove the speaker. The colours (from left to right) of the four leads to the speaker are red, brown, yellow and red.

Remove the four bolts from the base of the cabinet, the two fixing bolts holding the top of the scale to the top of the cabinet, the two bolts securing the back of the chassis to the side of the cabinet, and the two bolts holding the front of the chassis to the cabinet. Remove the two fixing clip bolted from the underside of the chassis on the front (inside) of the cabinet.

Special Notes.—There are three dial lights in the receiver, and these are of the M.E.S. base type rated at 6.2 volts .3 amp.

CIRCUIT DIAGRAM

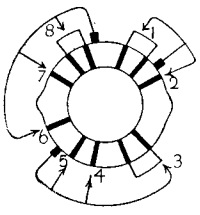
NO circuit diagram appears with this review, because E. K. Cole, Ltd., do not permit its publication. A particularly full circuit description is given, however, and the lay-outs and tables together identify and give the purpose of every component.

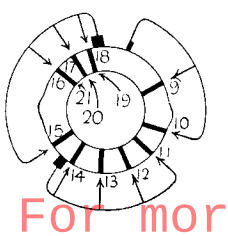
Two sockets enable an external speaker to be operated. This should have a speech coil impedance of 4 ohms. The internal speaker may be cut out by unscrewing S3, which is near the speaker sockets.

Condensers C46 and C48 are formed of wires spiralled over insulated wires. In

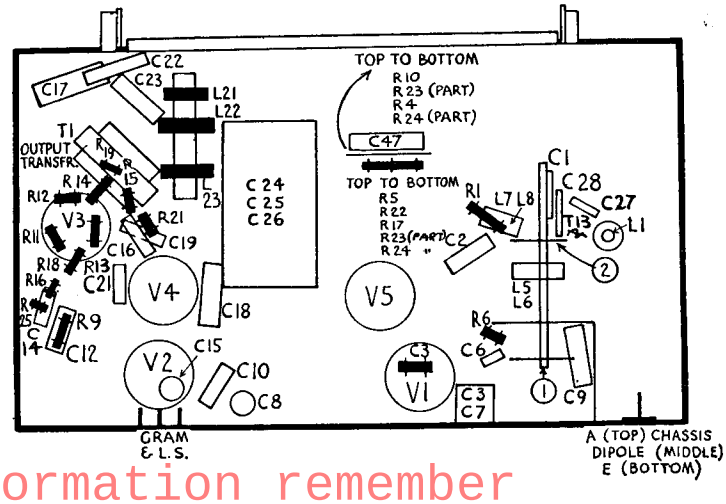
SWITCH POSITIONS

Band.	Closed contacts.
Long waves	18, 10, 14, 5, 8.
Medium waves	17, 19, 9, 13, 4, 2, 8
Short waves	16, 20, 19, 12, 3, 1, 7.
Television waves ..	15, 21, 20, 11, 3, 1, 6.

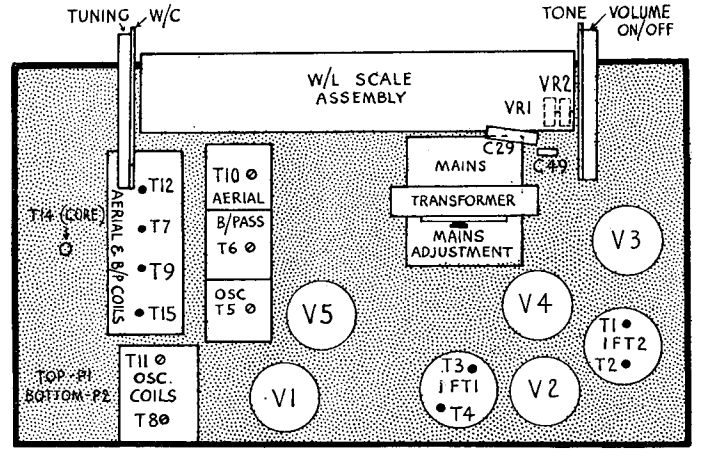




Left are shown the two switch banks, as seen from the rear of the chassis, and numbered to correspond with the table given above.



On the right, top and bottom, are chassis layout diagrams identifying all the components in the A.W.88. The duties of each part are given in the tables on the opposite page.



our particular chassis R23 was found to consist of two 20,000 ohms resistances in parallel, and R24 two 25,000 ohms in parallel. R8 and C13 are inside I.F.T.2 and C4, C11 and C5 inside the oscillator coil can.

Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer and a modulated oscillator *via* .002 condenser to the top grid cap of V1 and chassis, leaving set connection made. Switch set to L.W. and turn pointer to 1,950 metres. Set volume control to maximum and tone control to high position.

Tune oscillator to 126.5 kc. and adjust T1, T2, T3 and T4, in that order, for maximum response, reducing the input as the circuits come into line to render the A.V.C. inoperative.

Signal Circuits.—See that the cursor line covers the 550-metre mark when the gang is at maximum. Connect oscillator to A. and E. sockets. Only feed sufficient input from the oscillator to obtain definite peaks in the output meter to keep the A.V.C. inoperative. Use a trimming tool having a tip made of non-magnetic metal. In the following notes, S.W. indicates the ordinary short wave and T.S. the ultra-short waveband.

Short Wavebands.—Tune oscillator and set to 18 mc. and first unscrew T5, then screw in slowly until the first peak is obtained.

Tune oscillator to 20.75 mc. (second harmonic being 41.5 mc.). Switch to T.S. and adjust T6 for maximum.

Switch to S.W., tune oscillator and set to 15 mc. and adjust T7 for maximum.

Medium Waves.—Tune set and oscillator to 200 metres (1,500 kc.), screw T8 right up and then unscrew until the first peak is reached.

Tune set and oscillator to 250 metres (1,200 kc.) and adjust T9 and T10 for maximum.

Tune set and oscillator to 500 metres (600 kc.) and adjust P1 (core of coil) for maximum, simultaneously rocking the gang.

Repeat the three adjustments until no further improvement is noticed.

Long Waves.—Tune set and oscillator to 1,100 metres (272.5 kc.) and adjust T11, T12 and T13 for maximum. T13 is adjusted by sliding the spiralled wire on the insulating sleeve over the straight wire.

Tune set and oscillator to 1,700 metres (176.5 kc.) and adjust P2 (core of coil) for maximum, simultaneously rocking the gang.

Leave set gang on 1,700 metres, inject a strong signal of 126.5 kc., and adjust T14 (core of L1) for minimum response. Reduce oscillator output and tune set to 1,100 metres and oscillator to 272.5 kc., and repeat the L.W. alignment as above.

Image Filter.—Switch set to M.W., inject a strong 1,000-kc. signal, tune set to image (about 400 metres) and adjust T15 for minimum output.

Tune set and oscillator to 250 metres (1,200 kc.) and readjust T9 for maximum.

CONDENSERS

C.	Purpose.	Mfds.
1	M.W. aerial coupling	.001
2	V1 A.V.C. decoupling	.04
3	V1 screen decoupling	.1
4	M.W. osc. fixed padder	.002
5	L.W. oscillator fixed padder	.0008
6	Oscillator grid	.00005
7	V1 cathode bias shunt	.1
8	V2 screen decoupling	.1
9	Osc. anode decoupling (part)	.1
10	V2 A.V.C. decoupling	.04
11	A.V.C diode coupling	15 C.M.
12	H.F. bypass	.0002
13	H.F. bypass	.0002
14	L.F. coupling	.01
15	V2 cathode bias shunt	.01
16	L.F. coupling	.01
17	V3 cathode bias shunt	50
18	V4 cathode bias shunt	50
19	Neg. feed back input shunt	.004
21	Pentode compensator.	.004
22	Whistle filter	.2
23	Whistle filter	.2
24	H.T. smoothing	12
25	H.T. smoothing	8
26	V3 anode decoupling	2
27	I.F. filter	.00015
28	L.W. aerial shunt	.001
29	Tone control	.004
47	Osc. anode decoupling (part)	2
49	High note compensator	.00006

RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. decoupling	250,000
3	Osc. grid leak	25,000
4	V1 screen decoupling (part)	25,000
5	V1 cathode bias	250,000
6	Osc. anode stabiliser	200
8	H.F. stopper	500,000
9	Demodulating diode load	100,000
10	V2 cathode bias	300
11	V2 A.V.C decoupling	1 meg.
12	A.V.C. diode load	750,000
13	V3 anode decoupling	15,000
14	V3 anode load	50,000
15	H.F. stopper	75,000
16	V4 grid input (part)	250,000
17	V3 cathode bias	2,000
18	V3 grid input (part)	100,000
19	Negative feed back feed	32,000
21	Negative feed input shunt	20,000
22	V4 cathode bias	120
23	Osc. anode decoupling	20,000
24	V1 screen decoupling (part)	12,500
25	V4 grid input (part)	25,000
VR1	Volume control	1 meg.
VR2	Tone control	1.5 meg.

VALVE READINGS

No Signal. Volume Maximum. M.W. min. cap. 225 volts A.C. mains.

V.	Type.	Electrode.	Volts	Ma.
1	Mullard TH4A met. (7)	Anode	240	4.1
		Screen	103	7
		Osc. anode	105	7
2	EkcoVP41 met (7)	Anode	240	12
		Screen	240	4.6
3	Ekco DT41 met. (7)	Anode	105	1.7
4	Ekco OP42 (7)	Anode	225	39
		Screen	240	5.2
5	Mullard IW4/350(4)	Filaments	335	—

WINDINGS

Winding.	Ohms.	Winding.	Ohms
L1	40	L16 & L18	1
L2 & part L3	40	L19	9
L4	2.5	L18, L16 & L20	3
L5	too low	L21	2.5
L6	below .1	L22	5.5
L7	below .1	L23	2.5
L8	.4	*Output Transformer*	
L9	2.5	Primary	350
L10	27	Secondary	4
L11, 12, 13 each	80	Tertiary	40
R8 & L14	100, 80	*Mains Transformer.*	
L15	below .1	Primary	35
L16	.4	H.T. sec. total	550
L17	3	Field	1250

Ekco A.W. 88 on Test

MODEL A.W.88.—Standard model for A.C. mains operation, 200-250 volts, 40-100 cycles. Price, £13 2s. 6d. in walnut, £13 10s. in black and ivory.

DESCRIPTION. — Four-band, five-valve, including rectifier, table superhet.

FEATURES. — Full-vision scale with medium and long waves marked in metres and station names and short waves in mega-cycles. Edge-operated fly-wheel control for tuning and edge-operated combined volume and master switch. Tone and wave change controls lever operated. Sockets for extension speaker and pick-up. Connections for anti-interference all-wave aerial.

LOADING.—72 watts.

Sensitivity and Selectivity

TELEVISION SOUND BAND.—Gain not very great. Drift noticeable.

SHORT WAVES (16-50 metres).—Representative gain and selectivity with ease of handling and no noticeable drift.

MEDIUM WAVES (200-540 metres). —Good gain and selectivity. Gain well maintained. Fairly good background. Second channel noticeable in the London district.

LONG WAVES (900-2,000 metres).—Good gain and excellent selectivity. All mains stations easily received. Side splash in Deutschlandsender only.

Acoustic Output

Ample volume for an ordinary room, tone control not too drastic at commencement, but fully effective at the end. Tone rather deep, but with a good amount of top note response and only little colouration on speech. Musical reproduction pleasing and well balanced.

GROWL BACKGROUND

A FAULT which occurs occasionally with superhets takes the form of a constant whistle or growl background to all stations. The most obvious cause is L.F. oscillation, or the trouble may appear to be simple L.F. distortion due to some faulty part.

When, however, the L.F. side has been found correct—by, for example, the connection of a pick-up or other injection of an L.F. signal—some form of H.F. trouble has to be looked for.

Actually, this fault can be due to either oscillation of the I.F. amplifier or excessive regeneration, or parasitic oscillation, in the oscillator stage. All components, especially decoupling condensers, in these stages should be examined.

TEST REPORT PRICES

The prices of receivers given in the test report panels are those in effect when the reviews are originally published.