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EKCO AD76

Four-valve, plus rectifier, two waveband, AC-DC superhet table model. Provision is made for extra low-impedance loudspeaker with screw-switch for silencing internal speaker. There are no PU sockets. Suitable for operation from AC or DC mains, 200-250 volts. Made by E. K. Cole, Ltd., Service Department, Southend-on-Sea.

THE aerial input is taken through C1 to a tapping on L2 for MW and through a choke L1 to a tapping on L3 for LW. L1 is for preventing breakthrough of MW signals on LW. L2 and L3 are the primaries (tuned by VC1) of an inductively coupled band-pass coil assembly, the secondaries being L4—MW, and L5—LW, tuned by VC2.

On MW only switch contacts connect an image rejector trimmer, T9, from aerial input to grid of V1. The oscillator section

of V1 employs a tuned grid circuit with R1 and C4 the grid leak and condenser. L7 is the MW grid coil and L8 the LW grid coil tuned by VC3 section of the ganged condenser. L7 is connected to chassis via a fixed padder, C5, with padder trimmer, T8, in parallel.

The oscillator anode reaction coils, L8 and L9, are decoupled to chassis through C3, L10 and L11 couple V1 to the grid circuit of the IF amplifier, V2 which also acts as an LF amplifier in a reflex circuit.

L10 has a pair of switch contacts across it, which short out on gram.

A second transformer, L12, L13, passes on the signal to the double diode AVC and detector valve, V3. The signal diode of this valve is fed from L13 while the lower end of this coil proceeds via a filter circuit, R11 and C13, to the signal load R12, which connects to chassis.

From the junction of R11 and R12, LF signals are coupled by C15 and R13 to the volume control R14. The lower end of the volume control element is taken to chassis through C16, which acts as a bass boost when the volume control is towards its minimum position.

From the slider of the volume control, R14, the signal is fed to the lower end of

L11, the secondary of the first IF transformer, in series to the grid of V2. The screening of this valve acts as the screen of a triode amplifying valve. The screen is taken to the HT line through the load resistance R4 and the decoupling resistance R3.

From R4, the load resistance, the LF signal is passed via C17 to the grid of the output pentode valve, V4.

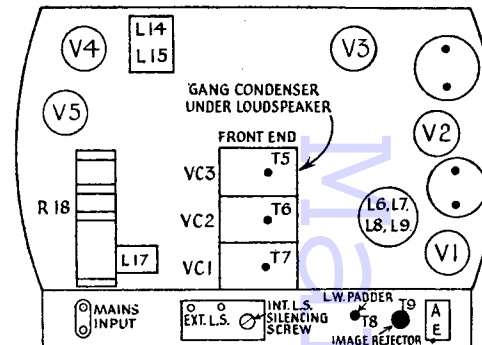
Reverting now to the AVC circuit, the AVC diode of V3 is fed from the anode of V2 through C10. R5 and C11 comprise the filter network while the AVC load is R6 and R7 in series, the latter connecting to the cathode of V3. Full AVC from the top end of R6 is applied to the grid circuit of V1 while the grid circuit of V2 derives AVC from the junction of R6 and R7.

The cathode of V3 is taken to earth through R9 and the noise-suppressor resistance R10, both being decoupled by C12. The cathode of V3 is also joined to the cathode of V2 by R8 so that R9 and R10 comprise a common biasing network for V2 and V3. When R10 is adjusted to maximum, i.e., "strong" position, 5 volts are developed across it and applied as a negative bias to the signal diode. Accordingly, any signal passed on by the

IF valve, which is not sufficient to overcome this bias, cannot be rectified by the signal diode and will therefore not be heard, thus only those transmissions which are of sufficient strength to give reliable programme value above any local background noise will be received, and the adjustment of R10 is made at the receiver locality to give a compromise between background noise and sensitivity.

The LF signal which we have traced as far as the grid of V4 is coupled to the energised low-impedance loudspeaker by the output transformer L14, L15. A permanent degree of tone correction is effected by C20 connected between the anode and cathode of V4. The valve is biased by R16 decoupled by C18.

The mains input to the receiver is filtered by HF coils L19 and L20 and condensers C22 and C23. The HT circuit is taken through a surge limiter R17 to the anode of the half-wave rectifier valve V5, from the cathode of which the



smoothing choke L17 and condensers C19 and C21 pass the current to the HT line. The field winding of the loudspeaker is connected between the cathode of V5 and chassis.

The heater circuit comprises the mains voltage dropping resistance, R18, with the valves and pilot lamps in series. The pilot lamp has a shunt resistance, R19, across it. Two 1 amp fuses are provided for mains protection.

GANGING

IF Circuits.—Switch to LW and set tuner to about 1,000 metres. Connect a 0 to 10 mm across R10 which should be turned to maximum (clockwise).

Inject a 130 kcs signal into the aerial and earth sockets and adjust T1, T2 and

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RESISTANCES

R	Ohms	R	Ohms
1	50,000	13	25,000
2	15,000	14	250,000
3	15,000	15	250,000
4	50,000	16	165
5	250,000	17	50
6	500,000	18	460+100+100
7	250,000	19	100
8	165	20	500,000
9	75	L18	5,500
10	2,000	L16	2.5
11	50,000	L17	300
12	250,000	L14	620

The AD76 is a universal model with an octode frequency-changer and a separate double-diode followed by a high gain output pentode

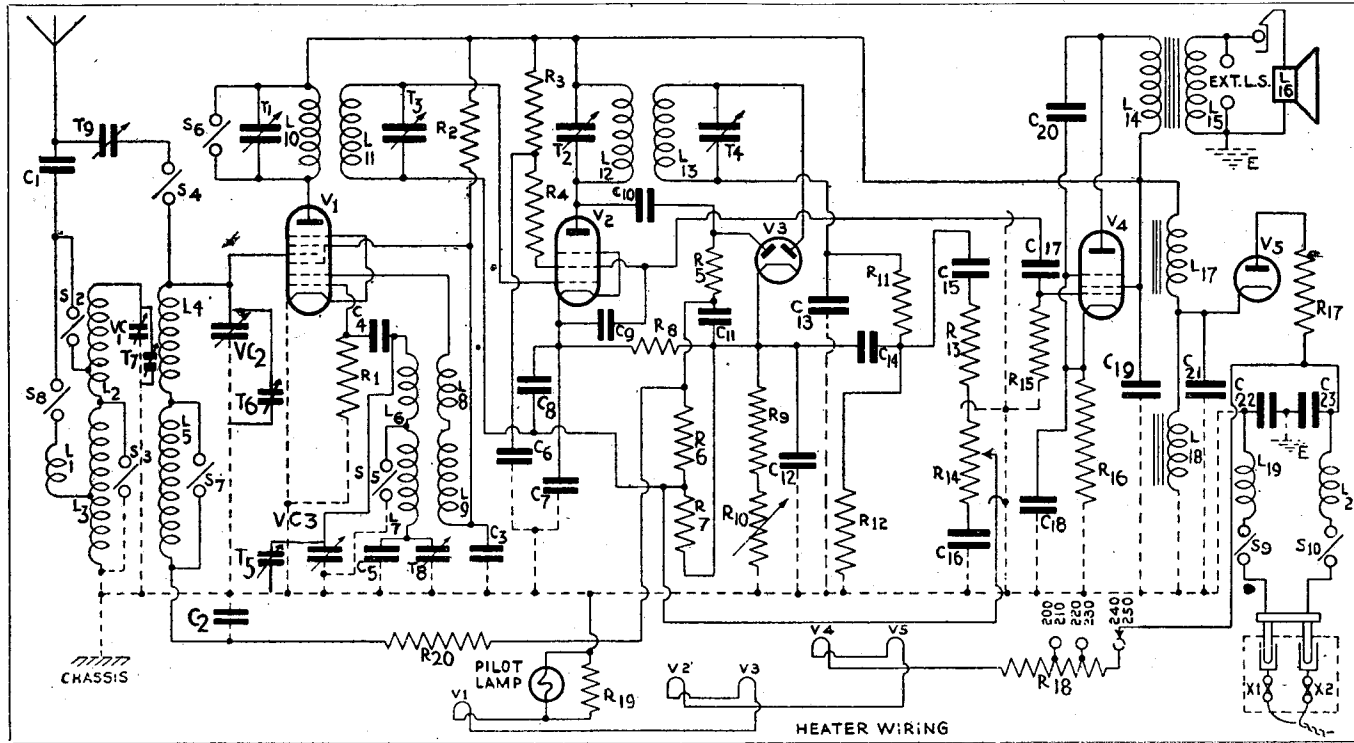
CONDENSERS

C.	Mfds
1	.0008
2	.1
3	.1
4	.001
5	.0007
6	.2
7	.25
8	.0008
9	.0008
10	15 CM
11	.1
12	.1
13	.0007
14	.001
15	.01
16	.1
17	.1
18	.25
19	.24
20	.0025
21	.8
22	.1
23	.1

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	FC13C (Met)	Anode	175	4.3
	(Mullard)	Osc. Anode	80	—
		Screen	80	4.3
2	VP13C (Met)	Anode	175	4
	(Mullard)	Screen	85	1.2
		Cathode	1 R10 at min	5 R10 at max
3	2D13C (Mullard)	—	—	—
4	PEN36C (Mullard)	Anode	155	34
		Screen	175	5
5	1D5 (Brimar)	Cathode	190	—

Volts measured with a 1,000 o-p-voltmeter.



EKCO AC97

Four-valve, plus rectifier and tuning indicator, superhet receiver covering medium and long waves and for operation from 200-250 volts, 40-80 cycle AC mains. Provision of high-fidelity, medium and distant tone positions, noise suppression during tuning and pick-up connections. Made by E. K. Cole, Ltd., Service Department, Southend-on-Sea.

THE aerial input is by band-pass circuit to V1, an octode frequency-changer, T1, between the aerial and V1 grid, is the image-rejector. The triode oscillator section is tuned grid with C9 and R4 as the grid condenser and leak; L7 and L8 are the anode reaction coils. L11 and L12 are the primary and

secondary of the first IF transformer, with T2 and T3 as trimmers. S7 and S8 are switches which broaden the selectivity by introducing damping by R5, R6.

V2, the IF amplifier, is coupled by tuned transformer to V3, the double-diode triode R11 is a filter with R12, the diode load passing LF via C20 to the volume control VR1. V6, the tuning indicator, is also fed from R12.

The AVC diode is energised by C18 from V2 anode. R9 and R10 are a split load providing different control voltages for V1 and V2.

V3 has tone control condensers across the grid and resistance-capacity feeds an auto-transformer coupling L15 to V4, the output valve. L15, with C25, C27 and VR2 are a special circuit to maintain tone balance at low volume levels.

The anode circuit of V4 contains the loud-speaker input transformer and also a triple choke L16-18 and condensers C39, C40 will provide a sharp cut-off above 8 kc to reduce whistles. V4 is run from a separate 2v heater winding, and is given an electrical centre-point by the hum-dinger VR3.

The speaker field in the negative HT line and the drop across it is tapped off by R23, R24 to bias V4. V5 is the full-wave rectifier

Quality Switching.—In the high fidelity position contacts E and D, F and G are open. In the medium position, E is open, D closed, F and G closed; distant position, E closed, D open, F and G closed.

Noise Suppression.—Contact A closes to B before B closes to C. Actuation is by depressing control knob which applies about 35 volts negative to V3 grid. At the same V4 grid circuit is shorted.

Valves.—V1, FC4; V2, VP4B, or Ekco VP41; V3, TDD4; V4, ACO42; V5, 1W4/350; V6, TV4. Pilot lamps, Osram 6.2 v, .3 amp.

GANGING

See that with gang at maximum pointer coincides with top of scale aperture. If not, remove chassis and see that drive disc is against its stop. If necessary, pointer can be adjusted on cord to cover centre of reflector plate fixing screen with gang at minimum.

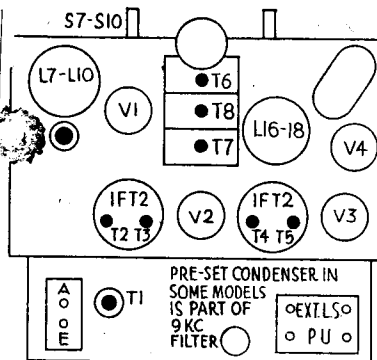


Diagram showing the top and back views of the chassis and indicating positions of the trimmers.

IF Circuits.—Inject 126.5 kc through .02 mfd to cap of V1, leaving grid lead connected. Turn volume to maximum. Injecting lowest possible signal, adjust T2, T4, T3 and T5 in that order for maximum on output meter.

Continued bottom next col.

Tables of valve readings are not available for some of these Ekco sets, but experienced engineers will know the kind of voltages and currents to be expected with the valves employed.

CONDENSERS

C	Mfds
4	.0008
7	.0003
9	.0001
10	.1
11	.1
12	.0008
14	.1
15	.1
18	15 cm
19	.00012
20	.1
21	.5
22	.1
23	.00015
24	.25
25	.25
26	.25
27	.2
29	.0015
30	.0005
31	.1
32	.8
33	.8
34	.8
35	.4
36	.4
37	.1
39	.01
40	.01

RESISTANCES

R	Ohms	R	Ohms
1	20,000	16	.25 meg.
2	1 meg	17	1 meg
3	300	18	50,000
4	100,000	19	600
5	3,000	20	2,000
6	6,000	21	4,000
7	1 meg	22	100,000
8	300	23	100,000
9	25 meg	24	30,000
10	5 meg	25	100,000
11	50,000	26	100,000
12	25 meg	VR1	.5 meg
13	2 meg	VR2	50,000
14	2 meg	VR3	30
15	.5 meg		

RADIO MARKETING SERVICE ENGINEER—V

Release of Ekco Circuits

FOR many years E. K. Cole, Ltd., have not allowed publication of their circuit diagrams. The ban has now been lifted and engineers will welcome a move which will contribute to the easing of their service difficulties.

We have taken the opportunity to devote this issue of "Service Engineer" to four popular Ekco models and other manuals will appear in future issues.

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T3 in that order for minimum reading on millimeter.

Adjust T4 for maximum millimeter reading.

MW Band.—Switch set to MW and adjust gang condenser to minimum position. Inject a signal of 194.5 m and adjust T4 for minimum deflection of millimeter needle.

Inject a signal of 250 m and tune the receiver to obtain minimum deflection of millimeter needle. Adjust T5 and T6 to still further reduce the millimeter deflection.

Switch set to LW and check calibration on 1,600 m. If it is incorrect to any serious degree adjust T7 to maximum output while rocking gang condenser.

Image Suppressor.—Tune in unwanted image and adjust T9 for minimum interference.

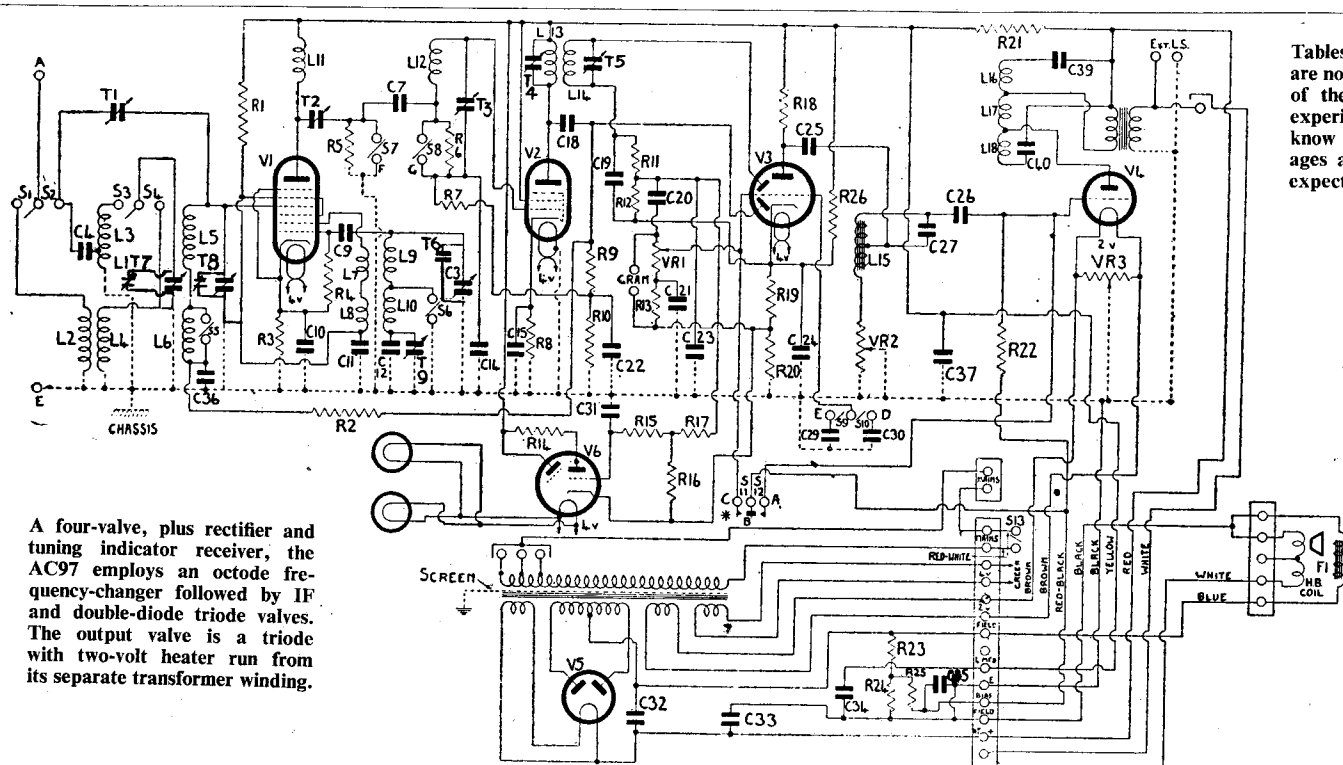
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MW Band.—Inject and tune to 200 m (1,500 kc). Fully unscrew T6 and then screw in slowly until maximum is obtained.

Inject and tune 250 m (1,200 kc) and adjust T7 and T8 for maximum.

LW Band.—Inject and tune to 1,700 m (170.6 kc) and adjust T9 for maximum.

Image Rejector.—Time to second channel whistle and adjust T1 for minimum.



A four-valve, plus rectifier and tuning indicator receiver, the AC97 employs an octode frequency-changer followed by IF and double-diode triode valves. The output valve is a triode with two-volt heater run from its separate transformer winding.