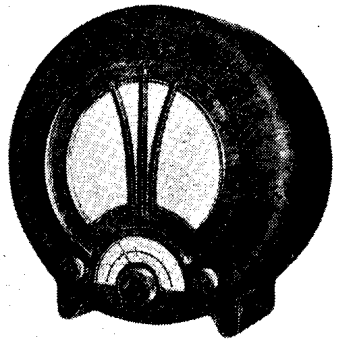
"TRADER" SERVICE SHEET

784

EKCO AD75

A.C./D.C. SUPERHET



INCLUDED in the Ekco post-war range, the AD75 is a 3-valve (plus rectifier) 2-band superhet designed to operate from A.C. or D.C. mains of 200-250V, 40-100 c/s in the case of A.C.

It is based on a pre-war set of the same model number and appearance, and although this *Service Sheet* was prepared from a post-war model, the differences in the earlier type are fully described under "Chassis Divergencies" overleaf.

Release dates and original prices: January, 1940, £7 7s, increased July, 1940, to £7 17s 6d; October, 1946, £11 11s, plus purchase tax, £2 9s 8d.

CIRCUIT DESCRIPTION

Aerial input via isolating capacitor **C1** and coupling coil **L1** to single tuned circuit **L2** (M.W.), **L3** (L.W.), and **C28,** which precedes triode hexode valve **(V1, Mullard metallized CCH35)** operating as frequency changer with internal coupling. On L.W., **S1** connects **C2** across **L1.**

Triode oscillator grid coils **L4** (M.W.) and **L5** (L.W.) are tuned by **C31.** Parallel trimming by **C30** (M.W.) and **C32** (L.W.); series tracking by fixed capacitors **C8** (M.W.) and **C9** (L.W.). Reaction coupling by anode coils **L6** and **L7.**

Second valve **(V2, Mullard metallized EF39)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings.

Diode second detector is part of double-diode output pentode valve **(V3, Mullard CBL31).** Audio-frequency component in rectified output is developed across load resistor **R11** and passed via **C19** and manual volume control **R12** to control grid of pentode section. I.F. filtering by **C15, R10** and **C16** in diode circuit.

Intermediate frequency 480 kc/s.

Second diode of **V3,** fed from **V2** anode via **C17,** provides D.C. potential which is developed across load resistors **R16, R17,** and a portion of it is fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control. Delay voltage, together with G.B. for pentode section, is obtained from the drop along resistors **R14, R15** in **V3** cathode lead to chassis.

When the receiver is operated from A.C. mains, H.T. current is supplied by half-wave rectifying valve **(V4, Mullard CY31)** which, with D.C. mains, behaves as a low resistance. Smoothing is effected by iron-cored choke **L13** and electrolytic capacitors **C23, C24.**

Valve heaters, together with adjustable ballast resistor **R19,** are connected in series across mains input, while a filter circuit comprising chokes **L14, L15** and capacitors **C25, C26** suppresses mains-borne interference. The aerial coupling coil **L1** and the speaker speech coil circuit are returned directly to the **E** socket, which is isolated from the mains by **C25, C26.**

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V, using the 220-230 V tapping on the heater ballast resistor.

The receiver was tuned to the lowest wavelength on the M.W. band and the volume control was at maximum, but there was no signal input.

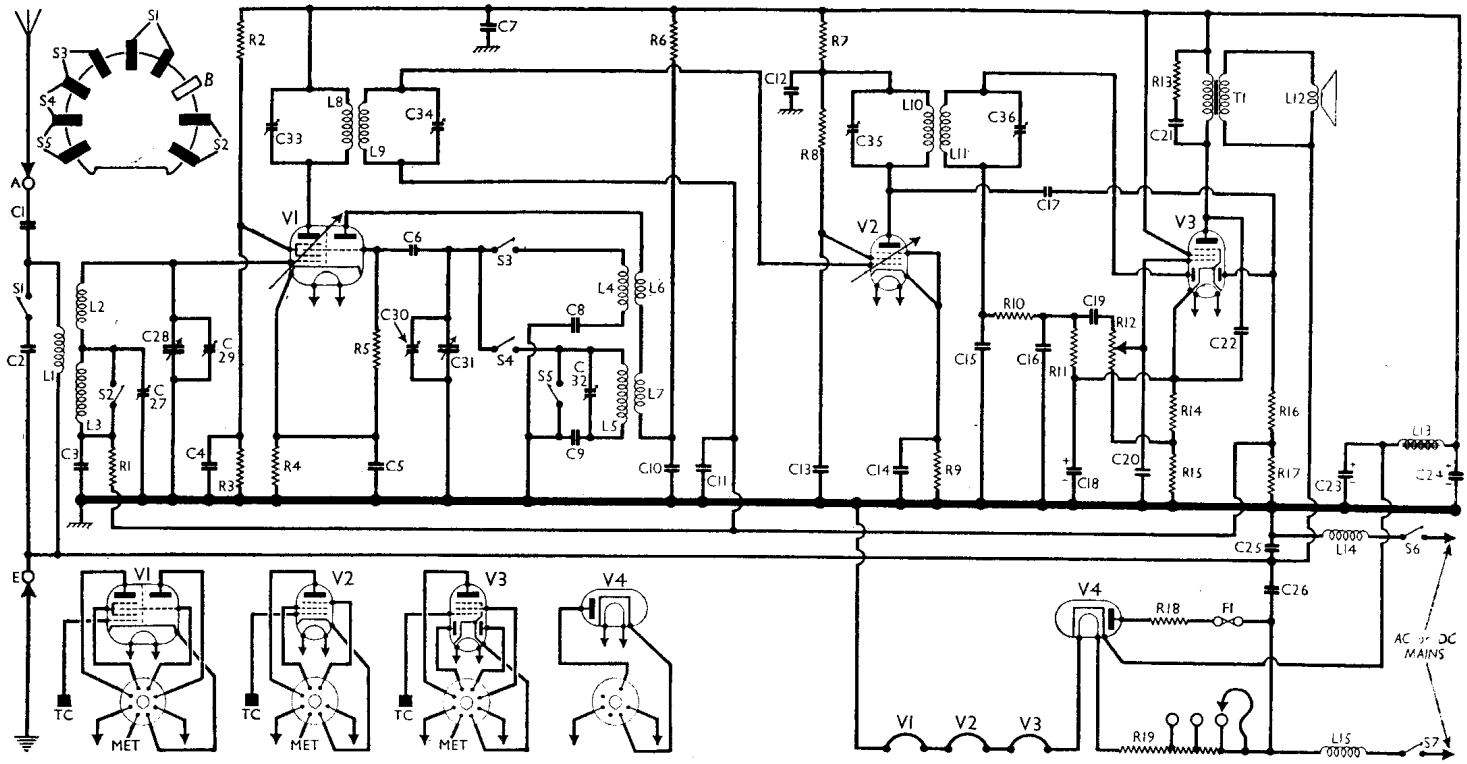
Voltages were measured on the 400 V scale of a model 7 Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 CCH35	240	1·35	86	3·0
	Oscillator			
	87	3·35		
V2 EF39	222	4·8	82	1·5
V3 CBL31	225	36·0	240	3·9
V4 CY31†	—	—	—	—

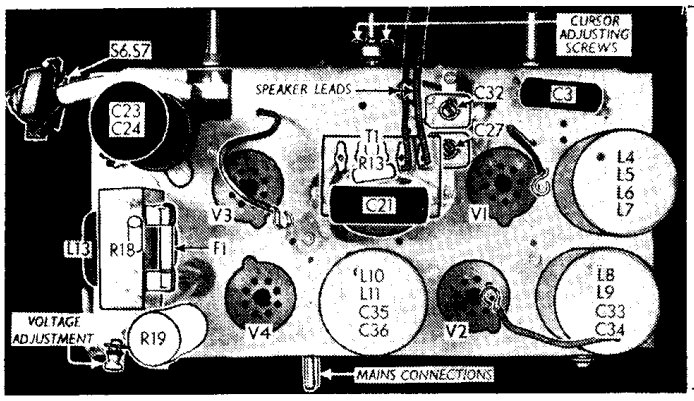
† Cathode to chassis, 260 v, D.C.

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws);
slacken the two cursor adjusting screws (indicated in our plan view), and turn the cursor so that it clears the bottom of the scale;
from the side of the cabinet, remove the mains switch fixing nut, and push switch in;
unsolder from the speaker the two leads connecting it to the output transformer on the chassis deck;



Circuit diagram of the Ekco AD75. Differences in early versions are described overleaf. Inset (top left) is the waveband switch diagram.



Plan view of the chassis. The cursor adjusting screws, which must be slackened before removing chassis, are indicated. The speaker connecting tags are identified on **T1**.

remove two cheese head screws (with washers) holding rear of chassis to ribs moulded in the cabinet, and withdraw chassis.

When replacing, readjust pointer for correct calibration and tighten adjusting screws before fitting tuning knob. With gang at maximum the pointer should cover the horizontal line at the high-wavelength end of the scale.

Removing speaker.—Unsolder the two green leads from tags on speaker, and remove two nuts and one washer from each of four fixing bolts. *When replacing*, connecting tags should be at the bottom.

GENERAL NOTES

Switches.—**S1-S5** are the waveband switches, ganged in a single rotary unit beneath the chassis. The unit is indicated in our underchassis view, and shown in detail in the diagram inset in the circuit diagram overleaf, where it is drawn as seen from the rear of an inverted chassis. In the M.W. position (control knob anti-clockwise) **S2, S3** and **S5** close only, and in the L.W. position (knob clockwise) **S1** and **S4** close only.

S6, S7 are the Q.M.B. double-pole mains switches, in a toggle unit normally mounted on the side of the cabinet but attached to the chassis by flexible leads.

Coils.—The aerial coils **L1-L3** are in an unscreened unit beneath the chassis. The oscillator coils **L4-L7** and the I.F. transformers **L8, L9** and **L10, L11** are in three screened units on the chassis deck. The mains R.F. filter chokes **L14, L15** are in a dual unit on the rear member beneath the chassis.

Fuse F1.—This is a standard 1¼in glass tubular fuse, rated at 500 mA. It is fitted on a panel on the H.T. smoothing choke **L13.**

Capacitors C23, C24.—These are two dry electrolytics in a tubular metal container mounted on the chassis deck. The red tag at the bottom is the positive connection of **C24** (24 μF) and the yellow tag that of **C23** (8 μF); the case forms the common negative connection. The unit is rated at 350 V DC working.

CHASSIS DIVERGENCIES

In the earlier model, which was released at about the beginning of the war, **R7** and **C12** shown in the H.T. feed circuit to **V2** were omitted, the junction of **R8** and **L10** going directly to the H.T. positive line.

Three small capacitors, made up of thin insulated wire wound over a thicker one, and having very low values, were connected across **C27, C29** and **C30** respectively; their values are about 15 μμF (0.000015 μF) each. There was also a 65 μμF (0.000065 μF) fixed trimmer in parallel with **C32. C9** was inserted in the lead between **L5** and **C32,** instead of in the one between **C32** and chassis.

C8 was then 0.000463 μF (463 μμF), and **C9** was 0.0003 μF (300 μμF). **R14** was 160 Ω, as against 330Ω in the later model. Also, the physical positions of **C27** and **C32** on the chassis deck may be transposed in the early model, **C27** being near the front edge instead of **C32;** and the double-pole mains switch **S6, S7,** which is now fitted on the cabinet, was ganged with the volume control **R12.** The valves used were ECH3, EF9, CBL1, CY1.

CIRCUIT ALIGNMENT

I.F. Stages.—For all alignment purposes, the chassis must be removed from the cabinet. Connect signal generator leads to control grid (top cap) of **V1,** via a 0.1 μF capacitor, and the **E** socket, switch set to M.W., turn gang and volume control to maximum, feed in a 480 kc/s (625 m) signal, and adjust **C33, C34, C35** and **C36** for maximum output.

R.F. and Oscillator Stages.—With the gang at maximum, the pointer should be horizontal. As the chassis must be removed from the cabinet, while the scale remains in the cabinet, and the pointer must be slackened out of adjustment for replacement of chassis, it is advisable to make up a dummy scale and use this for adjustments. It may be traced on transparent paper over the original scale, with calibration marks at 200 m, 250 m, 500 m and 1,000 m, and gummed on thin card. This scale can be held by a couple of 2BA nuts on the two gang fixing screws which project from the front chassis member.

M.W.—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C30** for maximum output. Tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust **C29** for maximum output. Check calibration at 500 m (600 kc/s).

L.W.—Switch set to L.W., tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust **C32,** then **C27,** for maximum output.

COMPONENTS AND VALUES

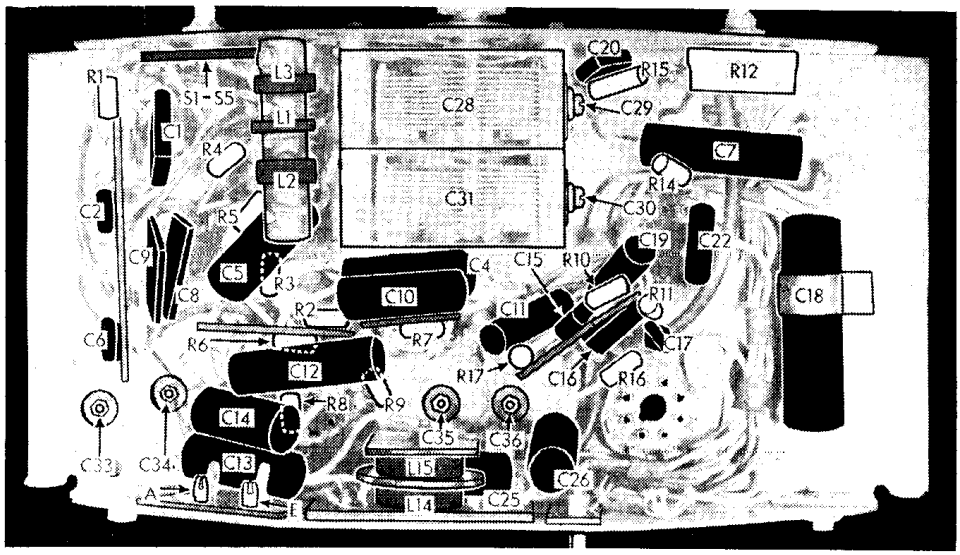
	RESISTORS	Values (ohms)
R1	V1 hex. C.G. decoupling	750,000
R2	V1 S.G. H.T. potential divider	47,000
R3		68,000
R4	V1 fixed G.B. resistor	200
R5	V1 osc. C.G. resistor	100,000
R6	V1 osc. anode decoupling	47,000
R7	V2 H.T. decoupling	2,200
R8	V2 S.G. H.T. feed	91,000
R9	V2 fixed G.B. resistor	330
R10	I.F. stopper	100,000
R11	V3 signal diode load	560,000
R12	Manual volume control	1,000,000
R13	Part of tone corrector	10,000
R14	V3 pent. G.B. and A.V.C. delay resistors	330
R15		150
R16	V3 A.V.C. diode load resistors	1,000,000
R17		470,000
R18	V4 anode surge limiter	47
R19	Heater ballast resistor	815*

* Tapped at 615Ω + 100Ω + 100Ω from V4 heater.

	CAPACITORS	Values (μF)
C1	Aerial isolator	0·002
C2	Aerial circuit L.W. shunt	0·0005
C3	V1 hex. C.G. decoupling	0·1
C4	V1 S.G. decoupling	0·1
C5	V1 cathode bypass	0·1
C6	V1 osc. C.G. capacitor	0·00005
C7	H.T. circuit R.F. bypass	0·1
C8	Osc. circ. M.W. tracker	0·00047
C9	Osc. circ. L.W. tracker	0·00022
C10	V1 osc. anode decoupling	0·1
C11	A.V.C. line decoupling	0·01
C12	V2 H.T. decoupling	0·1
C13	V2 S.G. decoupling	0·1
C14	V2 cathode by-pass	0·02
C15	I.F. by-pass capacitors	0·0001
C16		0·0001
C17	V3 A.V.C. diode coupling	0·000015
C18*	V3 cathode by-pass	50·0
C19	A.F. coupling to V3 pent.	0·01
C20	I.F. by-pass	0·0001
C21	Fixed tone correctors	0·04
C22		0·0025
C23*	H.T. smoothing capacitors	8·0
C24*		24·0
C25	Mains R.F. by-pass capacitors	0·1
C26		0·1
C27‡	Aerial circuit L.W. trimmer	—
C28†	Aerial circuit tuning	—
C29‡	Aerial circuit M.W. trimmer	—
C30‡	Osc. circuit M.W. trimmer	—
C31†	Oscillator circuit tuning	—
C32‡	Osc. circuit L.W. trimmer	—
C33‡	1st I.F. trans. pri. tuning	—
C34‡	1st I.F. trans. sec. tuning	—
C35‡	2nd I.F. trans. pri. tuning	—
C36‡	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial coupling coil	19·0
L2	Aerial M.W. tuning coil	4·7
L3	Aerial L.W. tuning coil	31·5
L4	Osc. M.W. tuning coil	3·4
L5	Osc. L.W. tuning coil	9·4
L6	Oscillator reaction coils total	3·25
L7		
L8	1st I.F. trans. Pri.	11·0
L9	Sec.	11·0
L10	2nd I.F. trans. Pri.	11·0
L11	Sec.	12·0
L12	Speaker speech coil	2·6
L13	H.T. smoothing choke	370·0
L14	Mains R.F. filter chokes	1·4
L15		1·4
T1	Output trans. Pri.	255·0
	Sec.	0·2
S1-S5	Waveband switches	—
S6-S7	Mains switches	—
F1	0·5 A fuse	—



Under-chassis view. Most of the components are grouped in four assemblies.

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