

TRADER SERVICE SHEET

237

EKCO AD38

3-VALVE A.C./D.C. RECEIVER

SUITABLE for mains of 200-250 V, the Ekco AD38 receiver is a 3-valve (plus rectifier) A.C./D.C. "Super-inductance" model with a variable-mu pentode R.F. amplifier, a pentode detector and a pentode output valve. The receiver has provision for an extension speaker and a switch for cutting out the internal speaker, while the reaction circuit is of an unusual design.

We regret that permission to publish Ekco circuit diagrams is still not available but the information given on these pages should be adequate to enable most faults to be traced and corrected.

CIRCUIT DESCRIPTION

Aerial input via **C1**, **S1** (M.W.) and **S2** (L.W.) and coupling coils **L1** (M.W.) and **L2** (L.W.) to single-tuned circuits **L3**, **C20** (M.W.) and **L4**, **C20** (L.W.). Switch **S3** short-circuits **L4** for operation on M.W. The aerial input circuit is shunted by a resistance **R1** connected between the aerial and earth sockets and two condensers (**C1** and **C2**) in series connected between the aerial socket and chassis, the input to the coupling coils **L1** and **L2** being taken from their junction.

First valve (**V1**, Mullard metallised VP13C or Ekco metallised VPU1) is a variable-mu R.F. pentode operating as radio-frequency amplifier. Gain control is effected by variable resistance **R4** in series with limiting resistance **R3** in cathode circuit, supplemented by another resistance between cathode and H.T. positive to increase the current through **R4**, thus increasing the range of G.B. control.

Tuned-secondary R.F. transformer

coupling by primary coils **L5** (M.W.), **L6** (L.W.), and secondary coils **L7** (M.W.) and **L8** (L.W.), which are tuned by **C24**, between **V1** and second valve (**V2**, Mullard metallised SP13C), an R.F. pentode operating as detector on grid leak system with **C6** and **R6**. Reaction is applied by compression type condenser **C23** connected between anodes of **V1** and **V2**. R.F. filtering by **C9**, **R10**, **C10** in anode circuit.

Resistance-capacity coupling by **R9**, **C11** and C.G. resistance **R11** between **V2** and pentode output valve (**V3**, Mullard Pen36C). Provision is made for the connection of a low impedance external speaker by means of a pair of sockets connected across the secondary of the output transformer **T1**, whilst a screw and contact-strip device permits the internal speaker speech coil circuit to be interrupted, thus muting it if desired.

Tone correction in anode circuit by an R.C. network, **R13**, **C13**, connected in series between anode and cathode and another condenser **C12**, connected also between anode and cathode.

When the receiver is used on A.C. mains H.T. current is supplied by a half-wave rectifying valve (**V4**, Mullard UR1C) which, with D.C. supplies, behaves as a resistance of low value. Smoothing is effected by iron-cored choke **L10** and large capacity electrolytic condensers, **C15** (wet tubular type) and **C16** (dry, in carton with **C8**). To prevent damage to **V4** in the case of a short-circuit a current-limiting resistance **R14** is included in its anode circuit, together with the fuse **F1**.

Valve heaters are connected in series together with ballast resistance **R16** which is tapped for adjustment to mains voltage. Their sequence is **L12**, **R16**, **V3**, **V4**, **V1**, **V2** and chassis. The scale lamp is connected between **L11** and chassis and is by-passed by a resistance **R15**. The chokes **L11**, **L12** and condenser **C17**, form a filter for the suppression of mains borne interference. Two further fuses **F1** and **F2** protect the receiver and the mains supply circuit from damage in the event of a short-circuit across the mains input circuit.

COMPONENTS AND VALUES

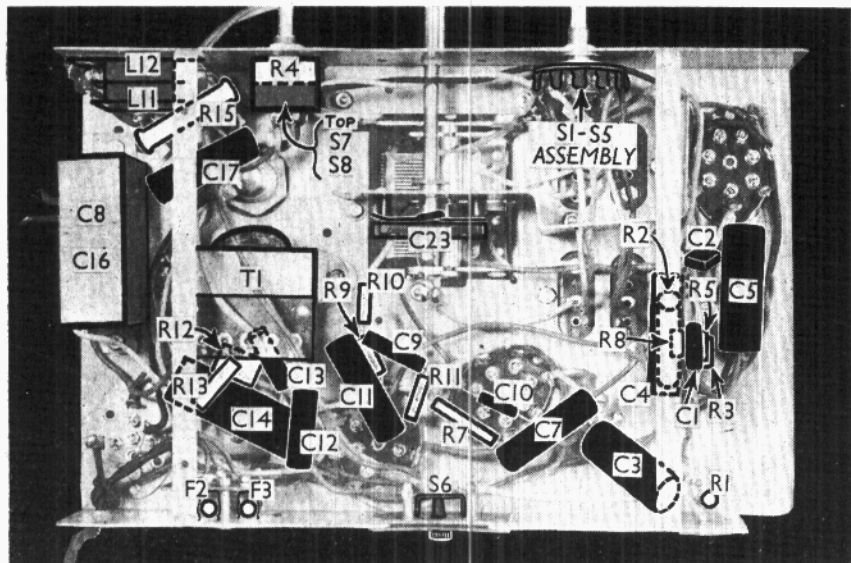
RESISTANCES		Values (ohms)
R1	Aerial-earth shunt	50,000
R2	Parts V1 variable gain control	30,000
R3	potentiometer	140
R4	V1 variable gain control	10,000
R5	V1 anode and S.G. H.T. feed.	10,000
R6	V2 grid leak	2,000,000
R7	V2 S.G. H.T. feed	250,000
R8	V2 anode decoupling	25,000
R9	V2 anode load	100,000
R10	V2 anode R.F. stopper	10,000
R11	V3 C.G. resistance	500,000
R12	V3 G.B. resistance	165
R13	Part of T.C. filter	10,000
R14	V4 current limiting resistance	100
R15	Scale lamp by-pass	50
R16*	Heater circuit ballast, total	775

* 575 Ω + 100 Ω + 100 Ω.

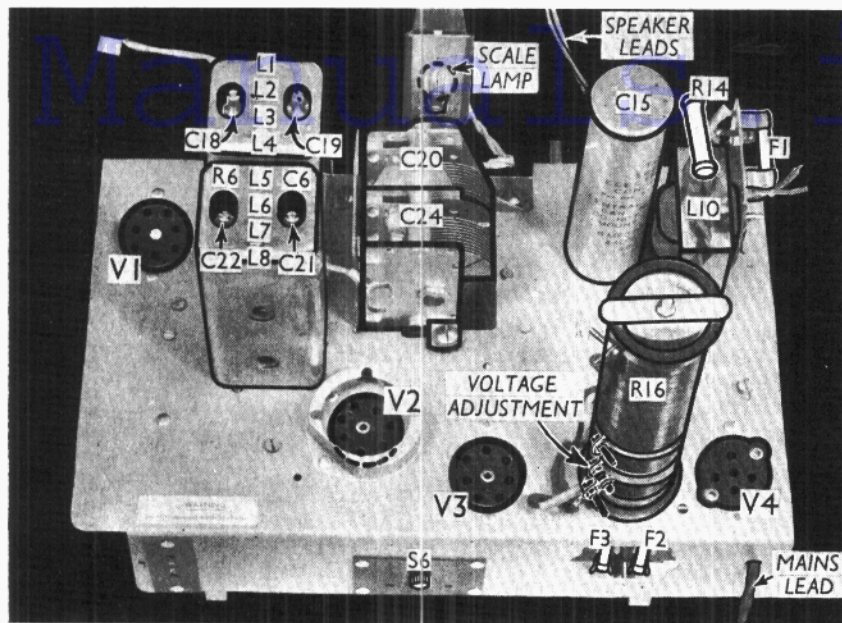
CONDENSERS		Values (μF)
C1	Aerial input circuit potential divider	0.0012
C2		0.00015
C3	Earth blocking condenser	0.1
C4	V1 cathode by-pass	0.25
C5	V1 anode and S.G. decoupling	0.15
C6	V2 C.G. condenser	0.000015
C7	V2 S.G. decoupling	0.1
C8*	V2 anode decoupling	2.0
C9	V2 anode R.F. by-passes	0.0003
C10	V2 to V3 A.F. coupling	0.0002
C11	Parts of T.C. filter	0.1
C12		0.01
C13	V3 cathode by-pass	50.0
C14*		8.0
C15*	H.T. smoothing	24.0
C16*		0.1
C17	Mains R.F. by-pass	—
C18†	Aerial circuit M.W. trimmer	—
C19†	Aerial circuit L.W. trimmer	—
C20†	Aerial circuit tuning	—
C21†	R.F. trans. sec. M.W. trimmer	—
C22†	R.F. trans. sec. L.W. trimmer	—
C23†	Reaction control	—
C24†	R.F. trans. secondary tuning.	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial circuit M.W. coupling coil	16.0
L2	Aerial circuit L.W. coupling coil	74.0
L3	Aerial circuit M.W. tuning coil	2.0
L4	Aerial circuit L.W. tuning coil	13.0
L5	R.F. transformer M.W. primary coil	2.0
L6	R.F. transformer L.W. primary coil	9.5
L7	R.F. transformer M.W. secondary coil	2.4
L8	R.F. transformer L.W. secondary coil	12.5
L9	Speaker speech coil	2.8
L10	H.T. smoothing choke	375.0



Under-chassis view of the Ekco AD38. Details of the S1-S5 assembly are on the opposite page.



Plan view of the chassis. The L5-L8 unit also contains C6 and R8. Three fuses are incorporated, and are clearly marked.

OTHER COMPONENTS (Continued)		Approx. Values (ohms)
L11	Mains circuit filter chokes	2.5
L12		2.5
T1	Output trans. { Pri.	650.0
	{ Sec.	0.3
S1-S5	Waveband-switches	—
S6	Internal speaker switch	—
S7, S8	Mains switches, ganged R4	—
F1	H.T. circuit fuse	—
F2	Mains fuses	—
F3		—

DISMANTLING THE SET

Removing Chassis.—Remove the wax covering the heads of the recessed grub screws holding the three small knobs, slacken the screws and remove the knobs. Remove the large knob (recessed screw).

Next remove the wax covering the heads of the four cheese-head screws (with washers) holding the chassis to the bottom of the cabinet and remove the screws. The chassis can now be withdrawn to the extent of the speaker leads.

When replacing, do not forget the two washers between the back of the chassis and the bottom of the cabinet and cover the heads of the chassis bolts and the screws in the small knobs with wax or a similar substance.

To free entirely, unsolder the leads from the speaker.

Removing Speaker.—If it is desired to remove the speaker, remove the four cheese-head bolts (with washers) holding the sub-baffle to the front of the cabinet and to free it from the sub-baffle, remove the four cheese-head screws (with washers, nuts and lock nuts) holding it. When replacing, see that the terminal panel is on the right and do not forget the washers between the sub-baffle and the cabinet front.

VALVE ANALYSIS

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

receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VPU1	125	4.5	125	1.9
V2 SP13C	40	0.9	65	0.3
V3 Pen36C	165	42.0	190	6.7
V4 UR1C†	—	—	—	—

† Cathode to chassis, 215 V D.C.

GENERAL NOTES

Switches.—S1-S5 are the waveband switches, in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis view, and shown in detail in the diagram in col. 3, where it is seen looking from the rear of the underside of the chassis.

The table below gives the switch positions for the two control settings, starting from fully anti-clockwise. O indicates open, and C closed.

Switch	L.W.	M.W.
S1	O	C
S2	C	O
S3	O	C
S4	O	C
S5	O	C

S6 is the internal speaker muting switch, operated by the small knob at the rear of the chassis. It opens when the knob is unscrewed, breaking the internal speaker speech coil circuit.

S7 and S8 are the Q.M.B. mains switches, ganged with the gain control, R4. Looking from beneath the chassis, the upper two tags (yellow wires) belong to S7, and the lower two (blue wires) to S8.

Coils.—L1-L4 and L5-L8 are in two screened units on the chassis deck, and each unit contains its two associated

trimmers at the tops of the cans. In addition, the second unit also contains R6 and C6. The smoothing choke L10 is on the chassis deck, while the R.F. filter chokes L11, L12 are beneath the chassis.

Scale Lamp.—This is a Mazda M.E.S. type, rated at 6.2 V, 0.3 A. It can be reached by sliding off the box-like indicator mask.

Fuses.—F1 is the H.T. circuit fuse, mounted in clips on the paxolin panel on L10. It is a "Truwind," rated at 500 mA, and is 1 1/2 in. long and 1/4 in. in diameter.

F2 and F3 are the mains circuit fuses, in clips at the back of the chassis. They are Ekco types, each rated at 1 A, and are 1 in. long and 1/4 in. in diameter.

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (3-4 O) external speaker. The internal speaker may be muted by unscrewing S6.

Condensers C8, C16.—These are two dry electrolytics in a single carton beneath the chassis, with a common negative (black) lead. The yellow lead is the positive of C8 (2µF) and the blue the positive of C16 (24µF).

Condenser C23.—This is the reaction control, of the flat plate compression type, with mica insulation.

Chassis Divergencies.—In the makers' diagram, C12 and C18 are shown returned to chassis, but in our set they were returned to cathode of V3.

CIRCUIT ALIGNMENT

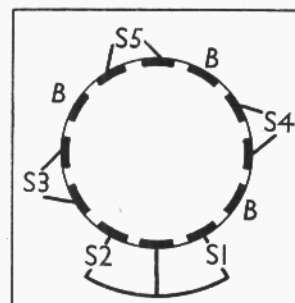
With the gang at maximum, pointer should cover the 560 m. mark on the scale. If it does not, loosen the two small screws in the front of the pointer mounting plate, and turn the pointer through the desired angle, subsequently tightening up the screws again.

Switch set to M.W., and tune to 250 m. on scale. Set volume (gain) control to maximum, and sensitivity (reaction) control to a point at which receiver is just short of oscillation.

Connect a signal generator to A and E sockets via a 0.0002 µF condenser, and feed in a 250 m. (1,200 KC/S) signal, adjusting C21 and C18 for maximum output.

Switch set to L.W., tune to 1,090 m. on scale, and re-adjust C23 (reaction) until receiver is just short of oscillation. Feed in a 1,090 m. (275 KC/S) signal, and adjust C22 and C19 for maximum output.

If during these operations receiver breaks into oscillation, reduce the reaction setting slightly to avoid this.



The switch unit, viewed from the rear of the underside of the chassis.

For more information remember