

"TRADER" SERVICE SHEET

657

EKCO AD37

AC/DC TRF RECEIVER

REVISED ISSUE OF SERVICE SHEET No. 151

FITTED with a pre-set reaction control and a high-voltage scale lamp, the Ekco AD37 is a 3-valve (plus rectifier) 2-band TRF receiver designed to operate from AC or DC mains of 200-250 V, 40-100 c/s in the case of AC.

Release date and original prices: March, 1936; walnut finish, £8 18s. 6d.; black and ivory finish £9 3s. 6d.

CIRCUIT DESCRIPTION

Aerial input via pre-set series condenser **C15** (aerial equaliser) and tapping on **L2** (MW) or coupling coil **L1** (LW) to single tuned circuit **L2**, **L3**, **C17**, which precedes variable-mu pentode RF amplifier (**V1**, Mullard metallised VP13C). Gain control by variable cathode resistor **R4** which, with **R1**, forms an HT potential divider and varies GB applied.

Tuned-secondary transformer coupling by **L4**, **L5**, **L6**, **L7** and **C20** to RF pentode detector (**V2**, Mullard metallised SP13C) operating on grid leak system with **C4** and **R5**. Reaction is applied between **V1** and **V2** anodes by pre-set condenser **C19**. RF filtering by choke **L8** and by-pass condensers **C7**, **C8**.

Resistance-capacity coupling by **R8**, **C9**, and **R9** to pentode output valve (**V3**, Mullard Pen 36C or Mazda Pen 3520). Tone correction in anode circuit by fixed con-

denser **C10**. Provision for connection of external low-impedance speaker across secondary of output transformer **T1**. Screw switch **S6** enables internal speaker speech coil circuit to be broken.

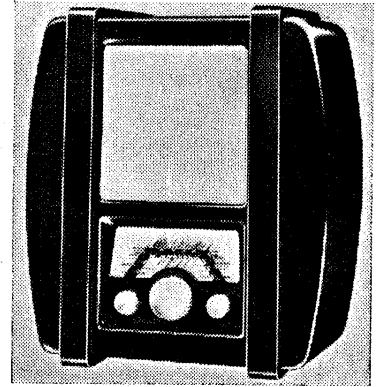
When the receiver is used with AC mains, HT current is supplied by half-wave rectifying valve (**V4**, Mullard UR1C or Brimar 1D5), which, with DC supplies, behaves as a resistor of low value. Smoothing by iron-cored choke **L10** and electrolytic condensers **C12** (aqueous) and **C13** (dry).

Valve heaters are connected in series together with tapped ballast resistor **R12** across mains input circuit. High voltage scale lamp is connected from 200 V tapping to chassis. Chokes **L11**, **L12**, and condensers **C1**, **C14** form a filter for suppression of mains-borne interference.

COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	Part HT pot. divider ...	30,000
R2	V1 HT feed ...	10,000
R3	V1 fixed GB resistor ...	140
R4	V1 gain control ...	10,000
R5	V2 grid leak ...	2,000,000
R6	V2 SG HT feed ...	500,000
R7	V2 anode decoupling ...	25,000
R8	V2 anode load ...	100,000
R9	V3 CG resistor ...	500,000
R10	V3 GB resistor ...	165
R11	V4 surge limiter ...	50
R12	Heater circuit ballast ...	700*

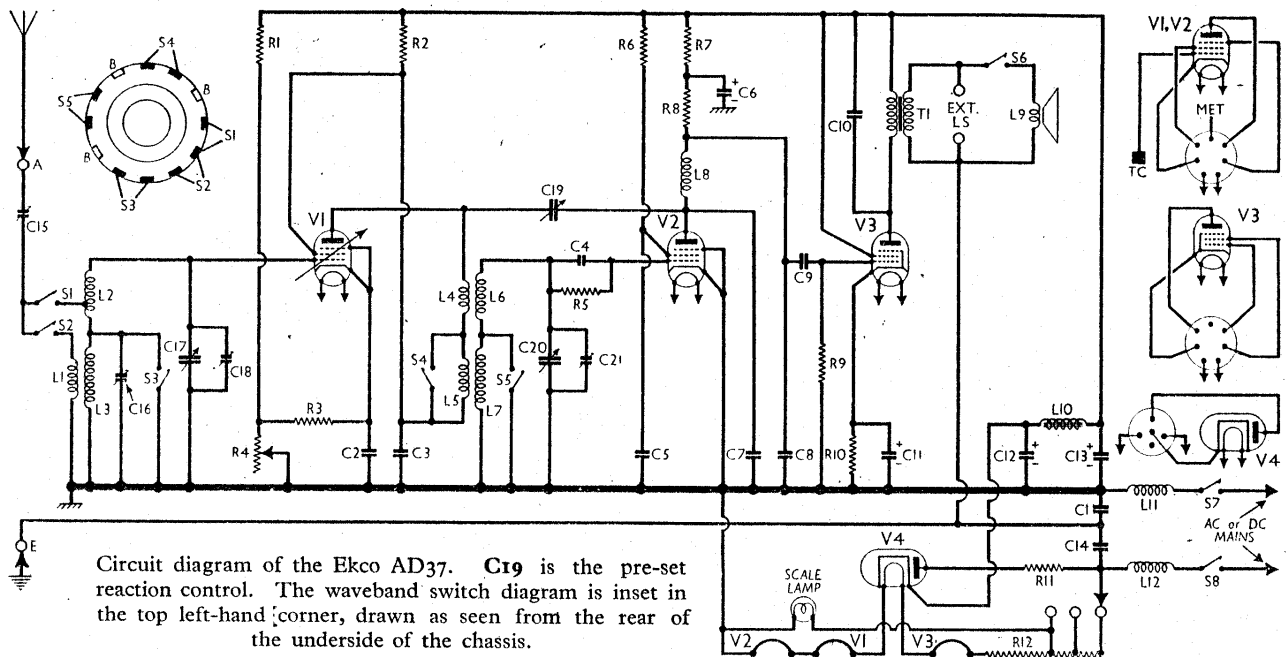
* Tapped at 500 Ω + 100 Ω + 100 Ω from V3 heater.



The appearance of the Ekco AD37 in the black and ivory finish.

CONDENSERS		Values (μ F)
C1	Earth blocking condenser	0.1
C2	V1 cathode by-pass ...	0.25
C3	V1 HT feed decoupling ...	0.15
C4	V2 CG condenser ...	0.000015
C5	V2 SG decoupling ...	0.1
C6*	V2 anode decoupling ...	2.0
C7	V2 anode RF by-pass con-	0.0003
C8	densers	0.0008
C9	V2 to V3 AF coupling ...	0.1
C10	Fixed tone corrector ...	0.004
C11*	V3 cathode by-pass ...	50.0
C12*	HT smoothing condensers {	8.0
C13*		24.0
C14	Mains RF by-pass ...	0.1
C15†	Aerial series condenser	—
C16†	Aerial FV trimmer	—
C17†	Aerial circuit tuning	—
C18†	Aerial MW trimmer	—
C19†	Pre-set reaction control	—
C20†	RF trans. sec. tuning	—
C21†	RF trans. MW trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.



OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial LW coupling coil ...	200.0
L2	Aerial tuning coils...	2.5
L3		15.0
L4	RF transformer primary	1.0
L5		11.5
L6	RF transformer secondary	2.5
L7		15.0
L8	V2 anode RF choke ...	280.0
L9	Speaker speech coil ...	2.5
L10	HT smoothing choke ...	365.0
L11	Mains RF filter chokes	2.5
L12		2.6
T1	Output trans. { Pri. ...	650.0
	Sec. ...	0.2
S1-S5	Waveband switches ...	—
S6	Internal speaker switch ...	—
S7, S8	Mains switches, ganged R4	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on AC mains of 215 V, using the 220-230 V tapping on the mains resistance. The volume control was at maximum, but there was no signal input.

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

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP13C	130	5.7	130	2.1
V2 SP13C	70	0.8	50	0.3
V3 Pen36C	175	45.0	205	5.8
V4 UR1C†	—	—	—	—

† Cathode to chassis, 230 V, DC.

DISMANTLING THE SET

Removing Chassis.—Remove the mains lead and cabinet backing (six screws with washers);

remove the three control knobs (recessed grub screws);

remove the four cheese-headed screws (with washers) holding the chassis to the bottom of the cabinet.

When replacing, the knob with coloured spots should go on the waveband spindle, the green spot being uppermost in the MW position.

Do not omit to re-wax the screw heads.

Removing Speaker.—Remove the sub-baffle (four bolts with washers) from the front of the cabinet; now remove the nuts, lock-nuts and

Plan view of the chassis. **C16** adjustment is reached through a hole in the side of the **L1-L3** coil unit screen.

washers from the four bolts holding the speaker to the sub-baffle.
When replacing, the terminal strip should be on the right.

GENERAL NOTES

Switches.—**S1-S5** are the waveband switches, in a single rotary unit, indicated in our under-chassis view and shown in detail in a separate diagram inset in the top left-hand corner of the circuit diagram overleaf. This shows the unit as seen from the rear of the underside of the chassis.

The table (col. 3) gives the switch position for the MW and LW control settings. A dash indicates open, and **C**, closed.

S6 is the internal speaker switch, at the rear of the chassis, operated by screwing the small insulated knob in or out.

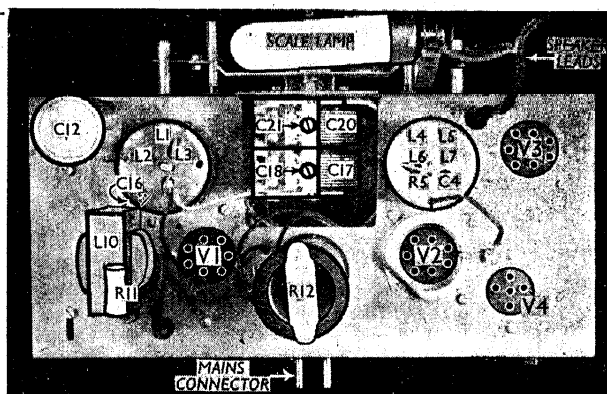
S7 and **S8** are the QMB mains switches, ganged with the gain control **R4**.

Coils.—Tune tuning coils, **L1-L3** and **L4-L7** are in two screened units on the chassis deck. The first of these also contains the trimmer **C16**, operated through a hole in the side of the screen. The second coil unit also contains **C4** and **R5**.

L8 is an RF choke, and **L11, L12** are two mains filter chokes, all beneath the chassis. **L10** is the HT smoothing choke, mounted on the chassis deck. **R11** is mounted above the choke.

Scale Lamp.—This is a special large tubular type, with a centre contact small bayonet cap. It is marked "Ensign Pilot, 200 V, 12 W," and as it is connected to the 200 V tapping on the ballast resistor **R12**, it is independent of the mains supply voltage.

Under-chassis view. The waveband switch unit **S1-S5** is shown in detail in the diagram inset in the circuit diagram overleaf, where it is viewed in the direction of the arrow in this illustration.



External Speaker.—Provision is made at the rear of the chassis for a low-impedance external speaker (2.5-3 Ω). By unscrewing the knob of **S6**, the internal speaker can be cut out.

Condensers C6, C13.—These are two dry electrolytics in a single unit with a common negative (black) lead. The yellow lead is the positive of **C6** (2 μF) and the blue the positive of **C13** (24 μF). **C12** is a wet electrolytic in a separate container mounted on the chassis deck.

Switch Table

Switch	WM	LW
S1	C	—
S2	—	C
S3	C	—
S4	—	—
S5	C	—

CIRCUIT ALIGNMENT

First see that when the gang condenser is at maximum, the pointer covers the green horizontal line corresponding to about 570 m. If it does not, remove tuning knob, and loosen screw in the slot in the flat end of the indicator arm. Adjust pointer, and re-tighten screw. The chassis must, of course, be in the cabinet during this operation.

Now connect a signal generator to the aerial and earth sockets, screw **C15** (rear of chassis) hard in, then slack it off one and a quarter turns. Connect a suitable output meter, and set receiver to 250 m on the scale. Feed in a 250 m (1,200 kc/s) signal and adjust **C21** for maximum output, then adjust **C18** similarly.

Switch set to LW, feed in a 1,500 m (200 kc/s) signal, and tune the set to this signal. Adjust **C16** (through hole in side of the **L1-L3** screen) for maximum output, rocking the gang condenser to obtain an optimum setting.

Adjusting C15.—To adjust the aerial equalising condenser, tune the receiver to a weak station around 220 m. Keep the gain control low, and adjust **C15** slightly if necessary.

Adjusting C19.—To adjust the pre-set reaction condenser, tune receiver to a station at the lower end of the MW band which necessitates advancing the gain control to maximum. Screw up **C19** until receiver is just short of oscillation, meanwhile rocking the gang condenser slightly.

