

"TRADER" SERVICE SHEET
753

EKCO B37

BATTERY TRF RECEIVER

REVISED ISSUE OF
SERVICE SHEET No. 119

PRE-SET reaction and anti-reaction circuits are used in the Ekco B37, a 3-valve 2-band TRF battery operated receiver.

The set is provided with a "local/distant" switch and external speaker sockets, while another switch permits the internal speaker to be muted. A series aerial trimmer is provided for adjustment when installing the receiver.

The plastic cabinet is made in two finishes: walnut, and black and ivory.

Release date and original prices: 1936: £6 16s. 6d. (walnut); £7 1s. 6d. (black and ivory). Batteries extra.

CIRCUIT DESCRIPTION

Aerial input is via pre-set trimming capacitor **C8** to single-tuned circuit **L2**, **L3** and **C10**. On MW, switch **S1** connects the aerial to a tapping on **L2**, while on LW **S2** connects it to coupling coil **L1**. Local/distant facility is provided by switch **S3**, which shunts **R1** across the aerial circuit in the "Local" position.

First valve (**V1**, Mullard metallised **VP2**) is a variable-mu RF pentode operating as signal frequency amplifier. Gain control by variable potentiometer **R2** which varies GB applied.

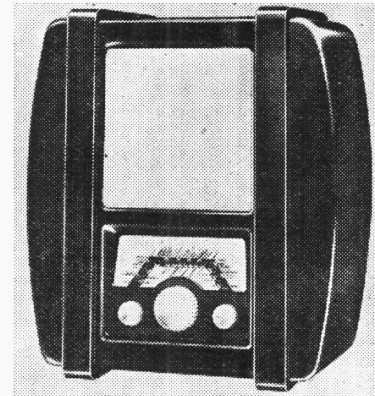
Tuned-secondary transformer coupling by **L4**, **L5**, **L6**, **L7**, **C14** to RF pentode detector valve (**V2**, Mullard metallised **SP2**) which operates on grid leak system with **C2** and **R3**. Pre-set reaction is provided by capacitor **C12** connected between the anodes of **V1** and **V2**. A small degree of "anti-reaction" on the LW band is obtained from the LW reaction equalising capacitor **C13**. RF filtering in **V2** anode circuit by choke **L8** and by-pass capacitor **C4**.

Resistance-capacitance coupling by **R5**, **C6** and **R6** between **V2** and pentode output valve (**V3**, Mullard **PM22D**). Fixed tone correction in anode circuit by **C7**. Provision for connection of low-impedance external speaker across secondary of output transformer **T1**, while switch **S7** permits internal speaker to be muted.

GB potential for **V3** is obtained from the drop along **R7** in the negative HT lead to chassis. The GB battery is used solely for **V1** and the volume control, and it is connected permanently in circuit across **R7** and **R2**.

COMPONENTS AND VALUES

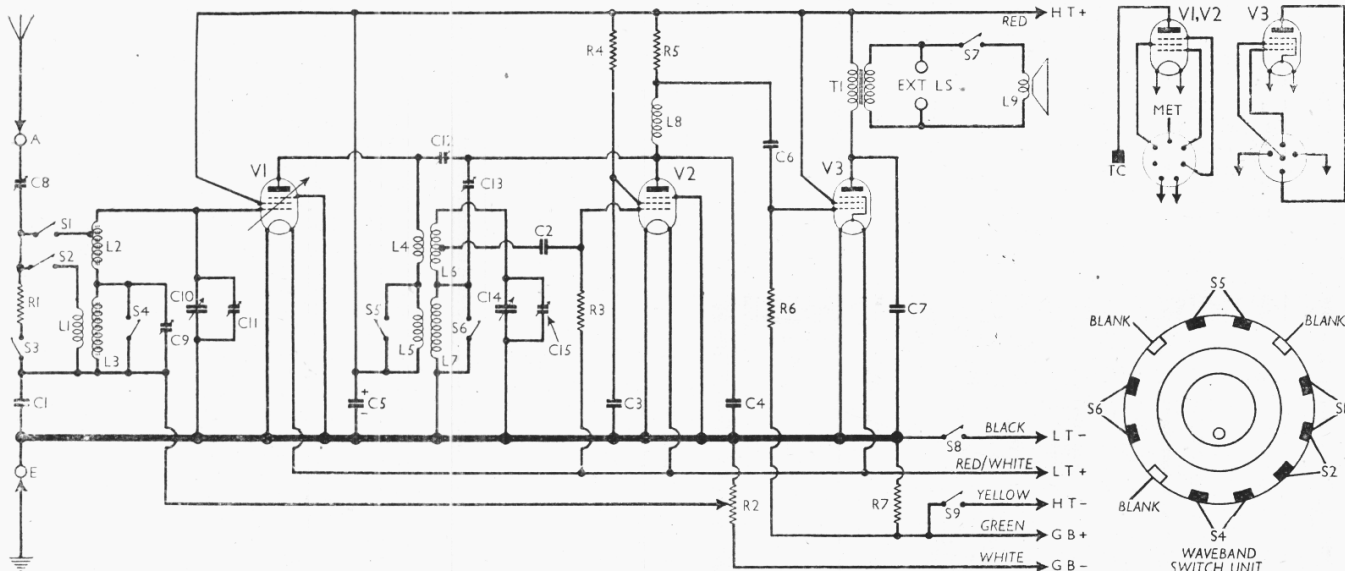
RESISTORS		Values (ohms)
R1	Aerial circuit shunt	1,500
R2	V1 gain control	500,000
R3	V2 grid leak	2,000,000
R4	V2 SG HT feed	500,000
R5	V2 anode load	150,000
R6	V3 CG resistor	1,000,000
R7	V3 auto. GB resistor	320



The Ekco B37 in black and ivory.

CAPACITORS		Values (µF)
C1	V1 CG decoupling	0.1
C2	V2 CG capacitor	0.0001
C3	V2 SG decoupling	0.1
C4	RF by-pass	0.0001
C5*	HT supply reservoir	10.0
C6	V2 to V3 AF coupling	0.02
C7	Fixed tone corrector	0.004
C8†	Aerial series trimmer	—
C9‡	Aerial circ. LW trimmer	—
C10†	Aerial circuit tuning	—
C11‡	Aerial circ. MW trimmer	—
C12‡	Pre-set reaction control	—
C13‡	LW reaction equaliser	—
C14†	RF trans. sec. tuning	—
C15‡	RF trans. sec. trimmer	—

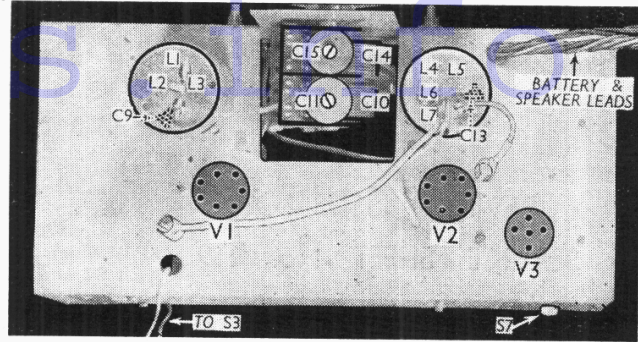
* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Ekco B37 TRF receiver. **C12** is the pre-set reaction adjustment, and **C13** is the anti-reaction adjustment which operates only on LW. **R2** is the gain control, shunted across the GB battery via **R7**. GB for **V3** is obtained from the drop along **R7** upon the passage of HT current through it. The GB battery is continuously in circuit, discharging very slowly. Inset on the right is a diagram of the waveband switch unit, drawn as seen from the rear of an inverted chassis.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial LW coupling coil ...	200-0
L2	Aerial tuning coils ...	2.75
L3		16.5
L4		1.0
L5	RF transformer primary coils ...	13.5
L6	RF transformer secondary coils ...	3.0
L7		15.0
L8	V2 anode RF choke ...	280.0
L9	Speaker speech coil ...	2.3
T1	Output transformer { Pri. ...	700.0
	{ Sec. ...	0.15
S1, S2	Waveband switches ...	—
S4-S6		—
S3	Local-distant switch ...	—
S7	Internal speaker switch ...	—
S8	LT circuit switch ...	—
S9	HT circuit switch ...	—

Plain view of the chassis. The positions of C9 and C13 are indicated in their respective coil units in which small holes give access to their adjusting screws.



VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a new HT battery reading 128 V. The volume control was at maximum and the local/distant switch was in the distant position. There was no signal input. Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	125	2.3	125	0.7
V2 SP2	50	0.5	35	0.2
V3 PM22D	120	3.6	125	0.6

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws); remove the four screws (with washers) holding the chassis to the bottom of the cabinet;

remove the local/distant switch from the side of the cabinet.

If the battery platform is now removed, the chassis may be withdrawn to the extent of the speaker leads; or, if the leads are unsoldered from the tags on the speaker, the chassis will be freed entirely.

Removing Speaker.—Remove the four bolts (with washers) holding the sub-baffle to the cabinet, and remove the nuts (with washers and lock-nuts) from the four bolts holding the speaker to the sub-baffle.

When replacing, the transformer should be on the right.

GENERAL NOTES

Switches.—S1, S2, S4, S5 and S6 are the waveband switches, in a single rotary unit beneath the chassis. This is indicated in our under-chassis view, and is shown in detail in the diagram inset beside the circuit diagram overleaf, where it is drawn as seen from the rear of the inverted chassis. The table below gives the switch positions for the two control settings. A dash indicates open, and C, closed.

S3 is the local-distant switch, of the QMB toggle type, fitted to the side of the cabinet. It is closed in the local position.

S7 is the internal speaker switch, operated by a small milled knob at the rear of the chassis. It is closed when the knob is screwed fully in. S8 and S9 are the HT and LT switches, ganged with the gain control, R2. Seen from the underside of the chassis, the two upper tags are those of S8, and the two lower lower ones, S9.

Coils.—L1-L7 are in two screened units on the chassis deck, the L1-L3 unit containing also C9, and the L4-L7 unit, C13. The choke L8 is a waxed unit, mounted beneath the chassis.

External Speaker.—There are two sockets at the rear of the chassis for a low impedance (2.4 Ω) external speaker.

Switch Table

Switch	MW	LW
S1	C	—
S2	—	C
S4	C	—
S5	C	—
S6	C	—

After this has been connected, the internal speaker may be silenced by S7.

Batteries.—For LT, a 2 V, 20 or 40 AH cell is recommended. The HT battery should be a 120 V type, while the GB battery should be a separate 9 V unit.

Battery Leads and Voltages.—Black lead, spade tag, LT negative; Red-white lead, spade tag, LT positive 2 V; Yellow lead and plug, HT negative; Red lead and plug, HT positive 120 V; Green lead and plug, GB positive; White lead and plug, GB negative 9 V.

CIRCUIT ALIGNMENT

The complete operation of alignment can be carried out without removing the chassis from the cabinet. First check that the pointer covers the green line at about 570 m when the gang is at maximum. If it does not, remove tuning knob to gain access to inner end of indicator arm, loosen small screw in slot in flat end of the arm, adjust pointer, and tighten screw.

MW.—Connect signal generator via a 0.0002 μF dummy aerial to the A and E sockets of the receiver, screw the aerial circuit trimmer C8 hard up, then slack it off exactly 1½ turns. Switch set to MW, tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust C15, then C11, for maximum output.

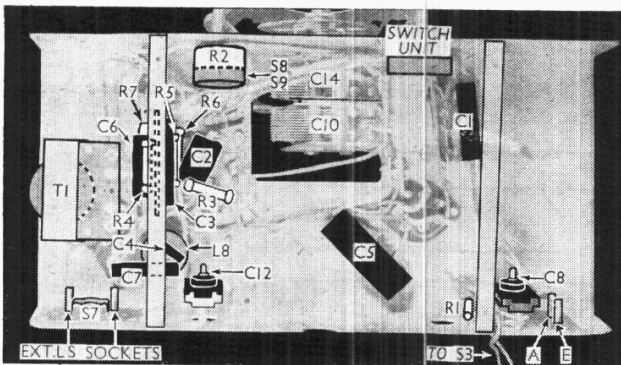
LW.—Feed in a 1,600 m (187.5 kc/s) signal, tune it in, and adjust C9 for maximum output while rocking the gang for optimum results. C9 is reached through a hole in the side of the L1-L3 coil unit.

Feed in a weak 300 m (1,000 kc/s) signal, and screw up C12 slowly until receiver is just short of oscillation, rocking the gang meanwhile. If receiver is now tuned to a station at about 250 m it should oscillate (prevented by retarding volume control). If it does not oscillate, screw in C12 a little more.

Finally, readjust C8 for optimum performance on the user's aerial.

Adjusting LW Reaction Equaliser.—After C12 has been set for the MW band, tune receiver to the point on the LW band (about 1,300 m) where self-oscillation is often encountered. Now turn C13 (inside L4-L7 unit) slowly in an anti-clockwise direction until receiver just stops oscillating.

For this and the previous adjustment, a new HT battery and freshly charged LT cell should be used. After adjusting C13 it is often necessary to re-gang the set on the LW band.



Under-chassis view. Several components are mounted in a small assembly near the output transformer T1. A diagram of the switch unit is inset with the circuit diagram overleaf.