

"TRADER" SERVICE SHEET  
**693**

# EKCO B38

## BATTERY TRF RECEIVER



REVISED ISSUE OF  
SERVICE SHEET No. 279

**T**HREE pentodes are used in the Ekco B38, a 2-band TRF battery receiver with dust-iron cored tuning coils. Provision is made for connecting an external speaker.

Release date and original prices: February, 1937; walnut finish, £6 19s. 6d.; black and chromium, £7 4s. 6d.

### CIRCUIT DESCRIPTION

Aerial input is via coupling coils **L1, L2** to single tuned circuit **L3, C10** (MW), plus **L4** (LW), which precedes variable-mu RF pentode (**V1, Mullard metallised VP2**), operating as signal frequency amplifier with gain control by variable potentiometer **R2** which varies GB applied.

Aerial damping for local reception by **R1** which shunts the aerial circuit via **S3** when the reaction control is turned to minimum.

Tuned-secondary RF transformer coupling by **L5, L7, C14** (MW), plus **L6, L8** (LW), between **V1** and detector valve (**V2, Mullard metallised SP2**), an IF pentode operating on the grid leak system with **C2** and **R3**. RF filtering in anode circuit by **L9, C4**. Reaction coupling by compression type variable capacitor **C13** between **V1** and **V2** anodes. When **C13**

reaches minimum capacity, **S3** closes automatically, so that a considerable degree of variable selectivity is obtained.

Parallel-fed auto-transformer coupling by **R5, C5** and **T1** between **V2** and pentode output valve (**V3, Mullard PM22A**). Fixed tone correction by **C6** in anode circuit. Provision for connection of low impedance external speaker across secondary of output transformer **T2**, while switch **S7** permits the internal speaker to be muted.

Negative GB potential for **V3** is obtained automatically from the drop along **R6** in the negative HT lead to chassis. This potential and the 9 V GB battery are arranged in series and applied across the gain control **R2**.

### VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with an HT battery reading 120 V on load. The receiver was tuned to the lowest wavelength on the MW band, and the gain control was at maximum, but the reaction control was at minimum and there was no signal input.

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

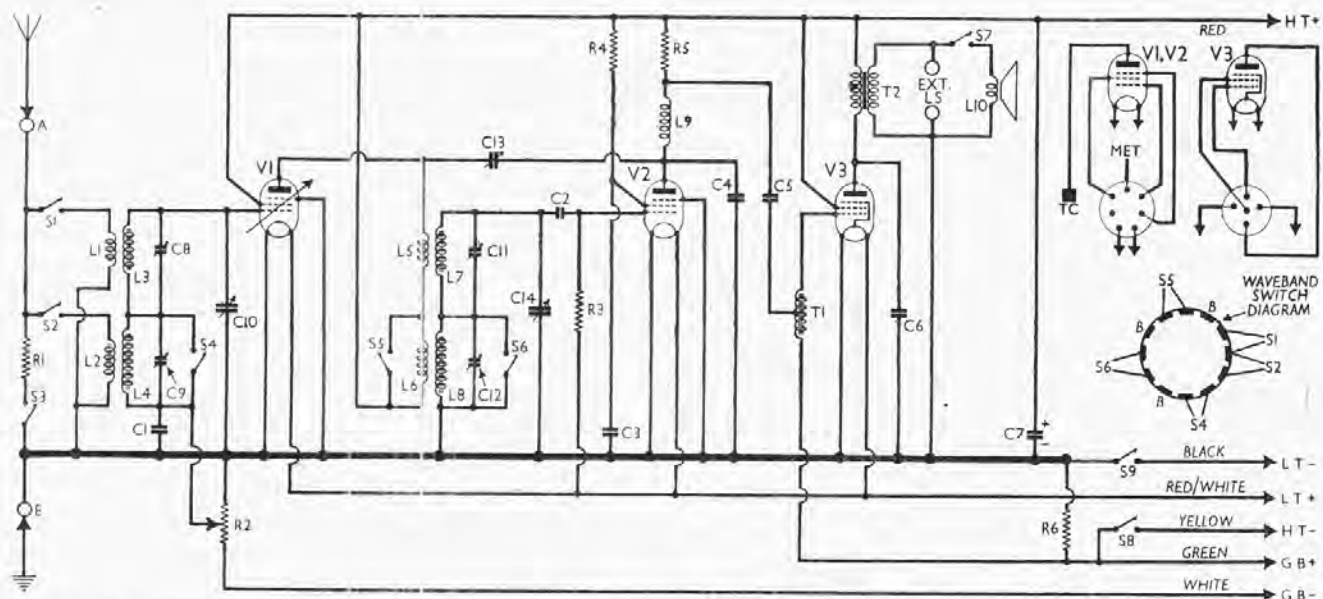
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2	115	2.7	115	1.0
V2 SP2	48	0.4	28	0.1
V3 PM22A	107	4.9	115	0.8

### COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	Local/distant shunt	400
R2	V1 gain control	500,000
R3	V2 grid leak	2,000,000
R4	V2 SG HT feed	500,000
R5	V2 anode load	100,000
R6	V3 GB resistor	440

CAPACITORS		Values (µF)
C1	V1 CG decoupling	0.1
C2	V2 CG capacitor	0.000015
C3	V2 SG decoupling	0.1
C4	RF by-pass	0.0001
C5	AF coupling to T1	0.015
C6	Fixed tone corrector	0.004
C7*	HT circuit reservoir	10.0
C8†	Aerial circ. MW trimmer	—
C9†	Aerial circ. LW trimmer	—
C10†	Aerial circuit tuning	—
C11†	RF trans. MW trimmer	—
C12†	RF trans. LW trimmer	—
C13†	Reaction control	—
C14†	RF trans. sec. tuning	—

\* Electrolytic. † Variable. ‡ Preset.



Circuit diagram of the Ekco B38 TRF receiver. The tuning coils are all dust-iron cored. **C13** is the reaction control capacitor. Inset on the right are diagrams showing the internal connections to the valve bases, and below them is the waveband switch diagram, as seen from the rear of the underside of the chassis.



OTHER COMPONENTS		Approx. Values (ohms)
L1, L2	Aerial coupling coils ...	14.0
L3	Aerial MW tuning coil ...	71.0
L4	Aerial LW tuning coil ...	1.7
L5	RF transformer primary coils ...	12.3
L6	RF transformer secondary coils ...	1.7
L7	RF transformer secondary coils ...	8.8
L8	RF transformer secondary coils ...	12.3
L9	V2 anode RF choke ...	270.0
L10	Speaker speech coil ...	2.8
T1	AF auto-trans., total ...	3,000.0
T2	Output trans. { Pri. ... 1,250.0 { Sec. ... 0.2	
S1, S2	Waveband switches ...	—
S3	Local/distant switch ...	—
S7	Int. speaker switch ...	—
S8, S9	Battery switches, ganged R2 ...	—

**DISMANTLING THE SET**

**Removing Chassis.**—Remove the four control knobs (recessed grub screws) from the front of the cabinet; remove the horizontal and vertical partitions inside the cabinet;

remove the four screws (with washers and lock-washers) holding the chassis to the bottom of the cabinet, when the chassis may be withdrawn to the extent of the speaker leads, or freed entirely if they are unsoldered.

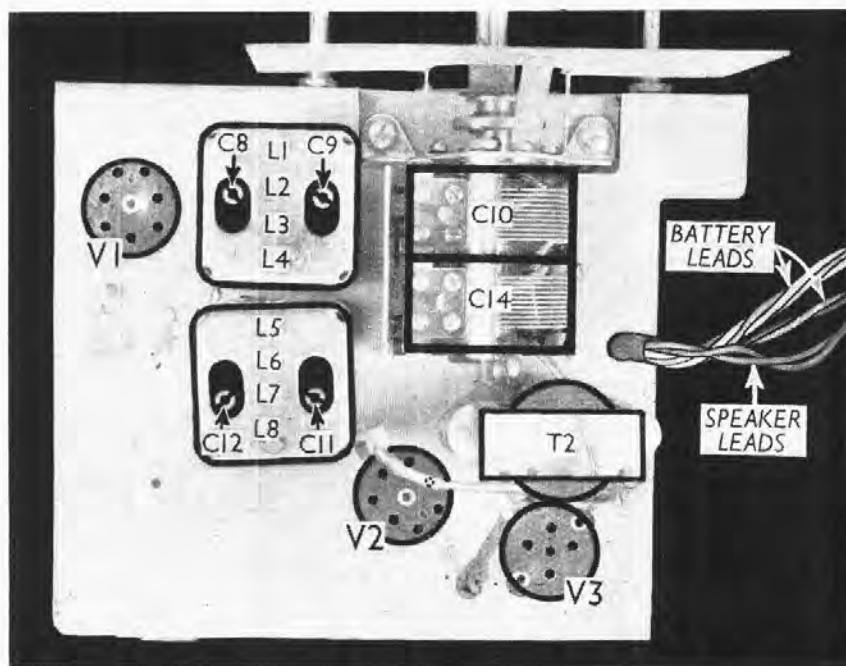
*When replacing,* care should be taken to fit the knob with coloured spots on the waveband switch spindle, and to position it correctly.

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

*When replacing,* note that the top of the sub-baffle is shaped to fit the cabinet; the connecting panel should point towards the top right-hand corner.

**GENERAL NOTES**

**Switches.**—S1, S2, S4, S5 and S6 are the waveband switches, ganged in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis view, and shown in detail in the diagram inset be-



Plan view of the chassis. The trimmers are all accessible without removing the chassis.

neath the valve base diagrams in the circuit diagram overleaf, where it is drawn as seen from the rear of the underside of the chassis.

In the LW (anti-clockwise) position of the control knob, all these switches, excepting S2, are open; in the MW (clockwise) position, all except S2 are closed.

S3 is the local/distant switch. It is

fitted beneath the chassis and operated by a disc on the reaction control spindle, and closes when C13 is at minimum capacity.

S7 is the internal speaker muting switch, mounted on the rear chassis member. S8 and S9 are the QMB battery switches, ganged with the gain control R2.

**Coils.**—The dust-iron cored RF tuning units L1-L4 and L5-L8 are in two screened units on the chassis deck with their associated trimmers. The RF choke L9 is mounted beneath the chassis.

**External Speaker.**—Two sockets are provided at the rear of the chassis for a low impedance (3.4 Ω) external speaker. Switch S7, which is mounted on the same panel, permits the internal speaker to be muted.

**Battery Leads and Voltages.**—Recommended batteries are: LT, 2 V, 40 AH accumulator cell; HT, 120 V; GB, 9 V. Intermediate tapings are not required.

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. Green lead and plug, GB positive; white lead and plug, GB negative, - 9 V.

**CIRCUIT ALIGNMENT**

With the gang at maximum, the 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. Adjust the pointer and tighten up the screws.

**MW.**—Switch set to MW, tune to 230 m on scale, turn gain control to maximum, and adjust the reaction control to a point just short of oscillation. Connect signal generator via a 0.0002 μF capacitor, to A and E sockets, feed in a 230 m (1,300 kc/s) signal, and adjust C11 and C8 for maximum output, resetting the reaction control if necessary.

**LW.**—Switch set to LW, tune to 1,090 m on scale, feed in a 1,090 m (275 kc/s) signal, and adjust C12 and C9 for maximum output, resetting the reaction to a point just short of oscillation.



Under-chassis view. C13 is a compression-type variable capacitor. A diagram of the waveband switch is inset in the circuit diagram overleaf.