

EKCO BAW69

Intermediate frequency 126.5 KC/S.

CIRCUIT DESCRIPTION

Aerial input on MW and LW via SW coupling coil **L4** and on MW coupling condenser **C1** or, on LW, coupling coil **L1**, to mixed coupled band-pass filter. Primary coils **L2**, **L3** are tuned by **C23**; secondaries **L6**, **L7** by **C28**. On SW, coupling is via **L4** to single tuned circuit **L5**, **C28**. Image suppression is carried out by **C25**.

First valve (**V1**, Mullard metallised **FC2A**) is an octode operating as frequency changer with electron coupling. Oscillator grid coils **L8** (SW), **L9** (MW) and **L10** (LW) are tuned by **C30**; parallel trimming by **C31** (SW), **C32** (MW) and **C33** (LW); series tracking by **C5** (MW) and **C6** (LW). Reaction by coils **L11** (SW), plus **L12**, **L13** (MW and LW) connected in series between oscillator anode and HT positive line, **L12**, **L13** being short-circuited on SW by switch **S13**.

Second valve (**V2**, Mullard metallised **VP2B**) is a variable-mu hexode, with second and fourth grids strapped, operating as intermediate frequency amplifier with tuned-primary tuned-secondary

transformer couplings **C34**, **L14**, **L15**, **C35** and **C36**, **L16**, **L17**, **C37**.

Diode second detector is part of double diode triode valve (**V3**, Mullard metallised **TDD2A**). Audio frequency component in rectified output is developed across load resistance **R6** and passed via AF coupling condenser **C13** and manual volume control **R7** to CG of triode section, which operates as AF amplifier. IF filtering by **C11**, **R5**, **C12** between **L17** and **R6**, and by **C15** from triode anode to chassis.

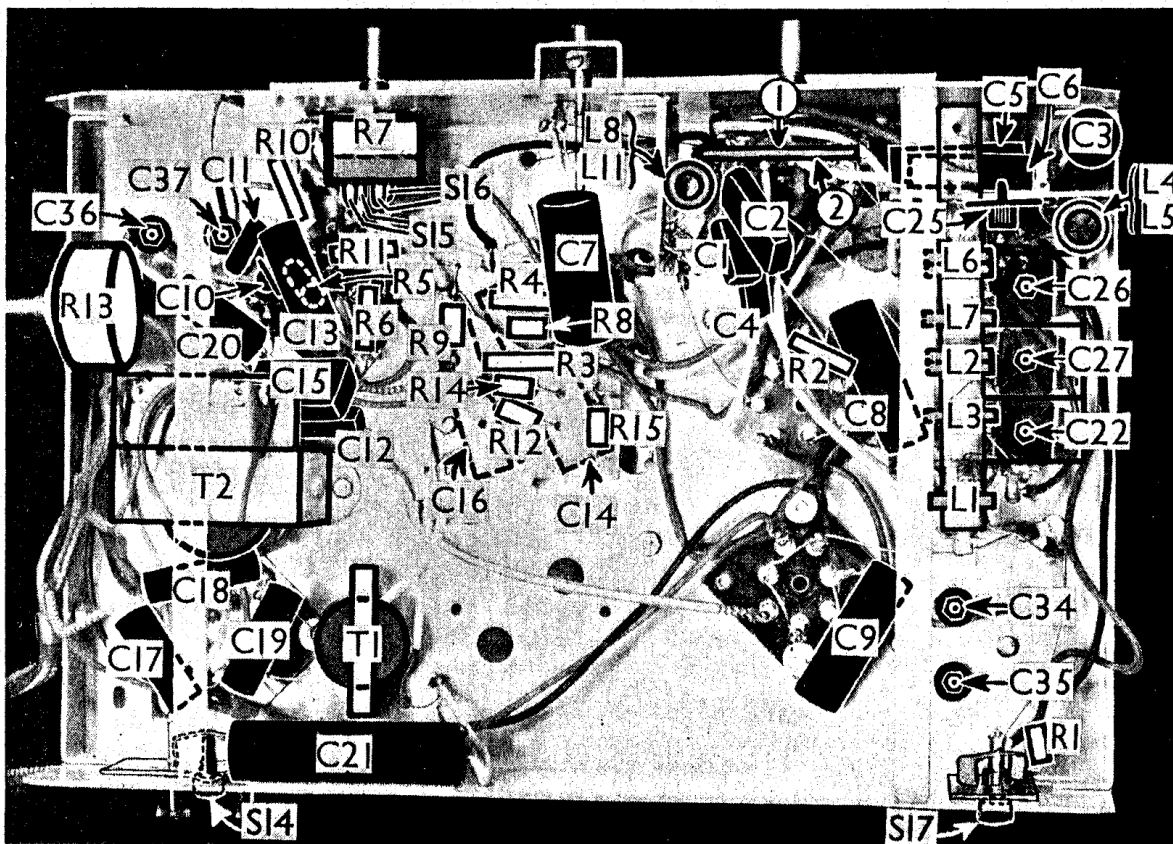
HT feed for **V1** and **V2** screens and **V3** triode anode is via **R8** from HT positive line, other anode circuits being connected directly to HT positive line.

Second diode of **V3**, fed from **V2** anode via **C10**, provides DC potential which is developed across load resistance **R10** and fed back via decoupling circuit **R11**, **C3** as GB to FC and IF valves, giving automatic volume control.

Parallel-fed transformer coupling by **R9**, **C16** and **T1** between **V3** triode and quiescent push-pull output valve (**V4**, Mazda **QP230**). Fixed tone correction by condensers **C17**, **C18**, one between each anode and chassis, and **C19** connected between the two anodes. Variable tone control by **C20**, **R13**, also connected between the two anodes. Provision for

It is regretted that permission to publish the circuit diagram is still not obtainable, but sufficient information is given to enable any competent engineer to effect repairs.

A SHORT-WAVE range of 15-52 m is covered by the Ekco BAW69 3-band battery superhet. The receiver uses an octode frequency changer, while the output stage employs a double-pentode QPP valve. A sensitivity switch is included. Provision is made for an extension speaker, and the internal speaker can be cut out of circuit when desired.



Under-chassis view of the BAW69. The wave change switch unit is double-sided, and detailed diagrams of it are on page iv. All the trimmers, except those on and near the gang condenser, are seen in this illustration. **S14** and **S17** are screw-type switches.

COMPONENTS AND VALUES

CONDENSERS	Values (μF)
C1	Aerial MW coupling .. 0.001
C2	Band-pass pri. LW shunt (SW and MW only) .. 0.00012
C3	V1 hexode CG decoupling .. 0.1
C4	V1 osc. CG condenser .. 0.00005
C5	Osc. circuit MW tracker .. 0.002
C6	Osc. circuit LW tracker .. 0.0008
C7	HT circuit RF by-pass .. 0.1
C8	V1 SG decoupling .. 0.1
C9	V2 SG decoupling .. 0.1
C10	Coupling to V3 AVC diode .. 0.000015
C11	IF by-pass condensers .. 0.0002
C12	AF coupling to V3 triode .. 0.01
C13	V3 triode anode and V1, V2 SG's decoupling .. 4.0

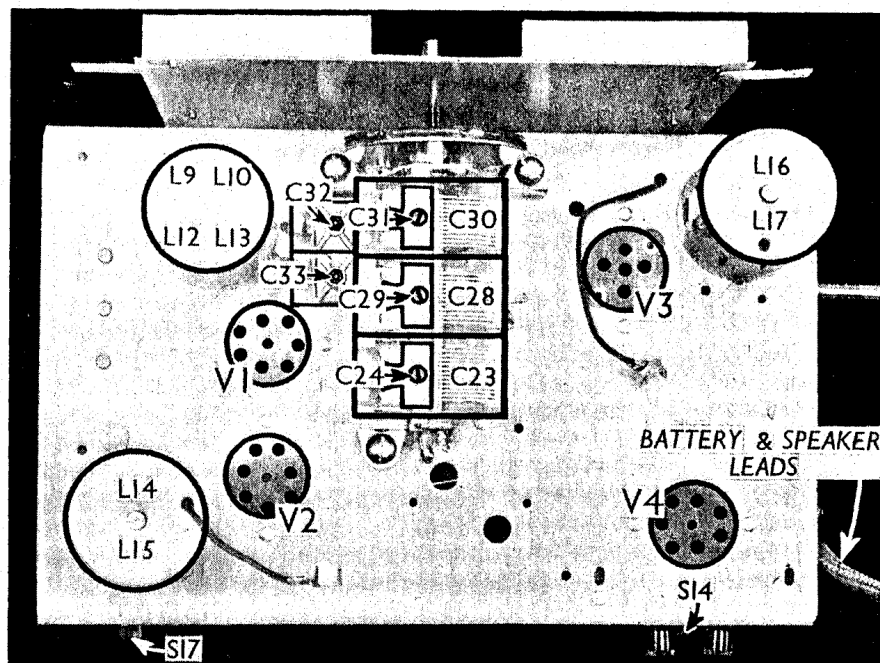
C15	IF by-pass .. 0.0003
C16	AF coupling to T1 .. 0.1
C17	V4 anodes circuit fixed tone correctors .. 0.005
C18	.. 0.005
C19	.. 0.003
C20	Part of variable tone control .. 0.02
C21*	HT circuit reservoir .. 10.0
C22†	Band-pass pri. LW trimmer .. —
C23†	Band-pass pri. tuning .. —
C24†	Band-pass pri. MW trimmer .. —
C25†	Image suppressor .. —
C26†	Band-pass sec. MW trimmer .. —
C27†	Band-pass sec. LW trimmer .. —
C28†	Band-pass sec. and SW aerial tuning .. —
C29†	Aerial circuit SW trimmer .. —
C30†	Oscillator circuit tuning .. —
C31†	Osc. circuit SW trimmer .. —
C32†	Osc. circuit MW trimmer .. —
C33†	Osc. circuit LW trimmer .. —
C34†	1st IF trans. pri. tuning .. —

C35†	1st IF trans. sec. tuning .. —
C36†	2nd IF trans. pri. tuning .. —
C37†	2nd IF trans. sec. tuning .. —

* Electrolytic. † Variable. ‡ Pre-set.

connection of low impedance external speaker across secondary of output transformer **T2**, while switch **S14**, in internal speaker speech coil circuit, permits the latter to be muted.

Potentials are automatically developed across resistances **R14**, **R15** in negative HT lead to chassis to provide GB for **V4** (across both resistances) and at their junction GB for **V3** triode, minimum GB for **V1**, **V2** and AVC delay.



Plan view of the chassis. Five of the trimmers are indicated, the remainder being beneath the chassis.

RESISTANCES		Values (ohms)
R1	Aerial sensitivity shunt	200
R2	V1 osc. CG resistance	50,000
R3	V1 SG HT feed	70,000
R4	V2 SG HT feed	175,000
R5	IF stopper	75,000
R6	V3 signal diode load	500,000
R7	Manual volume control	850,000
R8	V3 triode anode and V1, V2 SG's decoupling	6,000
R9	V3 triode anode load	50,000
R10	V3 AVC diode load	750,000
R11	AVC line decoupling	1,000,000
R12	V4 CG's decoupling	100,000
R13	Variable tone control	50,000
R14	V3 triode and V4 GB; V1, V2 fixed GB; AVC delay,	750
R15	potential divider	75

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial LW coupling coil and part L3	27.0
L2	Band-pass primary coils	2.5
L3		26.0
L4	Aerial SW coupling coil	0.4
L5	Aerial SW tuning coil	0.05
L6	Band-pass secondary coils	2.6
L7		26.0
L8	Osc. circuit SW tuning coil	0.05
L9	Osc. circuit MW tuning coil	8.5
L10	Osc. circuit LW tuning coil	18.0
L11	Oscillator SW reaction	0.6
L12	Oscillator MW reaction	2.25
L13	Oscillator LW reaction	3.0
L14	1st IF trans.	Pri. 70.0
L15		Sec. 75.0
L16	2nd IF trans.	Pri. 70.0
L17		Sec. 75.0
L18	Speaker speech coil	3.0
T1	Intervalve trans.	Pri. 370.0
		Sec., total 3,000.0
T2	Output trans.	Pri., total 1,350.0
		Sec. 0.3
S1-S13	Waveband switches	—
S14	Speaker switch	—
S15	HT circuit switch	—
S16	LT circuit switch	—
S17	Sensitivity switch	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new HT battery reading 140 V overall, on load. The receiver was tuned to the lowest wavelength on the medium 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 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 FC2A ..	125 oscill	0.35	50	0.9
V2 VP2B ..	125	2.9	—	—
V3 TDD2A ..	125	1.15	35	0.5
V4 QP230 ..	72	0.6	—	—
	125†	2.45†	125	1.2

† Each anode.

GENERAL NOTES

Switches.—S1-S13 are the waveband switches, in a double-sided rotary unit beneath the chassis. The sides are marked 1 and 2 in the under-chassis view, and diagrams of them are given in detail on page 14.

The table (p. 14) gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and C closed.

S14 is the internal speaker switch of the screw type, operated by a small knob at the rear of the chassis. When this is unscrewed, the internal speaker speech coil circuit is broken.

S15, S16 are the QMB battery circuit switches, ganged with the volume control, R7.

S17 is the screw-type sensitivity switch, operated by a small knob at the rear of the chassis. When it is screwed up, S17 is closed, and connects R1 across the aerial circuit, thus reducing the sensitivity.

Coils.—L1, L2, L3, L6, L7 are in a single unscreened unit beneath the chassis, while L4, L5 and L8, L11 are on two moulded tubular formers, also beneath the chassis. L4 and L11 are interwound with L5 and L8 respectively.

L9, L10, L12, L13 and the IF transformers L14, L15 and L16, L17 are in three screened units on the chassis deck. The trimmers for these are reached from beneath the chassis.

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (2.5-4 Ω) external speaker. S14 cuts out the internal speaker if desired.

Condenser C20.—This is given by the makers as 0.01 μF but is 0.02 μF in our chassis.

Condenser C2.—This is given as 12 μF in the makers' information, but is 0.00012 μF (120 μF) in our chassis.

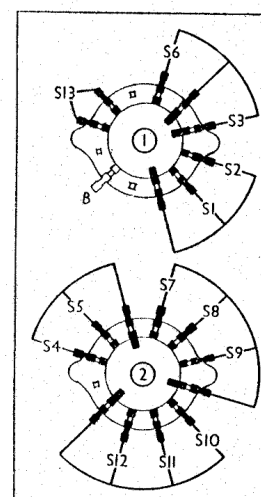
Batteries.—Recommended types are: I.T. 2 V 20-40 AH cell, Exide CZ3, CZH3; Pertrix SU24, PXC2; Hellensens T300, Ever Ready T300, Y2/30; Dagenite PM7.

HT, 135 V dry battery, Drydex H1131; Pertrix 494; Hellesens A230; Ever Ready Portable 53, Siemens 1,314. No GB battery is used.

Battery Leads and Voltages.—Black lead, spade tag, LT negative; red/white lead, spade tag, LT positive 2 V; brown lead, white plug, HT negative; red lead and plug, HT positive 135 V.

SWITCH TABLE AND DIAGRAMS

Switch	LW	MW	SW
S1	—	—	C
S2	—	C	—
S3	—	C	C
S4	—	C	—
S5	C	—	—
S6	—	C	—
S7	—	—	C
S8	—	C	—
S9	C	—	—
S10	—	—	C
S11	—	C	—
S12	C	—	—
S13	—	—	C



Diagrams of the single switch unit, as seen from the front and rear of the chassis.

CIRCUIT ALIGNMENT

IF Stages.—Turn gang to maximum, volume control to maximum, and switch set to LW. Connect signal generator via a 0.02 μF condenser to grid (top cap) of V1 and chassis, and feed in a 126.5 KC/S signal. Adjust C34, C35, C36, C37 for maximum output. Repeat these adjustments.

RF and Oscillator Stages.—With gang fully closed, set pointer to datum line (horizontal) on scale. Connect signal generator to A and E sockets.

SW.—Switch set to SW, and set pointer to 15 MC/S mark on scale, feed in a 15 MC/S (20 m) signal, and adjust C31 for maximum output, choosing the peak involving the least trimmer capacity. Then adjust C29 for maximum output.

MW.—Switch set to MW. Adjust C25 to minimum capacity. Tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust C32 for maximum

output. Tune to 250 m on scale, feed in a 250 m (1,200 KC/S) signal, and adjust C24 and C26 for maximum output. Now feed in a fairly strong 850 KC/S (352 m) signal, and tune in its image (at about 500 m). Adjust C25 for minimum output.

LW.—Switch set to LW and tune to 1,200 m on scale. Feed in a 1,200 m (250 KC/S) signal, and adjust C33, then C27 and C22, for maximum output.