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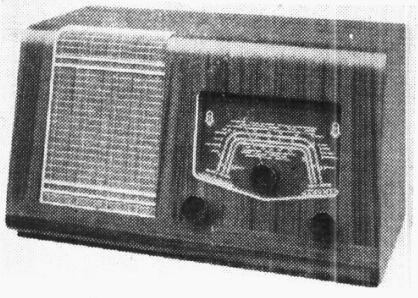
"TRADER" SERVICE SHEET

541

K-B 800

BATTERY SUPERHET



The K-B 800 receiver.

THE Kolster-Brandes 800 receiver is a 4-valve 3-band battery superhet. Red indicator pointers are fitted to all controls.

Release date: March, 1940.

CIRCUIT DESCRIPTION

Aerial input developed across shunt resistance **R1** appears also across the series **C1, L1, C2** which forms a potential divider. The condensers have a negligible impedance on SW, and the coil **L1** on MW and LW, and thus the input is fed to single tuned circuits **L2, C20** (SW) **L3, C20** (MW) and **L4, C20** (LW).

First valve **(V1, Mullard metallised TH2)** is a triode hexode operating as frequency changer with internal coupling. Triode grid coils **L5** (SW), **L6** (MW) and **L7** (LW) are tuned by **C21.** Parallel trimming by **C22** (SW), **C23** (MW) and **C24** (LW); series tracking by **C25** (MW) and **C7** (LW). Reaction coupling by **L8** (SW) and common impedance of **C25** (MW and LW).

Second valve **(V2, Mullard metallised VP2B)** is an RF hexode operating as IF amplifier with tuned-primary, tuned-secondary transformer couplings **C26, L9, L10, C27** and **C28, L11, L12, C29.**

Intermediate frequency 464 KC/S.

Diode second detector is part of double diode triode valve **(V3, Mullard metallised TDD2A).** Audio frequency component in rectified output is developed across load resistor **R8** and passed via **C12** and manual volume control **R9** to CG of triode section. IF filtering by **C10, R7.**

Second diode of **V3,** fed from **V2** anode via **C11,** provides DC potential which is developed across load resistance **R12** and fed back through decoupling circuits as GB to FC and IF valves, giving automatic volume control.

Parallel-fed auto-transformer coupling by **R10, C13** and **T1** between **V3** triode and pentode output valve **(V4, Mullard PM22A).** Fixed tone correction by **C14** in anode circuit.

Fixed GB potential for **V1** and **V2** (via **R12, R11),** GB for **V4** and AVC delay are obtained automatically from drop along **R13, R14,** which form a potential divider in negative HT lead to chassis.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those to be expected when the receiver is operating with no signal input and the volume control at maximum. Voltage readings should be taken with a high-resistance meter, whose negative lead is connected to chassis.

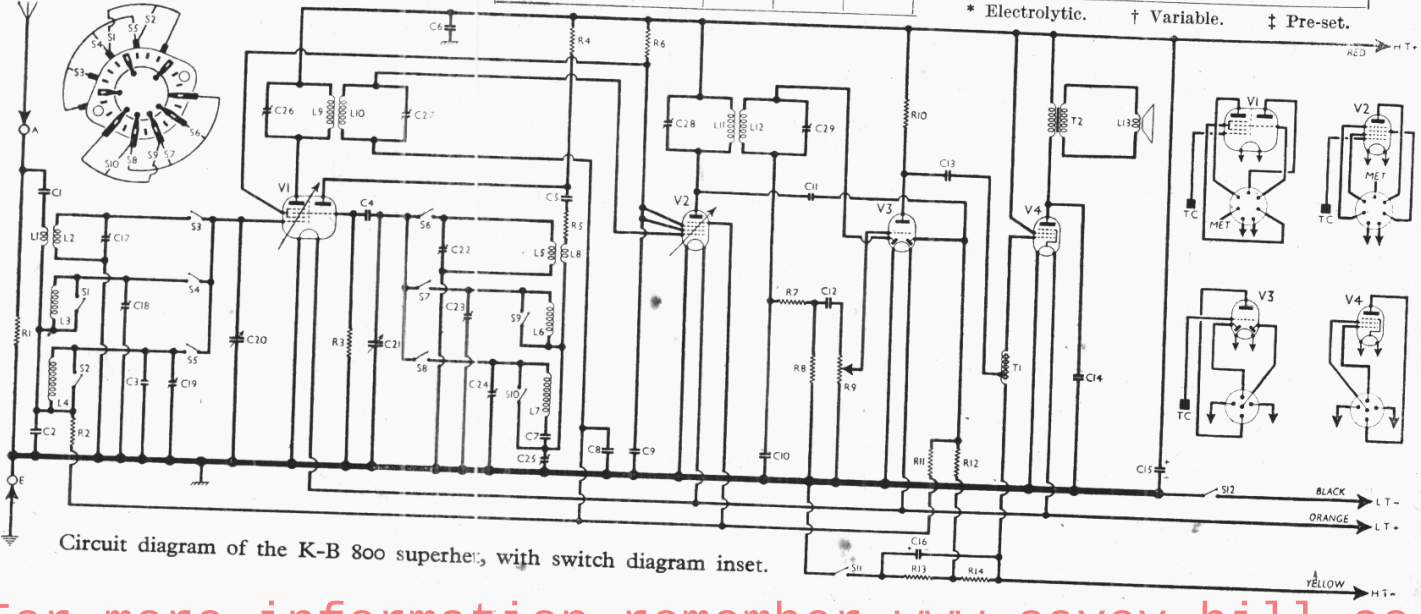
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH2	129	1·2	52	0·8
	Oscillator			
	55	3·0		
V2 VP2B	129	1·5	52	0·6
V3 TDD2A	45	0·7	—	—
V4 PM22A	128	2·0	129	0·3

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	Aerial circuit shunt ...	5,000
R2	V1 CG decoupling ...	500,000
R3	V1 osc. CG resistance ...	50,000
R4	V1 osc. anode HT feed ...	20,000
R5	Osc. reaction damping ...	50
R6	V1, V2 SG's HT feed ...	30,000
R7	IF stopper...	50,000
R8	V3 signal diode load ...	500,000
R9	Manual volume control ...	1,000,000
R10	V3 triode anode load ...	250,000
R11	AVC line decoupling ...	500,000
R12	V3 AVC diode load ...	250,000
R13	V1, V2, V4 GB and AVC	200
R14	delay resistances ...	400

	CONDENSERS	Values (μF)
C1	Aerial coupling potential	0·005
C2	divider	0·005
C3	Aerial LW fixed trimmer	0·000025
C4	V1 osc. CG condenser ...	0·0001
C5	V1 osc. anode coupling ...	0·01
C6	HT circuit RF by-pass ...	0·1
C7	Osc. circ. LW tracker ...	0·00023
C8	V2 CG decoupling ...	0·1
C9	V1, V2 SG's decoupling ...	0·1
C10	IF by-pass	0·0005
C11	Coupling to V3 AVC diode	0·000025
C12	AF coupling to V3 triode	0·01
C13	AF coupling to T1 ...	0·01
C14	Fixed tone corrector ...	0·005
C15*	HT reservoir condenser ...	2·0
C16*	Auto GB circuit by-pass...	25·0
C17‡	Aerial circuit SW trimmer	—
C18‡	Aerial circuit MW trimmer	—
C19‡	Aerial circuit LW trimmer	—
C20†	Aerial circuit tuning ...	—
C21†	Oscillator circuit tuning...	—
C22‡	Osc. circ. SW trimmer ...	—
C23‡	Osc. circ. MW trimmer ...	—
C24‡	Osc. circ. LW trimmer ...	—
C25‡	Osc. circ. MW tracker ...	—
C26‡	1st IF trans. pri. tuning ...	—
C27‡	1st IF trans. sec. tuning...	—
C28‡	2nd IF trans. pri. tuning...	—
C29‡	2nd IF trans. sec. tuning...	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the K-B 800 superhet, with switch diagram inset.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil	...	0·3
L2	Aerial SW tuning coil	...	Very low
L3	Aerial MW tuning coil	...	2·5
L4	Aerial LW tuning coil	...	34·0
L5	Osc. circ. SW tuning	...	Very low
L6	Osc. circ. MW tuning	...	5·25
L7	Osc. circ. LW tuning	...	16·5
L8	Osc. SW reaction	...	42·0
L9	1st IF trans. Pri.	...	7·5
L10	1st IF trans. Sec.	...	7·5
L11	2nd IF trans. Pri.	...	7·5
L12	2nd IF trans. Sec.	...	5·0
L13	Speaker speech coil	...	4·0
T1	Intervalve auto-trans, total	...	3,500·0
T2	Speaker input trans. Pri.	...	500·0
	Speaker input trans. Sec.	...	0·4
S1-S10	Waveband switches	...	—
S11	HT circuit switch	...	—
S12	LT circuit switch	...	—

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws); remove the two round-head wood screws holding the scale panel to the front of the cabinet; remove the four screws (with lock-washers and claw washers) holding the chassis to the bottom of the cabinet.

Chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free chassis entirely, unsolder from the speaker input transformer the two leads connecting it to chassis.

When replacing, connect the red speaker lead to the upper tag on the transformer, and the blue lead to the lower tag.

Do not omit to replace the felt washer, which should fit on the tuning control spindle, between the pointer and the window.

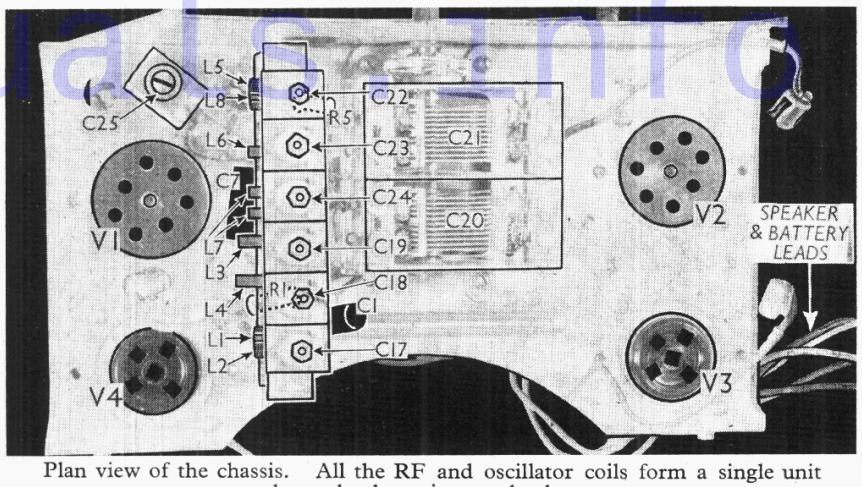
A metal washer should be fitted to each of the front chassis fixing screws, between the chassis and the bottom of the cabinet.

Removing Speaker.—Unsolder the two connecting leads, and remove the four round-head wood screws (with fibre washers) holding the speaker to the sub-baffle.

When replacing, the transformer should be on the left, and the leads should be connected as described above.

GENERAL NOTES

Switches.—S1-S10 are the waveband switches, in a single, double-sided rotary unit beneath the chassis. A diagram showing the unit in detail is inset in the top left-hand corner of the circuit diagram, where it is viewed in the direction indicated by the arrow in our under-chassis view. The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control. A dash indicates open, and **C**, closed.



Plan view of the chassis. All the RF and oscillator coils form a single unit beneath the trimmer bank.

Switch Table

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

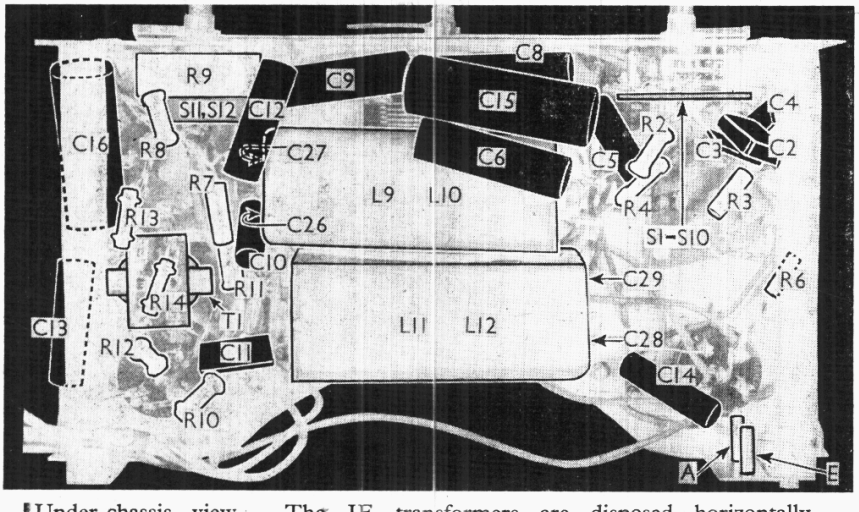
Coils.—All the RF and oscillator coils **L1-L8** are in a single tubular unit mounted horizontally across the chassis deck beneath the trimmer assembly. The IF transformers **L9, L10** and **L11, L12** are in two screened units with their associated trimmers, mounted horizontally beneath the chassis.

External Speaker.—No provision is made for this, but a high impedance (about 20,000 Ω) type could conveniently be connected to the primary tags of the input transformer **T1.**

Batteries and Leads.—The batteries recommended by the makers are: LT, Exide type GFG4C 2V accumulator cell; HT, Drydex type H1131 135V battery; GB is automatic. Black lead, spade tag, is LT−; orange lead, spade tag, is LT+ 2V. Yellow lead, black plug, is HT−; red lead, red plug, is HT+ 135V.

Condenser C15.—This is a 2 μF Plessey tubular electrolytic condenser rated at 250V working, 325V surge.

Condenser C16.—This is a 25 μF Plessey tubular condenser rated at 25V working, 35V surge.



Under-chassis view. The IF transformers are disposed horizontally side by side in the centre. The switch unit appears in detail in the diagram inset in the top left corner of the circuit diagram overleaf.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator via a 0.1 μF condenser to control grid (top cap) of **V1** and chassis, turn the volume control to maximum, switch set to MW and adjust pointer to 580 m on scale. Feed in a 464 KC/S (646.55 m) signal, and adjust **C26, C27, C28** and **C29** for maximum output.

RF and Oscillator Stages.—With the gang at maximum, the pointer should be horizontal. Transfer signal generator leads to **A** and **E** sockets via a suitable dummy aerial.

MW.—Switch set to LW, tune to 1,200 m on scale, feed in a 1,200 m (250 KC/S) signal, and adjust **C24** roughly. Tune to 1,714 m (spot on scale), feed in a 1,714 m 175 KC/S) signal, and adjust **C25** roughly. Switch set to MW, tune to 214 m (spot on scale), feed in a 214 m (1,400 KC/S) signal, and adjust **C23,** then **C18,** for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust **C25** for maximum output, while rocking the gang for optimum results. Repeat the 214 m adjustment.

LW.—Switch set to LW, tune to 1,200 m on scale, feed in a 1,200 m (250 KC/S) signal, and adjust **C24,** then **C19,** for maximum output.

SW.—Switch set to SW, insert a 400 Ω resistance as a dummy aerial in the signal generator lead, tune to 20 m (spot on scale), feed in a 20 m (15 MC/S) signal, and adjust **C22,** then **C17,** for maximum output.

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