

'TRADER' SERVICE SHEET

161

# K-B MODEL 580

## 4-VALVE BATTERY SUPERHET

**V**ARIABLE selectivity is provided in the Kolster-Brandes 580 4-valve battery operated superhet, and the tuning condenser and wave-change switch are operated by a single knob.

**CIRCUIT DESCRIPTION**

Two alternative aerial input connections **A1** and **A2** (with series resistance **R1** for local station reception) to choke coils **L1, L2** which are coupled by small condenser **C1** to capacity-coupled band-pass filter. Primary **L3, L4**, tuned by **C15**; secondary **L5, L6**, tuned by **C18**; coupling by **C2** and **C29**. (See "General Notes.")

First valve (**V1, Mullard metallised FC2**) is an octode operating as electron-coupled frequency changer. Oscillator grid coils **L8, L9** tuned by **C21**; trimming by **C20** (M.W.) and **C22** (L.W.); tracking by series condensers **C23** (L.W.) and **C5, C24** (M.W.); oscillator anode reaction coils **L10, L11**.

Second valve, a variable- $\mu$  H.F. pentode (**V2, Mullard metallised VP2**) operates as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C25, L12, L13, C26** and **C27, L14, L15, C28**. The second transformer is so arranged that the coupling between its primary and secondary windings can be varied in order to provide variable selectivity.

**Intermediate frequency 130 KC/S.**

Diode second detector is part of double diode triode (**V3, Mullard metallised TDD2A**). Audio-frequency component in rectified output is developed across load **R7** and passed via coupling condenser **C10** and manual volume control **R9** to C.G. of triode section which operates as L.F. amplifier. I.F. filtering by stopper **R8** and by-passes **C7, C8**. Two-point

tone control by C.G. circuit shunt condenser **C9** and switch **S7** which is ganged with variable selectivity control. Provision for connection of gramophone pick-up; plug and socket arrangement cuts out radio.

D.C. potential in rectified output from diode is fed back through decoupling circuit **R6, C6** as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacity coupling by **R10, C12** and **R11** between **V3** triode and output pentode valve (**V4, Mullard PM22A**). Tone correction in anode circuit by fixed condenser **C13**.

CONDENSERS (Continued)		Values ( $\mu$ F)
C15†	Band-pass pri. tuning...	0.0005
C16†	Band-pass pri. M.W. trimmer	—
C17†	Band-pass sec. L.W. trimmer	—
C18†	Band-pass sec. tuning	0.0005
C19†	Band-pass sec. M.W. trimmer	—
C20†	Oscillator M.W. trimmer	—
C21†	Oscillator tuning	0.0005
C22†	Oscillator L.W. trimmer	—
C23†	Oscillator L.W. tracker	—
C24†	Oscillator M.W. tracker	—
C25†	1st I.F. trans. pri. tuning	—
C26†	1st I.F. trans. sec. tuning	—
C27†	2nd I.F. trans. pri. tuning	—
C28†	2nd I.F. trans. sec. tuning	—
C29	Band-pass top coupling	Very low

\* Electrolytic. † Variable. ‡ Pre-set.

**COMPONENTS AND VALUES**

RESISTANCES		Values (ohms)
R1	Aerial series resistance	100,000
R2	V1 pent. C.G. decoupling	100,000
R3	V1 S.G.'s H.T. feed	50,000
R4	V1 osc. C.G. resistance	50,000
R5	Osc. M.W. reaction coil shunt	20,000
R6	A.V.C. line decoupling	500,000
R7	V3 diode load	500,000
R8	I.F. stopper	100,000
R9	Manual volume control	500,000
R10	V3 triode anode load	50,000
R11	V4 C.G. resistance	500,000
R12	V4 C.G. I.F. stopper	100,000

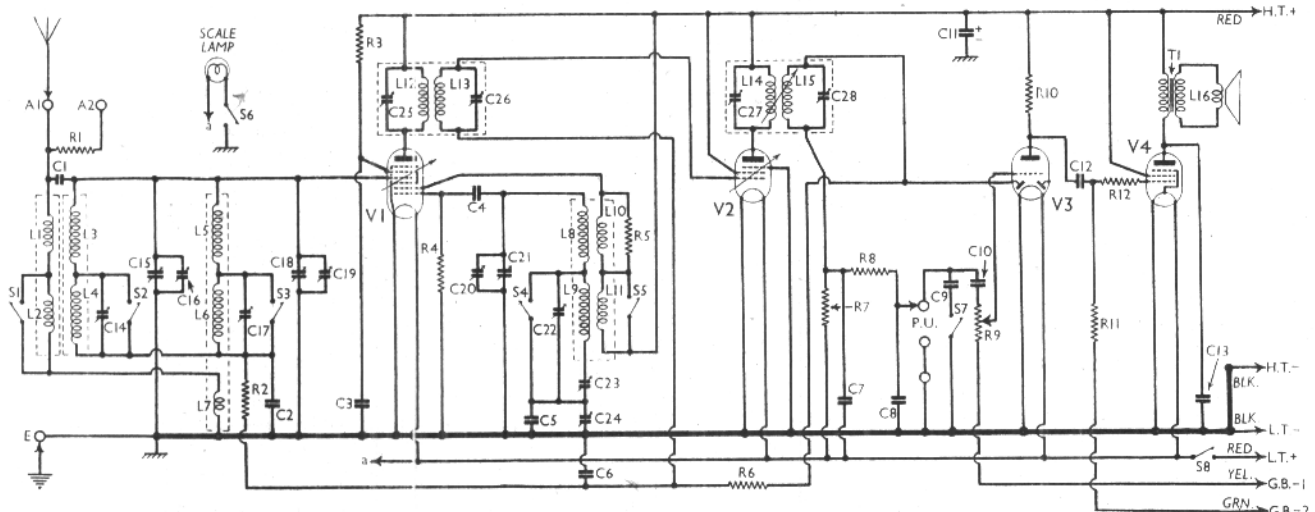
CONDENSERS		Values ( $\mu$ F)
C1	Capacitive aerial coupling	0.000018
C2	Band-pass coupling	0.01
C3	V1 S.G.'s by-pass	0.1
C4	V1 osc. C.G. condenser	0.0001
C5	Oscillator M.W. tracker, fixed	0.001
C6	A.V.C. line decoupling	0.1
C7	I.F. by-passes	0.0002
C8	I.F. by-passes	0.0001
C9	Tone control condenser	0.001
C10	L.F. coupling to V3 triode	0.02
C11*	H.T. supply reservoir	2.0
C12	V3 to V4 L.F. coupling	0.02
C13	Tone corrector	0.0005
C14†	Band-pass pri. L.W. trimmer	—

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial circuit coils	8.5
L2	Aerial circuit coils	29.0
L3	Band-pass primary coils	3.5
L4	Band-pass primary coils	10.0
L5	Band-pass secondary coils	3.5
L6	Band-pass secondary coils	10.0
L7	Image rejection coil	0.05
L8	Oscillator tuning coils	3.7
L9	Oscillator tuning coils	13.0
L10	Oscillator reaction coils	5.7
L11	Oscillator reaction coils	7.2
L12	1st I.F. trans. Pri.	70.0
L13	1st I.F. trans. Sec.	70.0
L14	2nd I.F. trans. Pri.	70.0
L15	2nd I.F. trans. Sec.	70.0
L16	Speaker speech coil	3.7
T1	Speaker input trans. Pri.	850.0
	Speaker input trans. Sec.	0.05
S1-S5	Waveband switches	—
S6	Scale lamp switch	—
S7	Tone control switch	—
S8	L.T. circuit switch	—

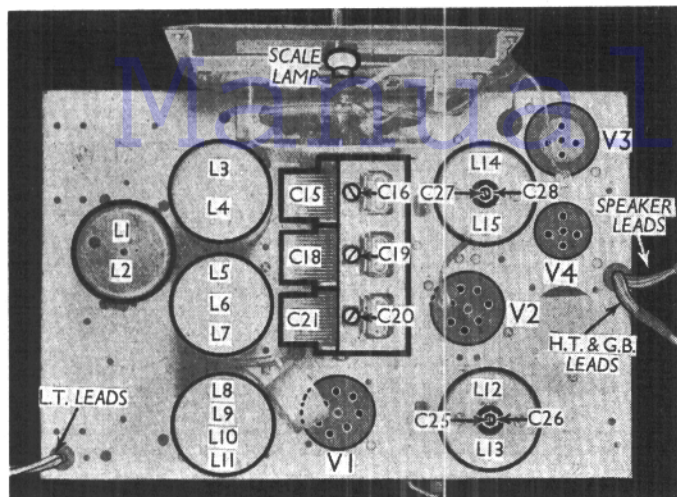
**DISMANTLING THE SET**

A detachable bottom is fitted to the cabinet and upon removal (four counter-sunk-head wood screws) gives access to most of the under-chassis components.

**Removing Chassis.**—Remove the three control knobs (recessed grub screws)



Circuit diagram of the K-B 580 4-valve battery superhet. A plug and socket device mutes radio when using a pick-up.



Plan view of the chassis. The I.F. trimmers are of the concentric type, the screws adjusting the primary windings and the nuts the secondaries.

and the two bolts (with lock and claw washers) and the four bolts (with lock washers and rubber washers) holding chassis to cabinet bottom. Now free battery and speaker leads from cleats on sides of cabinet, when chassis can be withdrawn to extent of speaker leads, which is sufficient for normal purposes. When replacing, do not forget to replace rubber washers between the chassis and cabinet bottom.

To free chassis entirely, unsolder speaker leads. When replacing, connect red and blue leads to top two tags on transformer terminal panel. Black lead goes to transformer frame.

**Removing Speaker.**—Remove nuts and lock washers from the four bolts holding it to sub-baffle. When replacing, see that transformer is on right.

**VALVE ANALYSIS**

Readings of valve voltages and currents given below are those measured in our receiver when it was operating from an H.T. battery reading 130 V, with 4½ V on G.B.—2. The set 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 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 FC2*	130	1.7	62	1.2
V2 VP2	130	1.9	130	0.6
V3 TDD2A	85	0.7	—	—
V4 PM22A	122	5.2	130	1.1

\* Oscillator anode (G2) 130 V, 1.5 mA.

**GENERAL NOTES**

**Switches.**—S1-S5 are the waveband switches in a single unit beneath the chassis. They are operated by pushing in the tuning knob, and then rotating. All the switches are closed on the M.W. band and open on the L.W. band.

S6 is the scale lamp switch, and S7 the tone control switch, ganged together and operated by a metal arm on the selectivity control spindle. When this spindle is turned fully clockwise (maximum selectivity) S6 and S7 are closed.

S8 is the Q.M.B. L.T. switch, ganged with the volume control R9.

**Coils.**—L1-L11 are in four screened units on the chassis deck, while L12, L13 and L14, L15 are the I.F. transformers in two further screened units, which also contain the I.F. trimmers. In L14, L15, variable coupling is arranged to provide a form of selectivity control, operated by the left-hand control knob.

**Pick-up Arrangements.**—At the rear of the chassis there is a plug and 3-socket device. For radio, the plug should be in the bottom socket. For gramophone, the plug is placed in the right-hand socket, and a pick-up plugged into the two vacant sockets.

**Scale Lamp.**—This is a low consumption M.E.S. type, marked "2.5 V." It only lights when the left-hand control is fully clockwise.

**External Speaker.**—A low resistance (about 4 Ω) speaker can be connected across the second and third (from the bottom) tags on the internal speaker terminal strip. To arrange for cutting out the internal speaker, remove the wire bridging the bottom and next to bottom

tags, and insert a suitable on-off switch.

**Batteries.**—L.T., Exide type GFG4 2 V cell; H.T. and G.B., Drydex H1123.

**Battery Leads and Voltages.**—Black lead, spade tag, L.T. negative; Red lead, spade tag, L.T. positive 2 V; Black lead and plug, H.T. negative and G.B. positive; Red lead and plug, H.T. positive 130 V socket; Yellow lead, black plug, G.B. negative 1, 1.5 V; Green lead, black plug, G.B. negative 2, 4.5 to 7.5 V.

**Condenser C1.**—This is formed of an enamelled wire wound in spiral form over a short length of insulated wire.

**Condenser C29.**—This is a very small condenser, formed by twisting the wires leading from the top tags of C14 and C17 to two of the coil units. It is indicated in an under-chassis view, but not in the circuit diagram.

**Trimmers C23, C24.**—These are adjusted by a concentric nut and screw, reached through a hole in the rear of the chassis. The screw adjusts C23, and the nut, C24.

**Resistance R6.**—This is enclosed in a length of insulating sleeving.

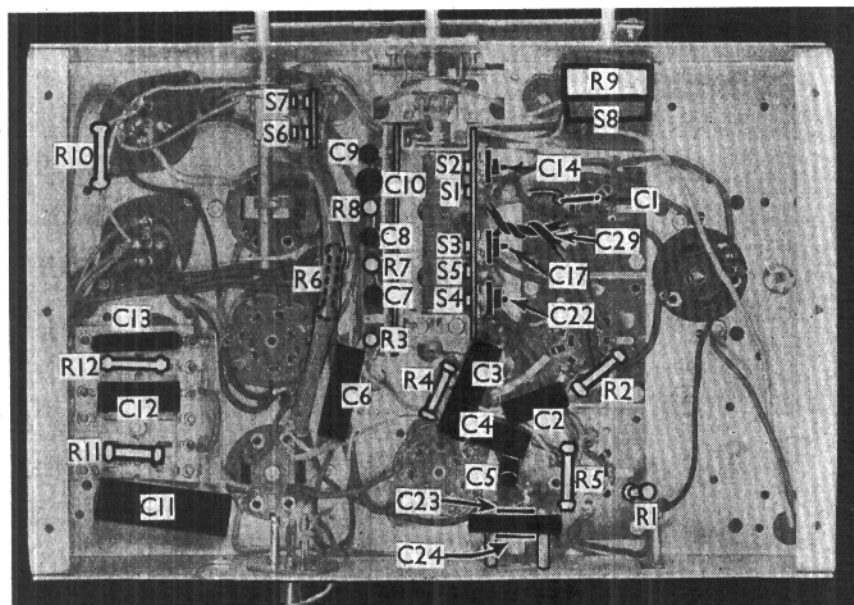
**CIRCUIT ALIGNMENT**

**I.F. Stages.**—Feed in a 130 KC/S signal between top cap of V1 and chassis, and adjust C28, C27, C26 and C25 for maximum output. The selectivity control should be in the maximum selectivity position (fully clockwise).

**H.F. and Oscillator Stages.**—Switch set to M.W., set scale pointer to 214 m., inject a 214 m. signal between A1 and E sockets, and adjust C20, C19 and C16 for maximum output.

Tune receiver to 500 m., feed in a 500 m. signal, and adjust C24 for maximum output, rocking the gang slightly for optimum results.

Switch set to L.W., tune to 1000 m., on scale and inject a 1,000 m. signal. Adjust C22, C17 and C14 for maximum output. Now tune to 1,714 m. (175 KC/S), feed in a 1,714 m. signal, and adjust C23 for maximum output, rocking the gang as before.



Under-chassis view. C1 and C29 are two very small condensers (see General Notes).