

**'TRADER' SERVICE SHEETS**

NUMBER THIRTY  
(VOLUME TWO)

**KOLSTER-BRANDES**

**K-B 381 UNIVERSAL SUPERHET**

THE K-B 381 is a 4-valve (plus rectifier) super-heterodyne table model of the universal A.C./D.C. type, and it is suitable for use with any mains supply having a voltage between 195 and 255. As usual with many K-B receivers, provision is made for the attachment of the "Rejcostat" anti-interference aerial system.

**CIRCUIT DESCRIPTION**

Aerial input by way of coupling coil L1 to mixed-coupled band-pass filter. Primary L2, L3 tuned by C23; secondary L4, L5 tuned by C25; coupling coil L6. First valve V1, Brimar 15D1 or Cossor 13PGA is a heptode (pentagrid) functioning as frequency-changer with electron coupling. Oscillator grid coils L7, L8 tuned by C27; oscillator anode coils L9, L10; tracking by pre-set condensers C29 and C30.

One variable-mu pentode intermediate frequency amplifier (V2, Brimar 9D2 or Cossor 13VPA) with tuned-primary tuned-secondary transformer couplings L11, L12 and L13, L14. I.F. 130KC S.

Half-wave diode second detector forming part of double diode triode (V3, Brimar 11D3 or Cossor 13DHA). Second diode provides steady potential, developed across resistance R14, which is applied by way of decoupling circuits as G.B. to V1 and V2, thus giving automatic volume control. L.F. output from rectifier diode is passed by way of coupling condenser C10 and manual volume control R10 to grid of triode section which operates as first L.F. amplifier.

Resistance-capacity coupling to output pentode (V4, Brimar 7D3 or Cossor 40PPA). Fixed tone correcting condenser C18 in anode circuit.

When the receiver is used with A.C.

mains, H.T. current is supplied by a half-wave rectifying valve (V5, Brimar 1D5 or Cossor 40SUA). With D.C. mains, the valve behaves as an ordinary resistance of low value. Smoothing by speaker field winding L17, additional L.F. choke L16, and large capacity dry electrolytic condensers C16, C20, C21 and C22.

Heaters of valves are connected in series with tapped ballast resistance R18 across mains supply, and dial lamps are connected across a section of the resistance. The mains input circuit includes safety switches S6 and S7, and choke coils L18, L19 for suppression of interference from the mains.

**DISMANTLING THE SET**

Since in this receiver the chassis is not necessarily at earth potential, precautions have been taken to prevent the possibility of the user coming into contact with the chassis or metal parts attached to it. If the back of the set is removed, and the sheet of cardboard under the chassis slid out, most of the pre-set condensers and the dial lamps can be reached through holes in the base of the cabinet.

**Removing Chassis.**—Remove the back of the cabinet, and the cardboard beneath the chassis. Remove the two black-finished wooden strips beneath cabinet (3 wood screws each). These disclose

four slotted screws holding chassis. Remove these, with their lock washers and large spiked flat washers. When replacing, the spikes should embed in the wood of the cabinet.

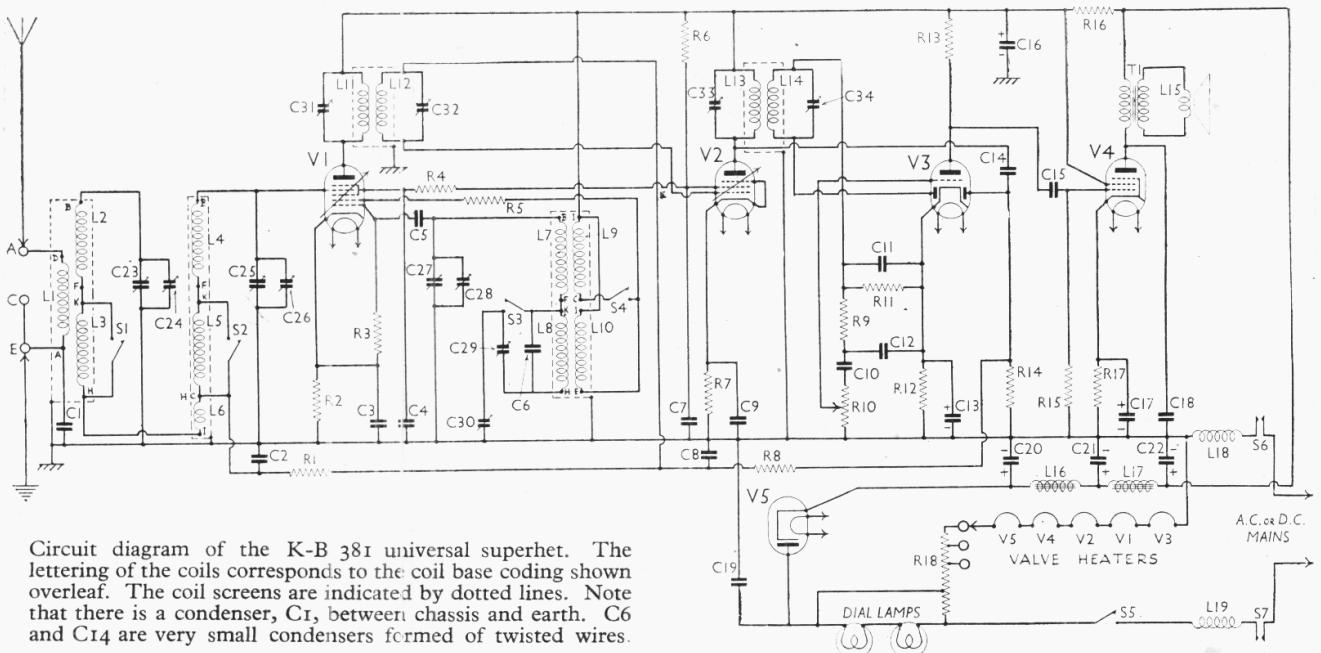
Remove control knobs (grub screws, which may be waxed in). When replacing, that marked "LM" is on the left. The grub screws bed on flats on the spindles. Chassis may now be withdrawn to the extent of the speaker and A.E. leads.

To remove it entirely, remove A.E. socket panel from top right-hand of cabinet. This is held to brackets by two screws with nuts and lock washers. Unsolder the four speaker and choke leads from the tags on insulating strip mounted on chassis. When replacing, follow the colour code indicated in our plan view of the chassis.

**NOTE.**—When the back of the receiver is removed, the set cannot be switched on unless the appropriate contacts of the safety device S6, S7 are shorted. It is possible to "plug" the back in upside down as a temporary expedient, or to obtain a special key from the makers.

**Removing Speaker, etc.**—It is best to remove the sub-baffle carrying the speaker, with its input transformer and the choke L16. The sub-baffle is held by four nuts and screws, the ornamental heads of which are at the front of the cabinet.

(Continued overleaf)



Circuit diagram of the K-B 381 universal superhet. The lettering of the coils corresponds to the coil base coding shown overleaf. The coil screens are indicated by dotted lines. Note that there is a condenser, C1, between chassis and earth. C6 and C14 are very small condensers formed of twisted wires.

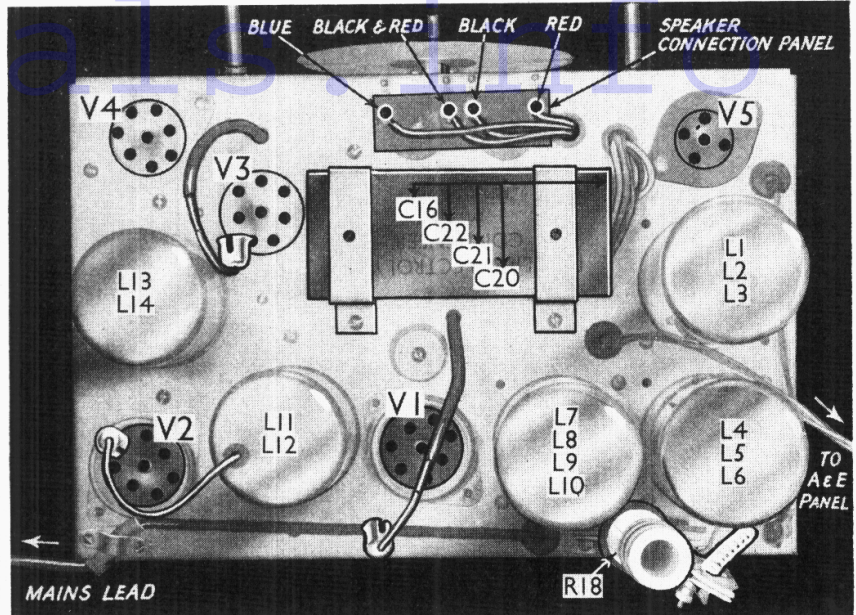
**KOLSTER-BRANDES MODEL 381**  
(continued)

**COMPONENTS AND VALUES**

Resistances		Values (ohms)
R1	V1 cont. grid decoupling	100,000
R2	V1 fixed G.B. resistance	150
R3	V1 osc. grid resistance	25,000
R4	V1 S.G.'s decoupling	15,000
R5	V1 osc. harmonic suppressor	2,500
R6	V1 and V2 S.G.'s H.T. feed	15,000
R7	V2 fixed G.B. resistance	300
R8	A.V.C. circuit decoupling	100,000
R9	H.F. stopper	100,000
R10	Manual volume control	500,000
R11	Rectifier diode load	500,000
R12	V3 G.B. resistance	10,000
R13	V3 anode resistance	250,000
R14	A.V.C. diode load	500,000
R15	V4 grid resistance	250,000
R16	V1, V2 and V3 H.T. feed	300
R17	V4 G.B. resistance	500
R18	Tapped ballast resistance, total	630

Condensers		Values (μF)
C1	Earth blocking condenser	0.01
C2	V1 cont. grid decoupling	0.02
C3	V1 cathode by-pass	0.1
C4*	V1 S.G.'s by-pass	0.5
C5	V1 osc. grid condenser	0.0001
C6	Oscillator L.W. trimmer, fixed	Very low
C7	V2 S.G. by-pass	0.1
C8	V2 cont. grid decoupling	0.1
C9	V2 cathode by-pass	0.1
C10	L.F. coupling to V3 triode	0.02
C11	Rectifier diode reservoir	0.0001
C12	H.F. by-pass	0.0001
C13	V3 cathode by-pass, electrolytic	25.0
C14	Coupling to A.V.C. diode	Very low
C15	L.F. coupling to V4	0.02
C16†	H.T. smoothing, electrolytic	4.0
C17	V4 cathode by-pass, electrolytic	25.0
C18*	Tone compensator	0.012
C19	Mains by-pass	0.01
C20†	H.T. smoothing, electrolytics	8.0
C21†		4.0
C22†		8.0
C23	Band-pass primary tuning	0.0005
C24	Band-pass pri. trimmer, pre-set	—
C25	Band-pass secondary tuning	0.0005
C26	Band-pass sec. trimmer, pre-set	—
C27	Oscillator tuning	0.0005
C28	Osc. main trimmer, pre-set	—
C29	Osc. L.W. tracker, pre-set	—
C30	Osc. M.W. tracker, pre-set	—
C31	1st I.F. trans. pri. tuning	—
C32	1st I.F. trans. sec. tuning	—
C33	2nd I.F. trans. pri. tuning	—
C34	2nd I.F. trans. sec. tuning	—

\* See General Notes. † In electrolytic block.



Plan view of the chassis. The valves and valve screens have been removed. Note the colour coding of the speaker connection panel. R18 is the mains adjustment.

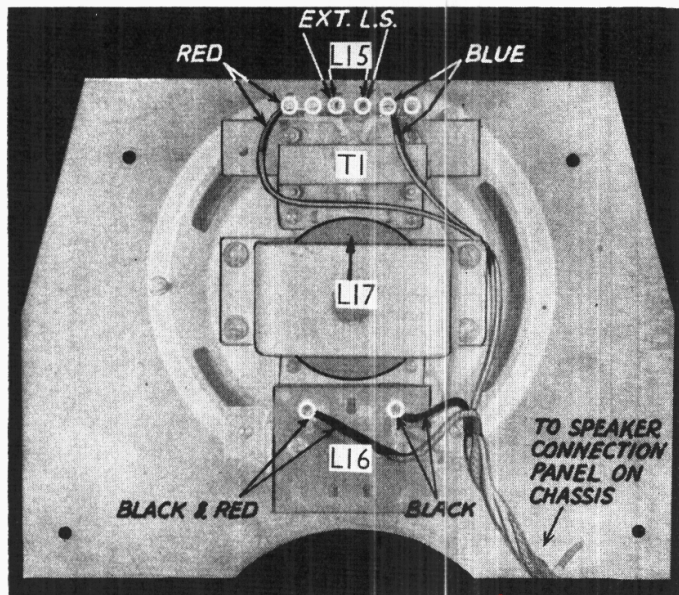
Other Components		Values (ohms)
L1	Aerial coupling coil	15.5
L2	Band-pass primary coils	5.0
L3	Band-pass secondary coils	20.0
L4		5.0
L5	Band-pass coupling coil	20.0
L6		0.5
L7	Oscillator grid coils	4.0
L8	Oscillator anode coils	13.0
L9		5.0
L10	1st I.F. transformer	19.0
L11		75.0
L12	2nd I.F. transformer	75.0
L13		75.0
L14	Speaker speech coil	75.0
L15		2.0
L16	H.T. smoothing choke	220.0
L17	Speaker field coil	1400.0
L18	Mains filter chokes	1.5
L19		1.5
T1	Speaker input trans.	500.0
S1-S4	Waveband switches, ganged	—
S5	Mains switch, ganged R10	—
S6-S7	Safety device	—

**VALVE ANALYSIS**

The voltage and current readings listed in the table below are those given by the makers for an average chassis working with its aerial and earth sockets short-circuited, and with the manual volume control at maximum. All voltages were measured with a high-resistance voltmeter, and the currents were taken with the help of an analyser. In the case of V2, the anode and screen currents were measured while the anode was by-passed to earth by means of a 0.1 μF condenser.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)	
V1	15D1*	125	5.0	55	4.5
V2	0D2	140	8.0	100	2.0
V3	11D3	80	0.1	—	—
V4	7D3	140	35.0	140	8.0
V5	1D5	—	65.0	—	—

\* Osc. anode (G2) 120 V 5 mA.



Rear view of the speaker unit. The wires to the panel on the receiver chassis are colour coded. An external low resistance speaker can be connected as shown.

**GENERAL NOTES**

**Switches.**—The four waveband switches, S1-S4, are mounted in a single unit underneath the chassis. They are indicated and identified in our under-chassis view. The switches are quite straightforward, and are all closed on the M.W. band and open on the L.W. band.

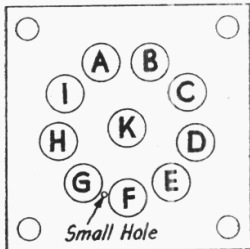
S5 is the Q.M.B. mains switch, ganged with the volume control R10. S6 and S7 are two jack switches in the mains leads, which are shorted by metal plates fixed to the removable back of the cabinet. When this is removed, S6 and S7 are opened, thus isolating the receiver from the mains.

**Coils.**—There are five coil units in all, three for the band-pass and oscillator circuits, and two I.F. transformers. They are all screened by tubular cans, which are not removable from the chassis. To reach the coils the units must be

removed, on their paxolin bases, which are bolted to the chassis.

For ease in identifying the I.F. and oscillator coils, their ends are lettered on the circuit diagram. These letters correspond with those on our diagram of a coil base, which indicates the various

Connections to the underside of a coil unit. The letters correspond with those on the circuit diagram.



tags. Since the tags are symmetrically arranged, they may be identified by a small hole which will be found drilled in the base between tags F and G.

The I.F. coils and trimmers are mounted on the chassis by paxolin strips. The primary and secondary coils are, of course, across the tags on the corresponding trimmers, which are identified in our under-chassis view.

**Filter Chokes L18, L19.**—These are wound in one unit, mounted against the back of the chassis. Four leads emerge from this unit, two red for one choke, and two black for the other.

**Condensers C16, C20, C21, C22.**—These are all dry electrolytics in one unit, mounted on top of the chassis. The black lead emerging is the common negative, the two yellows are the positives of C16 and C22, while the two reds are the positives of C20 and C21. The leads

emerge in the order indicated in our plan chassis view.

**Condensers C7, C9.**—These are 0.1  $\mu$ F paper types, mounted in a small block with one common tag. The connections are shown in a separate diagram, the common tag being that to which the black lead connects.

**Condensers C3, C4, C8.**—These are in another small block, also with one common tag, to which the black lead connects. A diagram of this block is also given. C4 in early chassis was 0.1  $\mu$ F instead of 0.5  $\mu$ F as given in our table. Slightly later chassis had an extra 0.5  $\mu$ F tubular condenser connected in parallel with C4, while in the latest chassis, C4 itself has been increased to 0.5  $\mu$ F.

**Condenser C18.**—This is the tone control condenser, and various values may be found in different chassis. Originally it was 0.006  $\mu$ F. Our chassis has two 0.006  $\mu$ F condensers in parallel, making 0.012  $\mu$ F. In other chassis C18 may be 0.01  $\mu$ F or 0.02  $\mu$ F.

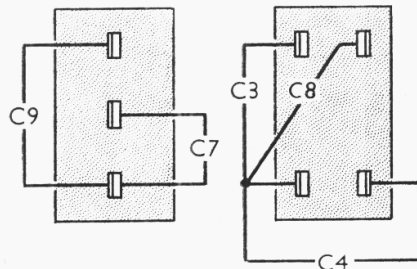
**Aerial-Earth Panel.**—This has three sockets, the upper one, A, to which the green lead from chassis is joined, being the aerial. The middle and bottom sockets, C and E, are earth sockets, and are connected to C1, the other side of which goes to chassis. The central socket is only used with the Rejectostat aerial device.

**Dial Lamps.**—These are two Osram M.E.S. types, rated at 3.5 V, 0.15 A.

**Condensers C6, C14.**—These are very small condensers formed by two lengths of enamelled wire twisted together. They are indicated in our under-chassis view.

**Loud-speaker Connections.**—The colour coding of the wires leading to the paxolin

loud-speaker connection strip on the chassis is indicated in our plan chassis view. Earlier chassis may have continuous leads from the speaker unit passing through a hole in the chassis.



Internal connections of the two small block condensers.

**Loud-speaker Unit.**—A separate rear view of this is given, with the coding of the leads indicated. The unit comprises the speaker, with its input transformer T1, and its field L17, while below it is the extra choke L16.

**Extra Loud-speaker.**—This should be of the low impedance type, with an impedance of 2 to 4  $\Omega$ . It may be connected by soldering leads to the two tags indicated in our illustration of the speaker unit.

**Dial Lamp Circuit.**—Our circuit diagram shows this in its latest form, with the lamps, in series, wired across only about 30  $\Omega$  of R18. Earlier models had a different arrangement, which sometimes overloaded the lamps while the receiver was warming up. Full details for conversion of early chassis are obtainable from the makers.

Under-chassis view. Note the two twisted wire condensers C6 and C14. The various switches are identified and all the trimmers are shown. Separate diagrams of the two block condensers are in Col. 3. C18 may be a single condenser in some chassis.

