KOLSTER-BRANDES - RB10

Intermediate frequency 470kc/s.

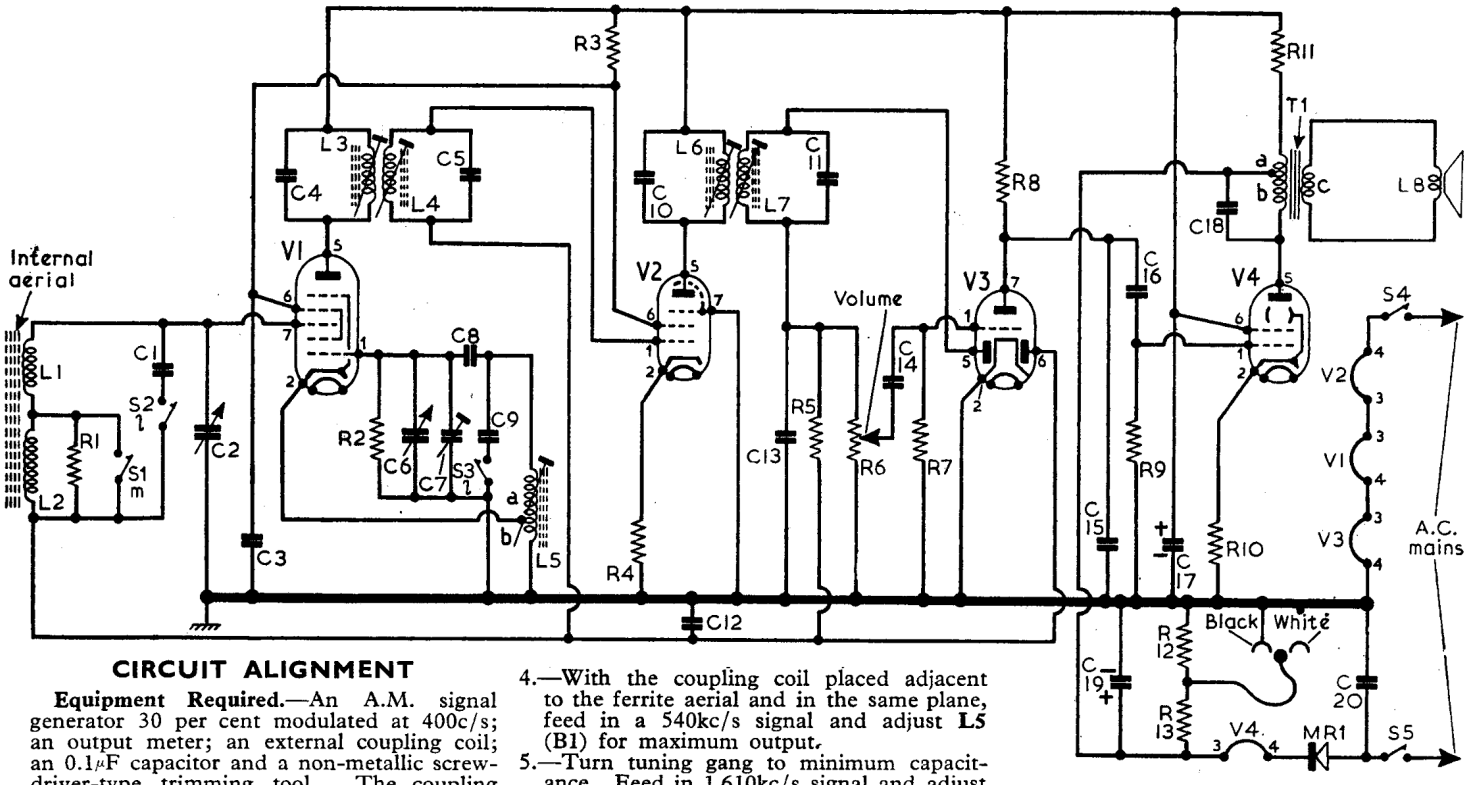
Valve Table

Valve	Anode (V)	Screen (V)	Cathode (V)
V1 12BE6	150	70	—
V2 6BJ6	150	70	0·4
V3 12AT6	50	—	—
V4 19AQ5	167	150	6·0

Resistors			C3	0·03μF	B2
R1	330kΩ	B2	C4	150pF	B2
R2	22kΩ	B1	C5	150pF	B2
R3	10kΩ	B1	C6	206pF	A1
R4	68Ω	B2	C7	5pF	B2
R5	2·2MΩ	B2	C8	244pF	B2
R6	500kΩ	C1	C9	204pF	‡B1
R7	10MΩ	C2	C10	150pF	B2
R8	220kΩ	C1	C11	150pF	B2
R9	470kΩ	C1	C12	0·1μF	‡B2
R10	220Ω	C1	C13	330pF	B2
R11	1·8kΩ	B1	C14	0·01μF	C1
R12	2·5kΩ	C2	C15	470pF	‡C2
R13	2·5kΩ	C2	C16	0·003μF	C1
Capacitors			C17	32μF	B2
C1	65pF	‡B1	C18	0·005μF	B1
C2	206pF	A2	C19	32μF	‡B2
			C20	0·03μF	B1

Coils*			
L1	8·0	A2	
L2	20·0	B2	
L3	—	B2	
L4	—	B2	
L5	10·0	B1	
L6	—	B2	
L7	—	B2	
L8	—	—	
Miscellaneous*			
T1 a	9·0		
T1 b	191·0		C1
T1 c	—		
MR1			‡C1

*Approximate D.C. resistance in ohms.
‡Underneath printed panel.



CIRCUIT ALIGNMENT

Equipment Required.—An A.M. signal generator 30 per cent modulated at 400c/s; an output meter; an external coupling coil; an 0.1μF capacitor and a non-metallic screwdriver-type trimming tool. The coupling coil can be made by winding 85 turns of enamelled copper wire on a 2in diameter former. All adjustments are made with a modulated signal and at each operation the signal generator output should be progressively attenuated, so as to maintain the output from the receiver at approximately 50mW.

1.—Set tuning gang to minimum capacitance (control knob fully anti-clockwise). Turn volume control to maximum.

Connect the signal generator with the 0.1μF capacitor in series with its "live" output lead, between chassis and pin 7 of **V1** across **C2.** Connect the output meter across the speaker speech coil.

2.—Feed in a 470kc/s signal and adjust **L7, L6, L3** and **L4** (location reference B2) in that order, for maximum output. Repeat adjustments to **L6** and **L7.**

3.—Disconnect signal generator from receiver and connect it to external coupling coil. Switch receiver to M.W. and turn tuning gang to maximum capacitance (control knob fully clockwise).

4.—With the coupling coil placed adjacent to the ferrite aerial and in the same plane, feed in a 540kc/s signal and adjust **L5** (B1) for maximum output.

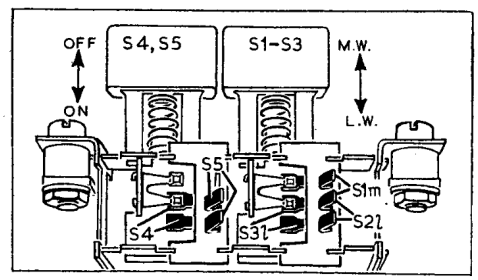
5.—Turn tuning gang to minimum capacitance. Feed in 1,610kc/s signal and adjust **C7** (B2) for maximum output. Check operation 4.

6.—Tune receiver to 500m mark on scale. Feed in a 600kc/s signal and adjust **L1** (A2) for maximum output by sliding it along the ferrite rod.

7.—Tune receiver to 222m mark on scale. Feed in a 1,350kc/s signal and position the connecting leads from **L1** for maximum output.

8.—Switch receiver to L.W. and tune to 1,333m on scale. Feed in a 225kc/s signal and adjust **L2** (B2) for maximum output by sliding it along the ferrite rod. Seal coil formers with cement.

Switches.—S1-S3 are waveband switches and **S4** and **S5** battery supply switches. They are mounted on the chassis in a press-button unit and appear as shown in our sketch below, when viewed from the front of the chassis. The letter "**m**" or "**l**" included in the switch number in the sketch, and in the circuit diagram, denotes that the switch closes on M.W. or L.W.



Switches S1-S5 as seen when viewed from the front of an upright chassis. The buttons depress and release independently giving two switch position for each button.

Valve Heater Circuit

The receiver has a very low power consumption of 25W and this is achieved by feeding the power supply to the valve heaters, in series, with the H.T. supply. By this means the amount of mains dropping resistance required is not so great, which has the effect of lowering the operating temperature, thus reducing component failure and cabinet damage caused by over-heating.

R12 and **R13** (shown in our location reference C1/2) are bleed resistors whose primary purpose is to complete a heater circuit when the receiver is switched on, providing partial heater current of approximately 50mA, which heats the cathodes sufficiently to commence the flow of anode current. The anode current also flows through the valve heaters, building up the heater current, until the receiver reaches a state of equilibrium.

The H.T. circuit now operates as a resistive element connected in parallel with **R12, R13,** in series with the heater chain. H.T. current measured at the junction of **V4** heater (pin 3) and the red lead to **T1** primary winding is 40mA. The heater balancing current flowing through **R12, R13** measured at the junction of **V4** heater (pin 3) and **R13** is 37mA.

The service engineer anticipating that the total heater current would measure its rated 150mA (heater ratings 0.15A) may deduce that the combined total of 77mA D.C. is incorrect. It should be pointed out, therefore, that in addition to D.C. the heater current contains an A.C. ripple component and if the rectified output were to be measured on, say, a hot-wire ammeter a reading of 150mA would be obtained.

With a D.C. input the value of bleed resistance **R12, R13** is too high to allow sufficient heater current to cause the valves to emit and the receiver is therefore unsuitable for use on D.C. mains. **V4** heater is wired in the H.T. positive side of the chain, separate from the remaining valves, as the inclusion of its heater in the earthy side would have the effect of raising the chassis potential, introducing susceptibility to hum.