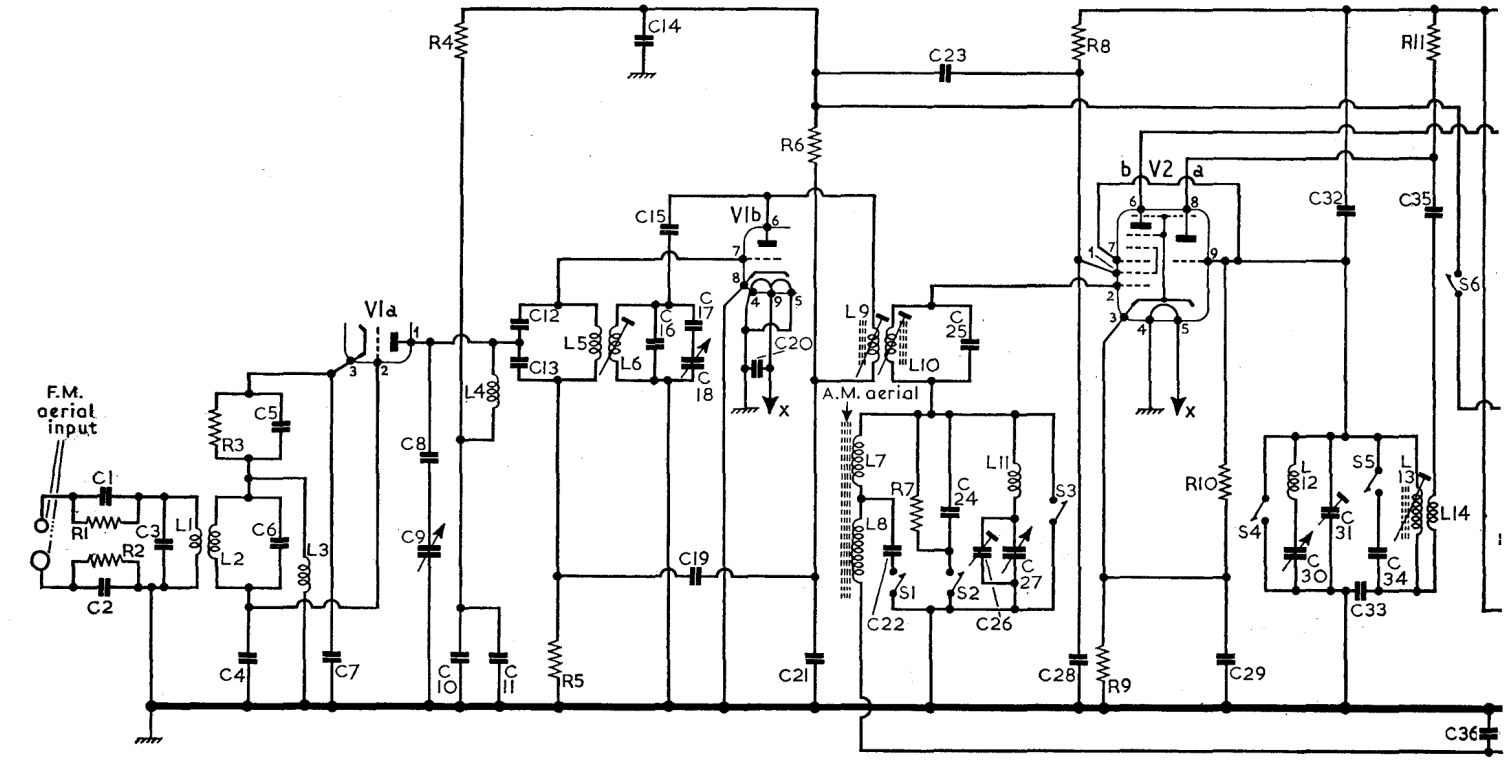


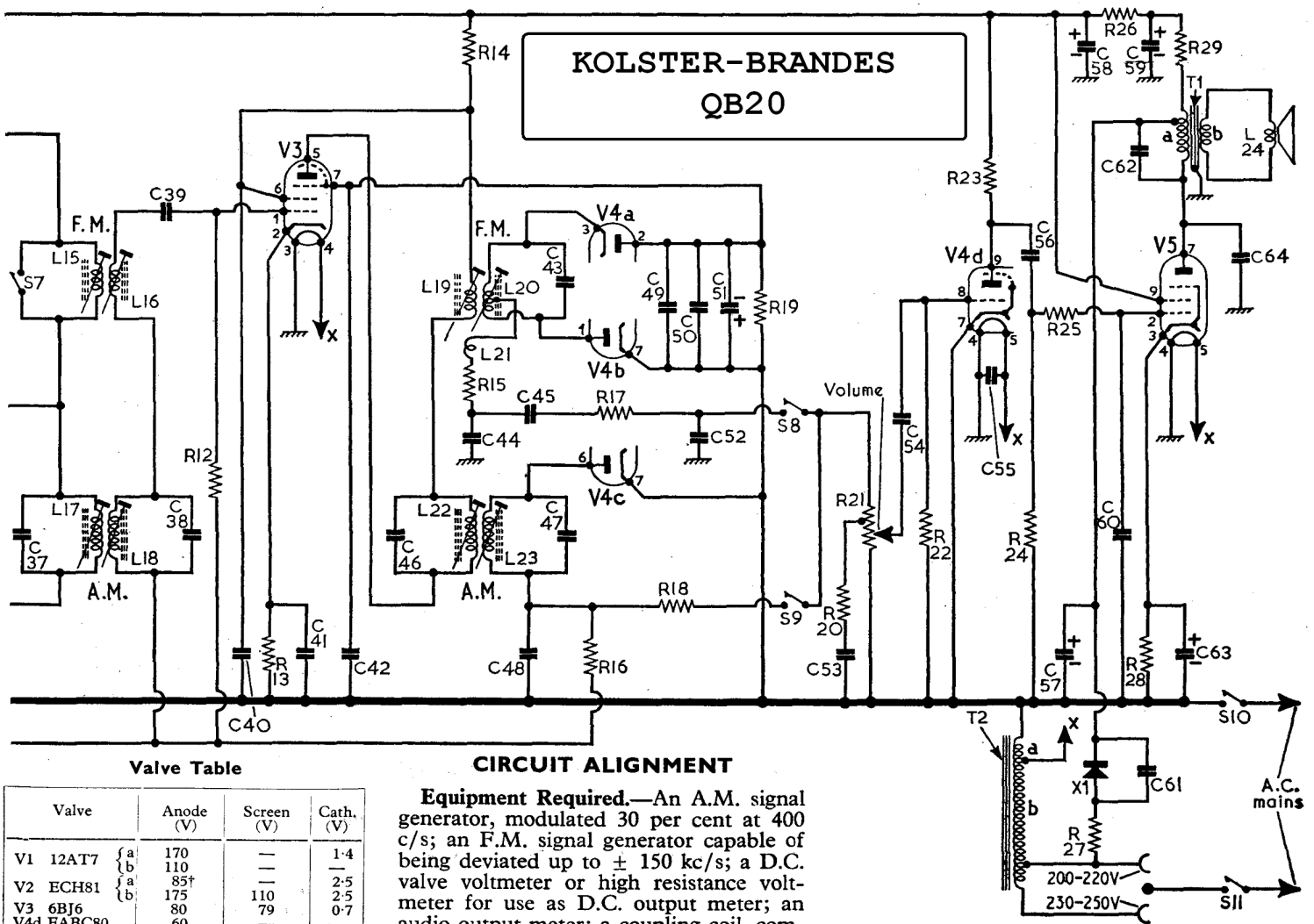


**Valve Table**

| Valve | | Anode (V) | Screen (V) | Cath. (V) |
|---|---|---|---|---|
| V1 12AT7 | a | 170 | — | 1·4 |
| | b | 110 | — | — |
| V2 ECH81 | a | 85† | — | 2·5 |
| | b | 175 | 110 | 2·5 |
| V3 6BJ6 | | 80 | 79 | 0·7 |
| V4d EABC80 | | 60 | — | — |
| V5 EL84 | | 210 | 175 | 5·0 |

†*Receiver switched to A.M.*

## CIRCUIT ALIGNMENT

**Equipment Required.**—An A.M. signal generator, modulated 30 per cent at 400 c/s; an F.M. signal generator capable of being deviated up to ± 150 kc/s; a D.C. valve voltmeter or high resistance voltmeter for use as D.C. output meter; an audio output meter; a coupling coil, comprising twelve turns of insulated wire on a 2 inch diameter former; two capacitors, 0.001$\mu$F and 0.1$\mu$F; an oscilloscope; and a screwdriver-type trimming tool.

A.M. alignment should be carried out first and completed before F.M. alignment. This is important in order to allow the receiver to warm up before adjusting the high frequency circuits associated with F.M.

Maintain the output of the signal generator as low as possible at all times during the alignment procedure to prevent A.G.C. action from masking the adjustment peaks.

# KOLSTER-BRANDES QB20

**Resistors**

| | |
|---|---|
| R1 | 2·2MΩ |
| R2 | 2·2MΩ |
| R3 | 150Ω |
| R4 | 220Ω |
| R5 | 22kΩ |
| R6 | 10kΩ |
| R7 | 470kΩ |
| R8 | 22kΩ |
| R9 | 220kΩ |
| R10 | 47kΩ |
| R11 | 33kΩ |
| R12 | 220kΩ |
| R13 | 68Ω |
| R14 | 10kΩ |
| R15 | 100Ω |
| R16 | 2·2MΩ |
| R17 | 47kΩ |
| R18 | 100kΩ |
| R19 | 39kΩ |
| R20 | 22kΩ |
| R21 | 500kΩ |
| R22 | 10MΩ |
| R23 | 470kΩ |
| R24 | 470kΩ |
| R25 | 100kΩ |
| R26 | 470Ω |
| R27 | 20Ω |
| R28 | 120Ω |
| R29 | 820Ω |

**Capacitors**

| | |
|---|---|
| C1 | 470pF |
| C2 | 470pF |
| C3 | 12pF |
| C4 | 5pF |
| C5 | 0·01μF |
| C6 | 10pF |
| C7 | 40pF |
| C8 | 25pF |
| C9 | — |
| C10 | 0·01μF |
| C11 | 0·001μF |
| C12 | 10pF |
| C13 | 10pF |
| C14 | 0·001μF |
| C15 | 10pF |
| C16 | 6·8pF |
| C17 | 40pF |
| C18 | — |
| C19 | 10pF |
| C20 | 0·01μF |
| C21 | 75pF |
| C22 | 0·01μF |
| C23 | 0·01μF |
| C24 | 150pF |
| C25 | 5pF |
| C26 | — |
| C27 | — |
| C28 | 0·01μF |
| C29 | 0·01μF |
| C30 | — |
| C31 | — |
| C32 | 4·9pF |
| C33 | 395pF |
| C34 | 390pF |
| C35 | 0·001μF |
| C36 | 0·05μF |
| C37 | 175pF |
| C38 | 175pF |
| C39 | 0·001μF |
| C40 | 0·003μF |
| C41 | 0·04μF |
| C42 | 0·001μF |
| C43 | 40pF |
| C44 | 150pF |
| C45 | 0·01μF |
| C46 | 175pF |
| C47 | 175pF |
| C48 | 330pF |
| C49 | 0·001μF |
| C50 | 0·001μF |
| C51 | 2μF |
| C52 | 0·003μF |
| C53 | 0·01μF |
| C54 | 0·01μF |
| C55 | 0·001μF |
| C56 | 0·01μF |
| C57 | 40μF |
| C58 | 40μF |
| C59 | 20μF |
| C60 | 25pF |
| C61 | 0·03μF |
| C62 | 0·001μF |
| C63 | 50μF |
| C64 | 20pF |

***Miscellaneous***

| | |
|---|---|
| T1 | a 507·0, b 0·5 |
| T2 | Total 250·0 |
| X1 | EC1/U567‡ |
| S1-S9 | — |
| S10, S11 | — |

**Switches.—S1-S9** are the waveband and A.M./F.M. changeover switches

**Switch Table**

| Switches | F.M. | M.W. | L.W. |
|---|---|---|---|
| S1 | — | C | — |
| S2 | — | — | C |
| S3 | C | — | — |
| S4 | C | — | — |
| S5 | — | — | C |
| S6 | C | — | — |
| S7 | — | C | C |
| S8 | C | — | — |
| S9 | — | C | C |

## A.M. Alignment

1.—Connect the audio output meter across **T1** secondary winding, and the A.M. signal generator via the 0.1μF capacitor to **V2b** control grid (pin 2). Switch the receiver to M.W., turn the tuning and volume control knobs fully clockwise.

2.—Unscrew the cores of **L18** (A2), **L23** (B2) and **L22** (B2). Feed in a modulated 422 kc/s signal and adjust the cores of **L23, L22, L18** and **L17** (A2), in that order, for maximum output.

3.—Check that with the tuning gang at maximum capacitance the cursor coincides with the datum mark between the M.W. and L.W. tuning scales.

4.—Connect the signal generator output leads to the coupling coil; place the coil close to, and in line with, the ferrite rod aerial coils **L7, L8** (location references B1, D1).

5.—Tune the receiver to 500m. Feed in a modulated 600 kc/s signal and adjust the core of **L13** (A2), and **L7** (B1), for maximum output. **L7** is adjusted by sliding its former along the ferrite rod.

6.—Tune the receiver to 190m. Feed in a modulated 1,580 kc/s signal and adjust **C31** (A2) for maximum output.

7.—Tune the receiver to 214m. Feed in a modulated 1,400 kc/s signal and adjust **C26** (C1) for maximum output while rocking the tuning gang for optimum results.

8.—Repeat operations 5, 6 and 7.

9.—Switch the receiver to L.W. and tune it to 1,333m. Feed in a 225 kc/s signal and slide the former of **L8** (D1) along the ferrite rod for maximum output.

10.—Seal the formers of **L7** and **L8** to the ferrite rod to prevent them from moving.

## F.M. Alignment

1.—Connect the D.C. output meter across **C51** (C1), positive terminal to chassis. Connect the F.M. signal generator via the 0.001μF capacitor to **V3** control grid (pin 1). Switch the receiver to F.M. and unscrew the cores of **L20** (C2), **L16** (B2), **L10** (B1) and **L9** (B1).

2.—Feed in an unmodulated 10.7 Mc/s signal and adjust the core of **L19** (C2) for maximum D.C. output. Then adjust the core of **L20** (C2) for a zero reading on the D.C. output meter.

3.—Transfer the signal generator to **V2** control grid (pin 2). Feed in an unmodulated 10.7 Mc/s signal and adjust the cores of **L15** (B2) and **L16** (B2), in that order, for maximum D.C. output. Then re-adjust **L19.**

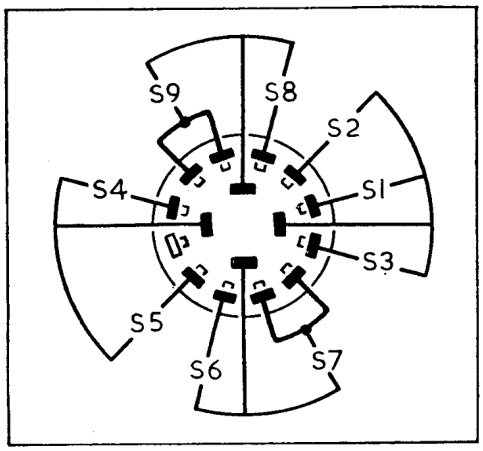


*Diagram of the waveband switch unit* **S1-S9** *as seen when viewed in the direction of the arrow in the rear-view illustration.*

4.—Transfer the signal generator to the aerial and earth sockets and turn the tuning gang to its fully open position. Unscrew the core of **L6** (B1) to its full extent.

5.—Feed in an unmodulated 10.7 Mc/s signal and adjust the cores of **L9** (B1) and **L10** (B1), in that order, for maximum D.C. output. Re-adjust the cores **L15** (B2), **L10** (B1) and **L19** (C2).

6.—Connect the audio output meter across the speaker. Tune the receiver to 92.5 Mc/s, deviated by ±25 kc/s, and adjust the core of **L6** (B1) for maximum D.C. output. Then adjust **L20** (C2) and **L4** (B1) for maximum audio output. Adjust **L4** by spacing its turns with a suitable tool. Recheck the adjustment of **L6** (B1).

7.—Connect the oscilloscope across **C52** (location reference C2). Feed in a 92.5 Mc/s signal, deviated by ±150 kc/s, and check the linearity and symmetry of the discriminator response curve. If the curve is not symmetrical the F.M. circuits should be re-aligned. The discriminator curve should be linear to ±75 kc/s either side of the centre frequency at all inputs above that required to give 2 watts audio output at 25 kc/s deviation.