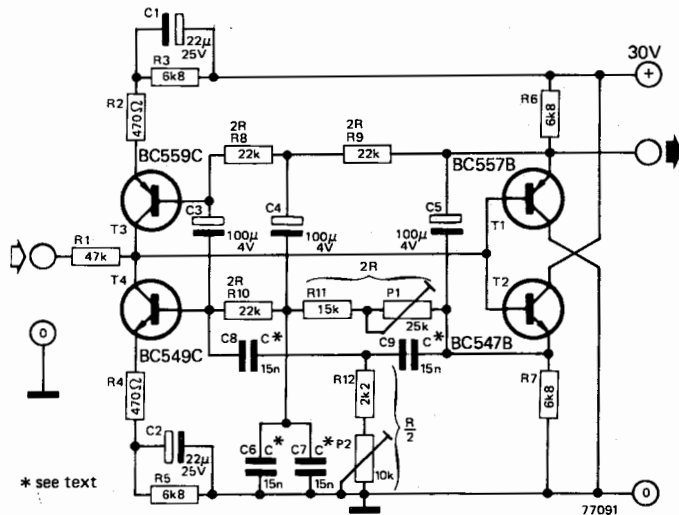


complementary twin-T selective filter



This filter will pass signals at its centre frequency while attenuating signals at all other frequencies.

The input signal is fed via R1 to the bases of the complementary emitter follower T1/T2. Feedback is taken from the emitters of T1 and T2, through the twin-T network to the inputs of the complementary amplifier T3/T4. At frequencies removed from the centre frequency of the twin-T network, the feedback signals will pass through the twin-T unattenuated. These signals will be amplified by T3 and T4 and will appear at T3 and T4 collectors in antiphase with the input signal. The input signal, and hence the output signal from the emitters of T1 and T2, will be greatly attenuated.

At the centre frequency of the twin-T the feedback signal will be greatly attenuated, so little antiphase signal will appear at the collectors of T3 and T4 and the input signal will pass unattenuated. The output may be

taken from the emitter of either T1 or T2. The quality factor of the filter is approximately $\frac{A}{4}$, where A is the gain of the T3/T4 stage, which is $\frac{2R1}{R2}$ (R2 and R4 are equal).

The Q-factor of this filter is thus about 500. Use of complementary stages ensures that the distortion introduced by the filters is low, which is a useful point if the filter is being used to clean up a distorted sinewave signal prior to using it for a distortion measurement.

The centre frequency of the filter is given by $f = \frac{1}{2\pi RC}$, and with the component values shown the centre frequency is about 1 kHz. P1 and P2 can be used to fine tune the filter for maximum output at the required frequency.