

Note that the output is taken at the second amplifier. The overall signal transfer is noninverting. The circuit parameters are

$$\begin{aligned}
 H_o &= \frac{1}{R_1} \left[\frac{1}{(1/KR_5)(1 + C_4/C_3) - 1/R_6} \right] \\
 \omega_o &= \left[\frac{1}{R_5 C_3 C_4} \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_6} \right) \right]^{1/2} \\
 \frac{1}{Q} &= \alpha = \sqrt{\frac{1}{R_5(1/R_1 + 1/R_2 + 1/R_6)}} \sqrt{\frac{C_3}{C_4}} \left(1 + \frac{C_4}{C_3} - \frac{KR_5}{R_6} \right) \\
 \phi &= \phi_{BP} \\
 \tau &= \tau_{BP}
 \end{aligned}$$

Since R_1 and R_6 are larger than R_2 , R_2 is used to trim the center frequency. Note that in this circuit Q can be adjusted with K without influencing ω_o . The sensitivity of the network parameters to element value changes are

$$\begin{aligned}
 S_{R_1}^{H_o} &= -1 \\
 S_{C_3}^{H_o} &= -S_{C_4}^{H_o} = \frac{H_o}{K} \frac{R_1}{R_5} \frac{C_4}{C_3} \\
 S_K^{H_o} &= S_{R_5}^{H_o} = \frac{H_o}{K} \frac{R_1}{R_5} \left(1 + \frac{C_4}{C_3} \right) \\
 S_{R_6}^{H_o} &= -H_o \frac{R_1}{R_6} \\
 S_{C_3}^{\omega_o} &= S_{C_4}^{\omega_o} = S_{R_5}^{\omega_o} = -\frac{1}{2} \\
 S_{R_1}^{\omega_o} &= \frac{-1}{2\omega_o^2 R_1 R_5 C_3 C_4} \\
 S_{R_2}^{\omega_o} &= \frac{-1}{2\omega_o^2 R_2 R_5 C_3 C_4} \\
 S_{R_6}^{\omega_o} &= \frac{-1}{2\omega_o^2 R_5 R_6 C_3 C_4} \\
 S_{R_1}^Q &= \frac{-1}{2\omega_o^2 R_1 R_5 C_3 C_4} \\
 S_{R_2}^Q &= \frac{-1}{2\omega_o^2 R_2 R_5 C_3 C_4} \\
 S_{R_5}^Q &= -\frac{1}{2} \frac{1}{(1 + R_6/R_1 + R_6/R_2)} - \frac{1}{(R_6/KR_5)(1 + C_4/C_3) - 1} \\
 S_{C_3}^Q &= \frac{Q}{\omega_o R_5 C_3} - \frac{1}{2}
 \end{aligned}$$