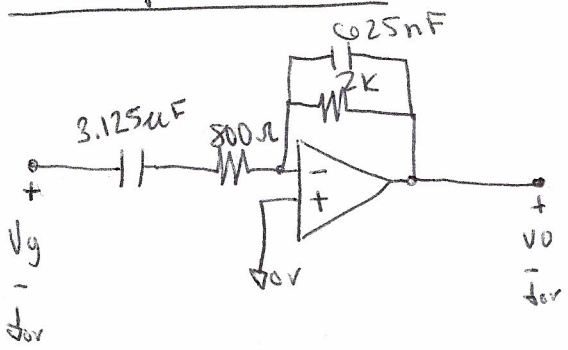
Bandpass Filter



$$\frac{1}{SC_1} = \frac{1}{3.125\times10^{-6}S} = \frac{.32\times10^6}{S}$$

$$\frac{1}{SC_2} = \frac{1}{.625\times10^{-9}S} = \frac{1.6\times10^6}{S}$$

$$Vg = 5000t = \frac{5000}{S^2}$$

$$Va = 0$$

$$Z_1 = \frac{.32\times10^6}{S} + 800 \qquad Z_2 = \frac{2000\left(\frac{1.6\times10^6}{S}\right)}{2000 + \frac{1.6\times10^6}{S}} \qquad Z_2 = \frac{1.6\times10^6}{S+800}$$

$$\left(\frac{S}{S}\right)\frac{Va - Vg}{\frac{.32\times10^6}{S}+800} + \frac{Va - Vo}{\frac{1.6\times10^6}{S+800}}\left(\frac{S+800}{S+800}\right)$$

$$-Vg\left(\frac{S}{.32\times10^6+800S}\right) = Vo\left(\frac{(S+800)}{1.6\times10^6}\right)$$

$$-Vg\left(\frac{S}{800(S+400)}\right) = Vo\left(\frac{S+800}{1.6\times10^6}\right)$$

$$-Vg\left(\frac{1.6\times10^6 S}{800(S+400)}\right) = Vo(S+800)$$

$$-Vg\left(\frac{1.6\times10^6 S}{800(S+400)(S+800)}\right) = Vo$$

$$Vo(S) = \frac{-5000}{S^2}\left(\frac{1.6\times10^6 S}{800(S+400)(S+800)}\right)$$

$$\boxed{Vo(S) = \frac{-10\times10^{-6}}{S(S+400)(S+800)}}$$

$$\frac{A}{S} + \frac{B}{S+400} + \frac{C}{S+800}$$

$$A = \frac{-10\times10^{-6}}{(400)(800)}$$

$$A = -31.25$$

$$B = \frac{-10\times10^{-6}}{-400(800-400)}$$

$$B = 62.5$$

$$C = \frac{-10\times10^{-6}}{-800(400-800)} \qquad C = -31.25$$

$$\boxed{Vo(t) = (-31.25 + 62.5e^{-400t} - 31.25e^{-800t})u(t)\ [V]}$$