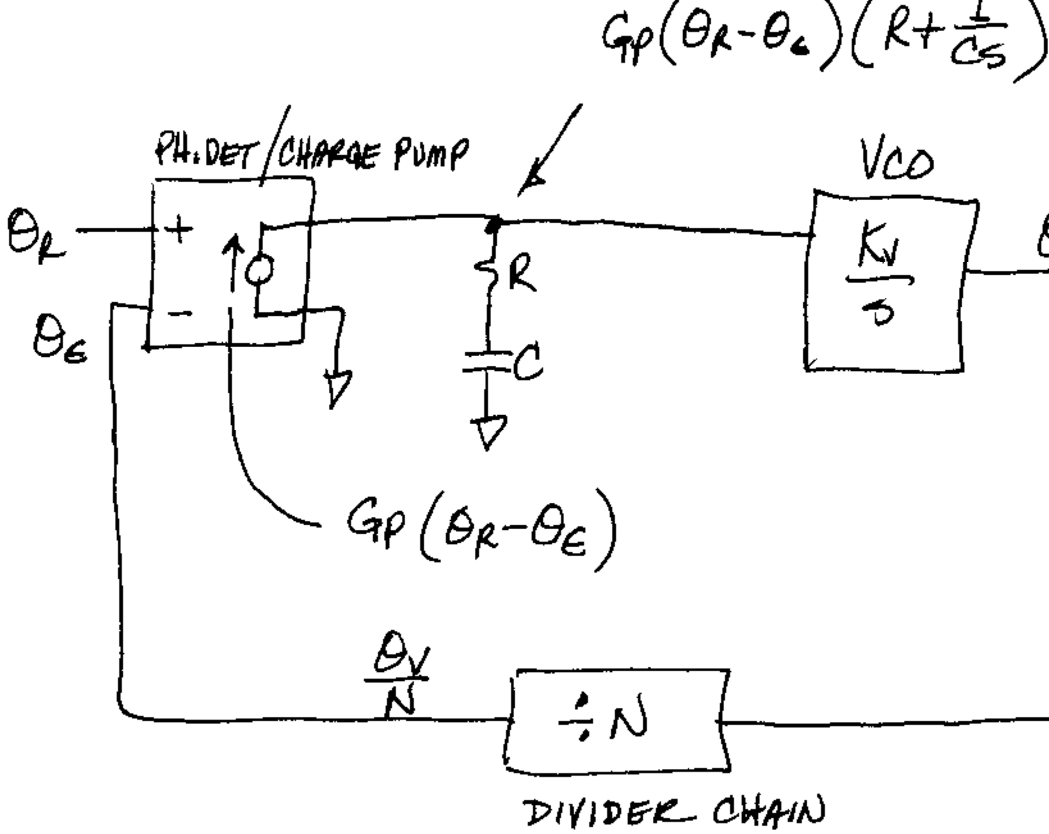

J. THOMPSON
08/02/2003

$$\theta_V = \frac{K_V}{s} G_P(\theta_R - \theta_\epsilon)\left(R + \frac{1}{Cs}\right)$$

$$\theta_V = \frac{K_V}{s} G_P\left(\theta_R - \frac{\theta_V}{N}\right)\left(\frac{RCs+1}{Cs}\right)$$

$$\theta_V\left[1 + \frac{K_V G_P}{NCs^2}(RCs+1)\right] = \theta_R \frac{K_V G_P (RCs+1)}{Cs^2}$$

$$\theta_V\left[NCs^2 + K_V G_P (RCs+1)\right] = \theta_R \cdot N K_V G_P (RCs+1)$$

$$\frac{\theta_V}{\theta_R} = \frac{N K_V G_P (RCs+1)}{(NCs^2 + K_V G_P RCs + K_V G_P)}$$

$$\frac{\theta_V}{\theta_R} = \frac{\frac{K_V G_P}{C}(RCs+1)}{\left(s^2 + \frac{K_V G_P R}{N} s + \frac{K_V G_P}{NC}\right)}$$

$$\omega_n^2 = \frac{K_V G_P}{NC}$$

$$2\zeta\omega_n = \frac{K_V G_P R}{N}$$