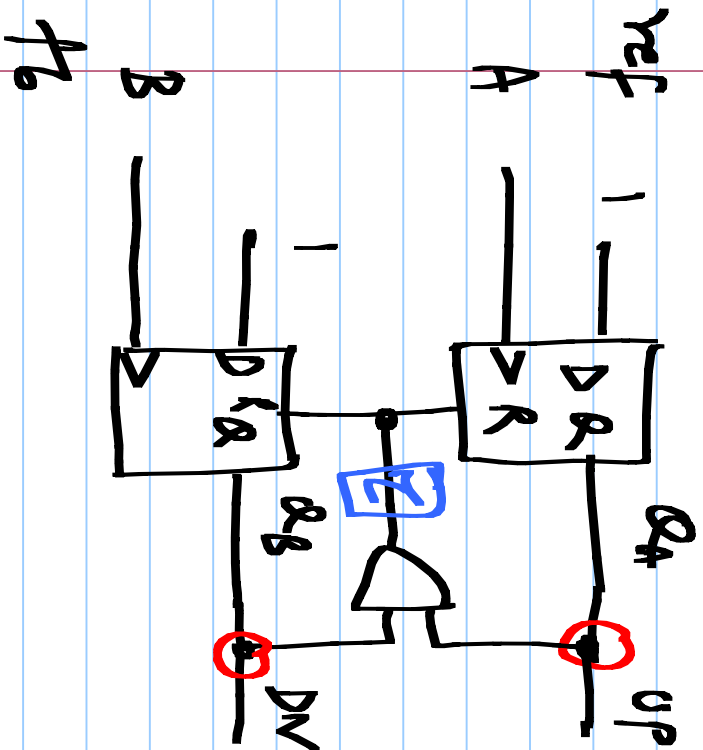


EE7322

16/3/2018

3-state PFD

A & B @ same frequency!



$$Avg (UP - DN) = \frac{\phi}{2\pi}$$

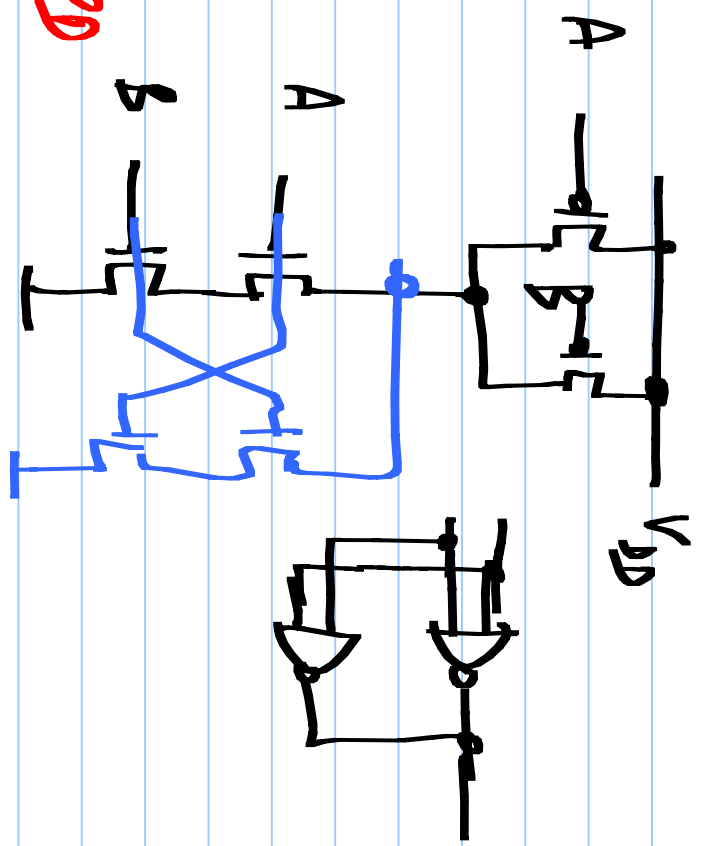
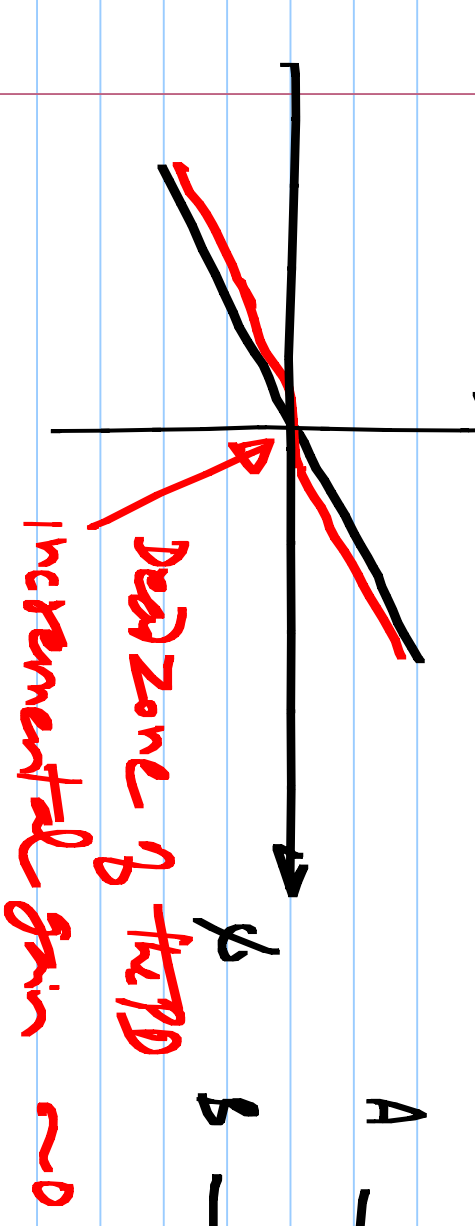
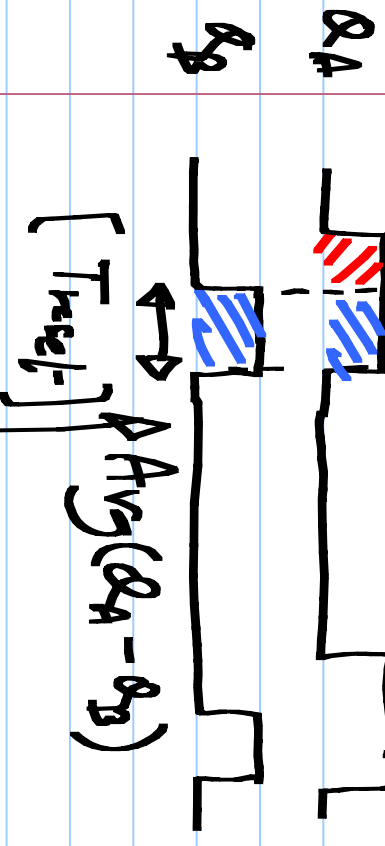
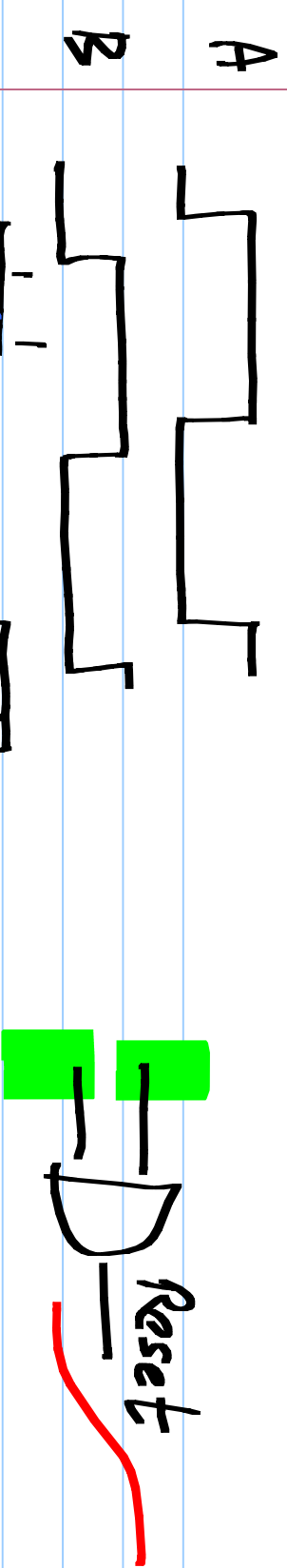
(A leading B)

$$f_A > f_B :$$

$$Avg (UP - DN) = 1/2$$

$$f_A < f_B :$$

$$Avg (UP - DN) = -1/2$$



* Cannot produce pulses below a certain width

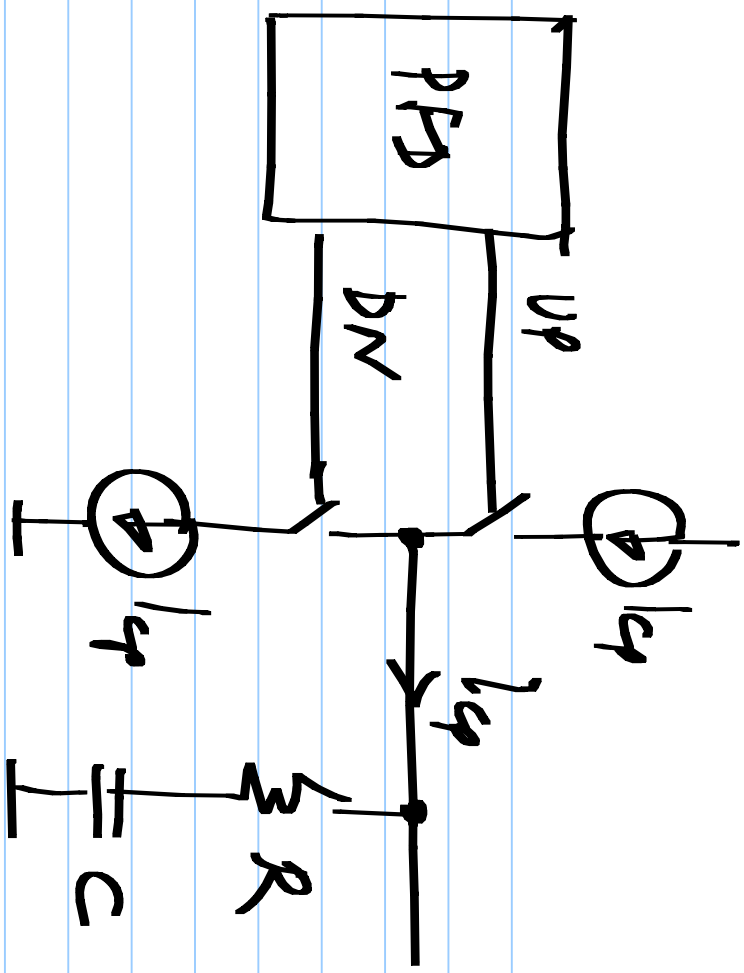
T_{min} \rightarrow Dead zone \rightarrow PLL unresponsive to

* Add reset path delay of $T_{reset} > T_{min}$
small phase differences

* If A leads B by ϕ ,

Up high for $\frac{\phi}{2\pi} \cdot T_{up} + T_{reset}$

DN " " T_{reset}



$V_P = V_N = 0$
 $V_P = V_N = 1$

$I_{q/2} = 0$
 $(C/R) \rightarrow$ mismatch

$V_P = V_N = 0$

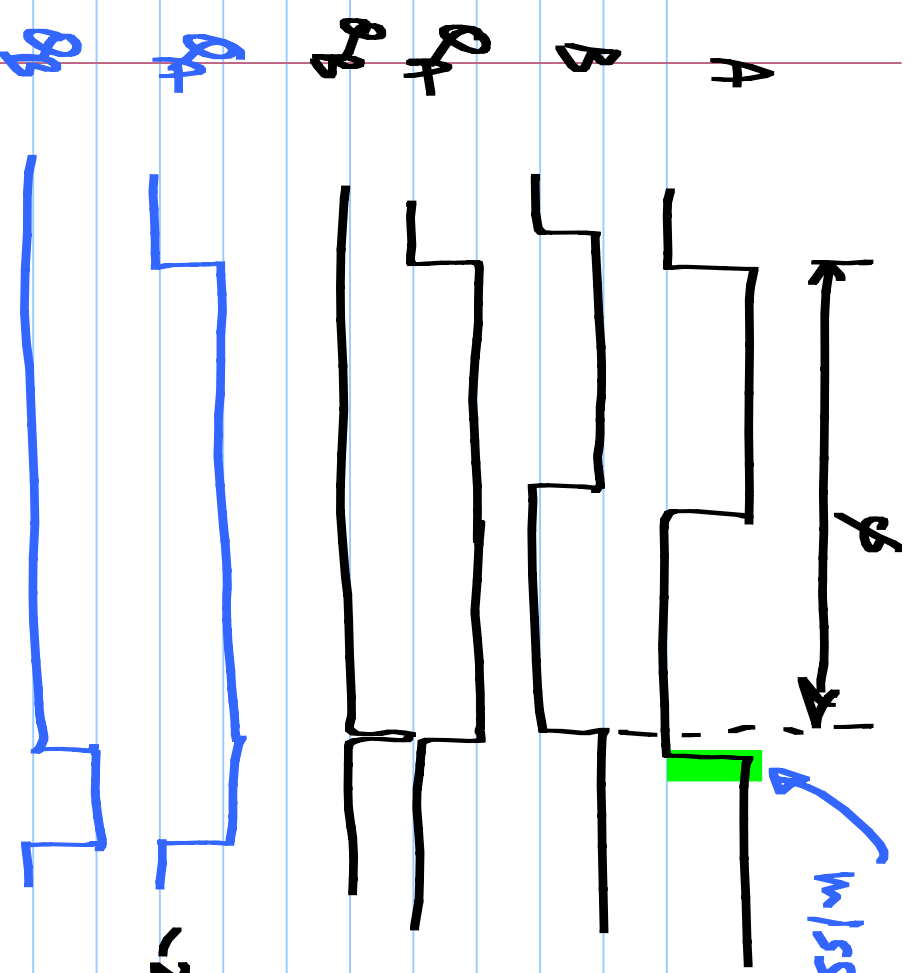
No noise from C

current sources

$V_P = V_N = 1$

Noise from C current sources add up.

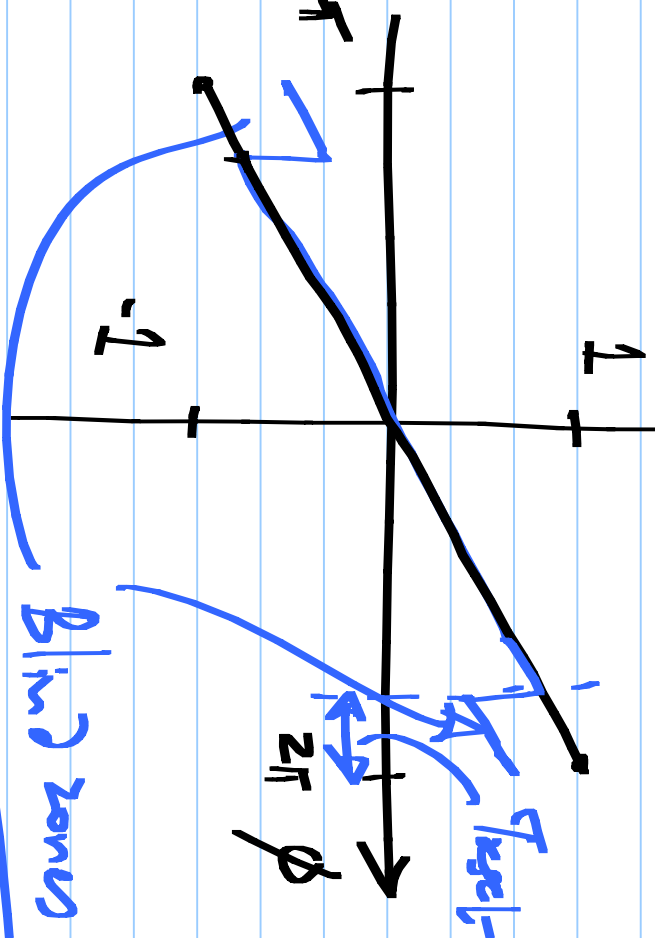
Don't have very large T_{ref}



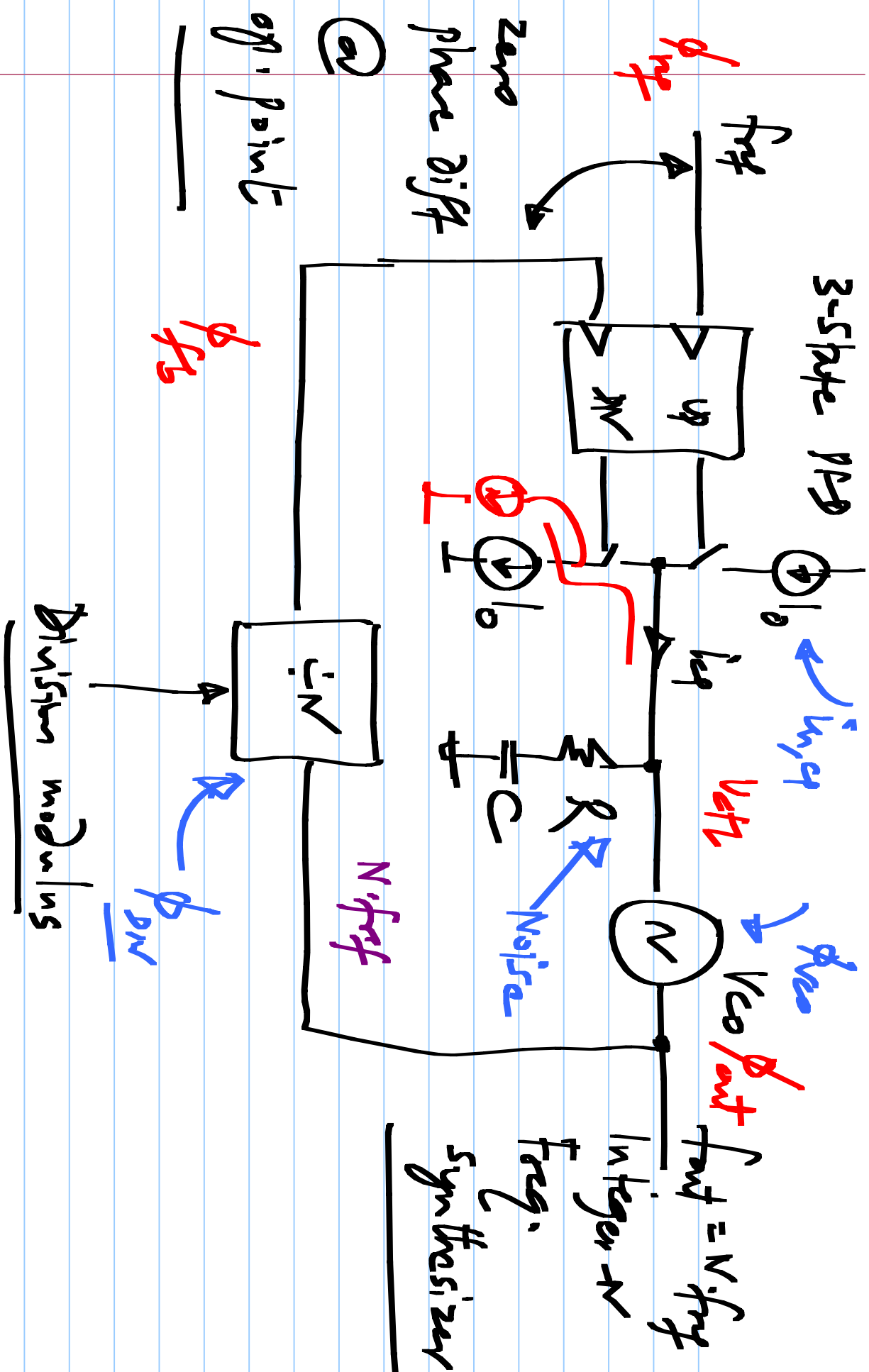
misses this edge information

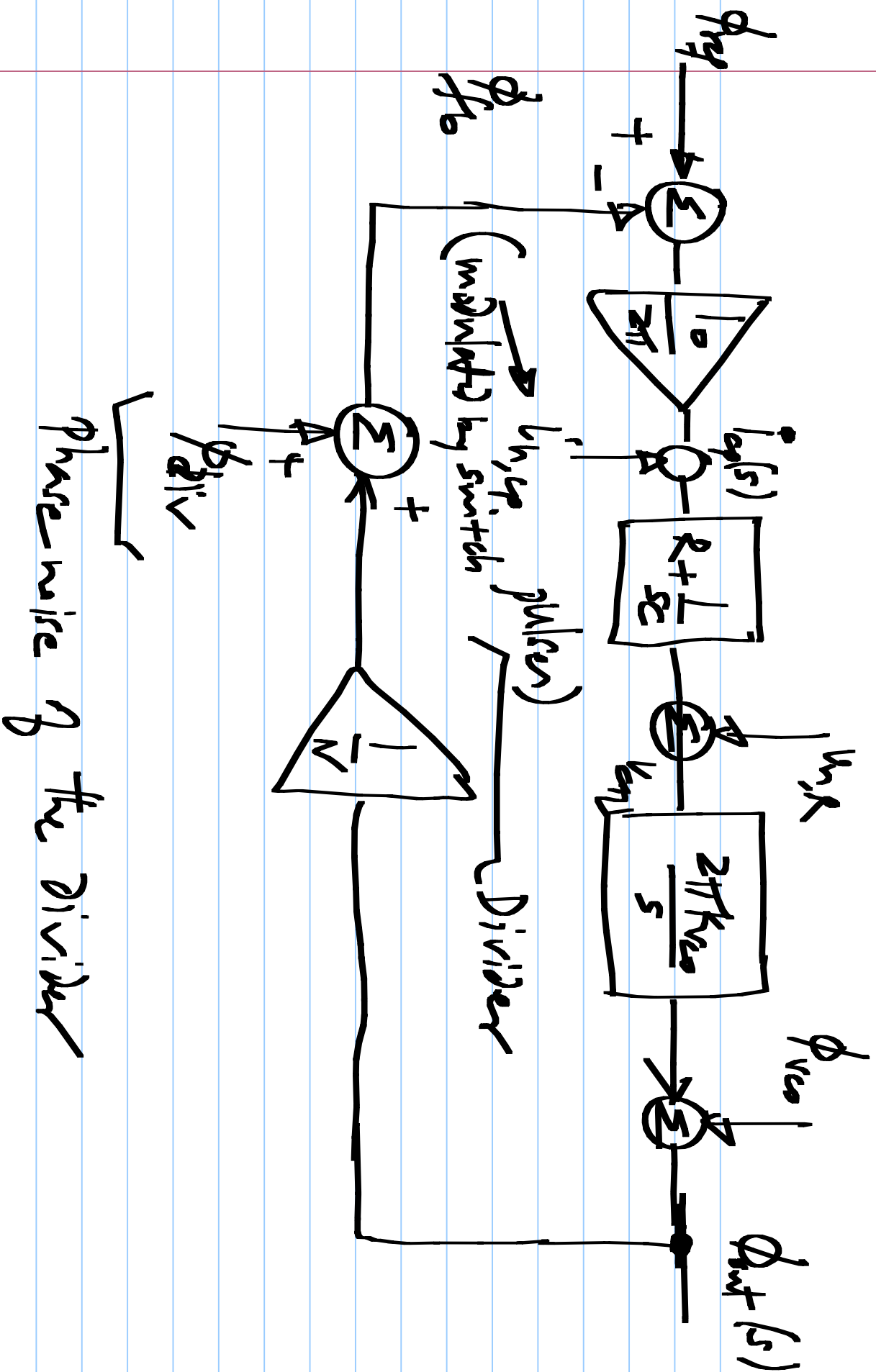
Reduce PD gain

Avy (up-down)

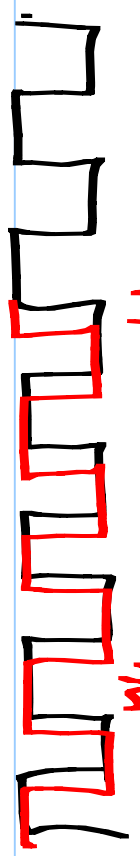


Blind zone



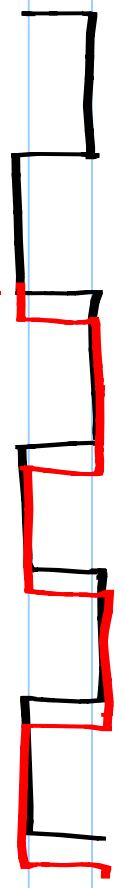


f_{in}



$\rightarrow k \Delta t \rightarrow \frac{\Delta t}{T_{in}} = 25\%$

f_{out}



$\rightarrow k \Delta t \rightarrow \frac{\Delta t}{T_{in}} = 25\%$

$\frac{1}{2}$

$$\frac{\phi_{out}}{\phi_{ref}} =$$

$$\frac{\phi_{out}}{\phi_{ref}} =$$

$$L(s) = \frac{\log R \cdot k_{no}}{N \cdot s} \cdot \left(1 + \frac{1}{sR}\right)$$

