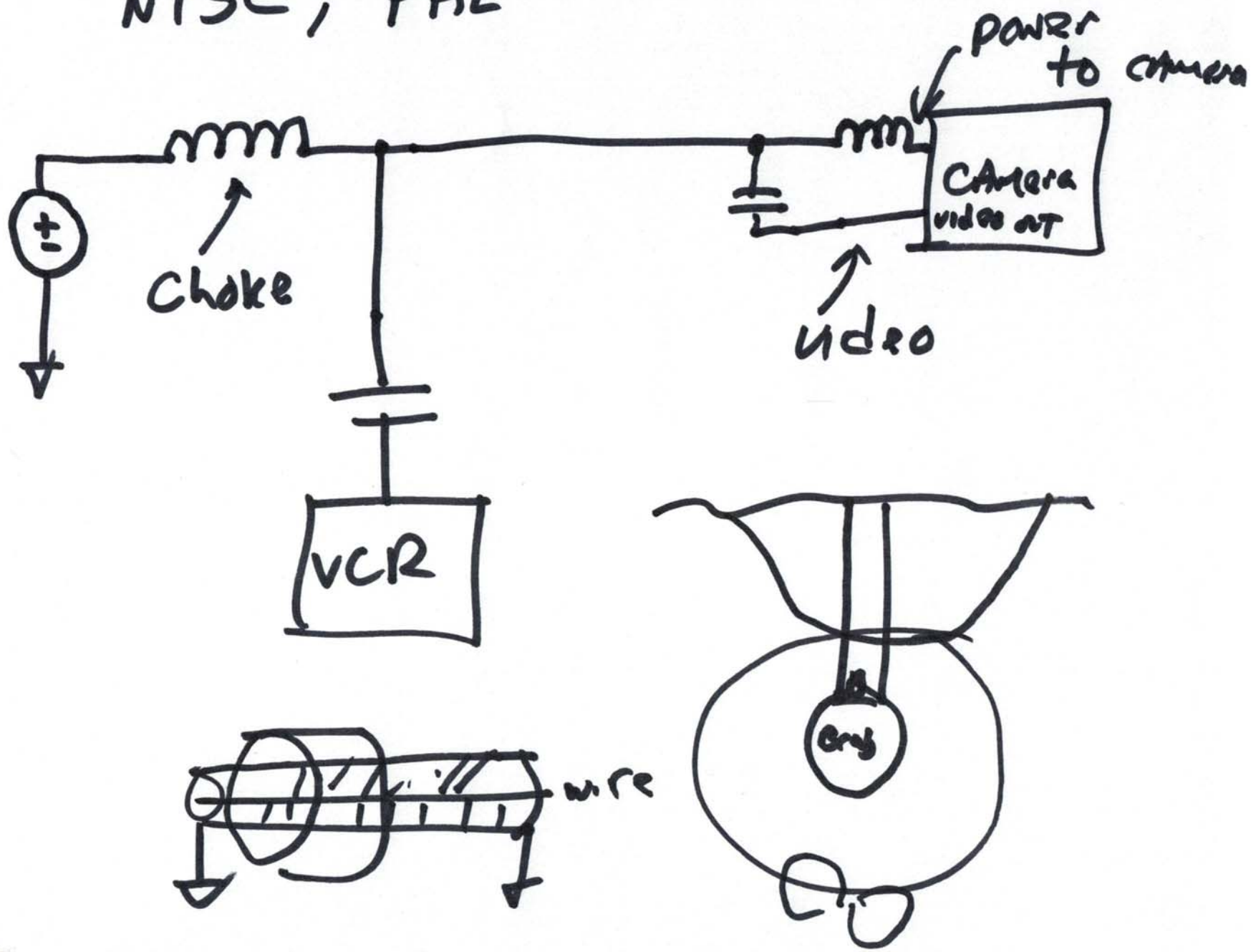
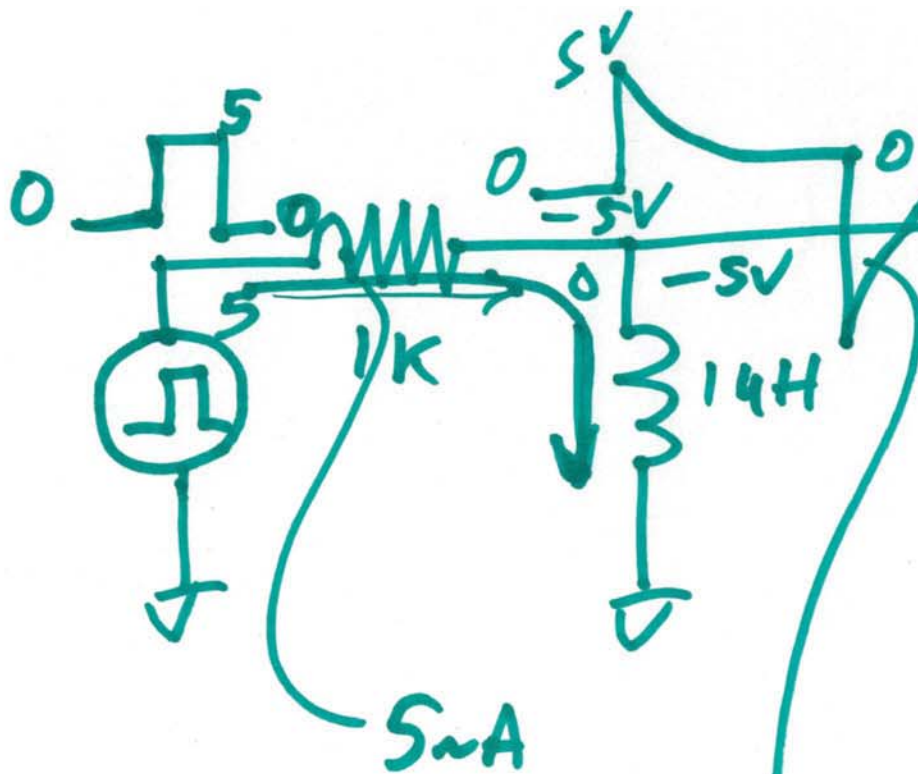




# NTSC, PAL



2)



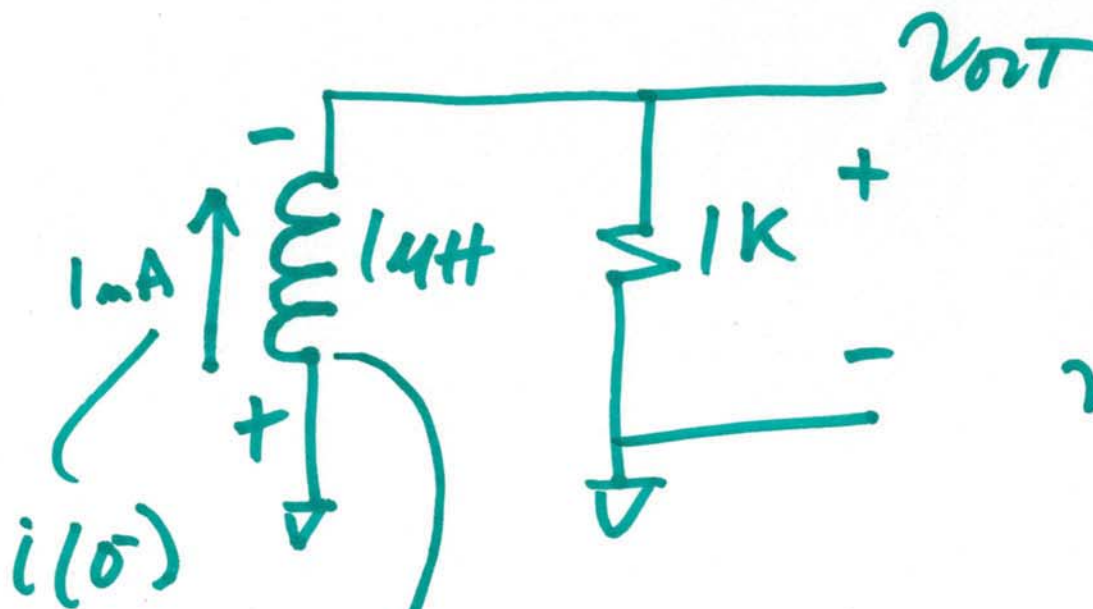
$V_{out} = ?$   
 ~~$V_i = 0V$~~   
 $V_i = 5V$   
 $V_f = 0$   
 f i f

$V_f + (V_i - V_f)e^{-t/4R}$   
 ~~$5 + (0 - 5)e^{-t/4R}$~~   
 ~~$5(1 - e^{-t/4R})$~~

$0 + (5 - 0)e^{-t/4R}$   
 $5e^{-t/4R}$

5)





$$v_i = 1\text{V}$$

$$v_f = 0$$

$$v_{0T} = 1 \cdot e^{-t/1\text{ms}}$$

$$= e^{-t/1\text{ms}}$$

$$0 - v_{0T} = L \cdot \frac{di}{dt} = i \cdot R$$

$$\frac{L}{R} \cdot \frac{di}{dt} = i$$

$$\frac{L}{R} \int \frac{di}{i} = \int_0^t dt$$

~~$$\frac{L}{R} \cdot di = \int_0^t i \cdot dt$$~~

4)

$$-\frac{L}{R} \cdot \frac{di}{dt} = i$$

$$\int_{i(0^-)}^{i(t)} \frac{L}{R} \cdot \frac{di}{i} = \int_0^t dt$$

$$\ln a - \ln b =$$

$$\ln \frac{a}{b}$$

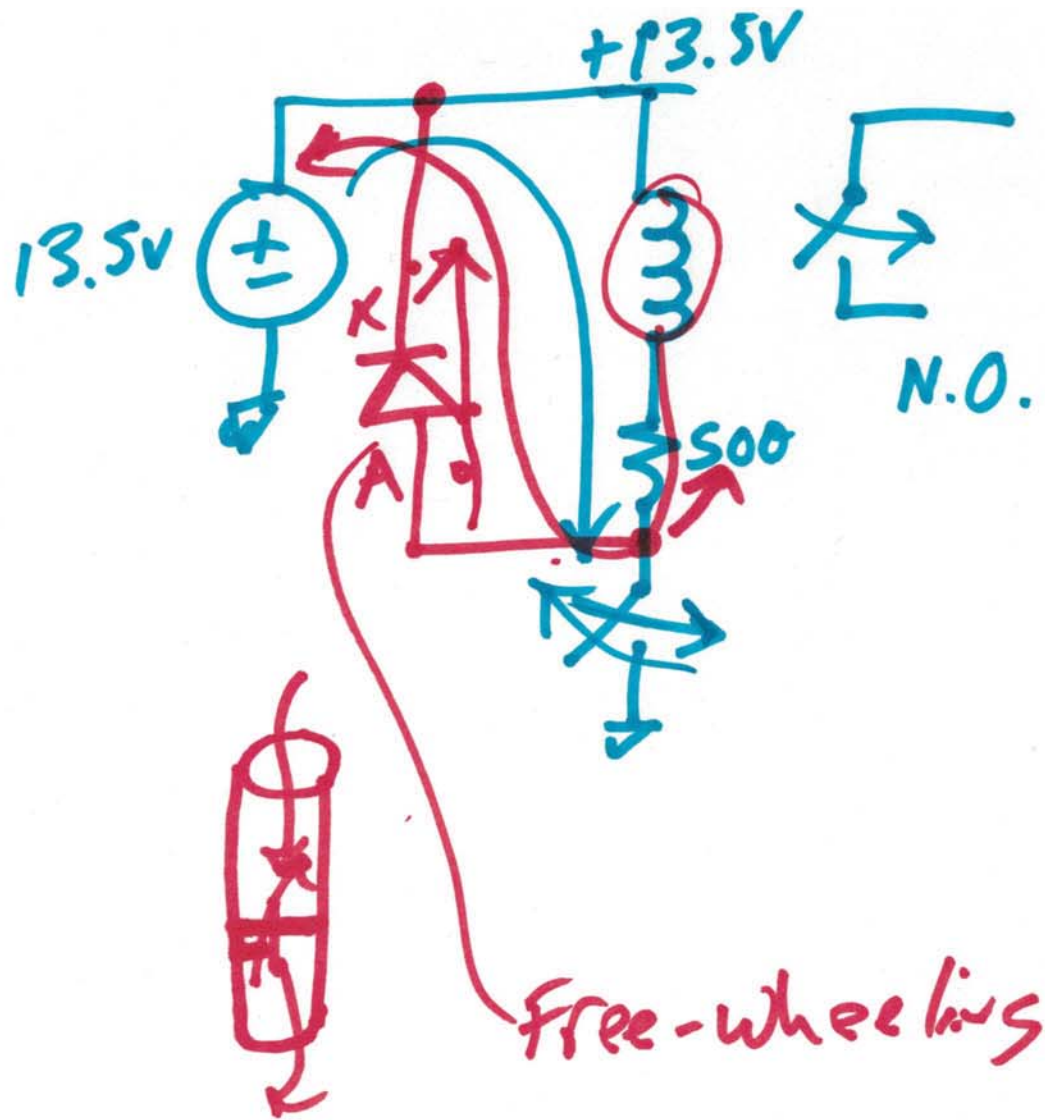
$$-\frac{L}{R} \left( \ln i(t) - \ln i(0^-) \right) = t - 0$$

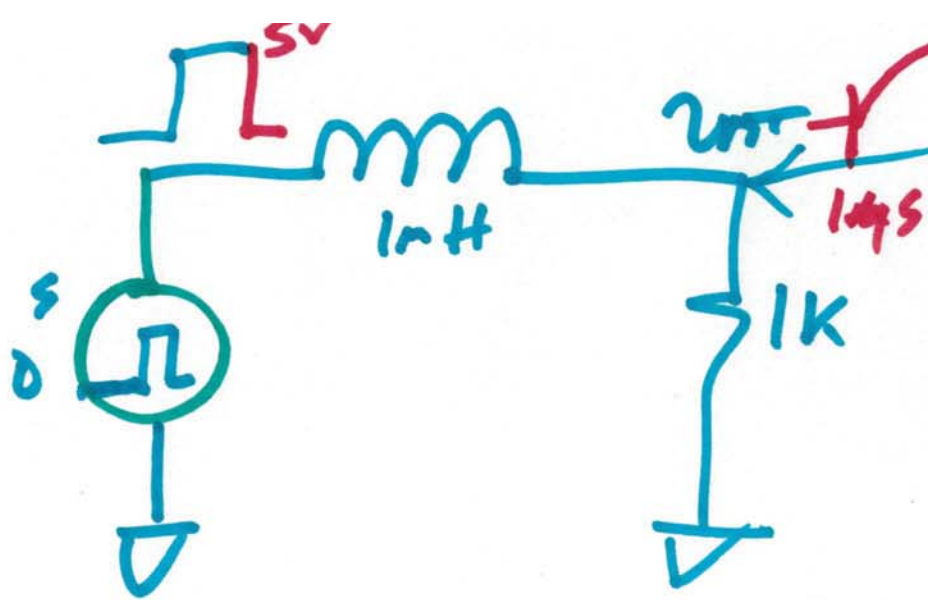
$\ln AR$

$$\ln \frac{i(t)}{i(0^-)} = -t / \frac{L}{R}$$

$$i(t) = i(0^-) e^{-t / \frac{L}{R}}$$

5)





$$v_i = 0$$

$$v_f = 5V$$

$$v_{out} = 5 + (0 - 5)e^{-t/145}$$

$$= 5(1 - e^{-t/145})$$

$$v_i = 5 \quad t > 145$$

$$v_f = 0 \quad (t - 145)$$

$$v_{out} = 0 + (5 - 0)e^{-\frac{t-145}{145}}$$

$$v_{out} = 5e^{-\frac{t-145}{145}}$$

$$t > 745 \quad (t - 745)/145$$