

Refer to AD 7847 data sheet.

Wire the chip:

Pin 1  $\overline{CSA} \Rightarrow$  pin 22 OUTPUT

Pin 3  $V_{ref A} \Rightarrow +5V$

Pin 4  $V_{out, A} \Rightarrow DMM$

Pin 5 Analog GND A

Pin 6  $+12V$

Pin 7  $-12V$

Pin 11 Digital GND

Pin 12 MSB  $\Rightarrow$  pin 30

Pin 13  $\overline{WR}$   $\Rightarrow$  pin 23

Pins 14-24  $\Rightarrow$  pins 31  $\rightarrow$  41

} OUTPUT

Now for the pseudo-code

Standard setup()

Pick an output voltage, say 2.718

Round  $\left[ \frac{2.718}{5.000} \times 4095 \right] \Rightarrow \text{integer}$

```
for (i=0; i<12; i++) {  
    bit[i] = bitRead[  
        , i  
    ]  
}
```

0-11  
bit[i]  $\Rightarrow$  digital Write [pin#] # 41  $\rightarrow$  30

$\overline{\text{CSA}}$   $\downarrow$

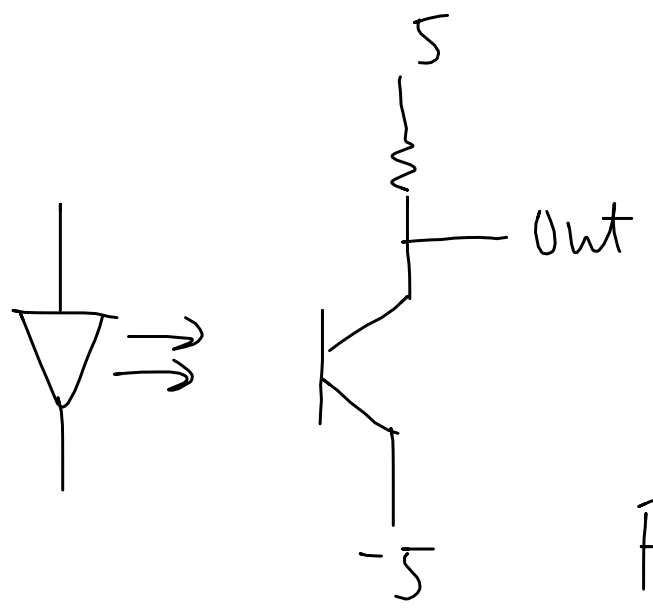
$\overline{\text{WR}}$   $\downarrow$

delay(1);

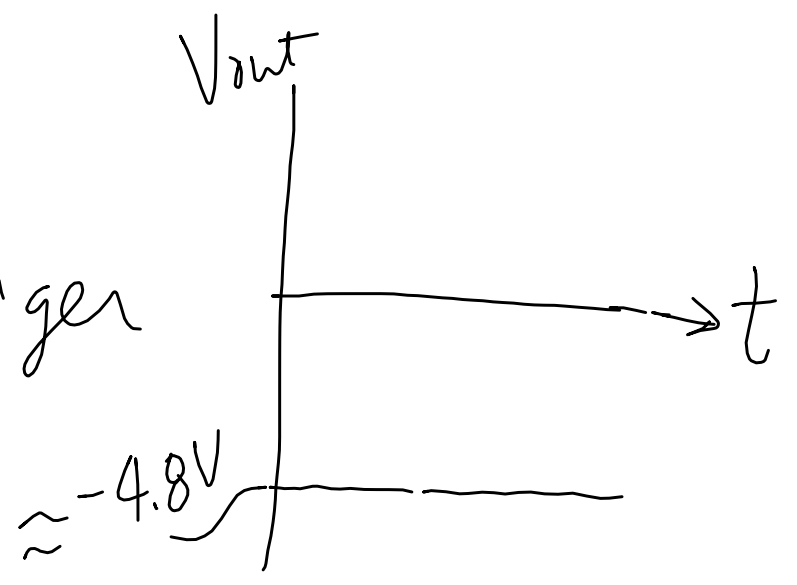
$\overline{\text{WR}}$   $\uparrow$

$\overline{\text{CSA}}$   $\uparrow$

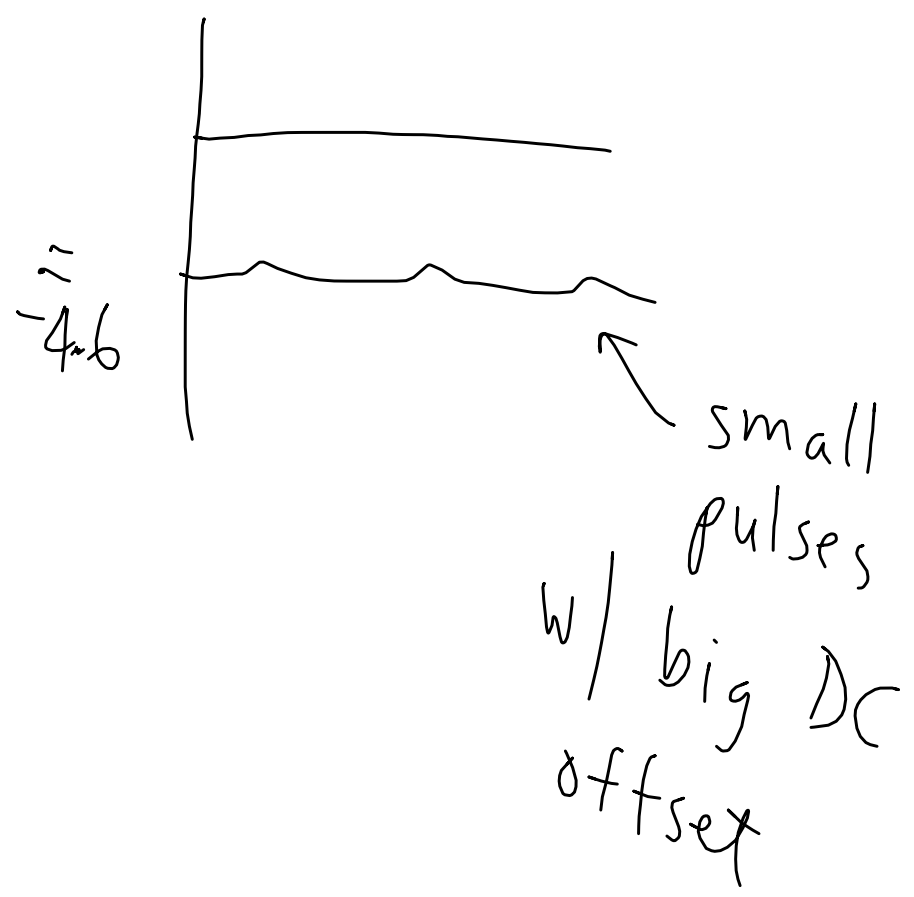
# Pulse monitor

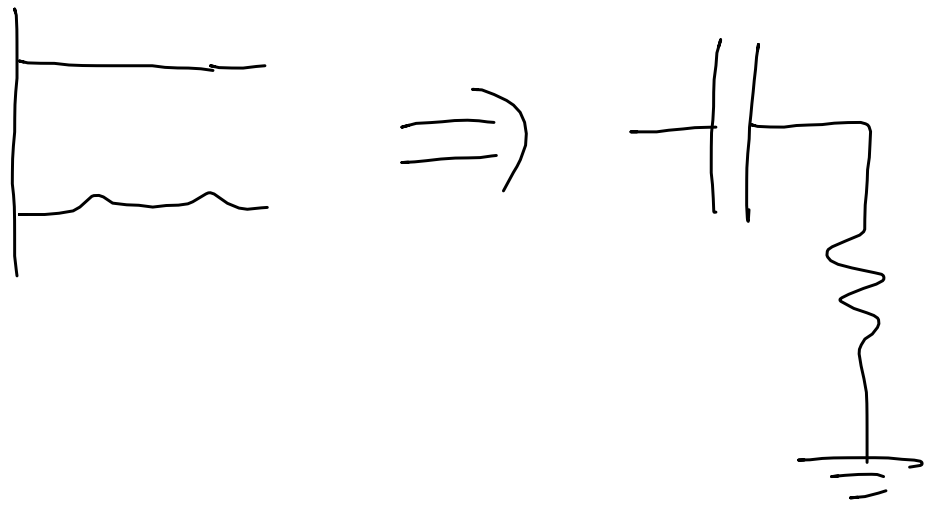


No finger

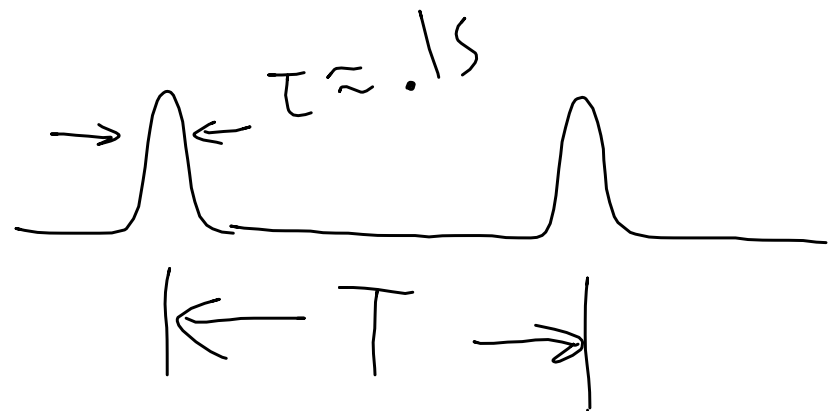


Finger





How to choose  $R$  +  $C$ ?



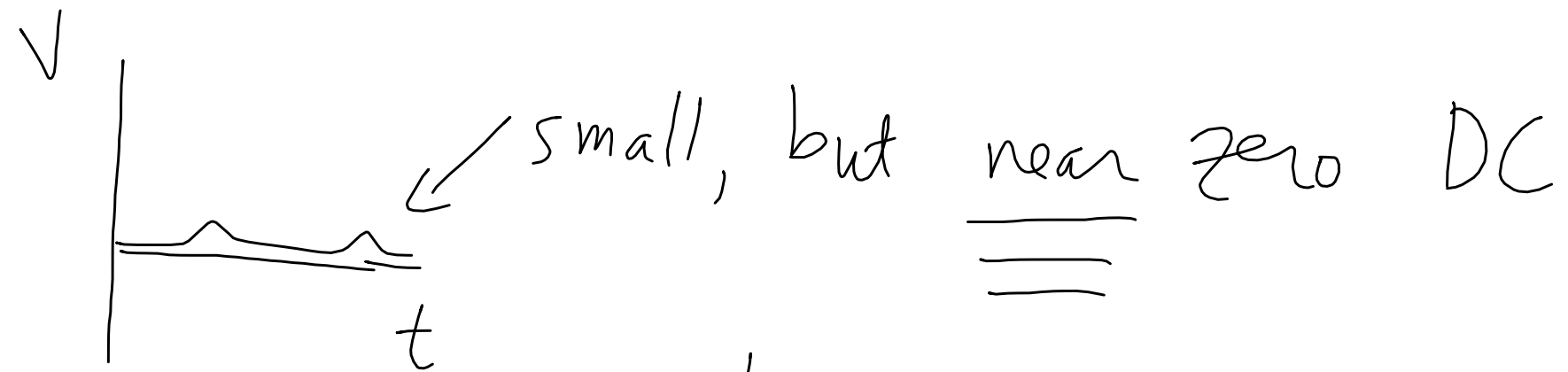
So pulse itself is  
 $\approx 10 \text{ Hz}$

$$T \approx 1 \text{ sec}$$

We have  $R = 10^6 \Omega$  +  $C = 0.1 \mu\text{F}$

$$f_{3dB} = \frac{1}{2\pi(10^6)(10^{-7})} = \frac{10}{2\pi} = 1.6 \text{ Hz}$$

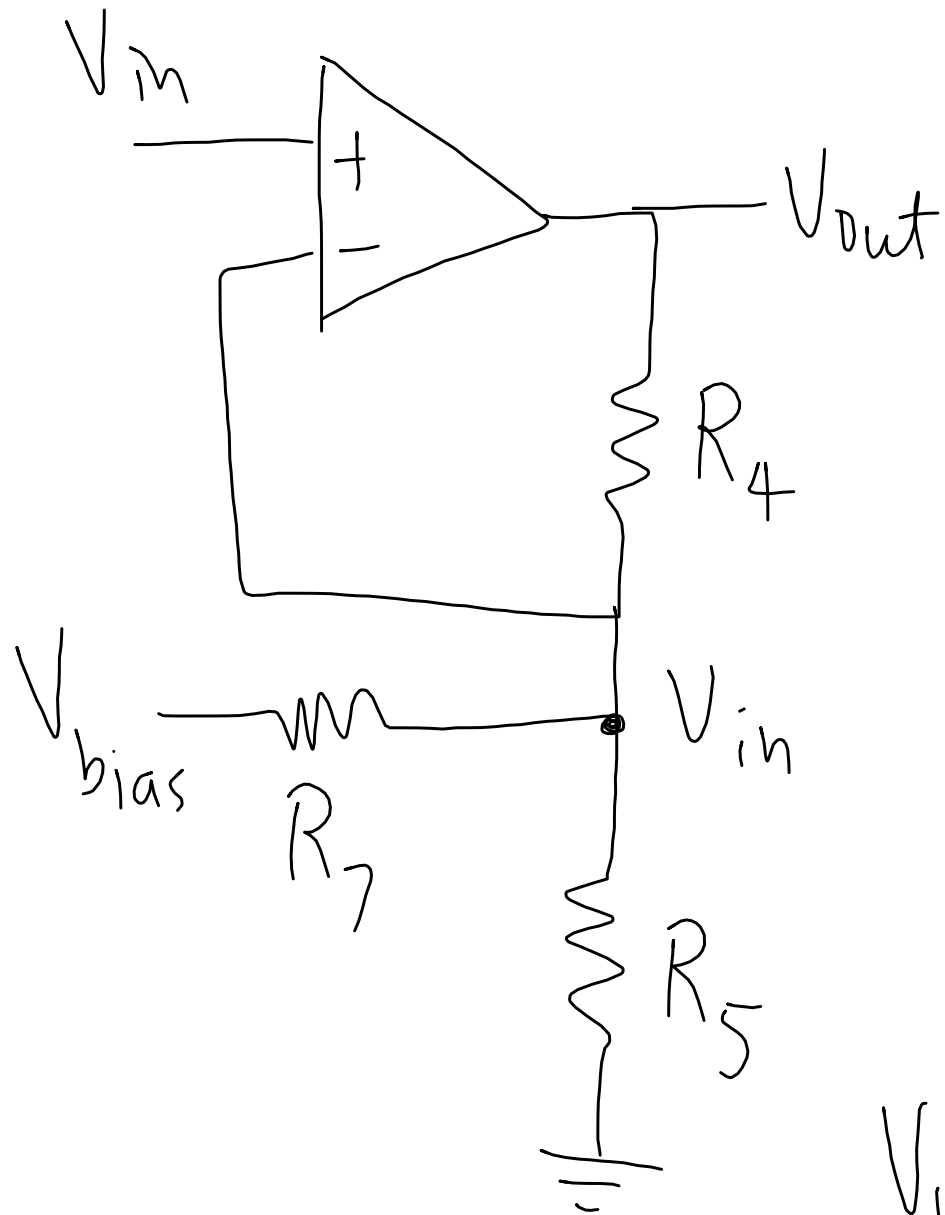
After high pass filter



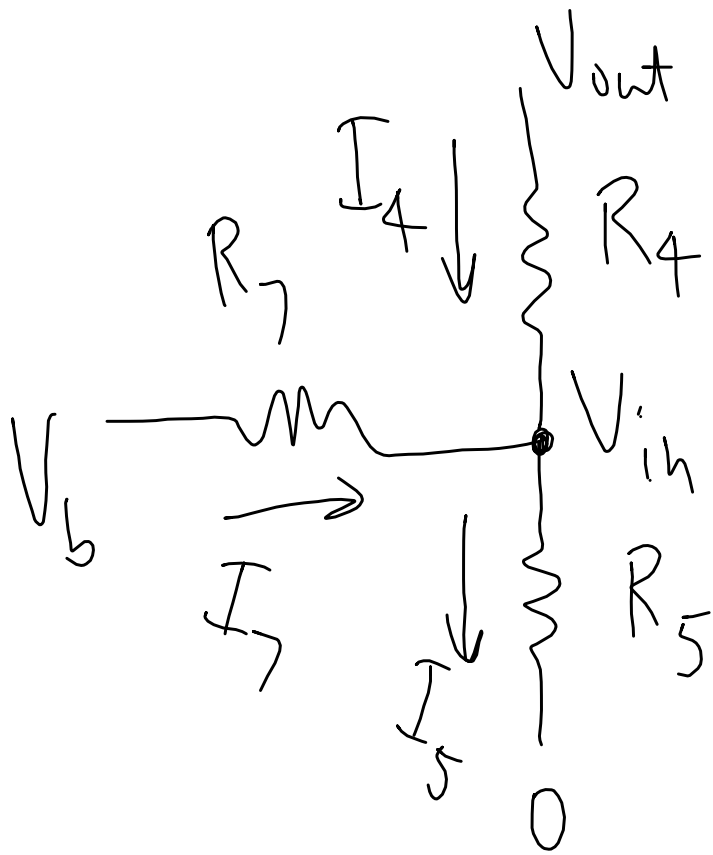
So amplify it!

But need control of DC level

for setting comparator threshold (later)



What is  $V_{out}$  in terms of  $V_{in}$ ,  $V_{bias}$  & the R's?

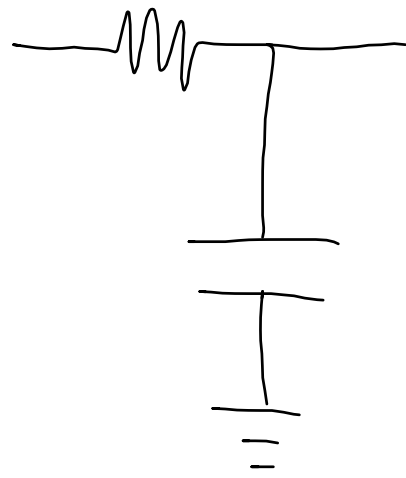




$$\left. \begin{aligned}
 \frac{V_{out} - V_{in}}{R_4} &= I_4 \\
 \frac{V_b - V_{in}}{R_7} &= I_7 \\
 \frac{V_{in}}{R_5} &= I_5 \\
 I_4 + I_7 &= I_5
 \end{aligned} \right\}
 \begin{aligned}
 \frac{V_{out} - V_{in}}{R_4} &= \frac{V_{in}}{R_5} - \frac{(V_b - V_{in})}{R_7} \\
 \frac{V_{out}}{R_4} &= V_{in} \left[ \frac{1}{R_5} + \frac{1}{R_4} + \frac{1}{R_7} \right] - \frac{V_b}{R_7} \\
 V_{out} &= V_{in} \left[ 1 + \frac{R_4}{R_5} + \frac{R_4}{R_7} \right] - V_b \frac{R_4}{R_7}
 \end{aligned}$$

$\approx 200$   
 Amplify

$\approx 2$   
 $\pm$  shift



low pass filter to get  
rid of high freq noise  
before going to the  
Comparator