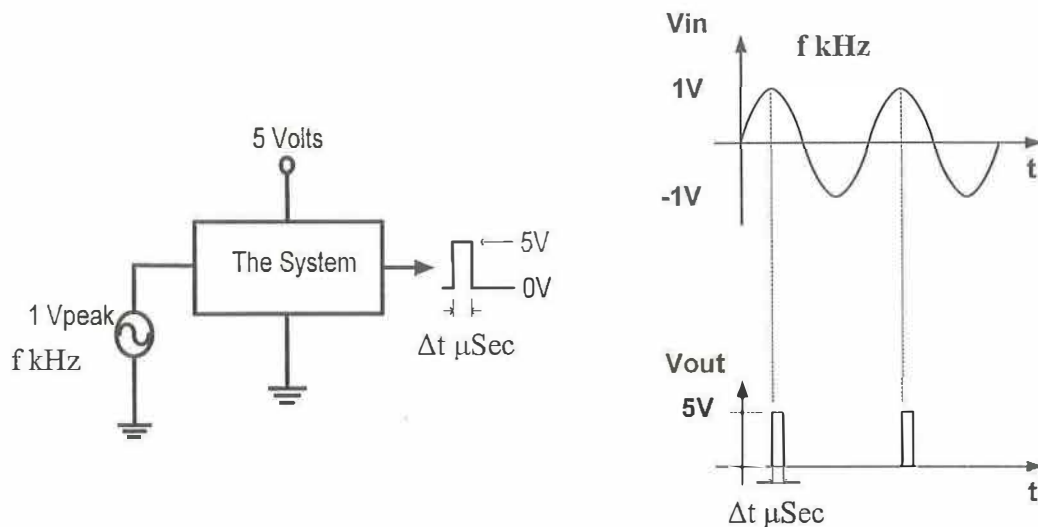


Final Project

Project Description:

You have to design a system, which will produce a narrow pulse whenever the incoming signal reaches its peak positive voltage.



The input is a sinusoidal wave with a 1V ($\pm 10\%$) peak signal and the output pulse is a 0 to 5 Volts signal with a duration as described in the following table.

Frequency of Input (kHz)	Pulse duration ($\pm 10\%$) μSec
1	80

You could use in your design Op-Amps, Comparators, resistors and capacitors. A nice feature would be that one could fine-tune the duration of the pulse with a potentiometer.

The optimum solution will use a single 5V power supply. If you use a split power supply to bias your components, your maximum grade will be only 80%.

Final Project: Report Guidelines

Your report will be the most relevant factor in regards to your final project's grade. As such, you are expected to produce a professional looking report, which includes the following items:

- A global description of the system to be designed
- An explicit specification of the technical requirements
- A thorough description of your design process, including relevant equations, and rationale for the different decisions made (i.e.: why you chose to use a comparator circuit at some point, etc.)
- PSpice simulations (For each block and whole circuit)
- A conclusion, including an evaluation of the system performance and your reflections about the design process

Design Tips

- Break up the problem in blocks! Do not try to come up with the final design at once, but rather try to tackle the different problems at a time. For example, how do you detect the peak of the sinusoid signal? How do you turn it into a square wave? How do you modulate the duration of the wave? Where will you get any needed reference signals? You can check with your instructor to see if you are taking the right approach as you make these decisions.
- Be neat when working on the breadboard! This project involves a number of components and different modules, and you will not be able to finish it if you have spaghetti on the breadboard.
- Test the different modules separately: If you are working on a comparator, make sure it is working fine before integrating it with the rest of the circuit. If you are working on an integrator, do the same.