

ECE 209L - FOURIER SERIES - LAB 20 SPECTRUMS OF PERIODIC SIGNALS - PART I

FALL 2003

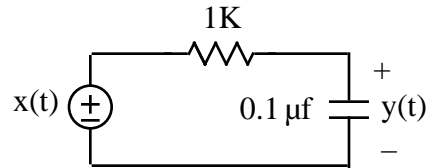
A.P. FELZER

OBJECTIVE

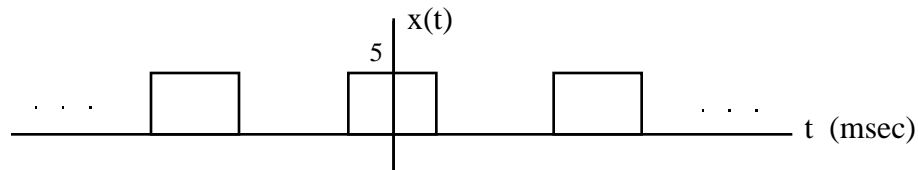
The objective of this lab is to compare the bandwidths of pulse trains and triangle trains.

LAB

1. Given the following first order lowpass circuit

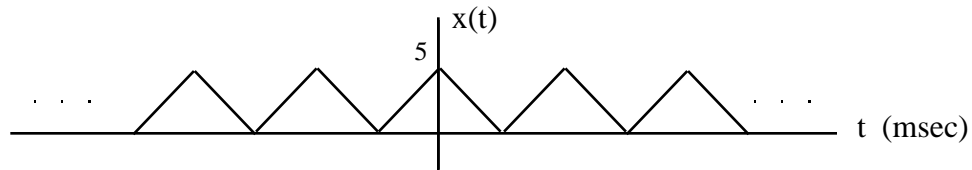


- a. **Prelab** - Obtain and measure your resistor and capacitor values. Then compare your nominal and measured values. Put your results in a Table
- b. Sketch the magnitude of your circuit's frequency response. Be sure to specify the 3dB frequency
- c. Connect up a pulse train input as follows



and then vary its frequency until $y(t)$ "just" looks like $x(t)$. Sketch a picture of your $y(t)$. Be sure to specify its frequency

- d. Now replace the pulse train input by a triangle train as follows



and then vary its frequency until $y(t)$ "just" looks like $x(t)$. Sketch a picture of your $y(t)$. Be sure to specify its frequency

- f. What can you conclude from your results in parts (b) and (d) about which signal - the pulse train or the triangle train - has a wider bandwidth - requires more harmonics to represent it.