ELEC 320
Prof. Rich Kozick
Fall, 2004

Homework 14

Date Assigned: Wednesday, November 3, 2004
Date Due: Monday, November 8 and Wednesday, November 10, 2004

Reading: Please continue to study Chapter 4 (all sections) in the Lathi text on the Fourier transform.

Lab: Before lab on November 8-9, please write an abstract describing your lab design project. Include the title, the names of the participants, and a brief description of what you plan to do. **Please send your abstract to me by email:** `kozick@bucknell.edu`

Please let me know if your lab group would like to switch from the Monday lab to the Tuesday lab (8:30 to 11:00 AM). If there are no volunteers, then I will ask each group in the Monday lab to take a turn on Tuesday morning.

Problems: Please do items 1-4 for Monday, and item 5 for Wednesday.

1. Find the Fourier transform of the functions $\delta(t)$ and $\delta(t-1)$ using the *definition* of the Fourier transform, not the table. In other words, compute the integral that defines the Fourier transform for these time functions. (Hint: Recall the "sifting" property of impulse functions.)

2. Please solve the following problems in the Lathi text for Monday, November 8.

   Problem 4.2-1.

3. Sketch $F(\omega) = 2000\,\mathrm{sinc}\,(1000\,\omega)$. Using the tables, find the inverse Fourier transform, $f(t)$, and sketch $f(t)$.

4. What is the Fourier transform of $\sin(2\pi 1000t)$? Sketch the 2-sided spectrum.

5. Please solve the following problems in the Lathi text for Wednesday, November 10.

   Problems 4.2-4 and 4.3-3(a).