Chapter 6

Final Design Project
Pre-Lab

1. Draw out a state machine that will cycle through displaying different digits on the multiple digit seven segment display. How quickly should that state machine cycle through the digits so that the digits don’t appear to blink? Research persistence of vision if you need more information.

2. Read what the final project will create and choose an analog voltage to measure with the ADC. Here are some suggestions:
   - The voltage across the batteries to estimate the remaining battery charge within the TekBot.
   - A voltage in the TekBot motor controller to estimate how hard the motors are working.

3. The final project will use an Analog to Digital Converter (ADC) in order to allow the measurement of voltages by the FPGA. The ADC used in this lab will not function correctly without the proper control signals. A module has been provided on the Tekbots webpage that generates the control signals for WR-RD Stand-Alone Mode. Using this module or the ADC0820 datasheet, draw two periods of the control signals for WR-RD Stand-Alone Mode on the provided axis. Note that the signals are inverted. Label the time axis in nanoseconds (ns) wherever a change occurs.

Figure 6.1: Prelab Question 3 Graphs