HOMEWORK 5

Revision 0

*Note: Late HW is **not** accepted!*

1. Complete the exercises in the *UF's DAD Waveforms Tutorial* (except you should skip the section "Digital Miscellaneous Functions"). Submit **screenshots** of each of the exercises. Note that you will need to use the DAD on each of your labs, starting with Lab 3.

2. Note: For every "new" part you use (like the 74'153), if you are not sure of a pins function, you should **verify its operation <u>before</u>** using it in a circuit. Most specifications sheets (including the one at https://mil.ufl.edu/3701/docs/74HC153_national.pdf) and Quartus show the select lines with labels A and B. Which select inputs correspond to A and B for you MUX?

   a) Use only your DAD with a 74'153 MUX in Quartus (search for 74153, see Figure 1) to determine if AB = S_1S_0 or AB = S_0S_1, or more precisely, which pin is for S_1 and which pin is for S_0. This is the only device in the design. Use the top MUX (as shown in Figure 1) and label the inputs as you move down on the figure as A, B, E, C0, C1, C2, and C3. Take a screen shot of the DAD output and explain why this screenshot proves your answer.

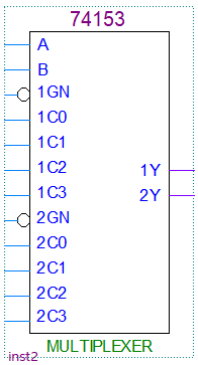

Figure 1: 74'153 in Quartus.

   b) Now document the total operation of one of the MUXes on the 74'153. Generate a 2.0 kHz (2000 Hz) 7-bit pattern for the inputs of the MUX using the signal generator (as discussed in the Pattern Generator section of the *DAD Waveforms 2015 Tutorial*). Use the generated signal from the DAD as inputs to your MUX circuit (with **<u>NO</u>** switches connected). Connect the DAD's DIO6 to the MUX chips enable pin (E=1GN), DIO5 and DIO4 to the same MUX's select lines (preferably DIO5 to S1 and DIO4 to S0, if you know which is which), and DIO3-DIO0 to the MUX's normal inputs (C3-C0). Now use the Logic Analyzer with the corresponding signal lines (e.g., DIO6 – DIO0) and the MUX's output attached to any other DIO. Connect the DAD to the appropriate DE10-lite pins and view the DAD's logic analyzer waveforms. Include a screen shot of the DAD's output in your homework document.