ECE385 Experiment #8

Eric Meyers, Ryan Helsdingen

Section ABG; TAs: Ben Delay, Shuo Liu

March 30th, 2016

emeyer7, helsdin2

I. Introduction

The purpose of this lab is to introduce concepts pertaining to USB protocol/communication and VGA display. The main goal of this lab was to connect a USB keyboard to the Altera FPGA and allow a user to control a ball displayed on a VGA-connected monitor.

II. Description of Circuit

RYAN SECTION

III. Purpose of Modules

RYAN SECTION

IV. Description of USB Protocol & Changes

ERIC SECTION

V. Schematic/Block Diagram

ERIC SECTION

VI. Post Lab

Resource	Value
LUT	
DSP	
Memory (BRAM)	
Flip-Flop	
Frequency	MHz
Static Power	mW
Dynamic Power	mW
Total Power	mW

TABLE I: Design Statistics

ERIC SECTION

1. What is the difference between VGA_clk and Clk?
Answer:

2. In the file io_handler.h, why is it that the otg_hpi_address is defined as an integer pointer while the otg_hpi_r is defined as a char pointer?
Answer:

3.What are the advantages and/or disadvantages of using a USB interface over PS/2 interface to connect to the keyboard? List any two. Give an answer in your Post-Lab.
Answer:

4. Note that Ball_Y_Motion in the above statement may have been changed at the same clock edge that is causing the assignment of Ball_Y_pos. Will the new value of Ball_Y_Motion be used, or the old? How will this impact behavior of the ball during a bounce, and how might that interact with a response to a keypress? Can you fix it?
Answer:

VII. Conclusion

RYAN SECTION

VIII. Figures