Computer Engineering 4DS4

Embedded Systems

Debugging Techniques for Embedded Systems

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Exercise 1

We decided to use the string `"Machester United F. C."` as it is our favourite football team. From the start of the printing the character `"M"` to the final character `"."` took approximately 107.1 μ seconds which seems reasonable for 1 print statement.

Exercise 2

For this experiment, the first thing we did was to setup and dual-port memory using the wizard in quartus. Next, we created a new System Verilog file that would instantiate our memory and contain the logic for determining what register we are writing to along with the IRQ FSM. After that was compiled, we went into quartus to create the my_component to implement our memory and FSM. Once completed, on the software side we made sure that we could write to and read from memory both for our IRQ and regularly.

Exercise 3

For this experiment, we first changed the writing of the header file to match the pdf file that was given to us, making slight change to account for the difference in size for a 320x240 pixel image. After ensuring we could write a BMP file to the sd card, we then had to edit the for loop to allow it to read the new header. Then we had to put limits on where the LCD would display the pixels in order to center the image and writing black for the RGB values of the pixels outside of the limit.