Lab 5

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Section 75C9

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* Prelab Questions:

1. List the XMEGA's USART registers used in your programs and briefly describe their functions.

*UsartD0\_CTRLA: Is for interrupt level.*

*UsartD0\_CTRLB:Enables transmitter and receiver.*

*UsartD0\_CTRLC:Parity, stop bit, bit frame*

*USARTC0\_BAUDCTRLA & USARTC0\_BAUDCTRLB: Baud rate configurations.*

*USARTC0\_STATUS:Check the status of the RX and TX, to see if we can receive or transmit.*

*USARTC0\_DATA:To actually send or receive the data from/to the USARTC system*

2. What is the difference between synchronous and asynchronous communication?

*Synchronous have a clock that was to wait in order to do something. While asynchronous doesn't have to wait and can be done at any time. In the lab we used asynchronous communication.*

3. What's the difference between serial and parallel communication?

*Serial communication transfers data one bit at a time, uses less wires, and can cover longer distances. Parallel communication sends data multiple bits at a time over multiple wires, and can do it much quicker.*

4. List the number of bounces from part A of this lab. How long (in ms) is your delay routine for debouncing?

*There are around 10 bounces on falling, and 2 bounces on rising. I used a 90ms delay for the debouncing.*

5. What is the maximum possible baud you can use **for asynchronous communication** if your board runs at 2Mhz? Support your answer with the values you would place in any special registers that are needed.

*he maximum baud rate is 124031 Hz, the bscale would be -7 and 1 for bsel.*

ldi R16, (BSel & 0xFF)

sts USARTD0\_BAUDCTRLA, R16

ldi R16, ((BScale << 4) & 0xF0) | ((BSel >> 8) & 0x0F) sts USARTD0\_BAUDCTRLB, R16

* Problems Encountered:

Getting the menu to pop before taking in any characters into the console.

* Future Work/Applications:

We now know how to interrupt a service which is useful for Operating Systems or other devices. We also learned serial communication which is used to receive and send data.