Exercise 3 Documentation

Summary of Task:

Exercise 3 should take a string from the terminal emulator which is connected to the SCI1 input port, then be read in through the SCI to be stored in memory. This string stored in memory should then be outputted through the SCI port and displayed on the terminal. The carriage break character should be used to denote the end of the string. The string should print out once per second.

Program Summary:

* The program reserves 300 bytes of memory at address inpstr
* The program sets the baud rate at 9600 by writing to the SCI1BDH/DL registers
* Loads the address of inpstr to reg x
* Using a subroutine the program jumps to the receive subroutine
  + The control register 2 is set to receiving enabled
  + When the mask for RDRF empty is 1, the subroutine will run, not moving to the next character until this mask is met.
  + The data in the SCI1DRL register is stored in reg b
  + This is compared to the carriage character value
  + If 0, return from the function and add the carriage character to the current memory address of inpstr
  + Else store the value of the char in reg b at current address positon in x, increment x
* Using a subroutine there is a delay of 1 second
* Using a subroutine the program jumps to the transmit subroutine
  + The control register 2 is set to transmitting enabled
  + When the mask for RTDE empty is 1, the subroutine will run, not moving to the next character until this mask is met.
  + The data in the address of x in moved to SCI1DRL register
  + This is compared to the carriage character value
  + If 0, return from the subroutine as this is the end of the string, only return when transmission is complete
  + Else store loop through the reserved memory until the carriage character

Diagram:

Testing:

* Are the SCI registers for baud rate, control and status being set correctly?
  + Located at the d0 register for the virtual board.
  + Check hex values match the desired binary
  + Check status register for errors when unexpected behavior occurs.
* Input a generic string stored as an fcc with a carriage, can this be outputted to the terminal?
  + Check that the sub-routine is being called and run by storing a variable in memory
  + Check that the delay is working by stepping through it and checking registers
  + Check that branching condiions work by using them in generic code
  + If errors, check the status registers for clues
* Inputing a string from the terminal
  + Check that the string is being stored in the location specified
  + Try storing string in another location
  + Overriding existing string correctly
  + Check that ascii values are entering as expected by using ascii table
* Printing to the terminal using input string
  + Check sci registers are set correctly and that that the control is set for transmitting, no errors ect such as framing error
  + Check that the routine in being entered by storing a character in memory
  + Check that the characters outputted to the terminal match those inputted

Discussion Questions:

What problems can you see arising from the use of polling when dealing with data input?

What happens if there are more characters input than there is space to store them?