## Homework #4 EECS 388 Due: October 31, 2007

**Problem #1.** Draw a diagram showing the bit format used for asynchronous serial data transfer. Label the start, stop, and parity bits. Number the data bits to show the order of transmission.

Problem #2. A terminal is transmitting simple asynchronous serial data at a1200 Baud.

- a) How much time is required to transmit 1 bit ?
- b) Assuming 7 data bits, a parity bit, and 1 stop bit, how long does it take to transmit one character ?

**Problem #3.** Show the bit pattern for the mode word and the command word that must be sent to an 8251A to initialize the device as follows: buad rate factor of 64, 7 bits/character, even parity, 1 stop bit, transmit interrupt enabled, receive interrupt enabled, DTR' and RTS' asserted, error flags reset, no hunt mode, no break character.

**Problem #4.** In this problem you will write a main routine and two subroutines in assembler (A total of three routines).

The main routine will call the first routine to setup the UART lite, and then call the second routine that inputs and outputs a character. After the main routine performs the initial setup of the UART Lite, it should continue to loop and call the second input/output routine and check the returned status. If an error occurred, then the main routine should exit.

The setup routine should turn the interrupt off, and reset both thetransmit and receive FIFO's.

The input/output routine reads in a character to R19, and then writes the character back out. Be sure and check that the UART is ready to transmit and receive and check for errors. If an error is identified, then the subroutine should first reset the corresponding FIFO, and then return a 1 in R3. If no error occurred, then the subroutine should return a 0 in R3.

Use the definitions defined in <u>http://wiki.ittc.ku.edu/ittc/images/1/11/HintsUART.txt</u> for your base and offset addresses.