

Assignment 6

due

*Wednesday, December 2, 1998
12:30 PM*

1 Question 1

See <http://www.altera.com/document/an/an042.pdf>
if you need more details.

Draw the waveform used for serial transmission of the ASCII character Q at 2400 bps with 7 data bits and no parity. Label the time and voltage axes.

2 Question 2

You are trying to figure out why one computer won't send data to another over a 25-pin RS-232 serial interface. You measure several pins on the first computer and find DSR is at +7 volts while TxD reads 0 volts. Is this computer wired up as a DTE or DCE? You check the other computer's interface and its CTS pin is at +10 volts and its TxD also reads 0 volts. What is likely to be the cause of the problem? Draw a diagram showing how you could connect up pins 2, 3 and 7 to try to establish a link between the two systems.

3 Question 3

The following sequence of bits contains two HDLC frame sync sequences framing a number of bits. List the data bits contained within the frame. Group the resulting bits into sets of 4 from left to right and give the corresponding hexadecimal digits (set any missing bits to zero).

0111 1110 1011 1010 1011 1110 1101 1011 1111 0000

4 Question 4

Use the values of C_1 , C_2 , and t_{OSU} for the FLEX 10K20-4 devices given in the lecture notes and assuming $t_{PD} = 5$ ns, compute the MTBF due to metastability for an FPGA input register clocked at 80 MHz that is sampling a 50 MHz input signal.