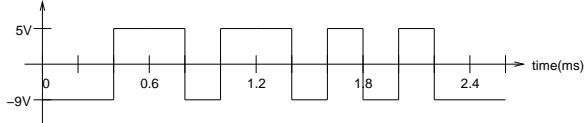


# Assignment 3 - Serial and Parallel Interfaces

due Wednesday, March 17  
9:30 AM

## Question 1

The figure below shows a plot of voltage versus time of the signal on the TxD pin of an RS-232 serial interface while one character is transmitted.



Answer the following questions:

- Are the voltage levels valid for an RS-232 interface?
- What is the (approximate) baud rate?
- Assume parity bits are not being used. How many data bits were transmitted?
- What character was transmitted?

## 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.

## Question 3

A computer's parallel printer interface is implemented using a 1-byte output port at address 0x180, a 1-byte status port at address 0x181 and an 1-byte control port at address 0x181. The status of the

BUSY signal can be read from the most significant bit of the status port (1=busy, 0=not busy). The other bits of the status port have unknown values. The STROBE signal can be controlled by setting the bit 3 of the control port (1=high, 0=low). The other bits of the control port have no effect.

Write a C function, `void cprint(char c)` that waits until the printer is not busy, writes `c` to the data port, sets the strobe signal low and then sets it high again. Use the same `speek()` and `spoke()` functions used in the lab.

Write another C function, `void sprint(char s[])`, that prints the string `s` on the printer.