Lecture 4

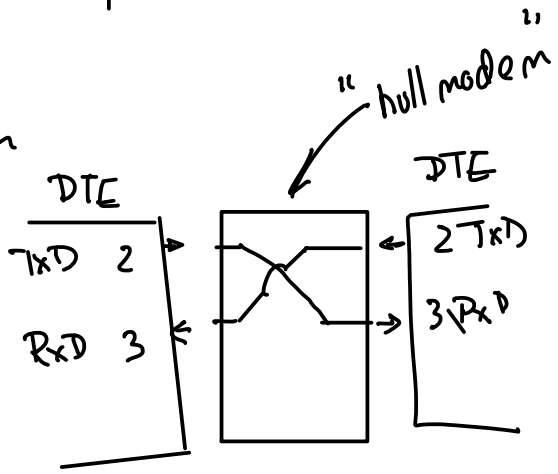
Exercise 1: Is the "Transmit Data" (TxD) signal an input or an output? How about "Receive Data" (RxD)? Is a computer a 'modem' or a 'terminal'?

	TxD	RxD
DTE	OUT →	IN
DCE	IN ←	OUT

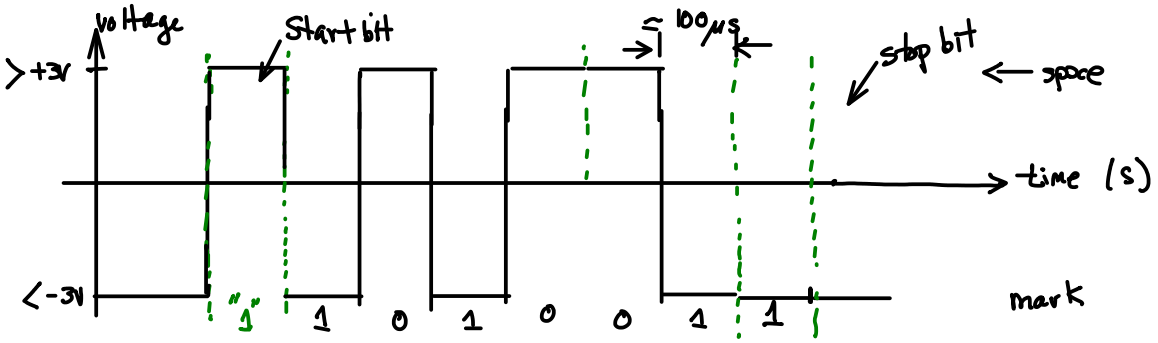
computer could be either

typically PC's are wired as DTEs.

NULL MODEM



Exercise 2: Draw the waveform used to send the ASCII character 'e' (hex 65) at 9600 bps with seven data bits and no parity.



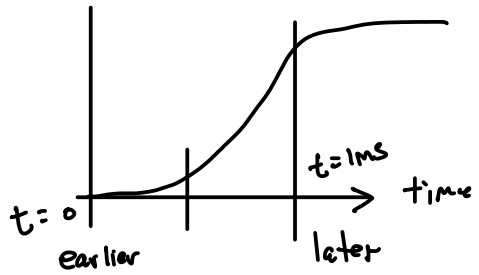
0x65 = 0110 0101

6 5

8th bit, not transmitted

$f_{bit} = 9600$

$T_{bit} = \frac{1}{9600} \simeq 100\mu s$



Exercise 3: Will the parity bit allow the receiver to detect all single-bit errors? All double-bit errors?

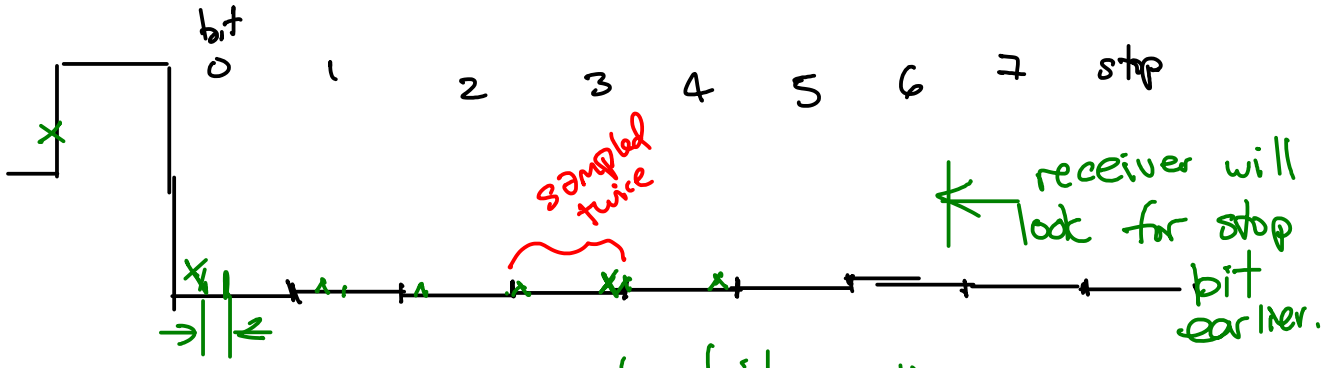
yes, any single error increases or decreases the # of 1's & ∴ changes parity

double errors will cause count to go
- up by 2
- down by 2
- no change

} parity (odd/even) does not change

0 0 ←
0 1
1 0 ∴ cannot detect double bit errors
1 1

Exercise 4: What happens if the receiver's clock is running faster than the transmitter clock?



- receiver samples each bit earlier
- error will increase for each bit

Exercise 5: What would happen if the receiver was expecting 8-bit characters and the transmitter was sending 7-bit characters? What about the reverse case?