ECS 154A Homework 6

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Fall 2013

1.

$$c = 3.00 \times 10^8 \frac{m}{s},\ d = 0.12m,\ d = rt \implies t = \frac{d}{r}$$

$$r = \frac{c}{3} = \frac{3.00 \times 10^8 \frac{m}{s}}{3} = 1.00 \times 10^8 \frac{m}{s}$$

$$t = \frac{0.12m}{1.00 \times 10^8 \frac{m}{s}} = 1.20 \times 10^{-9} s$$

$$\text{bandwidth } = \frac{\text{bits}}{t} = \frac{64b}{1.20 \times 10^{-9} s} = 5.33 \times 10^{10} \frac{b}{s}$$

The maximum theoretical bandwidth is $5.33 \times 10^{10} \frac{b}{s}$.

2. This would increase the bandwidth by a factor of $8B$. So, the new bandwith would be

$$8B \cdot 5.33 \times 10^{10} \frac{b}{s}$$

3. A Programmable Interrupt Controller (PIC) takes in multiple interrupt lines and combines them with priority to the cpu. One of the most popular ones is the 8259A.

4. The difference between an interrupt and an exception is that an interrupt is user invoked, like a keypress or closing the laptop lid, while an exception is invoked by the execution of a program, like a division by zero.