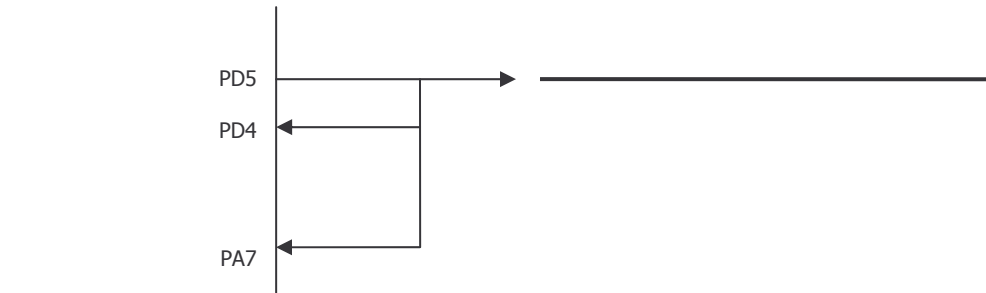# Project Information

This will be an Ethernet-type application and will use CSMA/CD

Whatever bits used have to be general purpose bits. Port D is a good choice because the ports are bi-directional.

You cannot transmit unless the bus is idle.

Possible Bus States:
Idle
Busy
Collision

In the case of a collision, then all stations have to stop transmitting and wait for a random amount of time and then check again to see if the bus is idle. If it is, transmission can begin again.

Conceptually, the most difficult thing to *design* is the bus monitor. However, that will be the easiest thing to *program*.

Monitoring the Bus
Remember, the data uses Manchester encoding. This guarantees that there will always be an edge in the middle of the bit being transmitted.

'1'   '0'

Transfer rate is 400 bps
Time per bit is $1 / 400 = 2.5$ ms

When the bus is idle, it should be high. Thus, if the bus is logical 1 for more than 2.5 ms, it is idle.

The only way that the bus will ever be low for more than 2.5 seconds is if there is a collision.

When finished transmitting, make sure that you write a logical high.

Pulse Accumulator

Associated Registers
PACTL
PACNT (8 bits)
TMSK2
TFLG2

Remember to use the "write 1 to clear" strategy

PACNT
You can have this increment under certain conditions.
We can have an interrupt occur and increment this counter every time it sees an edge. However, since it is an 8-bit counter, it can only count to 255 before overflowing and resetting to 0. You can monitor for this even, though.

Two Modes
External Event Counter – every time a falling edge occurs, increment the counter by one
Gated time accumulation mode –

TMSK2
Bit 5: PAOVI – interrupt every time PACNT overflows
Bit 4: PAII – interrupt every time an edge occurs on Port A

PAII ISR (Fires on every edge)
If PEDGE = 0, it interrupts on a falling edge. This is what we have to do initially to detect the falling edge use to identify start of transmission.

Need to:
Change PEDGE to 1 because the next edge we expect to see is a rising edge.
Set the PACNT value to 155 (after 100 counts, or 3.2 ms, the count will overflow)
Set Busy flag
Clear the associated flag

PACTL

7	6	5	4	3	2	1	0
DDRA7	PAEN	PAMOD	PEDGE				
0	1	1	0				

First Deadline – One week from Tuesday
Detect the state that the bus is in