Laboratory 04: Software Implementation of a UART Transmitter and Receiver and Use of a Saleae Logic Analyzer and Tera Term Terminal Emulator

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Lab Section L01

I. What would be the preferred hexadecimal value to send as an initial test of your UARI_sw_write function from Task 1 and why? Preferred in the sense that it would be the easiest to use to verify the bit times using an oscilloscope or logic analyzer.

A preferred hexadecimal value for testing in TASK 1, we would use a value which is constantly changing such as ob10101010 , which translates to 0xAA. This will allow us to constantly judge a changing value with the strictest timing.

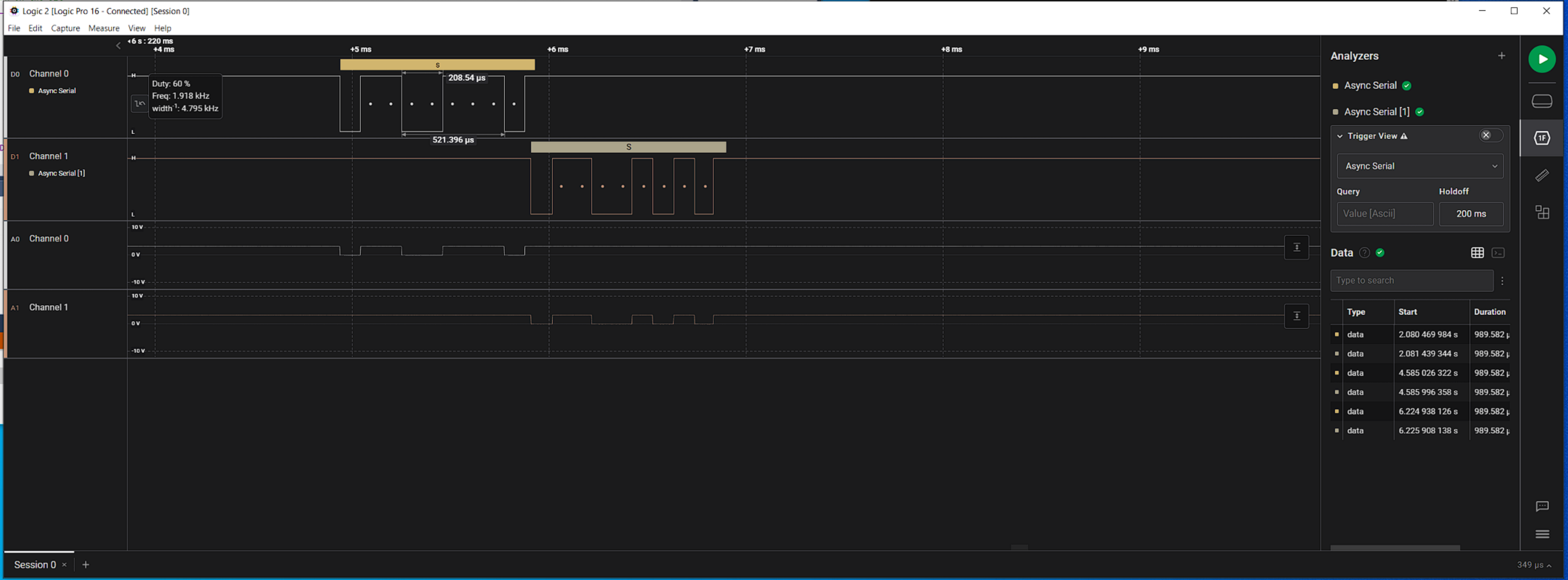
2. From the article Determining Clock Accuracy Requirements for UART Communications, what would you use as the maximum allowable percent error in your bit times for a software transmitter or receiver for the "nasty link" case and the "normal link" case respectively? Assume that the device you are communicating with has no bit time error.

For a "nasty" it would be 75% of the bit time

3. If we were to go to very high baud rates, how might that effect the avr-libe delay function(s) that you use in your program?

A high baude rate would require us to lower the delay used in the function

4. If you were implementing an interrupt driven software receiver, as in Task 4, for fairly low baud rates, how could you improve its performance by using one of the counters on the AVR128DB48? Provide a one paragraph explanation of how you would use the counter in the overall implementation of the receiver.



Duty: 60 %
Freq: 1.918 kHz
width^{-1}: 4.795 kHz

Analyzers

- Async Serial
- Async Serial [1]

Trigger View ⚠

Async Serial

Query: Value [Ascii]

Holdoff: 200 ms

Data

Type to search

	Type	Start	Duration
■	data	2.080 469 984 s	989.582 µ
■	data	2.081 439 344 s	989.582 µ
■	data	4.585 026 322 s	989.582 µ
■	data	4.585 996 358 s	989.582 µ
■	data	6.224 938 126 s	989.582 µ
■	data	6.225 908 138 s	989.582 µ