ELEX 2117

Brennan Pinette

A01073920

February 21, 2021

Lab 4 – Multiplexed Display

Code:

```
module lab4
    (
        input logic clock,
        output logic a, b, c, d, e, f, g, test,
        output logic [3:0]en
        );

        logic [19:0] count, count_next, n ;
        logic [1:0] digit, digit_next ;


        assign n = 20'h196E4 ;

        always_ff @(posedge clock) count = count_next ;

        always_ff @(posedge clock) digit = digit_next ;

        assign count_next =
        count ? count - 1 : n - 1 ;

        assign digit_next =
        count ? digit :
        digit == 2'b11 ? 0 : digit + 1 ;

        assign {en, a, b, c, d, e, f, g} =

        digit == 2'b01 ? { 4'b0001, 7'h01} : // 0
        digit == 2'b10 ? { 4'b0010, 7'h12} : // 2
        digit == 2'b11 ? { 4'b0100, 7'h04} : // 9
        { 4'b1000, 7'h06} ; // 3



Endmodule
```

Math:

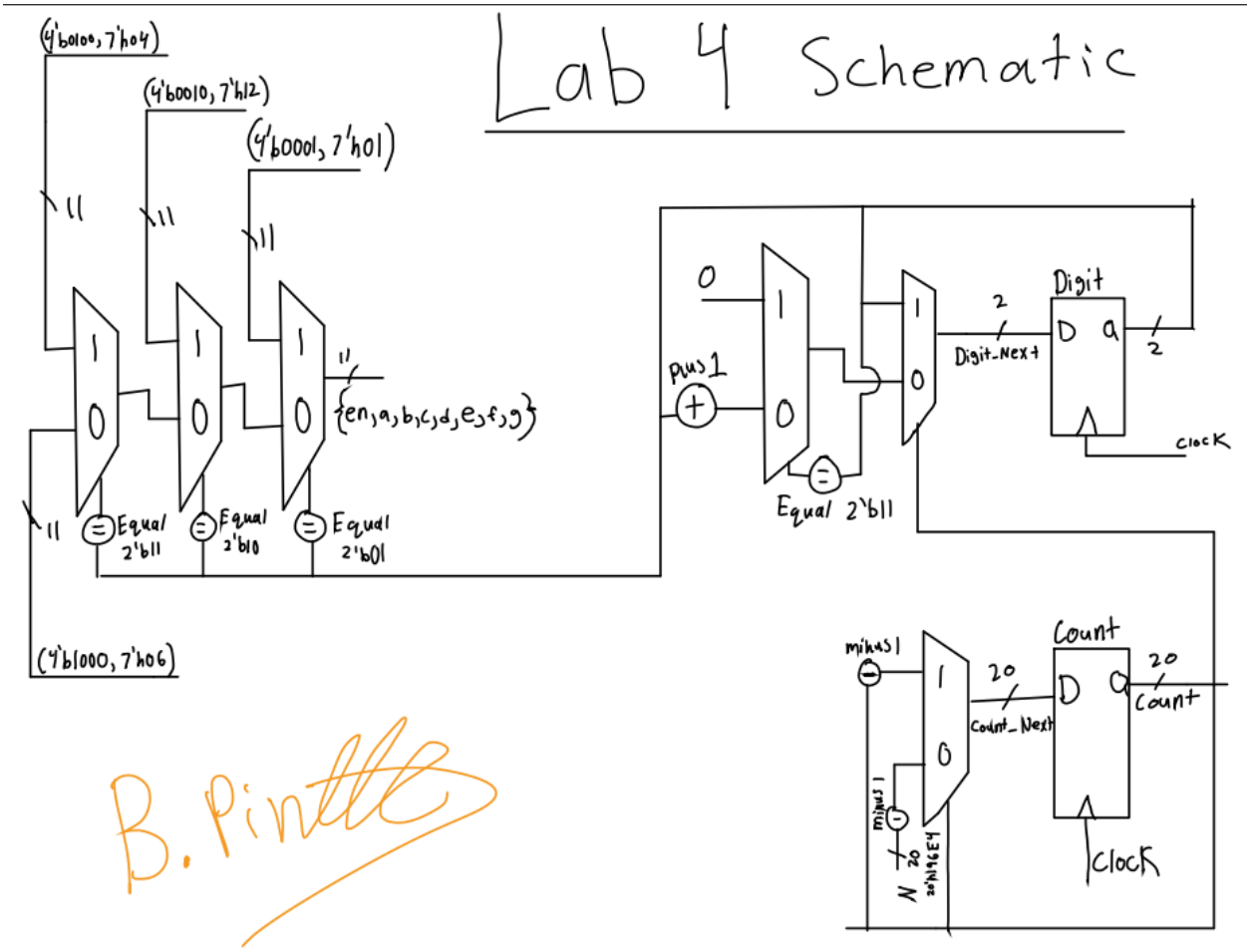
Clock Divider

$$\frac{50 * 10^6}{4 * (100 + 20)} = 104167$$

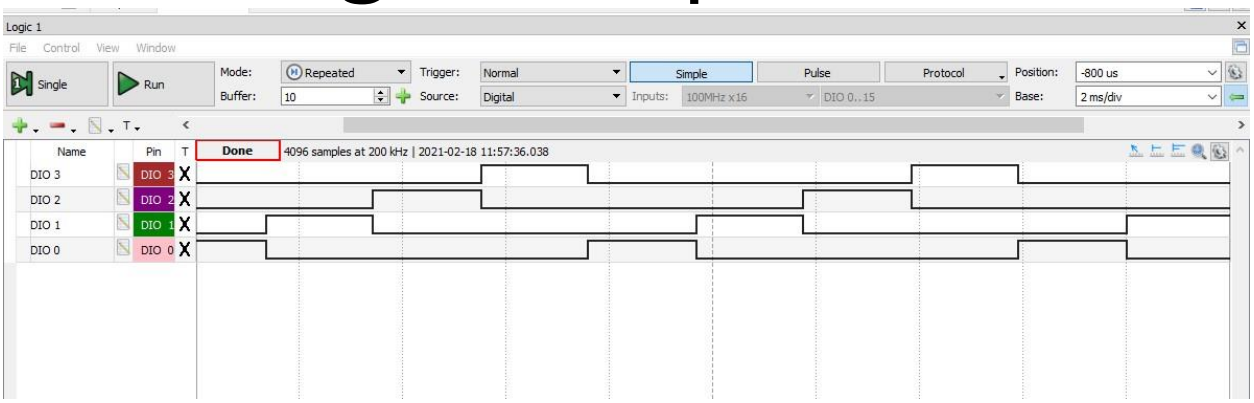
EN Sequence:

4’b1000 (EN[3]) -> 4’b0001 (EN[0]) -> 4’b0010 (EN[1]) -> 4’b0100 (EN[2])

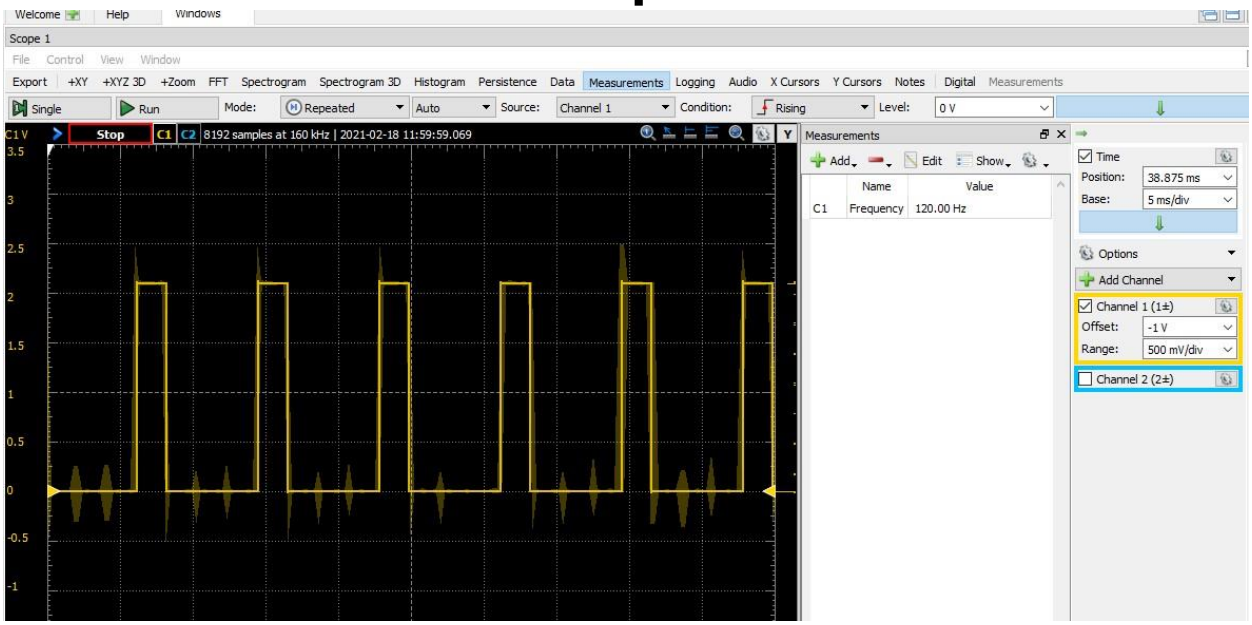
Block Diagram:



Logic Sequence:



Scope:



Compilation Report:

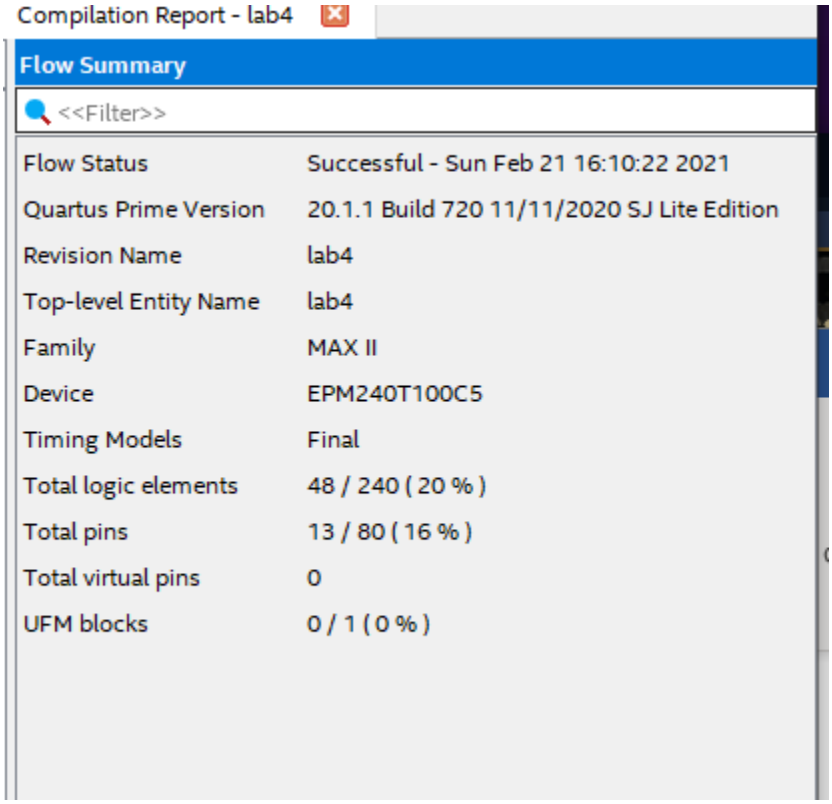


Photo of Breadboard: