Experiment 4: The Agilent LogicWave E9340A

Objectives:
To gain experience with a valuable piece of test equipment, the logic analyzer.
Compare the logic analyzer and the oscilloscope and learn to use the two together.
To experiment further with 68HC12 I/O ports and manipulating them in assembly.

Reading:
M68HC12B Family Advance Information.

Introduction:
The primary goal of this experiment is to learn how to use a logic analyzer and to
compare the capabilities of a logic analyzer with an oscilloscope. As part of this lab you
will write several small programs for the M68EVB912B32 evaluation boards to
manipulate the output ports so that you can observe the transitions on the logic analyzer
and scope.

Experiment:
1. Write a program that will loop repeatedly output the values 0h-255h on port P0.
Here is an example of C pseudo code:

   unsigned char value=0;
   while(1){
      portp = value++;
   }

Display the output from the 8 pins of port P on the logic analyzer and demonstrate it for
the instructor.

Pick a value for port P and have the logic analyzer trigger on that value. Have the logic
analyzer output a sync. Pulse and have the oscilloscope trigger off this pulse. Use the
scope to watch two of the signals that the logic analyzer is watching. How does the data
from the logic analyzer compare with that from the scope?

Instructor Signature:______________________________
2. Write a program that will loop repeatedly and will toggle the bits as shown below:

```c
unsigned char value=0;

while(1){
    portp = 55h;
    portp = AAh
}
```

Display the output from the 8 pins of port P on the logic analyzer and demonstrate it for the instructor.

Do you ever see any other values on port P (i.e., other than 55h or AAh)? Can you tell how long it takes for an instruction to execute on the HC12? Does this amount of time make sense when you review the clock speed and cycle counts for the instructions involved?

Experiment with E Clock. What is it, what does it do, how does it look on the logic analyzer

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(Note: Be sure to answer all the questions above in your report)