Answers to Group Questions

Red font are questions that arose in the middle of researching memory hierarchy.

Group 2: Instruction Set & Initialization

How much memory do we need to address?

- (How many instructions are you going to make?)
- Need to determine how much data we need to store first
- Also need to determine how many bits our processor will use for each instruction

Do we need special load and store functions?

- No. We are going to be using memory-mapped I/O, so the same load and store instructions will be used for memory and I/O devices.

What type of memory hierarchy are we going to design?

- Our memory hierarchy will contain registers, processor cache (most likely), read-only memory (ROM), and random-access memory (RAM).

What will we be storing?

- The current time
- The current time elapsed in the stopwatch
- The alarm time
- The current date (if we are storing any calendar data)(Month,Day, Year)

Group 3: Processor Pipeline, Bus, Registers

Define a memory size for us to be able to address.

- Need to determine how much data we need to store first
- Also need to determine how many bits our processor will use for each instruction

Define memory addresses for the I/O.

- Determine how many I/O pins we need
- Input
    - Backlight button
    - Set time button
    - Set alarm button
    - Alarm on/off switch
    - Minutes button
    - Hours button

- Each of these could be an I/O pin

- Output
    - It depends on how many I/O pins we need for an LED display.
        - 6 7-segment displays for each digit, meaning 42 pins to display each digit
        - 2 pins for the colon
        - 2 pins for the AM and PM icons (or 1 pin if we just want to display something for PM)
        - 1 pin for the alarm icon
        - 6 or 8 7-segment displays for displaying the date in a number format (10/12/11, 10/12/2011), as well as 3 dashes or slashes, so 45 or 59 pins to display the date
    - We also need to account for how many I/O pins we need to control the alarm sound.
    - 1 I/O pin is also needed to determine whether or not the display backlight is on or off.

Will your memory be fast enough where we don't need registers?

- Probably not, unless we get really expensive memory, which may not be a good idea for an affordable watch (assuming we want our watch to be affordable!).

Group 4: Power Consumption & Testing/Performance

How many modules do we plan on implementing (if not in one giant piece)?

- Registers
- Processor cache (?)
- ROM
- RAM
- I/O buses/pins

How are we going to receive and output values?

- Different for each component

What unit tests we did? (To compare and possibly redo them).

- Change watch time
- Save newly changed time to memory
- Input alarm time
- Save alarm time to memory

Group 5: Integration/Project Management

Components that need to be defined.

- Registers
- Processor cache (?)

- ROM
- RAM
- I/O buses/pins

Estimated time of component task.

- TBD

Estimated time to create/perform something.

- TBD