Task 4a **Due: See web page**

Task Purpose: **Making jumper wires**

Each year when the class starts using the USB logic analyzers, the students discover that the leads on these devices are handy to use for making connections. Unfortunately, this discovery results in the logic analyzers being returned missing leads, and new lead sets are expensive.

To avoid this problem, each kit has been provisioned with crimp on connectors for making your own jumpers. In this task, you will make jumpers that you can use rather than using the ones that come with the logic analyzer.

The process is pretty simple. A partially made jumper will be given to you in class. This jumper will have one end completed (with shrink wrap tubing) and the other end with just the crimped on connector so you can see what that end looks like.

The process is as follows.

1. Strip about 1/8” from each end of a piece of wire (around 22 gauge works pretty well). Natalie has wire strippers and wire available in the ELC.
2. You will notice that there are two different crimp areas on the wire end of the connector. The inner part is for connection to the wire, the outer is crimped around the insulation for strain relief.
3. Using the crimpers that Natalie has available in the ELC, crimp the connector onto the wire. Note that this is a two step process, first crimping the bare part of the wire in the inner area, and then the insulated part of the wire in the outer area. (Check the example wire given you in class if you are unsure what it should look like.) You should use the appropriate sized opening on the crimping tool (labeled B on the crimping tool I use).
4. Once you have crimped the connector onto the wire, there are several options:
    a. If you are just using jumper to connect between header pins, you should heat shrink some heat shrink tubing (provided in your kit, and also available in the ELC) around the connector to avoid shorts when using the jumpers. Natalie has heat guns for shrinking the tubing.
    b. If you are jumping to a protoboard, you might wish to put a connector on only one end, and leave the other end a bare wire to push into the holes in the protoboard.
    c. I have connector bodies that these pins fit into, so you can make a connector by installing a number of wires into a connector housing. These housing put the pins on .1” spacing which is the same as the spacing of the header pins on the kit board you are using. Note that you should not put heat shrink tubing on if you plan on doing this.

Notes:

- Solder is not necessary if you crimp properly.
- Please make up at least 3 jumpers.
- Use different color wires for your jumpers so you can keep signals straight.
- If I see you using the jumpers from the logic analyzer, you will loose the use of the logic analyzer.
- I have lots of pins, and can order more if you need to make more jumpers as the year progresses.
- If you see a crimper that is labeled EESD and has yellow grips, it is the crimper that I loaned to some students a couple of years ago and never got back.
- I do not recommend using these pins and housings for connectors in your final design. I find them too unreliable for that kind of use. If you need to interconnect two boards, I can recommend some connectors that the students have used in the past.