**Introduction**

Right now we have two circuits— one on a breadboard and the other on a perfboard. The breadboard circuit works but we are having problems with the perfboard, even though it should be an exact replica of the same circuit. Our current hypothesis is that somewhere along the way something is shorting out. We think that based on the effectiveness of the breadboard, however, it might make sense to order a custom PCB using that schematic. We do, however, also think that it might be worth considering switching back to using an arduino nano instead of the arduino uno, because it is so much smaller. Depending on ambient temperatures, a second battery connected in series with the first may also be necessary. Currently this is true for temperatures below about 20C, although that number depends on the specific microcontroller and the heat loss of the box.

Breadboard

A fritzing that accurately describes the breadboard can be found in the same folder as this document, and it's called PetriFI Breadboard.fzz. Here's what it looks like in real life:
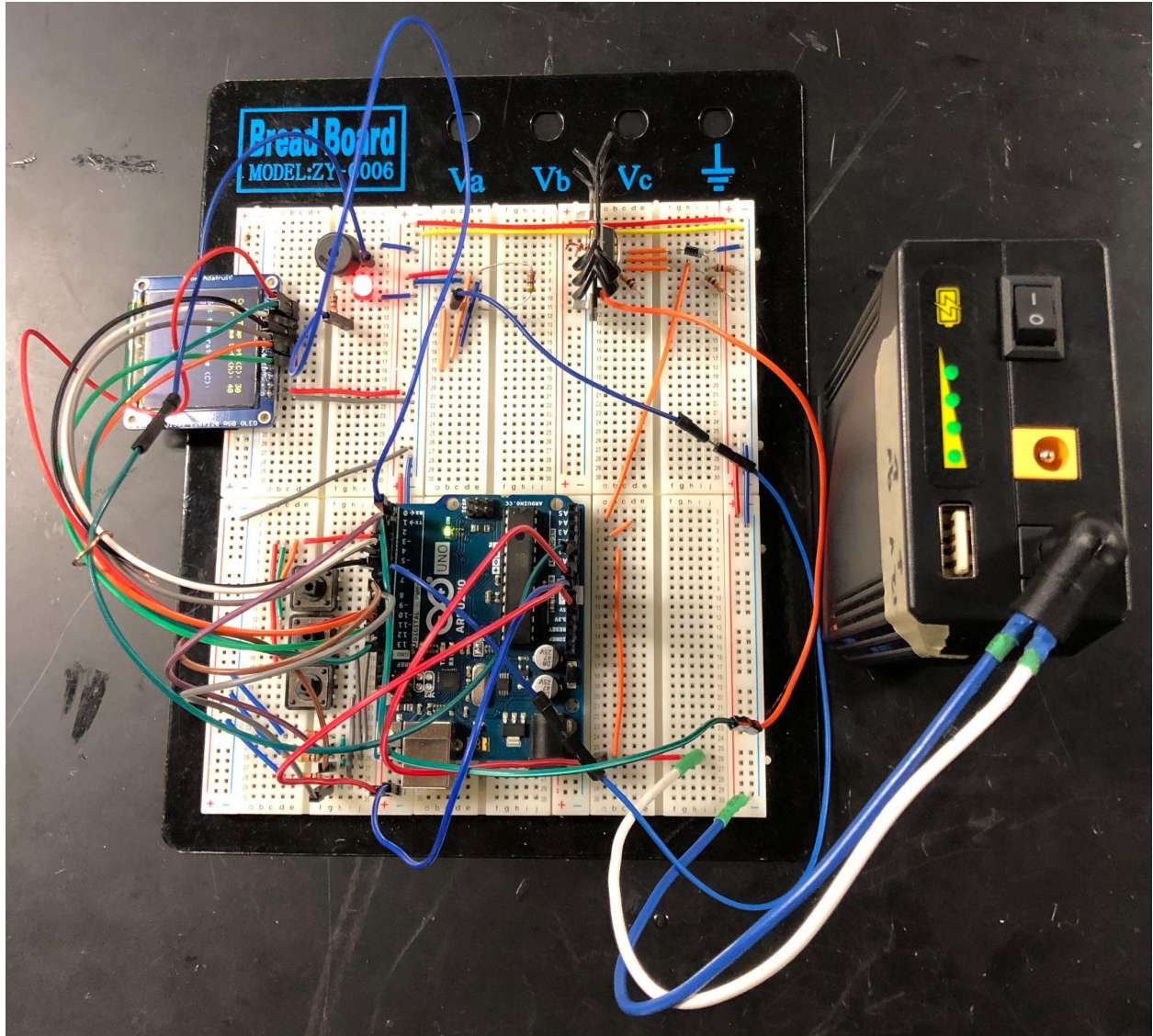
Perfboard

A fritzing for the perfboard can be found in the same place, and the file is called PetriFI Perfboard.fzz. There are a few things to note here:

- The arduino shield we used is not quite the same as the one on fritzing— the sideways strips are actually 4 holes long instead of only three

- The thermistor and diode were pushed behind the perfboard for visibility

- The ochre wires represent the different resistors— all of them are 10KΩ aside from the one for the thermometer, which is 4.7KΩ (or whatever is recommended for your thermometer if you don't use the same one we used).

Here are real-life images of the top and underside of the perfboard: