Preliminary PCB Layout

* Aside from being an important step in the completion of our project, this PCB was designed to test our maximum size and portability constraint of 3.5”x2”.
* As can be seen on the layout, there is plenty of room available to reduce the size of our full module.
* Going forward with this presentation, all references to engineering requirements or constraints are in purple bold text. This PCB design and the enclosure show that the constraint of size and portability may be met with a high level of confidence.
* The primary size constraining factors are aux ports (point), buttons and battery. Batteries will be underneath the board in the enclosure. (!)We look forward to seeing how small we can build this module.
* Not shown on this PCB are the 6 connectors needed to access pins on the Atmega328pb to write a program to the microcontroller. This will be included in the next version of the PCB layout.

Preliminary Design Schematic

* This is an update to our color-coded concept design, displaying more detail for components and paths, irrespective of mounting type.

Functional Flowchart

* This diagram describes how the device operates under all conditions.
* There are 4 modes: data collection, interrupt detection, OFF and interrupted. When the device is on, data is collected for 20 seconds. Then the device begins to check if the most recent data sets fall outside of a gaussian distribution of these 20 seconds. If a recent data set exceeds a threshold, audio is turned off. If the data set does not exceed the threshold, it is used as the final 2 seconds of a new 20 second distribution.
* Whether audio plays is determined overall by: the system being on or off, the threshold choice, the ambient average, the ambient standard deviation and finally the average level of the most recent data.