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Meeting Leader: Katherine D.

Meeting Minutes: Jeff M.

Overview

All orders in in, except microphone, and battery

What battery should we choose?

About the photodiode: The current is abit small, maybe transimpedance amplifier
Amplifier gain not as large as expected, but works.

Subsystem explanations:

Sensor Subsystem:

- Sensor definition
 - Light intensity description
- Power stability → capacitors
- **Not convinced we needs 5V (IS THIS NECESSARY)**
 - Lithium are 3.7V
 - Will be difficult to find 3.3V battery. Maybe 3.7V
 - Alkaline 1.5V
 - Usually you'd run a DC to DC converter to make the 3.3
 - With the buck boost it would work from 5v to 2.8 range of the battery
 - At some point you want to shut down the battery so it's not discharged
 - Easier to lower voltage in a DC to DC converter than to raise
 - How do we mount the sensors so the ambient light sensor gets ambient light, gas sensor has some sort of air flow, tied to efficiency
 - Packaging, so it would be open
 - 2 layer board =/ doesn't have to many components
 - Junction boxes for PCB inside
 - YES we can do that
 - 3-D printing could give a better result!
 - More efficient and customized for the application
 - FREE
- 3-D printing
 - Peaks when the mechanicals are doing senior design
 - Pretty slow rn, but its all q'ued, what is the time delay in the semester
 - Is there anywhere we can check

- Joe perry → jeff and peter have a 3-D printer
- First come first serve basis
- Microphone
 - Makes the light easier
 - Detecting levels of sound, detecting what is said
 - I2S and amplitude / volume of the sound
 - Maybe transmit the actual sound if possible.
 - Easier managing analog signals

Schematic

- All I2C stuff is 3.3V
 - Level shifting on the I2C, since its possible to get 3.3V sensors

Optical Communication

Shafer: What drives bandwidth requirement? Dont expect any of our metrics to change too fast. Maybe have the device sleep most of the time, using interrupt pins. So 100kb/s may be overkill. If things were changing faster, then maybe.

→ how long can processor be in Low Power Mode, before it becomes important to record data

We want to do 3m. Look at the possible technologies that remotes use(to achieve this distance)

- IR remote application

Look specifically at specific angles of incidence for the beams to ensure integrity.

How do we plan on powering the opamps eg? → if using op-amp as a comparator, don't need 5V (he suggests)

Can power the esp32-s3 with usb possibly, from wall power. Maybe doesnt make too much sense to use UART. Don't put this on our final board.

The ethernet jacks on the wall dont produce power.

The receiver side should probably plug in . If transmit side dosnt do things all the time, more efficient. Receiver side should always be on, since it doesnt know when things transmit all the time.

8 hours was considered constantly on. Can definitely shift this to more time with sleep mode.

200mAh - 1400mAh, may be enough??

Need to look at spec sheets of how much the different components consume in different modes. Distance should be more than 3 meters.