

Team sddec20-06
EE 491
16 February 2020
Batteryless, Encapsulated Hydrometer

Bi-weekly Status Report #2 [B2]

Individual Contributions:

Name	Contributions to the team	Hours Worked for the Week	Total Cumulative Hours
Tilden Chen	Mechanical Design Research	6	12
Josh Hall	Microcontroller/Embedded Research	6	12
Jensen Mayes	Mechanical Design Research	6	12
Chris McGrory	Microcontroller/Embedded Research	6	12
Griffin Orr	Antenna/Hardware Research	6	12
Chris Pedersen	Microcontroller/Embedded Research and Power Circuitry	6.5	13

Summary:

In the past two weeks of development, we started selecting components and laying out a plan for our project. We began by defining the requirements for our project and selecting hardware that will meet the needs we have defined. Once our hardware was selected, a development board with the microcontroller we chose was obtained and passed off to the embedded development team for research and testing. The hardware team also selected an antenna and plan to begin testing with that antenna. We also have laid out a plan to begin testing with the energy harvesting mechanism for our project.

Individual Contributions

- Griffin Orr
 - In the past two weeks I have begun to dig into the RF portion of the project. As a team we have decided to use Bluetooth 5 for our wireless communication, so I have selected a few antennas for the hardware team to do some range and power testing with. I also met with a couple of RF professors to discuss design needs and considerations of a RF system.
- Chris McGrory
 - In the past two weeks, I have begun researching the required onboard instrumentation such as the accelerometer and temperature sensor. Specifically

looking into power consumption and microcontroller compatibility. The goal of this project is to design an onboard module that has low power operations and a short start up time.

- Josh Hall
 - In the past 2 weeks, I have downloaded the SDK and started trying to figure out the given skeleton code for setting up Bluetooth 5.0 communication for the microcontroller we are wanting to use.
- Christopher Pedersen
 - Hello, my name is Christopher Pedersen and I spent the last two weeks looking into the dataflow of the battery less Hydrometer as well as the power circuitry we will be using to implement our senior design project.
- Jensen Mayes
 - I have been working on learning the inner workings of hydrometers and determining how to design our system to work properly as an accurate hydrometer while being able to harvest enough power to operate at the same time. I have also been looking at different tools for designing the mechanical aspects of our sensor and am comparing some different CAD program options now.
- Tilden Chen
 - I have been learning about the mechanical aspects of how the tilt aspect of the hydrometer should work (how to calculate the physics for determining the tilt of a floating mass, accounting for the center of mass and buoyancy).

Pending Issues:

- No major pending issues.

Future Plans:

- Design impedance matching circuit for the antenna and test the power and range of the antenna.
- Determine a functional mechanical layout of the hydrometer.