**What** is the problem, **Why** that is a problem, **How** are your planning on solving, or **How** you solved it.

Due Sunday 11/14/2021

Class Week 13

Journal #5

Recounting:

We have the electronics programmed to work with sensors connected and able to send an output to ChirpStack. Some time after, the housing arrived to package it so we can test it under a car to really check if the values will output as expected (the Time of Fight would read a distance and the magnetometer would output a number higher than baseline). We still haven’t calibrated the Time of Flight sensor, because the cross-talk is happening due to the cover glass and airgap being greater than 1mm. We also ran into the issue of the magnetometer reading a higher baseline number than expected and not as sensitive as expected when a car drives over it.

Current Problem:

We just received the new Time of Flight sensor (same sensor model, packaged differently) to install it as close to the cover glass as possible to increase the fidelity. We also need to review our results of the magnetometer’s output (there is a high spike [large positive], low spike [large negative], and a return to base line [not detecting non-ferrous material]) and re-calibrate our expectations for a successful output.  
  
Solution:  
 As we were testing a possible form of detection (radar type), we noticed that it required 5V rather than the 3.3V – 3.7V we are currently using. It worked as expected once we gave it 5V. We shortly got curious if the current sensors we have would actually work better with 5V. We were surprised that it gave us more resolution (magnetometer’s baseline value is lower with more certain spikes and the time of flight sensor being able to detect a greater distance). While this gave us a solution for the magnetometer, this still doesn’t fully solve our time of flight sensor issue. We will need to install the new sensor and observe if giving 5V and installing it right on the cover glass will detect a far enough distance.