

Crumple Zone and LoRa Development

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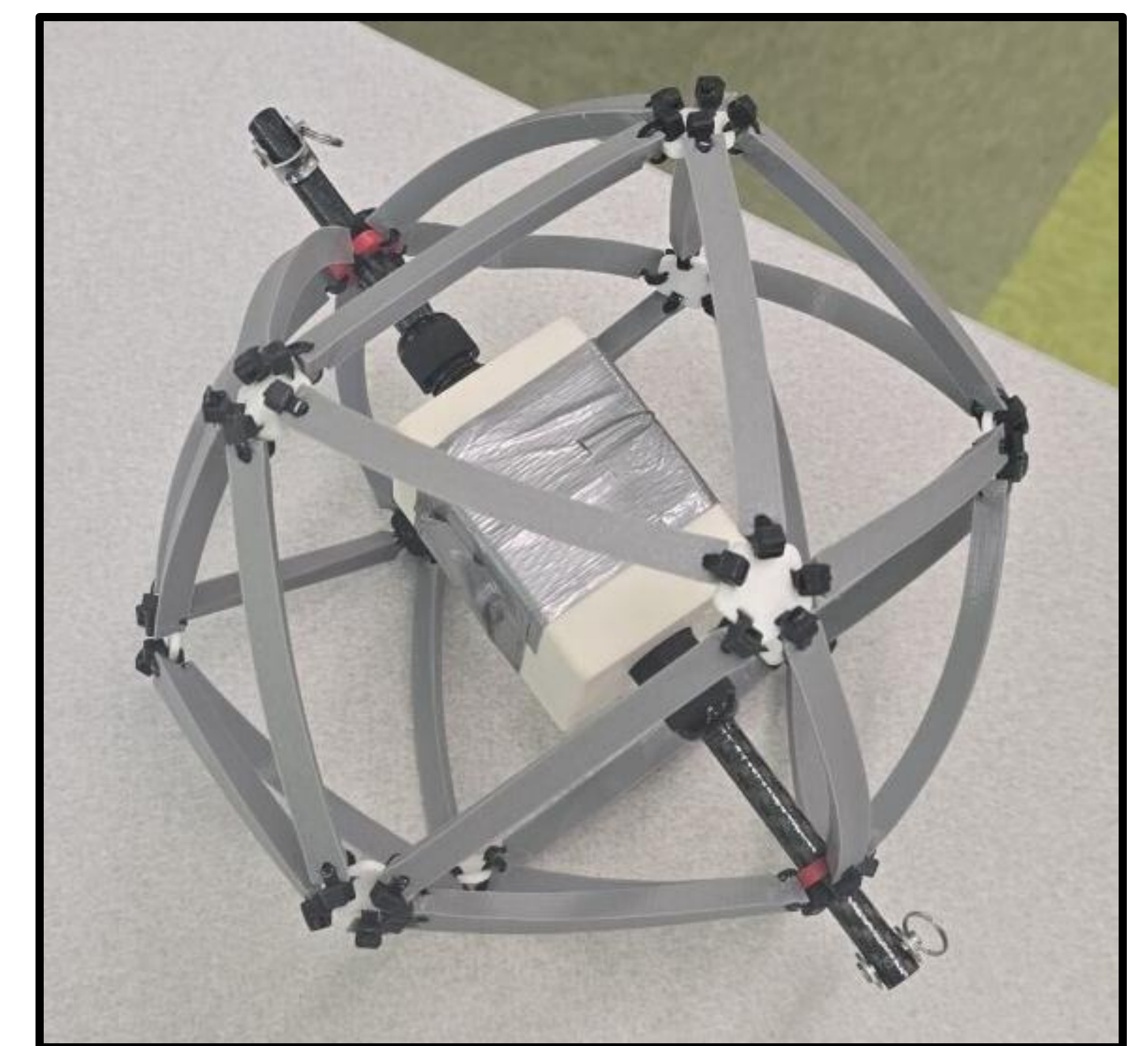
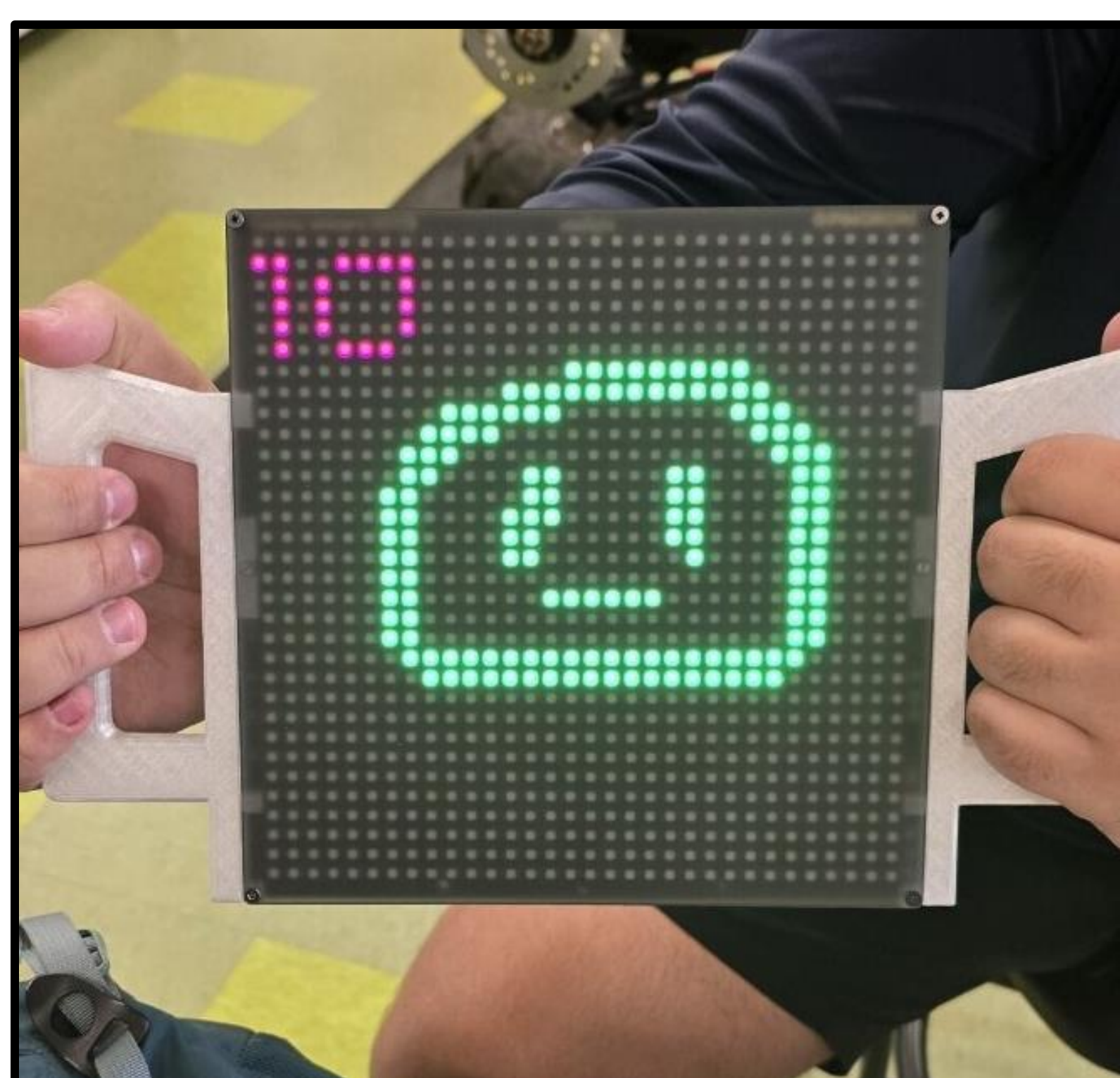
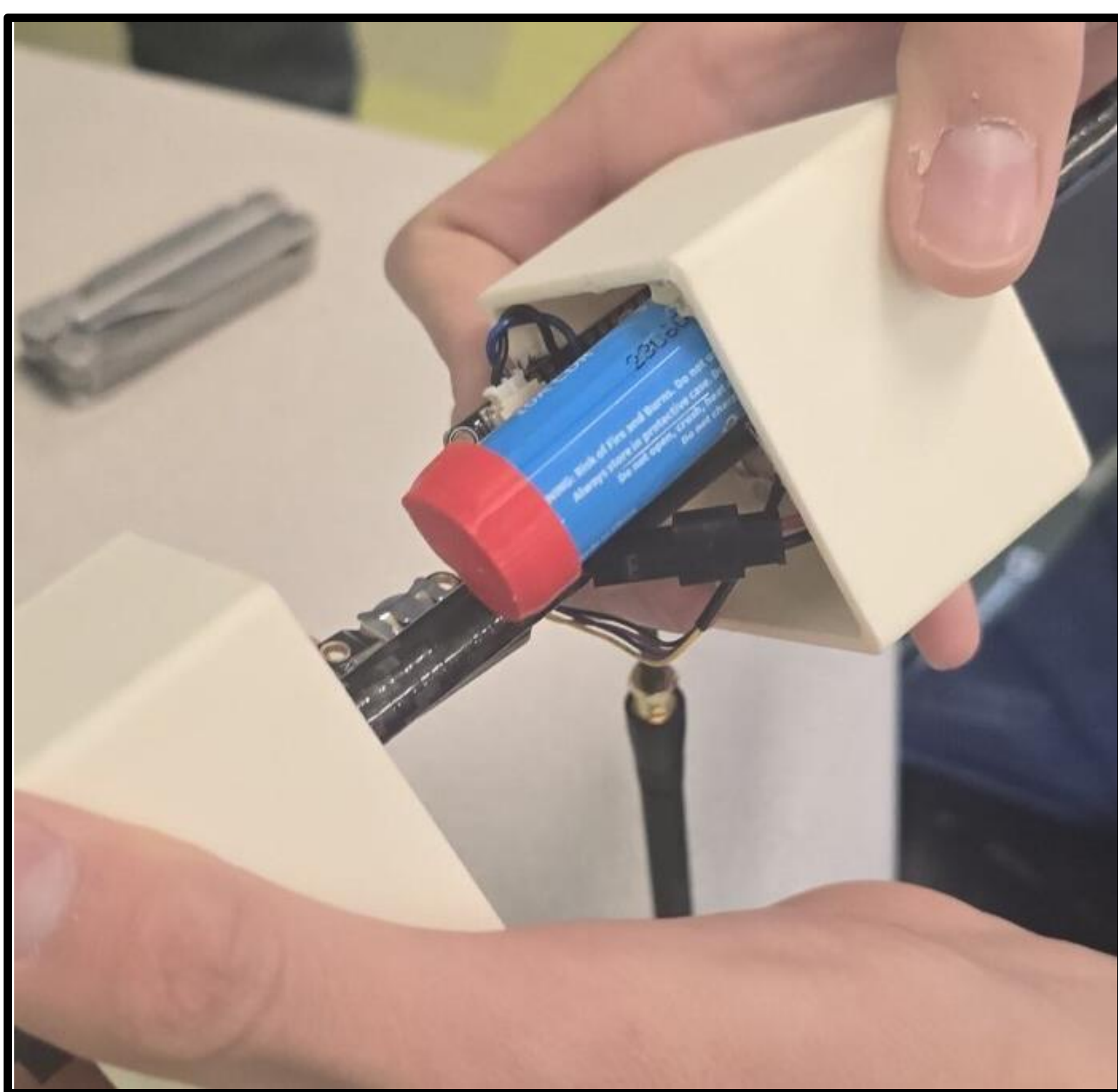
Overview: Can we create a modular and light weight crumple zone design to protect the internal components? Can the long-range radio be used to communicate with a ground station?

Introduction & Project Description:

- Used an icosahedron shaped crumple zone design to absorb the impact.
- Used a long-range radio to transmit data to our ground station.
- Collected acceleration, altitude, temperature, and pressure.

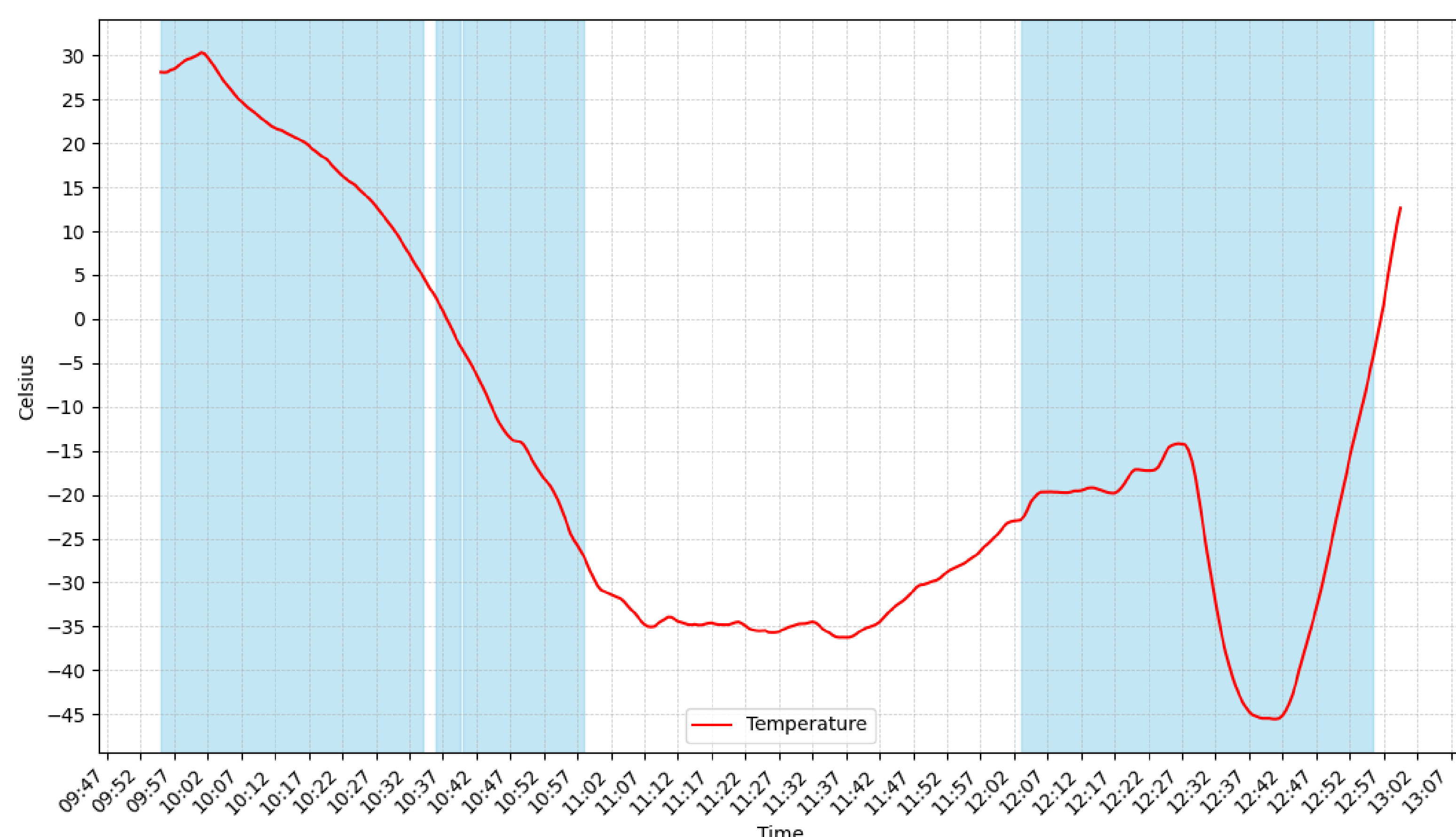
Results:

We found no damage to the housing unit, electronics, or crumple zone. During the launch we received data every 5 seconds transmitted from our LoRa. The transmitted and received data matched.



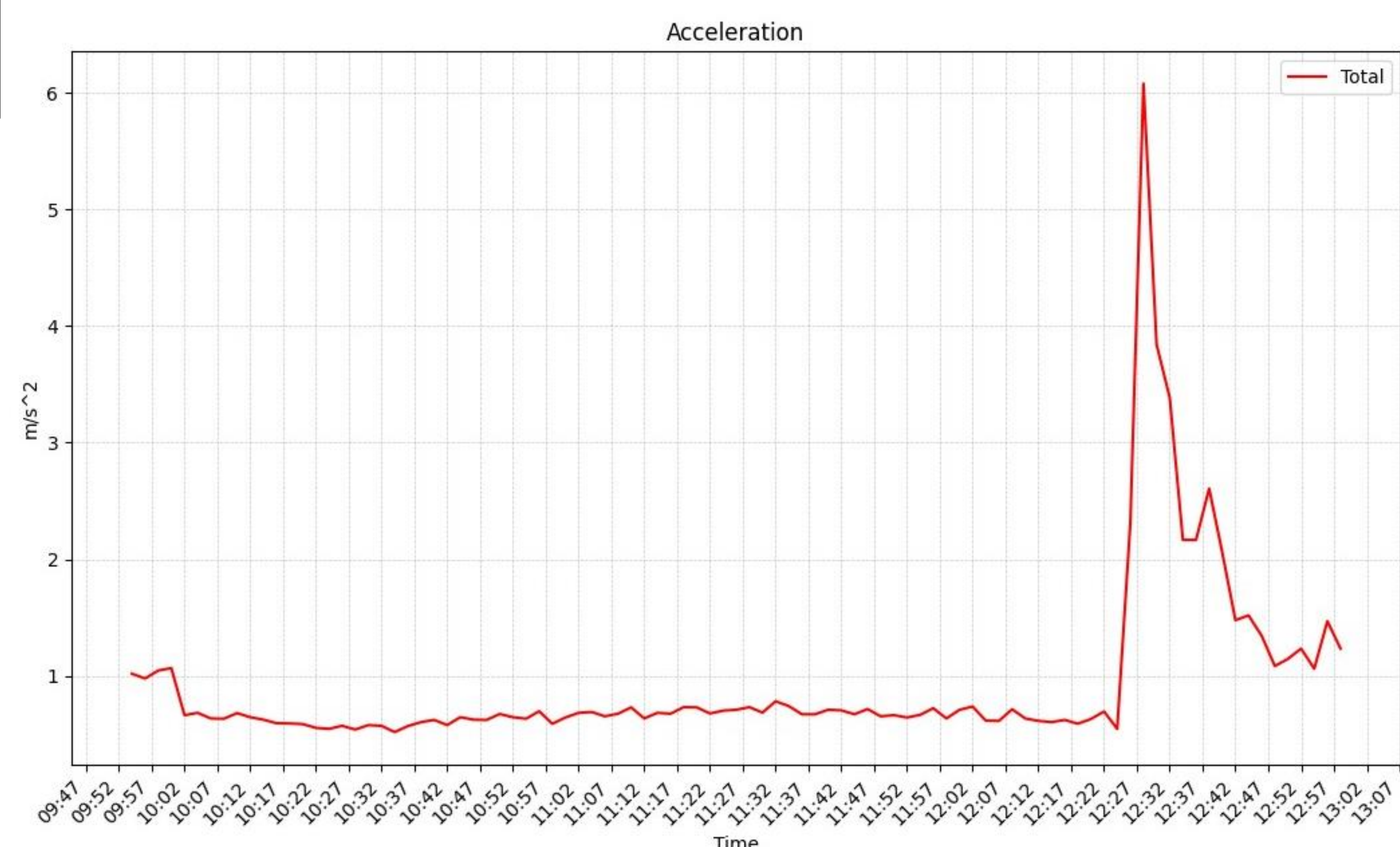
Methods:

The housing unit was printed out of ASA-aero filament and was surrounded by an icosahedron shaped crumple zone printed out of both TPU and ASA. The LoRa transmitted data to our ground station. RP 2040 feather with a built-in LoRa module was used to log the data.



Conclusion:

The crumple zone was effective in protecting our housing unit and electronics. It stayed intact and we can even reuse it for future projects. The LoRa collected data successfully.



Future Projects: We want to continue to expand on the LoRa, working towards being able to communicate with our payload. We also want to expand on the crumple zone design.