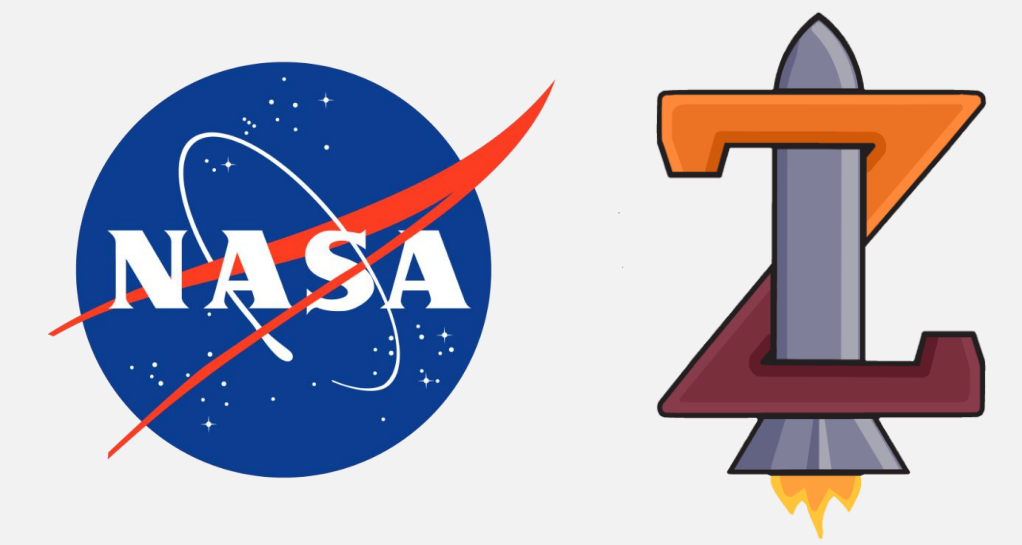


2025 NASA Student Launch: Payload Design



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Background

Competition:

The NASA Student Launch Competition is an annual event challenging universities to design, build and fly a high-powered rocket with a payload experiment.

Team Objective:

Design and integrate the payload experiment into another team's rocket for the competition. The payload must be capable of transmitting flight data via radio waves, transporting STEMnauts, and surviving landing conditions.

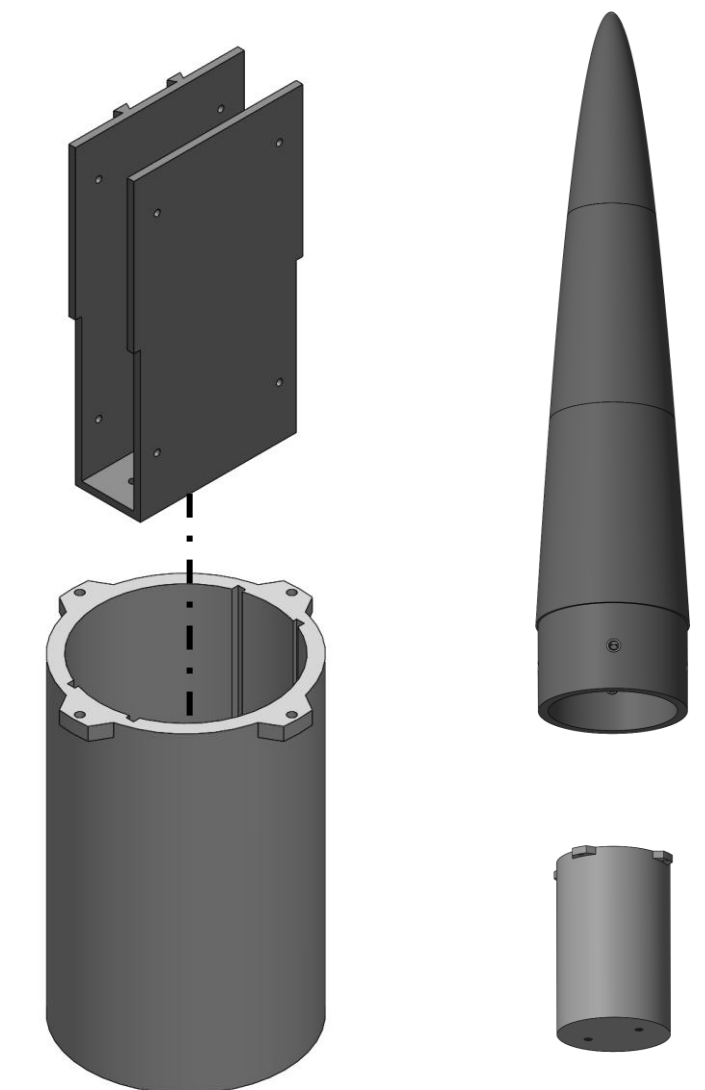
Design Attributes



- Measure eight flight parameters
- Transmit data after landing
- Withstand forces during test flight
- Safely transport four model astronauts (STEMnauts)
- GPS recovery system for rocket – payload system

Physical Structure

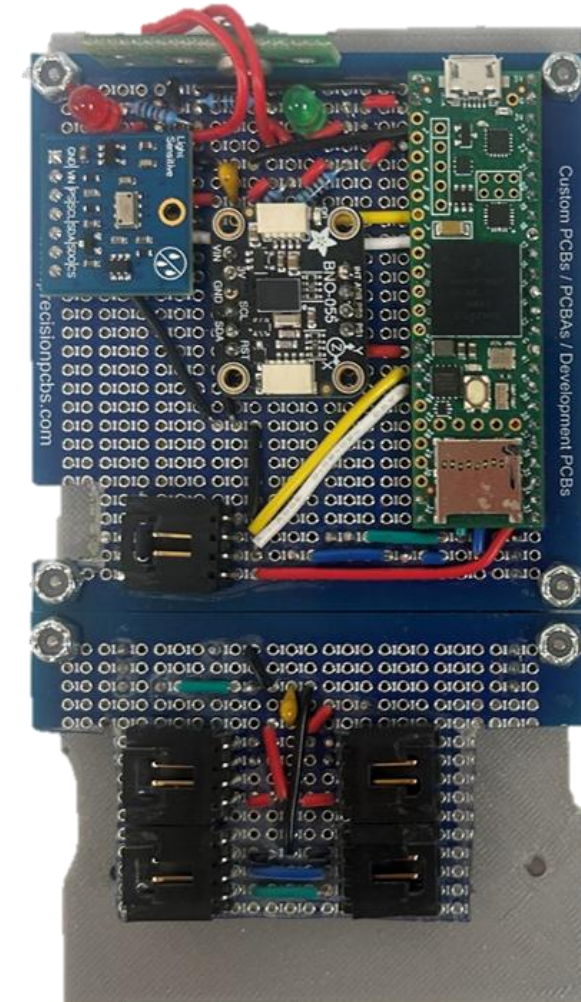
- SLS printed Nylon-12 body
- Three chambers for housing electronics
- Minimum factor of safety: ~ 1.5 at worst case landing conditions
- Easy to assemble: ~ 10 min assembly time
- Mounts to rocket nosecone



Data Collection

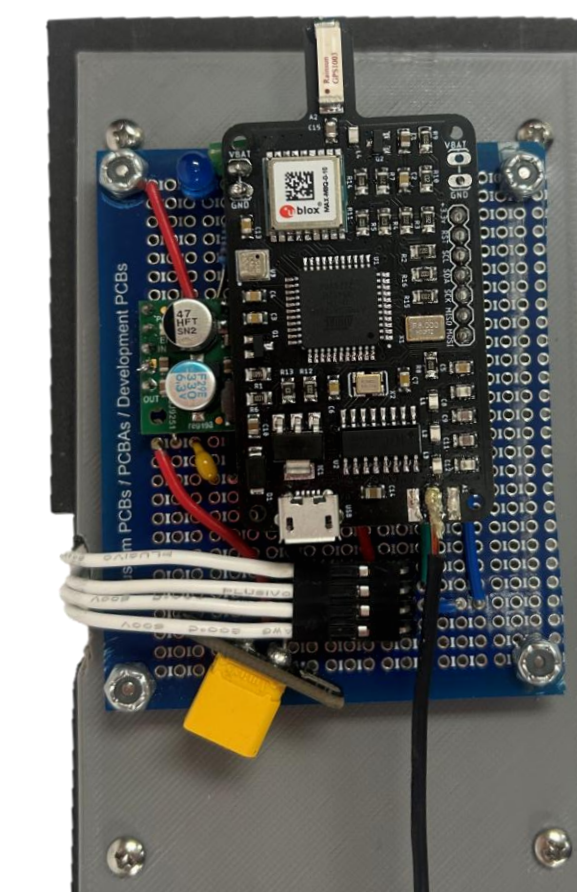
Flight Parameters:

1. Maximum Altitude
2. Maximum Velocity
3. Flight Time
4. STEMnaut Orientation
5. STEMnaut Survivability
6. Power Check
7. Atmospheric Temperature
8. Peak G-Force

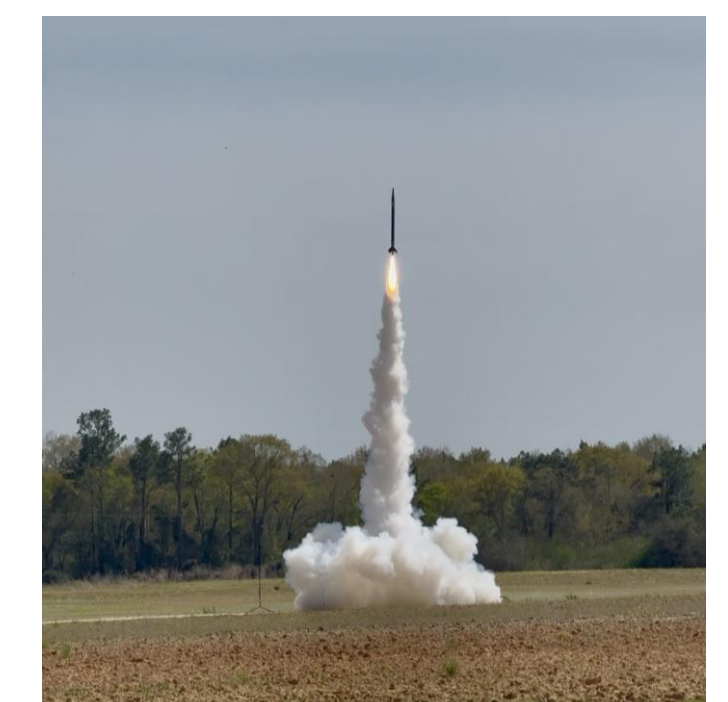


Data Transmission

- Transmitted on 2m-band (144-147 MHz)
- Transmitted at 5W of power
- Transmission packets:
 - Single transmission per flight parameter
 - Duplicate packets of transmitted data



Results



- Structural body survived three flight demonstrations
- Successful collection of all flight parameters
- Successful transmission of all collected data

Acknowledgements

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