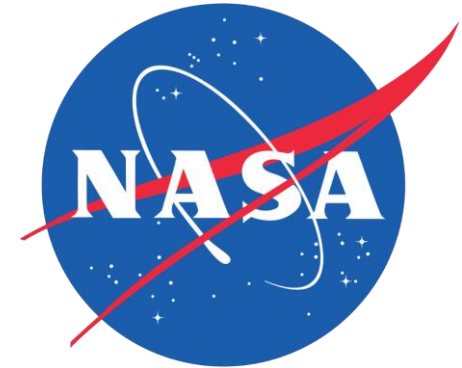


EagleSat-1 Project: Mission Synopsis

Deborah Jackson

Embry-Riddle Aeronautical University

Aerospace Engineering, Sophomore



AZ/NASA Space Grant Symposium

April 14, 2018

Presentation Overview

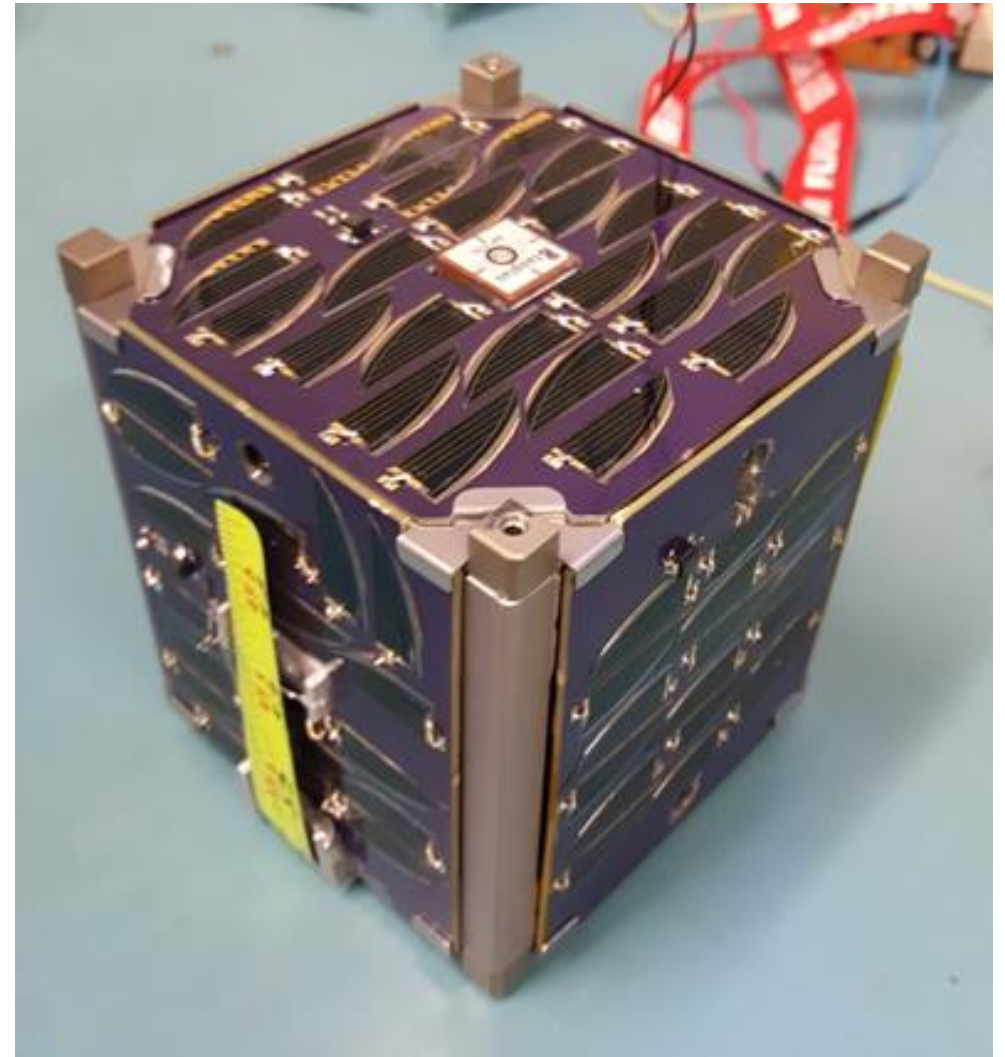


- Mission Overview
- Satellite Structure
- Satellite Testing
- Integration and Launch
- Satellite Communications
- Failure Analysis
- Next Steps
- Future of EagleSat-1

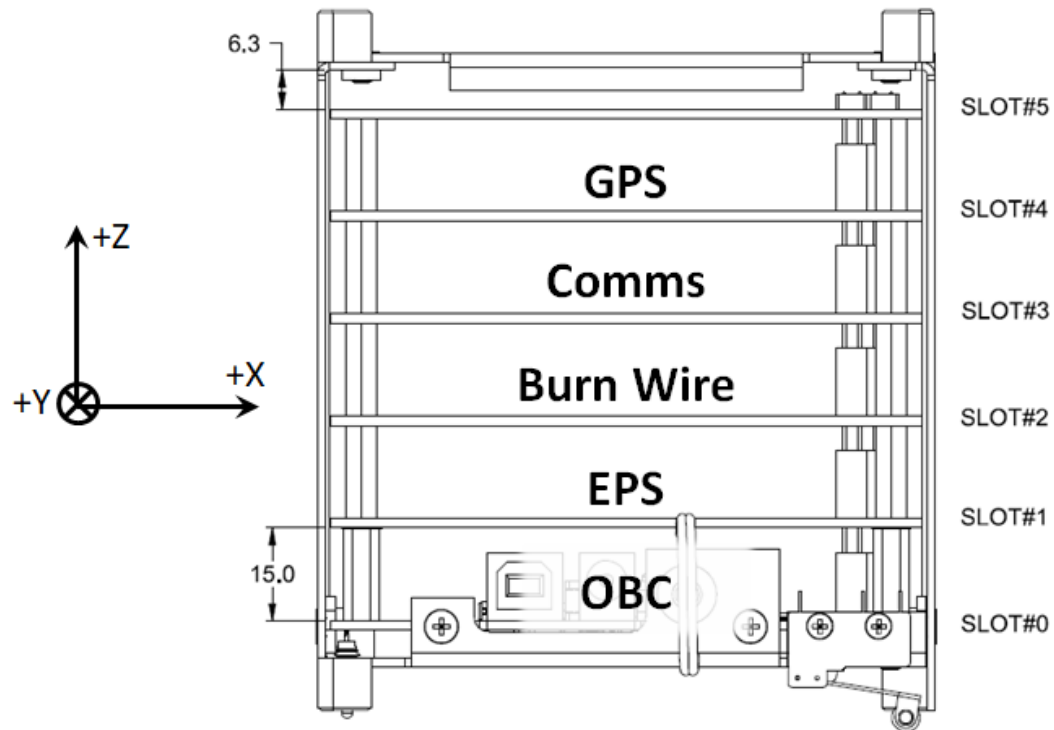


Mission Overview

- Primary Objective: Educational
- Secondary Objectives:
 - Primary: Orbital decay
 - Secondary: Supercapacitors



Satellite Structure



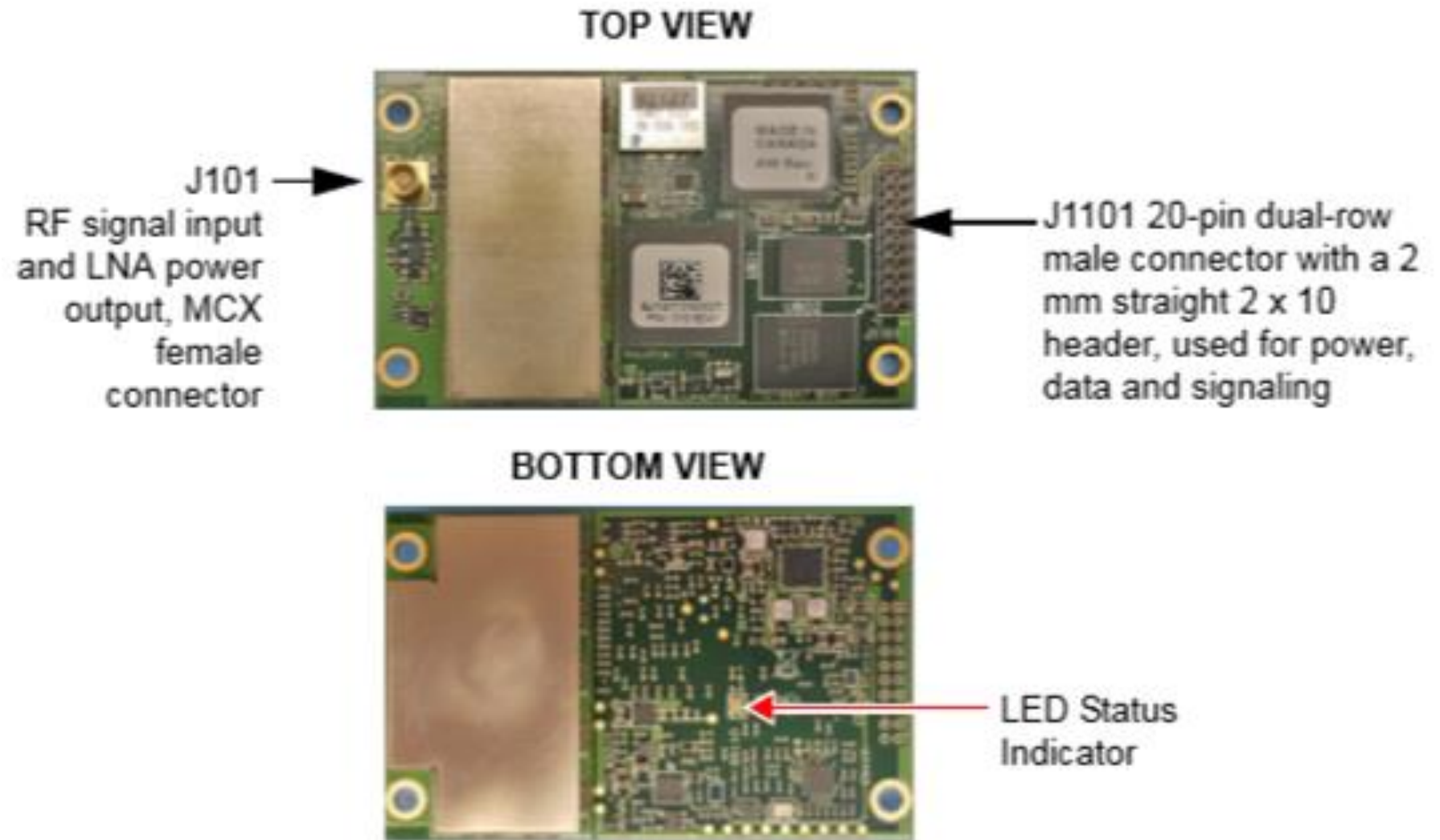
Pumpkin, Inc. (2003). Pumpkin CubeSat Kit
User Manual. Rev. D2, 13.



Satellite Structure: GPS

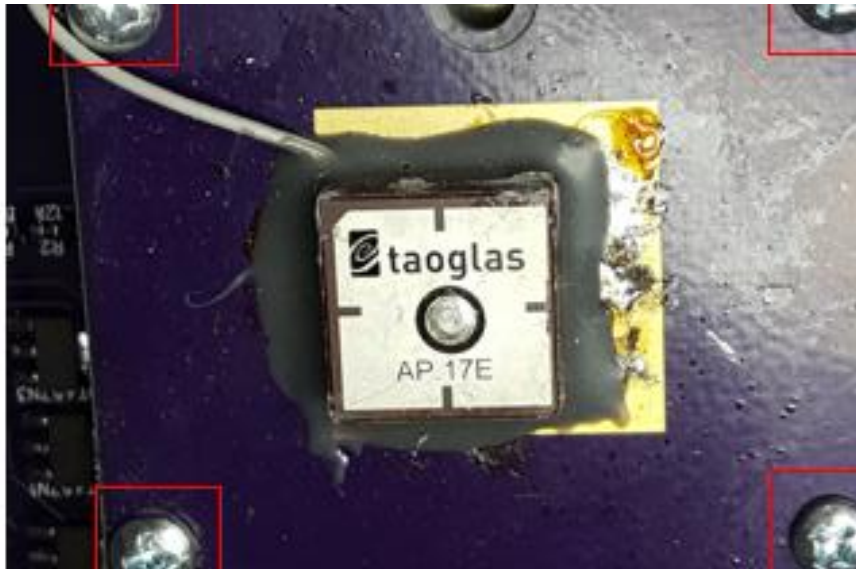


- Novatel OEM615



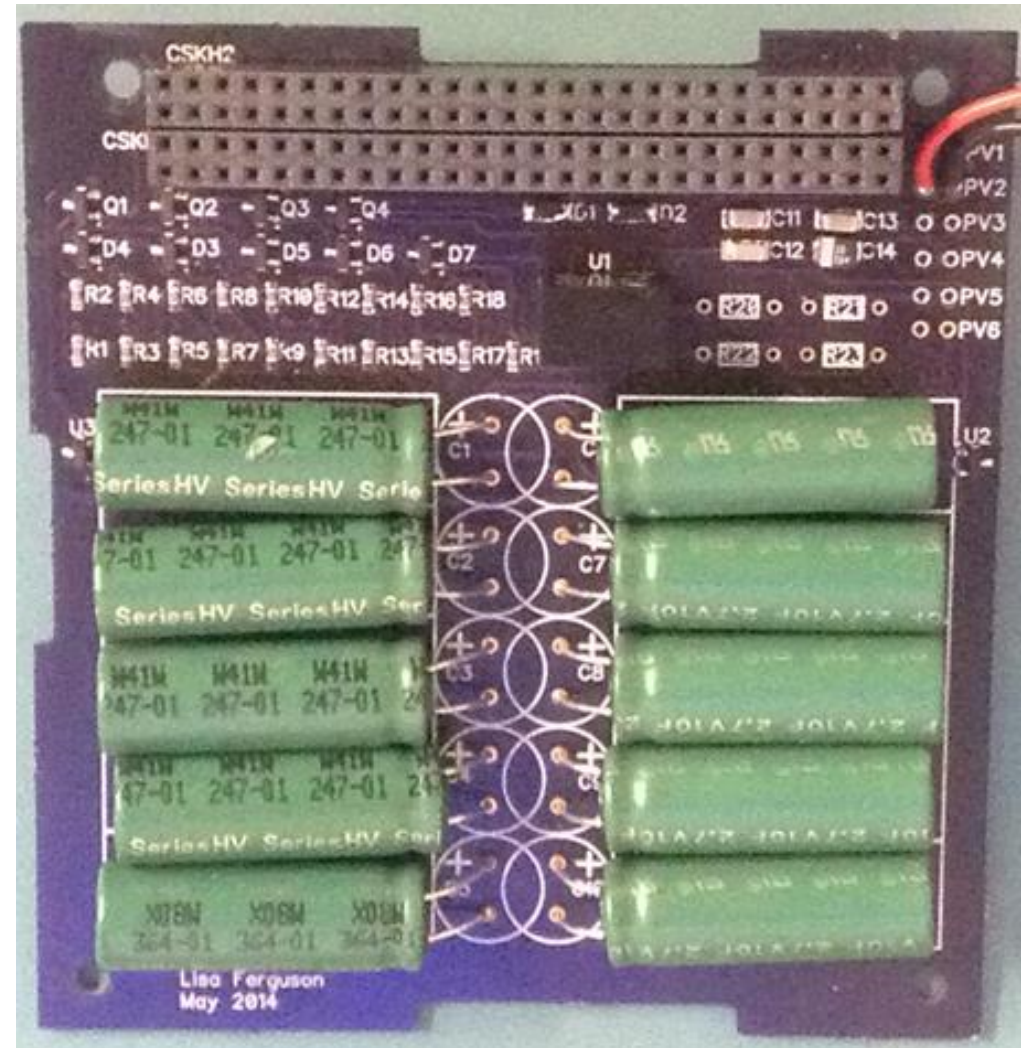
Satellite Structure: Comms

- Taoglas Antenna Ceramic GPS Patch for RF
- Wood and Douglas Radio Module

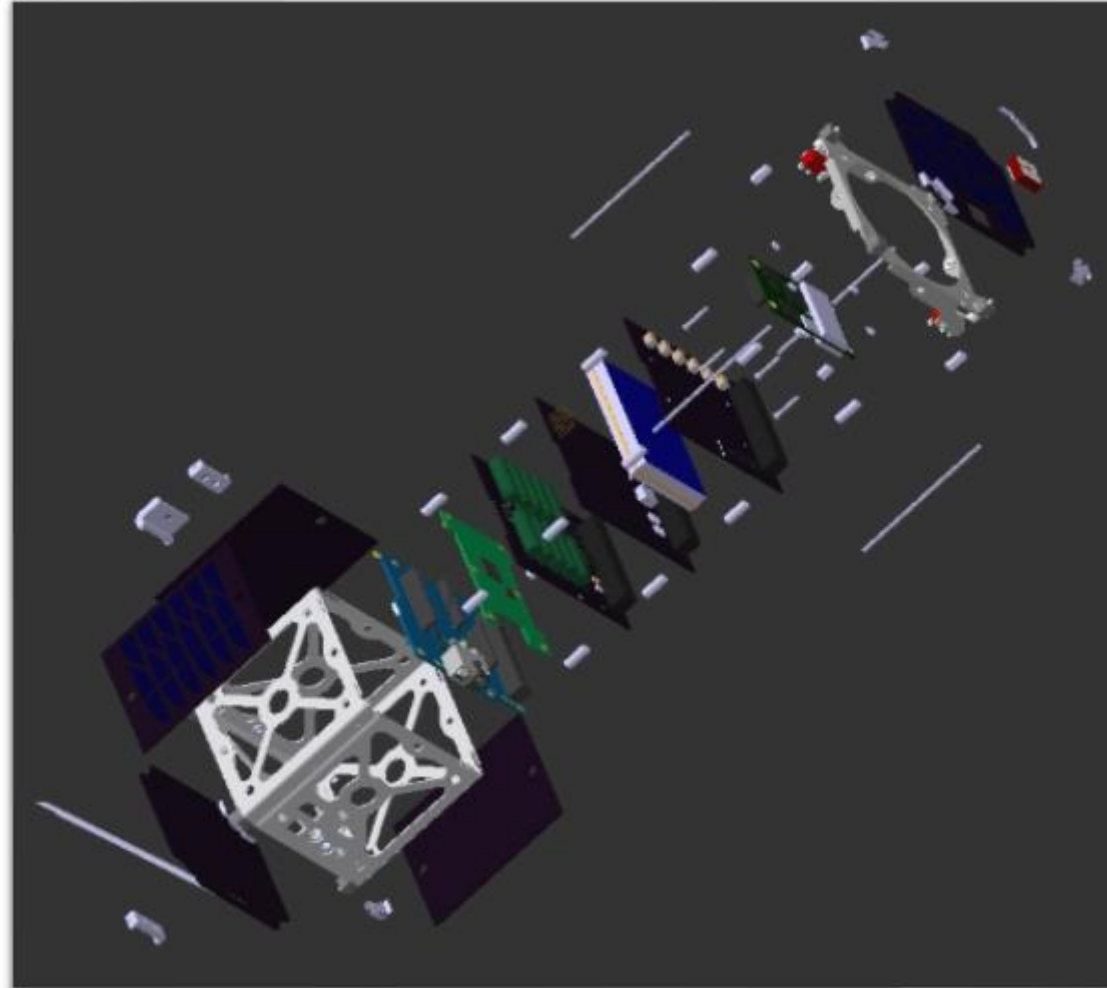


Satellite Structure: Power

- Eaton HV1030-2R7106-R 10F (3V) Supercapacitors
- Provides 4F (15V)

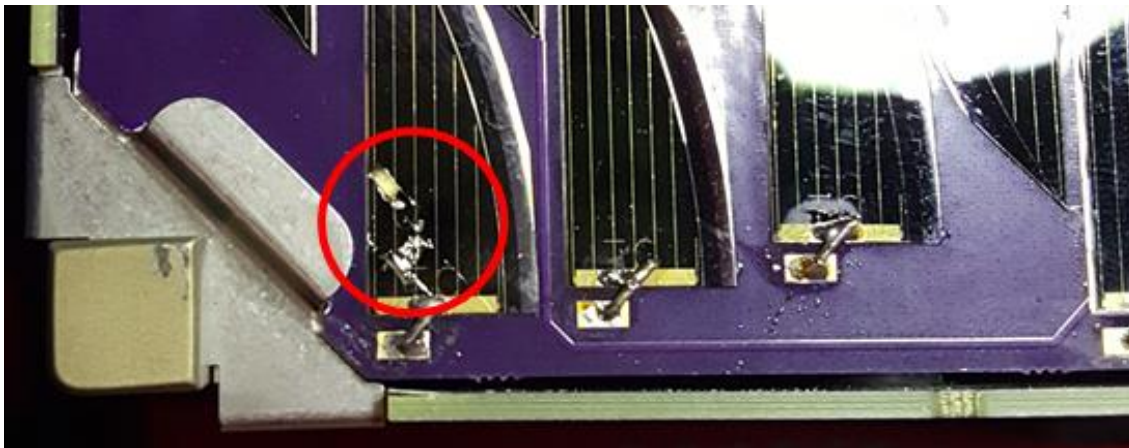


Satellite Structure



Satellite Testing

- Day in the Life Test: software verification
- Random Vibration: launch vehicle
- Shock: launch vehicle
- Thermal Bakeout: outgassing

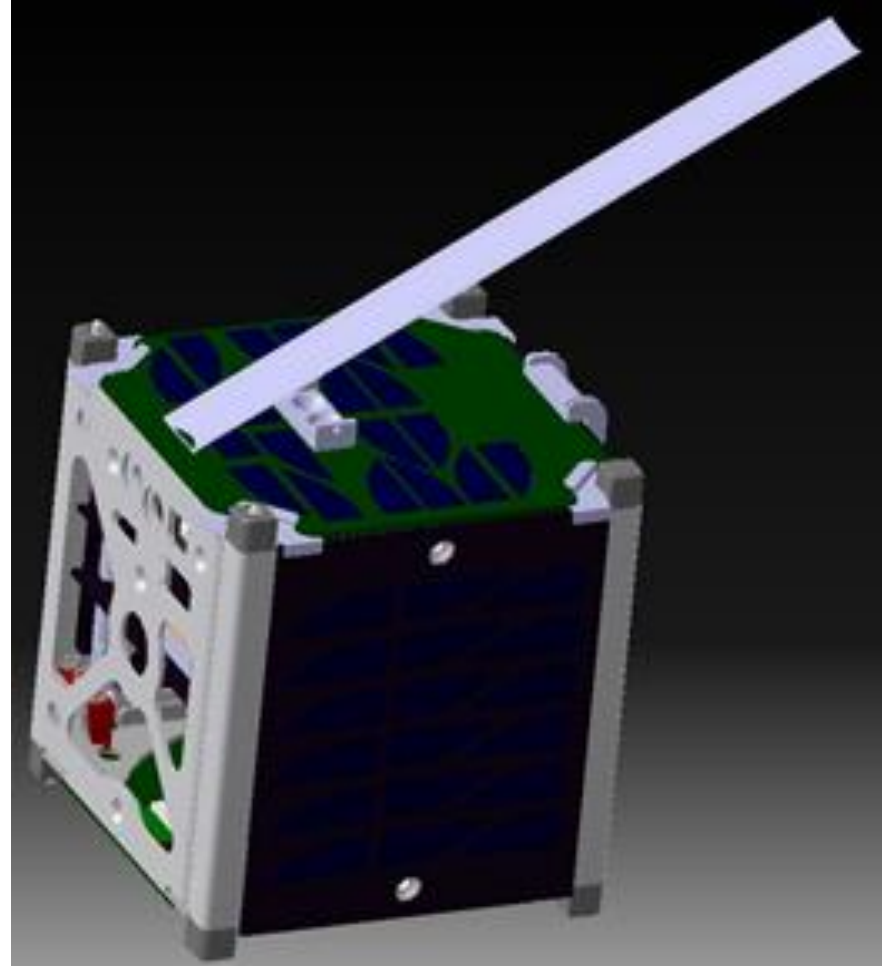
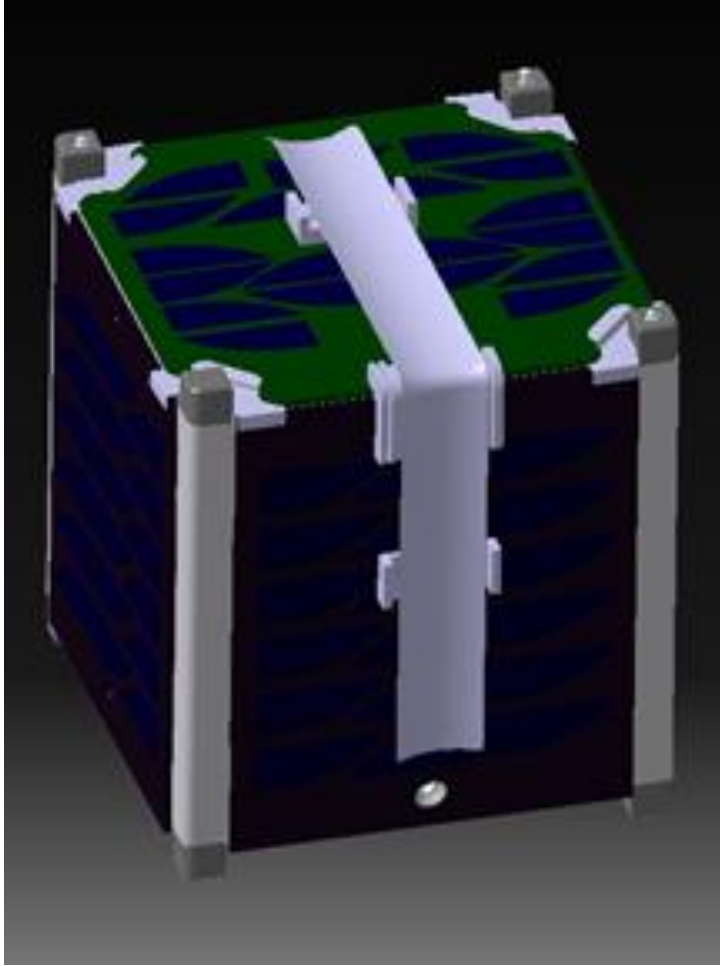


Integration and Launch

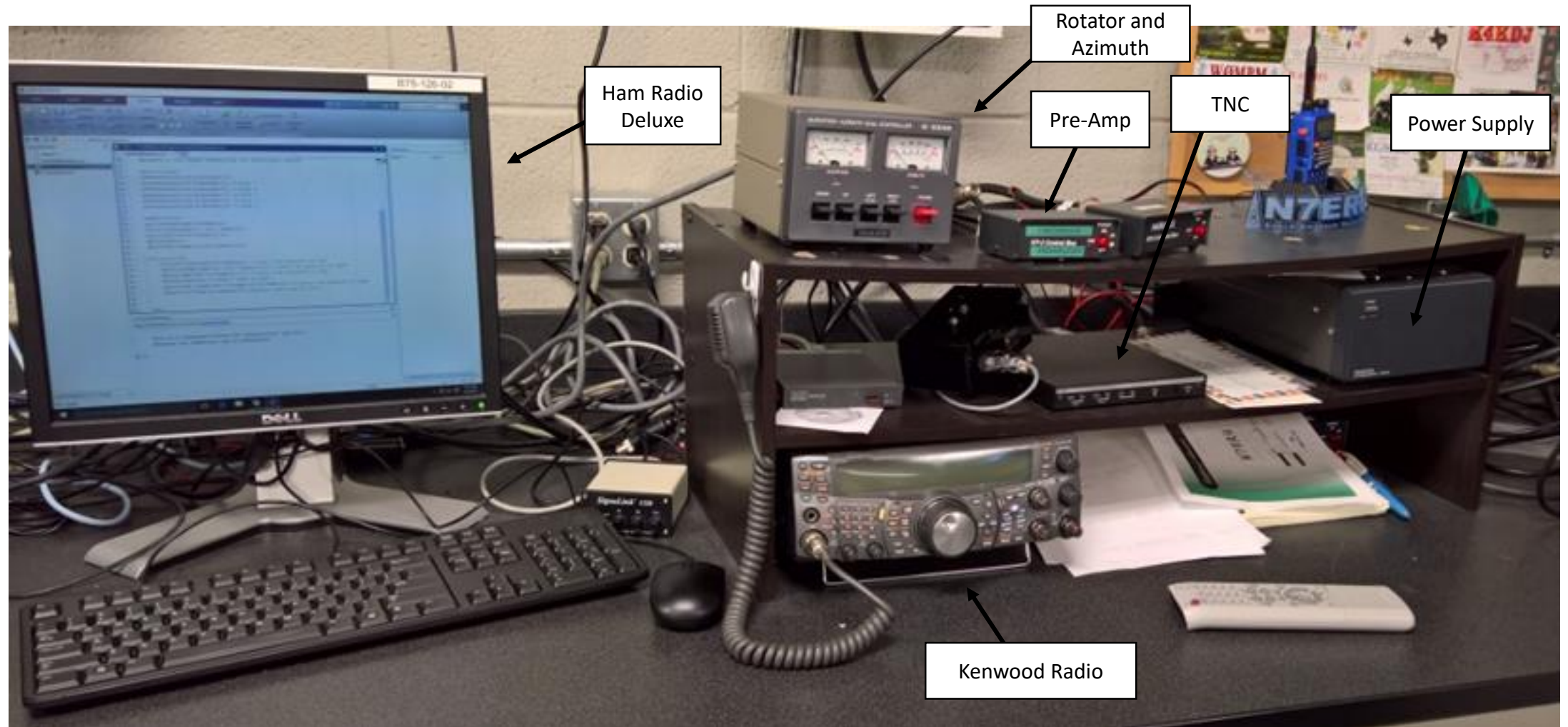


NASA (2017)

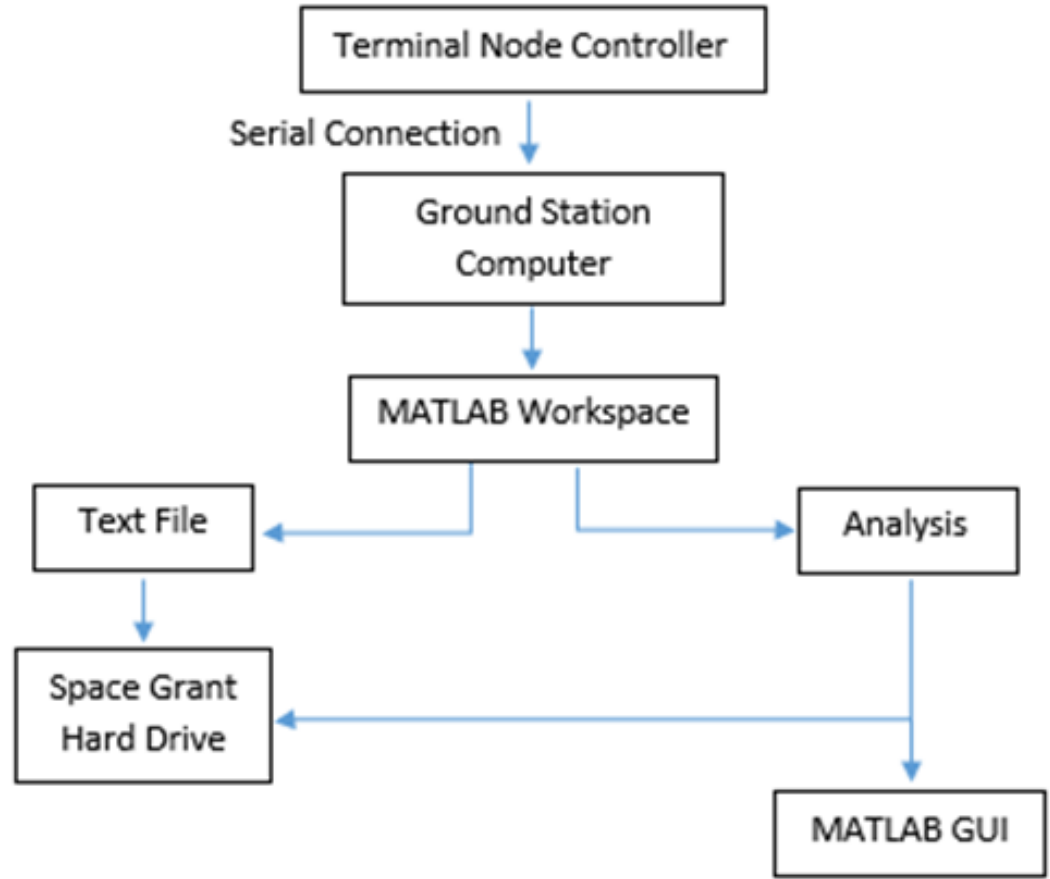
Communications



Ground Station



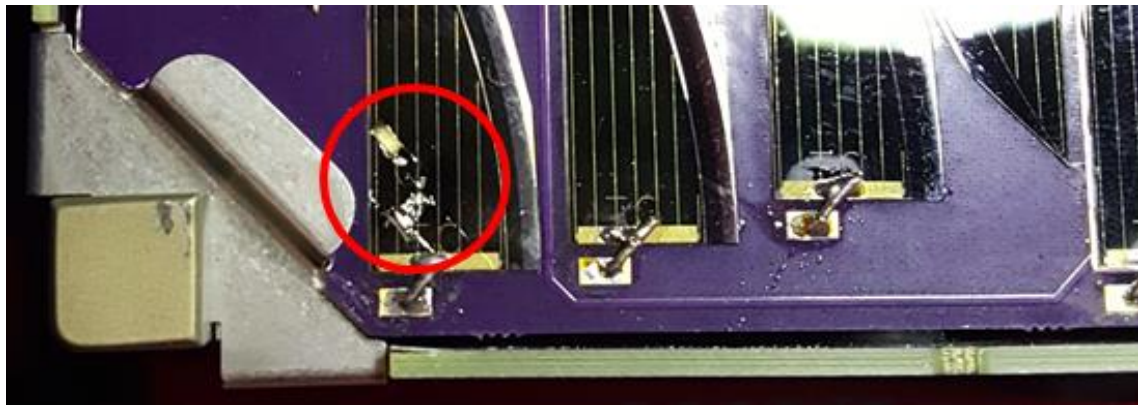
Data Flow



Failure Analysis: Silent Treatment



- Antenna not deployed
- Discharging before transmitting
 - Shorting near solar cells
 - GPS consuming
- Damaged solar cells
- Damaged critical components



United Launch Alliance (2018)

Next Steps

- Surrounding frequencies
- Old frequency
- Eclipsed and non-eclipsed passes

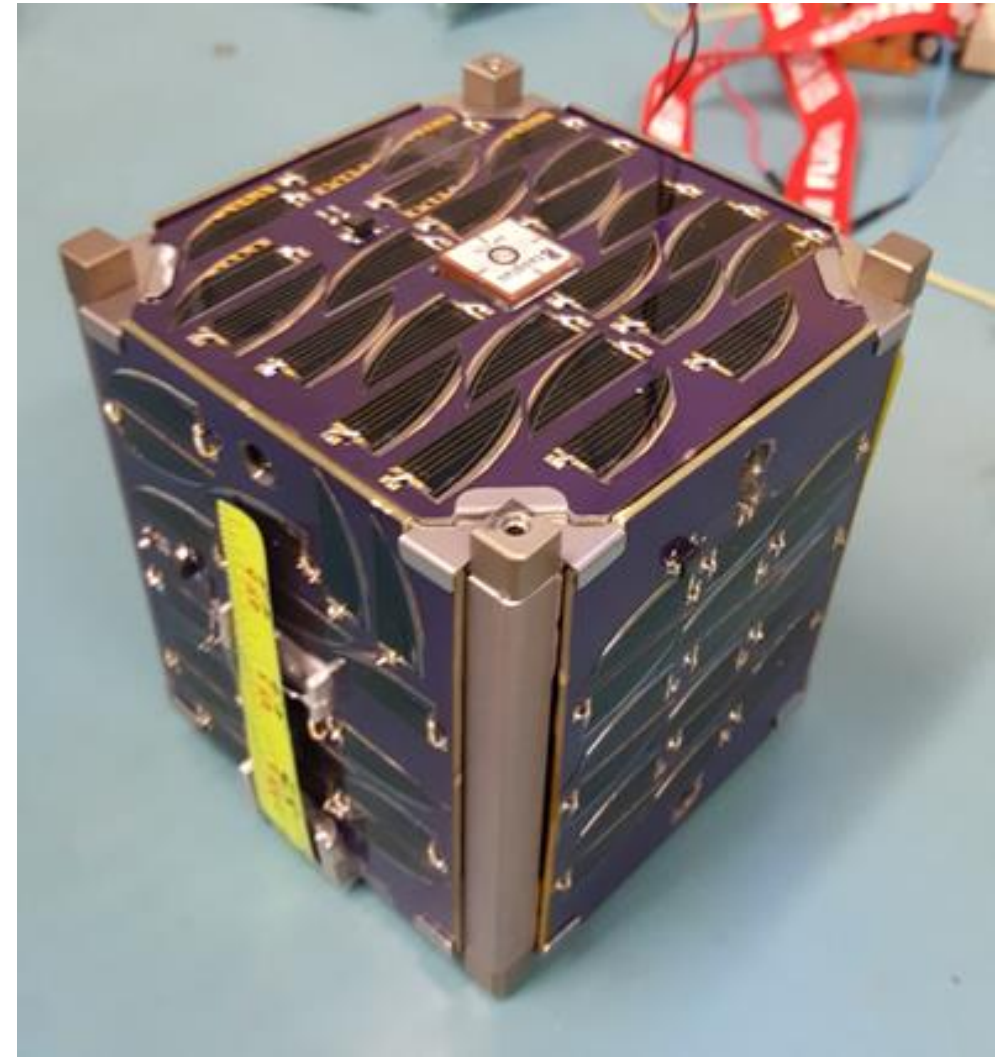
- Visual confirmation
- 4.5 meter dish



Rfhamdesign.com

Future of EagleSat-1

- Estimated Life span: 1-2 years
- Orbit Life span: 7-9 years
- GPS data will analyze models for small satellites



Acknowledgements





Questions?

Deborah Jackson
jacksd40@my.erau.edu

*"Success is not final, failure is not fatal: it is the courage to continue that counts."
Winston Churchill*

Citations



- NASA (2017), JPSS Launch 3a [Online Image]. Retrieved March 23, 2018 from <https://www.nasa.gov/press-release/nasa-launches-noaa-weather-satellite-aboard-united-launch-alliance-rocket-to-improve>.
- United Launch Alliance (2017), Delta II JPSS-1 Mission Profile [Screenshot]. Retrieved March 23, 2018 from <https://www.youtube.com/watch?v=tLkbdYZyf1c>
- User picture 4.5 Meter Dish [Online Image]. Retrieved on March 23, 2018 from <http://www.rfhamdesign.com/products/parabolicdishkit/45meterdishkit/index.php>.