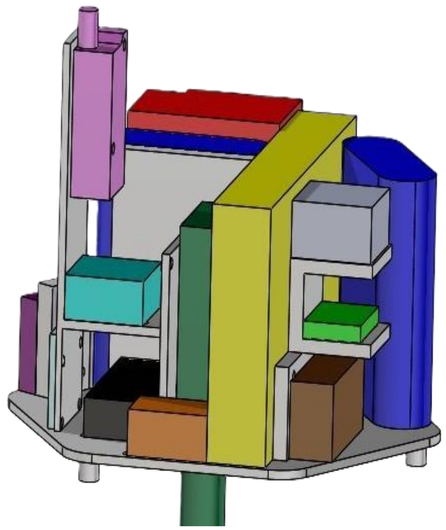
Long-Distance Video and Telemetry Streaming

Team Leads: Evan Hiland,[1] Kyle LaClair,[2] Calvin Lindemann,[3] and Santiago Nuno[4]
Mentor: Dr. Yabin Liao
Embry-Riddle Aeronautical University—Prescott ASCEND! Team

Introduction

- Current data collection dependent on payload recovery
- Streaming can allow for more consistent data
- Video and live telemetry visually interesting



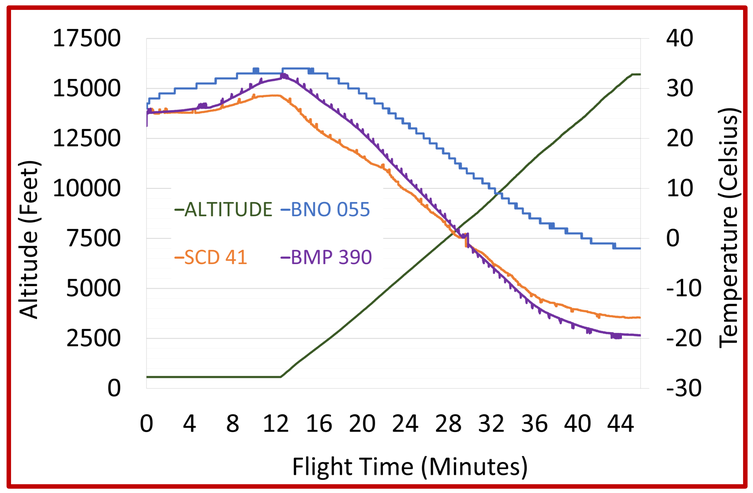
Internal Payload Layout (LaClair, 2025)

Payload Information

- 2.24 pounds
- Fiberglass shell
- 3D-Printed internal structure
- 7.4 Volt battery
- ONE RS 4K Camera
- STM32F405 Microcontroller
- Variety of sensors
- RFD 900x-US radio

The Flight

- Focused entirely on telemetry and data, no live video
- All sensors transmitted live telemetry to ground station via RFD 900x-US serial passthrough
- Telemetry processed into graphs using Grafana



Altitude and Temperature Data (Payload 2025)

Data Collection

- BNO 055 – IMU
- SCD 41 – CO_2
- BMP 390 – Altitude, Pressure, Temp.
- ISM 330DLC – IMU
- AS 7341 – MSS
- STEMMA MiniGPS

Past Flights

- Limited live-stream video over 2.4 GHz and 5.8 GHz to 10000 feet
- Major disconnections and signal noise issues

Ground Station (2024)

- Physical system recycled from Eclipse Project
- Onboard motor control processes python inputs
- Same system used for both 2024 and 2025 launches

Live Image (Hiland, 2024)

Conclusions

- Insulation or heat required despite small payload size
- Redundant GPS required
- Camera connected to payload power supply

Looking Forward

- Collect live telemetry and live video from the same payload
- Longer duration with live video and telemetry
- Full flight data collection
- Reusable structural design
- Modular electronics system

Acknowledgments

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[1] Aerospace Engineering, Aeronautics
[2] Aerospace Engineering, Astronautics
[3] Cyber Intelligence and Security
[4] Aerospace Engineering, Aeronautics