

# B2SPACE Parachute Recovery System



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## Abstract

Controlled parachute recovery systems have the ability to autonomously deliver stratospheric payloads to a target landing zone. This will enable pin-point landing for near-space payloads, such as B2Space's rockoon launch system, providing ease of recovery and reusability.



*Airborne Systems' Guided Precision Aerial Delivery Systems*  
<https://airborne-sys.com>

## Project aims

- Develop a small prototype system that can:
- Launch on a stratospheric balloon
  - Autonomously navigate to a target location
  - Communicate with a ground station using the Iridium satellite network
  - Be scaled up for larger payloads
  - Withstand the harsh environmental conditions of the upper atmosphere

## Test

- Short flight tests off a castle tower
- Analysed flight performance and stability
- Tuned flight controller's PID control loops for autonomous flight



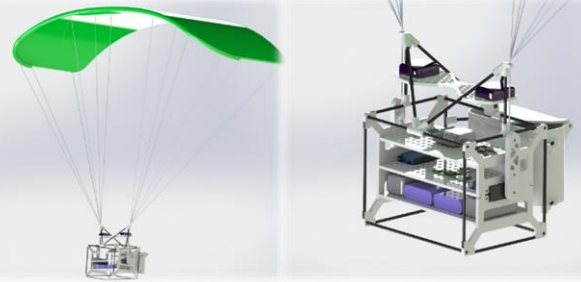
*Payload flight testing*

## Further Development

- Tethered balloon flights to test the autonomous navigation and parachute deployment
- Stratospheric balloon flights for full flight tests

## Design

- Designed a payload with a parafoil that can be deployed with a drogue parachute
- Parafoil controlled with two servo motors on either side of the payload
- Payload can be easily manufactured with additive manufacturing and carbon fibre
- Payload can be thermally insulated
- Dimensions: 15x15x20 cm

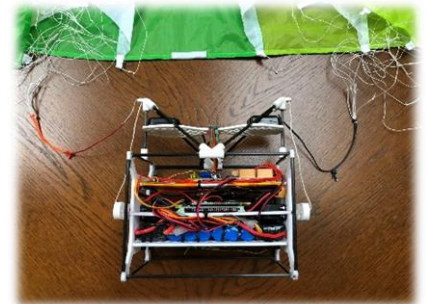


*Render of the prototype payload*

## Manufacture

### Structure

- 3D printed using PLA
- Reinforced with carbon fibre rods to improve structural rigidity



*Completed payload assembly*

### Flight Controller Avionics

- Real time clock
- 9-DOF orientation
- GPS
- Battery monitoring
- Atmospheric sensing
- Servo motors with position feedback
- RC receiver for manual flight testing



*Flight controller avionics*

### Payload subsystems

- Thermal management system to maintain a stable payload temperature in the stratosphere
- Two-way satellite communication system using the Iridium satellite network