To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, IE Capstone Design Programs

COTEL: Storm Flight Platform (SFP)

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Mission Goals

- Deploy a High Altitude Balloon (HAB) and attached scientific instrumentation into a frontal storm cell
- Collect and broadcast detector data to a ground station
- Track trajectory of the SFP throughout flight
- Provide power to the detector
- Terminate the flight at the target altitude
- Operate within FAA regulations

Measurable Specifications

Specification	Design Value	Measured Value
Target SFP weight	1.8 kg	2.9 kg
Target altitude	15 - 18 km	18.0 km
Power to detector payloads	7 W at 12 V	12W at 12V
Transmission rate	5280 bit/s	7680 bits/s
Pre-launch operations distance from storm	10 km	10 km
Maximum weight of each launch equipment kit	22.7 kg	19.6 kg
Maximum weight to size ratio (if payload is heavier than 1800 g)	13 g/cm^2	1.94 g/cm^2
Maximum payload mass	< 2.7 kg	671 g
Operating temperature range	-30 – 85 ºC	4 – 48 ºC

Assembly

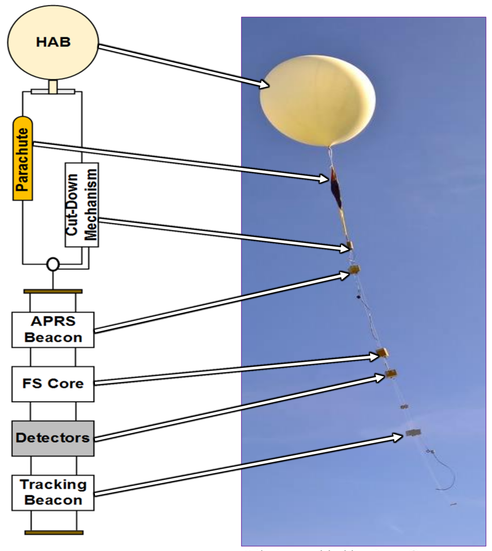
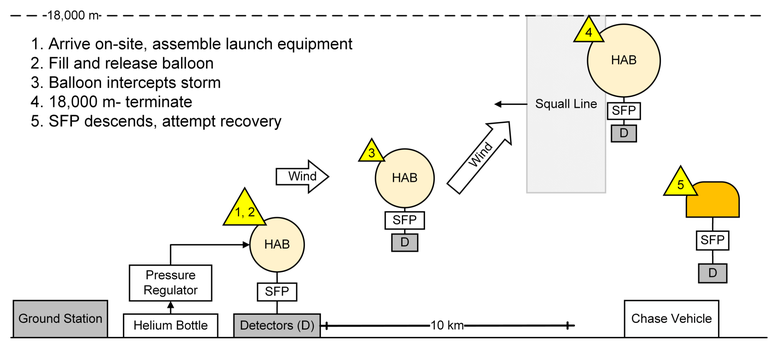


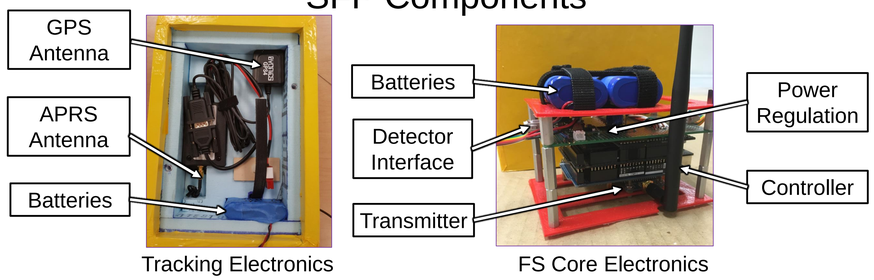
*Photo provided by Doug Granger

Flight String during Launch

Mission Overview



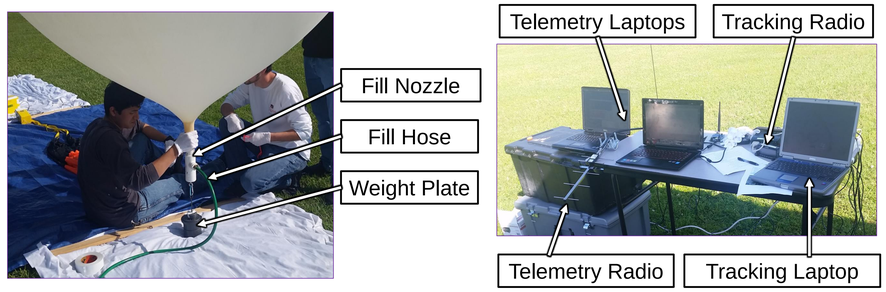
SFP Components



Tracking Electronics

FS Core Electronics

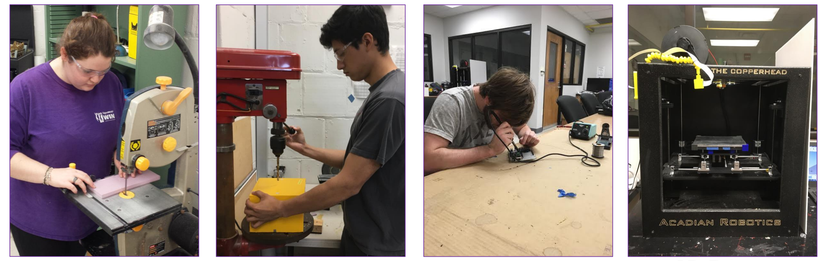
Flight String Assembly



Balloon Fill System

Ground Station

Payload Manufacturing



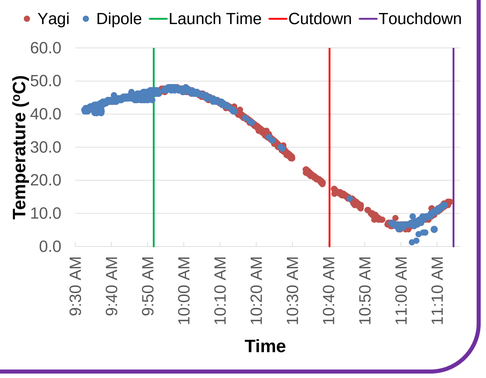
Band Saw | Drill Press | Solder Station | 3D Printer

Testing Results

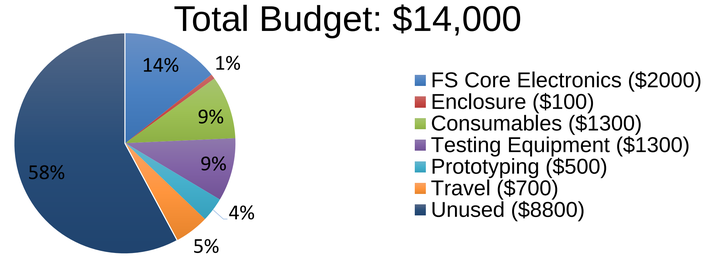
COTEL 4/13/17 Flight Test
Launch Site: West Feliciana Sports Complex
Cut Altitude: 18 km
Landing Site: Ethel, LA

	Yagi	Dipole
Packets Received	4380	2968
Packet Error Rate	1.5%	0.88%
Range (km)	31.2	31.2

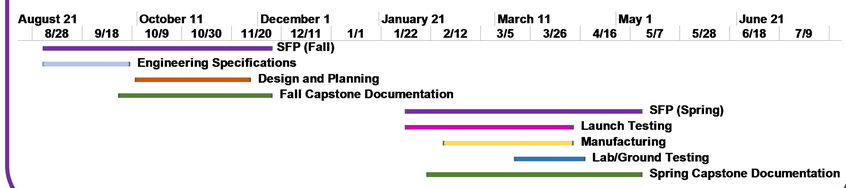
Temperature vs Time



Total Budget: $14,000



Timeline



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