Wepwawet
Flight Readiness Review

Breeana Pritchard, Jaden Fitzpatrick, Phoebe Mertens, Wyatt Taylor

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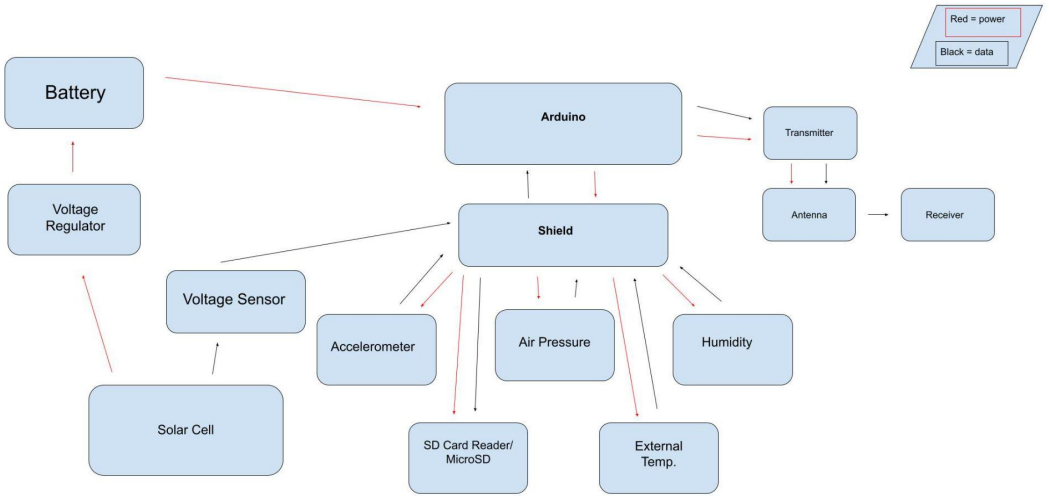
Mission Overview

- Create an efficient, cost-effective, sustainable, and reusable solar-powered weather balloon
- Build an effective base product for others to build off
  - Show industry there are more sustainable options than current radiosonde network
- Challenges:
  - Is solar enough to power our system for an entire flight?
  - Will our telemetry setup prove to be enough for our balloon chase?

Design Overview

- Weight: 526g
- Solar Subsystem
  - 3 solar panels, voltage sensor, voltage regulator, rechargeable battery
- Weather Balloon Subsystem
  - Similar to test build, higher quality sensors
- Telemetry Subsystem
  - 915Hz Arduino compatible radios

Design Overview - Subsystems



Solar Subsystem

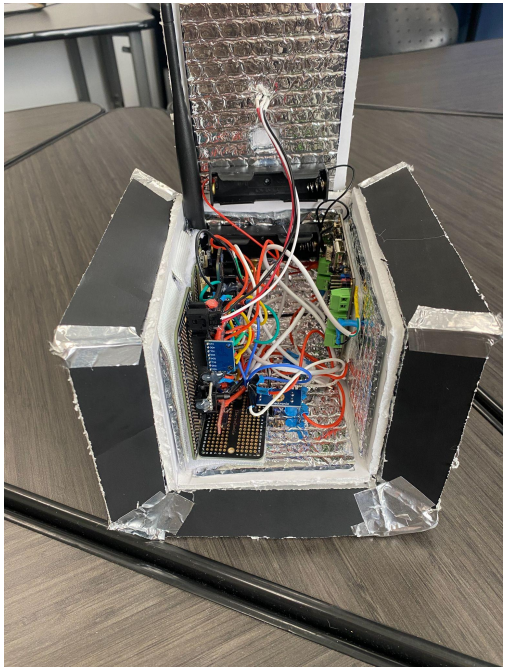
- Initial Concerns
  - Will solar power subsystem be durable enough?
  - Will enough power be provided?
- Solar panel manager
  - Regulates voltage before reaching arduino
  - Supports use and recharge of backup battery

Telemetry Subsystem

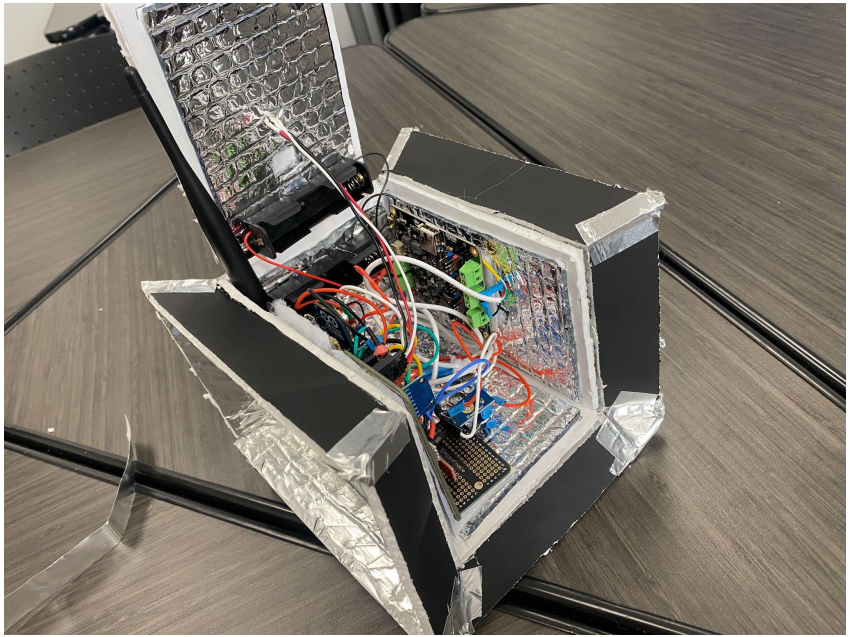
- Arduino MKR LoRa Radio
  - Packet Programming
- Antennas (ground and air)
- Testing

Payload Design

- Similar design to the test payload
- Extra solar panel protection

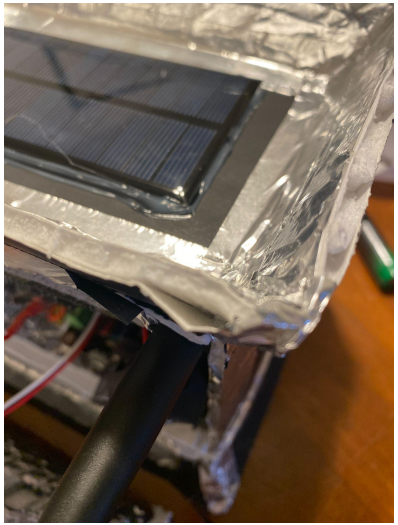


More Pictures!



Test Results

- Drop Test



Predicted Data

- Pressure sensor
- External Temperature sensor
- Humidity sensor
- Accelerometer
- Voltage sensor

Parts Lists

Telemetry Subsystem	
Part	Reason
Arduino MKR WAN 1310	Ground & Air Radio
Directional Antenna	Ground station
Omnidirectional Antenna	Air Station

Box Design	
Part	Reason
Foam Core	Build
Insulation	Insulation
Flight Tube	Stability
Aluminum Foil	Wave amplification

Weather Balloon Subsystem	
Part	Reason
Temp sensors	Weather prediction
Humidity sensor	Weather prediction
Pressure Sensor	Weather prediction
Accelerometer	Weather prediction
SD Card Reader	Data Collection
Micro SD	Data Collection

Solar Subsystem	
Part	Reason
3.7V recharg lithium ion batt	Power backup/storage
Solar panels	Power
Solar Power Manager	Buck converter/voltage regulation
Voltage Sensor	Measure actual voltage for solar

Budget

Part	Pack Cost	Actual Cost (used parts)
Arduino MKR WAN 1310	$95.60	$95.60
Antenna for Ground	$35.09	$35.09
Antenna for Air	$14.00	$7.00
Solar Power Manger	$38.90	$38.90
IPEX Connector	$7.47	$7.47
Solar Panels	$30.46	$15.21
Battery Holders	$7.99	$2.00
Arudino MKR MEM Shield	$23.99	$23.99
3.7 Li-Ion Batts	$23.99	$12.00
Voltmeters	$5.89	$1.18
Accelerometer	$6.49	$6.49
Pigtail Connectors	$12.99	$3.25
	$302.86	$248.18

What's Left?

Flight Day! GO WEPWAWETS!