To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, BE Capstone Design Programs

Team 29: Khaos Rocket Glider

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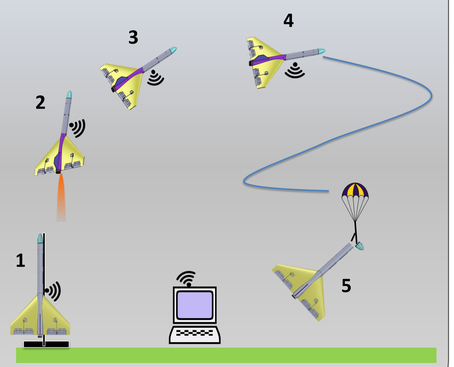
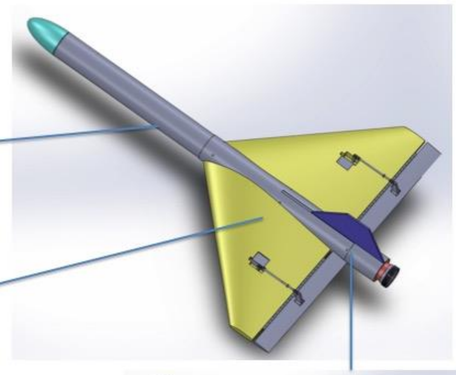
Background

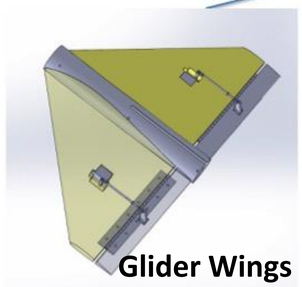
- **Task**: Develop a Reusable Rocket-Glider Platform and Experimental Rocket Motor Test Stand.
- Compatible with Different Types and Diameters of Rocket Motors, Including Hybrid Rockets.
- **Purpose**: Future Testing Platform for End Burning Hybrid Motor Concept.

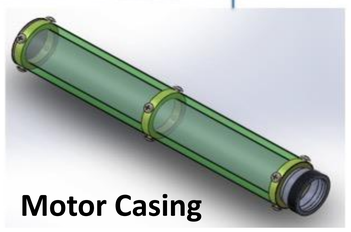


Overview of Rocket Glider Concept


Electronics Bay




Glider Wings


Motor Casing

Objectives

1. **Design, build, fly, and recover a functional rocket glider vehicle that meets the required customer specifications.**
2. **Design, assemble, and test Potassium Nitrate/Sorbitol (KNSB) rocket motors.**

Customer Requirements

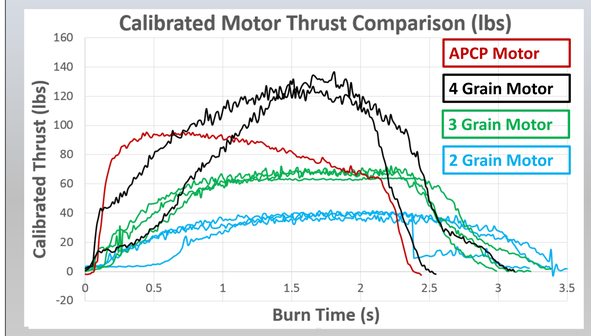
Rocket Glider Customer Requirements:

- Execute controlled vertical ascent using rocket propulsion.
- Achieve altitude between 1000 -2000 ft.
- Return to ground in controlled, lift-assisted descent.
- Designed reusability (Launch & Recovery survivability).
- Must be safe to operate.

Vehicle Specifications:

Height:	46.5 in	Dry Weight:	12.12 lbf
Wingspan:	36 in	Total Impulse:	172 lbf·s
Tube Diameter:	3 in	Average Thrust:	60.0 lbf

Testing and Data



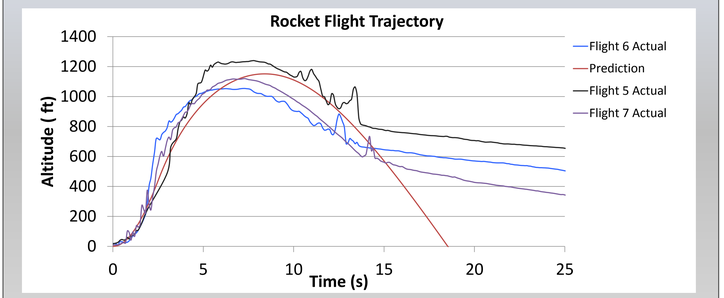
Motor Test Matrix:

- 1x 2-Grain APCP Test (Control)
- 2x 4-Grain KNSB Tests
- 3x 3-Grain KNSB Tests
- 3x 2-Grain KNSB Tests

Wing Durability Testing:

- Load 10 cycles with 40lb distribution
- Easily held all 40lb on wing tip
- Easily held over 100lb distribution

Rocket Glider Performance



- All Percent Errors are Less Than 10%

Safety

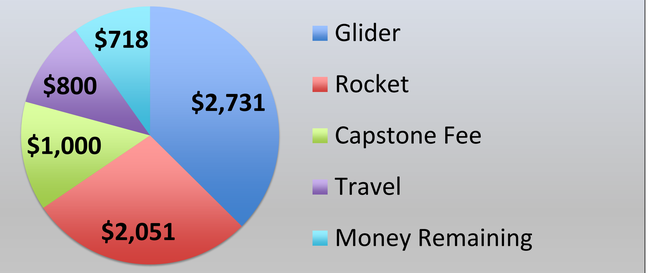
Rocket Glider Design:

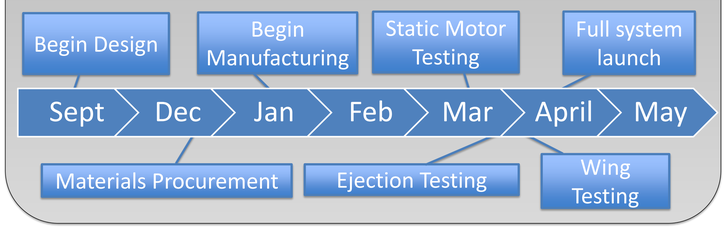
- Control System Manual Override
- 60” Recovery Chute with Manual Redundant Deployment

Rocket Launch and Testing:

- Launch IAW FAA and NFPA regulations
- Keyed Arming Switches
- 300 ft. Wireless Ignition Range
- LSU Safety supervised and approved testing

Budget and Schedule





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Rocket-Glider Video: