Glider Workshop
UCF SECME Glider Competition 2021-2022

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What Makes a Good Glider?

➢ What makes a good glider?
  ➢ Wing Shape
  ➢ The Importance of a Tail
  ➢ Balance

➢ Competition Rules
Wing Design

➢ Long, Thin Wings
   ➢ Length/Cord ratio >6
   ➢ Maximum Lift/Drag in slow flight

➢ Smooth, Thin Airfoil Shape
   ➢ Essential for good gliding performance
Wing Design

➢ Swept Wings, Bad Idea for Gliders
  ➢ Doesn’t help at low speeds
  ➢ Makes structure difficult/heavy

➢ Dihedral Angle
  ➢ Stabilizes straight forward flight
  ➢ Slightly decreases lift
  ➢ Can be polyhedral (flat and angled)
➢ Wings must be strong enough
  ➢ Light, but strong design
  ➢ The more bend, the less lift

➢ Example wing structure
  ➢ Folded material with spar

Leading (front) Edge

Trailing (back) Edge

Spar (structural support)
Tail Design

- Tail is critical for stability
- **Horizontal Stabilizer**
  - At least 1/5 area of wings
- **Vertical Stabilizer**
  - At least 1/10 area of wings
- **Fuselage Length**
  - 4-6x wing cord length
  - If too short, won't be stable

- **Canards and Flying Wings**
  - More efficient
  - Almost always unstable
Forces on a glider

- Gravity
- Lift
- Drag
- Stabilizer Lift

Thrust?
Balance

- Most important, Center of Gravity in front of Center of Lift
  - CG too far forward flies poorly, CG too far back flies once

- Body length should be close to wingspan
  - Back section 4-6x Wing Cord Length
Wrap-Up

➢ Long, thin wings. Strong enough to hold up
➢ Tail Surfaces
  ➢ Far enough back, big enough to keep the plane stable
  ➢ Lightweight
➢ Balance
  ➢ CG before CL
Rules Review

- Minimum 24in Wingspan, no max
- Maximum 4x4 Body Width, any length
- Must carry 16 marbles in sealed sandwich bag, 2.1oz
- Weight between 8oz and 12oz (including marbles)
- Total of 4 flights, score is total distance glided
- If glider breaks, score reduced by 25%
- No designs/parts from kits, no metals/hard materials for safety
Suggestions

➢ Hobby/craft stores have balsa wood, foam board, monokote/ultracoat
➢ Leading edge balsa wood is great
➢ You can build small balsa gliders for practice
➢ Don’t waste material/weight on unnecessary things
Good luck!

If you have any questions, you can contact us at AIAA.Central.FL@gmail.com