Elastic Launch Glider

Science Olympiad 2014
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• Two Major Components
  – Glider design
  – Flight Log (test records)
Construction Rules

• Maximum Wingspan - 28 cm
• Glider weight 3.0 to 10.0 grams
• Only wood, foam, paper, plastic film, carbon fiber, tape, thread and glue and non-metallic ballast allowed
• Nose cannot fit inside lip balm cap
• Launched with a non-metallic, elastic band
• Label each glider with team name and no.
Flight Log

- Minimum of 10 entries (record even bad tests)
- Minimum of 4 data points, more may be useful
  - Peak height
  - Length of launch loop
  - Flight Time
  - Any one other
- 10% deduction for incomplete log, 30% for none
- Most important part of practice and competition!
- Change only one parameter at a time and record if result was better or worse, then go on to next
Construction - General

• Anticipate building more than one glider throughout the project

• Priorities
  – 1 Build quality/trueness/straightness
  – 2 Strength
  – 3 Light weight
  – 4 Various designs
Construction - Details

• Use jigs and fixtures to keep wings and tail straight while gluing
• use minimum of glue
• Check balance to center of gravity by moving wing back and forth before gluing in place
• Check first flights by hand launch without elastic launch
Building Jigs
Testing - Basics

- Trim for lowest sink rate
- Stall – Wave pattern on descent: add ballast to nose or bend stab trailing edge down
- Dive – Goes down too fast: add ballast to tail or bend stab trailing edge up
- Adjust only one parameter at a test, ballast or bend
- After balanced, adjust rudder to turn glider inside the room: bend rudder trailing edge to right or add small ballast to right wing tip for right circle
- Start elastic launch tests and repeat above cures
Glider “Secrets”

• Set glide speed just faster than start of stall
• Set climb angle to get maximum height and smooth transition to glide
• Elastic power depends on height of ceiling, wider band or longer stretch for higher ceiling
Links

• LOTS of information: legacy.amaglider.com
• Forums: www.scioly.org
• Bulk Balsa: www.nationalbalsa.com,
• www.a2zcorp.us/store
• www.freedomflightmodels.com
• www.amaglider.com/static/sciolympia/cmarkflight-glider-ad-2014.pdf