

SCIENCE OLYMPIAD



Balloon Launch Glider – B

Wright Stuff – C

2007

Matthew Chalker & CeAnn Chalker

matthew@chalker.org ceann@chalker.org

BLG and WS –

How are they the Same?

- Allowed 2 Ultra light aircraft built and tested prior to competition
- Flown indoors
- Timed for duration aloft
- No Impound
- Aircraft to be labeled with team's identification name & number



BLG and WS – How are they the Same?

- Allowable Materials
 - Wood, paper, plastic film covering, and glue
 - Thread, wire, plastic tubes & rubber bands may be used to attach major components
 - Any dense material for ballast
- Flight log for 10 previous flights before beginning their test flights at competition

BLG and WS –

How are they Different?

- Number of flights allowed per team
 - BLG – 3 Glider flights
 - WS – 2 Rubber Band powered Plane flights
- Launching/Power
- Building Specifications
- Other Requirements/Info
- Flight Log Specifications



Launching/Power - BLG

- Glider launched from a helium balloon
- Glider has no power, glides to ground



Launching/Power - WS

- Plane launched from hand
- Plane powered by wound rubber band
- Uses a propeller



Building Specifications - BLG

- Total mass of plane must be at least 2.0 grams
- 40.0 cm max horizontal projected wing span
- 10.0 max wing chord
- 28.0 max horizontal projected stabilizer span



Building Specifications - WS

- Total mass of plane must be at least 7.0 grams (without rubber motor)
- Must be a monoplane
- 50.0 cm max horizontal projected wing span
- 7.0 cm maximum wing chord
- 30.0 cm max horizontal projected stabilizer span
- 4.5 cm max stabilizer chord



Building Specifications – WS (cont'd)

- Propeller
 - Single two-bladed commercially made plastic propeller
 - Maximum diameter of 18.5 cm
 - Trimming, shaving, twisting allowed
- Rubber Motor
 - 2.0 grams maximum mass (includes O-rings)

Additional Requirements/Info -

BLG

- 8 minutes to launch 3 flights starting when their first official flight begins
- Event Supervisor will provide at least one Balloon Launching Rig capable of lifting a 10 gram glider to the ceiling
- Competitors may bring their own Balloon Launching Rigs

Additional Requirements/Info - WS



- 8 minutes to launch their 2nd flight after their 1st official flight ends
- Motors impounded after check-in, available only for official flights



Flight Log - BLG

- Flight log with minimum of 4 parameters and for at least 10 flights
 - Height of balloon at glider launch
 - Glider mass at launch
 - Flight time
 - Any other parameter (same for all flights)



Flight Log - WS

- 6 parameters for 10 previous flights prior to competition
- 3 required parameters
 - Motor size before windup
 - Winds on the motor at launce
 - Flight time
- Additional parameter examples
 - Turns remaining at landing
 - Estimated peak flight height
 - Estimated flight path diameter
 - Torque at launch



Bonus – WS

- State – 10% of the flight time will be added if the plane is a Pusher Plane (Prop behind the wing)
- Nationals – 10% of the flight time will be added if the plane is a Canard Design (Stab is in front of the wing and prop is behind the wing)



Competition – BLG & WS

- Competitors only allowed in testing/flight area
- Test flights allowed throughout competition ending at least by the last 30 mins. of the tournament
- Test flights will yield to official flights
- Multiple aircraft may test fly at once



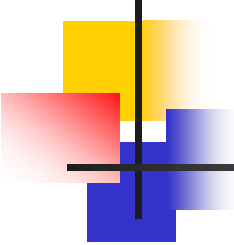
Scoring – BLG & WS

- Winner is team with longest flight time for any single flight.
- Ties broken by second longest flight time.



Deductions & Violations – BLG & WS

- Flight Log discrepancies
 - Incomplete flight logs will have 10% of the flight time deducted from each flight
 - No flight log will have 30% of the flight time deducted from each flight
- Rule Violations without a specific penalty will be ranked after all teams that do not violate the rules



Resources & Supplies

- Resources
 - indoornews.com
 - indoorduration.com
 - Yahoo Groups –
 - Wright Stuff & Balloon Launch Glider
 - SO website
- Supplies on line
 - F1D.biz
 - FAImodelsupply.com



Additional Resource

Matthew Chalker

matthew@chalker.org