

**AERIAL SCRAMBLER with Mass Launch– Trial Event 2019**  
Georgia Science Olympiad; modified

1. **DESCRIPTION:** At the tournament, teams will assemble and test fly two rubber-powered monoplanes using provided materials. Teams can provide their own rubber motors that should not exceed 2 grams each.

**A TEAM OF UP TO:** 2 Students

**IMPOUND:** None

**EVENT TIME:** 5- 90 minutes

2. **EVENT PARAMETERS:**

- A. Teams **must** bring a first-aid kit with **at least 3 band-aids**.
- B. They may also bring these permitted tools: winders, assembly tools, fixtures (free-standing from airplanes), cutters/knives, sandpaper, adhesives, threads, tapes, rubber O-rings for motors, rubber motors, **lubricant, measuring tape, pins and clay. ~~cutting board and wax paper~~**. All must fit in a box with a 12” x 12” footprint. A cutting board and wax paper must be used to cover any and all work surfaces. **They can be separate from the tool box. Not allowed – carbon fiber, boron, extra wood or foam plastic materials.** No pre-built devices may be brought into the testing area.
- C. State event supervisors will provide the AMA Alpha kits to build two rubber-powered monoplanes. If Regionals choose to run the event, they will either provide the kits or give teams at least a 4 week notice to purchase kits.
- D. Competitors will be allowed at least 30 minutes before their official time-slot to build and test their models.
- E. Each team is responsible for their work site. The site must be cleaned and all debris disposed of before the team can attempt an official flight.

3. **CONSTRUCTION PARAMETERS:**

- A. Competitors will be given 2 standard kits from which to construct their 2 models at State. At Regionals, if teams are asked to purchase their own kits, they must be unopened and will be inspected at primary check-in.
- B. The stock rubber motor may be replaced by other rubber elastic loops.
- C. **Glue, tape, pins or clay may be added as ballast and are considered as parts of each model.**
- D. Total mass must be more than ~~8.0~~ **10** grams and cannot exceed 15.0 grams for the model **without motor**.
- E. The wingspan cannot exceed ~~36.0 CM~~ **50 cm**
- F. Airplanes must use the provided propeller **which may not exceed 14 cm**
- G. The rubber motor cannot exceed 2 grams. Motors may be lubricated after check-in.
- H. Airplanes will be labeled using a colored writing implement chosen and provided by the event supervisor.

4. **THE COMPETITION:**

- A. The event must be held indoors. Tournament officials must announce the room dimensions (approximate length, width and ceiling height) in advance of the competition. Tournament officials and event supervisors are urged to minimize the effects of environmental factors such as air currents. Rooms with minimal ceiling obstructions are preferred over very high ceilings.
- B. **PRIMARY Check-In:** Once the competitors enter the cordoned off competition area, they must –
  - 1) Sign-in and then be scheduled, in order of arrival, for official flight time-slots.
  - 2) Receive kits at State and present:
    - a. Their toolbox and materials for measurement and inspection; **20% deduction if not using a cutting board and wax paper**
    - b. Their unopened kits if Regionals require teams to provide their own kits
    - c. Their first-aid kit (**at least 3 band aids**) or deduct 10% from final score
  - 3) Teams must remain in the competition area till their official flights are done. *No outside assistance.*
  - 4) Teams will assemble up to two airplanes from the two kits and proceed to trim/test fly. The first 30 minutes include check-in, model construction, flight-trimming and test-flights.
  - 5) At the event supervisor’s discretion:
    - a. Teams ready early may proceed to make their official flights
    - b. No test flights may occur during the last 30 minutes of the event.
    - c. Flights may occur during the official flight time but must yield to official flights.

## AERIAL SCRAMBLER B (contd.)

- 6) A self-check inspection station may be made available to competitors for checking their airplanes prior to the Secondary Check-in for their official flights.
- 7) Competitors may use any kind of winder, except one requiring electricity.

C. **SECONDARY Check-in:** Competitors must present up to two airplanes and up to 4 motors for inspection during the Secondary Check-In immediately prior to their two official flights.

- 1) Event supervisors must try to utilize 3 timers on all flights. The median flight time in seconds to the precision of the device used, recorded by the 3 timers, is the official time aloft. If only 2 timers are available, the time aloft will be the mean of both timers.
- 2) Timers must follow and observe teams as they are winding their motors. All motors that meet specifications will be collected at check-in by the timers and will be available to the teams for their official flights.
- 3) Teams may make up to two official flights. They may use either of their airplanes for each official flight.
- 4) After Secondary Check-in, teams will be taken in groups of 3-4 to make official flights. They may use only 1 plane per official flight.
- 5) Teams will be instructed to put their airplanes on the floor then asked to pick them up. They will have one minute from the time picked-up to wind their planes.
- 6) In the last 10 seconds of that minute, a timer will loudly call out the countdown. At," 3-2-1 Launch!" all models in the group will be launched and timed independently. Any model not launched within 3 seconds of the command will forfeit that flight and time aloft will be counted as 0 seconds.
- 7) When the last model lands, teams will have at least 30 seconds to replace their device with the second model if they choose to fly the second model in the next round.
- 8) At the end of the 30 second period, teams will again be instructed to pick-up their models which will start the one minute countdown as before for the second official flight. This flight will be timed to conclusion.
- 9) Time aloft for each flight starts when the model leaves the competitor's hands and stops when any part of the model touches the floor, the lifting surfaces no longer support the weight of the model (such as the airplane landing on a girder or basketball hoop) or the judges otherwise determine the flight is over.
- 10) In the unlikely event of a collision, re-flights of the devices that collided are at the discretion of the event supervisor as long as all teams have the same chances in case of a collision.
- 11) If teams have time to repair their device in the 30-second period between the 2 official flights, they may do so. They will not be given extra time to recover or repair their airplanes even in the case of a collision. Planes that are stuck may be recovered after the event is over for all teams competing **or after the awards ceremony at the Tournament Directors discretion.**

### 5. **SCORING:**

- a. The final score is the total time aloft, in seconds, of the two official flight times together.
- b. Ties will be broken by the longest single official flight time per team.
- c. **20% deduction if Rule 4B. 1a. not followed**
- d. **10% deduction if Rule 4B. 1c. not followed**
- e. **Tiers are as follows:**
  - a. **Tier 1: Completed flights with no competition or construction violations**
  - b. **Tier 2: Completed flights with any Construction violations**
- f. **Assistance (verbal or non-verbal) and any materials provided to students from anyone other than the Event Supervisors once teams enter the testing environment will result in a disqualification. This is a spectator event held in the same room as the awards ceremony.**

*This Event is sponsored by the Academy of Model Aeronautics*