

Aerial Scramble Trial Event (modified)

Technology & Engineering Committee

1. **DESCRIPTION:** At the Tournament, teams will assemble **One** aircraft from standardized kit (**Guillow's Balsa Wood Flying Machine Kit**), test their plane, and fly their plane in competition.

A TEAM OF UP TO: 2 **IMPOUND:** None **APPROXIMATE TIME:** 50 minutes 2. **EVENT PARAMETERS:**

- a. Teams may bring winders, assembly tools, fixtures (freestanding from airplanes), sandpaper, cutting boards, adhesive systems, thread, pins, tape, wax paper, rubber o-rings for motors, clay and their logbook in one clear sided container with an approximate footprint of no more than 12" x 12".
 - b. Additionally, teams must bring a first aid kit that should contain at least 3 adhesive band-aids and any other first aid equipment the team feels is necessary.
 - c. Work boards and wax paper must be used to cover any and all work surfaces. **These are considered separate from the contents of the tool box. Any team not using a cutting board will receive a 20% deduction on their final score.**
 - d. Teams can provide their own rubber motors that will not exceed 2 grams each.
 - e. For Invitational and Regional competitions, teams bring **One** unopened kits for inspection and their use. At the State and National Competitions, event supervisors will provide all airplane kits for official distribution. Organizers will stipulate the airplane kit to be used in competition at least 2 weeks previous to the competition. Only kits that by design, are assembled without adhesives and can be disassembled to fly again will be accepted. All teams must use their state's standardized kit.
 - f. Participants will be allowed a minimum of 20 minutes before their official time-slot window to build and test their models. Multiple models can test fly in this period.
 - g. Each team is responsible for their work site. Any debris must be disposed of, the site cleaned and inspected before official flights are attempted.
 - h. Teams will be allowed to attempt two (2) official flights for scoring.
3. **Construction Parameters:**
 - a. At the regional competitions, competitors will bring two unopened kits for inspection and their use.
 - b. At the State and National competitions, students will choose two kits for their team from a provided selection of unopened standardized kits (such as the AMA Alpha).
 - c. Only those materials found as part of the two kits will be allowed in model assembly. Glue, tape, pins or clay ballast may be added by teams and are considered as parts of each model.
 - d. Boron, Carbon Fiber, Extra Wood or Foam Plastic Materials are not allowed in the construction of the aircraft.
 - e. The stock rubber motor may be replaced by other rubber elastic loops.
 - f. Total mass must be more than 10.0 grams and cannot exceed 15.0 grams for model without motor.
 - g. The wingspan cannot exceed 50.0 cm.
 - h. Airplanes must use the propeller provided in the kit and not exceed 14 cm in diameter.
 - i. The rubber motor cannot exceed 2 grams.
 - j. Motors may have rubber o-rings and be lubricated after check-in.
 - k. Airplanes will be labeled in such a way that can be identified by the participants in reference for their logbooks.
 4. **The Competition:**
 - a. The event must be held indoors. Tournament officials will announce the room dimensions (approx. 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. The event will be scheduled in hour time slots with no more than 10 teams competing in a time slot. The first 30 minutes will be devoted to complete primary check-in, model assembly and trim flights. The final 20 minutes will be to accomplish the team's two official flights. These flights will occur in 2-3 team mass launches within a 4-minute scheduled window.

- c. At their schedule time a team will enter a cordoned off competition area to begin Primary Check-In, where they:
 - i. Sign-in and are scheduled, in sequence of their arrival, for an official flight time-slot, as well as have their model kits inspected by or receive their model kits from the event supervisors depending upon the type of competition being held.
 - ii. Teams will then submit their tools and materials kit (2.a) as well as their first aid kit (2.b.) for inspection. Teams must show officials that they have at least a minimum of 3 adhesive band-aids as part of this kit or a 10% deduction will be applied to their final score. iii. The team members remain in the competition area until their official flights are completed. No Outside assistance is allowed.
- iv. Teams will assemble up to two airplanes from the two kits and proceed to test/trim fly their models. The first thirty minutes of the hour include check-in, model construction and flight trimming. v. At the Event Supervisor's Discretion:
 - (1) Test Flights may occur throughout the contest but will yield to official flights.
 - (2) Teams ready early can proceed to make their official flights in sequence.
 - (3) No Test Flights may occur in the last half hour of the event.
- vi. 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.
- vii. Competitors may use any kind of winder, but electricity may not be available.
- d. For Secondary Check-in and their Official Flight Time-Slot, teams must present up to two airplanes, their logbook, and up to 4 motors for inspection during the Secondary Check-In immediately prior to their Official Flight Time-Slot. Logbooks must describe at least 4 tasks that were used in either model construction or test flight of the model prior to the competition. The logbooks may contain numerical data.
- e. After Secondary Check-in, teams will be taken in groups of 2 or 3 to make official flights:
 - i. Teams may make up to two (2) official flights using 1 or 2 airplanes.
 - ii. Teams will be instructed to put their airplanes on the floor then asked to pick them up.
 - iii. All motors that meet specifications will be collected by timers at check-in and will be made available to the teams for their official flights.
 - iv. When picked-up, teams will have one minute to wind airplanes.
 - v. Timers will follow and observe teams as they are winding their motors.
 - vi. In the last 10 seconds of that minute, a timer will audibly announce the countdown. At," 3-2-1 Launch!" all model in the group will be launched and timed independently.
 - vii. When the last model lands, teams will again be instructed to pick-up their models starting a oneminute countdown for the second official flight. These flights will be timed to conclusion.
 - viii. 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.
 - ix. In an unlikely event of a collision, the two teams involved will re-fly the round.
 - x. Timers will record the time to the accuracy of their instruments. The median of all timers will be recorded as the official flight time for each official flight.

5. **SCORING:**

- a. The final score is made by adding the two flight times together.
- b. Ties will be broken by the longest single official flight time per team.

Recommended Resources: The Science Olympiad Store (store.soinc.org) carries the Tech/Problem Solving CD which contains resources about building and flying airplanes; other resources may be found on the Trial Event page at soinc.org. Lastly, resources may be found on the Academy of Model Aeronautics website.

Aerial Scrambler Event Information & Rule Modifications

1. Teams to bring One (1) unopened Guillow's Balsa Wood Flying Machine Kit for build and competition;

Amazon: <https://www.amazon.com/Guillows-Balsa-Wood-Flying-Machine/dp/B000GL1CT6>

Hobby Lobby: <https://www.hobbylobby.com/Crafts-Hobbies/Hobbies-Collecting/Gliders-Planes/Flying-Machine-Model-Airplane-Kit/p/80798010>

2. Plane mass should be at least 12.0 g, including propeller but excluding launch gear and rubber (revised from the rule);
3. Logbook must have 4 tasks or parameters used in model construction or test flight prior to the competition. Incomplete logbook will receive 10% deduction from their final score; and 30% deduction without logbook.
4. Teams without First-Aid kit will have 10% deduction of their final score; Teams without cutting board / wax paper in their tool kit will receive 20% deduction of their final score;
5. Teams have construction violation will be ranked as Tier 2.
6. Teams are allowed to bring their own rubber motors and winder or use the thick rubbers from the kit and winding by hand.