

# Indiana Aerial Scramble (replacing Bottle Rockets)

1. **Description:** At the tournament, teams will assemble and test fly two rubber-powered monoplanes using the Guillows Skystreak™. Teams can provide their own rubber motors that will not exceed 2 grams each. **Note that for regional competitions, competitors bring two unopened kits for inspection and their use.**

**A Team of Up to: 2 Students Impound: None Time: 6 minutes**

## 2. Event Parameters:

- a. Teams may bring their own tools such as winders, assembly tools, **fixture or jigs freestanding from airplanes**, cutting board, **tape** and wax paper, etc. Wax paper must be used to cover any and all work surfaces.
- b. At the IN State Competition, Event Supervisors will provide all airplane kits.
- c. Students will be allowed a minimum of 30 minutes before their official time-slot to build and test their models.
- d. Each team is responsible for their work site. Any debris must be disposed of and the site cleaned before official flights are attempted.
- e. **Teams will be allowed to attempt three (3) official flights for scoring.**

## 3. Construction Parameters:

- a. **At the state competition**, students will choose, from a provided selection of unopened Skystreak™ kits, two models for their team.
- b. **At the regional competitions, competitors bring two unopened kits for inspection and their use.**
- c. Only those materials found as part of that kit will be allowed in the assembly. **Glue, tape or clay ballast may be added by teams and are considered as parts of each model.**
- d. The stock blue rubber motor may be replaced by other rubber elastic loops.
- e. Total mass must be more than 8.0 grams and cannot exceed 15.0 grams for **each** model.
- f. The wingspan cannot exceed 36.0 CM
- g. Airplanes must use the propeller provided in the kit.
- h. The rubber motor cannot exceed 2 grams. Motors may be lubricated after check-in.
- i. Airplanes will be labeled in such a way that they can be identified by the students in reference to their logbooks.

## 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 competitors enter the cordoned off competition area,
  - 1) They must sign-in for their PRIMARY Check-In to receive their two airplane kits. Event supervisors may designate **the dispersal of these kits.**
  - 2) **The team members remain in the competition area until their official flights are completed.**
- c. Students must show officials that they have a first-aid kit.
- d. Teams will assemble up to two airplanes from the two kits and proceed to test/**trim** fly. A time frame will be designated, at the Event Supervisors discretion, for each team to have at least 30 minutes to one hour to make flight trim adjustments to their models before those teams' scheduled official flights are made.
- e. At the Event Supervisor's Discretion:

1. Multiple official flights may occur simultaneously.
2. Test Flights may occur throughout the contest but yield to official flights.
3. No test flights will occur in the final half-hour of the event's last period, except for teams that declare a trim flight during their 8-minute flight period.
- f. 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.
- g. Competitors may use any kind of winder, but electricity may not be available.
- h. **SECONDARY Check-in:** Competitors must present up to two airplanes and up to 8 motors for inspection during the Secondary Check-In immediately prior to their three official flights. Timers must follow and observe teams as they are winding their motors. All motors that meet specifications will be collected at check-in for the timers and will be available to the teams for their official flights. **Note that any additional motors needed during official flights must be inspected before use.**
- i. **The teams must submit their construction log book for review.** Information required is an airplane identification number or letter designation and a numbered list of changes or modifications used in developing an airplane's final design. **These notes may include data made during prior tests and experiments.** Log books will be returned at the end of each inspection.
- j. Teams may make up to a total of three (3) official flights using 1 or 2 airplanes.
- k. After the Secondary Check-in, teams must be given a six minute Flight Period starting when their first flight (trim or official) begins. Any flight beginning within the 6-minute period will be permitted to fly to completion.
- l. Competitors may make adjustments/repairs/trim flights during their 6-minute period. Before their launches, competitors must indicate to the Timers whether a flight is either an official or trim flight. A flight is considered official if a team fails to notify Timer(s) of the flight's status. Teams will not be given extra time to recover or repair their airplanes.
- m. Time aloft for each flight starts when the airplane leaves the competitor's hands and stops **when** any part of the airplane touches the floor, the lifting surfaces no longer support the weight of the airplane (such as a the airplane landing on a girder or basketball hoop) or the judges otherwise determine the flight to be over.
- n. Event Supervisors are strongly encouraged 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.
- o. In an unlikely event of a collision with another airplane, a team may elect a re-flight. The decision to re-fly may be made after the airplane lands. Timers are allowed to delay a launch to avoid a possible collision. The 6-minute period does not apply to such a flight.
- p. Timers must record (the median w/ 3 timers) each official flight time.

**4. Scoring:** The final score is made by adding the best two flights together. Ties will be broken by the longest third official flight time.

Recommendations to Teams-

- A) Any component of the kit may be utilized as part of the final design.
- B) Kits will have subtle differences such as minor warps and weight of the wood. Be prepared to handle these nuances as you create the aircraft for competition.
- C) **Models constructed using methods to make them lighter without sacrificing strength have the potential to fly longer (lighter wing-loading)**
- D) It is recommended that each team bring a trash bag to clean-up their work area.