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Commercial sUAS Drone Competition (Team of 2 Members)

Description

The Commercial sUAS Drone Competition evaluates students' readiness for careers related to the safe, responsible, and effective operation of drones within the National Airspace System (NAS). The competition emphasizes FAA-aligned knowledge, flight operations, mission planning, teamwork, communication, and professionalism, while remaining appropriate and equitable for the high school level.

Competitor Requirements

- Open to teams of two (2) students from the same school.
- Students must be enrolled in programs where drone technology, aviation, engineering, or related fields are an instructional focus.
- A full team must be registered to compete.
- Substitution and penalty rules follow standard competition regulations.

Clothing Requirements

- NYC SkillsUSA T-Shirt
- Black Dress Slacks (accompanied by black dress socks or black or skin-tone seamless hose) or black dress skirt (knee-length, accompanied by black or skin-tone seamless hose).
- Black leather shoes that are not backless or open toe

Equipment and Materials

1. **Supplied by contestant:**
    a. Fully assembled and operational drone with onboard camera either the HolyStone HS360s or the Echo Drone
    b. Fully charged batteries
    c. Laptop (one per competitor)
    d. Eye protection
    e. Surge protector
    f. One-page resume (printed and submitted online)
    g. All competitors must create a one-page resume.
2. **Supplied by competition:**
    a. Flight arena
    b. Field elements
    c. Team identification materials

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Scope of the Competition

The competition consists of knowledge-based and skill-based assessments designed for the high school level.

Competitors will be evaluated in the following areas:

- FAA Knowledge
- Manual Flight Opereations
- Flight Knowledge and Operational Decision-Making
- Autonomous Flight and Data Collection
- Professionalism

Competition Tasks & Scoring (1,000 points total)

TASK 1 – Flight Operations & Crew Communication (270 points)
Teams demonstrate safe, controlled flight while communicating effectively as a flight crew.
Includes:

- Manual flight control
- Visual observer coordination
- Aviation phraseology
- Camera and system setup
- FAA operational compliance
- Scenario-based missions:
    - Environmental mapping and object search
    - Object acquisition and relocation
    - Detection avoidance
- Operational workflow:
    - Pre-flight planning
    - Pre-flight briefing
    - Launch
    - Flight execution
    - Recovery
    - Post-flight debrief

TASK 2 – Flight Knowledge & sUAS Systems Understanding (Hybrid) (250 points)
This task evaluates both individual student knowledge and team-based decision-making using scenario-based assessment methods appropriate for high school students.
This task does NOT require physical disassembly, repair, or modification of a drone.

Time Limit

- Task 2 is designed to be completed in approximately 15 minutes per team.

Part A – Individual Knowledge Assessment (150 points total)

- Each competitor is assessed individually
- 75 points per student
- Camera and system setup
- FAA operational compliance

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- Scenario-based missions:
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- Operational workflow:
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- Assessment may include:
  - Oral questions
  - Written responses
  - Diagrams or images
  - Short scenario prompts
- Topics include:
  - FAA regulations and airspace fundamentals
  - Weather interpretation and operational risk
  - Emergency procedures
  - Core sUAS system concepts (motors, batteries, sensors, flight controller basics)

Part B – Team-Based Scenario Assessment (100 points total)

- Team evaluated together
- Single industry-style operational scenario

Teams must:

- Identify operational issues
- Recommend safe corrective actions
- Explain decision-making logic
- Demonstrate effective crew communication

TASK 3 – FAA Knowledge Test (250 points)

- Individual written knowledge assessment
- **125 points per competitor**
- FAA-style questions covering:
  - Regulations
  - Airspace
  - Weather
  - Operations and safety

TASK 4 – Autonomous Flight & Mission Planning (225 points)

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Teams demonstrate their ability to plan and execute an autonomous mission.
Includes:

- Mission and waypoint planning
- Explanation of flight logic and decisions
- Autonomous flight execution
- Data collection accuracy
- Data delivery and explanation

TASK 5 – Professional Development Assessment (25 points)

- Evaluates:
    - Employability skills
    - Professional conduct
    - Workplace readiness

PENALTIES

- Improper competition clothing: **–10 points**
- Resume non-compliance: **–10 points**

SAFETY & TECHNICAL GUIDELINES

- Drones must be safely designed and enclosed
- Eye protection required at all times in flight areas
- Unsafe operation may result in point deductions or disqualification
- Drones heavier than 3.5 lbs require special approval
- No flight outside the competition area is permitted

TIE-BREAKERS

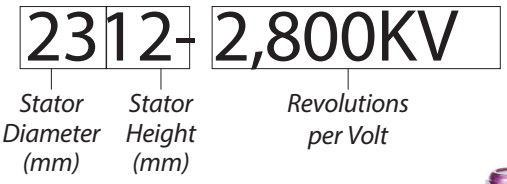
1. Flight Operations & Crew Communication
2. Autonomous Mission Planning & Execution

Technical and Safety Guidelines

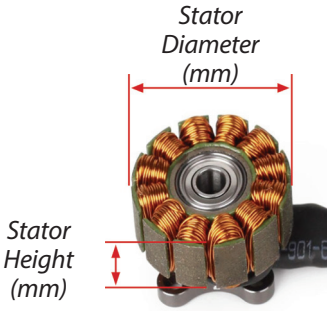
Airframe: There are no limitations regarding the design of the sUAS airframe; small, medium, large sizes as well as different shapes and configurations are all welcome. Please refer to page 11 for dimensions of the field elements to ensure your drone can maneuver through the course. Drones heavier than 3.5 pounds are not permitted in the competition unless special permission is granted.

Number of Rotors: There are no limitations to the number of rotors that may be employed on the sUAS airframe.

Maximum Motor Power: Any brand motor is welcome to be used so long as it has a can size no greater than 2312 (size of magnetic stator in millimeters) and power of 2,800 kV (1,000 rpm per volt). Both can size and power should be etched on the outside of the motor housing. If it is not listed on the motor, please bring the motor manufacturer's specifications with you to the competition; these are typically found on the manufacturer's website. See the following diagrams for more information.



The combination of the motor's stator *diameter* and *height* determine its maximum torque value. The motor should be labeled with this information as in the image to the left.



Propeller Safety: Fingers, face, hair, clothing, and other bodily objects must be kept away from the propellers at all times. Safety glasses must be worn any time a propeller is in operation.

Safety Guards: Each rotor, no matter how many have been employed, must be protected and enshrouded by a safety guard that is capable of keeping the outside edge of the propeller from making contact with anything while in operation.

Safety Glasses and Harmful Objects: Safety glasses must always be worn inside and around the field of play. No sharp objects or drone appendages that could potentially cause harm or damage to a person, objects, or playing field are allowed.

Drone and Controller Device: The drone must be capable of taking photographs and the contestant must be able to immediately show the judges the photos at the completion of their task on a display screen. No post-processing of images is allowed. Additionally, the pilot is the contestant who must take the photos.

Connectivity: Controllers that utilize Wi-Fi might experience interference issues within Wi-Fi-dense environments, such as large convention centers. Contestants should be aware that Wi-Fi controllers may work fine in some settings and not in others. It is the responsibility of the contestants to be prepared in situations where Wi-Fi interference occurs. The host facilitators will not be providing alternate drones for contestants.

FPV Equipment: If a contestant utilizes FPV equipment, it must be commercially produced and must be FCC certified without need for a ham radio license.

Minor Violations: The contest judges will assign minor violations if an infraction occurs. They may assign additional violations, which have not been listed, per their discretion, related to sportsmanship, integrity, respect, safety, and so on. A first minor violation is a written warning, a second minor violation is a 50-point deduction, and a third minor violation is team disqualification.

Major Violations: If any major violation occurs, putting oneself or others' safety at risk, the contest judges also have the authority to disqualify a team for that infraction. NEVER OPERATE sUAS OUTSIDE OF THE EVENT CENTER OR COMPETITION COURSE AS DOING SO WILL RESULT IN IMMEDIATE TEAM DISQUALIFICATION.

Videos

Video explanations for this competition can be found here: http://my.crossflightskysolutions.com/2026skillsusa/

Competition Overview
LMS Directions
Competition Safety Video
Task 1 Description
Task 2 Description
Task 3 Description
Task 4 Description

National Competition: As a reminder, this Guidebook is focused on the National Competition. Each individual state may choose to adjust the event as they desire. The Competition Committee has outlined numerous safety specifications in the Guidebook, with hopes the states will ensure the same level of student safety.

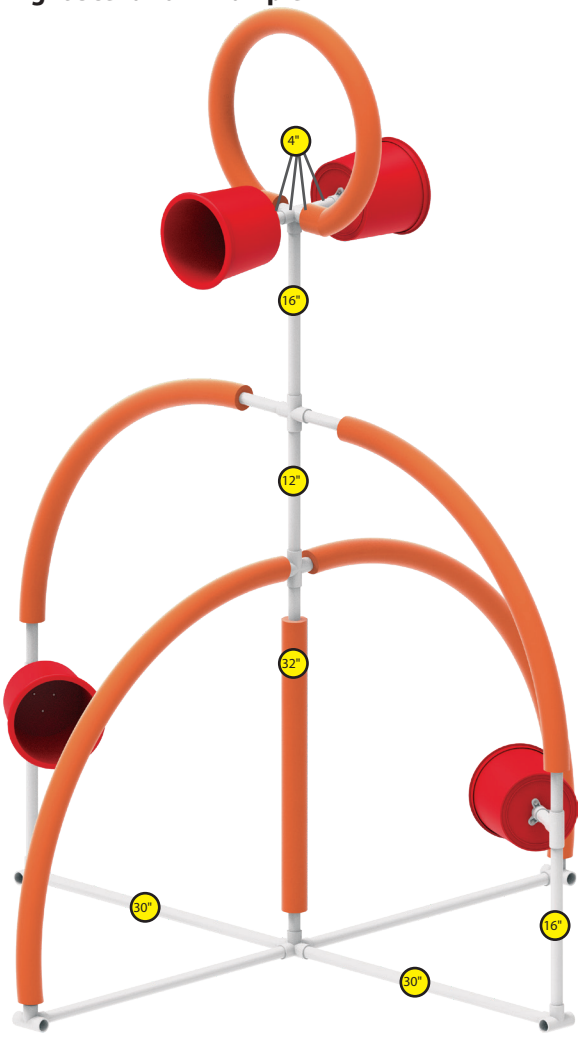
Learning Management System (LMS)

As a part of the Commercial sUAS (Drone) Competition, certain tasks can be scored through an online learning management system (LMS). Access to the LMS can be available for all states that are planning a competition. Included in the LMS will be:

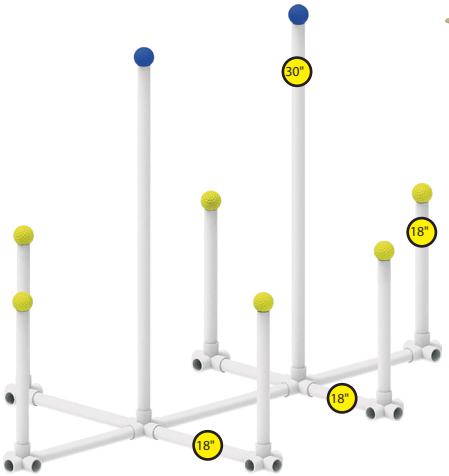
- Directions for use, portals for submissions, and assessments for all tasks being evaluated.
- Early access to information about requirements that may be shared with participants and schools (including video tutorials).
- Access for competition facilitator for scoring and viewing of submitted requirements.

Field Element Examples

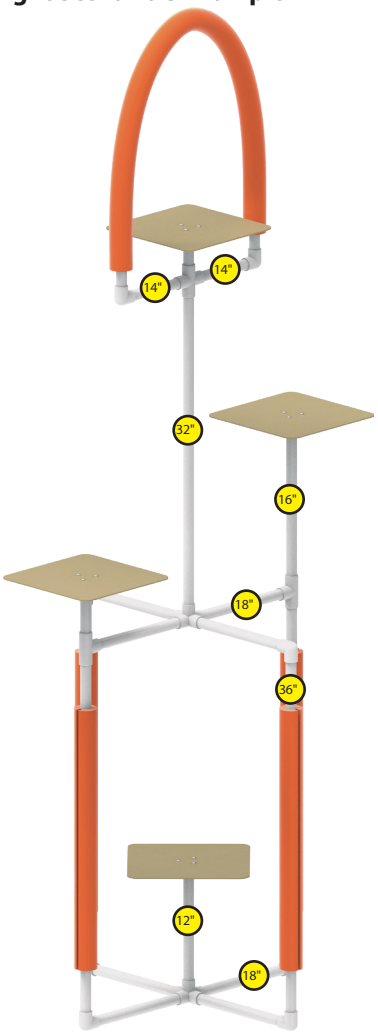
Flight Scenario 1 Example



Flight Scenario 2 Example



Flight Scenario 3 Example



Links to SkillsUSA Components

Drone (Pitsco): https://www.pitsco.com/DJI-Mini-3-Pro-Drone

Drone (MINDS-i): https://mindsieducation.com/collections/competition-gear

Field Elements: https://www.pitsco.com/Drone-Industry-Field-Elements-Kit

Arenas: https://www.pitsco.com/Drone-Arena-10-x-20 and https://www.pitsco.com/Drone-Arena-20-x-20

FAA Testing Supplemental: https://www.pitsco.com/FAA-Testing-Supplemental