



## Commercial sUAS Drone

# Career Competition

**Career Cluster:** Transportation, Distribution and Logistics

**State Qualifying Event:** No

**National Contest:** Yes

**Participation:** Team of 2

### Competition Description

To evaluate team members' skills and preparation for employment in multiple career fields related to the safe and efficient use of drone technology in the National Airspace System and to recognize outstanding performance by participants in real-world, scenario-based situations.

### Tasks To Be Evaluated

- **Task 1:** Flight Skills Student teams will need to be able to prove competency in the ability to operate sUAS in a safe and effective manner as a flight team and document appropriately. The teams will be given three scenarios and asked to plan, fly, collect data, communicate, and document based on industry generated scenarios. Students should have a good understanding of how an sUAS operates and flies as well as all regulations and safety protocol and procedures. Students will be required to prove their skill and competency while flying on a live video feed, and designated school officials will be responsible for safety, protocols, and liability for all flights. Flights will be conducted indoors and inside of a safe drone arena.
- **Task 2:** sUAS Maintenance Troubleshooting and Repair Teams will be given virtual scenarios and asked to solve industry-based problems and prove competency in the ability to troubleshoot and recommend corrective repairs common to sUAS. Students will need a detailed understanding of the mechanics of how drones operate, including the functionality of key components such as sensors, controls, and other technologies. All portions of this task will be given in a virtual format including multiple-choice questions, real world scenarios, schematics, CAD renderings, and possible explanations required.
- **Task 3:** FAA Knowledge Test: see details in knowledge performance section of the Technical Standards.
- **Task 4:** Autonomous Flight Students will be provided a mission scenario and will need to plan and explain all aspects of the flight as well as provide documentation showing calculations and decision-

### Provided by Competitor

- Fully assembled, tested, and operational drone with onboard camera
- Eye protection (always required in the competition area)
- Computer and video equipment
- 6' multiple outlet surge protector
- All competitors must create a one-page resume.

### Provided by Technical Committee

- Arena
- Field elements
- Judges' sheets
- Team identifier stickers



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making strategies. Teams may use software of their choice but will need to be able to share results appropriately (for example, DroneDeploy, Pix4D, Litchi, or many others). Evaluation criteria will include but are not limited to effectiveness of mission accomplishment, flight plan efficiency, utilization of available power, cargo weight compensation, data-sharing capability, effective communication, and so on. This competition will be delivered and accepted through a full virtual platform, but pictures/scans of documents will be provided as well as other file uploads.

### **Clothing Requirement**

#### **National Requirement:**

**Class E:** Competition Specific: Business Casual Attire

- Official SkillsUSA white polo shirt
- Black dress slacks or black dress skirt (knee-length minimum)
- Black, closed-toe dress shoes.

#### **State Requirement:**

National Requirement OR

- White polo shirt or button-down dress shirt (other colored polo/dress shirt will be subject to deductions)
- Black dress slacks or black dress skirt (knee-length minimum)
- Black, closed-toe dress shoes.
- Any embroidered names or school patches must be covered, if applicable.



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### **Additional Information**

**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. 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. The information is typically found on the manufacturer's website.

**Propeller Specifications:** Propellers with a maximum length of 5 inches with a blunt edge are allowed in the sUAS competition. Fingers, face, hair, clothing, and other bodily objects must be always kept away from the propellers. 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.

**Containment Arena:** If the host location does not utilize a containment arena, then no additional students should be permitted in the competition area during flight. All adults in the area must always wear safety glasses.

**Minor Violations:** The competition judges will assign minor violations as specified if an infraction occurs. They may assign additional violations, which have not been listed, per their discretion, related to sportsmanship, integrity, respect, safety, etc. A first minor violation is a Commercial sUAS Drone, 2022-23 • 5 written warning, a second minor violation is a 50-point deduction, and a third minor violation may result in a team disqualification.

**Major Violations:** The competition judges also have the authority and discretion to disqualify a team for any single major violation that relates to putting others' safety at risk. Never operate sUAS outside of the event center or competition course as doing so will result in immediate team disqualification. [LINKS TO SKILLSUSA COMPONENT](#)