

Carnival Games- 2023 Drone Challenge (UAV)

Overview

The mission of your team is to design, build, assemble, document, and test fly an open source Unmanned Aerial Vehicle drone that can complete maneuvering and dropping tasks of varying difficulty in a course designed to test the handling, maneuverability, hardware capabilities, and piloting of your drone.

The event will consist of a pre-inspection and check-in of the team members, drone, and all equipment associated (controllers, flight goggles, etc.) at the time and location provided in the conference program. All event materials will be sequestered in a specified area.

THE UAV DRONE CHALLENGE COMPETITORS ARE TO ENGINEER AND BUILD AN OPEN SOURCE UAV Drone.

Different drones may have different capabilities, but to complete all tasks required of the event, the UAV DRONE should be able to pick up and drop a small <10g bean bag and plastic ring onto or within 4 inches of specially marked drop target that it finds hidden on the competition field. Drones may be designed to use claws, hooks, or magnets for the dropping device.

The Flight Mission:

- Mission Time: 6 minutes. (Entering the tent, mission time, and exiting the tent – 10 minutes)
- There will be 6 payloads for the drone to deliver. 3 bean bag and 3 rings.
- Drones must take only one payload at a time.
- There will be 3 paths for the pilot to choose from – The ladders, the reverse hurdles, and the tunnel. Competitors can choose the path for each payload. Competitors must complete each of the obstacles in the path they choose to receive credit for completion and drop. Described in more detail below.
- Pilot will fly UAV Drone via FPV or visual flight methods. Secondary Pilot may use FPV (goggles, video screen, phone, etc.) to identify targets and complete payload load and drop operations.
- Start from the launch station (pilot area), collect payload and then choose path to the targets. Payloads will be organized by the team; no outside devices can be used to hold/stand payloads.
- Spotters should communicate the UAV Drone location and any targets.
- Judging team will tally up the successful drops and lands onto specified targets during the 6-minute window.

Overview/Procedures

- All Projects, materials, and supplies must be brought with the team to the sign up and will be sequestered by the event staff. The team will arrive at the assigned time, retrieve their materials and supplies, and transition to the pit area. Once in the pit area, the team will have 10 minutes to setup and 30 minutes to test and correct any problems. A safety inspection will take place in the pit area.
- Pit Area Assignment. The Event Coordinator will provide a designated area for UAV Drone Teams to work on and prepare their UAV Drone for flight.
- When UAV Drone is out of the competition tent area, all propellers must be removed. **NO EXCEPTIONS.** Violation of this will result in an automatic disqualification.
- Once a bean bag/ring has been dropped, then the drone must return to the start point to load another bean bag/ring.
- Once a payload is dropped in the competition area, the payload will remain there until the competition time has expired or ended due to successful completion of all course targets.
- Pilots must take their drone through a chosen obstacle before the drop will count.
- Points will be score based on the accuracy of the drop to the target and on the course that the pilots choose to take their drone to get to the target.
- If the drone is not carrying a payload, then the path points do not count.
- Fly back to start zones between drops to pick-up new payload; dropped payload (beanbags/rings) within the competition arena may not be retrieved by the drone during competition.
- Time is taken, in the case of a tie in points the faster time will advance.

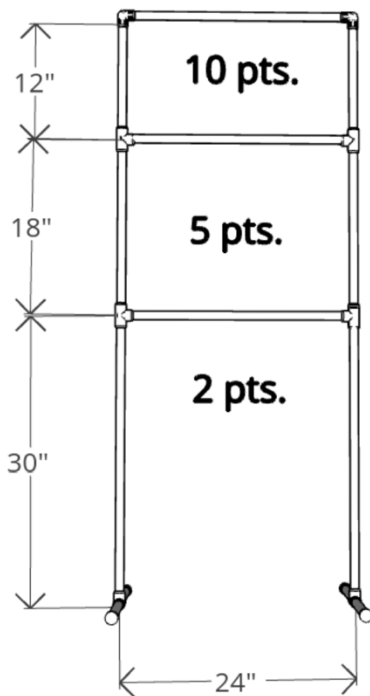
Regulations

- Following all safety guidelines and precautions of this competition is the most important regulation. Violation of the safety guidelines can result in a warning or removal from the competition depending on the severity.
- When a team enters the competition tent field, the team members attach the battery cable and turn on their UAV Drove and become ready to fly only at the discretion of the Event Coordinator.
- When a UAV Drone is outside of the competition tent area, all batteries must be unplugged from the UAV Drone stack, which should consist of the flight controller receiver and the Electronic Speed Controller (ESE). **NO EXCEPTIONS.**
- When the competition and practice sessions are taking place and a UAV Drone is in the competition field area flying, all UAV Drones in the pit area or outside the pit area must be **POWERED OFF.**
- All UAV Drones must fly **ONLY** within the competition field.
- Violations of any of the above regulations will result in disqualification.

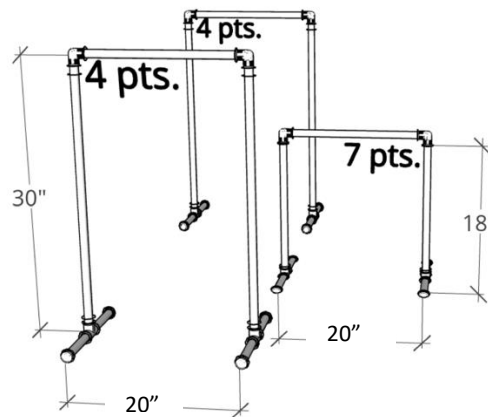
Course Obstacles/Payloads/Targets:

- Payloads will be similar to the one found [here](#)
- Targets for the rings will be a cone. Five (5) pts for each successful drop.
- Target for the beanbags will be 4-quart [wooden fruit basket bowl](#). Four (4) pts for each successful drop.
- Course obstacles and locations will be determined at the conference. A time for an open viewing of the course will be provided during the check-in/sign-up. The open viewing will allow the team time for planning.

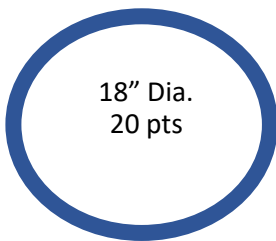
Path 1 – The ladders – made of ½” PVC Pipe and measurements are the opening size. The course will have two (2) ladders. Participants will choose one area per ladder on the course.



Path 2 – The reverse hurdles – made of ½” PVC Pipe and measurements are the opening size. The course will contain two (2) 30” hurdles and one (1) 18” hurdle. Participants will fly thru each of the obstacles in the course.



Path 3 – Tunnel – 18” x 68” [Similar to this one](#) can be formed to a shape or strait.



TESTING OF DRONE

Team Number			Time		
Payload item	Path Taken	Points Acquired	Payload Drop Successful	Payload Drop Points	Run Total Points
1 Bean Bag or Ring	1 2 3		Yes or No		
2 Bean Bag or Ring	1 2 3		Yes or No		
3 Bean Bag or Ring	1 2 3		Yes or No		
4 Bean Bag or Ring	1 2 3		Yes or No		
5 Bean Bag or Ring	1 2 3		Yes or No		
6 Bean Bag or Ring	1 2 3		Yes or No		
Final Total Points					