

# STEAM DRONE CODING FOR AUTONOMOUS FLIGHT CHALLENGE

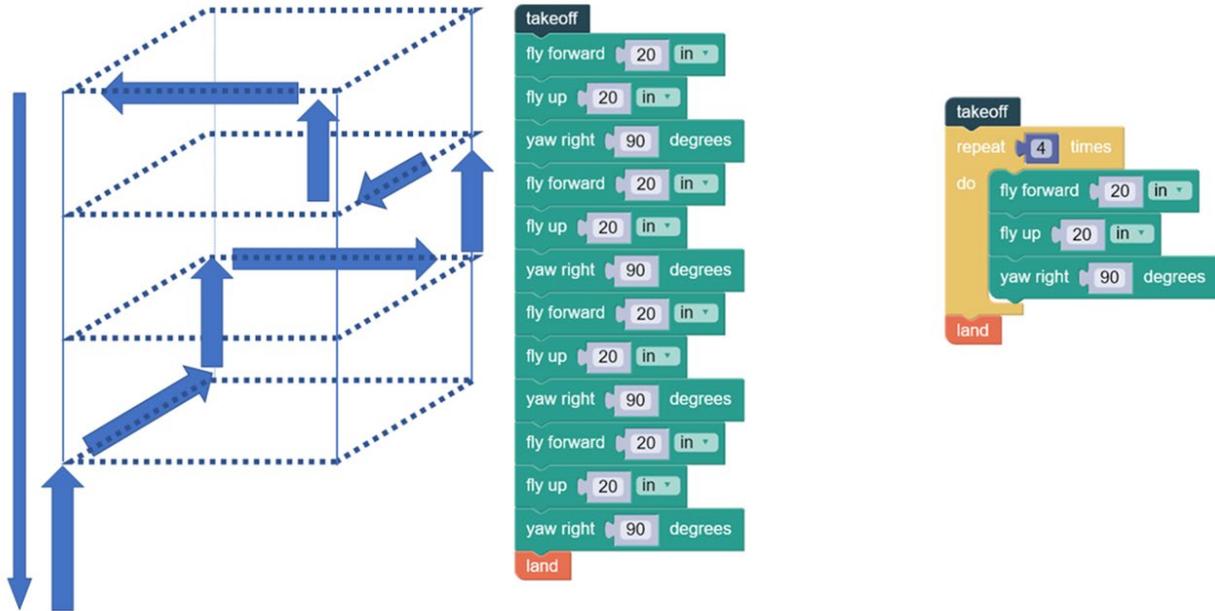
## RULES & GUIDELINES

*will likely vary somewhat as per local host*

The **Drone STEAM Challenge Series** announces its call for entries for the *Drone Coding for Autonomous Flight Challenge*.

- 1: Eligibility: The competition is open to individuals or groups of professionals, amateurs, residents, students, and visitors, as per specific guidelines and constraints of contest host (*e.g., students only*)
- 2: Fees: See the submission guidelines provided for each individual contest.
- 3: Purpose: To evaluate coding team's ability to quickly, safely, and flexibly accomplish pre-programmed flight missions for the efficient use of drone technology in the National Airspace System and to recognize outstanding performance by participants in real-world, scenario-based situations.
- 4: Before the Competition: About two weeks prior to competition, registered flight mission teams will receive details of the upcoming challenge. Most of the details will be provided, but flight mission teams will need to be able to adapt their flight codes for autonomous flight on site.  
  
It is fully expected that flight mission teams will have carefully calibrated their own drone's performance under autonomous flight. For example, if a drone command is given to pitch and fly 20-inches forward, the flight mission team will need to know precisely how far forward their drone will go before it stops, so that they can adjust their coding to be as precise in their flight pathway as possible. This goes for throttling, rolling, and pitching as well.
- 5: Coding Format: Flight mission teams may code in whatever form they wish, *DroneBlocks*, *Python*, *Scratch*, *R*, whatever. *We kindly recommend that novice teams consider starting with DroneBlocks for the Tello Drone on a tablet or cell phone (<https://amzn.to/2XvOCTX> and <https://linktr.ee/DroneBlocks>) until they gain considerable expertise, flexibility, and facility, regardless of age and coding experience.*
- 6: At the Competition: Flight Teams will have 25-minutes to complete their assigned flight mission. They may make as many attempts as time allows. They will be judged on the precision in which they complete the tasks, staying within tolerances (for example, how far off flight path they are). *Any ties will be broken based on the total flight time from take-off to landing or precision in landing exactly on the final target, dependent on the local host event official.*

7: Example Task: Starting from a table 36" above the ground, take off, fly forward, then fly down and under the table, and back to land in precisely the same spot, but this time on a stack of books that has been placed there during flight, of previously unknown height, making a loop, in the shortest amount of time possible without colliding with the table or the floor.



8: Another Example Task:

*Phase One:* Take off, fly through a 2.5 ft square opening 2.5 feet off the ground five feet from the launch pad;

*Phase Two:* Turn left and fly behind a curtain obscuring the flight path to fly through an unseen 2.5 ft square opening four feet away and with a center of 4.5 feet off the ground;

*Phase Three:* Follow a bent pipeline straight for 36", then veer 45° to the right, and follow the pipeline for another 36" at an altitude of 4.5 feet;

*Phase Four:* Turn another 45° to the right and move to a lower altitude to fly beneath a 3 ft tall bridge located Value A feet away (Value A is a precise distance between 20" and 50" and not revealed until flight mission teams arrive at their appointed time for competition, necessitating a change in coding).

*Phase Five:* Return and land as close as possible to the center of the designated landing pad.

Score is based on best time in flight, adherence to constraints, and accuracy of precisely landing on target.