

2027 Drone Racer



Texas TSA Power and Electric has developed NEW smart electrical meters for the city! These smart meters can be read wirelessly by a drone and then transmitted back to headquarters to determine usage amounts. We need your drone teams to collect this data from across our city and transmit it back to Texas TSA Power and Electric's headquarters as quickly as possible!

Rules

- Each team will build their drone either from individual parts or a kit. **Ready to fly drones purchased will not be accepted.**
- Teams must consist of a minimum of two (2) student members with a maximum of three (3) student members.
- Time begins when the drone leaves the starting position. Time ends after the pilot has successfully landed on each smart meter's landing pad, navigated through each communication gate, and landing at the ending position.
- Teams must maneuver their drone to a landing pad to collect smart meter data, then fly through a race gate to submit data back to headquarters. Each landing pad and race gate may only be used once to collect points. The order and path taken can be determined by each team.
- One team member other than the pilot will be designated to enter the enclosure to return a downed drone to the take-off position. The judge will give permission when it is safe to enter the enclosure. The drone is not allowed to restart props until the team member is completely out of the closure and the judge has given the all clear to resume. The timer will continue to run during this time, the clock will not be stopped.
- The judges may disqualify any team for any safety infraction.
- All radios/controllers must be impounded, except when contestants are flying, until all flights are over. Failure to return your radio/controller to the impound area will mean disqualification from the contest.
- Any team flying their drone outside of the drone enclosure will be immediately disqualified. This includes any location inside or outside of the Fort Worth Convention Center during the dates of the Texas TSA State Competition.
- Missed race gates or landing pads will result in a time penalty.

Specifications

Length	12 inches x 12 inches maximum
Height	6 inches maximum
Weight	250 grams maximum with battery
Battery Size	2s maximum
Propeller Size	3 1/2" maximum
Number of Rotors	4

- Must not receive or use GPS
- Must not have any object avoidance systems
- Drone must be controlled via handheld remote (no cell phones) and pilot may use FPV goggles but not required.

Safety Requirements

- All drones must have propeller guards/shrouds that at a minimum enclose all propeller arcs on the outside of the drone.
- The Coordinator may call for an Emergency Stop at any time if they determine that a drone is unsafe due to unsafe equipment or unsafe piloting.
- All team members must wear OSHA approved (Z87.1) clear safety glasses at all times.
- All team members must wear OSHA approved hard hats at all times inside the drone marked safety zone around the perimeter of the drone enclosure. Texas TSA will not supply hard hats. Teams without hard hats will not be allowed to fly.
- All team members must have a signed Texas TSA Liability Release form physically with them at the Drone Contest. Not having the Texas TSA Liability Release form disqualifies that member from competing as part of the Team during the Drone Contest.

Drone Racer

- Each team and their drone will be inspected prior to flight to ensure compliance with all safety rules.
- All drone controllers must be powered off and turned in to the Drone Contest Director at the beginning of the contest. No other drones will be allowed to be turned on during the Contest to ensure that there is no interference between the current pilot and the current drone.
- There will not be any opportunity for practice flights prior to the beginning of the Drone Contest. Drones are not allowed to be powered on in any area of the Fort Worth Convention Center during the Texas TSA State Conference.
- All team members must remain in the designated areas at all times during the flight.
- The Pilot must be in the Pilot Box at all times during that team's flight. Additional team members must remain in Team Box areas at the back corners of the Designated Contest Area.
- Teams waiting to compete will be instructed where to wait by the Drone Contest Director at the beginning of the contest.
- All control of the UAV must be through direct inputs to the controller by the pilot, without any autopilot, flight, or navigational aids, with the exception of auto takeoff and landing functions.
- Teams using a UAV that does not conform to these rules will not be permitted to use it at the competition.
- Each team must use their own drone for the competition.

Documentation

The competitor will provide an Engineering Portfolio that will be submitted in a three brad clear front portfolio cover (No binders allowed. [Example portfolio](#)). The Event Coordinator will provide each team a sticker for their portfolio, drone and controller. The teams will place the stickers on the outside of the folder at the top right corner of the front cover. The Engineering Portfolio must include:

- Cover page with Student ID#, Category #, Category Name and a 3"x5" picture of the Drone
- Table of Contents
- Research for the design concept
- Detailed design drawings to scale, no larger than 11" X 17", of all parts, sub-assemblies or final car with appropriate dimensions
- Student explanation of their design
- Pictures documenting the build process (2 pages maximum)
- Professionally Cited Sources for Research

Judging

- 25% Appearance: Quality of craftsmanship and appearance
- 25% Engineering Portfolio: Completeness and detail level of the required elements
- 50% Race Results: Points will be awarded based upon race times

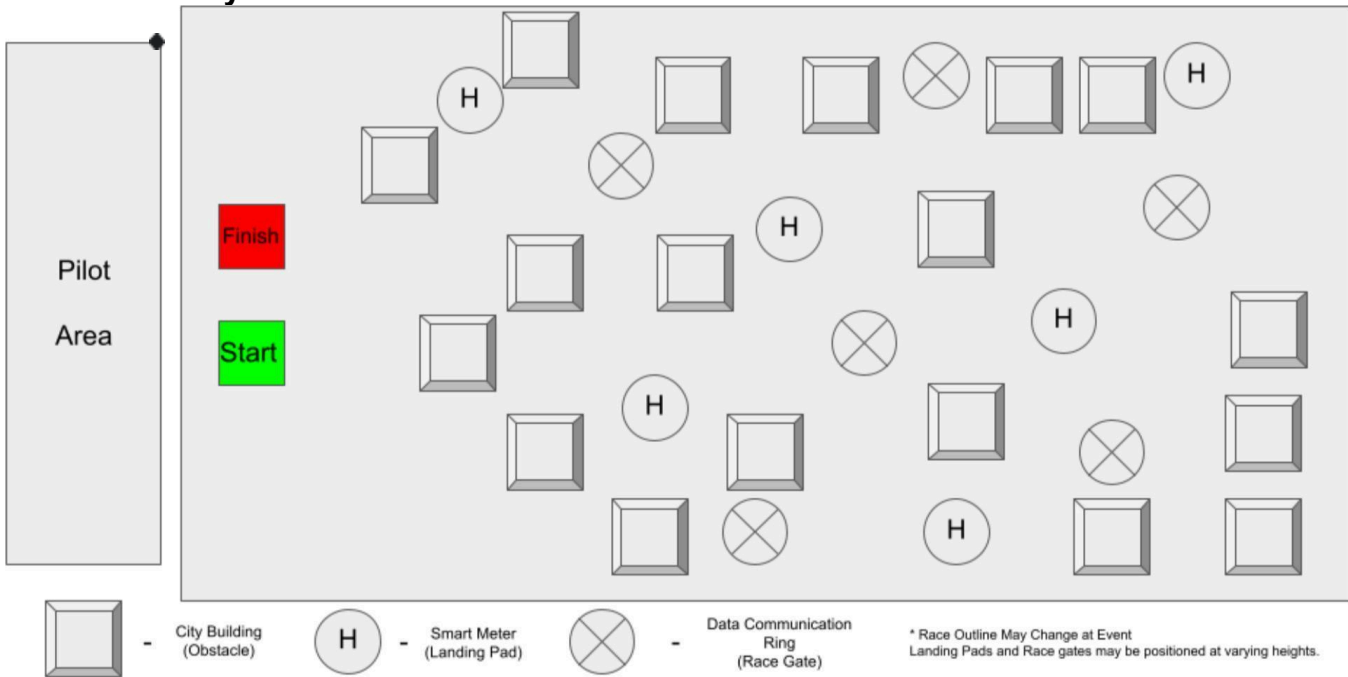
Each Racer will be judged based on the rubric for this event. For race results, 1st place will receive 10 points, 2nd place will receive 9 points, 3rd place will receive 8 points. Points continue decreasing by one point per place through 10th place. In case of a tie, the Racer with the highest engineering portfolio score will place higher.

Example Kits (not limited to these kits):

<https://www.pitsco.com/products/drone-maker-kit>

https://www.amazon.com/dp/B0C1YYCK2P?ref_=cm_sw_r_cp_ud_dp_YB3EVDYQA4XY8NM1WZIX

2027
Drone Racer
Field Layout



Race Gate Dimensions:
Inner diameter: 14.5 in (37cm)
Outer diameter: 23.6 in (60cm)

<https://newbeedrone.com/collections/racing-flying-accessories/products/balloon-gate>



Dia.: 21.65inch
Double-Side Printed: Blue / Orange

Landing Pad Dimensions:
Diameter: 21.65 in (55cm)
<https://www.amazon.com/dp/B07N1CQJ33/>

Race Gate Link: <https://newbeedrone.com/collections/racing-flying-accessories/products/balloon-gate>

Landing Pad Link: <https://a.co/d/0b58hu8X>