

2018 TEXAS TSA DRONE COMPETITION

		Classification #	
		Middle School	High School
Drone Competition	3	MU125	HU125

Contest Concept: Ol' TEX is on a hike out in Big Bend National Park. Something bit him or scratched him and he is having a severe allergic reaction. Your team's objective is to fly an Emergency Epinephrine Injector out to him using a drone. Your team must determine a way that you can remotely drop the "Injector". This includes a way to attach the "Injector" to your drone and drop it to Ol' TEX. Your drone will be flying through some narrow canyons and crevices of varying altitudes in order to reach Ol' TEX. And he is down in a narrow arroyo that requires the drone to drop the "Injector" from an altitude of 6 feet or higher. Good luck! Ol' TEX is depending on you!

CONTESTANT & SAFETY REQUIREMENTS:

- S1: ALL drones must have propeller guards/shrouds that at a minimum enclose ALL propeller arcs on the outside of the drone.**
- S2: The Drone Contest Director may call for an Emergency Stop at ANY TIME if they determine that a drone is unsafe due to unsafe equipment or due to unsafe piloting.**
- S3: Teams must consist of a minimum of two (2) student members with a maximum of three (3) student members.**
- S4: ALL team members MUST wear OSHA approved (Z87.1) CLEAR safety glasses at all times.**
- S5: ALL team members MUST wear OSHA approved hard hats at all time during the contest. Texas TSA will NOT supply hard hats. Teams without hard hats will not be allowed to fly.**
- S6: 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.**
- S7: Each team and their drone will be inspected prior to flight to insure compliance with all safety rules.**
- S8: ALL drone controllers MUST be powered off and turned in to the Contest Director at the beginning of the contest. No other drones will be allowed to be turned on during the Contest to insure that there is no interference between the current pilot and the current drone.**
- S9: There will NOT be any opportunity for practice flights prior to the beginning of the Drone Contest.**
- S10: 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. In the event that the drone crashes or is instructed to land, team members may NOT leave the Team Boxes until told to do so by the Contest Director.**
- S11: Teams waiting to compete will be instructed where to wait by the Drone Contest Director at the beginning of the contest.**

Team Scores and therefore **Final Placing** will be determined by a combination of two things: **FLIGHT TIME** and **DROP ACCURACY**.

Flight Time - You must fly your drone through the canyons and arroyo of "The Course"

1a: The Course consists of a pathway of 10 "windows" that the drone must transit while in route to the "target".

1b: "**The Course**" consists of a pathway of **10 "windows"** that the drone must transit while in route to the "**Target**".

1c: Each team's **Flight Time** will begin at lift-off of the drone and ends when the "Injector" hits the target on the floor.

1d: The "Windows" would be made of 1.5" PVC pipe and measure 60" (5 feet) square.

1e: There would be 3 different heights of window as measured from the floor to the bottom of the window: a) 6" from floor, b) 36" from floor, and c) 72" from floor.

1f: If a drone flies outside of the designated contest area, the pilot **MUST** land the drone immediately in a safe area. In this event, that flight is over. The team will be allowed one additional flight opportunity to complete the "The Course". The Designated Contest Area will be clearly marked and will be shown to all team members prior to the beginning of their first flight.

1g: Drones must maintain a safe distance/altitude from the ceiling of the venue in order to avoid damage to the Convention Center. This distance will be 20 feet maximum above the floor of the Convention Center and may be lower depending upon venue.

1h: In the event that the "Injector" is dropped prior to flying through the 10th window, that flight is over. The team will be allowed one additional flight opportunity to complete the "The Course". If the "Injector" is dropped after flying through the 10th window but outside of the Drop Zone, the team will receive a ZERO for their Drop Accuracy score.

1i: All Flight Times will be placed in rank beginning with the shortest Flight Time and going in increasing order to the longest Flight time. The shortest Flight Time will be given a numerical score corresponding with the number of Drone Contestants – ie: If there are 16 Drone Contest entries, the shortest Flight Time will be given a numerical score of 16, the 2nd shortest flight time will be given a numerical score of 15, the 3rd shortest flight time will get a score of 14 and so on and so on.

1j: Failure to transit/fly through any window will result in a time penalty of 10 seconds being added to a contestant's contest time.

1k: Failure to transit/missing 3 or more windows will result in an automatic disqualification of that flight.

1l: In the event that the drone drops the "Injector" from lower than 6 feet, there will be a penalty of 10 seconds added to that team's Flight Time.

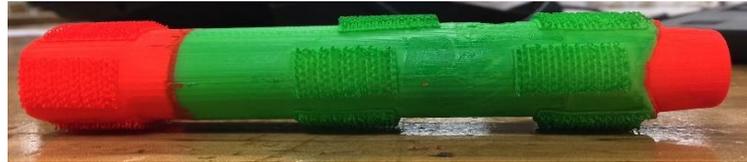
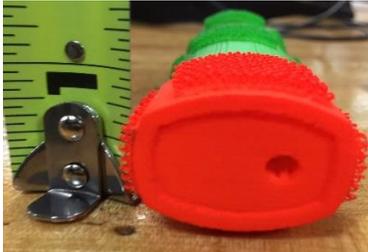
1m: At any time, the Drone Contest Director may call for an emergency stop. In this event, the Drone Pilot **MUST** immediately stop their drone and safely land at the closest safe location.

1n: In the event of a tie, the teams that tie will both receive the score of the appropriate highest non-used placing and the score placing below that will be eliminated – ie: If the 4th place shortest flight time out of 16 entries is a tie between two teams, both teams will receive a placing score of 13 points. No score of 12 points will be awarded for a 5th place time. The next awarded time will be 11 points for 6th place flight time.

DROP ACCURACY - The objective is to drop the "Injector" as close to Ol' TEX as possible. The farther that Ol' TEX has to move to the Injector, the worse a contestant's score is on this segment of the contest.

2a: The "Injector" must be dropped from a height of 6 feet. A horizontal square of 1.5" PVC pipe that is 5 feet 6 inches by 5 feet 6 inches (5' 6" x 5' 6") that stand 6 feet tall will mark the top of the drop zone.

2b: The "Injector" is a 3D printed model. It is printed in 3 parts and those parts are glued together with cyanoacrylate glue (SuperGlue).

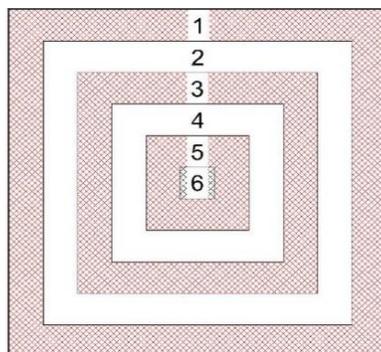


Note: The "Injector" measures 6 inches long, 1 1/16 inches thick/tall and 1 3/8 inches wide. Competitors must devise a method to carry and release the "injector". Weight = 45g to 55g

2c: The "Injector" will have the 4 long axis sides covered with the "hooks" of a hook & loop system (Velcro). The surface of the Target will be covered with the "loops" of a hook & loop system (Velcro). This will help minimize bouncing of the "Injector" when it impacts the Target.

2d: The "Injector" will be provided by the Contest Director. No other "Injector" will be allowed. **For reference purposes, the "Injector" will weigh between 45 grams and 55 grams.**

2e: The Drop Zone Target would consist of a square measuring 5 feet 6 inches (5' 6" x 5' 6") with concentric squares within it at 6" intervals. The center square or "bulls eye" would award a contestant 6 points. Each square outward would be awarded one less value. See the diagram below:



2f: touched/covered by the payload – ie: If a drop results in the "Injector" coming to rest with most of it in the "5 point" area but a small portion is resting in the "4 point" area – the contestant will receive 4 points. If the payload sticks over from one square to another, the points earned are for the lowest valued square.

2g: The points are awarded for where the payload stops/comes to rest – NOT where it hits when dropped from the drone.

FINAL SCORING/PLACING: The two point scores for each team are combined to give a FINAL SCORE. The team with the highest score wins. Teams will be ranked according to FINAL SCORE descending from highest to lowest. This ranking will determine 1st Place, 2nd Place, etc.

In the event of a tie, the team with the best Flight Time wins. If still tied, the team with the best Drop Accuracy wins. For First Place ONLY – If still tied, there will be a head to head fly-off competition to determine the winner. Both Flight Time and Drop Accuracy will again be used to determine the winner.