



2017-2018
STEM-Based Team Drone Challenge

Presented by



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Welcome to the CNY Drones 1st Annual STEM'D Challenge: Rig Rescue!

We are pleased that so many great volunteers and organizations have come together to make this new and exciting STEM program using drones a reality! Please join us as we continue to grow interactive experience-based STEM learning in Central New York through our year-round support system and a great drone community!

CNY Drones Overview

CNY Drones is a hub for Central New York's recreational drone community volunteers, promoting STEM education and safety awareness.

CNY Drones Commitment to STEM & Safety

- *providing an information support hub connecting students, enthusiasts, engineers, educators and companies in our community*
- *STEM mentorship and promotion via an annual student challenge, drone clinics, workshops, interactive demonstrations, and races*
- *continued promotion of safe practices within the local recreational drone community*
- *growing interest in STEM through sponsor supported drone kit donations to local groups in need*

CNY Drones' mission is to promote involvement in STEM through the development and promotion of opportunities for students and adults to learn, compete, and create solutions to real world situations using drones while providing mentorship connections via an information hub linking students, engineers, hobbyists, educators, technology-driven organizations and the public.

Event Volunteers

CNY Drones welcomes volunteers of all backgrounds and experience levels and actively solicits volunteers from local organizations. Volunteers are needed year-round to help support the ongoing relationship between students and local engineers as well as our annual competition. Volunteers are expected to act in accordance with competition rules and guidelines and agree to act as ambassadors for the CNY Drones community. With disclosure, event volunteers can be family members and/or have affiliations with event participants. We ask that volunteers with such affiliations, make that declaration upon entering the event so that we can make appropriate arrangements to avoid judging conflicts during competition. New volunteers are given smaller assignments before moving into areas of added responsibility. We like to meet all volunteers before events to help insure each is a good fit with our current staff. Interested volunteers should contact CNY Drones via their contact page at CNYDrones.org or via CNYDrones@gmail.com

2017 Rig Rescue Challenge Sponsorship

CNY Drones will be accepting sponsorships and donations specifically for the 2017-2018 Rig Rescue Challenge starting on October 1, 2017. Challenge Sponsorship levels will be available at CNYDrones.org.

1. The Challenge

1.1. Introduction

1.1.1..1. This manual describes the scope of an annual, low-cost, indoor, STEM-based team drone challenge. Each year, CNY Drones will release a challenge with a theme-based real-world topic. Teams will design, build (or modify), program, and operate drones to successfully complete flights/flying missions. Points are scored by successfully completing as many of the task based missions in a pre-determine time limited “flight”. The points are based on the complexity of the flight missions.

1.1.1..2. The challenge will include a series of awards (see Section 12) which may change from year to year based on participation and theme. The competition will be held at a suitable location to house event participant pit areas (tables) for up to 16 teams (10 for Season 1/Rig Rescue), a minimum of one 30’w x 60’l x 10’h enclosed/netted field and some anticipated spectators.

1.2. STEM Emphasis

1.2.1..1. **CNY Drones Challenge missions were created keeping in mind the eight practices of science and engineering identified by the Framework for K-12 Science Education, a blueprint for the Next Generation Science Standards (NGSS).** NGSS were developed by teams of science educators from 26 States that worked together with a writing team and partners throughout the country.

1.2.1..2. “A joint effort between the National Research Council, the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve has created the foundation for all students to have a solid K-12 science education.

1.2.1..3. *A Science Framework for K-12 Science Education provides the blueprint for developing the Next Generation Science Standards (NGSS)...Key to the vision expressed in the Framework is for students to learn these disciplinary core ideas in the context of science and engineering practices.*

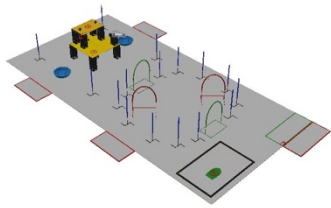
1.2.1..4. *The eight practices of science and engineering that the Framework identifies as essential for all students to learn and describes in detail are listed below:*

- *Asking questions (for science) & defining problems (for engineering)*
- *Developing & using models*
- *Planning & carrying out investigations*
- *Analyzing & interpreting data*
- *Using mathematics & computational thinking*
- *Constructing explanations (for science) & designing solutions (for engineering)*
- *Engaging in argument from evidence*
- *Obtaining, evaluating, & communicating information”*

Source: <http://www.nextgenscience.org>

1.3. Rig Rescue Description

1.3.1. The Story - A malfunction has led to a fire on an off-shore oil platform. Your rescue team has been dispatched to navigate through shark infested waters to help secure the facility and retrieve platform workers. Using the latest drone technology your team can attempt to assist in surveying the damage, activating fire suppression systems that have not previously been triggered, retrieve critical proprietary information stored on the platform's computer drive, secure a free-swinging crane, and rescue workers.



1.3.2. The 2017 Challenge, **Rig Rescue**, was developed with **9 key elements** mimicking real-world situations. The Challenge was developed by a volunteer subcommittee made up of Central New York drone industry professionals, educators, college students, drone enthusiasts and parents.

1.3.3. “Rig Rescue” drone teams can attempt to:

- Navigate an air corridor and obstacles
- Assess the situation & take photos of key issues
- Activate a fire suppression system
- Land on the oil rig platform in 1 or 2 locations
- Retrieve a hard drive within the rig structure
- Secure a crane
- Toss out flotation devices to those in the water
- Rescue survivors in the water
- Return to a moving rescue ship

1.3.4. Re-use of Challenge Format

Please realize that Rig Rescue is a first run STEM-based competition created by volunteers who put countless hours into the development of a challenging format. Volunteers used their experience with drones, robotics and other STEM activities and events to bring our area a low-cost, annual team competition with appeal to multiple age groups. Organizations wishing to use our challenge format are asked to contact us. (see Section 12: Contact Information). We welcome the opportunity to assist other groups in promoting STEM through drones. We are also happy to accept feedback on how to make improvements for future events.

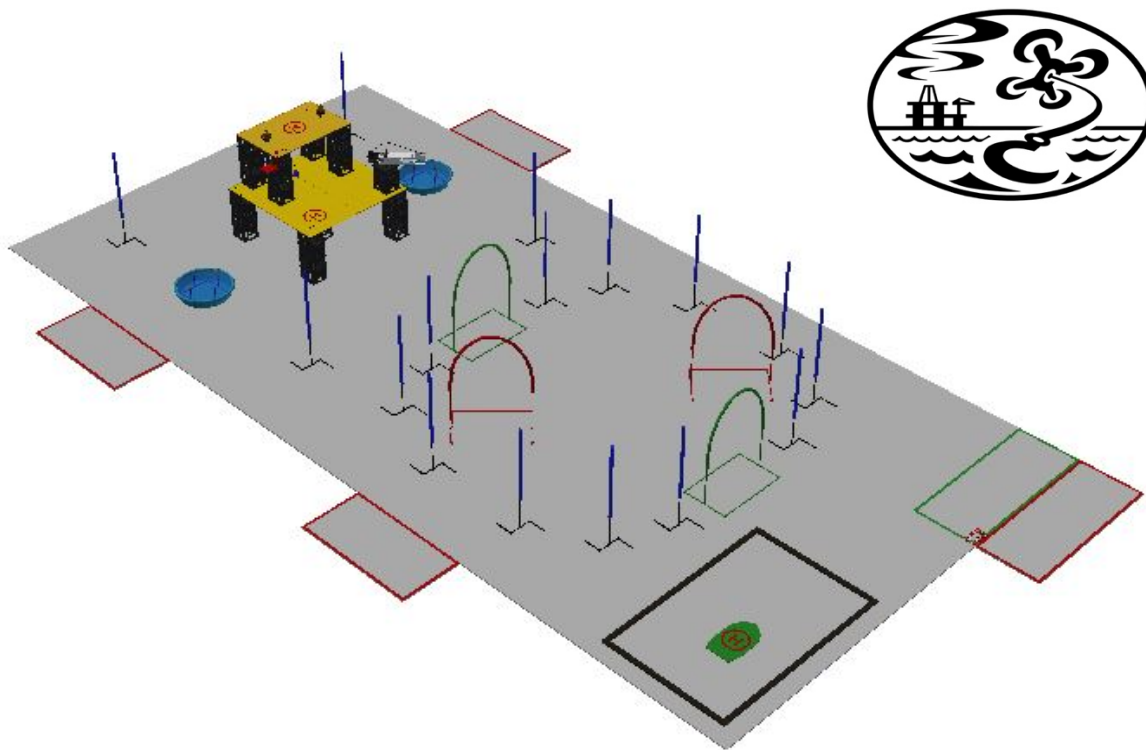
2. Challenge Definitions

2.1. Team Definition

2.1.1. A flight team can consist of any age combination (**age 11+**) and experience level. Teams must be a minimum of 2 individuals and include one adult. (See 3.1 for further details on the competing Flight Crew requirements.)

2.2. Flight Zone (FZ)

- 2.2.1. 30' x 60' competition space/field contained by standard sports netting (approximately 10' tall) on 4 sides with an open top.
- 2.2.2. The FZ area is designated for drone flight during the competition.
- 2.2.3. Only authorized individuals will be allowed in this area.
- 2.2.4. Pilots (as defined in 3.4) will be allowed to enter this area **ONLY** when accompanied by a Referee and only when Flights are not in progress.



2.3. Crew Zones (CZ)

- 2.3.1. Designated areas surrounding the FZ for badged team members and referees only.
- 2.3.2. Areas are outlined in RED tape.

2.4. Flight

- 2.4.1. A single timed session of flying by a team.
- 2.4.2. Each team will have 2 flights.

2.5. Pilot

- 2.5.1. The Pilot is responsible for flying activities using a controller and receiving direction from Visual Observer(s).
- 2.5.2. The Pilot is the team lead when dealing with Flight Zone Referees.

2.6. Operator

2.6.1. The Operator manipulates game elements using a drone controller which may be the same or separate from the Pilot's controller.

2.6.2. This person can be the same as the Pilot or a separate team member.

2.7. Visual Observers (VO)

2.7.1. A team can have up to 4 VO's at designated locations outside the field.

2.8. Pit Crew – Team members involved in the design, building, coding, maintenance and repair of a team's competition drone.

2.9. Badged Team Member aka Flight Crew (2 Minimum / 5 Maximum)

2.9.1. Team member designated as part of a Flight Crew.

2.9.2. Only Badged Team Members are allowed in the CZ's.

2.10. Field Referees (3 Minimum on field + 2 For Drone Inspection)

2.10.1. The Referees will oversee each Flight in the Flight Zone (field). All decisions of flight zone referees are final.

2.11. Scoring Sheet

2.11.1. Each Flight will be scored using the Flight Scoring Sheet. At the end of each Flight the Team Pilot will review with the Referee(s) and sign-off acknowledging the scoring.

2.11.2. A Sample Flight Scoring Sheet is available on the CNYDrones.org website prior to competition.

2.12. Home Base/Safe Zone (Outlined in GREEN on the right bottom of the field)

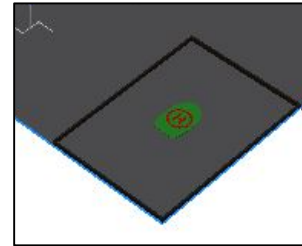
2.12.1. The Home Base/Safe Zone is the location in the Flight Zone where flights initiate and drones can be serviced during a flight. It is also where scoring elements can be deposited during flight.

2.12.2. See 3.4 Flight Scoring.

2.13. Moving Base – Floating Return Ship

2.13.1. The Floating Return Ship (GREEN) is a moving landing area within an 8'x 12' area on the "ocean".

2.13.2. Floating Return Ship perimeter is outlined in BLACK.



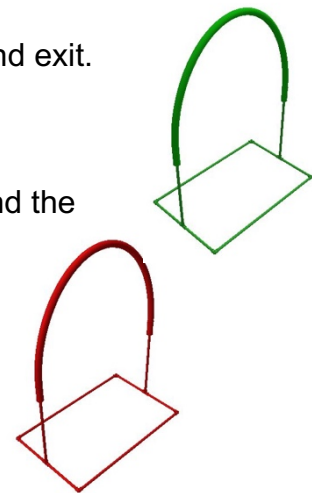
2.14. The Storm – Green & Red Gates

2.14.1. Green gates are located at the Storm's entrance and exit.

2.14.2. Red gates are located inside the Eye of the Storm.

2.15. Storm Obstacles

2.15.1. Storm Obstacles are stationary objects around the Eye of the Storm that cannot be knocked over without penalty.



2.16. Life Preserver Dispatch

2.16.1. Life Preservers are red or blue 4 ½ inch diameter plastic donuts that weigh approximately .8 oz. that can be carried from the Safe Zone to a water rescue area and deployed near or onto survivors.



2.17. Water Rescue (Pick Up Survivors)

- 2.17.1. Water rescue is the picking up of a survivor and delivery to the Safe Zone.
- 2.17.2. Survivors weigh .8 oz.
- 2.17.3. Be advised that actual water will be used inside an approximately 45” pool.



2.18. Landing Zones – On the Oil Rig

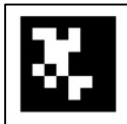
- 2.18.1. High Zone – activates the “flares” by sensor.
- 2.18.2. Low Zone – points only



2.19. Fire Suppression Switch Activation – Rig

- 2.19.1. The Fire Suppression Switch can be activated by partial landing on a platform or moving the lever forward.

2.20. April Tag Identification – Rig



- 2.20.1. An April tag will be located on 4 upright portions of the oil rig structure. Locations will be varied.
- 2.20.2. Pilots can record video footage or take photos of April tags on the oil rig.
- 2.20.3. At the end of the flight, the pilot will provide an SD card for verification.

2.21. Hard Drive Retrieval

- 2.21.1. Hard drive retrieval consists of a rectangular object with a large loop that can be air-lifted and brought to the Safe Landing area.
- 2.21.2. Hard drive will weigh approximately 1 oz.
- 2.21.3. The hard drive will be located on the first level of the platform in the area underneath the second level. Location will be varied.



2.22. Secure the Crane

- 2.22.1. Securing the crane consists of moving the crane boom completely over the rig structure.



3. Flight Rules

3.1. Flight Crew (FC)

- 3.1.1. Flight Crews are team members actively participating in scored flights on the playing field.
- 3.1.2. Flight Crews must consist of a minimum of 1 Pilot and 1 VO.
- 3.1.3. There can be up to 4 VO's and only 1 Operator.
- 3.1.4. The Operator can be the Pilot.
- 3.1.5. Flight Crew requires an adult participant.
- 3.1.6. Maximum number of Flight Crew Members is 5.
- 3.1.7. Minimum age of a Flight Crew Member is 11 on the date of competition.
- 3.1.8. All flight crew members must adhere to Facility Flight Rules (Safety Rules) found on the CNYDrones.org website.

3.2. Pre-Flight Set-Up

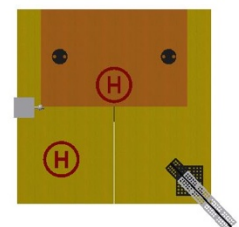
- 3.2.1. Drone Placement
 - 3.2.1..1. Drones can be placed anywhere in the Home Base/Safe Zone in preparation for a flight.
- 3.2.2. Field Issues
 - 3.2.2..1. Teams may notify a referee of any field issues prior to their flight.

3.3. Penalty Scoring

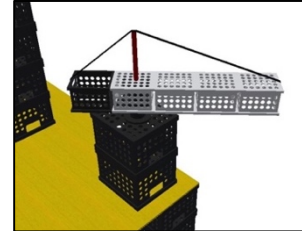
- 3.3.1. Drone Retrieval
 - 3.3.1..1. Teams will be penalized 5 pts. for drone retrieval during the flight.
 - 3.3.1..2. Drone retrieval can be granted by any referee.
- 3.3.2. Flying Outside Designated Flight Zone
 - 3.3.2..1. Referees can assess a 5 point penalty for each occurrence of a drone leaving the Flight Zone after initial warning.

3.4. Flight Scoring

- 3.4.1. Move safely through air corridor &/or obstacles
 - 3.4.1..1. Direction through gates is irrelevant.
 - 3.4.1..2. 5 pts per red gate, scoring is once per gate.
 - 3.4.1..3. 10 pts per blue gate, scoring is once per gate.
- 3.4.2. Assess the situation & take video or photos of key structural areas
 - 3.4.2..1. 8"x 8" April Tags are located on 4 locations on the platform upright structures.
 - 3.4.2..2. 12 pts each tag videoed or photographed or 50 points if all 4 are taken.
 - 3.4.2..3. SD card must be presented for verification at the end of a flight.
- 3.4.3. Activate a fire suppression system
 - 3.4.3..1. 15 pts upon completion
 - 3.4.3..2. The system is considered activated when it is not in its original position.
- 3.4.4. Land on the oil rig bottom landing pad
 - 3.4.4..1. 5 pts for landing inside the designated area.
 - 3.4.4..2. "In" for this instance is defined as ½ or more of a drone braking the plane.
 - 3.4.4..3. Touch and go landing.
- 3.4.5. Land on top landing pad to set off flares
 - 3.4.5..1. 10 pts upon completion
 - 3.4.5..2. Touch and go landing
 - 3.4.5..3. Drone must activate the sensor



- 3.4.6. Retrieve a hard drive within the rig structure
 - 3.4.6..1. 15 pts for retrieval + 15 pts if delivered to Safe Zone
 - 3.4.6..2. Hard drive retrieval consists of a rectangular object with a large loop that can be air-lifted and brought to the Safe Zone landing area.
 - 3.4.6..3. Scoring Objects can be removed by a Flight Crew Member only when a drone has landed **and is deactivated**.
 - 3.4.6..4. Scoring Objects can be dropped in the Safe Zone without landing.
 - 3.4.6..5. Crew members can only enter the Safe Zone when a drone is fully deactivated. This area will be monitored by a referee.



- 3.4.7. Secure the crane
 - 3.4.7..1. 5 pts
 - 3.4.7..2. The crane is considered secure when the boom is completely over the rig deck.

3.4.8. Deploy flotation devices/rafts/rings

- 3.4.8..1. 10 pts in water
- 3.4.8..2. 30 pts around a survivor
- 3.4.8..3. 6 flotation devices/rafts/rings will be available prior to each flight.
- 3.4.8..4. Flotation devices can be secured to a team's drone just before a flight begins/when setting up for a flight.
- 3.4.8..5. -1 pts for attempting but missing the water area completely per device
- 3.4.8..6. Flotation devices can be added during flights only if the drone is landed and deactivated in the Safe Zone.



3.4.9. Rescue survivors in the water

- 3.4.9..1. 30 pts each picked up
- 3.4.9..2. 30 pts for Safe Zone return
- 3.4.9..3. Scoring Objects can be removed by a Flight Crew Member only when a drone has landed and is deactivated.
- 3.4.9..4. Scoring Objects can be dropped in the Safe Zone without landing.
- 3.4.9..5. Crew members can only enter the Safe Zone when a drone is fully deactivated. This area will be monitored by a referee.



3.4.10. Return to a moving rescue ship – landing safely

- 3.4.10..1. 50 pts
- 3.4.10..2. The drone is considered “landed” at the end of the Flight ONLY.
- 3.4.10..3. The drone must break the landing zone vertical plane.

3.4.11. Safe Zone Scoring

- 3.4.11..1. To be considered “in” the Safe Zone, the drone or scoring elements need to break the Safe Zone vertical plane.

3.4.12. Order of Missions

- 3.4.12..1. There is no specific order in which missions need to be accomplished, with the exception of “*landing on the rescue ship*”, which, if attempted, is completed as a final task before the end of a flight for scoring purposes.

4. Safety Rules

4.1. Facility Safety Rules

- 4.1.1. Facility Safety Rules will be available at the event and on the CNYDrones.org website.
- 4.1.2. As part of the Inspection Process, Teams will sign off that they have read the Facility Safety Rules.

4.2. Drone Flight Perimeter

- 4.2.1. Flights must stay within the perimeter of the Flight Zone (FZ).
- 4.2.2. Perimeter of the FZ will be 10' high side netting. **Top will be open.**
- 4.2.3. Pilots must not fly outside the 60'l x 30'w x 10'h area without penalty.

4.3. Safety Gear

- 4.3.1. All Flight Crew are required to wear safety glasses and "closed toed" shoes.
- 4.3.2. Those not wearing complying will be removed from the Flight Zone by the Referee.

4.4. Stopping Flights

- 4.4.1. Flights will be stopped by referees for safety reasons **including but not limited to leaving the flight zone.** (60'l x30'w x10'h specified field)
- 4.4.2. Flights will be stopped by referees when a drone is entangled.
- 4.4.3. Flights will be stopped by referees for any outside interference.
- 4.4.4. Flights will be stopped when a pilot motions for a referee leaving their controller on the table in "fail safe" mode.

4.5. Destruction, Damage to Flight Zone

- 4.5.1. Any drone deemed by Referees as "out of control" or "behaving badly" will be removed from a flight and/or competition.
- 4.5.2. The decision of the Head Referee is final.

4.6. Post Flight Removal of Drones

- 4.6.1. Drones will be removed by a Referee and/or a Pilot ONLY when accompanied by a Referee.
- 4.6.2. No measuring or photos are allowed inside the flight zone during drone removal.

4.7. Disabled Drone Eligibility

- 4.7.1. Disabled drones can be flagged upon notification to a Referee by a Pilot.

4.8. Blade Guards on Drones

- 4.8.1..1. We encourage the use of blade guards to help protect field elements, drones and flight crews.

4.9. Flight Zone Tolerances

- 4.9.1. Plus (+) or minus (-) 12" for element set-up location on the field.
- 4.9.2. Plus (+) or minus (-) 3" for all elements.

4.10. Egregious Behavior

- 4.10.1. CNY Drones reserves the right to remove any participant or spectator from the event facilities due to inappropriate behavior.
- 4.10.2. No drones can be flown in areas not deemed appropriate by the event staff.

4.11. Communications

- 4.11.1. **Teams will be responsible for their own communications while on the field.**
- 4.11.2. Walkie-Talkies, phones or hand signals are all reasonable forms of communications.

5. “Rig Rescue” Specific Rules

5.1. Scoring Elements

5.1.1. Sample **Life-Raft** element will be available for pick-up by registered teams upon request.

5.1.2. A Sample **Survivor** will be available for pick-up by registered teams upon request.

5.2. Violations/Penalties

5.2.1. De-scoring

5.2.1..1. Knocking over an Air Corridor Obstacle (-5 points)

5.2.1..2. Downed drone retrieval -5pts for each occurrence

5.2.1..3. Drone leaving the Flight Zone -5 pts for each occurrence after warning

5.2.1..4. Killing a shark -5 pts for each occurrence

5.2.2. Interference/Flight Crew Zone Violations

5.2.2..1. All violation penalties will be assessed at the discretion of the referees.

5.2.2..2. Movement outside specified crew areas during a flight. (-5 points)

5.2.2..3. Immediate flight disqualification:

5.2.2..3.1. Entering the field when a drone is in flight and not in fail safe mode.

5.2.2..4. Immediate event disqualification:

5.2.2..4.1. Intentional damage of field elements or facilities.

5.2.2..4.2. Disregarding referee directions.



6. Tournament Safety

6.1. Field Protection

6.1.1. The field perimeter will be surrounded on 4 sides by standard sports netting. The top of the field is not enclosed.

6.1.2. Flights will be stopped by referees for safety reasons **including, but not limited to, leaving the flight zone.***

6.1.3. Flights will be stopped by referees when a drone is entangled.*

6.1.4. Flights will be stopped by referees for any outside interference.*

6.1.5. Any drone deemed by Referees as “out of control” or “behaving badly” will be removed from a flight and/or competition.*

*(*Similar safety references repeated from in Sections 4.4 – 4.5)*

6.2. Pit Safety

6.2.1. All personnel and team members in Pits, Flight or Crew Zones **MUST** wear safety glasses or shields on prescription glasses.

6.2.2. Dark and/or reflective glasses are not allowed.

6.2.3. Pilots do not need to have safety glasses on during FPV flights.

6.3. Audience & Participant Safety

6.3.1. Safety glasses are recommended for ALL spectators.

6.3.2. We advise anyone closest to the “flight zone” to be aware of the risk from flying objects/debris.

6.3.3. We advise against bringing infants and toddlers to this event due to small parts hazards and the recommendation of safety glasses for all spectators.



7. Team Registration

7.1. Registration Timeline

7.1.1. Teams should register **no later than 2 weeks** prior to competition.

7.2. Registration Donation

7.2.1. Team registration fee of **\$50** is payable **via PayPal using the CNY Drones site** or by check to CNY Drones c/o the Griffiss Institute, 725 Daedalian Drive, Rome, NY 13441. Registration is non-refundable. Checks **MUST** include the following notation **CNY Drones Rig Rescue Team**. **Checks received without notation are entered as donations and will not be immediately added to our team list.** Registrations will help cover event costs with remaining funds covering participant scholarships.

7.3. Day of Event Registration

7.3.1. Event participants will be allowed into on the day of the event **ONLY** if space permits and for showcase purposes. Last minute entries will not be eligible for awards.

7.3.2. Day of event registration is at the discretion of the event organizers.

7.4. Scholarships

7.4.1. Event scholarships will be available on a need basis and is not guaranteed.

7.4.2. Teams seeking event scholarship funds should contact event organizers prior to registering for competition.

7.5. Showcase Teams

7.5.1. Teams may register to “showcase” rather than compete at this event as we wish it to be as inclusive as possible, including all ages and skill levels. We understand that there are those who would rather share their skills with others rather than receive an award.

7.5.2. Showcase team registration is a **suggested donation of \$10.**

7.6. Registration & Competition Notifications

7.6.1. The public will be notified when Registration opens, closes and reaches capacity via website, Facebook and Twitter.

7.6.2. The public will be notified of any changes to the competition schedule via website, Facebook, and Twitter.

7.6.3. Teams will be notified of any changes to the competition schedule via the email address provided at registration.

7.7. Registration Limit

7.7.1. Registration is limited to **16 teams**. Please register early!

7.8. AMA Registration Requirement for Pilots

7.8.1. ALL *Team Pilots* for this competition are required to join the Academy of Model Aeronautics (AMA) (Info at: modelaircraft.org). This is not an AMA requirement. **It is an event organizer requirement.** Currently, AMA Membership for those through age 19 is free, age 19-65 is \$75, 65+ is \$65. AMA Membership provides individual insurance for event Team Pilots.

7.8.2. Proof of membership by each team’s Pilot must be provided on or before entry into the event facilities. (*photo copy of receipt or membership card*)

7.9. Suggested AMA Registration of Crew Members

7.9.1. All Flight Crew team members are encouraged to join the AMA (Go to: modelaircraft.org). It is not a requirement for non-pilots in this event.

7.10. FAA Drone Registration Requirements

7.10.1. If a team’s drone weighs more than ½ lb. it does not need to be FAA registered for flying indoors.

8. Practice

8.1. Flight Simulator – anticipated for competitions in 2019 & beyond

8.1.1. A flight simulator/field simulation will be available for all those wishing to learn the field set-up prior to competitions.

8.1.2. **The simulation is not exact.** It is a close approximation of the field.

8.1.3. Flight simulator software/app cost may be additional.

8.1.4. **A link to the simulator will be available at CNYDrones.org.**

8.2. Informal Meet-Ups

8.2.1. Teams **are** encouraged to arrange meet-ups with other teams and share information when possible.

8.2.2. We would be happy to announce meetings on the CNYDrones.org site.

8.2.3. CNY Drones intends to have a Workshop/Kick-Off event to showcase the competition field, answer questions and begin registration of teams.

8.3. Day of Event Practice

8.3.1. All teams will be given an opportunity to practice on the “Rig Rescue” Field on the morning of the event.

8.3.2. If the venue permits, the field may be available on the evening before the event.

8.3.3. A second field **may** be available at the competition or at future events, depending on sponsorship. This would provide more opportunity for day of event practice, possibly shorten the time needed for the competition and/or allow more teams to participate.

8.3.4. Check with event organizers for updates on field practice opportunities.



9. Tournament Day Procedures & Schedule

9.1. Check-In

- 9.1.1. Check-in will be at the designated registration table at the event entrance.
- 9.1.2. Teams will check-in at 8:00am.

9.2. Event Schedule Overview (approximates)

- 9.2.1. Team Check In: 8:00am
- 9.2.2. Team Practice: 8:00am-10:00am
- 9.2.3. Opening Ceremony: 10:15am
- 9.2.4. Lunch: 12:00pm-12:30pm
- 9.2.5. Flight Schedule: 10:30am-12:00pm/12:30pm-4:30pm
- 9.2.6. Awards Ceremony: 5:00pm (time subject to # of registrations & flight completions)
- 9.2.7. Event Schedule is subject to change based on the number of participating teams and any unforeseen delays.
- 9.2.8. We will do everything possible to insure the competition goes according to schedule.
- 9.2.9. **Changes to competition schedule beyond the control of event organizers include weather, security or venue issues/conflicts.**

9.3. Flight Crew Designation

- 9.3.1. Flight Crews will have specially marked lanyards to allow access to the Crew Zone. Only those with FCD will be allowed to compete.

9.4. Inspection

- 9.4.1. Description
 - 9.4.1..1. Inspection will take place prior to each team's initial Flight.
 - 9.4.1..2. Inspection includes chassis, rotors, motors, sensors, batteries and any attachments/enhancements used to accomplish competition tasks.
 - 9.4.1..3. Re-inspection is necessary if changes are made to any drone or attached manipulator between Flights.
 - 9.4.1..4. Inspection will be provided by Referees or other designated Inspectors.
- 9.4.2. Inspection Related Rules
 - 9.4.2..1. All drones must be within the pre-determined competition specifications (see Section 11)
 - 9.4.2..2. Rotors must spin in the correct direction
 - 9.4.2..3. Batteries must be the appropriate size and voltage set forth in the drone specifications
 - 9.4.2..4. Pilot must demonstrate "fail safe" setting.
 - 9.4.2..5. Arming switch so the drone can quickly be disarmed
 - 9.4.2..6. Drones that are GPS reliant will not be able to operate in the tournament facilities.
 - 9.4.2..7. Drones weighing more than ½ lb. will need to be identified with their FAA number.
 - 9.4.2..8. All teams will sign-off that they have read the Facility Safety Rules.
 - 9.4.2..9. **Facility Flight Rules (Safety Rules) will be available at: CNYDrones.org.**

9.5. Spectator Area

9.5.1. All spectators are encouraged to wear safety glasses.

9.6. Pit Area Specs

9.6.1. A “pit” will be designated for each competing team.

9.6.2. Each pit will consist of a minimum 6 ft. table and 2 chairs with additional walking space around the perimeter.

9.6.3. Electrical outlets will be limited so please bring appropriate surge protected power strips and cording.

9.6.4. Please notify the event organizers of any special requirements for your team.

9.7. Flight Rules (aka rounds)

9.7.1. Each team “Flight” will be timed and last up to 5 minutes.

9.7.2. Flights can be halted by a Referee if deemed unsafe.

9.7.3. Flights can include landing and changes made in the Safe Zone within the 5-minute time period.

9.7.4. Flights cannot include a change of drones.

9.7.5. Flight rules can be updated prior to the event.

9.8. Elimination Rules

9.8.1. The team with the most points after **2 Flights** will be the winner.

9.9. Event Visitor Booths

9.9.1. We anticipate event visitor booths including:

- Welcome/Registration/general information table
- drone clinic booth
- safety video presentation booth
- first time flyer

9.9.2. Event visitor booths will be made available to sponsors and volunteer groups if space permits.

9.10. Food and Beverage Availability

9.10.1. Food and drinks will be permitted in the spectator and pit areas.

9.10.2. Water will be provided to volunteers.

9.10.3. No food will be sold on the premises.

9.10.4. Teams are encouraged to bring in or have deliveries of food to their pit areas. All items brought in must be removed upon the end of the competition day.

9.10.5. Menus from area establishments will be available at the registration table.

9.11. Awards Ceremony

9.11.1. An awards ceremony will take place upon completion of all team “Flights”.

9.11.2. Trophies will be awarded based on the Flight outcomes and award criteria. (see Section 11)

9.12. Team Advancement Opportunities

9.12.1. There are currently no advanced competitions affiliated with our events.

9.12.2. Teams wishing to attend an advanced event are encouraged to consider AMA annual competitions. Info at: Modelaircraft.org

9.12.3. CNY Drones will offer mentorship and advice to those seeking additional events.

10. Award Categories & Criteria

10.1. Challenge Champion

- 10.1.1. Champions will be awarded for 1st Place, 2nd Place & 3rd Place
- 10.1.2. Participating teams will be ranked based on scoring of their 2 flights.
- 10.1.3. The top 3 teams will receive awards*
- 10.1.4. Ties will be determined by:
 - Least amount of penalties received
 - Number of elements completed
 - Number of elements attempted

10.2. Design Innovator

- 10.2.1. This award will be presented to the team that displays design innovation and out-of-the-box thinking in their drone and/or attached devices used to manipulate field elements.

10.3. Design Creativity

- 10.3.1. This award will be voted on at the competition by teams competing in the flight competition. Teams will not be allowed to vote for their own team. Only one vote will be submitted by a competing team.

10.4. Safety Video

- 10.4.1. Applicants must submit a link to a public service announcement depicting "Drone/UAV Safety".
- 10.4.2. Submitted video can be either 30, 60 or 90 seconds in length.
- 10.4.3. Link should be to a YouTube video. Video can be public or private. Please contact us if you any issues using this format.
- 10.4.4. Submitted video cannot use copyrighted music, clips, photos or brands.
- 10.4.5. All sources, including the applicant's affiliation(s) must be properly identified at the end of the video. This portion will not be counted as part of the video timing.
- 10.4.6. Video applicants do not need to be registered for the flight competition.
- 10.4.7. There is a **NO REGISTRATION FEE for video applicants** from teams that are not part of the main/flight competition.
- 10.4.8. Video must be submitted as a team registration no later than 7 days prior to competition. This window will allow sufficient time for judging.

10.5. Engineering Challenge – for future season competitions

- 10.5.1. Heavy Weight Lifting
 - 10.5.1..1. Participants can be separate from the flight competition.
 - 10.5.1..2. An application small fee for competing will be determined for those not in the flight competition. Register using the same form.
 - 10.5.1..3. Fee is waived for a single entry from a team competing in the flight competition.
 - 10.5.1..4. Heavy Weight Lifting Drone Spec
 - 10.5.1..4.1. 300 mm rotor to rotor

**award type subject to competition sponsorships received*

11. Flight Competition Drone Specifications & Rules

11.1. Allowable Drone Specs

- 11.1.1. Size: 500 mm motor to motor
- 11.1.2. Drones must not have GPS flight restrictions and **must** be capable of flight without GPS lock.
- 11.1.3. Competition drones can be **purchased, modified, kit or built from scratch**.
- 11.1.4. Drone frame and attachments can be made of any available materials. Creativity is encouraged.

11.2. Example Qualifying Drones

- 11.2.1. [Links to drone purchase, kit or build possibilities may be listed at: CNYDrones.org. Listings are just examples & will be added to &/or modified as we receive feedback.](#)

11.3. Allowable Number of Drones Per Team

- 11.3.1. Teams will only be allowed up to 2 drones for inspection.

11.4. Allowable Number of Active Drones in the Flight Zone

- 11.4.1. Only 1 drone per team “Flight”.
- 11.4.2. Only 2 challenge registered drones (maximum) allowed per team.
- 11.4.3. Teams may “swap out” between their registered drones **ONLY** in between matches.
- 11.4.4. Batteries and other adjustments can be made in the “Home Base”.

11.5. Changes Made During Competition

- 11.5.1. Any changes other than swapping out batteries require re-inspection.



12. Event Contact Information

12.1. CNY Drones Organizational Information & Contacts

- 12.1.1. CNY Drones is a volunteer group and exists fiscally under the a 501(c)3 of the Griffiss Institute, Rome New York to cover STEM event costs.
- 12.1.2. Administrator & Event Coordinator: Lisa Payne
- 12.1.3. Volunteer Coordinator: Bob Payne
- 12.1.4. Website: CNYDrones.org
- 12.1.5. Facebook: www.Facebook.com/CNYDrones
- 12.1.6. Twitter: [@CNYDrones](http://www.twitter.com/CNYDrones)
- 12.1.7. Texts & Voice Messages: 315-732-1001

13. Competition & Manual - Additional Information

- 13.1.1. This manual is subject to updates as needed. Major revisions are discussed by a volunteer Event Planning Committee and agreed upon before updates are listed.
- 13.1.2. The competition field was designed and constructed by volunteers with special attention to the need for team access to low cost materials.
- 13.1.3. The competition field was created using donated material and equipment, sponsor purchases, and purchases to be reimbursed by event registrations and sponsorship funds.
- 13.1.4. It is the intent of CNY Drones to continue to provide a competition annually that encourages participation by offering low-cost registration and low-cost alternatives for teams to use when considering either building or purchasing a competition drone.
- 13.1.5. We encourage others to host STEM-based drone competitions and are willing to give advice based on our experiences.
- 13.1.6. Those wishing to reuse this competition, all or in part, must contact event organizers listed in Section 12. This competition, logo, competition manual and additional files mentioned in the manual are property of CNY Drones @RoboSpartans Robotics.
- 13.1.7. We appreciate any suggestions for improvements! This is a first-run competition and we want to continuously improve to make it better for everyone involved. Share your thoughts with us!
- 13.1.8. The next competition will be Forest Fury. Let us know what you'd like to see included!

