Introduction to the Aerial Drone Competition

Presented by Aerial Drone Competition Support Team Robotics Education & Competition Foundation



AERIAL**DRONE** COMPETITION



NADINE AMAYA West & South Central Regions

SHELLI BRASHER

North Central & Southeast Regions

LOUANN CORMIER

Northeast Region

LISA SCHULTZ International Regions





ABOUT THE REC FOUNDATION

Aerial Drone Competition I Robotics Education & Competition Foundation



Meeting the challenges of today for our future students

Our Mission

The Robotics Education & Competition (REC) Foundation's global mission is to provide every educator with competition, education, and workforce readiness programs to increase student engagement in science, technology, engineering, math, and computer science.

Our Vision

We see a future where every student designs and innovates as part of a team, overcomes failure, perseveres, and emerges confident in their ability to meet global challenges.

About the REC Foundation

2010

Founded

Articles of Incorporation as 501c3 signed in April of 2010

107

Employees

107 Employees in 36 US States and Australia, Canada, China and United Kingdom

1,740

Event Partners

1,740 Event Partners hosted workshops, scrimmages, camps and competitions this past season

26M

Volunteer Hours

Over 26 Million hours are invested by our volunteers annually











2023-2024 Team Registration Breakdown

VEX GO Robotics Competition - Elementary (2nd – 4th)	18,800
VEX IQ Robotics Competition - Elementary (3rd – 5th)	9,147
Middle School Robotics	13,106
High School Robotics	14,328
Aerial Drone Competition (started in 2019)	1,576/ <mark>2,271</mark>
VEX AI Robotics Competition	31
University Robotics	278
Factory Automation Competition	3,218
TSA	1,128
SkillsUSA	34 States
Industry Certification	1,600



Aerial Drone Competition

Our Aerial Drone Competition offers an exciting **indoor** educational drone competition event.

Teams learn about:

- Drones
- Flight principles
- Programming
- Documentation
- Critical thinking & problem solving
- Communication skills

Students expand their understanding and build interest for Drone-related workforce and career opportunities.





WHY CHOOSE US

Sparking students curiosity in drones

Drones are quickly finding their way into our everyday lives.

Drones in the hands of the students spark curiosity in aviation, engineering, coding and much more.

Drones are an effective tool to encourage students to learn skills that are not easily taught in traditional classroom settings.

Drones are attracting students from all backgrounds, who have not previously shown interest in STEM.

THE COMPETITION

Aerial Drone Competition I Robotics Education & Competition Foundation

FUTURE INNOVATORS ON THE RISE

Raising the bar through competition

4 Missions - 1 Competition Students compete in local and national events. Competitions are recommended for students in grades 5-12.



Teamwork Mission

Drones are piloted by students. Two teams fly together on the same competition field to maximize their score in a 90 second match.



Autonomous Flight Mission

Drone is programmed by students to operate entirely autonomously. Each team competes alone to score as many points as possible in a match.



Piloting Mission

Drone is piloted by students to fly through an obstacle course. Each team competes alone to score as many points as possible in a 60 second match.



Communications Mission

Teams interview with Judges about their Drone, Programming and Competition Logbook Documentation.

MISSION 2025



Qualifying Matches and Rankings

Alliances in the Finals

The number of Alliances is determined by the number of Teams at the event.



NUMBER OF TEAMS	NUMBER OF ALLIANCES	ELIMINATIONS BEGIN AT		
20 or more	10	Quarterfinals		
8-19	4	Semifinals		
7 or less	2	Finals		

Piloting Mission

Two 60 second matches





Piloting Mission Flight Path





SEPT 20 24

Autonomous Flight Mission Two 5 minute sessions up to 3 matches I reset allowed per match





ACABENCE BELANCE

SEPT 20 24

Communications Mission

Flight Logbook and Interviews







Competition Logbook Rubric

COMPETITION

Link To Rubric

COMPETITION SECONDETITION LOGBOOK RUBRIC | MISSION 2025

TEAM #

GRADE LEVEL O MS | O HS JUDGE NAME:

DIRECTIONS: Determine the point value that best characterizes the content of the Competition Logbook for that criterion. Write that value in the column to the right. This rubric is to be used for all Competition Logbooks regardless of format (physical or digital).*Judges may award fractional points, such as a 3.5, 4.5, etc.

Criteria	Expert: 4-5 points*	Proficient: 2-3 points*	Emerging: 0-1 points*	Points
Written Communication Skills (All-Around, Communications, Airmonship)	Includes clear, complete and organized records of evidence of Mission Objectives. Examples of this may include: • Dated entries with the names of contributing students. • An overall system of organization: numbered pages and a table of contents with entries organized for future reference. • Uses fight terms throughout the competition logbook. • Provides clear evidence of the iterative process.	Is included but lacks some detail or is missing information.	Not included or lacks many details.	
Teamwork and Leadership (All-Around, Communications, Airmonship)	Includes clear, complete and organized records of team roles and project and time management techniques.	Is included but lacks some detail or is missing information.	Not included or lacks many dataits.	
Safety Plan & Training Records (All Around, Communications, Airmanship)	Is clearly identified, including documentation of the team's knowledge of dronemaintenance, safety, and training courses and local drone regulations. Examples of this may include: • Pie and Post Flight Checklists • Flight Log • Completion of FAA Trust (US Teams Dely) • Completion of Robolink's Getting Started Course	Is included but lacks some detail or is missing information.	Not included or lacks many details.	
Drone Data and Analysis (All-Around, Communications, Airmanship)	Is clearly identified, including documentation of the team's data about their drose and controller performance, based on testing and analysis. Examples of this may include: • Battary Life • Flight Time Performance • Additional Drose/Costroller Data	is included but has limited analysis and decumentation.	Not included or lacks many details.	
Teamwork Mission: Analysis and Strategies (All-Around, Communications)	Is clearly identified, including documentation of the team's knowledge and understanding of the Teamwork Mission. Examples of this may include: • Analysis of Praerwork Mission Rules & Scening • Analysis of Praerice and Competition Results • Documentation of Brainstorming, Testing, and Sharing Results of strategies developed • Documentation of Multiple Iterations as the team progressies	Is included but has fimited analysis and documentation.	Not included or lacks many details.	
Astonomeus Flight Mission: Programming Documentation and Strategies (All-Around, Communications, Coding)	Is clearly identified, including documentation of the team's knowledge and understanding of the Autonomous Flight Mission. Examples of this may include: • Analysis of Mission Rules & Secong • Analysis of Plactice and Competition Results • Bocumentation of Programming Code and version history, including annotations. • Documentation of Brainstorming, Testing and Sharing Results of programs developed • Documentation of Multiple Iterations as the team progresses	Is included, but lacks some details, missing information and/or does not show multiple iterations of programming code.	Not included or lacks many details.	
Piloting Skills Mission: Flight Analysis and Strategies (All-Around, Communications)	Is clearly identified, including documentation of the team's knowledge and understanding of the Piloting Skills Mission Examples of this may include: Analysis of Piloting Skills Mission Rules & Scoring Analysis of Piloting Skills Mission Rules & Scoring Documentation of Rules & Scoring Rules & Scoring Analysis of Piloting Rules & Scoring Rules & Scoring Analysis of Piloting Rules & Scoring Rules & Scoring Analysis & Scoring Rules & Scoring Rules & Scoring Analysis of Piloting Rules & Scoring Rules & Scoring Analysis & Scoring Rules & Scoring Rules & Scoring Analysis &	Is included but has Brited analysis and documentation.	Not included or lacks many details.	
Drone and Aviation Caroer and Industry Practices (All-Around, Communications, Airmonship)	Is clearly identified, including specific examples, discovery, and documentation of the team's knowledge and understanding of drone and aviation career opportunities. Resources used are referenced. Examples of this may include: Researching how drones are used in multiple professions Interviewing a professional in the drone industry and documenting the interaction Researching and reporting on current trends in aviation and drone technology	Includes limited or general examples and discovery of drone and aviation careers and/or does not reference resources used.	Not included or lacks many details.	
		TOTAL BOINTS		

Team Interview Rubric



Team Interview Rubric

AERIAL DRONE

Link to Team Rubric

AERIAL DRONE COMPETITION COMPETITION

TEAM

GRADE LEVEL C MS | C HS

JUDGE NAME:

DIRECTIONS: Determine the point value that best characterizes the content of the Team Interview for that criterion. Write that value in the column to the right. *Judges may award fractional points, such as a 3.5, 4.5, etc.

Criteria	Expert: 4-5 points*	Proficient: 2-3 points*	Emerging: 0-1 points*	Points
Verbal Communication Skills (All Awards)	Students communicate effectively and interact respectfully, courteously, and positively in their interview. Most or all team members contribute to the interview.	Students communicate clearly but some students do not contribute to the interview.	Few team members contribute to the interview and/or students interrupt each other or the judges.	
Teamwork and Leadership (All Awards)	Students clearly explain roles of team members.	Explanations were limited or vague.	Explanation not communicated.	
Project Management (All Awards)	Students clearly explain how they manage their time, develop their skills, and resources. It is evident to judges that the students have autonomy and follow the student centered ethos of the program.	Explanations were limited or vague.	Explanation not communicated.	
Drone Safety and Awareness (All-Around, Communications, Airmanship)	Students can fully explain the importance of drone safety and how safety is managed on their team. Team is aware of local drone laws and have taken appropriate training. Team uses aviation and drone terminology when talking with judges.	Explanations were limited or vague.	Explanation not communicated.	
Teamwork Mission Strategies (All-Around, Communications, Airmanship)	Students clearly demonstrate the team's knowledge and understanding of the Teamwork Mission. Students explain how the team developed and tested their Teamwork strategies for this Mission.	Explanations were limited or vague.	Explanation not communicated.	
Autonomous Flight Mission Strategies (All-Around, Coding)	Students clearly demonstrate the team's knowledge and understanding of the Autonomous Flight Mission. Students demonstrate an understanding of programming concepts and can explain how they developed their drone's programming evolution.	Explanations were limited or vague.	Explanation not communicated.	
Piloting Skills Mission Strategies (All-Around, Communications, Airmanship)	Students clearly demonstrate the team's knowledge and understanding of the Piloting Skills Mission. Students explain how the team developed their Piloting strategies for this mission.	Explanations were limited or vague.	Explanation not communicated.	
Drone and Aviation Career Connections (All-Around, Communications, Airmanship)	Students have explored multiple drone or aviation careers, real-world applications, and are able to discuss in detail what they've learned.	Students have explored one drone or aviation career and/or did not share details about the careers.	Students have not explored beyond scope of the competition.	
Special Attributes and Overall Impressions (Judges)	d Does the team have any special attributes, accomplishments, or exemplary effort in overcoming challenges at this event or during the season? Please describe.			
Write 1-3 three things the	I at made this team standout to you or something that impressed you a	bout the team. 🚫		1

All Judging materials are strictly confidential. They are not shared beyond the Judges/Judge Advisor and are destroyed at the end of the event.

MISSION 2025

2025-2026 Season Timeline

Teams attend local events and earn invitations to represent their state at a Regional Championship Event based on season performance and awards.

Learn more about the <u>Qualifying Criteria</u>

September 9, 2025

25-26 Competition Reveal

October - March 2026

Local/Qualifying Tournaments

April-June 2026

Regional Championship Events



Develop your team

- A drone for every team (1 drone = 1 team)
- It is common for a school/organization to have multiple teams
- Recommended team size is 3-5 Students
- Plan your space
 - When practicing, you may not need a full field set up
- Plan your schedule
 - Some teams meet once a week for a few hours;
 others will meet more frequently and for longer times
 - Younger students = shorter sessions
- Help your team to set goals
- Celebrate successes





Coaches Roles

- Register your teams
- Manage Teams
- Place Orders
- Organize meeting space
- Schedule Work Sessions
- Register for Events
- Organize Travel
- Show Students where to find resources
- Allow Students to Learn in a safe environment

Team Roles

Tips and Suggestions - Do what make sense for your group and organization. Lots of options!

Team Role Suggestions

- Drone Pilots
- Co-Pilots
- Visual Observers
- Programmers
- Logbook Documentor
- Team Scout

Additional Team Role Suggestions

- Team Captain
- Fundraising Coordinator
- T-Shirt Designer
- Videographer/Photographer
- Outreach Coordinator
- Flight Crew Manager
- BE CREATIVE!!!



About Team Grants

Through the generosity of our sponsors, our Team Grant Program matches schools land organizations that are interested in adopting the world's largest and fastest growing academic robotics competitions with the program resources necessary to get started. This unique program allows the REC Foundation to provide the resources needed to inspire the next generation of scientists and engineers.

Grant support is based upon sponsor requirements. The REC Foundation does its best to support all requests, but can not guarantee each applicant will receive support.

Learn More About Grants

Whether you are developing a robotics program or starting a competition team, grants are available for you!

EXPLORE GRANT OPPORTUNITIES

ADDITIONAL GRANT RESOURCES

THE EQUIPMENT

Aerial Drone Competition I Robotics Education & Competition Foundation



The CoDrone EDU

CoDrone EDU is a programmable drone ideal for learning

- Python or Block-Based Coding
- 7 Sensors
 - Color SensorBottom RangeFront RangeGyroscopeOptical FlowAccelerometerBarometer

Note: The JROTC edition was created to meet funding requirements for the JROTC programs. It's the same drone as the CoDrone EDU, but with specific components sourced from different manufacturers to meet those requirements.

dronecompetitiongates.com

Field Element Kit

One time purchase that can be used year after year. Ideal for setting up practice fields and even hosting your own events.

Field Element Kit - \$1,000 and includes:

- 1 Red Arch Gate
- 1 Blue Arch Gate
- 1 Yellow Keyhole Gate
- 1 Green Keyhole Gate
- 1 Red Landing Pad
- 1 Blue Landing Pad
- 1 Blue Cube 12"
- 1 Red Cube 18"
- 3 Programming Mats
- 3 Color Mats
- Shipping Included (to Continental US)



Pro Tip: Many teams have Field and Game Element Kits. Ask teams to bring and setup their elements in exchange for a free event registration.

Pro Tip: Ask your local home improvement store to donate PVC.



The Game Elements

These will change every season based on the missions designed.

Game Elements for Mission 2025 are pictured.

Be sure to request Mission 2026 Game Elements!

PVC

The Aerial Drone Competition also uses PVC Pipe to create field perimeters and game obstacles. This can be purchased at your local hardware store and is used from season to season.



\$360

REGISTRATION FEES

Aerial Drone Competition I Robotics Education & Competition Foundation

Registration Fees

Two types of registration fees Season Registration and Event Registration

Season Registration

Funds go to REC Foundation and help cover costs of the program including:

- Coach and Event Partner Support and Training
- Competition Design and Rule Development
- Scoring Software
- Judging Rubric and Volunteer Training
- ...and more

\$200 Per Team

Most organizations have multiple teams.

Event Registration

Funds go to the person/organization hosting the competition and help cover costs including:

- Venue Rental
- Competition Fields
- Audio/Video Equipment
- Trophies
- Volunteer Lunches
- ...and more

Typically \$50 - \$100 per team per event - varies by

region

PRO TIP: You can host your own event as a fundraiser to support your teams.

Registration

Ready to be part of our mission?

- 1. Purchase your Drones at <u>Robolink.com</u>
- 2. Purchase Field and Game Elements at dronecompetitiongates.com
- 3. Register your Teams at <u>RECFevents.org</u>
- 4. Complete a background check.
- 5. <u>Create teams</u> of students (3-5 students per team)
- 6. Bookmark <u>REC Library</u> for loads of resources
- 7. Register your teams for a Local Competition
- 8. Ask us about hosting your own event
- 9. <u>Volunteer</u> at an Event! You will learn so much by being a referee or judge and take that information back to your own team



10. Have fun!

HELP AND SUPPORT AFTER YOU REGISTER YOUR TEAMS

Aerial Drone Competition I Robotics Education & Competition Foundation

Help and Support

We are here to help!

- <u>REC Library</u>
 - Hundreds of short articles sorted by Coaches and Teams, Competitions, Equipment and More
- Your Regional Support Manager
 - \circ $\,$ Call, email or text us
- Competition Manual and Resources
 - **Mission 2026** Competition Manual **coming soon!**
 - Training and Certifications
 - Judging Rubrics and Resources
 - Score Sheets
 - Inspections and Checklists
 - Field Element Set up Video
- Robolink
 - Robolink help section
 - o <u>Support</u>



First Steps

AERIAL DRONE

Getting Started with the CoDrone EDU

Have your students complete the <u>Getting Started Lessons</u> at Robolink to become familiar with the drone and then take the <u>CoDrone EDU Pilot Quiz</u>







Email drones@recf.org

Website drones.recf.org

REC Library adc-kb.recf.org

> Follow Us Facebook Instagram LinkedIn

CONTACT US

Get In Touch



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