

MISSION 2025

GRAVITY

SEASON KICKOFF

WEBINAR

SEPTEMBER

18 AND 19




SEPT

20

24

Hosting a Competition

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



AERIAL *DRONE*
COMPETITION





AERIAL *DRONE*
COMPETITION



Topics in this session:

- Why Host?
- Budgeting
- Layouts, Agenda, and Match Cycle Times
- Tournament Manager Software and Electronics
- Volunteers
- How to Get Started

The background features a light gray gradient with several large, overlapping geometric shapes. On the left, there are three nested, rounded triangular shapes pointing right, in shades of gray. On the top right and bottom right, there are green shapes, including a triangle and a larger rounded shape, all with white borders.

THE DRONE SUPPORT TEAM

Aerial Drone Competition | Robotics Education & Competition Foundation



Nadine Amaya

Regional Support Manager
South Central and West
nadine_amaya@recf.org



Shelli Brasher

Regional Support Manager
North Central and Southeast
shelli_brasher@recf.org



Louann Cormier

Regional Support Manager
Northeast
louann_cormier@recf.org



Lisa Schultz

Regional Support Manager
International
lisa_schultz@recf.org

Aerial Drone Competition

Meet Our Team

Your Regional Support Managers are here to help you in all aspects of competing in the Aerial Drone Competition.

Our Regional Support System

NADINE AMAYA

West & South Central Regions

SHELLI BRASHER

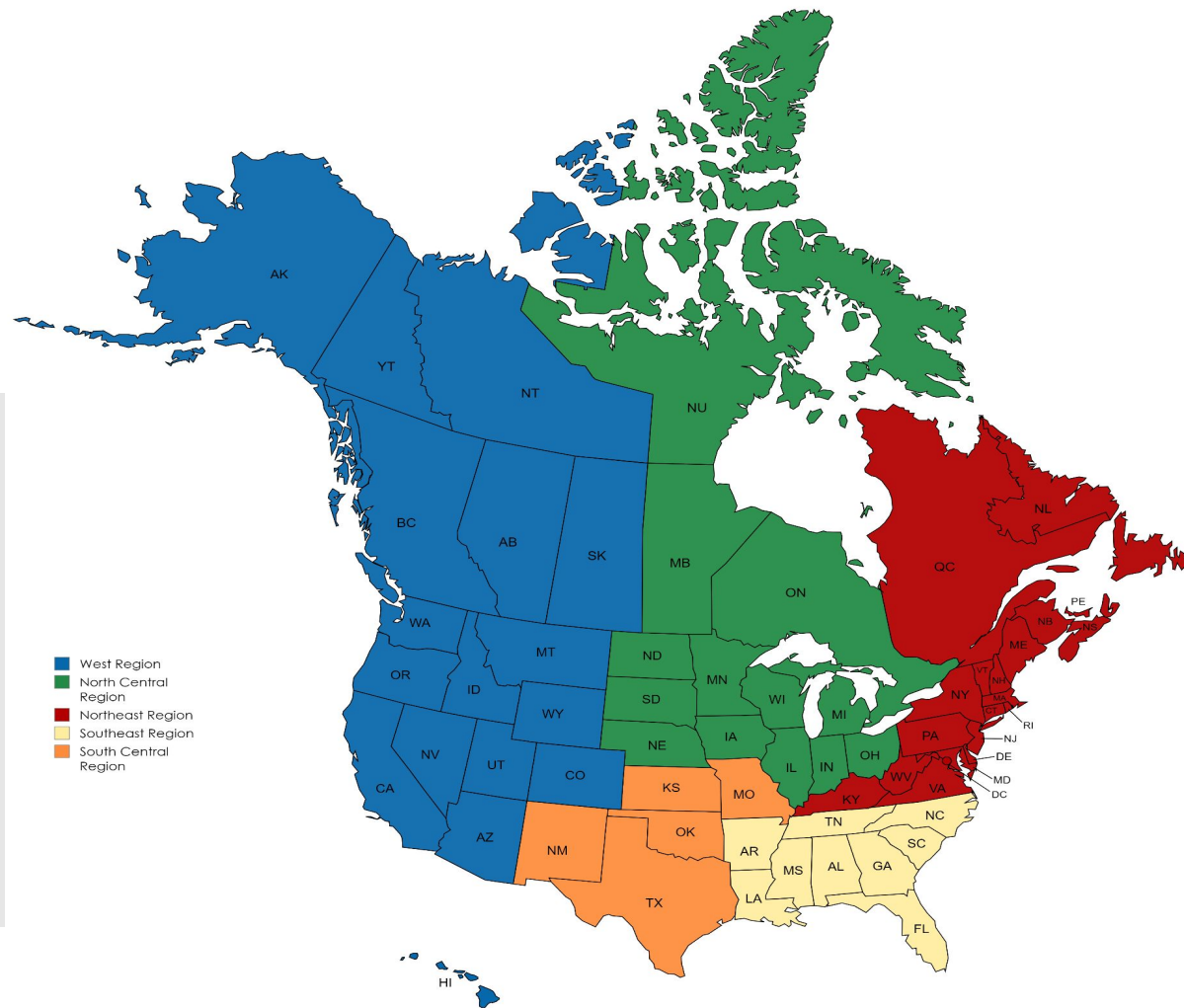
North Central & Southeast Regions

LOUANN CORMIER

Northeast Region

LISA SCHULTZ

International Regions



Disclaimer

These slides (and associated webinar) are for training and reference only. Referees must understand and follow all rules as posted in the Competition Manual and the Official Q&A. Event Partners must follow all rules in the Qualifying Criteria, Official Q&A, and Commitment to Event Excellence (CEE).

In case of any discrepancy in this training document or webinar, the Competition Manual and official Q&A are the only places for official rulings.





WHY HOST?

Aerial Drone Competition | Robotics Education & Competition Foundation

Hosting Builds a Community

Support local Aerial Drone Competition teams

Host a local event to support your local teams and build a community of drone enthusiasts.

Events are a great way to showcase all the program has to offer and raise funds and awareness to the program as a whole.



Factors to Consider

Is becoming an Event Partner for you?

Checklist and asks

- ☐ Is there a need for an event in your area?
- ☐ Do you have a venue?
- ☐ Do you have volunteers and support?
- ☐ Do you have access to equipment?
- ☐ Do you have time to engage in this project?

[Resource Library](#)



Event Registration

Cost Considerations

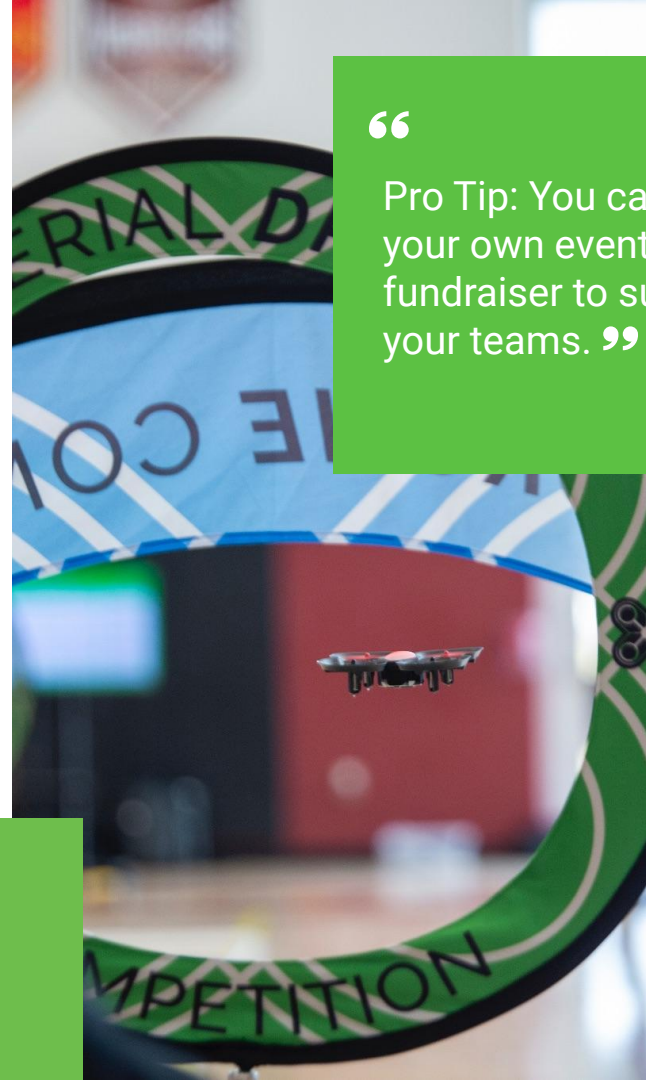
Funds go to the person/organization hosting the competition and help cover cost including:

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

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.”



Event Types

Tournaments (Most Popular)

Tournaments are qualifying events

- Typically one day events
- Includes all 4 Missions:
 - Teamwork
 - Piloting Skills
 - Auton Skills
 - Communications
- Certified Head Referee and Judge Advisor
- Designated awards will qualify winners to a championship event
- Follow all rules in the Qualifying Criteria, Competition Manual, and Official Q&A

Scrimmages

Scrimmages are non-qualifying events

- Can be a full day or a few hours
- Provides a less formal opportunity for teams to play and practice. (Also for tournament staff to practice)
- Scrimmage results do not upload to RobotEvents.com.
- May or may not include all 4 Missions
- Does not require Certified Officials
- Winners will not advance to a championship
- Results are not uploaded to Robotevents.com

Workshops and Camps

Workshops include camps, virtual or in-person training, and STEM activities. Some workshops are designed specifically for EPs or volunteers, while others may be for student participants.

ASK ME ABOUT GIRL POWERED!



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.

1

Teamwork

Drones are piloted by students. Two teams fly together to maximize their score

2

Autonomous Flight

Drones programmed by student to operate entirely autonomously. Each team competes alone to score as many points as possible in a 1 minute match.

3

Piloting

Drone is piloted by student to fly through obstacle course. Each team competes alone to score as many points as possible in a 1 minute match.

4

Communications

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

BUDGETS

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Budget

Game-related Equipment

- Does the organization have access to needed game equipment, such as fields and elements?
- Costs of any needed electronics? This includes computers, tablets, projectors, routers, cables, monitors, printers, power strips, extension cords, etc.
- Make sure you arrange for any trophies you will need for the awards you intent to offer.

Venue-specific Items

- Are there rental or facility fees?
- Are there custodial or security services required?
- Are there costs required for event insurance?
- Is wi-fi available or will hot spots need to be purchased?

Supplies

- Office supplies - paper, toner, pens, clipboards
- Volunteer supplies: referee shirts, t-shirts (optional), snacks, lunch and water
- Concession stands - great way to raise additional funds

“Pro Tip - Teams will need wifi to run their programming code”



AERIAL **DRONE**
COMPETITION



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.

\$1,000

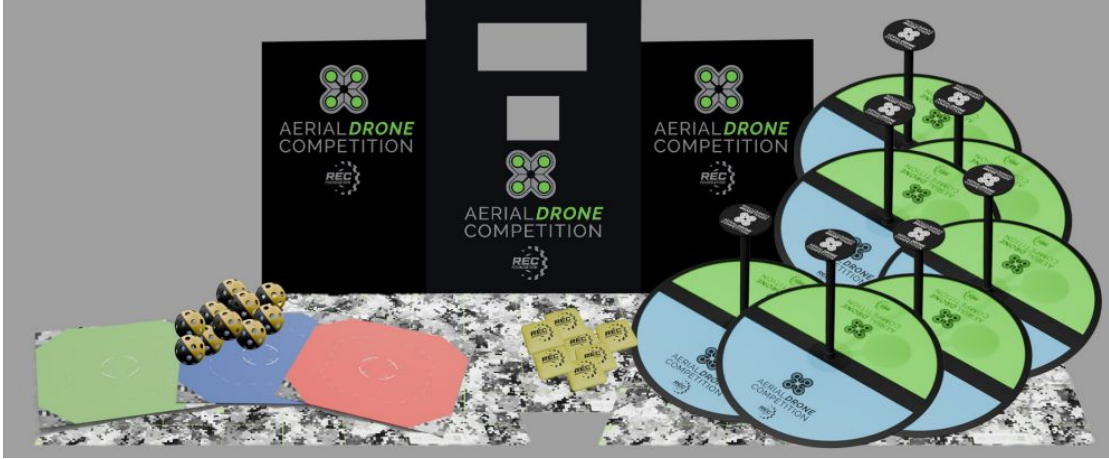
Field Element Kit - \$1,000 and includes:

- 3 Sets of Arch Gate Hardware
- 5 Fabric Arch Gates (2 Red, 2 Blue, 1 Screen)
- 2 Keyhole Gates (1 Yellow, 1 Green)
- 2 Landing Pads (1 Red, 1 Blue)
- 2 Cubes 12" (1 Red, 1 Blue)
- 2 Cubes 18" (1 Red, 1 Blue)



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.**
New Game Elements for Mission
2025 are shipping out now.

\$350

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.

\$200

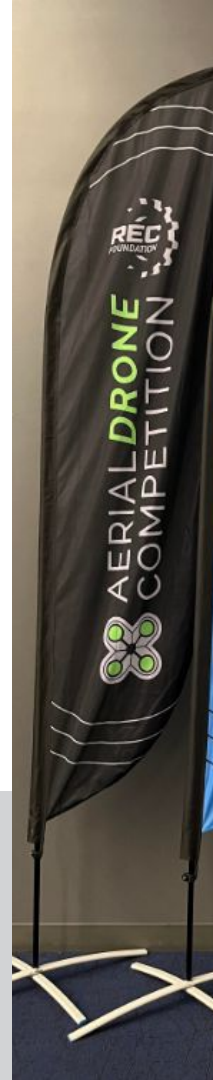
Equipment

Tournament Extras

Done Competition Gates

Alliance Flags

Set of 3
\$150 plus shipping



Trophies

Trophy pack (8)
\$200 plus shipping

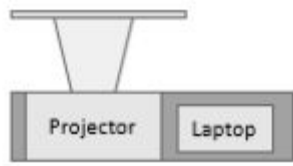
Trophies - EPs can purchase these trophies, design their own, and/or use award certificates in TM



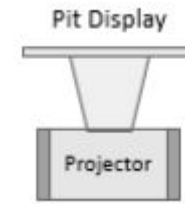


LAYOUTS, AGENDA AND MATCH CYCLE TIME

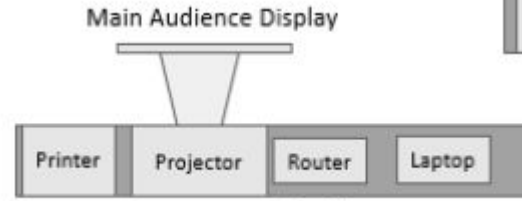
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Typical High School Gym = 110 x 60



Teamwork Fields
Queuing



Head Table

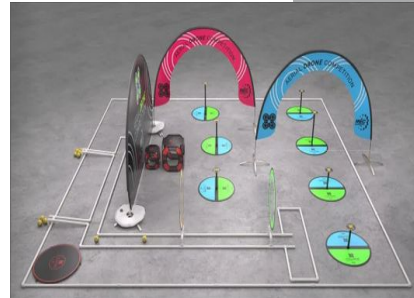
Skills Fields
Queuing



15'

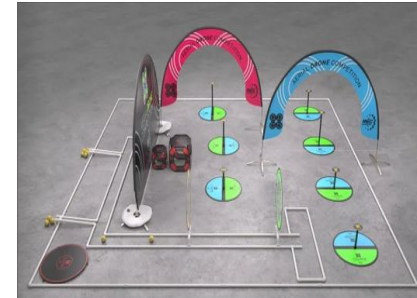
20'

Skills Field approx
16' x 13'



10'

Teamwork Field approx 20'x20'

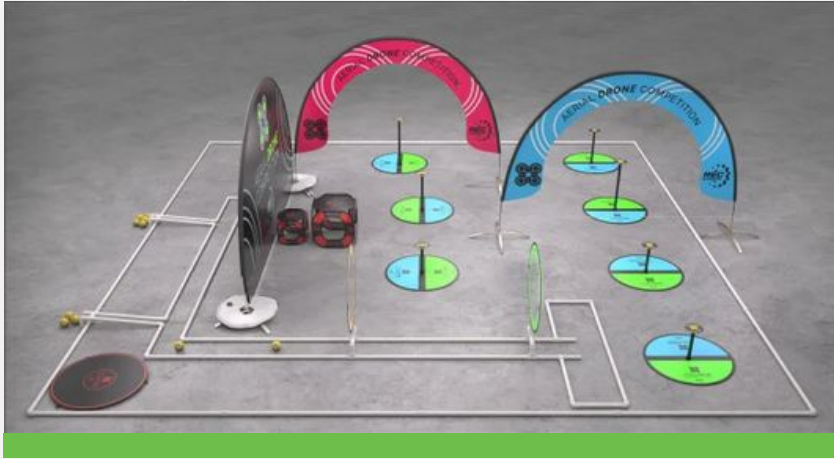


12'

Teamwork Field approx 20'x20'

Audience Area

Each team should also have a dedicated work space to charge batteries, keep spare parts, work on programming and have snacks. Each team's "PIT" should have a table, chairs and access to power. The "Pit Areas" may be in the same room as the event, or in a nearby space, such as a hallway, auxiliary gym, or cafeteria.



Teamwork Field Layout



Skills Field Layout

MISSION 2025

GRAVITY

*Mission 2025: Gravity
Competition Manual*



MISSION 2025
GRAVITY



Mission 2025: Gravity Competition Video

*"To have a sport that's related to
skills needed right now for jobs
that are emerging is awesome."
-Coach Kovach*

What's New for Mission 2025

- **Challenges with Higher Levels of Difficulty** – Game Design offers task challenges of varying difficulty to welcome new pilots and challenge returning teams.
- **Updated Award Names to better reflect Missions** – All-Around Champion, Communications Mission Champion, Judges Award, Coding Award, and Airmanship Award
- **Updated Rubrics** – More focus on aviation terminology, drone flight principles, drone programming, flight safety and communication
- **Drop lowest Teamwork match score** - New Rule added: The lowest score will be dropped after 6 teamwork mission matches.
- **Autonomous Flight Mission Reset** - One reset of drone during mission to give teams opportunity to complete more autonomous flight tasks and encourage more coding.
- **REC Library Resources** – Total revamp of library articles
- **New Certification Courses** – Coach, Event Partner, Judge, and Head Referee Certifications

Sample Competition Agenda (18 Team Event)

7:30 AM - Doors Open

7:45 AM - Team Check in, Inspections Begin

8:00 AM - Piloting Missions Begin

9:00 AM - Piloting Mission Ends

9:00 AM - Flight Team Meeting and Match Schedule Created

9:30 AM - Teamwork Matches, Autonomous Flight Mission and Judging Begins

12:00 PM - Lunch

12:30 PM - Teamwork Matches, Autonomous Flight Mission and Judging Resume

1:30 PM - Teamwork Matches, Autonomous Flight Mission and Judging End

1:45 PM - Alliance Sections

2:00 PM - Finals and Awards

3:00 PM - Event Ends

Suggested numbers of fields

- Teamwork Mission Fields: 1
- Skills Mission Fields: 2

Approximate time needed to complete

- Piloting Skills Mission: 1 Hour
- Autonomous Flight Skills Mission: 2 Hours
- Teamwork Mission: 3 Hours
 - 8 Matches and 3 minute cycle time
- Alliance Selection, Finals Matches and Awards: 1 Hour

Sample Competition Agenda (24 Team Event)

7:30 AM - Doors Open

7:45 AM - Team Check in, Inspections Begin

8:00 AM - Piloting Missions Begin

9:00 AM - Piloting Mission Ends

9:00 AM - Flight Team Meeting and Match Schedule Created

9:30 AM - Teamwork Matches, Autonomous Flight Mission and Judging Begins

12:00 PM - Lunch

12:30 PM - Teamwork Matches, Autonomous Flight Mission and Judging Resume

2:30 PM - Teamwork Matches, Autonomous Flight Mission and Judging End

2:45 PM - Alliance Sections

3:00 PM - Finals and Awards

4:00 PM - Event Ends



Suggested numbers of fields

- Teamwork Mission Fields: 1 - 2
- Skills Mission Fields: 2

Approximate time needed to complete

- Piloting Skills Mission: 1 Hour
- Autonomous Flight Skills Mission: 2.5 Hours
- Teamwork Mission: 4 Hours
 - 8 Matches and 2.5 minute cycle time
- Alliance Selection, Finals Matches and Awards: 1.5 Hours

Sample Competition Agenda (36 Team Event)

7:30 AM - Doors Open

7:45 AM - Team Check in, Inspections Begin

8:00 AM - Piloting Missions Begin

9:00 AM - Piloting Mission Ends

9:00 AM -Flight Team Meeting and Match Schedule Created

9:30 AM - Teamwork Matches, Autonomous Flight Mission and Judging Begins

12:00 PM - Lunch

12:30 PM - Teamwork Matches, Autonomous Flight Mission and Judging Resume

3:30 PM - Teamwork Matches, Autonomous Flight Mission and Judging End

3:45 PM - Alliance Sections

4:00 PM - Finals and Awards

5:00 PM - Event Ends

Suggested numbers of fields

- Teamwork Mission Fields: 2-3
- Skills Mission Fields: 2-4

Approximate time needed to complete

- Piloting Skills Mission: 1 Hour
- Autonomous Flight Skills Mission: 3.5 Hours
- Teamwork Mission: 4 Hours
 - 8 Matches and 2 minute cycle time
- Alliance Selection, Finals Matches and Awards: 1.5 Hours



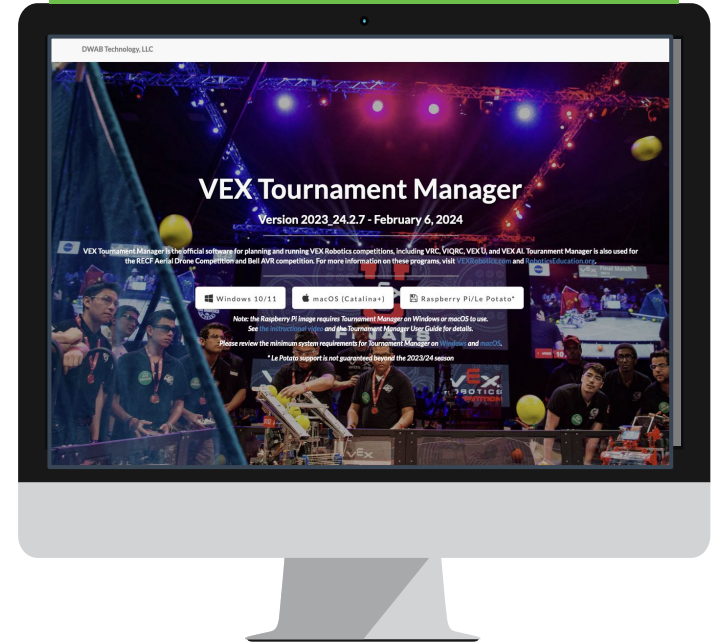
TOURNAMENT MANAGER AND ELECTRONICS

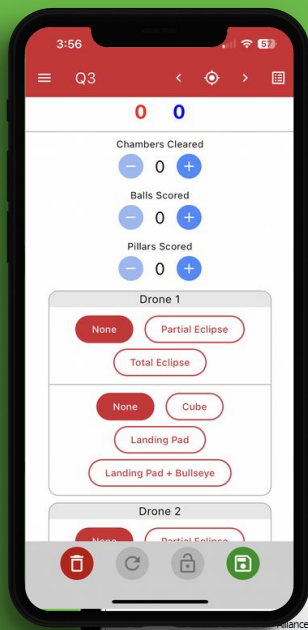
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Tournament Manager Software - FREE

- **Tournament Manager (TM):** Records scores, assigns awards, runs timers, and displays information at events.
- **Scalable Functionality:** Adapts to event size and feature needs.
- **Tournament Manager Server:** The computer running TM with event setup.
- **Limited Mode:** TM can run with restricted features as a standalone display or check-in interface.
- **Customizable:** Add sponsor logos to displays
- **Printables:** Team List, Emcee Notes, Pit Signs, Certificates, and more

Download the free software:
<https://vextm.dwabtech.com/>



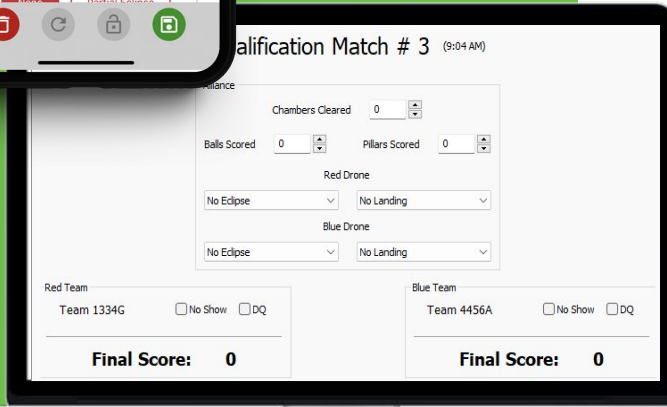


Main Functions of Tournament Manager

Ease in Scoring

Use tablets and connect to Tournament Manager wirelessly for starting and stopping matches, entering scores for teamwork matches and skills runs, and entering award winners.

- Scores are entered either manually or with the [VEX TM Mobile Scoring APP](#)
- Results are automatically posted to [robotevents.com](#) when an event is uploaded



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Qualification Match List

Eclipse Launch

Match	Field	Time	Red	Blue
Q1	Main Field	Tue 9:00 AM	1245P	1045G
Q2	Main Field	Tue 9:02 AM	1996E	2007A
Q3	Main Field	Tue 9:04 AM	1334G	4456A
Q4	Main Field	Tue 9:06 AM	1406N	2145A
Q5	Main Field	Tue 9:08 AM	2445E	1756P
Q6	Main Field	Tue 9:10 AM	2267E	8675A
Q7	Main Field	Tue 9:12 AM	1145A	1345A
Q8	Main Field	Tue 9:14 AM	5676A	1623D
Q9	Main Field	Tue 9:16 AM	9567A	3435A
Q10	Main Field	Tue 9:18 AM	134G	7453A
Q11	Main Field	Tue 9:20 AM	6567A	1835E
Q12	Main Field	Tue 9:22 AM	2245A	1534E
Q13	Main Field	Tue 9:24 AM	4456A	
Q14	Main Field	Tue 9:26 AM		
Q15	Main Field	Tu		
Q16	Main Field	Tu		
Q17	Main Field	Tu		
Q18	Main Field	Tu		
Q19	Main Field	Tu		
Q20	Main Field	Tue 9		
Q21	Main Field	Tue 9		
Q22	Main Field	Tue 9		
Q23	Main Field	Tue 9-4		
Q24	Main Field	Tue 9-4		

134G

Team 134G
Pembroke Academy
Pembroke, New Hampshire

AERIAL DRONE
COMPETITION

Page 1 of 1

EXCELLENCE AWARD

Is Presented To:

TEAM 134G
TAKE FLIGHT

Recognizing their efforts and accomplishments at the
Eclipse Launch on September 12, 2023

AERIAL DRONE

Main Functions of Tournament Manager Printed Reports

Printing

- Match Lists
- Signs
- Certificates
- Reports

“

Pro Tip - Have a good printer at the head table. Test is before the event and have an extra ink cartridge and paper.

”

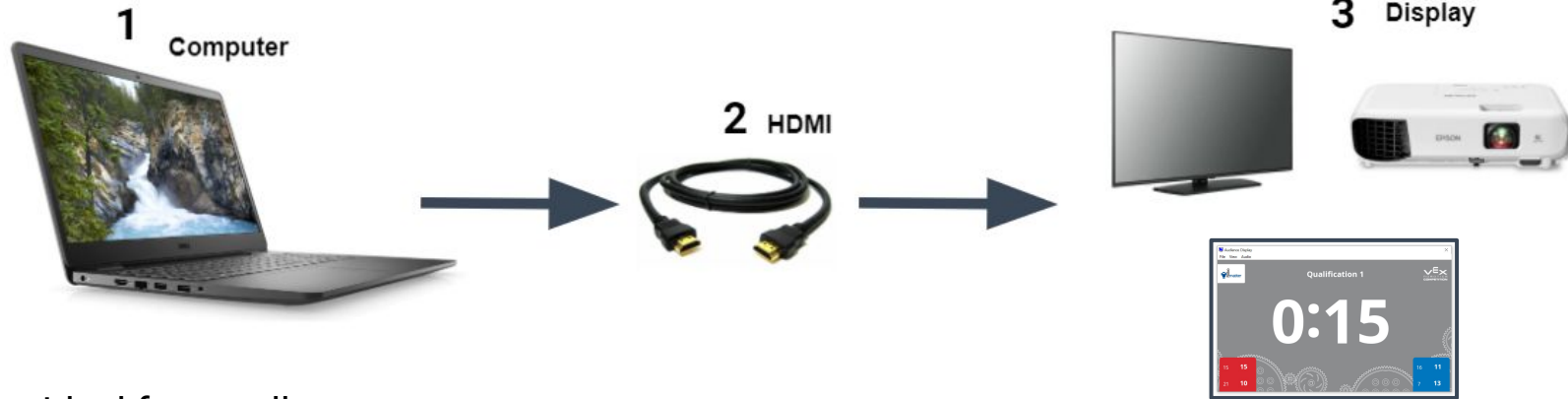


AERIAL DRONE
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Main Functions of Tournament Manager

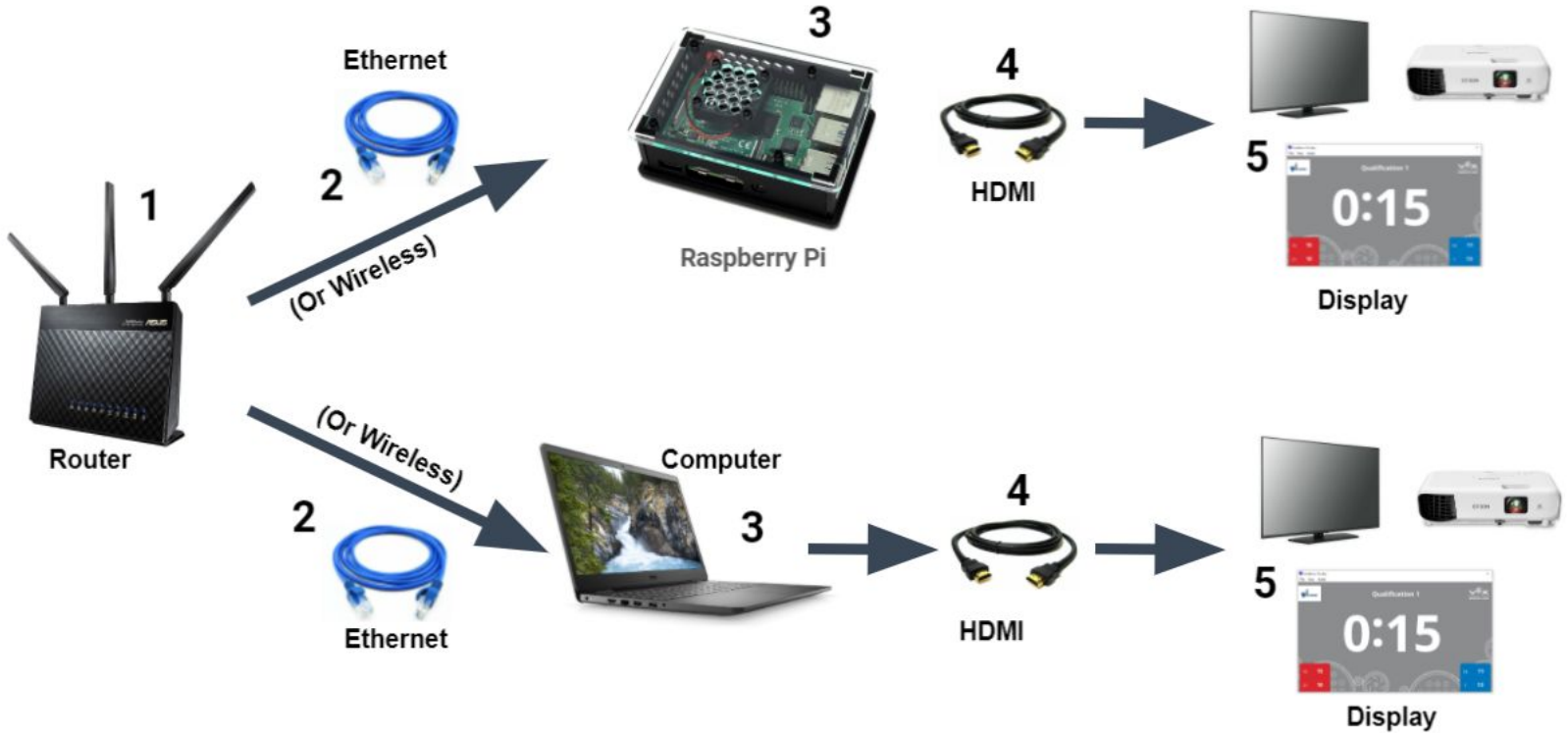
One Computer - One Display



- Ideal for small events.
- Computer: Runs Tournament Manager.
 - PC preferred
- 2nd Screen: Shows Audience Display, including timer, scores, and rankings.
 - Large TV
 - Projector and Screen
- TM Operator (Volunteer Role): Manages all displays.

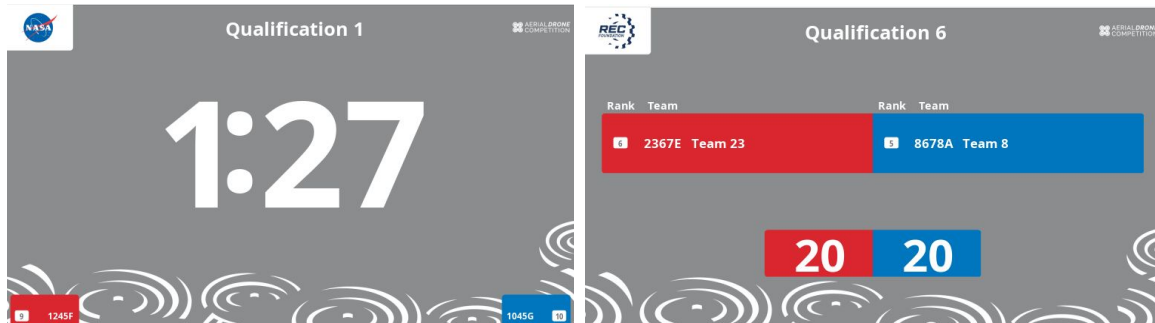
Main Functions of Tournament Manager

Router to Multiple Displays



Main Functions of Tournament Manager

Managing Displays at an event



Qualification Rankings				AERIAL DRONE COMPETITION			
Rank	Team	Matches	Avg Score	Match Schedule and Results			
1	1756F Team 17	1	32.00	Q1	1245F	1045G	5
2	2445E Team 24	1	32.00	Q2	1956E	2067A	10
3	2145A Team 21	1	25.00	Q3	1334G	4456A	4
4	1456N Team 14	1	25.00	Q4	1456N	2145A	Main Field
5	8678A Team 8	1	20.00	Q5	2445E	1756F	Main Field
6	2367E Team 23	1	20.00	Q6	2367E	8678A	Main Field
7	2067A Team 20	1	10.00	Q7	1145A	1345A	Main Field
8	1956E Team 19	1	10.00	Q8	5678A	1623D	Main Field
9	1245F Team 12	1	5.00				
10	1045G Team 10	1	5.00				
11	4456A Team 4	1	4.00				
12	1334G Team 13	1	4.00				
13	1145A Team 11	1	3.00				
14	1345A Team 2	1	3.00				
15	1835E Team 18	0	0.00				
16	95687A Team 9	0	0.00				
17	66567A Team 6	0	0.00				
18	2245A Team 22	0	0.00				
19	7453A Team 7	0	0.00				

Managing Displays at an Event

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

- Audience Display (Main Display)
 - Field Timer and Sounds
 - Match Scores
 - Alliance Selection
- Pit Displays (event information)
 - Team Rankings
 - Skills Rankings
 - Upcoming Matches



VOLUNTEERS

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Key Volunteers

Tip - Your **Key Volunteers** are your TEAM that is helping you run the event. These are people you know and can count on!

Head Referee

- Interprets and consistently enforces the rules of the game
- Trains and supports scorekeeper referees & field resetters

Judge Advisor

- Ensures all judging is done in compliance with the Judges Guide
- Trains and supports judges

Tournament Manager Operator

- Uses TM Software to initiate matches, record scores, and manage displays
- Works with Emcee to keep event flowing smoothly

Volunteer Coordinator

- Helps all Key Volunteers recruit and organize volunteers
- Supports Volunteer and Team Check in Stations
- Manages Hospitality room, lunches, and Thank-yous

Additional Volunteers

Volunteer Role	Number Needed	Tasks
Scorekeeper Referees	1-2 per field	Record and verify scores using paper score sheets or tablets. Discuss possible rule violations with the Head Referee after the match. Ensure the field is reset and drones are ready for the next match.
Emcee	1	Provides the play-by-play during the event and shares information between matches.
Judges	2 for every 8 - 10 teams	Evaluate student teams through interviews, Competition Logbooks and on field performance.
Queuers	1 per field plus one in Pit Area	Assist teams in
Team and Volunteer Check In	1 - 2	Welcome teams, volunteers and guests, direct people where to go, hand out materials and answer basic questions.
Field Resetters	1-2 per field	Help reset the field in between matches

Event Partner / Volunteer Coordinator

Recruiting Volunteers

Keep your volunteers happy!

- Food and Drink
- Comfort
- Recognition
- Tokens of Appreciation
- Handwritten Notes
- Social Media
- Follow up and stay in touch

Volunteer

Where to find Volunteers

- Parents, Teachers, School Administrators, Mentors, Local Drone and Robotics Teams, and Siblings
- Local Businesses and Sponsors
- Schools, Colleges, and Universities
- Community Groups, Organization Chapters, and Church Groups
- Online Resources - Social Media
- Employee Programs and Corporate Responsibility
- Connections in Aviation/Drone Industry

GET STARTED

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Drones in Action

NASA Langley Drone Competition

“To have a sport that’s related to skills needed right now for jobs that are emerging is awesome.”

-Coach Kovach

[Albuquerque Public Schools News](#)

[NASA Langley Aerial Drone Competition 2024](#)

It's not a race.
It's a challenge.
Take flight with the
Aerial Drone
Competition!



Becoming an Event Partner

First Steps

1. Contact your RSM or email drones@recf.org
2. Complete Background Check in RobotEvents.com
3. Request Event Partner account permission on RobotEvents.com
4. Complete the ADC Event Partner Certification Course (**Coming Soon**)
5. Post your event on RobotEvents.com
6. Complete the Event Partner Certification Course (**Coming Soon!**) [REC Library](#)
7. Gain Event Partner Experience, if possible. Volunteer at another event!
Take your Key Volunteers, too.

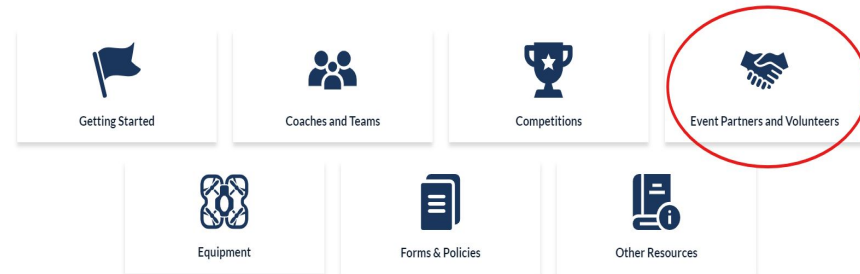
B.RECF.ORG

[K](#)

RECF Library

Event Planning Resources

[KB.RECF.ORG](https://kb.recf.org)



[Aerial Drone Competition](#) / Event Partners and Volunteers

Getting Started

Planning

Running Events

Tournament Manager

Volunteers

RobotEvents

EP Resources and References





Questions?



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COMPETITION





SEPT

20
24

Email
drones@recf.org

Website
drones.recf.org

REC Library
adc-kb.recf.org

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Thank You.



QUESTIONS?

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Reach out us at drones@recf.org