

Q&A

Aerial Drone Competition 2023-2024

Welcome to the official Aerial Drone Competition Question & Answer system, where all registered teams have the opportunity to ask for official rules interpretations and clarifications. This Q&A system is the only source for official Aerial Drone Competition 2023-2024 rules clarifications, and the clarifications made here from the Game Design Committee (GDC) are considered as official and binding as the written Game Manual itself.

Please review the Q&A Usage Guidelines before posting. This system is only intended for specific Aerial Drone Competition 2023-2024 rules questions.

- For event, registration, or other competition support questions, please contact your REC Foundation Manager.
 - For game questions, suggestions, or concerns outside of specific and official rules questions, contact drones@roboticseducation.org

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1646: Flight Team Member and Drone Interactions During Game Play

11-Sep-2023

G7 gives the manner in which flight team member may touch their drone if it has not completed takeoff. However, the game manual doesn't state if this is the ONLY circumstance that allows for human interaction, and makes no reference to how/if flight team members may retrieve/touch their drone if it becomes downed/flipped/entangled during gameplay. The same can be said for the piloting skills mission. Since the competition has an "IQ" theme to it, would it be allowable for teams to retrieve a drone that has encountered an issue (and hasn't been downed due to a violation or loss of control and out of bounds) and then return the drone to a legal starting position and then be able to continue gameplay? For teamwork, you could even require the alliance partner to hover in place in these instances. Or would this not be allowed at all? Thanks!

<G7> During a match, Flight team members may touch their own drone if the drone has not completed take off. If the drone has not taken off, then students may momentarily reach into the flight zone to retrieve their drone and troubleshoot. Common troubleshooting may include: a. Turning the drone on or off. b. Plugging in a battery. c. Pairing the drone to the controller. d. Making a quick repair. Once ready, the team should place the drone back into a legal starting position to re-enter the match.

Answered by committee

Per Rule <S2>, Teams are not allowed to break the plane of the field perimeter other than during the interaction allowed by rule <G7>

Rule <S2> Stay in the pilot station or visual observer stations and out of the field during a match. Once a drone is placed in a legal starting position at the beginning of a match, pilots and visual observers must stay in their pilot station or visual observer station until the referee gives the all clear. Flight team members should not break the plane of the field perimeter other than during the interaction allowed by rule <G7>.

1653: Legal Drones

18-Sep-2023

Just a confirmation needed here. The Parrot Mamba and CoDrone EDU are the only 2 legal stock drones. The new FTW Hopper drone is illegal, correct? Teams that utilize the "early adopter upgrade package" to transform their Mambas into Hoppers would be illegal as well, correct? And the use of the Parrot Mamba camera attachment is also illegal, yes? Thank you!

Answered by committee

Per <D1> Teams must use the Parrot Mambo or CoDrone EDU as their stock drone. All teams must use the Parrot Mambo or CoDrone EDU as their starting point. Teams must ensure that replacement motors, propellers and batteries are functionally identical to the equipment on the stock drone.

Per <D3> Drones must utilize stock drone electronics. Drones may not remove or otherwise modify any stock drone electronics.

Therefore any drone not listed in rule <D1> or changes to drone electronics, is not legal for the Aerial Drone Competition.

Per <G10> No electronic communication devices allowed...this includes any device that provides camera or video images.

Therefore the Parrot Mambo camera attachment is illegal.

1675: Flight Skill Mission <AM6> & <PM6>

3-Oct-2023

The manual (p50 & p59) related Flight Skill Mission's Keyhole Loop <AM6> & <PM6> #3 line says "UNDER" is that referring to going under the whole keyhole ring or just going through the center hole of keyhole ring again?

Reason they asked is because the Eclipse video shows it going through the ring while we think the manual meant to go under the whole keyhole ring?

<AM6> Keyhole loop.

To complete an keyhole gate loop, the drone must complete the following tasks in order before attempting any other tasks.

1. Earn points for flying through a keyhole gate (rule <AM5>)
2. Fly over the same keyhole gate in the opposite direction
3. Fly **under** the same keyhole gate again in the same direction as step #1

Answered by committee

Thank you for your question. This is a typo in the competition manual and will be updated in the next release. Drones need to fly **through** the keyhole gates.

The correct wording of Line #3 of rules <AM6> and <PM5> is

Fly **through** the same keyhole gate...

1709: Elimination Round continuation for teams

19-Oct-2023

What is the selection procedure for teams to move on in each round of elimination? If event has a quarterfinals round, is it always the top 4 scoring alliances that advance to the semifinal rounds as in the graph on pg.45? Are the next round alliance rankings based on previous elimination round score? or an alliances total elimination rounds Avg. Score? What would be the procedure if 3 teams in the semifinals are disqualified?

<TM22> Elimination matches are played sequentially in rounds. Each round of elimination matches is played sequentially, starting with the lowest ranked alliance. Rankings are recalculated after each round.

Answered by committee

Thank you for the question.

In reference to your question about the procedure of teams moving on in each round: Per rule <TM22> Rankings are recalculated after each round. We will add the following text rule <TM22> to the next game manual update to help clarify which teams advance.

At the end of the quarterfinal round, the alliances with the top 4 scores of the quarterfinal round will advance to the semifinals, and alliances will be ranked based on their scores from the quarterfinal round. At the end of the semifinals round, the alliances with the top 2 scores of the semifinal round will advance to the finals, and alliances will be ranked based on their scores from the semifinal round. In reference to your question about if multiple teams are disqualified:

An alliance that receives a disqualification in an elimination match receives a score of zero.

If there are not have enough alliances to move on to the next round due to scores of zero, or if multiple alliances are tied for second place after tiebreakers, then then the round will be repeated.

1736: <AM4><AM6> Fly "Over" Definition

31-Oct-2023

In the game manual, it requires the drone to fly "over" the gate and keyhole, does this "over" means the drone position has to be above the highest point of gate or keyhole? The reason I am asking is that the IR height sensor has 1.5m range, both the gate and keyholes are higher than 1.5m, so the drone won't be able to sensor the highest points of both elements. The team members have to come up something to work around this limitation. So they need to know the allowable positions during this fly "over". If they are allowed to fly "around" the element in a horizontal plane, what's the boundary?

Answered by committee

The intention of the rule is for the drone to complete a loop around the keyhole or arch gate. Because there is no definition or rule that specifies exactly where the loop must occur, as long as the drone has gone

1. Thorough the keyhole or under the arch gate
2. Around the keyhole or the arch gate
3. Back through the keyhole or under the arch gate a 2nd time

To further clarify, we have updated the word "over" to the word "around" in the November 1, 2023, competition manual update in rules <AM4>, <AM6>, <PM3>, and <PM5>.

1834: Clearing an area (Red/Blue)

18-Dec-2023

If a team clears an area of the colored (red/blue) balls, for example a team clears the red balls out and then a blue ball inadvertently goes into the red area, is the area still considered cleared?

Answered by committee

Per rule <TM1> "A chamber is considered cleared when there are no balls partially or fully in the chamber at the end of the match", therefore if there is a red or blue ball in a chamber at the end of the match, it is not considered scored.

1835: Autonomous Skills

18-Dec-2023

AM1 Set Up Color Mats - Does the 5 minute clock start before or after the roll of the dice and the placement of the mats?

Answered by committee

When the Team arrives at the skills field, the Referee will roll the die and start the 5 minute timer. The team will then place the color mats and in the correct positions, place their drone on Mat #1 and begin their first skills attempt.

1863: Piloting Skills Scoring (Land to earn all points?)

8-Jan-2024

For the Piloting Skills Mission, do you have to land/land successfully to earn points for all other previous tasks completed? Example: If a team completes steps 1-11, then goes back and repeats 2-6, but then runs out of time to land, do they still earn all their points for completing steps 1-11 AND 2-6, and simply lose the opportunity to earn landing points?

Answered by committee

For the Piloting Skills Mission, per the note in rule <PM9> "teams may leave the flight path to land on the landing pad at any time." Since the scoring description states that the "referee will score the match while the drone is flying" any tasks that are completed before the drone leaves the flight path will be scored.

Therefore if a teams completes steps 1 - 11 and then continues on to complete 2-6 in the 2nd round, and then lands on the landing pad and/or bullseye per rules <PM7> and <PM8>, the points for completing steps 1 - 11, completing steps 2-6, and landing the landing pad and/or bullseye bonus will be scored.

1874: Clarifications on AM9, AM11, PM7

14-Jan-2024

1. In <AM9> Repeating tasks, its said "Teams may repeat the arch gate and keyhole gate tasks to earn additional points, but may not use the same field element twice in a row."

Can the team just repeat couple tasks (say arch and keyhole tasks) as needed, and skip some tasks such as landing? Would that be ok?

2. In <PM7> Land on landing pad, the team is not assigned a color and compete alone. Can drone land on any color pad?
3. In <AM11>, drone can contact either the color mat or programming mat as shown in Figure 45. And display white light. What is the significance of color of starting mat? Do have to do anything special if starting mat was red/green/blue?

Answered by committee

In the future submit a separate Q&A for each question asked to help teams, coaches and referees find the answers quickly.

1. For the Autonomous Flight Skill Mission, it is expected that teams will choose some tasks and skip other tasks based on programming experience, therefore as long as all other rules are followed, teams may choose to complete tasks, not complete tasks and repeat tasks.
 2. In Piloting Skills Mission, teams may earn the "land on a landing pad and/or bullseye bonus" points for landing on either the red or blue landing pad.
 3. In the Autonomous Flight Skills Mission, you must set up both color mats per the rules <AM1>. Per Rule <AM7> teams may use "programming code to identify the color of a color mat."
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1880: <AM 9> auto flight scoring

18-Jan-2024

Team is questioning if they fly during Autonomous sense the color mate (pts) before take off (pts) fly under the arch (Pts) fly through the Keyhole (pts) , then reverse through booth features and fly back through arch (pts) and keyhole (pts), repeat this many times. As the rule in <AM 9> states you can score a field element more than once as long as it was not the last one scored. Example was fly under red arch (pts) fly under Blue arch (pts) repeat.

Answered by committee

A team can earn points for loops like the one you've described; however, if the same task is completed on the field element twice in a row, the 2nd will not score points.

1895: Competition

25-Jan-2024

Hello what do we need to bring to competition?

Answered by committee

The Official Q&A is used to answer questions and/or provide clarification about rules in the Competition Manual. Please read the usage guidelines at the top of this page for more details.

For any other questions, we suggest you reference the [REC Library](#) or reach out to our support team at drones@recf.org.

1906: Landing Cubes used for Teamwork setup?

29-Jan-2024

During the field setup for Teamwork, I was bit confused about which cubes to use. I initially thought it was the the large cubes but after a phone call discovered to use the small cubes. Could a note be added to the Game Manual in case someone else is confused as well?

Answered by committee

Thank you for your question.

The Larger Cubes are used on the Skills Field. The Smaller Cubes are used on the Teamwork Field.

1944: Legal to squat during teamwork?

8-Feb-2024

Our team was wondering if it is legal to squat to lower the eye-level (both feet will still be on the floor and the feet will be the only thing touching the floor) on the teamwork course to be eye-level with pillars? Also if it's legal to be squatting during the piloting challenge to be eye-level with the cubes?

Answered by committee

As long as team members are in the pilot and/or visual observer stations, there are no rules preventing teams from squatting.

1952: autonomous skills

12-Feb-2024

In autonomous skills challenge is it acceptable for a team to code their drone to fly under the first arch, through the first keyhole, loop back around the keyhole and back through the arch, and then continue going under the arch and through the keyhole repeating that pattern until time is up? I do not see anything that says we can't. The only thing I read is that teams can't do the same thing over and over like looping an arch, but can do can arch, keyhole, arch, keyhole, etc.

Answered by committee

Per Rule <AM9> Teams may repeat the arch gate and keyhole gate tasks to earn additional points, but may not use the same field element twice in a row. Therefore, it is acceptable to go under the arch and through the keyhole repeating that pattern as stated in your question.

1982: Repeating tasks (<AM9>)

1-Mar-2024

Take the following scenario in an autonomous mission: (1) The drone completes a loop around the green keyhole, ending on the far side. (2) The drone flies back through the green keyhole. It is now on the near side of the green keyhole. (This doesn't score any points under <AM9>.) (3) The drone flies through the yellow keyhole from right to left. (4) The drone flies back through the yellow keyhole from left to right. (5) The drone loops around the yellow keyhole and flies through it again from left to right.

Does the drone score points for looping around the yellow keyhole in (5)? One possible interpretation would be that it doesn't, because it scored <AM5> in (3), (4) scores nothing under <AM9>, and (5) would then not score under <AM6> because the drone went through the loop in the wrong direction. A more generous interpretation of <AM9> would allow (3) to be the disqualified instance of <AM5>, which would then make (4) score <AM5> and (5) score <AM6>.

Answered by committee

The intent of rule <AM9> is to prevent teams from programming their drone to fly back and forth or around and around the same obstacle. Therefore it is acceptable to complete both:

- <AM3> and <AM4> on the same element before moving on to another field element
- <AM5> and <AM6> on the same element before moving on to another field element

You may return to complete <AM3> and <AM4> and/or <AM5> and <AM6> again, once you have completed a task on a different field element.

1983: Can a team abort their program and still score points? (<AM10>)

1-Mar-2024

If a team must stop their autonomous drone before the program is designed to end, is this a violation of <AM10>? Does the team score points for the actions completed before the abort?

Answered by committee

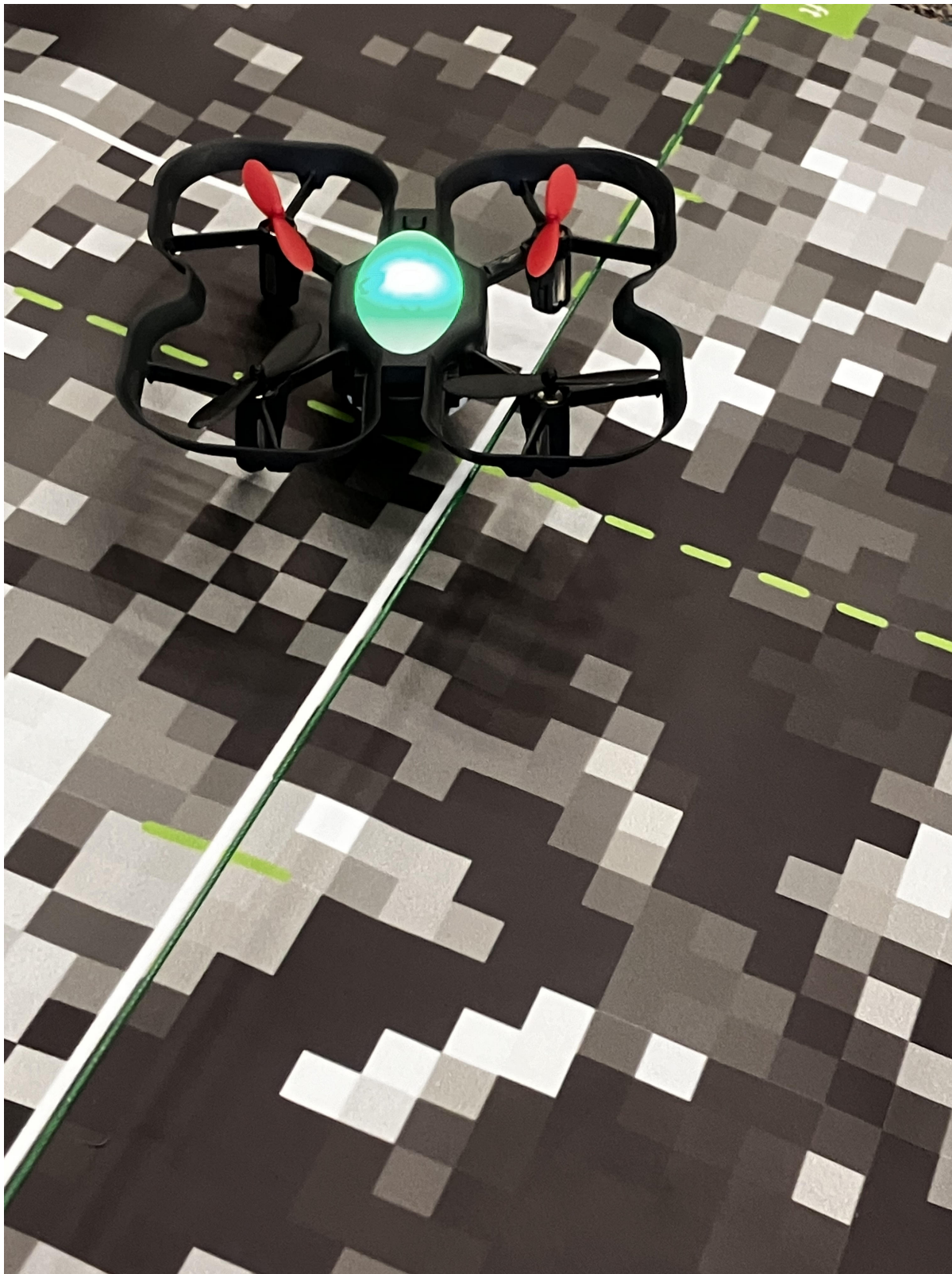
If a team must stop their autonomous drone before the program is designed to end, it is NOT a violation of <AM10> and any points before the run was aborted will count towards your score.

1984: What counts as a landing? (<AM8>)

1-Mar-2024

If a drone identifies a green color mat, then lands mostly in the square but partially on the blue arch gate tension wire (not touching the programming mat outside of the square), does it score points for landing? (Yes, this has actually happened to us) From <AM8>: A drone is considered to be landed in the square if:

1. The drone is contacting the area of the programming mat inside the white square. The white line is considered part of the square. In our scenario, the drone is touching the inside of the square.
2. The drone is not touching the programming mat beyond the white lines of the square. In our scenario, the drone isn't touching the programming mat outside of the square. It's *over* the mat outside of the square, but it's not *touching* that area because it's being supported by the tension wire.
3. The drone is upright. In our scenario, the drone is perhaps 15 degrees off vertical. Does this qualify as "upright?"
4. The drone has landed before the match timer reaches zero. In our scenario, there was plenty of time to spare.



Answered by committee

Rulings on specific edge cases, such as the ones you present, must be made by the Head Referee(s) for the Match based on their judgment and the larger context of the Match.

1985: When does autonomous timing start?

1-Mar-2024

Does autonomous timing begin:

1. When the Python code begins to execute
2. Once the Python code has connected to the controller (~1.5s after start of execution)
3. When the drone first starts to make actions (i.e. reading color sensor, spinning up props)

Answered by committee

The one minute timer for an autonomous run will begin as soon as the programmer selects run on their program.

1991: Starting Prop before match on CoDroneEDU

7-Mar-2024

Hello

Last year students were allowed to start the props on the CoDrone to help with the 3-4 second launch delay. Is this still allowed? We have not found any place that states you can not.

Answered by committee

There are no rules that prohibit teams from having the propellers spinning at the start of the match, therefore this is legal as long as the drone is on the ground in a legal starting position.

1993: Autonomous

7-Mar-2024

During Autonomus if team follows below steps then is it allowed? Step 1: Detect Color Step 2: Take - off Step 3: Go forward through Red Arc gate Step 4: Go forward through Key hole gate Step 5: Go reverse straight back through keyhole and red arc gate. Step 6: Repeat step 3, 4, 5 and 6 untill 60 seconds done.

Lets assume team finished Step 1 - One time Step 2 - One time Step 3, 4, 5 and 6 - 10 times (all 4 step 10 times)

How many points/score team will get?

Answered by committee

We are not able to provide exact scores on the Q&A based on scenarios. Please refer to the competition manual to calculate the score.

The intent of rule <AM9> is to prevent teams from programming their drone to fly back and forth or around and around the same obstacle. Therefore based on your scenario you would earn

Identify Color Mat - 15 points Take off - 10 points Under Arch - 5 points Through Keyhole Gate - 10 points Under Arch - 5 points Through Keyhole Gate -10 points Under Arch - 5 points Repeat this pattern It is also acceptable to complete both:

<AM3> and <AM4> on the same element before moving on to another field element

<AM5> and <AM6> on the same element before moving on to another field element

You may return to complete <AM3> and <AM4> and/or <AM5> and <AM6> again, once you have completed a task on a different field element.

1998: What happens if <AM9> is broken?

22-Mar-2024

If a team breaks <AM9> (either by accident, or by transiting through a field element that was just scored with on the way to somewhere else), what happens? Do they just not score points for going through that element, or does the round end?

Answered by committee

It a team breaks rule <AM9> (using the same field element in twice in a row), the team would not earn points for using that element and no additional points are earned until the drone completes a task on a different field element. Please read Q&A <https://www.robotevents.com/ADC/2023-2024/QA/1982> for more information about repeating tasks.

1999: Color mat 2 identification in autonomous flying

8-Apr-2024

Since Codrone Edu cannot identify the color of a mat without touching the mat, does this mean that the drone has to land on mat 2, then take off again and then landed on the final pad/square ?

Answered by committee

There are no rules prohibiting the drone from landing and taking off again during the autonomous flight mission. You are correct that the CoDrone EDU needs to land on the mat to detect color, therefore you would land on the mat, then take off again to land on the correct landing location.

Points for landing are only earned if all steps in <AM8> are completed.