



ROBOTICS EDUCATION & COMPETITION FOUNDATION

RADC Judge Guide

2020-2021

RADC
COMPETITION

FTU
ROBOTICS

For Coaches, Team Members, Teachers, and Parents

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Judging Overview

This Judge Guide is for RADC competitions sanctioned by the REC Foundation, including RAD Competition Worlds.

The Judge Guide describes the judged award criteria and informs the Judges, Judge Advisor, and Event Partner on their roles and responsibilities in the judging process. Additionally, this guide helps coaches and teams understand the judged award criteria and processes so they may improve their performance on judged awards.

Local qualifying events, and events that qualify teams directly to the RADC World Championship must follow the criteria and processes in the Judge Guide. Should anything in the Judge Guide contradict the Game Manuals or Qualifying Criteria Documents, the Game Manuals and/or Qualifying Criteria Documents will take precedence.

In the RADC Competitions, teams of students demonstrate their knowledge of the engineering design process by documenting their strategy, team communication, and design process in an Engineering Notebook.

Student led teams exhibit their skills and game strategy during match play and skills challenges. All these activities are to be completed by the students with minimal adult assistance. Students must make the decisions, complete the work, and demonstrate their learning and knowledge for their team to qualify for judged awards.

Judge Advisor Role

- The Judge Advisor must be an adult.
- Organize and oversee the judging process at an event.
- Solicit, assign and train the Judges to prepare them for an event.
- Use the Judge Guide for reference and to help train the Judges.
- Ensure judging is done in compliance with the Judge Guide.
- Ensure correct award winners are uploaded to Tournament Manager and manage presentation of awards.
- Protect the confidentiality of the judging process.

Judge Role

Judges can play multiple roles depending on the assignment, including:

- Review Engineering Notebooks.
- Judge presentations (online or in person).
- Observe teams on the competition floor.
- Interview teams in the judging interview area (the primary Judge role).
- Deliberate over awards selection as outlined in the Judge Guide.
- Present awards as needed (the Event Partner will decide who presents awards).

Event Partner Role

- The Event Partner oversees the operation of the entire event and provides support for the Judges and Judge Advisor.
- The Event Partner picks the Judge Advisor.
- The Event Partner must know and understand the role of the Judges and the Judge Advisor.
- Decisions on all judged awards are made by the Judges in consultation with the Judge Advisor.

Event Partners may not recommend or assign judged awards to any team.

Judging: Recruiting and Preparation

Overview

The Event Partner recruits the Judge Advisor and Judges 1-2 months before the event. Good sources include local professional or technical workers, employees of any event sponsors, teachers, school or district administrators, college students, and local service organizations. The two main skills required for a Judge is an interest in STEM and the ability to converse in a comfortable way with students.

For all RADC events, Judges must be adults. No students, except adult college students, are to be Judges. Anyone age 18 or older and not a high school student is considered an adult for RADC judging.

Pre-event Training

The Event Partner and Judge Advisor should agree on the process of recruitment and selection of the Judges well in advance of the event. The Event Partner and Judge Advisor should both have the contact information for the Judges.

The Judge Advisor should ensure that the following is sent to the Judges at least one to two weeks prior to the event to prepare for the volunteer role:

- The Judge Guide.
- Relevant Game Manual for RADC, game introduction video, one-page game description.
- A list of the judged awards for the event and/or the event page on RobotEvents.com.
- The REC Foundation Code of Conduct and Student-Centered Policy.
- An agenda for the event including expected arrival time and estimated departure time for Judges on the day of the event.
- Ask Judges to wear comfortable closed-toed shoes and comfortable business casual clothing that is team-neutral (i.e., does not show any team numbers or team branding).

All of the materials needed for Judges and the judging process should be provided by the Event Partner or Judge Advisor.

Pre-event Preparations

The Judge Advisor guides, and is responsible for, the judging process at the event. Therefore, it is necessary that the Judge Advisor know and understand the role of Judges and all aspects of the Judge Guide.

Two to three weeks prior to an event the Judge Advisor should:

- Review with the Event Partner the awards to be offered at the event.
- Ensure adequate Judges are recruited and confirm their attendance.
- Prepare a judging schedule based on the number of teams registered and the agenda for the event. The Judge Guide provides a sample judging agenda.
- Consult with the Event Partner on the process for Engineering Notebook submission at team check-in.
- Confirm the location of the separate Judges Room and that food/refreshments are provided.
- Ensure that you will have judging materials, including clipboards, pens, highlighters, Post-It notes, copies of the Judge Guide, Engineering Notebook Rubric, Team Interview Rubric, Awards Scoring and Ranking Sheets, Team Interview Tips and Sample Questions, and other needed items.

The Judge Advisor should do the following on the day of the event:

- Prepare the Judges Room.
- Train and orient the Judges prior to the start of the event.
- Keep a record of which teams have submitted Engineering Notebooks at check-in.
- Ensure Judges sign in on the Judge Sign-In sheet provided in the Judge Guide; also, monitor and manage any team affiliations or potential conflicts of interest noted by the Judges.
- Pair up Judges in teams.
- Print a team list and team schedule for each judging team; match schedules will be ready once check-in is complete.
- Assign Judges to teams to interview and ensure all teams are interviewed.
- Manage time and ensure judging teams are keeping pace to interview all teams on schedule.
- Lead deliberations for judged awards.
- Record the results of all judged awards and transmit the list of award winners to the Event Partner and Tournament Manager operator; also, have the Tournament Manager operator print the award scripts to be used at the award ceremony.
- Collect and destroy all judging materials to ensure confidentiality.
- Ensure the process for returning all Engineering Notebooks to teams is completed.

Judging: Orientation, Training and Scheduling the Day

Judges should check-in to the event as a volunteer and be directed to the Judges Room by the volunteer coordinator. Once in the Judges Room, the Judges will sign-in on the Judge Sign-in Sheet provided in this Guide and disclose any potential conflicts on that document. Once the Judges are gathered, the Judge Advisor should welcome the Judges, have them introduce themselves, and let them know where the refreshments and restrooms are located.

The Judges will engage in the following activities during the course of the event. The Judge Advisor will give the Judges a short outline for the day with specific times:

- Judges Orientation Meeting.
- Interview Teams and Sort Engineering Notebooks.
- (Approximately) Short Meeting to regroup.
- Working lunch to nominate teams for awards.
- Skills Challenges end time/Qualification Matches end time: Collect Rankings report.
- End Deliberations.

The Judge Advisor will cover the following at Judge orientation:

- The fundamentals of the judging process, including key sections of the Judge Guide.
- Review this season's drone challenge.
- Review and explain the Team Interview Rubric and the Awards Scoring and Ranking Sheet
- Read through the different sections of the Rubric so they have an understanding of how to record their observations; the team interviews and the Rubric will be covered more in depth in another unit.
- Explain how to interview teams at the judging interview area.
- Judges are paired in teams of 2 to go out and interview teams at the judging interview area.
- Use the Team Interview Tips and Sample Questions page to guide the team interview process.
- List the judged awards for the event, then read the descriptions for each of those awards.
- Review how to sort Engineering Notebooks; this is covered more in depth in a later unit.
- Review the day's schedule and explain when the meetings (i.e., check in and deliberations) are and what will be discussed at the meetings.

Make sure the Judges have a copy of the event agenda for the day.

Sample Judging Schedule for an event:

Sample Judging Schedule	
7:30 – 8:00 a.m.	Judge Advisor arrives, reviews awards offered, and gathers judging materials.
8:00 – 9:30 a.m.	Judges arrive and receive training. Judge Advisor assigns Judge Teams and assigns teams to be interviewed. Engineering Notebooks are reviewed, and Judge Teams begin team interviews.
9:30 – 9:45 a.m.	Judges should attend the Opening Ceremony.
9:45 – 11:30 a.m.	Judge Teams complete initial interview of assigned teams. Engineering Notebook Judges complete the Engineering Notebook rubric for the select notebooks that qualify.
11:30 – 12:30 p.m.	Working lunch – initial deliberations – each Judge Team identifies their top candidates for each award and uses Post-it® notes or white board to list teams under the award categories. Judge Advisor identifies teams that require follow-up interviews, especially for Flight Plan Award and High Flyer awards, and assigns Judge Teams for follow-up interviews.
12:30 – 1:30 p.m.	Judges observe teams in the competition area for follow up interviews and observation as necessary to complete rankings for each award category. If possible, several Judge Teams should visit with the top contenders for each award.
1:30 – 2:30 p.m.	Judges return to the Judges Room to conduct final deliberations and determine judged award winners.
2:30 – 2:45 p.m.	Judge Advisor oversees entry of judged award winners into Tournament Manager software.
2:45 – 4:30 p.m.	If possible, Judges attend finals matches and award ceremony. Judges may be asked to read an award script and announce a judged award winner if comfortable doing so.

Student-Centered Teams

The REC Foundation seeks to increase student interest and involvement in science, technology, engineering, and mathematics (STEM) by engaging students in hands-on sustainable and affordable curriculum-based robotics engineering programs across the U.S. and internationally. Judges play an important role in our efforts to ensure that our program remains student-centered. We believe that the student-centered model of learning is aligned with the REC Foundation’s mission and provides effective educational benefits to students.

Teams must be student-centered. There are a variety of definitions for the term “student-centered” in the educational community, and the REC Foundation would like to communicate a definition for student-centered that will apply for teams that participate in the RADC competitions to increase the transparency of the expectations and increase the student learning opportunities. The term student-centered is encompassed in both the learning and application settings for REC Foundation events and activities:

Student-Centered Learning: Students are actively involved in learning opportunities to increase their knowledge and skills in the engineering design process, mechanical design, programming, and teamwork under the guidance of adult mentorship.

Student-Centered Application: Students have ownership on how their drone is programmed, and utilized in match play with other teams and Skills matches.

Through observation and interviews with teams, Judges identify teams that are student-centered. These teams understand that the purpose of the program is to enhance the learning process, not to win at any cost. Judges shall give higher consideration to teams that favor the enhancement of student learning over teams that favor winning at any cost.

Judges, with input from event staff, should identify teams that are not student-centered. Teams that are not student-centered should not receive judged awards.

Additional information and guidance on student-centered teams is found in the REC Foundation's Student-Centered Policy:

➔ <https://www.roboticseducation.org/studentcenteredpolicy/>

Judging Concepts and Guidelines

Judges are in a position of trust. To ensure the judging process is an effective, equitable, and positive experience, it is important for Judges to understand these concepts and follow these guidelines:

- **Confidentiality:** The judging process includes frank discussions about teams. These discussions must remain confidential and Judges should take precautions to ensure that these discussions are not shared with or overheard by teams or other event participants.
- **Impartiality:** Proactively advise the Judge Advisor and Event Partner of any possible conflicts of interest and remove yourself from discussions and decisions in which you may have a personal interest. Event Partners may not recommend, advise, or assign judged awards to any team.
- **Engagement:** Demonstrate your full interest and involvement in discussions with students and your Judge Team by refraining from distractions such as phone usage or side conversations.
- **Youth Protection:** Do not be alone with students. Always work with at least one other Judge and two or more students. Do not meet with teams in a private space.
- **Discretion:** All written judging materials, including Judges notes, Rubrics, awards worksheets, etc., are to be given to the Judge Advisor for disposal after the event. None of these materials are to be given back to teams or given to the Event Partner. Judges should not discuss deliberations, awards, or judging with teams after an event. These discussions are easily misinterpreted or misunderstood by students, coaches, mentors, and parents. Please refer any inquiries about the judging process to the Judge Advisor.
- **Judgement:** Judges are expected to apply qualitative judgement when making final decisions on all judged awards. For example, the Engineering Notebook rubric is quantitative in nature, but Judges must deliberate and apply qualitative judgement when making a final decision on the Flight Plan Award winner.
- **Inclusion:** Only a limited number of teams at an event will earn a judged award. However, every team at an event should be interviewed by Judges regardless of their status for a Judged award.
- **Equitability:** No team shall be awarded more than one judged award at an event. Top teams often win drone performance awards in addition to judged awards.
- **Common Sense:** When reading and applying the rules, criteria, and processes in this document, please remember that common sense always applies.
- **Team Ethics and Conduct:** Ethics is an important part of every engineer's professional training and practice. The REC Foundation considers the positive, respectful, and ethical conduct of teams to be an essential component of the RADC competition. A team includes the students, teachers, coaches, mentors, and parents associated with a team. Judges will consider all team conduct when determining judged awards.

Overview of the Event Competition

The competition area is where matches and skills challenges take place. Should read the Judges should spend time observing teams in the competition area. Judges can validate statements made by teams during their interview and can evaluate their drone performance and game strategy. Additionally, Judges can assess a team's sportsmanship, energy, and enthusiasm while observing them in the competition area.

RAD Competition Game Description:

MATCHES are played on a 50' x 29' MARTIAN LANDSCAPE.

Two ALLIANCES, one "red" and one "blue" composed of two TEAMS each, compete in each :90 Second MATCH. The object of the game is to obtain a higher score than the opposing ALLIANCE by completing DOWNDRAFTS and moving MARTIAN ARTIFACTS to the CARGO SHIP.

The Awards Overview

There are two types of awards at REC Foundation-sanctioned RADC competitions:

- **Performance Awards:** Based on robot performance on the competition field in match play (Tournament Champion) and skills challenges (Robot Skills Champion). Judges do not determine performance awards. Team rankings on robot performance are considered by Judges when deliberating on the High Flyer Award (more details on the specifics of this process is covered in later sections).
- **Judged Awards:** Based on the award criteria in the Judge Guide. Judges, in coordination with the Judge Advisor, determine judged awards using the process outlined in the Judge Guide.

The High Flyer Award

The High Flyer Award is given to the top overall team. It is the highest honor given out in the RAD Competition. As a strong contender in numerous award categories, this team is a shining example of dedication, devotion, hard work, and teamwork. This team deserves to be recognized for building a quality drone program and a "team" committed to quality in everything that they do.

Key criteria:

- Engineering Notebook must be submitted (usually at team check-in).
- Ranking for Qualification Matches.
- Ranking for Skills
- Ranking for other judged awards.
- Quality of the team's interview with the Judges.
- High-quality drone program.
- Team conduct.

The Flight Plan Award

The Flight Plan Award is presented to a team that demonstrates an organized and professional approach in regards to project and time management. Additionally, the team members have worked together to document and implement a safe and efficient operation.

Key criteria:

- Engineering Notebook must be submitted (usually at team check-in).
- Engineering Notebook demonstrates a clear, complete, organized record of a safe and efficient operation.
- Team demonstrates effective management of time, talent, and resources.
- Team interview demonstrates effective teamwork, and professionalism.

The Modeling and 3D Printing Award

The Modeling and 3D Printing Award is presented to a team that demonstrates excellent use of 3D modeling of an original design, as a replacement part or additional parts(s) for the RADC drone.

Key criteria:

- Engineering Notebook is required
- Engineering Notebook is a clear, complete, and organized document, and has written evidence of design goals and/or engineering constraints (at minimum, the design should still allow the drone to pass inspection.)
- Written evidence of design work, calculations, and iterations.
- Evidence that the design was designed with 3D printing, assembly, and repair and/or replacement in mind.
- Use of renderings or drawings with appropriate dimensions and annotations, as well as physical prototypes to demonstrate the finished design.

The Flight Crew Award

The Flight Crew Award is presented to a team that can clearly explain their communication plan for both on and off the field.

Key criteria:

- Team can clearly explain their communication strategy
- The communication plan is evident by their on field performance
- Team clearly explains the team management process
- Students understand and explain how they worked together to develop their plan

The Mechanics and Control of Flight Award

The Mechanics and Control of Flight Award is presented to a team that has the most consistently high scoring and competitive drone.

Key criteria:

- Drone is consistently high scoring and competitive
- Drone programming is effective, successful, and consistent
- Students understand and explain how they worked together to develop their highly efficient flight plan

The Judges Award

The Judges Award is presented to a team that is most deserving of special recognition. Key criteria:

- Team displays special attributes, exemplary effort and perseverance at the event
- Team overcomes an obstacle or challenge and achieves a goal or special accomplishment at the event or at some time throughout the season
- Team distinguishes itself in some way that does not fit under other award criteria but nonetheless deserves special recognition
- Students demonstrate teamwork and effective communication skills

Judging: The Engineering Notebooks

Using the Engineering Notebook for Judged Awards

One of the primary missions of the REC Foundation is to help students acquire real world life skills that will benefit them in their academic and professional future. Following the engineering design process and creating an Engineering Notebook helps students practice and develop a variety of real-world life skills including project management, time management, brainstorming, communication, and teamwork. The engineering design process and the Engineering Notebook are used by engineering and design professionals in many different fields.

The engineering design process is iterative. Students identify and define a problem, brainstorm strategies and design ideas to solve the problem, test their ideas, and continue to improve their process until a solution is reached. During the engineering process, students will encounter obstacles, successes and failures, and learn many lessons. Everything a team does throughout the engineering process should be documented by the students in their Engineering Notebook.

All Engineering Notebooks should contain these elements:

- Team number on the cover.
- Errors crossed out using a single line (so errors can be seen).
- Notebook has not been edited.
- All pages intact; no pages or parts of pages removed even if they contained errors.
- Each page numbered and dated in chronological order.
- Each page is signed or initialed by the student author.
- Team meeting notes as they relate to their strategy and design process.
- Pictures, CAD drawings, documents, examples of code, or other material relevant to the design process are glued into the notebook (tape is acceptable, but glue is preferred).

Outstanding Engineering Notebooks should contain these additional elements:

- Table of contents.
- Each page is signed by a student witness as well as student author.
- First entry is the first team meeting, and each team meeting has an entry.
- Descriptions of brainstorming sessions.
- Descriptions, sketches, and pictures of 3D design concepts and the design process.
- Observations and thoughts of team members about their strategy, team communication, and the design process.
- Records of tests, test results, and evaluations of specific 3D designs or design concepts.
- Team organization practices as they relate to the design process.
- Project management practices including their use of personnel, financial, and time resources.
- Notes and observations from competitions to consider in the next meeting or event.
- Descriptions of programming concepts, programming improvements, or significant programming modifications.
- A person unfamiliar with the team's work would be able to recreate the 3D printed models or design/s based only on information in the Engineering Notebook.

Sorting the Notebooks

Follow steps 1-2 below to evaluate the Engineering Notebooks and identify the outstanding Engineering Notebooks.

1. Perform a quick scan of all the Engineering Notebooks and divide them into two categories: *Developing* and *Fully Developed*.
 - Developing Engineering Notebooks contain little detail, will have few drawings, and will not be a complete record of the design process. These are usually turned in by new teams without a fully developed robotics program. These teams will not be contenders for the Design Award. To save the Judge's time, the Engineering Notebook rubric will not be completed for these teams. However, the Engineering Notebooks should be retained for consideration of other awards.
 - Fully Developed Engineering Notebooks will contain much detail, will include detailed drawings, will include tests and test results, will include solutions to problems the team encountered, and will be a complete record of the design process. These are usually turned in by teams with a developed robotics program and a strong emphasis on the design process. These may be roughly the top 10 teams or top 30% of teams (whichever is larger).
2. Complete the first page of the Engineering Notebook rubric for the Fully Developed Engineering Notebooks and divide them into two categories: *Intermediate* and *Outstanding*. The Engineering Notebook rubric **MUST** be used for this evaluation:
 - Intermediate Engineering Notebooks will lack some details and will not be as complete as Outstanding notebooks.
 - Outstanding Engineering Notebooks will be a complete record of the team's engineering design process. Outstanding notebooks may be the top 5 teams or top 20% of teams (whichever is larger). A Judge Team shall interview the teams with Outstanding Engineering Notebooks. The Judge Team shall complete the Team Interview rubric immediately after the interview.

Judging: Team Interview Rubric and Award Scoring Sheet

Overview

The Team Interview Rubric is used for all team interviews. The Rubric has a 5-point scale to help you score the teams. Write the points in each row for the criterion that best describes the performance of the interview on each topic, then total the points.

Use the Team Interview Tips and Sample Questions in the Judge Guide to assist your team interviews.

Interview teams as assigned by the Judge Advisor. Interviews should be conducted in the Judging Interview area. All teams will be interviewed, but contenders for top awards may be cross interviewed by different judge teams.

Conducting Team Interviews:

- Complete the Team Interview rubric and Awards Scoring and Ranking sheet away from the teams you interview and not during the interview.
- Plan to interview one team every 10-15 minutes. Staying on schedule is important to ensure all teams are interviewed and there is sufficient time to conduct deliberations.
- Observe teams in the competition area during match play and skills play, with a focus on the teams you have been assigned to interview by the Judge Advisor.
- Identify student-centered teams with positive, respectful, and ethical conduct during the team interviews and team observations.
- Take notes during interviews and observations to support your evaluations and assist with deliberations.
- Immediately after interviewing a team rank them using the Awards Scoring and Ranking Sheets, complete the Team Interview rubric. Again, please complete the worksheets in private and not in front of the teams or during the interview.
- The Judges will deliberate after team interviews are complete to determine judged awards.

Judging Awards – Team Interviews

Where additional Judged Awards are offered at an event (beyond the High Flyer and Flight Plan Awards), the Judge Advisor will provide the Awards Scoring and Ranking Sheet to Judge Teams assigned to interview all teams. The Judge Teams will use both Team Interview rubric and the Awards Scoring and Ranking Sheet in interviewing teams.

Judges will write down the team numbers of the teams they are assigned to interview on the Awards Scoring and Ranking Sheet, and highlight the additional Judged Awards being offered at the event. The Judge Teams will then use the spaces provided to rank top contenders for each of the additional Judged Awards being offered at the event.

Teamwork, professionalism, interview quality, and team conduct shall be considered in scoring of all judged awards. Each time you meet a team, fill in a row of scores on the provided Awards Scoring and Ranking Sheet then rank each team for each award. Compare new teams to the teams you ranked previously and make notes for later use in deliberations.

The Code of Conduct

Team Ethics and Conduct

Ethics is an important part of every engineer's professional training and practice. The REC Foundation considers the positive, respectful, and ethical conduct of teams to be an essential component of any REC Foundation-sanctioned event. A team includes the students, teachers, coaches, mentors, and parents associated with a team. Judges will consider all team conduct when determining judged awards.

The REC Foundation Code of Conduct can be found here:

➔ roboticseducation.org/codeofconduct/

Feedback to Judges

Any conduct that may be a violation of the REC Foundation Code of Conduct shall be reported immediately to the Event Partner. The Event Partner will contact their Regional Support Manager to discuss the possible violation.

Any event volunteer may provide feedback to the Judges, Judge Advisor, or Event Partner about the conduct of teams, coaches, mentors, or parents using the "Field Note to Judges" form. Volunteers may report conduct such as a team that helps another by assisting in some other way. Volunteers may report conduct such as a team that is impolite or consistently late arriving to matches. Judges may also report issues, including circumstances where a team is not student-centered or there are behavior issues with adults.

Removal of Teams from Consideration of Judged Awards

The Event Partner should share any Field Notes to Judges by providing them to the Judge Advisor. The Judge Advisor may speak with the Event Partner, volunteer who reported the issue or other individuals at the event in considering negative reports on teams. When possible, the Event Partner will contact their Regional Support Manager to discuss the possible violation.

The Judge Advisor, in consultation with the Event Partner, may decide to remove a team from consideration for judged awards where: (1) the behavior is repeated or egregious; and (2) there is sufficient reasonable evidence to support the decision. The decision to remove a team from consideration for judged awards should be done with caution and with a reasonable benefit of the doubt given to the team.

Where a team has been removed from consideration of judged awards at an event, the Event Partner must inform the REC Foundation Regional Support Manager as soon as possible. The Event Partner must also follow up in writing (i.e., via email) with a summary of the issue and include the name(s) and contact information of the Judge Advisor, team information, and any relevant information for the REC Foundation to review the matter.

The Do's and Don'ts of Judging

Judging is an exciting and rewarding process for both the Judges and the student competitors. While the process may initially feel overwhelming, focusing on making it a student-centered experience is key to the success of the program.

The Do's of Judging

Make sure teams receiving judged awards are student-centered. Students must do the majority of the work. Coaches, mentors, and parents may provide minimal assistance but may not do any of this work without students present and involved. Through observation and interviews with teams, Judges identify teams that are student-centered. These teams understand that the purpose of the program is to enhance the learning process, not to win at any cost. Judges shall give higher consideration to teams that favor the enhancement of student learning over teams that favor winning at any cost. Judges, with input from event staff, should identify teams that are not student-centered.

Positively engage with the student competitors. Smile and be warm and friendly towards the students. Demonstrate your full interest and involvement in discussions with students and your Judge Team by refraining from distractions such as phone usage or side conversations. Also, encourage parents and coaches to allow the students to answer all questions during the pit interviews.

Focus on qualitative assessments over quantitative assessments. While Judges will consider objective factors as a part of the judging process, the decisions on judged awards ultimately must be based on qualitative deliberations. Judges, under the guidance of the Judge Advisor, should focus on qualitative judgements when reaching consensus on judged awards.

The Don'ts of Judging

Don't have a real or perceived conflict of interest. Judges should not judge or interview teams that they have any affiliation with. Judges can judge at an event where they have teams, but they must disclose this proactively to the Judge Advisor and provide this information on the Judge Sign-in Sheet. The Judge Advisor will ensure that any Judge with a potential conflict is screened off of judging any teams they should not interview, and the Judge with the conflict should refrain from any participation in deliberations of that team or teams for which they have a potential conflict.

Don't ask the students personal questions during pit interviews. Do not be alone with students. Always work with at least one other Judge and two or more students. Do not meet with teams in a private space.

Don't look back at other events to see what teams have already qualified to higher levels. Judged awards given at each event are to be given based on the judging at that event. The Judge Advisor and Judges must refrain from looking at which teams may have won awards at previous events or which teams have already qualified to a state/regional/provincial/national championship or RADC Worlds in deciding judged awards.

Don't take the rubrics or judging materials with you or give them back to the team or coaches. The judging process includes frank discussions about teams and the documentation relating to the judging process must be protected from disclosure. These documents and discussions must remain confidential and Judges should take precautions to ensure that these documents and discussions are not shared with or overheard by teams or other event participants.

Don't "share the wealth" by re-allocating judged awards based on performance awards.

Judged awards must be decided based on the Judge Guide. Therefore, Judges should not know or look at which teams have won the Tournament Champions Award or Skills Champion Award when deciding on judged awards. For example, Judges should not change which team is given the High Flyer Award because a team won the Tournament Champions Award or Skills Award. Judged awards and performance awards must be done independently. A team is allowed to win performance awards and one judged award at an event.

Don't give more than one judged award to a team at an event. No team shall be awarded more than one judged award at an event. Top teams often win robot performance awards (e.g., Robot Skills Champion) in addition to judged awards.

Don't let the Event Partner give input or be part of deliberations for judged awards. This does not apply to instances where there is a reported Code of Conduct issue.

Judging: Deliberations

Overview

Deliberate for the award recipients under the guidance of the Judge Advisor. The Event Partner or Judge Advisor should print a copy of the Qualification Match Rankings and Skills Rankings for consideration during judging deliberations.

- Post or share your top ranked teams for each award as advised by the Judge Advisor. Typically, each Judge Team will post the top five teams for each award or 25% of the judged teams, whichever is greater. A white board, flip charts, or Post-it® notes may be used to post the top ranked teams underneath the award descriptions so they are visible to all Judges. Standard award descriptions are included at the end of the Judge Guide.
- Work cooperatively with other Judges to reach consensus on the award recipients. If the judges can't agree on which team should receive an award, then review and read the description of the award out loud, then look at the criteria for that award to help them make the decision. The Judge Advisor, time permitting, may send additional Judge teams out to cross-interview teams that are leading contenders for top awards.
- All deliberations should take place in the Judges Room. Deliberations include frank discussions about teams and are confidential. What is discussed in the Judges Room stays in the Judges Room. Only Judges are allowed in the Judges Room.
- Remove yourself from discussions involving affiliated teams or any teams that may present a conflict of interest.
- Share all questions or concerns with the Judge Advisor.
- Leave notes, rubrics, and all other judging materials with the Judge Advisor after deliberations. The Judge Advisor will destroy these materials as they are not to be returned to teams, the Event Partner, or anyone else.
- Do not discuss any judging or deliberations with any teams, the Event Partner, or anyone else. The judging process is confidential.

Judging Process

Note: A team does not have to be among the Teamwork or Tournament Champions or Finalists to receive the High Flyer Award but must be competitive in the qualification and skills rankings.

If No Teams Meet the Minimum Criteria for High Flyer or Flight Plan Award

There may be circumstances where the Judges should not award the High Flyer Award or the Flight Plan Award to any team at an event. This may happen when either no teams submit an Engineering Notebook, or no Engineering Notebooks meet the Engineering Notebook requirements. In either case, the minimum requirements for the High Flyer Award or the Flight Plan Award have not been met and therefore neither should be awarded to any team at the event.

The Event Partner must be notified as soon as possible if the High Flyer Award or the Flight Plan Award will not be awarded at the event. The results of the event cannot be published until the Event Partner adjusts the award configurations for the event.

The objective in not awarding High Flyer or Flight Plan Awards under these circumstances is:

1. To avoid situations where only one or two teams turn in notebooks that consist of a title page or very little content.
2. To avoid recognizing a team as excellent and worthy of emulation by other teams when no team has yet achieved at least the minimum level of excellence.

This is not meant to punish teams but rather to encourage them to improve. It is expected that these circumstances will be rare and only arise early in the season before teams have had time to organize themselves. If Judges decide not to award High Flyer or Flight Plan awards, the Judge Advisor should make an event-wide announcement and remind teams that the Engineering Notebook Rubric may be used as guides to help teams develop their notebooks.

Finalizing the Judged Awards at an Event

After deliberations for judged awards have concluded, the Judge Advisor will record the results of all judged award winners. The Judge Advisor should be careful to accurately record the team number and letter (e.g., Team 123A) for each judged award. The Judge Advisor should promptly inform the Event Partner when judging has concluded.

The Judge Advisor will bring the judged award results to the Tournament Manager operator and oversee the entering of the judged awards into the competition software. Some events may provide a tablet or computer for the Judge Advisor to personally enter the results of the judged awards. If this is the case, ensure another Judge reviews the entries for accuracy.

Awards Presentation: Once the award winners are entered into Tournament Manager, the Judge Advisor should obtain award scripts from the Tournament Manager operator or Event Partner for each judged award. The Event Partner will decide when the judged awards are announced and will typically ask the Judge Advisor to make some general comments on the judging. Judges and the Judge Advisor may be asked to present awards at closing ceremonies.

Return the Engineering Notebooks to the teams: This is usually done by placing the notebooks on a table in the competition area for teams to pick up their notebooks. The Judge Advisor should ensure the emcee announces where and when the notebooks can be picked up.

Confidentiality: Collect all written judging materials, including Judges notes, Rubrics, awards worksheets, and so on. After the event, the Judge Advisor should shred or destroy all of these materials. Under no circumstances are any of these materials to be returned to teams, coaches or the Event Partner.

Feedback to Teams: We celebrate the student-centered experience of competitive robotics, for which judges serve a key role. However, Judges should be cautious in giving individual feedback to teams as the judging process must maintain confidentiality. Judges should not discuss deliberations, awards, or judging with teams during or after an event. These discussions are easily misinterpreted or misunderstood by students, coaches, mentors, and parents. Please refer any inquiries about the judging process to the Judge Advisor.



Standard Award Descriptions for Judges Room

Overview

The following pages contain RADC award descriptions for use by Judges in the judging room. They list key criteria for each award and are useful in guiding the Judges' deliberations.

Not all events will give out all awards. Each Judge Advisor should consult with their Event Partner to determine which awards will be given out at an event. The Judge Advisor may then print the award descriptions that will be used for a specific event.

Judge Advisors may wish to print these descriptions in color and then laminate them or place them in plastic sheet protectors for use at multiple events.

High Flyer Award

is presented to the top overall team. It is the highest honor given out in the REC Foundation Aerial Drone Competition. Team is a strong contender in numerous award categories.

Key criteria:

- Engineering Notebook must be submitted.
- Ranking for Qualification Matches.
- Ranking for Robot Skills
- Ranking for other judged awards.
- Quality of the team's interview.
- High-quality drone program.
- Team conduct.



Flight Plan Award

is presented to a team that demonstrates an organized and professional approach regarding project management, time management, and team organization.

Key criteria:

- Engineering Notebook must be submitted.
- Engineering Notebook demonstrates a clear, complete, organized record of their safe and efficient operation.
- Team demonstrates effective management of time, talent, and resources.
- Team interview demonstrates their ability to explain their flight plan strategy.
- Team interview demonstrates effective teamwork, and professionalism.



Judges Award

is presented to a team that is most deserving of special recognition.

Key criteria:

- Team displays special attributes, exemplary effort and perseverance at the event
- Team overcomes an obstacle or challenge and achieves a goal or special accomplishment at the event or at some time throughout the season
- Team distinguishes itself in some way that does not fit under other award criteria but nonetheless deserves special recognition
- Students demonstrate teamwork and effective communication skills



Modeling and 3D Printing Award

is presented to a team that demonstrates excellent use of 3D modeling of an original design as a replacement part or additional part/s for their RADC drone.

Key criteria:

- Engineering Notebook is required
- Engineering Notebook is a clear, complete, and organized document and has written evidence of design goals and/or engineering constraints (at minimum, the design should still allow the drone to pass inspection.)
- Evidence that the design was designed with 3D printing, assembly, and repair and/or replacement in mind
- Use of renderings or drawings with appropriate dimensions and annotations, as well as physical prototypes to demonstrate the finished design



Flight Crew Award

is presented to a team with that can clearly explain their communication plan for both on and off the field.

Key criteria:

- Team can clearly explain their communication strategy
- The communication plan is evident by their on-field performance
- Team clearly explains their team management process
- Students understand and explain how they worked together to develop their plan



Mechanics and Control of Flight Award

is presented to a team that has built the most consistently high scoring and competitive drone.

Key criteria:

- Robot design is consistently high scoring and competitive
- Drone programming is effective, successful, and consistent
- Students understand and explain how they worked together to develop their highly efficient flight plan.





Field Note to Judges

MATCH#		DATE:	
TEAM Number			
TEAM Name			
School Name			

GREEN	Please tell the Judges what you have observed. This may be either positive feedback, which you want judges to know, or reporting a problem that you believe judges should be aware of during their confidential deliberations.	RED

Referee Emcee Volunteer	Print and sign full name: _____	TIME:	
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Team Interview Tips and Sample Questions

Judges need to talk to students, not adults. Occasionally enthusiastic adults may want to answer the Judge's questions. If this is encountered, politely remind the adult(s) that the Judges are there to interview the students.

- Help put the students at ease by asking them questions about their drone.
- Try not to ask yes or no questions. Encourage teams to elaborate on their answers.
- Be prepared to rephrase your questions. It is important to be mindful of differences in communication style. Also be mindful of students who do not speak the language you are using as their first language.
- Be aware of different age levels and approach students in an age appropriate way.
- Be sure all team members are present and include all team members in the interview.
- Being a Judge gives you a unique opportunity to impact students. They will be looking to you for positive reinforcement. Just a few words of encouragement can make their day.
- Be attentive to students and do not engage in other conversations during interviews.
- Take a picture of each team with their drone. This will help you identify teams and drones later during deliberations.
- After interviewing the team, mark the team list to indicate the team has been interviewed.

Questions

- Did your team turn in an Engineering Notebook? When did you start making entries?
- What is your plan or strategy for this year's game?
- Is your strategy effective? Does your drone contribute to scored points?
- How does your team work together and what are the members' roles?
- Explain your communication plan on and off the field?
- What drone and/or team challenges have you encountered? How did your team solve them?
- If you had one more week to prepare for an event, what would you do differently?
- Tell us about your drone's programming. Autonomous mode? Driver control mode? Who did the programming?
- Do you have any 3D printed models? (Note: 3D printing is a process, never completed)
- What changes did you make to improve during the season?