Section

8 THE TOURNAMENT

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8.1 OVERVIEW

Each Regional Competition and the Championship will be played in a Tournament format. Each Tournament will consist of three sets of rounds called Practice Rounds, Qualifying Rounds and Elimination Rounds. The purpose of the Practice Rounds is to allow each Team a chance to run its Robot on the Playing Field prior to the start of the competition matches. The purpose of the Qualifying Rounds is to allow each Team to earn a Ranking that may qualify them for participation in the Elimination Rounds. The purpose of the Elimination Rounds is to determine the event Champions.

In the Qualification Rounds, teams can be individually disqualified in a match. In the Elimination Rounds, a team disqualification will result in the disqualification of the entire alliance for that match.

For the Championship Event, teams will be split into four Divisions. Each Division will play exactly like a Regional Event and produce a Division Champion Alliance. Those four Alliances will then proceed to the Championship Rounds to determine the Grand Champion Alliance.

8.2 PRACTICE ROUNDS

8.2.1 Schedule

The Practice Rounds will be played all day Thursday. The Practice Rounds schedule will be available on Thursday morning. Practice Rounds will be randomly assigned. Each team will be assigned an equal number of Practice Rounds. At some events, additional rounds may be available on a standby basis. Each Practice Round will consist of a ten-minute period in which teams may operate their robot on the field. The first five minutes of each Practice Round will start with a 10-second autonomous period, and followed by a "free-form" session, in which the robots may be exercised to evaluate operational characteristics, gain driver experience, determine system robustness, etc. The second five minutes of each Practice Round will be conducted as a "match" with approximately two minutes for set up, two minutes and fifteen seconds of regular game play (including autonomous operations), and one minute to clear the field.

8.3 QUALIFICATION ROUNDS

8.3.1 Schedule

The Qualification Rounds will be played all day Friday and finish Saturday morning at approximately noon. The Qualifying Rounds will consist of a series of Matches, with an Arena Reset between each Match. The Qualification Rounds schedule will be available Friday morning.

8.3.2 Match Assignment

The Scoring System will randomly assign each team two Alliance Partners for each Qualifying Match played. All teams will play the same number of Qualifying Matches **except** if the number of teams in attendance is not divisible by six, the Scoring System will randomly select some teams to play an extra Match. For purposes of scoring, those teams will be called Surrogates for the extra Match. The qualification match schedule with the timing of the surrogate matches will be available Friday morning.

8.3.3 Match Qualification Points and Ranking Points

The combination of Qualification Points and Ranking Points enable the Scoring System to determine the seeding of teams at any point in time.

At the completion of each Qualification Match, each team will receive a win, loss or tie depending on the final score. Each team on the winning Alliance will receive two Qualifying Points. Each team on the losing Alliance will receive zero Qualifying Points. In the event of a tie Match Score, all six teams will receive one Qualifying Point.

The winning alliance teams will receive a number of Ranking Points equal to the un-penalized score (the score without any assessed penalties) of the winning or losing alliance, whichever un-penalized score is lower.

The losing alliance teams will receive a number of Ranking Points equal to their final score (with any assessed penalties).

In the case of a tie, all six alliance teams will receive a number of Ranking Points equal to their alliance score (with any assessed penalties).

A Surrogate team will receive zero qualifying Points and will not receive any Ranking Points.

A team is declared a no-show, and will be disqualified, if __no__ member of the team is in the alliance station at the start of the match. Teams that do not show up for a scheduled qualification match will receive zero (0) Qualifying Points (QP's) and zero (0) Ranking Points.

A disqualified team will receive zero Qualifying Points and zero Ranking Points. In the very unlikely case that all three teams on an Alliance are disqualified (DQ'd), all three teams on the winning Alliance would get their own score as their Ranking Points for that match.

8.3.4 Qualifying Score

The total number of Qualifying Points earned by a team throughout their Qualification Rounds summed together will be their Qualifying Score.

8.3.5 Ranking Score

The total number of Ranking Points earned by a team throughout their Qualification Rounds, divided by the number of Matches played, then truncated to two decimal places, will be their Ranking Score.

8.3.6 Highest Match Score

The Scoring System will keep track of the Highest Match Score earned by each team during the Qualification Rounds but this score will not be displayed.

8.3.7 Qualification Ranking

All teams in attendance will be ranked during the Qualification Rounds. If the number of teams in attendance is 'n', they will be ranked '1' through 'n', with '1' being the highest ranked team and 'n' being the lowest ranked team.

The Scoring System will use the following Ranking Method:

- Teams will be broken into Tiers based on their Qualifying Score. A Tier is made up of all teams with the same Qualifying Score.
- Within each Tier, teams will be sorted by their Ranking Score. *Note: Because your Ranking Score is derived directly from the Match Scores of the losing alliances in the matches you play, it is in*

your best interest to support your opponents and win by helping each alliance score as many points as possible.

- If any teams within a Tier have the same Ranking Score, they will then be sorted by their Highest Match Score.
- If any teams within a Tier have the same Ranking Score and the same Highest Match Score, then the Scoring System will sort those teams based on a random electronic coin toss.

8.4 ELIMINATION ROUNDS

At the end of the Qualification Rounds, the top eight ranked teams will become the Alliance Leads. The top ranked Alliances will be designated, in order, Alliance One, Alliance Two, etc., down to Alliance Eight. Alliances One through Eight may invite any team below them in the rankings that has not already declined any invitation to join an alliance. The Alliance Selection Process will consist of two rounds so that each of the eight-playoff alliances consists of three teams.

8.4.1 Alliance Selection Process

Each of the Alliance Leads will designate a student to be the Alliance Captain. Each remaining team will choose a student to act as Team Representative. Each Alliance Captain and Team Representative will proceed to the Playing Field at the designated time to represent her or his team. In descending order, each Alliance Captain will invite to join them, a team ranked below them in the standings, which has not already accepted or declined an invitation, to join an Alliance. The invited Team Representative will step forward and either accept or decline the invitation. If the team accepts, it is moved into that Alliance. If the team declines, it is not eligible to be picked again and the Alliance Captain extends another invitation to a different team. If an invitation from a top eight alliance team to another top eight alliance team is accepted, the team currently ranked ninth will move up to become the number eight alliance. If an invitation from a top eight alliance team to another top eight alliance team is declined, the declining team may still invite teams to join their alliance, however, it cannot accept invitations from other alliances. The process continues until Alliance Eight makes a successful invitation. The same method is used for each Alliance Captain's second choice except the selection order is reversed, with the eighth seeded alliance picking first. This process will lead to eight alliances of three teams.

8.4.2 Pit Crew – Elimination Rounds

Pit Crew: During the elimination rounds, extra team members are often needed to move team robots from the team's pit station to the queuing area and onto the playing field. For this reason, each alliance team is permitted to have three (3) additional "pit crew" members who can also help with needed robot repairs/maintenance.

At the Championship only team members wearing proper badges are allowed on the Arena floor**.** *FIRST* will distribute these badges to the Alliance Captains during the pairing selection process, which takes place on the division fields. These badges will provide the necessary access to the field for Pit Crew members.

 We suggest that all teams assume they may be chosen for an alliance, and think about the logistics of badge distribution and set a plan prior to the pairings. It is each Alliance Captain's responsibility to get the team's badges to his/her team's Pit Crew members.   Only one adult is permitted on this crew.

8.4.3 Backup Teams - Regional Events

Of the remaining eligible teams, the highest seeded teams (up to eight) shall remain on standby and be ready to play. If a robot from one team in a three-team alliance becomes inoperable, at the discretion of the Alliance Captain, the highest seed of the standby teams shall join that alliance. The resulting alliance would then be composed of four teams, but only three teams will be permitted to continue with match play. The inoperable team remains part of the alliance for awards but cannot play, even if their robot is repaired.

The original three-team alliance shall only have one opportunity to draw from the teams on standby. If a second robot from the alliance becomes inoperable, then the alliance must play the following matches with only two (or even one) teams. It is in the best interests of all teams to construct their robots to be as robust as possible to prevent this situation.

8.4.4 Backup Teams - Championship Event

8.4.4.1   Divisional Playoffs

For the purposes of illustration, assume that the three teams on any alliance going into **Divisional Playoffs** are A, B, C. The Highest Seeded team in that division NOT on one of the 8 alliances is Team D.

If at any point during the **Divisional Playoffs**, one of alliance teams A, B or C can't go on and the alliance captain decides to bring up Team D to replace said robot (for this example, we'll use team C), Team C (the replaced robot) may not play in any subsequent **Divisional Playoff** matches.

8.4.4.2   Einstein Playoffs

IF the above alliance wins their division and moves on to the **Einstein Playoffs**, at that point the alliance can move Team C back into play in place of Team D, making Team D the backup again.

In this case, if this alliance wins the **Einstein Playoffs**, the Grand Champions would be teams A, B, C, and D.

If Team C is not able to be repaired and teams A, B, and D play and win the **Einstein Playoffs**, the Grand Champions would be teams A, B, C, and D.

If Team C is not able to get repaired and if one of team A, B or D gets damaged in the **Einstein Playoffs**, thus creating a need for a third robot, then the alliance may bring up Team E (the highest remaining seeded team from their division, which did not participate in the *Divisional Playoffs*) to replace the damaged robot.

In this case, if the alliance with Team E wins the **Einstein Playoffs**, the Grand Champions will be teams A, B, C, D, and E.
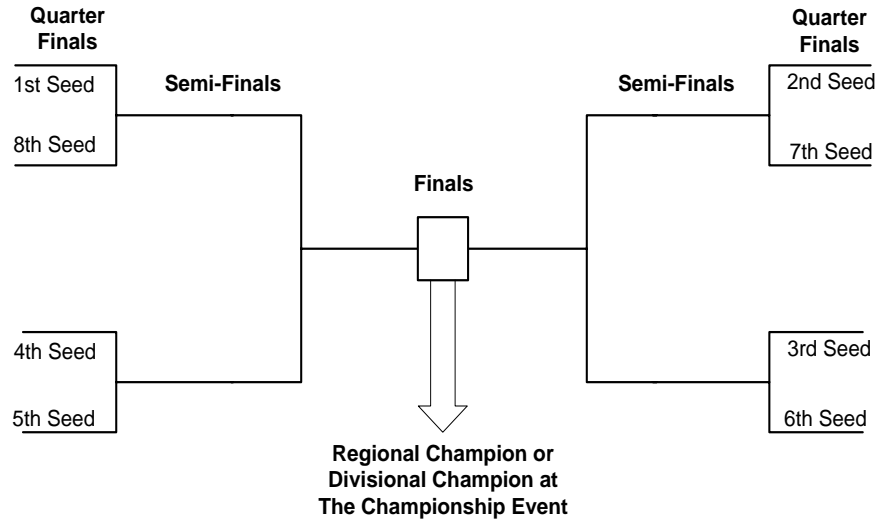
In any case, once a replacement robot is used in the **Einstein Playoffs**, none of the teams who sat out a match can come back into play.

8.4.5 Schedule

The Elimination Rounds take place on Saturday afternoon and will consist of a series of Matches, with an Arena Reset between each Match.

8.4.6 Match Ladder

The Elimination Rounds will play in a ladder format as follows:

Note: 1st Seed = 1st Seeded Alliance, etc.

8.4.6.1 <u>Order of Match Play</u>

The order of play is as follows:
- 1st match from 1 v 8
- 1st match from 4 v 5
- 2nd match from 1 v 8
- 2nd match from 4 v 5
- Etc. until 8.4.4 is satisfied

Similarly the order of play then continues as follows:
- 1st match 2 v 7
- 1st match 3 v 6
- 2nd match 2 v 7
- 2nd match 3 v 6
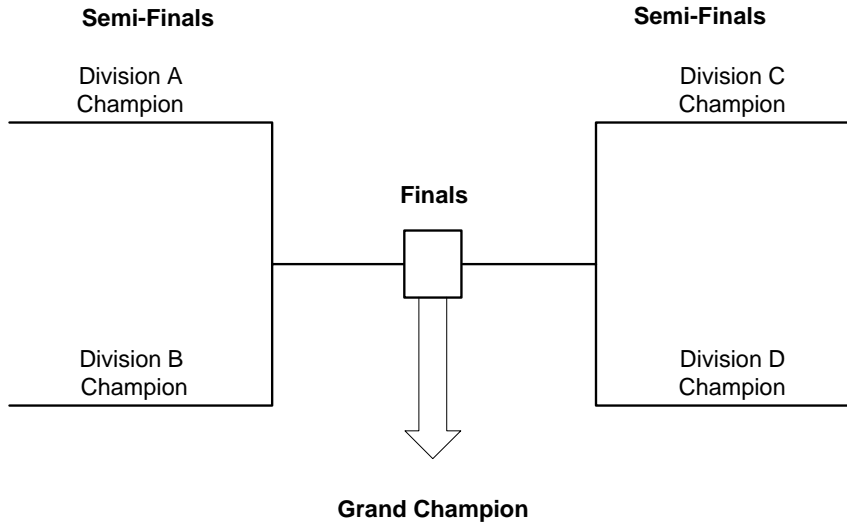- Etc. until 8.4.4 is satisfied

8.4.7 Elimination Scoring

In the Elimination Rounds, teams do not get "points (2, 1, 0)"; they get a win, loss or tie.

Within each bracket of the Elimination Match Ladder, Matches will be played to determine which Alliance advances, as follows:

- The first Alliance to win two matches advances.
- Any tied matches will be replayed until an Alliance has two wins.

8.5 CHAMPIONSHIP EVENT – FINAL ROUNDS

8.5.1 Match Ladder

Semi-Finals   **Semi-Finals**

Division A Champion   Division C Champion

Finals

Division B Champion   Division D Champion

Grand Champion

The Championship Rounds will play exactly like the Semi-Finals and Finals of the Elimination Rounds.

8.6 TOURNAMENT RULES

<T01> Referees have ultimate authority during the competition. <u>THEIR RULINGS ARE FINAL!</u>   The referees will not review recorded replays.

<T02> During the elimination rounds, alliances will have at least four minutes between scheduled matches.

<T03> There are **no time outs** in the Qualifying Rounds.   If a robot cannot report for a match, the queuing manager shall be informed and at least one member of the team should report to the field for the match.

<T04> In the elimination rounds, each alliance will be allotted one time out for no more than 6 minutes. This six minute period is in addition to the four minutes allowed between matches. If an alliance wishes to call time out, the alliance captain must inform the head referee or his or her designee (typically the field manager) within approximately three minutes after their robot has left the field. After approximately four minutes of the time out (eight minutes after the robots have left the field), if an alliance wishes to insert a standby robot, the alliance captain must inform the head referee or his or her designee.
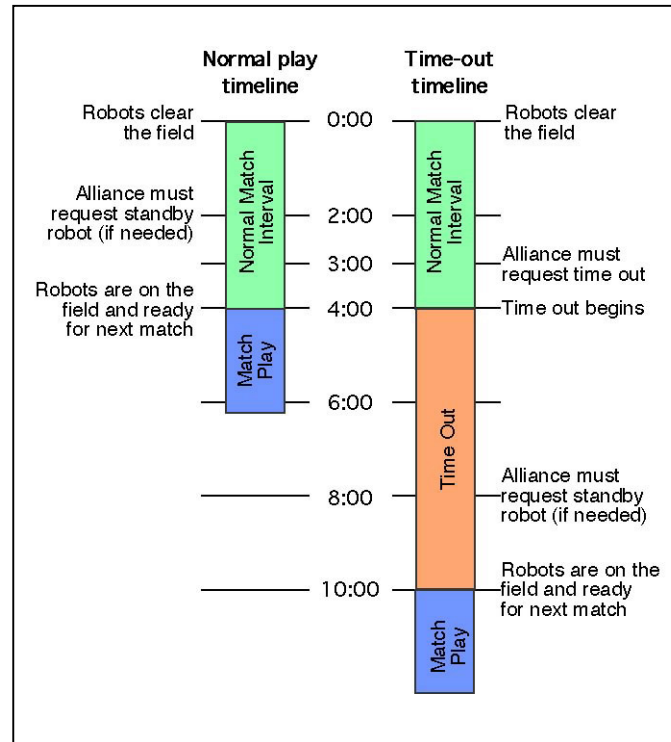
\<T05\> In the elimination rounds, if an alliance wishes to draw from the standby robots without calling a time out, the alliance captain must inform the head referee or his or her designee (typically the field manager) within two minutes after the robots have left the field.

\<T06\> Robot Field power will **<u>not</u>** be re-enabled after a match. Robots must be designed to permit removal of balls without requiring activation of the robot power system. Teams should design mechanisms that allow easy access to ball storage and handling systems. At the discretion of the head referee or field manager, robots may be powered up and controlled via tether to collapse the robot to permit safe and/or rapid removal from the field and transport to the pits. Teams that power up to collapse their robots must do so in a timely manner. For information on using the tether, please refer to the control system documentation from Innovation First.

\<T07\> Robots that become entangled in the field barriers, field elements or other robots will not be freed until after the match has finished unless the entanglement represents a safety hazard. Any entangled robot may be disabled if the head referee deems it necessary.

\<T08\> The qualification match schedule will indicate alliance partners and match pairings. It will also tell the alliance its color, RED or BLUE, for each match. The color is used to determine the placement of each team's robot, drivers, human players, and coach around the playing field.

\<T09\> Prior to each match, teams shall indicate to the queuing manager their choice of available starting positions for that alliance. Once starting locations are selected, teams must place their robot in the selected location. Robots may not be repositioned in response to robot positions of the opposing alliance. During elimination rounds, teams may orient their robots within the selected locations once the robots are placed on the field. The higher seeded alliance will have the last opportunity to orient their robots within the selected locations.

\<T10\> Special clothing and/or equipment will only be allowed on the playing field for those who demonstrate a need based on a physical disability.

\<T11\> If, in the judgment of the head referee, a "field fault" occurs that affects either the play of the game or the outcome of the match, the match will be replayed. Example field faults include broken field elements, power failure to a portion of the field, improper activation of the field control system, errors by field personnel, etc.

8.7   TOURNAMENT SAFETY RULES

\<T12\> **Teams are responsible for providing their own safety glasses at each event. All team members, including coaches, <u>must</u> wear safety glasses while in the Pit or alliance stations during matches. Safety glasses must also be worn during the building of the Robot.**

\<T13\> All team members must wear sneakers or appropriate footwear while in the Pit area or competing on the field. **No bare feet, sandals or open-toed footwear are allowed.**

\<T14\> Wireless / radio control mode of robot operation is not permitted in any of the Pit areas. Robots may only be operated via the tether when not competing on the field.