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7 Team Advancement

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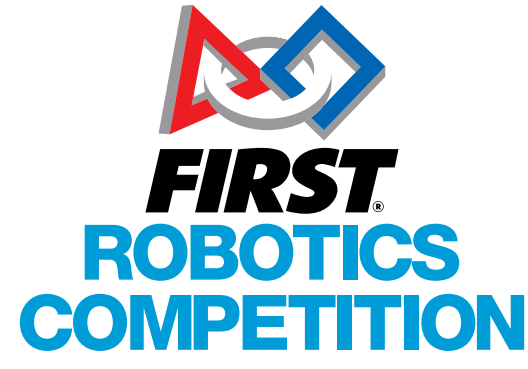

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7 TEAM ADVANCEMENT

7.1 Overview

Teams advance through the season in different ways depending on the events at which they compete: Regional or District Events. This section details how teams advance from Regional events to the *FIRST* Championship, and how teams advance from District Qualifying Events, to the District Championship, then to the *FIRST* Championship.

After a team is selected to attend a District Championship or *FIRST* Championship, the team's Lead Mentor 1 or Lead Mentor 2 Contact will receive an email from *FIRST* Robotics Competition Team Support with additional information and details about next steps needed to secure their registration for the event.

7.2 Pre-Qualifying Teams

Some *FIRST* Robotics Competition Teams have "pre-qualified" for the *FIRST* Championship in one of four ways:

- By being a member of the *FIRST* Hall of Fame,
- By being an original and sustaining team since 1992,
- By being one of the 2016 *FIRST* Championship winners, or
- By being one of the 2016 *FIRST* Championship Engineering Inspiration Award winners.

A list of these teams can be found in the Championship Eligibility Criteria document.

7.3 Teams Competing at Regional Events

There are three ways that teams can qualify for the *FIRST* Championship while competing at a Regional Event. District teams competing at Regional events are eligible for these methods of qualification, along with all other teams present.

7.3.1 Qualifying Awards at Regional Events

Teams may qualify for the *FIRST* Championship by being selected for one of three awards: the Regional Chairman's Award, the Engineering Inspiration Award, or the Rookie All-Star Award. Details on these awards can be found in the Section 6: Awards.

7.3.2 Winning Alliance at Regional Events

Teams may also qualify for the Championship Event by being on the Winning Alliance at their Regional Events. This qualification extends to all teams on the Alliance, including Back-Up Teams that were called up to play on the Alliance. More details on this method of qualification are available in the *Game Manual* Section 5: Tournament.

7.3.3 Wild Card Slots at Regional Events

Finally, a team can earn a Wild Card slot at their Regional Event. Any team at a Regional who has already earned a *FIRST* Championship spot prior to the Regional and earns an additional spot at the Regional (by being on the Winning Alliance or being selected for one of the three qualifying awards) will generate a

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Wild Card slot. Additionally, any team earning two qualifying spots at a single Regional (e.g. by being on the Winning Alliance and earning the Chairman's Award) will generate a Wild Card slot.

A team who has already earned a spot at *FIRST* Championship prior to the Regional and earns two qualifying spots at the Regional will generate two Wild Card slots.

A team is considered to have already earned a *FIRST* Championship spot prior to the Regional if they are a pre-qualified team per Section 7.2 Pre-Qualifying Teams, earned a spot at an earlier Regional by being selected for one of the three qualifying awards per Section 7.3.1 Qualifying Awards at Regional Events, are on the Winning Alliance per Section 7.3.2 Winning Alliance at Regional Events, or earned a Wild Card slot per this section. Teams who have been selected from the Waitlist to participate in the *FIRST* Championship do not generate Wild Cards.

The Wild Card slots are distributed to the Finalist Alliance, in the order of team selection (Alliance Captain, 1st Pick, 2nd Pick, Back-Up team, if a Back-Up team participated), until either all Wild Card slots generated at that event are distributed or the Finalist Alliance is out of teams, whichever comes first. If a member of the Finalist Alliance has already earned a spot at the *FIRST* Championship, they are passed over and the next member of the Alliance is given the available Wild Card slot. A team may decline a Wild Card slot they have been offered, but this does not pass the Wild Card slot down to the next team in line, instead, that Wild Card slot will go unused. Unused Wild Card slots will not be backfilled or replaced.

7.4 Teams Competing at District Events

Teams will accumulate points at the first two District events they attend, within their home District, in chronological order, as well as at the District Championship. Teams will not earn any points at third or subsequent District events, nor at any inter-district events or Regional events they attend during the 2016 season.

District teams will be ranked throughout the season based on the points they accumulate. Each District will determine the number of teams they wish to have at their District Championship. Teams attending the District Championship to compete with their ROBOT will be comprised of all teams who won the Chairman's Award at District events, in addition to teams from the pre-District Championship ranked list, in order, until all slots at the District Championship are filled. If a team declines an invitation to the District Championship, the next highest uninvited team on the list will be invited, and so on, until all slots are taken. See Section 7.4.1.4 Awards for details regarding competition at the District Championship for the Engineering Inspiration and Rookie All Star awards.

Teams from outside a given District, competing at a District event under the inter-district competition program, are not eligible to be selected for the Chairman's Award, the Engineering Inspiration Award, or the Rookie All Star Award. They are eligible for all other awards. Also, as they earn no points outside their home District, they are not eligible to attend the other District's Championship event.

Points earned at District Championships will be multiplied by three and then added to points earned at District events, to determine the final season points total for the Team. Because of the size of the Michigan District Championship in 2016, a modified points system may be used, though this determination has not yet been made. If a modified points system will be used for Michigan, the information will be published in this document.

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7.4.1 District Ranking

Points are awarded to teams as follows:

Point Category	Points
Qualifying Rounds	
Qualification Round Performance	$QualificationPoints\,(R,N,\alpha) = \left\lceil InvERF\left(\frac{N-2R+2}{\alpha N}\right)\left(\frac{10}{InvERF\left(\frac{1}{\alpha}\right)}\right)+12\right\rceil$ (For typically-sized district events, this will result in a minimum of 4 points being awarded for qualification round performance. For events of all sizes, a maximum of 22 points will be awarded)
Alliance Selection Results After Alliance Selection is Complete	
Alliance Captains	Equal to 17 minus the Alliance Captain Number [e.g. 14 points for Alliance #3 Captain]
Draft Order Acceptance	Equal to 17 minus the Draft Order Acceptance Number [e.g. 12 points for the Team that is 5th to accept an offer of Alliance]
Playoff Round Performance	
Teams on Alliances Advancing Playoff Level [e.g. An Alliance advancing from Quarterfinals to Semifinals]	Points awarded based on team participation in individual playoff rounds, and whether or not the alliance advances. See details below.
Awards	
Judged Team Awards	10 Points for Chairman's Award 8 Points each for Engineering Inspiration and Rookie All Star Awards 5 Points each for all other judged Team awards
Team Age	
Team Age	10 Points for Rookie Teams 5 Points for second-year Teams

7.4.1.1 QUALIFICATION ROUND PERFORMANCE

This attribute measures the individual match performance of a Team.

The calculation of Qualification performance points is done using the equation (an inverse error function) in the table above. The equation utilizes the following variables:

- R – the qualification rank of the team at the event (as reported by FMS)
- N – the number of *FIRST* Robotics Competition teams participating in the Qualification rounds at the event
- Alpha (α) – a static value (1.07) used to standardize the distribution of points at events

This formula generates an approximately normal distribution of Qualification Round Performance points at an event, based on rank, with most teams getting a moderate number of points, and fewer teams getting the highest or lowest numbers of points available.

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The table below displays sample Qualification Round points for variously ranked teams at a 40 team event. The system will automatically generate the appropriate points for each team based on their rank and the number of teams at the event.

	Team rank at the end of Qualification rounds												
	1	2	3	4	……	19	20	21	……	37	38	39	40
Qualification Round Performance points earned	22	21	20	19	……	13	13	12	……	6	6	5	4

Note: Teams familiar with the points awarded for this attribute in prior years will remember that we switched away from using Win-Loss-Tie to calculate these points for the 2015 season because the game that season was not based on Win-Loss-Tie. This led to us developing a Qualification Round Performance points system focused on rank. As we considered this attribute for the 2016 game, we realized there were advantages to staying with a formula based on rank for 2016, even though the 2016 game itself includes Win-Loss-Tie as one portion of the team ranking method. Using only rank to calculate Qualification Round Performance points ensures all intended elements of the team ranking method designed into the game are taken into consideration, and helps ensure District teams are 'playing the same game' as Regional teams.

7.4.1.2 ALLIANCE SELECTION RESULTS

This attribute measures both individual Team qualification round seeding performance and recognition by peers.

Alliance Captains are recognized based on their qualification round seeding rank. This rank is a result of the full rules for each game, which typically incorporate several team performance attributes, and are designed to eliminate ties in rank. Non-Alliance Captains are rewarded based on peer recognition. To be invited to join an Alliance, a Team's peers have decided that the Team has attributes that are desirable. Giving points for Alliance selection also supports come-from-behind Teams. A Team taking several matches to optimize their performance may be recognized as a late bloomer by a top seeded Team, even if that performance isn't reflected in the rankings because of poor performance in early matches. These points also have the potential to recognize Teams employing a minority strategy with their ROBOT. Teams with unique or divergent ROBOT capabilities that complement the strengths of other alliance members may be selected to fill a strategic niche.

Note also that Alliance Captains are given the same number of points as the Team drafted in the same sequence. For example, the third Alliance Captain gets the same number of points as the third draft. Numerical analysis supports the idea that Alliance Captains are about as strong in ROBOT performance as equivalently drafted Teams. As an additional minor benefit, awarding the same points for Alliance Captains and equivalent drafts lubricates the acceptance of draft offers between Alliance Captains, which gives Teams out of the top eight the chance to experience being Alliance Captains themselves.

7.4.1.3 PLAYOFF ROUND PERFORMANCE

This attribute measures Team performance as part of an Alliance.

All Teams on the Alliance winning a particular playoff series, who participate in matches with their robots, receive 5 points per match won. In most cases, this will usually mean Teams will receive 10 points at each of the Quarter Final, Semi-Final, and Final levels, unless a backup robot is called in to play

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7.4.1.4 AWARDS

This attribute measures Team performance with respect to judged Team awards.

The points earned for Team awards in this system are not intended to capture the full value of the award to the Team winning the award, or to represent the full value of the award to *FIRST*. In many ways, the Team's experience in being selected for awards, especially the Chairman's Award, the Engineering Inspiration Award, and the Rookie All Star Award, is beyond measure, and could not be fully captured in its entirety by any points-based system. Points are being assigned to awards in this system only to help Teams recognize that *FIRST* continues to be "more than robots", with the emphasis on our cultural awards, and to assist in elevating award-winning Teams above non-award winning Teams in the ranking system.

Teams earning the Chairman's Award at the District event level get automatic byes to the District Championship, where they will compete both with their ROBOTS and for the District Championship Chairman's Awards. Earning a District Championship Chairman's Award will earn the Team a slot at the *FIRST* Championship regardless of their final rank in their district.

Engineering Inspiration and Rookie All-Star Award winners at the District event level will compete at the District Championship level for those specific awards, even if they do not rank high enough to compete with their ROBOTS. Winning one of these awards at the District Championship will also earn them a slot at the *FIRST* Championship (with their ROBOT) regardless of their final rank in their Districts.

Note that Teams only get points for judged Team awards. If an award is not judged, for example, Rookie Highest Seed, or is not for a Team, for example, the Dean's List Award, no points are earned. Also, please note that the Industrial Safety Award, while it is judged by the Safety Advisors, is still considered a judged award and will earn the points indicated for the winning team.

7.4.1.5 TEAM AGE

This attribute recognizes the difficulty in being a Rookie or second year Team.

Extra points are awarded to Rookie and second year Teams in recognition of the special challenges Teams face in those early years, and to increase the chance that they will make it to the District Championship to compete with their ROBOTS. Like our dedicated Rookie awards, these additional points are intended to recognize and motivate newer participants in *FIRST* Robotics Competition. These points are awarded once at the beginning of the season. Rookie year is calculated based on the year in which *FIRST* recognizes the Team as a Rookie.

7.4.2 Additional Notes

7.4.2.1 THIRD/OUT-OF-DISTRICT EVENT PARTICIPATION

District Teams participating in three or more home District events during the season, or at any events outside of their home District, do not earn points for their actions at those events. The first two events attended inside their home District, chronologically, will be used for District point calculations. If the events are in their home District, Teams will still be eligible for all awards at those later events, and any benefits that go along with winning those awards, such as automatic advancement to the District Championship for winning Chairman's Award.

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7.4.2.2 REGIONAL PARTICIPATION

District Teams do not earn points for their actions at any Regionals they may attend, but are still eligible for Team awards at those events, and any benefits that may go along with winning those awards, such as earning their way to the *FIRST* Championship. However, if a District Team does earn a slot at the *FIRST* Championship while attending a Regional event, that slot does count as part of the total Championship allocation the District is receiving for the season.

7.4.2.3 MULTIPLE AWARDS

District Teams will only be able to be selected for *FIRST* Robotics Competition's most prestigious awards – Chairman's Award, Engineering Inspiration Award, and Rookie All Star Award – once per season at the District level. This supports the broader distribution of those awards.

7.4.2.4 TIES

Teams earning the same points in this system will be sorted in rank using this hierarchy:

- 1st Order Sort: Total Playoff Round Performance Points
- 2nd Order Sort: Best Playoff Round Finish at a single event
- 3rd Order Sort: Total Alliance Selection Results Points
- 4th Order Sort: Highest Qualification Round Seed or Draft Order Acceptance (i.e. Highest Alliance Selection points at a single event)
- 5th Order Sort: Total Qualification Round Performance Points
- 6th Order Sort: Highest Individual Match Score, regardless of whether that score occurred in a Qualification or Playoff match
- 7th Order Sort: Second Highest Individual Match Score, regardless of whether that score occurred in a Qualification or Playoff match
- 8th Order Sort: Third Highest Individual Match Score, regardless of whether that score occurred in a Qualification or Playoff match
- 9th Order Sort: Random Selection

7.4.3 District Championship

Team capacity at District Championships for the 2016 season will be as follows:

Chesapeake District Championship 58

Indiana State Championship 32

Michigan State Championship 102

Mid-Atlantic Robotics District Championship 55

North Carolina *FIRST* Robotics State Championship 32

New England District Championship 60

Pacific Northwest District Championship 64

Peachtree District State Championship 45

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7.4.4 *FIRST* Championship Teams from Districts

Districts will receive the percentage of available slots at the *FIRST* Championship, rounded up to the nearest whole slot, equal to the percentage of teams they have in their District compared to all of *FIRST* Robotics Competition in the current season. In calculating available slots at the *FIRST* Championship, pre-qualified teams will be excluded. For team counts, this calculation uses a 'snapshot' of teams, that have both registered and paid, taken on a specific day a few weeks after payment for the season is due.

These allocated slots are guaranteed to the Districts. These slots will be made up of qualifying award winners from the District Championship (Chairman's Award, Engineering Award, and Rookie All Star winners), all teams on the Winning Alliance from the District Championship (including any Back-Up teams participating), any qualifying award winners among district teams who traveled to Regionals, plus the teams on the final District ranking list, as deep in the ranking list as the District needs to go to fill their allocation. If a District team earns a slot to the *FIRST* Championship within the season, but is not able to attend for whatever reason, the top ranked team who has not yet been offered a slot is given the opportunity, and so on, until all slots are filled. District teams earning *FIRST* Championship slots at Regionals do count as part of the District allocation. Even though a District team may earn their *FIRST* Championship slot at a Regional, they are still from the District and can be considered part of the District contingent to the *FIRST* Championship.

Pre-qualified teams, as defined in Section 7.2 Pre-Qualifying Teams, from a District do not count as part of their slot allocation. Districts are able to send to the *FIRST* Championship the number of teams allocated to them using the proportional representation model, plus their unique pre-qualified teams. Unlike the allocated slots, however, slots for pre-qualified teams may not be backfilled. If a pre-qualified team from a District is not able to attend the *FIRST* Championship, it will not be replaced with another team from the District. A pre-qualified team slot is reserved for that specific team only, not the District from which that team comes.

For Dean's List Awards, Chairman's Awards, Rookie All Star Awards, and Engineering Inspiration Awards, Districts may decide the number of awards to present at their Championships within a range established by *FIRST* Headquarters. Each District may present one or two Rookie All Star Awards and one or two Engineering Inspiration Awards. For Dean's List Awards and Chairman's Awards, awards count boundaries are set by ratios of the *FIRST* Championship team allocation the District has received. The table below indicates *FIRST* Championship team allocations, award limits, and the number of awards each District has selected to present at their District Championships. For the Dean's List Award, the minimum number presented is two, and for Chairman's Award, the minimum presented is one, regardless of District size.

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		Dean's List Award			Chairman's Award			Rookie All Star Award			Engineering Inspiration Award		
District	# of *FIRST* Championship Slots Awarded	Max Ratio 9	Min Ratio 6	District Selection	Max Ratio 18	Min Ratio 9	District Selection	Min	Max	District Selection	Min	Max	District Selection
Chesapeake	25	3	4	4	1	3	3	1	2	1	1	2	2
Indiana	9	2	2	2	1	1	1	1	2	1	1	2	1
Michigan	76	8	13	8	4	8	4	1	2	1	1	2	1
Mid-Atlantic Robotics	22	2	4	4	1	2	2	1	2	1	1	2	2
North Carolina	10	2	2	2	1	1	1	1	2	1	1	2	2
New England	34	4	6	6	2	4	4	1	2	1	1	2	2
Pacific Northwest	30	3	5	5	2	3	3	1	2	1	1	2	2
Peachtree	12	2	2	2	1	1	1	1	2	1	1	2	2

Allowing Districts flexibility in selecting the number of these awards to present gives them the ability to tailor their Championships to local needs. Setting upper and lower limits to these numbers allows *FIRST* Headquarters to ensure the meaning and intent of these awards has some level of consistency between Districts.

7.5 Championship Waitlist

Teams may join the Championship Waitlist to fill any remaining *FIRST* Championship slots not consumed by qualifying Regional or District teams. Teams who sign up for the Waitlist will be randomly selected at various points throughout the season in an effort to give teams as much time to make travel plans as possible while ensuring we do not exceed *FIRST* Championship capacity.

Rookies are not eligible to sign up for the Waitlist.

Teams may sign up for the Waitlist through TIMS. To do so, a team's Lead Mentor 1 or Lead Mentor 2 Contact must login to TIMS, click on the "Team Summary" button and select the "Edit/View" button in the Event Registration section.

Teams will receive a number of "entries" to get selected from the Waitlist equal to 2016 minus the last year they attended Championship (or their rookie year, or when they most recently returned as an active team, whichever year is the most recent). As examples, a team that attended in 2014 will get two entries in the waitlist drawing, a team that last attended in 2013 will get three, and a team that has never attended but has been continuously active since 2005 will get eleven.

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