event.

<I3> The maximum size of the *Robot* for starting a Qualifying or Elimination Match is 18 inches (45.72cm) wide by 18 inches (45.72cm) long by 18 inches (45.72cm) high. The *Robot Sizing Box* will be used as the official gauge in determining conformance to this rule. To pass inspection a robot must fit within the box without exerting force on the sides or top of the box. The *Robot* must be self-supporting while in the *Robot Sizing Box* either:

a. by mechanical means with the *Robot* in a power-OFF condition, or

b. by a *Robot Initialization Routine* in the Autonomous mode program that may pre-position the servo motors, with the *Robot* in a power-ON condition, to the desired position by means of a single instruction to the HiTechnic Servo controller for each servo motor effected. The label shown in rule <RG04> must be affixed to the robot if servos move during the *Robot* Initialization Routine.

<I4> The team is required to request a re-inspection of their *Robot* by an Inspector when a modification to improve performance or reliability of their *Robot* has been made.

<I5> It is the FTC Inspector's responsibility to evaluate *Robots* to insure each *Robot* has been designed to operate and function safely. Section 5 and Game Manual Part 2, Section 1.5.1 specify the safety rules and limitations that apply to the design and construction of all *Robots*.

<I6> *Robot* inspection is a Pass / Fail process. A *Robot* has passed inspection when ALL requirements listed on the official FTC "*Robot* Inspection Sheets" have been successfully met and recorded as passed by an FTC Inspector.

7.0 Judging & Award Criteria

7.1 Overview

This chapter provides a complete description of all of the FTC Awards; the judging process, criteria and philosophy that teams need to be aware of in preparation for participating at FTC Tournaments.

Teams have spent a significant amount of time designing, building, programming their robot, and learning what it takes to be a part of a team. For many FTC teams, the event is the reward for all their hard work throughout the season. While there are several types of events, they all offer a fun and exciting way for teams to demonstrate the result of their efforts.

The judged awards represent another positive way we recognize teams who embody important values like teamwork, creativity, innovation, and the value of the engineering design process. These judging guidelines are a part of the road map to success.

7.2 FTC Award Eligibility

To ensure fairness to all teams and to provide equal opportunity for all teams to win an award at an FTC Championship tournament, teams are only eligible to win an award at the first three Championship tournaments that they attend. Those teams who compete in more than three Championship tournaments do so for the purpose of being involved in the fun and excitement of the tournament and not with the intention of winning awards or advancing to the next tournament level.

Teams are allowed to win the Inspire Award only once during each tournament level (Qualifying, Championship, and Super-Regional) in their region. Once a team wins the Inspire Award at a Qualifying tournament in their region, they are

not eligible for consideration for the Inspire Award and are only eligible to win the other judged or alliance awards at subsequent Qualifying tournaments in their region. The same restriction applies to teams attending multiple Championship and Super-Regional tournaments.

7.3 FTC Award Categories

7.3.1 FTC Inspire Award

This formally judged award is given to the team that truly embodied the 'challenge' of the FTC program. The team that receives this award is chosen by the judges as having best represented a 'role-model' FTC Team. This team is a top contender for all other judging categories and is a strong competitor on the field. The Inspire Award Winner is an inspiration to other teams, acting with Gracious Professionalism™ both on and off the playing field. This team is able to communicate their experiences, enthusiasm and knowledge to other teams, sponsors, and the Judges. Working as a unit, this team will have demonstrated success in accomplishing the task of creating a working and competitive robot.

In past seasons, the winner of the Inspire Award at each tournament level has received an automatic invitation to the next tournament level. Once a team has won an Inspire Award at a Championship, they are no longer eligible to win the Inspire Award at additional championship tournaments they may attend. Similarly, once a team wins an Inspire Award at a Qualifying tournament, they are no longer eligible to win the Inspire Award at subsequent Qualification tournaments within the same region.

Guidelines for the Inspire Award:

- Team must demonstrate respect and Gracious Professionalism both for team members and fellow teams
- Team is a strong contender for all Judged awards. The Inspire Award is based on the guidelines for all of the Judged Awards
- Engineering Notebook must be submitted, and must include an Engineering Section, a Team Section and a Business or Strategic Plan. The entire Engineering Notebook must impress the judges
- Team demonstrates and documents their work in their community spreading awareness of the team, *FIRST*, and FTC within the community
- Team displays good communication and teamwork skills within the team as well as with their alliance partners
- Team communicates clearly about their robot design and strategy to the judges
- Team presents themselves well in the judges' interview
- Robot and team effectively competes in the game challenge and impresses the judges
- Team and robot consistently perform well during matches

7.3.2 Rockwell Collins Innovate Award

The Rockwell Collins Innovate Award celebrates a team that not only thinks outside the box, but also has the ingenuity and inventiveness to make their designs come to life. This judged award is given to the team that has the most innovative and creative robot design solution to any or all specific field elements or components in the FTC game. Elements of this award include elegant design, robustness, and 'out of the box' thinking related to design. This award may address the design of the whole robot, or of a sub-assembly attached to the robot. The creative component must work consistently, but a robot does not have to work all the time during matches to be considered for this award. The team's Engineering Notebook should be marked with journal entries to show the design of the component(s) and the team's robot in order to be eligible for this award, and entries should describe succinctly how the team arrived at that solution.

Guidelines for the Rockwell Collins Innovate Award:

- Team demonstrates respect and Gracious Professionalism to all
- Robot or robot sub-assembly must be elegant and unique in its design
- Creative component must work reliably
- Team must submit an Engineering Notebook with an Engineering Section
- Robot is stable, robust and controllable
- Robot design is efficient and consistent with team plan and strategy

7.3.3 PTC Design Award

This judged award recognizes design elements of the robot that are both functional and aesthetic. All successful robots have innovative design aspects; however, the PTC Design Award is presented to teams that incorporate industrial design elements into their solution. These design elements could simplify the robot's appearance by giving it a clean look, be decorative in nature, or otherwise express the creativity of the team. The winning design should not compromise the practical operation of the robots but complement its purpose. This award is sponsored by Parametric Technology Corporation (PTC), developers of the CAD tools, Creo and Mathcad. PTC gives licenses to the FTC student teams for these software products to help them with their designs. Use of these tools is not required to be eligible, however, teams that use them in their design are given extra consideration for this award.

Guidelines for the PTC Design Award:

- Team demonstrates respect and Gracious Professionalism to all
- Team must submit an Engineering Notebook with an Engineering Section that includes detailed robot design drawings
- Robot differentiates itself from others
- Design is both aesthetic and functional
- Basis for the design is well considered (i.e. inspiration, function, etc.)

7.3.4 Connect Award

This judged award is given to the team that most connected with their local community and the engineering community. A true *FIRST* team is more than a sum of its parts, and recognizes that its schools and communities play an essential part to their success. The recipient of this award is recognized for helping the community understand *FIRST*, the FTC, and the team itself. The team that wins this award is aggressively seeking engineers and exploring the opportunities available in the world of engineering, science and technology. In addition, this team has a clear Business or Strategic Plan and has identified steps to achieve their goals.

Guidelines for the Connect Award:

- Team demonstrates respect and Gracious Professionalism to all
- An Engineering Notebook must be submitted and must include a Business or Strategic plan.
- Team provides clear examples of outreach to community
- Team has worked to develop an in-person or a virtual connection with the engineering, science or technology community
- Team has a business or strategic plan that identifies their future goals and the steps they will take to reach those goals. The plan could include fundraising goals, sustainability goals, timelines, outreach and community service goals.

7.3.5 Motivate Award

This judged award celebrates the team that exemplifies the essence of the FTC competition through team building, team spirit and enthusiasm. They celebrate their team, their individuality and their spirit through costumes and fun outfits, a team cheer and their outstanding spirit. This team has also made a collective effort to make *FIRST* known throughout their school and community.

Guidelines for the Motivate Award:

- Team demonstrates respect and Gracious Professionalism to all
- Team functions as a cohesive unit to discover the goals of the program
- Team can articulate the journey of becoming a team of individuals with different roles
- Team has formed and can articulate internal processes to assign roles and communicate between team members
- Team attitude of celebration and spirit is consistent throughout the team and the competition
- Team is enthusiastic
- Team functions well as a unit
- Team enthusiasm is evident in community outreach

7.3.6 Think Award

This judged award is given to the team that best reflects the "journey" the team took as they experienced the engineering design process during the build season. The engineering section of the notebook is the key reference for judges to help identify the most deserving team. The team's engineering notebook should focus on the design and build stage of the team's robot. Journal entries of interest to judges for this award will include those describing the underlying science and mathematics of the robot design and game strategies, the designs, re-designs, successes, and those 'interesting moments' when things weren't going as planned. A team is not a candidate for this award if they have not completed the Engineering Section of the Engineering Notebook.

Guidelines for the Think Award:

- Team demonstrates respect and Gracious Professionalism to all
- Team must submit an engineering notebook with an Engineering Section Team notebook must be clearly identified with the Team # and Team Name
- Engineering notebook must demonstrate that the team has a clear understanding of the engineering design process, with pictures or drawings and details documenting all stages of robot design
- Engineering notebook must be organized and follow the formatting guidelines provided by *FIRST* and include a Summary Page
- Teams must tab/flag 6 to 8 pages of the Engineering Section to support entries on the summary page.
- It is acceptable to include designs/ideas that are adapted from an outside source, providing that this is noted and credit is cited to the original source
- Supporting drawings and diagrams must be included in the correct chronological order, not in a separate section.

Note: Teams should review the engineering notebook section of this manual for a complete description and format specifications.

7.3.7 Control Award (Optional Pilot)

The Control Award celebrates a team that uses sensors and software to enhance the robot's functionality on the field.

This award is given to the team that demonstrates innovative thinking in the control system to solve game challenges such as autonomous operation, enhancing mechanical systems with intelligent control, or using sensors to achieve better results on the field. The control component should work consistently on the field. The team's Engineering Notebook should contain details about the implementation of the software, sensors, and mechanical control. Please check with your local Affiliate Partner to find out if this award will be offered in your region.

Guidelines for the Control Award:

- Team demonstrates respect and Gracious Professionalism to all
- Team must submit an Engineering Notebook with an Engineering Section
- Control Components must be documented in the Engineering Notebook
- Control Components must enhance the functionality of the robot on the field
- Control Components must work reliably
- Teams are encouraged to demonstrate control components to the Judges
- Advanced software techniques and algorithms are encouraged
- Prototyped sensors and custom hardware are encouraged

7.3.8 Promote Award (Optional)

This judged award is optional and may not be given at all tournaments. Please contact your tournament organizer to determine if it will be given at an event you attend.

The Promote Award is given to the team that is most successful in creating a compelling video message for the public designed to change our culture and celebrate science, technology, engineering and math.

Guidelines for the Promote Award:

- Team must present a thoughtful and high-quality video which appeals to the general public.
- Strong production value is important, but the message and impact of the video are of greater weight for the judges.
- Creativity in interpreting the annually assigned theme is desired.
- Submissions for this award will be considered for the Inspire Award but are not required.
- Team must have rights to any music used in the video.

Winning videos will be submitted to *FIRST* and used to promote the higher values of the FTC. Teams may win the Promote Award only once at a Championship level event and only once at a qualifying level event.

Team must submit a one-minute long public service announcement (PSA) video one full week prior to the event to be eligible for this award. Additional submissions are welcome but will not be eligible for awards. The submission process for this award may vary by tournament. Please check with your tournament's organizer for details.

PSA Subject for 2013-2014 Season

- Create a one-minute PSA video that begins with the following sentence: "Leadership is"

7.3.9 Compass Award (Optional)

An FTC team is about more than building robots, and competing at tournaments, it is a journey to a destination through trial and error, success and failure, with challenging new technology and obstacles to navigate where no road maps are provided. How does a team find their way?

The Compass Award recognizes an adult Coach or Mentor who has provided outstanding guidance and support for a team throughout the year. The winner of the Compass Award will be determined from candidates nominated by FTC team members, via a 40-60 second video submission, highlighting how their Mentor has helped them become a champion team. We want to hear what sets the Mentor apart.

Guidelines for the Compass Award:

- Only one video submission per team will be considered. Teams may submit new or updated videos at each tournament.
- The video must be submitted at least one week prior to tournament day. Instructions for submitting videos may vary from tournament to tournament. Please check with your tournament's organizer for details.
- Videos must not be longer than 60 seconds (including introduction and credits if you choose to use them).
- Videos must be submitted in AVI, WMV or MOV format. Remember that the winning video may be shown on a large screen during the awards ceremony. Use the best resolution you have available for your final version.
- Team must have rights to any music used on the video.
- Team must submit an Engineering Notebook.

7.3.10 Judges' Award

During the course of the competition, the judging panel may encounter a team whose unique efforts, performance or dynamics merit recognition, yet doesn't fit into any of the existing award categories. To recognize these unique teams, *FIRST* offers a customizable judges award. The judging panel may select a team to be honored, as well as the name of the judges' award.

7.3.11 Winning Alliance Award

This award will be given to the winning alliance represented in the final match.

7.3.12 Finalist Alliance Award

This award will be given to the finalist alliance represented in the final match.

7.4 Judging Process, Schedule, and Team Preparation

The schedules at the FTC tournaments may vary from site to site. Exact times for both the matches and meeting with judges cannot be given within this manual. All teams receive this schedule prior to or during check-in at the competition.

7.4.1 Judging Process

At FTC Championship Tournaments, there will be three parts to the judging process:

1. Interview with judges
2. Evaluation of performance
3. Evaluation of the Engineering Notebook.

Each team will have an interview with a panel of two or three judges. No awards will be determined on the basis of this interview alone. Judges use the guidelines provided in this chapter to assess each team.

Teams should present their engineering notebooks at the Pit Administration Table during check-in unless otherwise directed by the tournament officials. The engineering notebooks are generally provided to the judges prior to the team interviews.

After the judges review the submitted Engineering Notebooks, complete the initial team interviews and evaluate the team and robot performance during matches, they convene to review their assessments and create a list of top candidates for the various judged awards. Judges may require additional impromptu discussions with teams if necessary. Deliberations are usually completed during the elimination matches. When the judges have finished their deliberations, the engineering notebooks are returned to teams.

Teams are asked to bring their robot to the judge interview. This is the best chance for teams to explain and demonstrate their robot design to the judges in a quiet and relaxed environment.

7.4.2 Judging Schedule

The judging generally takes place in a separate area away from the noise of the competition and pit. Teams follow the schedule that outlines team interview times and locations. In some cases, teams may receive this information in advance, but more often, teams will receive this information when they check-in on the morning of the event.

Upon arrival, please familiarize yourself with where the judging will occur and allow enough time to get there. To keep this process on time throughout the event, we require that all teams arrive at the judge queuing area five minutes before their scheduled judging interview.

7.4.3 Team Preparation

Teams are encouraged to use the award guidelines to assess where they are within an award category and help them establish higher goals. These guidelines are the same ones used by the judges during each FTC tournament, Super-Regional Championship, and at the FTC World Championship.

The judges want to know highlights about the team; its history and make up; what the team achieved during the competition season; and the experiences that were gained. Team representatives' abilities to answer the questions or elaborate on robot design functions or attributes are evaluated during the team interview. Check with the event organizer to see if Mentors and Coaches are allowed to observe the team interview. Mentors may not contribute to the judging process. Mentors should always keep in mind that FTC is a student-centered activity and it is about giving the students a unique and stimulating experience in all aspects of the program.

7.5 FTC World Championship Event Eligibility

The culmination of the *FIRST* event season is the *FIRST* Championship Event held in St. Louis, MO. This event represents the conclusion of the season for Jr. *FIRST* LEGO League (Jr. FLL), *FIRST* LEGO League (FLL), the *FIRST* Tech Challenge (FTC), and the *FIRST* Robotics Competition (FRC). This is a fun and exciting experience for teams in all programs to participate.

FIRST Tech Challenge teams earn their way to the FTC World Championship with their performance on and off the field. Advancement Criteria for the FTC World Championship is outlined in Section 3.8 and is similar to advancing from local Qualifiers to local Championship tournaments and to Super Regional Championships. Teams are responsible for their own entry fees, lodging, and travel costs to all *FIRST* events.

8.0 Team Resources

8.1 Overview

This chapter provides teams with necessary information for contacting FTC staff, accessing technical support, using the FTC Q&A system, and using the *FIRST* and FTC logos.