2016-2017 FIRST® Tech Challenge Referee and Head Referee Manual
Volunteer Thank You

Thank you for taking the time to volunteer for a FIRST® Tech Challenge event. FIRST® and FIRST® Tech Challenge rely heavily on Volunteers to ensure events run smoothly and are a fun experience for Teams and their families, which could not happen without people like you. With over 4,600 Teams competing annually, your dedication and commitment are paramount to the success of each event and the FIRST Tech Challenge program. Thank you for your time and effort in supporting the mission of FIRST!

Sponsor Thank You

Thank you to our generous sponsors for your continued support of the FIRST Tech Challenge!

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Revision History

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### Tournament Rules

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*Gracious Professionalism<sup>®</sup> - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”*
Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
Introduction

*What is FIRST® Tech Challenge?*

FIRST Tech Challenge is a student-centered activity that focuses on giving students a unique and stimulating experience. Each year, Teams participate in a new Game that requires them to design, build, test, and program autonomous and driver-operated robots that must perform a series of tasks.

The playing field for the Game consists of the FIRST Tech Challenge game pieces set up on a foam-mat surface, surrounded by a metal and polycarbonate Field frame. Each Tournament features Alliances, which are comprised of two Teams, competing against one another on the playing field. Teams work to overcome obstacles and meet challenges, while learning from, and interacting with their peers and adult Mentors. Students develop a greater appreciation of science and technology and how they might use that knowledge to impact the world around them in a positive manner. They also cultivate life skills such as:

- Planning, brainstorming, and creative problem-solving.
- Research and technical skills.
- Collaboration and teamwork.
- Appreciation of differences and respect for the ideas and contributions of others.

To learn more about FIRST Tech Challenge and other FIRST Programs, visit [www.firstinspires.org](http://www.firstinspires.org).

*FIRST Tech Challenge Core Values*

Volunteers are integral to the FIRST community. FIRST Tech Challenge relies on Volunteers to run the program at many levels, from managing a region to Mentoring an individual Team. Our Affiliate Partners coordinate the program in each region or state. These Affiliate Partners fundraise, run Tournaments, hold workshops and demonstrations, market FIRST Tech Challenge locally, handle public relations, and recruit Volunteers and Teams. They are a tremendous resource for Mentors and FIRST would not exist without them.

FIRST asks everyone who participates in FIRST Tech Challenge to uphold the following values:

- We display *Gracious Professionalism*® with everyone we engage with and in everything we do.
- We act with integrity.
- We have fun.
- We are a welcoming community of students, Mentors, and Volunteers.
- What we learn is more important than what we win.
- We respect each other and celebrate our diversity.
- Students and adults work together to find solutions to challenges.
- We honor the spirit of friendly competition.
- We behave with courtesy and compassion for others at all times.
- We act as ambassadors for FIRST and FIRST Tech Challenge.
- We inspire others to adopt these values.

*FIRST Tech Challenge is MORE THAN ROBOTS℠!* While competing, students develop personal and professional skills they will be able to rely on throughout their life.
Gracious Professionalism®

FIRST uses this term to describe our programs’ intent. This is one of the most important concepts that can be taught to a young person who is learning to get along in the work world. At FIRST, Team members help other team members, but they also help other Teams.

Gracious Professionalism® is not clearly defined for a reason. It can and should mean different things to everyone.

Some possible meanings of Gracious Professionalism® include:

- Gracious attitudes and behaviors are win-win.
- Gracious folks respect others and let that respect show in their actions.
- Professionals possess special knowledge and are trusted by society to use that knowledge responsibly.
- Gracious Professionals make a valued contribution in a manner pleasing to others and to themselves.

In the context of FIRST, this means that all Teams and participants should:

- Learn to be strong competitors, but also treat one another with respect and kindness in the process.
- Avoid leaving anyone feeling as if they are excluded or unappreciated.
- Knowledge, pride and empathy should be comfortably and genuinely blended.

In the end, Gracious Professionalism® is part of pursuing a meaningful life. When professionals use knowledge in a gracious manner and individuals act with integrity and sensitivity, everyone wins, and society benefits.

Watch Dr. Woodie Flowers explain Gracious Professionalism® in this short video.

"The FIRST spirit encourages doing high-quality, well-informed work in a manner that leaves everyone feeling valued. Gracious Professionalism seems to be a good descriptor for part of the ethos of FIRST. It is part of what makes FIRST different and wonderful."

- Dr. Woodie Flowers, National Advisor for FIRST

Gracious Professionalism® for Volunteers

It is a good idea to spend time going over this concept with Volunteers. Provide Volunteers with real-life examples of Gracious Professionalism in practice before, during, and after the event and recognize great Gracious Professionalism when you see it in action!
Youth Protection Program

The purpose of the FIRST® Youth Protection Program (FIRST YPP) is to provide Coaches, Mentors, Volunteers, employees, others working in FIRST programs, team members, parents, and guardians of team members with information, guidelines, and procedures to create safe environments for everyone participating in FIRST programs.

The FIRST YPP sets minimum standards recommended for all FIRST activities. Adults working in FIRST programs must be knowledgeable of the standards set by the FIRST YPP, as well as those set by the school or organization hosting their team.

Youth Protection Expectations and Guidelines
Coaches and Mentors are expected to read and follow elements in the FIRST Youth Protection Program guide that are labeled as required are mandatory in the United States and Canada, and may not be waived without the approval of the FIRST Youth Protection Department.

FIRST recommends that the standards set forth in the FIRST Youth Protection Program guide be applied outside of the United States and Canada to the extent possible. At a minimum, local regulations regarding youth protection must be complied with.

Forms are available here: http://www.firstinspires.org/sites/default/files/uploads/about/FORMS.zip


Information on the Canadian Screening process is available here: http://vimeo.com/30137373

You can find FAQ and additional information about the FIRST Youth Protection Program on the FIRST website at: http://www.firstinspires.org/resource-library/youth-protection-policy

NOTICE OF NON-DISCRIMINATION
United States Foundation for Inspiration and Recognition of Science and Technology (FIRST®) does not discriminate on the basis of race, color, national origin, sex, disability, or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Lee Doucette, Youth Protection Program Manager, 200 Bedford Street, Manchester, NH 03101, 603-666-3906, Ext. 250.
Volunteer Bill of Rights

Volunteers are our most valuable asset. Their selfless contributions of time and resources are instrumental in accomplishing our mission of inspiring the next generation of science, technology, engineering and mathematics leaders and innovators. At the foundation of the relationship between FIRST and our Volunteers, are their rights. All FIRST Volunteers have a right to:

- Be treated with Gracious Professionalism®. Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. With Gracious Professionalism, fierce competition and mutual gain are not separate notions.
- Feel valued. FIRST recognizes the significant contributions of time and resources our Volunteers make as they help us achieve our mission.
- Inclusion. All Volunteers have the right to be treated with respect and dignity in inclusive environments. FIRST values diversity and opposes discrimination.
- Information regarding their role. FIRST will inform Volunteers about what’s expected of them, when they are scheduled to serve, any changes to program or policy, and who to contact should they need assistance.
- Safety. FIRST strives to create safe environments for all Volunteers and participants and will always factor safety into program planning.
- Fair treatment. All FIRST Volunteers will be treated fairly and any performance issues will be handled using the FIRST Volunteer Behavior Intervention Recommendations.
- Request a different role if they feel their current assignment is not a good fit.
- End their Volunteerism. FIRST appreciates and respects the fact that all of our Volunteers are here by choice.
- Contact FIRST Headquarters directly if they feel they are being treated improperly. If attempts to resolve issues and conflicts at the local level are not successful, Volunteers can call (800) 871-8326 or email volunteer@firstinspires.org.

Volunteer Code of Conduct

The mission of FIRST is to inspire a generation of science and technology leaders who are both gracious and professional. This FIRST Code of Conduct lists some of the basic behaviors Mentors, Coaches, Volunteers, team members, Affiliate Partners, contractors, staff, and other participants should adhere to while participating in FIRST activities.

- Exhibit Gracious Professionalism® at all times. Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. With Gracious Professionalism, fierce competition and mutual gain are not separate notions.
- Ensure the safety of all participants in FIRST activities.
- Not engage in any form of bullying, harassment, use of profane or insulting language, or any actual or threatened violence.

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
• Adhere to all FIRST Youth Protection Program (YPP) policies.
• Report any unsafe behavior to event or local FIRST leadership.

Persons who do not comply with this Code of Conduct may be barred from participating in FIRST activities.

Tournament Organization Structure

Learn more about the roles of Volunteers on our Volunteer Resources page, “Volunteer Role Description”. 
Referee Job Description

Refereeing is one of the most challenging and rewarding FIRST Volunteer opportunities. Not to mention that it comes with the fringe benefit of having the best seats in the house! This Manual contains information that is vital to your success as a Referee. Please make sure to take the time to get familiar with the current Game, VELOCITY VORTEX SM as well as the role of Referee as soon as possible. The full Game Manuals Part 1 and 2 are available on the FIRST Tech Challenge Game website.

FIRST Tech Challenge Tournaments squeeze a lot of activity into one day. One of the keys to running a smooth and successful Event is for Teams and Volunteers to show up prepared. Teams spend countless hours preparing for Competition day and we ask our Volunteers to prepare for Tournament Day as well.

Volunteer Training and Certification
Volunteers must apply to their role using the Volunteer Information Management System (VIMS). After the volunteer has selected their role, FIRST Tech Challenge will send an email to the Volunteer with access to their training resources and certifications (when applicable) located in Schoology. Emails will be sent twice a week, on Tuesdays and Thursdays. If you have applied for a role but have not received access to the training, please email FTCTrainingSupport@firstinspires.org.

FIRST Tech Challenge requires Referees to be trained prior Volunteering in the role. Training, including review of the current year’s Referee Manual, supplemental Manual review (Game Manuals Part 1 and 2), training video, the Referee certification test, and review of the FIRST Tech Challenge Game Forum will take approximately three to four hours.

Event Time Commitment
Most FIRST Tech Challenge Events are whole-day events. Please plan on showing up early and staying for the entire tournament.

Dress Code
Dress for this role includes ANSI Z87.1 certified safety glasses worn at all times on and around the Competition Playing Fields and in the Pit areas. Those Referees that wear prescription glasses must wear safety goggles over them or attach safety side shields. In addition, wear comfortable clothing that will allow you to move easily and closed-toe shoes that will provide all-day-on-your-feet comfort and will not harm the foam Playing Field floor covering.

Volunteer Minimum Age Requirement
The minimum age allowed for Referees is 18. Students who have been a part of a Team must be at least 3 years removed from the Team before they can function as a Judge at an Official FIRST Tech Challenge Tournament. Adult Volunteers may not have children accompany them while volunteering or be responsible for supervising their own children at the event. Children under the minimum age are welcome at FIRST Competitions with appropriate supervision by someone other than a Volunteer.

Key Volunteer Role Minimum Age Requirement
Volunteers MUST be at least 18 years of age before being assigned to a Key Volunteer Role. Key Volunteer positions include: Volunteer Coordinator, Head Referee, Judge Advisor, Field Manager, Field Technical Advisor, Control System Advisor, Wi-Fi Technical Advisor, Lead Hardware Inspector, and Lead Scorekeeper. When a Volunteer who is applying for a Key Role is also a recent FIRST participant (participated in a FIRST program within the last 4 years), this Volunteer falls under the category of an inexperienced Volunteer, and should be assigned with an experienced Volunteer in the Role in which the inexperienced Volunteer would like to serve. Recognize that while we strongly encourage Alumni to volunteer, it is important to talk through with...
this inexperienced Volunteer that they need to be careful in personalizing their experience and comparing the Teams and situations at this specific Event to what they remember about their own experiences.

**Bring a Friend!**

Volunteers are such a vital part of the FIRST Tech Challenge Program and continuing to inspire students to pursue science, technology, engineering, and math (STEM) careers. FIRST Tech Challenge needs your help in recruiting new volunteers to keep our programs thriving for future generations! If you have a friend or co-worker you think would be interested in volunteering at an event, there are just a few easy steps to help get them involved!

1. Check out our full list of Volunteer opportunities online!
2. Have them apply for the Event in VIMS. All Volunteers must be screened before volunteering.
   a. Check out the VIMS User Guide Here!
3. Have them contact FTCTeams@firstinspires.org with any questions they may have.

If they are concerned about jumping in head first, no worries! Job shadowing at an FIRST Tech Challenge Event is one of the best ways to get a taste of what a full day’s worth of competition looks like, and discover ways they can fit their own personal skills into a Volunteer position!

**Overview of Responsibilities**

Refereeing at FIRST Competitions is different from a traditional sporting event in that the Referees help the competitors to avoid breaking the Rules of the Game. We like to remind Team members if they are getting close to an infraction and warn them rather than watching passively. Continued violations of the Game Rules outlined in this Manual and the Game Manuals should fall into fair and consistent enforcement. Penalties will be applied for these violations and could lead to disqualification of a competitor. It is important for a Referee to understand what constitutes a penalty, and to allow a competitor the opportunity to remedy the situation. It is important for a Referee to understand what constitutes a penalty and to allow a competitor the opportunity to remedy the situation.

**Experience and skills needed**

- Ability to “take charge” and be assertive, but be friendly and tactful.
- Thorough knowledge of the Competition Game and Rules of play.
- Outgoing personality; high energy.
- Strong communication and diplomacy skills.
- Ability to collaborate with others; work as a member of a Team.
- Attention to detail.
- Ability to move about the Field.
- Ability to stand for long periods of time.
- Strong assessment skills.

Referees observe Team Matches and identify Rule violations and “call” them. They score the Game Elements and Autonomous points and record these on the Score Sheet. The Scorekeeper will enter this data into the Scoring System, which then calculates and displays the Match Score. The Referees work under the direction of the Head Referee and may be required to participate in deliberations regarding Referee calls contested by Teams.
**Personal Demeanor**
As a referee, it is important to recognize the very public nature of your volunteer role as well as the close level of interaction with the students. Your actions are seen and heard by many participants and spectators at your tournament. The manner that you display in your actions frequently carries more weight with the students than what you say in your interactions with them.

As you are carrying out your responsibilities, keep in mind a few key thoughts;

- I am participating as a volunteer to help inspire students
- I have many opportunities to serve as a mentor/teacher to those students during the event
- My job is not to punish teams that commit rule violations. My job is to keep gameplay fair and equitable
- I inspire better when it is obvious I am having fun with the people around me while doing my job

Keeping these thoughts in mind and focusing on having fun with the students will make for a great experience for all involved!

**Pre-Tournament Responsibilities**

**Prior to the Event**
It is important prior to the Event that the Referee reviews the [Game Manual Part 1 and 2](#), and watches the pre-recorded Referee Training video. Referees are required to pass a Certification Test in order to fill this Role at an Event.

The training will walk through the Referee’s responsibilities throughout the Event, and discuss the game rules in greater detail. The scheduled Q&A calls will provide an opportunity to ask questions, and even provide feedback to other Referees. The Referee must be confident and comfortable with the Game Rules to be able to reliably make calls during the hectic pace of a *FIRST* Tech Challenge Event. Learning ahead of time will go a long way towards keeping the Event running smoothly and on time.

**Required Reading**
All Referees must read and be familiar with the entire VELOCITY VORTEX℠ Game Manual Part 1 and 2. Specifically, it is critical to read and completely comprehend the following portions:

**Part 1, Section 4 – The Tournament**
Pay attention to the Tournament Definitions and the Tournament Rules.

**Part 1, Section 5 – The Robot**
Ideally, this section of the Game Manual is managed primarily by the Inspection process. It is important to be familiar with and aware of the general rules for Robot construction. Referees can, as appropriate, require a Robot to go back for Inspection if there is a concern about a violation of the Robot construction rules.

**Part 2, Section 1 – The Game**
It is key to familiarize yourself with the Game Overview, Game Definitions, and Game Rules. Referees must understand the set of Rules that can trigger penalties for an Alliance. Penalties come in several weights, minor penalties, major penalties, disablement, and yellow or red cards.

A table summarizing the penalties can be found in [Game Manual Part 2, Section 1.8](#). The table is a summary; the body of the Game Manual will always supersede the summary.
The current revision of the VELOCITY VORTEX℠ Game Manual Part 1 and Part 2 can always be found at: http://www.firstinspires.org/node/4271

It is also essential for Referees to be up-to-date with the state of the Game rulings that have taken place. Game rulings can be found in the FIRST Tech Challenge Game Forum. They are updated throughout the season. They should be read and understood immediately prior to the Tournament. Updates stop for the week on Thursdays at approximately 12:00PM Eastern time during Tournament season. The FIRST Tech Challenge Game Forum is also converted to PDF, EPUB, and MOBI formats every Thursday afternoon.

Event Day Responsibilities

Match Play

Queuing and Entering the Field Prior to the Match
- Check for Badges – both Drivers and the Coach must have a Badge. Coaches will have a dot or other designation on their Badge. At some events, Badges are not provided. If this is the case, ask the Event Coordinator or the Affiliate Partner about methods to identify Coaches and Drivers.
- Remind the Coach not to touch the controls during the Match.
- Check for safety glasses; be sure that everyone has them on.
- Remind the Drive Team to remain in the Alliance Station.
- Ensure that the Field has been reset properly.

Score Trackers
Scoring for the VELOCITY VORTEX℠ game requires a separate set of volunteers called Trackers, one for each Alliance, to watch and count real time when an Alliance scores a Particle into their Alliances Corner Vortex. Each Tracker should have a method of counting each time an Alliance scores. The following are recommendations to purchase to assist the Tracker in keeping an accurate count throughout the Match:

http://www.officedepot.com/a/products/295033/Great-Star-Tally-Counter/

http://tallycounterstore.com/hand-counters/

Since the Tracker will only need to track the Particles scored in the Corner Goal, each will require only one tally counter or other method of tracking the score. There are also phone apps that can be downloaded to assist with keeping track of the score.

Important Note: Trackers are only watching the Particles that are scored into the Alliances Corner Vortex. The Referees should continue to track the Center Vortex, Beacons, and watch for any penalties or violations of rules.

During the Autonomous Period
- Teams may not touch the controllers after the Beacons are randomized and until the Autonomous Period is complete.
- Watch the Drivers in the Alliance Station to be sure they do not touch the controls or any part of the Playing Field during the Autonomous Period.
• Score each Alliance at the end of the Autonomous period on your Referee Score Sheet.

**During the Driver-Controlled Period**

• Watch that Coaches do not touch the controls in any way during the Match.
• Watch for Team members touching their Robot, Game Element, Scoring objects, or any part of the Playing Field.
• Watch for Robot pinning, trapping, or blocking.
• Watch for Rule violations or intentional damage to the Field or other Robots.

**After the Match, the Referee Shall**

• Enter Field and score. All Referees confer as needed and agree on a Score.
• The Head Referee shall complete the Score Sheet and return it to the Scoring table.
• The Head Referee will communicate with the Teams as necessary.

**Referee Question Box**

The Referee Question Box is a place where Teams can ask questions of the Referee’s after a Match. Per Rule <T3>b:

All questions about a Match or scores must be must be brought forward to the Referees by using the Referee Question Box located in the Competition Area. Only one student from an Alliance is permitted to enter the question box, and must do so within the time period of three (3) Matches following the disputed Match.

Referees should refer questions from Teams to the Head Referee. Head Referees must be diligent to ensure they are addressing questions from Teams in a timely manner, but not so that it affects the Match schedule. Only students are allowed to ask questions in the Question Box; if a coach or parent approaches the Question Box, graciously remind them that it is the responsibility of the student to be present to ask a question.

**Game Summary**

**VELOCITY VORTEX** is played on a 12 ft. x 12 ft. square field with approximately 1 ft. high walls and a soft foam mat floor. Two Alliances – one “Red” and one “Blue,” composed of two Teams each – compete in each Match. The object of the game is to attain a higher Score than the opposing Alliance by Scoring Particles into the Corner Vortex and the Center Vortex, lifting Cap Balls, Capping the Center Vortex with a Cap Ball, claiming Beacons, and navigating to specific parts of the field. The Scoring Elements for the game are 10 Alliance-specific Particles (5 per Alliance) and 2 Alliance-specific Cap Balls (1 per Alliance). The game is played in two distinct periods: Autonomous and Driver-Controlled.

The game starts with a 30-second Autonomous Period in which robots operate using only pre-programmed instructions. Alliances earn points by: (1) Claiming Beacons, (2) moving the Cap Ball off of the Center Vortex Assembly onto the field floor, (3) scoring Particles in their Alliance’s Center Vortex or Corner Vortex, and (4) by parking their robot in contact with the Center Vortex Assembly or Corner Vortex Ramp.

*Gracious Professionalism®* - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
The two-minute Driver-Controlled Period follows the Autonomous Period. During this period, Teams earn points for their Alliance by: (1) scoring Particles into their Alliance’s Center Vortex, (2) scoring Particles in their Alliance’s Corner Vortex and (3) Claiming Beacons for their Alliance.

The final 30 seconds of the Driver-Controlled Period is called the End Game. In addition to the previously listed Driver-Controlled Period Scoring activities, Alliances earn bonus points by (1) raising the Cap Ball off of the Playing Field floor, or (2) by placing the Cap Ball into their Center Vortex.

Penalties

There are several Rule infractions that can result in a Team being assessed a penalty. A summary of the penalties that can be incurred are listed in the official Game Manual. There are two types of Penalties, Minor and Major. Minor Penalties result in a loss of 10 points per offense. Major penalties result in a loss of 40 points per offense. In addition, there are a few offenses that carry double minor penalty points. Penalties are designed to allow Teams to continue to play, in spite of having committed a significant infraction of the Rules.

When a penalty is called, the Referee making the call should signal the penalty by waving the appropriate flag (either Red or Blue), pointing at the offending Robot, and verbally indicating the Rule violation that has resulted in the penalty. This communication is needed to help ensure that Teams are aware that their actions are drawing penalties.

It is important to keep track of the penalties assessed to each Team/Alliance during the Match, as they may become part of discussions between the Teams and the Head Referee post-Match. A notepad and/or clipboard are useful tools to keep track of penalties for the Match.
**Yellow/Red Cards**

In addition to rule violations explicitly listed in Section 1.6 – Rules of Game Play, Yellow Cards and Red Cards are used in the FIRST Tech Challenge to manage Team and Robot behavior that does not align with the mission of FIRST.

The Head Referee may assign a Yellow Card as a warning, or a Red Card for Disqualification in a Match, as a result of egregious Robot or Team member behavior, or repeated (3 or more) violations of a rule at the event. A Yellow Card or Red Card is indicated at the end of a Match by the Head Referee standing in front of the Team’s Alliance Station and holding a Yellow Card and/or Red Card in the air.

Yellow Cards are additive, meaning that a second Yellow Card is automatically converted to a Red Card. A Team is issued a Red Card for any subsequent incident in which they receive an additional Yellow Card, including earning a second Yellow Card during a single Match. A second Yellow Card is indicated by the Head Referee standing in front of the Team’s Alliance Station and holding a Yellow Card and Red Card in the air simultaneously after the completion of the Match. A Team that has received either a Yellow Card or a Red Card carries a Yellow Card into subsequent Matches, except as noted below. A Red Card results in Match Disqualification. Multiple Red Cards may lead to Tournament Disqualification. Once a Team receives a Yellow Card or Red Card, its Team number will be presented with a yellow background on the audience screen at the beginning of all subsequent Matches as a reminder to the Team, the referees, and the audience that they carry a Yellow Card.

Yellow Cards do not carry over from the Qualification Matches to the Elimination Matches. During the Elimination Matches, Yellow and Red Cards count against the entire Alliance, not to a specific Team. If a Team receives a Yellow Card or Red Card, it results in the entire Alliance receiving the Yellow Card or Red Card for that Match. If two different Teams on the same Alliance are issued Yellow Cards, the entire Alliance is issued a Red Card. A Red Card results in zero (0) points for that Match, and the Alliance loses the Match. If both Alliances receive Red Cards, the Alliance which committed the action earning the Red Card first chronologically loses the Match.

**Obtaining Yellow and Red Cards**

Every Head Referee should carry with them a Yellow Card and a Red Card throughout the Event. This will act as a visual aid not only to the Teams but to the audience when the Alliance or Team has received a Yellow or Red Card. Yellow and Red Cards can be purchased such as the following:


Yellow and Red cards can also be simply cut out of construction paper. If needed an app can be downloaded to serve as the visual aid, however the Head Referee must clearly display the screen to the Team as well as to the audience. Although the Yellow Cards will be displayed on a screen to the audience, this is only displayed after the completion of the Match, only after the Scorekeeper has entered the information to be displayed.

**Issuing & Tracking Cards**

If you observe a rule violation that merits a team receiving a Yellow or Red Card, you should notify your Head Referee of the infraction, explain your observations to allow your Head Referee to be able display the appropriate card to the team(s) involved and be able to discuss the situation with the team(s) as needed.

Yellow and Red Cards will be tracked within the scoring system and by the Head Referee.

**Repeated Rule Violations**

There are several Rules in the VELOCITY VORTEX℠ Game Manual that make references to repeated actions leading to more significant penalties being applied. An action that is repeated 3 or more times should be
considered for additional penalties. These should be acknowledged with verbal warnings given to the offending teams at each of the 1st and 2nd offenses.

**General Game Rule Interpretation**

<G1> **Electronic Communication Devices in the Alliance Station**
Rule <G1> prohibits Teams from bringing electronic communication devices to the Alliance Station. This includes, but is not limited to; cell phones, walkie-talkies, Bluetooth headsets, tablets with internet connections, etc. Any device that would be reasonably assumed to be a communication device should not be brought to the Alliance Station. This of course does not apply to the Driver Station (i.e. the cellphone that is a part of the Driver Station).

<G2> **Robot Placement**
This Rule specifies the order that the Robot should be placed onto the Field. During Qualification Matches, Blue Alliance Robots should be placed first. If the Blue Alliance arrives to the Match late, and the Red Alliance has already placed their Robots, the Red Alliance will be given the opportunity to reposition their Robots. During Elimination Matches, the lower seeded Robots should be placed first (i.e. 3rd place seed places before 2nd place seed). During any Match, an Alliance may waive its right to place last (i.e. they are not required to wait until the opposing Alliance has placed, but are merely given the right to place last if they choose. Make sure to watch for Teams that may be 'gaming' this Rule, looking to take advantage and possibly delay Match start. Remind them of the goals of Gracious Professionalism®.

<G3> **Robot Size**
Robots are required to start in a legal configuration. Robots that are unable to establish and maintain an appropriate starting configuration should be disabled for the Match. If disabled, they should sit where they are, without running their Autonomous program (if any). The controllers for the Team should be left on the ground for the entire Match.

<G4> **Alignment Devices**
Robots are allowed to use alignment devices. The alignment devices must be made from legal parts/materials and must be a permanently attached part of the Robot. Additionally, they must be within the 45.72cm (18in) starting configuration during the entire setup process (i.e. they cannot be extended outside the 45.72cm (18in) starting configuration during setup). Using body parts, team members standing inside/outside the field perimeter, are examples of dis-allowed alignment devices.

Final decisions about disabling a Robot for a Match due to <G4> violations should be made by the Head Referee. Robots disabled for violations of <G4> will remain on the Field, where they were when the <G4> violation occurred, powered off, until the Match is completed.

<G5> **Leaving the Alliance Station**
Rule <G5> prohibits a Player from leaving the Alliance Station during a Match, except in the case of safety. This includes leaning and/or reaching into the Field from the Alliance Station. Teams that reach/lean into the Field should be warned to keep inside their Alliance Station. Repeated violation should result in penalties being assessed.

Similar arguments apply to Team members stepping out of the Alliance Station. Some latitude can be allowed for minor crossings of the Alliance Station perimeter, coupled with gentle reminders. Repeated or more blatant violation should be assessed with penalties.
<G6>, <G7>, <G8> Starting Game Play Early, Starting Game Play Late, Stopping Game Play Late
Robots that start or end Game Play either late or early will receive a Minor Penalty. A Major Penalty may be assessed instead, if the referees determine competitive advantage was gained. Scoring that occurs as a result of late Game Play by Robots will not be counted as scored.

<G9> Contact with Game Elements
Members of a Drive Team should not make contact with Game Elements, including those that leave the Field of Play. Teams should not be penalized for unintentional and incidental contact with Game Elements that leave the Field into the Driver Stations. Teams should leave the Game Elements alone and allow designated Field personnel to return the Game Elements to the Field when it is safe to do so.

<G10> Untangle and Upright Robots
This Rule is intended to allow the Head Referee the maximum ability to allow Teams to be successful during the Driver-Controlled Period. If it is not possible to safely disentangle Robots, without damage to the Robots involved or to the Field and Game Elements, the Robots will not be disentangled. Uprighting and untangling of Robots will be done after a brief discussion by the Head Referee and the affected Team(s). The Head Referee has the discretion to disentangle Robots during the process of Scoring after the end of the Autonomous Period, and before the start of the Driver-Controlled Period. Robots should only be moved enough to separate them.

<G11> Coach Controlling Robot
The member of the Drive Team that is designated as the Coach is not allowed to control the robot. Coaches are allowed to hold the Driver Station Android device, including interacting with it to select OpModes, start/stopinitialize/reset the robot (as appropriate for the current Period of the match)

<G12> Game Elements Scored When they Come to Rest
In general, scoring is finalized when the game elements come to rest, not when the end of match buzzer sounds. Small Balls or Large Balls that are released prior to the end of the match should be allowed to come to rest before they are scored (or not). This does allow for the classic “buzzer-beater” shot to be in the air as the buzzer is sounding.

<G13> Deliberately Detaching Parts
Robots that deliberately detach parts during a match should be issued a Minor Penalty. Additionally, if the detached part affects gameplay of any robot, the penalty should escalate to a Major Penalty and a Yellow Card. Parts of robots that are attached only with a tether will count as detached for the purposes of <G13> penalties.

<G14> Grab/Grasp/Grapple
In general, Rule <G14> prohibits Team Robots from grabbing onto Game or Field Elements. The Game Specific Rules will provide exception where necessary for a given year’s Game.

<G15> Entanglement
Entanglement occurs when parts of two or more Robots are locked together. Not all occurrences of entanglement require a penalty. It is up to the Referee to determine if a Robot has an arm or other device that greatly increases the chance of entanglement. A Referee may also assign a penalty for a strategy resulting in entanglement, such as intentionally spearing a Robot with an arm.
Scenario 1:
Two Robots collide and their wheels interlock, preventing either from moving freely. No penalty should be awarded since wheeled Robots are a conventional design and neither has a design that increases the chance of entanglement.

Scenario 2:
Blue 1 has wires running loosely from an arm to the Robot body. Red 2 drives by and is caught on Blue 1’s wires. Blue 1 should receive a penalty for entanglement since the wires clearly extend beyond the main part of the Robot and were not properly tied down to prevent catching on a Robot or Field Element.

<G15> Tipping
The intent of this Rule is to prevent one Robot from tipping over and disabling an opponent. This Rule is similar to the entanglement Rule in that it is very situation and Robot dependent. VELOCITY VORTEXSM is a highly interactive Game and Robots are expected to push and otherwise make physical contact with each other. Robots should be designed with that in mind. The fact that a Robot is top heavy and easily falls over when bumped by another Robot should be taken into account before a penalty is awarded. A Robot with a feature that enhances the ability to tip over other Robots, regardless of the feature’s intended purpose (such as a ramped plow to herd Game Elements) should be warned that contact with other Robots using this plow can be interpreted as tipping. Teams should be warned not to take advantage of a situation when an opposing Robot is off balance.

Scenario 1:
Red 2 is driving up the edge of the platform and is off balance. Blue 1 drives up and begins to push Red 2, causing Red 2 to tip over. Blue 1 should be penalized for tipping.

Scenario 2:
Red 1 and Blue 2 are pushing each other with their arms. Blue 2 is off balance so Red 1 backs off. Blue 2 cannot recover and falls. This action should not be a tipping penalty.

Scenario 3:
Blue 2 has a ramp in front that is used to scoop up blocks. When Blue 2 is pushing Red 2, the ramp goes under the wheel of Red 2, tipping Red 2 over. Blue 2 should be penalized for tipping.

<G16> Pinning/Trapping/Blocking
Pinning is a Rule that generates a great number of complaints/comments from Teams. The intent of this Rule is to stop one Robot from preventing the motion of an opposing Robot. Many times this is confused with blocking. Blocking, or preventing a Robot from moving in a specific direction is legal, but holding a Robot against a Field Element or another Robot and preventing it from moving in any direction is illegal. The pinning Rule is applied differently in the Autonomous mode and the Driver-Controlled mode. Trapping applies in cases where a Robot can move, but it prevented from being able to leave or access an area of the field.

Autonomous Mode
In general, pinning, trapping or blocking in Autonomous mode is quite rare. The difficulty with calling this penalty is that since the Robots are not being driven, the Referee cannot ask the offending Robot to back up. The Referee must determine whether the pinning, trapping, or blocking is intentional or accidental. Unless the offending Team has specifically targeted their opponent and has demonstrated in past Matches a strategy aimed at pinning a Robot, the Referee is usually better off issuing a warning. If pinning, trapping, or blocking does occur, the Referee must notify the Team with the pinning, trapping, or blocking Robot that as soon as the
Driver-Controlled Mode starts, their Robot must back up 91.44cm (36in) immediately (approximately 1.5 full Field tiles). There will be no 5 second count.

**Driver-Controlled Mode**

For pinning to occur, the pinned Robot must not be able to move in any possible direction. Blocking a Robot from traveling in its preferred direction is not pinning. Open Field contact between Robots is not pinning. If pinning does occur, the Referee must notify the offending Team and begin counting. The count should be visible, pointing fingers is recommended, and the count should be loud enough for the Teams to hear. Referees should start the count at 2, since by the time the count is started at least one second has gone by. The pinning Robot must back off a minimum of 91.44cm (36in) (approx. 1.5 full Field tiles). If the offending Robot does not back up, the Referee should assign a penalty. Repeated pinning for less than 5 seconds is allowed, provided the offending Robot backs up a minimum of 91.44cm (36in) each time. If the Robot continues to violate the Rules, the Referee should disable the Robot, but only after making the Team move the Robot away from the pinned Robot.

A key phrase in the definition of pinning is “preventing the movement in all directions of an opposing Robot”. If the Robot is not attempting to move, there is no pinning. A Robot must be actively attempting to move for it to be considered pinned. Contact with a Robot parked against a Field Border or Field Element in a way that would prevent a Robot from moving is not sufficient to be considered pinning. The pinned Robot must be attempting to move away from the object that it is being pinned against.

**Scenario 1:**

Red 1 is 3" from the wall. Blue 2 is preventing Red 1 from moving toward the Center Vortex. The red Team is calling for a pinning penalty, but since Red 1 has room to turn and move parallel to the wall, the Referee should not begin the count. It is not trapping if the Robot can move in another direction.

**Scenario 2:**

A Referee starts a pinning count on Red 1 for pinning Blue 2. Red 1 backs up 30.48cm (12in) and then drives back to Blue 2. The Referee continues counting (30.48cm (12in) is not sufficient to end the pin), and at 5 seconds assigns penalty to Red 1 and warn them to back off at least 91.44cm (36in). If Red 1 continues to pin the Blue Robot, the Referee should ask the Red Alliance to move at least 91.44cm (36in) away, and the Robot will be disabled.

**Scenario 3:**

Blue 1 has driven up the Corner Vortex attempting to score. The Red Alliance has positioned their Robot in a manner to allow Blue 1 to drive up or down the Corner Vortex ramp, but has shielded the Robot from exiting the Corner Vortex. The referees should begin a Trapping Count for the Red Alliance Robot.

**<G17> Forcing a Penalty**

Referees should keep an eye out for instances where a Robot is forced into a penalty by an opposing Robot. This may be accidental or intentional. If intentional, the offending Team should be warned and if the conduct continues can result in a disable or disqualification.

**Scenario:**

A Blue Robot is parked by the Red Alliance’s Corner Vortex. A Red Robot pushes the Blue Robot, causing the Blue Robot to enter the Red Corner Vortex, which could potentially be a violation of
No penalty will be assessed on the Blue Robot providing the Blue Robot moves out of blocking position as soon as possible.

**<G18> Game Elements Deliberately Out of Bounds**
Team should not intentionally remove Game Elements from the Field. They should expect to be penalized for each Game Element placed out of bounds. Actions that repeatedly and routinely cause Game Elements to leave the Field will be determined to be intentional.

Game Elements that leave the Field of Play should be returned to the Field at the earliest possible SAFE opportunity, at approximately the position where they left the Game Field. Due to the proximity of the Driver Station to the Field edge, it may be difficult to return Game Elements that leave the Field in front of the Driver Station in a timely way. It is important to make sure not to interfere with any of the members of the Drive Team while returning Game Elements to the Field.

It is possible that some Game Elements that leave the Field of Play may not make it back into Play for the remainder of the Match, particularly for those that leave the Field near the Alliance Station.

All Game Elements that leave the Field during the Autonomous Period should be returned to the Field of Play during the pause between the Autonomous Period and the Driver Controlled Period, while the Robots are all inactive.

**<G19> Scoring Elements in Contact with Robots**
In general, game elements that are in contact with a robot of the same alliance do not score for that alliance. <GS16> provides related to contact with the Cap Ball at the end of the match.

**<G20> Post-Match Removal of Game Elements from Robots**
Robots need to be designed to allow quick removal of game elements from the robot. The goal of the rule is to efficiently get robots off the field at the end of a match and the field prepped and ready for the next match.

**<G21> Controlled Game Elements Part of Robot**
Game elements (Cap Balls and Particle Balls) that are controlled by a robot are considered a part of that robot. This applies to interactions between robots, game elements, or field elements. For example, a red robot that is controlling a red Particle Ball and uses it to control the blue alliance’s Cap or Particle Balls is in violation of <GS10>

**<G23> Disabled Robot Eligibility**
A robot that is disabled by the referees due to rule violations is deemed ineligible to score for the remainder of the match. Before the team puts down their controllers, the robot should be moved into a neutral, non-scoring position. The ineligibility includes any actions by their alliance partner that would cause the disabled robot to be moved into a scoring position.

**<G25> Match Replay**
This Rule dictates the conditions that the Head Referee and the Field Technical Advisor (FTA) will use to determine the possibility of a Match replay. The key here is that a discussion between the FTA and the Head Referee will be the determination of possible replay. Verifiable faults are required. Head Referee decisions are final. Note that the justification for Match replay requires situations that are deemed “likely to have impacted which Alliance won the Match” in order to justify Match replay.
**<G26> Egregious Behavior**

Teams should expect to behave appropriately in all situations at the Playing Field. This includes respectful interactions with all Field personnel, as well as with all competitors in the Match. This same respect extends to the Game Rules and to general safety around the Playing Field.

All discussions regarding possible <G26> violations should involve the Head Referee.
VELOCITY VORTEX\textsuperscript{SM} Game-Specific Rule Interpretation

\textbf{<GS1> Controlling Possessing Particles}
Once match play has begun, there is no limit to the number of Particles (of their own Alliance’s) that a robot may control or possess.

\textbf{<GS2> Particles Scoring Eligibility}
All Particles that have been scored must make contact the Playing Field Floor before they are eligible to be scored again. Particles that are scored in violation of this rule should not be counted towards match score (i.e. 0 value)

\textbf{<GS3> Corner Vortex Scoring Violations}
To prevent robots from attempting to control the Particle’s path as it travels through the Corner Vortex, robots are not allowed to break the rear plane of the bar that marks the Corner Vortex. Additionally, the robots are not allowed to interact with the Particles until they become eligible for scoring again (i.e. have made contact with the Playing Field Floor). A Minor Penalty should be issued for each violation of <GS3>.

\textbf{<GS4> Touching Robots/Controls after Randomization}
Teams are not allowed to make contact with their robots or interact with their driver station once the Beacons are randomized for the match. Offending robot is not eligible to trigger Beacons. A Minor Penalty per Beacon should also be issued.

Referees should double-check with teams prior to randomization to minimize risks to teams.

\textbf{<GS5> Drive Team Triggering Beacons}
Drive team members are not allowed to interact with the Beacons. Pressing any of the buttons on the Beacon results in a Major Penalty for the Alliance. This includes the randomization button on the outside of the field and the two playing field facing buttons.

\textbf{<GS6> Opposing Alliance Beacon During Autonomous Period}
Pressing any of the buttons on an opposing Alliance Beacon during the Autonomous Period results in the offending robot receiving a Major Penalty per offense. The robot is not eligible to earn a bonus Particle. The offended Alliance is still eligible to claim the Beacon and earn the bonus Particle.

\textbf{<GS7> Autonomous Keep Out Area}
Robots are not allowed to cross into the Opposing Alliance half of the field during the first 10 seconds of the Autonomous Period.

Inadvertent and Inconsequential entry should not be penalized. Contacting Opposing Alliance Robots or Game Elements will not be considered Inconsequential and should be penalized.

Observed, repeated, unforced crossings should not be considered Inadvertent and should be penalized.

\textbf{Important Note: For the 2016-2017 season game, the clock will sound 10 seconds into the Match to let Teams know they can now cross the center line on the Field. Please see the Field Configuration Guide for more details on the Match Timer Display.}

\textbf{<GS8> Robot Height}
Prior to the End Game, robots are not allowed to extend above the height of the Center Vortex horizontal bar (nominally 71.12cm (28in)). A Minor Penalty should be immediately issued. Additional Minor Penalties should be given each 5 seconds the violation continues. The height of the Alliance Flag is exempted from <GS8>
**<GS9> Particle Interference**
Once a particle has been fully released by a robot and is above 18” from the Playing Field Floor, it may not intentionally be interfered with by an Opposing Alliance Robot.

All shots blocked in violation of <GS9> should be counted as scored. To count as a violation, the shot blocked had to have had a realistic intention of scoring.

Repeated and/or continuous violation of this rule should escalate to Yellow/Red Cards rapidly.

**<GS10> Blocking Access to Scoring Elements**
Robots are not allowed to Block Access to the Opposing Alliance’s Scoring Elements (Particle and Cap Ball).

A warning should be given at the first instance during a match. Subsequent violations should result in a Major Penalty with additional Minor Penalties being given for each 5 seconds the violation persists.

**<GS11> Cap Ball Interference**
During the End Game, robots may not interfere with an Opposing Alliance Robot that is in Possession of a Cap Ball. A Major Penalty should be given, with additional Minor Penalties being given for each 5 seconds the violation persists.

The goal is to allow robots the opportunity to score the Cap Ball without interference.

**<GS12> De-Scoring Capped Center Vortex**
Robots may not De-Score a Cap Ball from the Center Vortex once it has been scored. It is important to note that <GS12> does not have allowances for incidental/inconsequential actions. Violation of <GS12> earns a team two Major Penalties.

**<GS13> Blocking Opposing Alliance Center Vortex**
Robots are not allowed to block the opposing alliance Center Vortex. This includes using any part of the robot or any Cap Ball. A Major Penalty and Yellow Card should be issued for violation of <GS13>. Note that there are additional Minor Penalties that are earned for each 5 seconds the blockage persists.

**<GS14> Blocking Access**
Robots that are blocking the entrance to an Opposing Alliance Corner Vortex should expect that they will have a Blocking Access count started if there is an Opposing Alliance robot actively attempting to enter or exit the Corner Vortex.

A Minor Penalty should immediately be assessed for violating rule GS14. Additionally, a 5 second count should be started if the blocking access violation continues. If the count gets to 5 seconds, another Minor Penalty should be assessed. Additional Minor Penalties should apply each 5 seconds that the Blocking Access violation continues.

<GS14> is very similar to <G16> Pinning in terms of the implementation and communication to the teams.

**<GS15> Starting End Game Achievements Early**
Robots are not allowed to begin materially lifting the Cap Ball off of the Playing Field Floor until End Game has begun. Minor lifting of the Cap Ball as a consequence of moving it around the Playing Field should be considered normal and not penalized.
<GS16> Cap Balls In Contact with a Robot
A Scored Cap Ball that is still in contact with a Robot of the corresponding Alliance is not eligible to be counted as Capping the Center Vortex. It is eligible to be Scored as Low or High as is appropriate (i.e. above or below the Center Vortex crossbar)

Robot Rules

There are guidelines and specifications Teams must follow when constructing their Robot (refer to Part 1 of the Game Manual for the full list of specifications). Although all Robots must pass an Inspection prior to competing, the Referee has the discretion to send a Robot back to Inspection if the Referee believes the Robot violates the stated Rules. There are a few of the Robot construction Rules that are of particular importance to Referees:

<RG02> Robot Size
This Rule limits the physical size of a Robot in its starting configuration to be able to fit within an 45.72cm (18in) cube. This includes all attachments, extensions, etc. If there is any doubt about the size of a Robot, the Head Referee should be notified, the Inspectors summoned and a possible re-Inspection of the Robot may be required.

<RG03> Robot Controller
The Robot Controller MUST be accessible and visible by competition personnel.

The Robot Controller shall be mounted such that the display screen is protected from contact with the Playing Field elements or other Robots. This and other electrical components (batteries, motor and servo controllers, switches, etc.) make poor bumpers and are unlikely to survive the rigors of game play when attached in a Robot-to-Robot contact area

<RG04> Flag Holder
This Rule requires all Robots to provide a means to mount a “standard” Flag (either Red or Blue) on the Robot. Flags allow the Referee and the audience to quickly identify the Robot Alliance. Robots must have a sturdy Flag holder that keeps the Flag firmly attached to the Robot during a Match. If the Referee believes the Flag is not sufficiently supported, the Referee may ask the Team to modify their Robot. The Robot will not be allowed to compete until it has been re-Inspected.

<RG05> Team Numbers
This Rule requires all Robots to clearly display their Team number. There are requirements for size and contrast of the numbers, as well as their positioning. The primary requirement is for the Referee to be able to clearly identify the Robot at all times (both by number and by Alliance).

<RG08> Projectiles
This Rule limits the energy that FIRST Tech Challenge Robots can impart onto any projectiles that they launch. It is an operational definition and its intent is completely about safety for the Alliances, the Field Personnel, and the audience that may be seated near the Field. If at any time the Referee and Inspector disagree on a Ruling, the final decision on whether to allow a Robot to compete is up to the Head Referee.

If there is a determination of excessive velocity, based on observation during game play, the robot in question should be sent back to inspection for a formal assessment of the velocity of its shots.
Tournament Rules

There are a few Tournament Rules in the Game Manual that have an impact on the role of the Referee. This section is important to understand since it lays out the flow of the Tournament, including the descriptions of the different types of Matches.

<T3> Referee Rulings Are Final

Rule T2 from Part I of the Game Manual introduces that Referee Rulings are final. Additionally, it sets a process and a time limit for the possible questioning of disputed Rulings. Most Tournaments will have a designated area where a student-member of the Drive Team waits for the opportunity to discuss a Ruling with a Head Referee.

When a question is brought forward it should be directed to the Head Referee only, and in the designated Referee Question Box located in the Competition. All questions and discussions with the Team are addressed by the Head Referee only.

If a non-student Team member attempts to bring forward a question, politely remind them that all questions and discussion occur only with student Team members. Ask them to leave the immediate area of the discussion and continue the discussion with student members.

At no point should you ever allow Teams to show you pictures or videos of Matches. Rule T2 expressly prohibits review of recordings or pictures.

Be aware that Teams often may not agree with the decisions of the Referees. They may attempt to engage in repeated attempts to reopen the discussion about the decision. Remind them that the Head Referees’ decisions are final and that repeated discussions will not change the outcome. If they persist, gently remind them about the ideals behind Gracious Professionalism®. It would also be good at this point to highlight the Team’s behavior to the Judge Advisor.

<T4> Non-allowed Wi-Fi Communication

<T3> No Team, Team Member, or event attendee is allowed to set up their own Wi-Fi 802.11a/b/g/n/ac (2.4GHz or 5GHz) wireless communication in the venue. Non-allowed wireless communications include, but are not limited to:

- Cellular Hotspots (e.g. cell phones, tablets, MiFi).
- Ad-hoc networks.
- Nintendo DS peer-to-peer.
- Bluetooth communication with Robots in the Competition Area.

No Team, Team Member, or event attendee shall interfere with a Team’s Wi-Fi Direct® communication with their own Robot.

The Penalty for violating rule <T3> is disqualification of the entire Team from the Event and their removal from the venue property. Teams may not appeal the penalty and no refunds will be given for registration fees, pre-paid meals, etc. FIRST may conduct a post-Event review and determine if any additional penalties are to be imposed upon the offending Team.

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
**<T₈> Team Badges**
Teams are issued Badges as part of the check-in process for the Tournament. All members of the Drive Team must wear the provided Badges. If they are not readily visible, encourage the members to place the Badges more visibly (i.e. above the waist). Badges may NOT be swapped during a match (i.e. the Coach at the start of the Match remains the Coach for the entire Match).

**<T₉> - <T₁₂> Timeouts and Match Timing**
There are no timeouts during Qualification Matches. During Elimination Matches, each Alliance has exactly one timeout. Alliances asking to use their timeout during the Elimination Matches should be referred to the Head Referee.

**<T₁₄> Safety Glasses**
Safety is everyone’s responsibility. All Drive Team members MUST wear safety glasses (or shatterproof prescription glasses with side shields).
Head Referee Manual Supplement
Please make sure to read ALL of the Referee Manual. The duplicate Head Referee Manual information has been removed and the following section is meant to serve as a Head Referee supplement with information that applies only to the Head Referee role.

**What is the FIRST Tech Challenge Head Referee Manual?**

The purpose of the FIRST Tech Challenge Head Referee Manual is to:

- Provide new Head Referees with a foundation of knowledge to fulfill the role at events.
- Familiarize new Head Referees with the FIRST experience.
- Help returning Head Referees refresh their skills for the upcoming season.

The guide focuses on the skills and concepts needed for the development of the following general goals:

- Provide Head Referees with an in depth description of the Game rules.

This guide would not be possible without the contributions of time, ideas, and resources provided by the following people:

- Content and revisions provided by Mark Edelman.

**Head Referee Job Description**

Refereeing is one of the most challenging and rewarding FIRST Volunteer opportunities. Not to mention that it comes with the fringe benefit of having the best seats in the house! This Manual contains information that is vital to the success of a Head Referee. Please make sure to take the time to get familiar with VELOCITY VORTEX℠ Game as well as the role of Head Referee as soon as possible. The full Game Manuals Parts 1 and 2 are available on the FIRST Tech Challenge Game website. Having knowledge of the role will ensure success at an Event.

FIRST Tech Challenge Tournaments squeeze a lot of activity into one day. One of the keys to running a smooth and successful Event is for Teams and Volunteers to show up prepared. Teams spend countless hours preparing for Competition day and we ask our Volunteers to prepare for Tournament Day as well.

**Volunteer Training and Certification**

Volunteers must apply to their role using the Volunteer Information Management System (VIMS). After the volunteer has selected their role, FIRST Tech Challenge will send an email to the Volunteer with access to their training resources and certifications (when applicable) located in Schoology. Emails will be sent twice a
week, on Tuesdays and Thursdays. If you have applied for a role but have not received access to the training, please email FTCTrainingSupport@firstinspires.org.

FIRST Tech Challenge requires Head Referees to be trained prior to volunteering in the role. Training, including review of the current year’s Head Referee Manual, supplemental manual review Game Manual Part 1 and 2, the Head Referee training video, the Head Referee Certification Test, and review of the FIRST Tech Challenge Game Forum will take approximately three to four hours.

Volunteer Minimum Age Requirement
The minimum age allowed for Referees and Head Referees is 18. Students who have been a part of a Team must be at least 3 years removed from the Team before they can function as a Judge at an Official FIRST Tech Challenge Tournament. Adult Volunteers may not have children accompany them while volunteering or be responsible for supervising their own children at the event. Children under the minimum age are welcome at FIRST Competitions with appropriate supervision by someone other than a Volunteer.

Key Volunteer Role Minimum Age Requirement
Volunteers MUST be at least 18 years of age before being assigned to a Key Volunteer Role and high school graduates. Key Volunteer positions include: Volunteer Coordinator, Head Referee, Judge Advisor, Field Manager, Field Technical Advisor, Control System Advisor, Wi-Fi Technical Advisor, Lead Hardware Inspector, and Lead Scorekeeper. When a Volunteer who is applying for a Key Role is also a recent FIRST participant (participated in a FIRST program within the last 4 years), this Volunteer falls under the category of an inexperienced Volunteer, and should be assigned with an experienced Volunteer in the Role in which the inexperienced Volunteer would like to serve. Recognize that while we strongly encourage Alumni to volunteer, it is important to talk through with this inexperienced Volunteer that they need to be careful in personalizing their experience and comparing the Teams and situations at this specific Event to what they remember about their own experiences.

Head Referee Role Responsibilities
Refereeing at FIRST Competitions is different from a traditional sporting event in that the Referees help the competitors to avoid breaking the Rules of the Game. We like to remind Team members if they are getting close to an infraction and warn them rather than watching passively. Continued violations of the Game Rules outlined in this manual should fall into fair and consistent enforcement. Penalties will be applied for these violations and could lead to disqualification of a competitor. It is important for a Referee to understand what constitutes a penalty, and to allow a competitor the opportunity to remedy the situation. It is the responsibility of the Head Referee to have a complete understanding of the Rules and penalties of VELOCITY VORTEXSM and be able to convey and communicate these Rules and penalties clearly and effectively.

Experience and skills needed
- Ability to “take charge” and be assertive, but friendly and tactful.
- Thorough knowledge of the Competition Game and Rules of play.
- Outgoing personality; high energy.
- Strong communication and diplomacy skills.
- Ability to collaborate with others; work as a member of a Team.
- Attention to detail.
- Ability to move about the Field.
- Ability to stand for long periods of time.
- Strong assessment skills.
The Referees work under the direction of the Head Referee and may be required to participate in deliberations regarding Referee calls contested by Teams. Head Referees play a critical role in ensuring smooth flow of Match play and maintaining the pace of the event.

**Personal Demeanor**
As a referee, it is important to recognize the very public nature of your volunteer role as well as the close level of interaction with the students. Your actions are seen and heard by many participants and spectators at your tournament. The manner that you display in your actions frequently carries more weight with the students than what you say in your interactions with them.

As you are carrying out your responsibilities, keep in mind a few key thoughts;

- I am participating as a volunteer to help inspire students
- I have many opportunities to serve as a mentor/teacher to those students during the event
- My job is not to punish teams that commit rule violations. My job is to keep gameplay fair and equitable
- I inspire better when it is obvious I am having fun with the people around me while doing my job

Keeping these thoughts in mind and focusing on having fun with the students will make for a great experience for all involved!

**Pre-Tournament Responsibilities**

**Prior to the Event**

It is important prior to the Event that the Head Referee reviews the Game Manual Part 1 and 2, and watches the pre-recorded Head Referee Training video. Head Referees are required to pass a Certification Test in order to fill this role at an Event. Once assigned as Head Referee, the Volunteer Coordinator or Affiliate Partner will send an email that provides a link to the training video, certification test, and a schedule of Head Referee Monthly Discussion Q&A calls.

The training will walk through the Head Referee’s responsibilities throughout the Event, and discuss the game rules in greater detail. The scheduled Q&A calls will provide an opportunity to ask questions, and even provide feedback to other Head Referees. The Head Referee must be confident and comfortable with the Game Rules to be able to reliably make calls during the hectic pace of an FIRST Tech Challenge Event. Learning ahead of time will go a long way towards keeping the Event running smoothly and on time.

**Required Reading**

All Head Referees must read and be familiar with the entire VELOCITY VORTEXSM Game Manual. Specifically, it is critical to read and completely comprehend the following portions:

**Part 1, Section 4 – The Tournament**

Pay attention to the Tournament Definitions and the Tournament Rules.
Part 1, Section 5 – The Robot

Ideally, this section of the Game manual is managed primarily by the inspection process. It is important to be familiar with and aware of the general Rules for Robot construction. Head Referees can, as appropriate, require a Robot to go back for inspection if there is a concern about a violation of the Robot construction Rules.

Part 2, Section 1 – The Game

It is key to familiarize yourself with the Game Overview, Game Definitions, and Game Rules. Referees must understand the set of Rules that can trigger penalties for an Alliance. Penalties come in several weights, 10-point, 40-point, disablement, and disqualification.

A table summarizing the penalties can be found in Game Manual Part 2, Section 1.8. The table is a summary; the body of the Game Manual will always supersede the summary.

The current revision of the VELOCITY VORTEXSM Game Manual Part 1 and 2 can always be found at: http://firstinspires.org/node/4271

It is also essential for Head Referees to be up-to-date with the state of the Game Rulings that have taken place. Game Rulings can be found in the FIRST Tech Challenge Game Forum. They are updated throughout the season. They should be read and understood immediately prior to the Tournament. Updates stop for the week on Thursdays at approximately 12:00PM Eastern time during Tournament season. The FIRST Tech Challenge Game Forum is also converted to PDF, EPUB, and MOBI formats every Thursday afternoon.

Tournament Day Responsibilities

Match Play

Queuing and Entering the Field Prior to the Match
- Check for Badges – both Drivers and the Coach must have a Badge. Coaches will have a dot or other designation on their Badge. At some events, Badges are not provided. If this is the case, ask the event coordinator or the Affiliate Partner about methods to identify Coaches and Drivers.
- Remind the Coach not to touch the controls during the Match.
- Check for safety glasses; be sure that everyone has them on.
- Remind the Drive Team to remain in the Driver Station.
- Ensure that the Field has been reset properly.

During the Autonomous Period
- Teams may not touch the controllers after the IR Beacons are placed until the Autonomous Period is complete.
- Watch the Drivers in the Driver Station to be sure they do not touch the controls or any part of the Playing Field during the Autonomous Period.
- Score each Alliance at the end of the Autonomous period on your Referee Score Sheet.

During the Driver-Controlled Period
- Watch that Coaches do not touch the controls in any way during the Match.
- Watch for Team members touching their Robot, Game Element, Scoring objects, or any part of the Playing Field.
- Watch for Robot pinning, trapping, or blocking.

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
Watch for Rule violations or intentional damage to the Field or other Robots.

**After the Match, the Referee Shall**

- Enter Field and score. All Referees confer as needed and agree on a score.
- The Head Referee shall complete the score sheet and return it to the scoring table.
- The Head Referee will communicate with the Teams as necessary.

**Referee Question Box**

The Referee Question Box is a place where Teams can ask questions of the Referee’s after a Match. Per Rule <T3>b:

> All questions about a Match or scores must be must be brought forward to the Referees by using the Referee Question Box located in the Competition Area. Only one student from an Alliance is permitted to enter the question box, and must do so within the time period of three (3) Matches following the disputed Match.

Referees must be diligent to ensure they are addressing questions from Teams in a timely manner, but not so that it affects the Match schedule. Only students are allowed to ask questions in the Question Box; if a coach or parent approaches the Question Box, graciously remind them that it is the responsibility of the student to be present to ask a question.

**Head Referee - Additional Roles and Responsibilities**

In addition to the responsibilities of a Referee, the Head Referee also has additional roles and responsibilities. These include: serving as a knowledge reference and training resource for the Referee crew, communication with the Teams, helping manage Tournament schedule, and serving as a role model for *Gracious Professionalism*.

**Knowledge and Training Resource for Referees**

The Head Referee serves as a role model and a knowledgeable resource for the Referee crew and the Tournament staff. The entire Referee crew looks to the Head Referee to be a reference for all Rulings on the Field and for the interactions with the Teams and Coaches.

Take the time to study the Game Manual and online Q&A Forum, understand the intent of the Rules and be able to explain as needed to the Referee crew.

Depending upon the Affiliate Partner or Event Director, the Head Referee may be asked to help with the training for the Referee Crew at the Event.

**Tournament Flow Management**

The Head Referee plays a critical role in keeping the Match Schedule flowing smoothly and on time. Effective management of the Field Reset, Pre-Match Robot setup, and the Scoring of the Matches will keep the day running smoothly. Keeping an eye out for bottlenecks and any possible inefficiency during the day and working with your Tournament Director or Field Manager will also help.
Drivers Meeting
One of the Head Referee’s additional responsibilities is leading the Driver’s Meeting that takes place the morning of the Tournament, prior to the start of any Matches.

The Driver’s Meeting should emphasize key Rules and interpretations and reiterate any recent changes or clarifications to the Rules as published in the online Q&A Forum. It should serve to clarify any misunderstandings the Teams may have of Game or Robot Rules or of the Scoring for the Game.

The meeting is an opportunity to make sure that all the Teams understand the Match flow; i.e., when and where they should Queue, the order the Robots should be placed onto the Field, the sequence of the Match, and the cue for the Reset of the Field and the removal of their Robots. The Field Manager may handle this part of the meeting. Also the Field Technical Advisor (FTA) may wish to communicate with Teams during this meeting.

During the Drivers Meeting the Head Referee should describe the process for Teams to ask questions. Make sure to emphasize the timing for questions. It is also critical at the Driver’s Meeting to point out the location of the question box where the Team member should wait to ask his or her question.

Make sure to allow time for questions from the Teams. Depending on the size of the Tournament and the noise level where the Driver’s Meeting takes place, you will possibly need to repeat questions so that all attending the meeting can hear the questions as well as the answers.

Yellow and Red Cards

In addition to rule violations explicitly listed in Section 1.6 – Rules of Game Play, Yellow Cards and Red Cards are used in the FIRST Tech Challenge to manage Team and Robot behavior that does not align with the mission of FIRST.

The Head Referee may assign a Yellow Card as a warning, or a Red Card for Disqualification in a Match, as a result of egregious Robot or Team member behavior, or repeated (3 or more) violations of a rule at the event. A Yellow Card or Red Card is indicated at the end of a Match by the Head Referee standing in front of the Team’s Alliance Station and holding a Yellow Card and/or Red Card in the air.

Yellow Cards are additive, meaning that a second Yellow Card is automatically converted to a Red Card. A Team is issued a Red Card for any subsequent incident in which they receive an additional Yellow Card, including earning a second Yellow Card during a single Match. A second Yellow Card is indicated by the Head Referee standing in front of the Team’s Alliance Station and holding a Yellow Card and Red Card in the air simultaneously after the completion of the Match. A Team that has received either a Yellow Card or a Red Card carries a Yellow Card into subsequent Matches, except as noted below. A Red Card results in Match Disqualification. Multiple Red Cards may lead to Tournament Disqualification. Once a Team receives a Yellow Card or Red Card, its Team number will be presented with a yellow background on the audience screen at the beginning of all subsequent Matches as a reminder to the Team, the referees, and the audience that they carry a Yellow Card.

Yellow Cards do not carry over from the Qualification Matches to the Elimination Matches. During the Elimination Matches, Yellow and Red Cards count against the entire Alliance, not to a specific Team. If a Team receives a Yellow Card or Red Card, it results in the entire Alliance receiving the Yellow Card or Red Card for that Match. If two different Teams on the same Alliance are issued Yellow Cards, the entire Alliance is issued a Red Card. A Red Card results in zero (0) points for that Match, and the Alliance loses the Match. If both
Alliances receive Red Cards, the Alliance which committed the action earning the Red Card first chronologically loses the Match.

**Issuing Cards**
The act of displaying a Yellow or Red Card to a team needs to be timely and non-confrontational.

If a Yellow or Red Card is to be issued as a result of rule violations in a match, the process below should be followed:

- The referee that observed the infraction should have an immediate discussion with the Head Referee.
- The Head Referee should, while inside the playing field, walk calmly toward the affected team and hold in the air the appropriate colored card. Care should be taken to verify the correct team before showing the card.
- If the team is receiving a Red Card as a result of a 2nd Yellow Card, the Yellow Card should be displayed first, immediately followed by the team being shown the Red Card.
- The Head Referee should encourage the team to send a representative to the question box after the match to discuss the rule violation.
- The Referee Crew should finalize the scoring for the match and allow the field to be immediately reset.

**Tracking Cards**
It is important to keep track of the Yellow and Red Cards that have been issued during the course of the tournament. The scorekeeping software will provide a means to review the cards, but the Head Referee should keep notes for each team that receives cards during the course of the tournament.

**Cards During Playoff Matches**
All teams enter the playoff portion of an event with a clean slate; i.e., any record of prior cards is cleared for all teams.

Cards received by teams during the Playoff Matches apply to the entire Alliance. Any two Yellow Cards earned during a playoff match results in the Alliance receiving a Red Card for the match.

Red Cards during the Playoff Matches are a disqualification for the entire Alliance and causes the Alliance to lose the Match.

**Alliance Selection Meeting**

During the short meeting for Captains that takes place as part of the Alliance Selection, you should emphasize a few key differences between the Qualification Matches and the Elimination Matches.

Clearly explain the consequences of a Team disqualification during the Playoff Matches (if a Team is disqualified, the Alliance in turn is disqualified which equates to the loss of the Match).

You should also take the time to explain the process for using Alliance time outs during the Elimination Matches. Although Teams are not allowed time outs during Qualification Matches, each Alliance is allowed one time out during Elimination Matches. A time out must be called at least two minutes prior to their next Match’s starting time. The time-out begins at the time their Match was going to start and lasts for no more than three minutes.
Answering Team Questions
One of the key responsibilities for a Head Referee is to address questions from Teams and to provide fair, consistent, Rule-based answers to their concerns.

It is important to make sure to patiently listen to the questions from the students. Make sure to consider their points and to hear them out completely. They are often very passionate about their concerns and that passion typically becomes more heated if they are not allowed to finish their argument.

Do not allow a Team to bring more than one person to the question box. If they do come with multiple members, politely remind them of the “one student limit” and wait to begin the discussion until they comply. Similarly, if an adult Mentor or Coach comes to the question box, politely remind them of the “students only” Rule and ask them to send a student Team member to ask any questions or to raise any concerns.

At the end of the discussion, it is a good idea to reinforce any positive behaviors displayed by the students. Thanking them for having a calm, intelligent discussion and wishing them good luck with the remainder of the tournament will help with keeping a positive environment around the playing field.

Don’t be afraid to correct errors. The referee crew is human. If, in consulting with your crew, you determine that the team has a valid concern, appropriate corrections should be made.

Remember that while working with the students in the Question Box, the goal is to have a reasoned discussion, not an argument. The Question Box is not a courtroom. The discussion is not a trial.

Model for Gracious Professionalism®
As Head Referee, you serve in a very visible role in a Tournament. You are frequently front and center and in the thick of the activity. As such, your actions are very noticeable. You should make sure to keep a professional demeanor in working with the entire Referee crew as well as all the Field personnel around the Playing Field. A light-hearted, friendly personal style around the Field should help to keep the interactions with everyone, including the Teams, friendly and cordial.

Referee Conferences
Occasionally, during Scoring or in answering a Team’s questions, it is useful to hold an impromptu Referee conference. Gather the Referee crew and discuss the situation as needed. Make sure to allow the entire crew the opportunity to speak if they wish.

Sometimes a Referee conference is a valuable tool for defusing dispute. As you listen to a Team’s questions it may be useful to step away, confer with your crew, and then provide the answer; even if the conference doesn’t impact the decision you would have made anyway. Taking the time to discuss the question with the crew helps the Team feel that their concerns were heard, understood, and valued, even if the final decision doesn’t go the way they are arguing for. Make sure that the short conference happens away from earshot of the Teams that are asking (also away from others that may eavesdrop).
2016-2017 FIRST® Tech Challenge Referee and Head Referee Manual

Appendices
Appendix A: Resources

Game Forum Q&A
http://ftcforum.usfirst.org/forum.php

Anyone may view questions and answers within the FIRST® Tech Challenge Game Q&A forum without a password. In order to submit a new question, you must have a unique Q&A System User Name and Password for your team.

FIRST Tech Challenge Game Manuals
Part 1 and 2 - http://www.firstinspires.org/node/4271

FIRST® Headquarters Pre-Event Support
Phone: 603-666-3906
Mon – Fri
8:30am – 5:00pm
Email: FTCTeams@firstinspires.org

FIRST Tech Challenge Event On-Call Support
These numbers are available for event personnel only. Please do not call these numbers if you are a Team looking for a ruling, a decision, or assistance. We trust that you will not misuse this resource.

General Day of Event support (e.g. scoring system, referee rulings, general questions): 603-206-2412
Day of Event Robot Control System Support: 603-206-2450

FIRST Website: firstinspires.org
FIRST Tech Challenge Page – For everything FIRST Tech Challenge.
FIRST Tech Challenge Volunteer Resources – To access public Volunteer Manuals.
FIRST Tech Challenge Event Schedule – Find FIRST Tech Challenge events in your area.

FIRST Tech Challenge Social Media
FIRST Tech Challenge Twitter Feed - If you are on Twitter, follow the FIRST Tech Challenge Twitter feed for news updates.
FIRST Tech Challenge Facebook page - If you are on Facebook, follow the FIRST Tech Challenge page for news updates.
FIRST Tech Challenge YouTube Channel – Contains training videos, Game animations, news clips, and more.
FIRST Tech Challenge Blog – Weekly articles for the FIRST Tech Challenge community, including Outstanding Volunteer Recognition!
FIRST Tech Challenge Team Email Blasts – contain the most recent FIRST Tech Challenge news for Teams.
FIRST Tech Challenge Google+ community - If you are on Google+, follow the FIRST Tech Challenge community for news updates.

Gracious Professionalism® - “Doing your best work while treating others with respect and kindness - It’s what makes FIRST, first.”
Feedback
We strive to create support materials that are the best they can be. If you have feedback regarding this manual, please email ftcteams@firstinspires.org. Thank you!

Appendix B: Referee Tip Sheet

A good Referee will:

- Warn a Team if they are getting close to being penalized.
- Make the necessary calls, even if something happens unintentionally.
- Be fair and consistent to all Teams.
- Be friendly and encouraging – make sure this is a fun and positive experience for all Teams.
- Be sure of a call and stick to it, Referee decisions are final.
- Direct all Match questions to the Head Referee.
  Do not discuss or argue rulings with Team members (or others affiliated with the Team such as Coaches, parents, siblings, etc.).
- Attend the Practice rounds in the morning to get an idea of the intensity of the Game Play. During Practice Matches the Rules are not enforced, but this is an opportunity to instruct the Drivers and pre-empt violations during the Competitions.
- Not view any video replays or photographs of a Match to make the call.
- Set an example by adhering to and enforcing FIRST safety Rules.

Primary Referee focal points are:

- Field Borders.
- Driver’s and Coach’s actions.
- Robot actions and interactions
- Scoring

Dress:

- Referee shirt, supplied by FIRST Affiliate Partner or Tournament Director
- Dark pants or shorts (black preferred).
- Comfortable, close-toe shoes (black preferred)
- Safety Glasses (required of all personnel at the Field and provided by the Tournament as needed).

At times, there will be photographers and video crews at the Playing Field area who will seem to be, or will be, in the way. Please be tolerant, but make sure they do not interfere with the Match or obstruct the audience view.
Appendix C: Score Sheet Instructions

The Scorecards used by Referees is designed to look like the Scoring System. There will be one Scoresheet for the Red Alliance, and one Scoresheet for the Blue Alliance. Below is an image of the Scoring System, you can see how the Scorekeeper enters Match information to the Scoring System.

Below are the Scoresheets a Referee will use to write down Match scores for the Scorekeeper to input. Referees will fill out a Scoresheet for each Alliance.
**Step by Step Instructions**

1. Fill out the Match number.
2. Indicate which Field the Match is taking place (if there are multiple Fields being played).

3. **Autonomous Period:**

   - Write in the number of Beacons Scored. Write “0” of none.
   - Check if Large Ball was removed from Center Vortex Base.
   - Write in how many Particles were scored into the Center or Corner Vortex. Write “0” if none were scored.
   - Check where each Robot was parked at the end of Autonomous. This should be filled out for both Robots on an Alliance.
4. **Driver Controlled Period**

   **Driver-Controlled Period**

   - **# Beacons**
   - Write in the number of Beacons claimed by the Alliance.

   - **# Particles**
   - Write in the number of Particles scored in the Center and Corner Vortexes.

5. **Autonomous Period**

   Check off that either the Cap Ball was not scored, or the Height that it was scored. Only one box should be checked in this field.

6. **Penalties**

   Write in if the Team received a Minor or Major Penalty. If no penalties were given, write “0”.

7. **No Show/Yellow Card/Red Card**

   If a Team was disqualified, or received a Yellow Card or Red Card, make sure to fill out the team number and check the appropriate box.
### Appendix D: Drivers Meeting Talking Points

<table>
<thead>
<tr>
<th>Setup:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• During qualification - Blue Alliance first, Red can waive and setup first if they wish (&lt;G2&gt; &amp; &lt;T9&gt;)</td>
</tr>
<tr>
<td>• Must be in 18” cube configuration before match start (&lt;G3&gt;)</td>
</tr>
<tr>
<td>• No alignment devices that are not part of the robot! (&lt;G4&gt;)</td>
</tr>
<tr>
<td>• No “Calibration” during setup (e.g., light sensor calibration, etc.) (&lt;T3&gt;.d)</td>
</tr>
<tr>
<td>• No touching/adjusting game elements (&lt;G2&gt;.d)</td>
</tr>
<tr>
<td>• Robot Flags!!! (&lt;RG04&gt;)</td>
</tr>
<tr>
<td>• Make sure that drive team badges are visible! (&lt;T8&gt;)</td>
</tr>
</tbody>
</table>

Robots are put back on drive trains and/or un-entangled after Autonomous (<G10>)

Controllers must remain on the floor until instructed to pick them up (discuss w/ event host and/or emcee for local variances)

<table>
<thead>
<tr>
<th>Blocking/Pinning/Trapping (&lt;G16&gt;):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Watch for referee counting (be smart!)</td>
</tr>
<tr>
<td>• Must back off by at least 36” to stop pinning count</td>
</tr>
<tr>
<td>• If pinning during Auto, must back off immediately at start of Driver Control, otherwise an immediate penalty is assessed</td>
</tr>
<tr>
<td>• Strategic Pinning during Auto = penalty</td>
</tr>
</tbody>
</table>

Forced Penalties (<G17>):

- If forced, not counted as a penalty
- When no longer forced, must immediately remove self from penalty condition (example of contact w/ opposing alliance home zone during end game)

“Rough Play” (<G15>) – Tipping/Entanglement/Damage:

• Interactive game – some contact is expected
• Intentional damage = possible Yellow Card – includes intentional field damage

<table>
<thead>
<tr>
<th>Play Smart, Be careful</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blocking Access to Game Elements (Particle or Cap Ball) (&lt;GS10&gt;)</td>
</tr>
<tr>
<td>• Cap Ball Interference (GS11&gt;)</td>
</tr>
<tr>
<td>• Blocking Access to Corner Vortex (GS14&gt;)</td>
</tr>
<tr>
<td>• Robot Height (GS8&gt;) ... limit prior to End Game = 29.7” (Center Vortex bar)</td>
</tr>
</tbody>
</table>

Robot rules always apply:

• Changes may need re-inspection! (<I1>.a) |
• Referees can request re-inspection at any time (<I1>.b) |

<table>
<thead>
<tr>
<th>No Timeouts in Qualifying Matches (&lt;T11&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum of 5 minutes between matches (&lt;T12&gt;)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges/Questions after matches (&lt;T3&gt;.b):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No photos/videos (&lt;T3&gt;.a)</td>
</tr>
<tr>
<td>• Must be made within 3 matches during Qualification Matches</td>
</tr>
<tr>
<td>• Before the match that involves either Alliance during Elimination</td>
</tr>
<tr>
<td>• Challenges can ONLY be made in designated spot – Question Box (describe where)</td>
</tr>
</tbody>
</table>
| Questions???

- ONLY 1 student team member per team in the Question Box
- ONLY with Head Referee
- Be gracious
- **Head Referee ruling is FINAL!**
### Appendix E: Alliance Captains Meeting Talking Points

<table>
<thead>
<tr>
<th>Setup (&lt;T9&gt;.b)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lower Seed (i.e. lower ranked) Alliance 1st (4 before 1, 3 before 2, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timeouts (&lt;T13&gt;):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1 timeout per alliance – for the entire set of elimination matches</td>
<td></td>
</tr>
<tr>
<td>• Timeout is max of 3 min</td>
<td></td>
</tr>
<tr>
<td>• Must be called 2 min prior to match start time</td>
<td></td>
</tr>
<tr>
<td>• Timeout starts at Match start time</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yellow &amp; Red Cards (&lt;T2&gt;)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Apply to entire alliance</td>
<td></td>
</tr>
<tr>
<td>• Yellow Card for 1 robot = yellow card for every robot in alliance</td>
<td></td>
</tr>
<tr>
<td>• Red Card for 1 robot = Disqualified robot = disqualified alliance = loss of match</td>
<td></td>
</tr>
</tbody>
</table>