

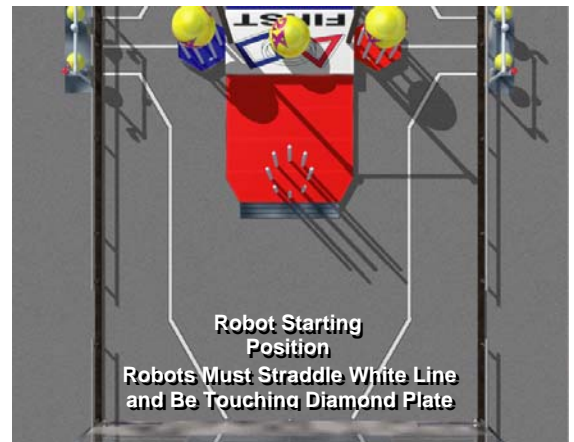
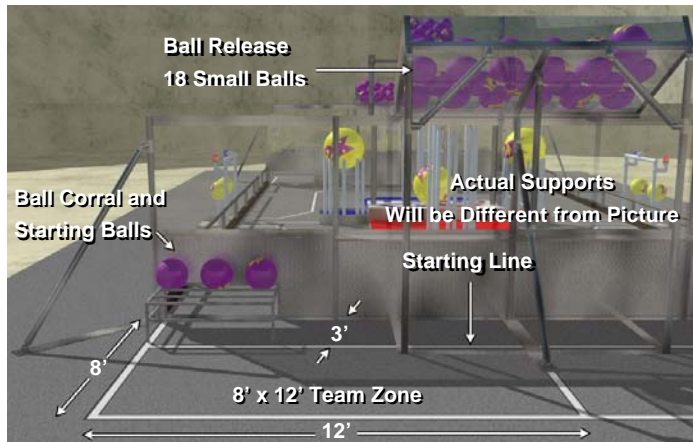
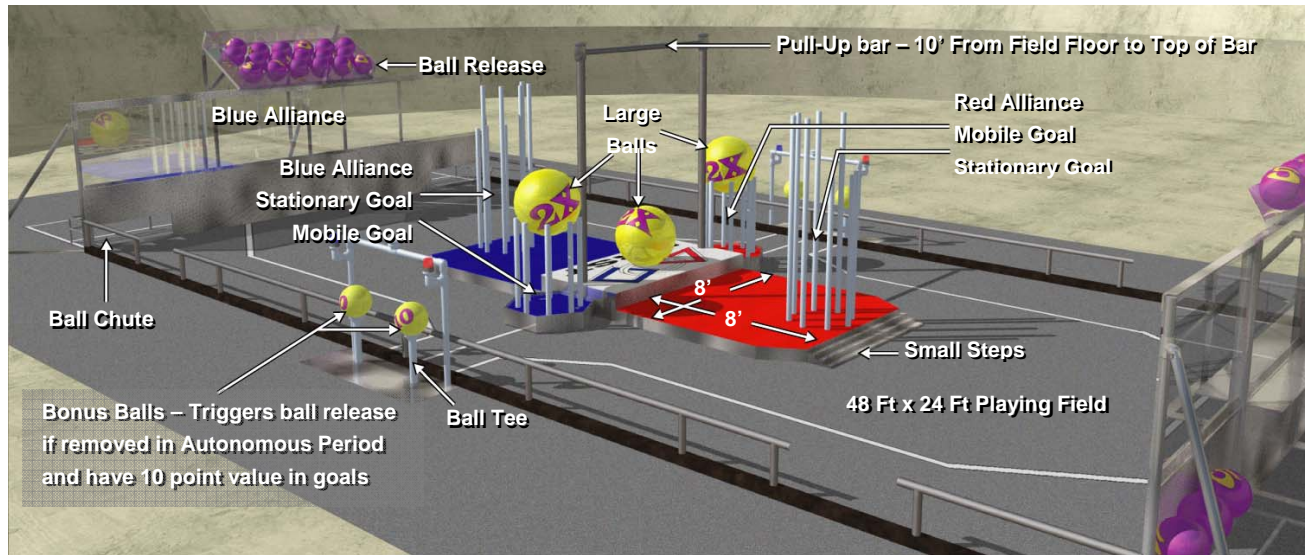
4 THE GAME

[This section includes all modifications through Team Update 14]

4.1 GAME OVERVIEW

The object of the game is to attain a higher score than your opponent alliance by delivering balls into goals, capping goals with larger balls, and/or having robots hanging from the Pull-Up Bar at the end of the round of competition. The point values for each of those actions are explained below.

FIRST FRENZY: Raising the Bar is played on a field initially set up as illustrated in the figures below. Two alliances comprised of two teams compete in each match.



Note: the mobile goals will start against the sides of the Center Structure in random orientation.

Note: The animated pictures in this section of the manual are for a general visual understanding of the field and game only. Teams should refer to the drawings for exact dimensions and field construction. For example, the stationary goals are positioned back from the steps, not right near them as shown in the renderings.

4.2 PLAYING FIELD

The playing field construction and dimensions are detailed in the Arena Section of this manual.

4.3 THE GAME

4.3.1 Definitions

ROBOT – Anything (which has passed inspection) that a team places on the field prior to the start of a match.

SMALL – Balls that are inflated to approximately 13 inches in diameter.

LARGE – Balls that are inflated to approximately 30 inches in diameter.

COACH – A student or adult mentor designated as the team advisor during the match and identified as the person wearing a “COACH” pin.

DRIVER – A pre-college student team member responsible for operating and controlling the ROBOT.

HUMAN PLAYER – A pre-college student team member designated as the only team member permitted to throw SMALL balls onto the field.

SCORED – A SMALL ball is SCORED when it is contained within a goal or SUPPORTED only by the goal and/or other SCORED SMALL balls. A ball is not considered SCORED if it is touching a ROBOT of that alliance or is SUPPORTED by a structural part of the field other than the goal.

CAPPING – A LARGE ball is considered to be CAPPING a goal if it is SUPPORTED by the goal poles and/or SCORED SMALL Balls. A LARGE ball is not considered to be CAPPING a goal if it is touching an alliance ROBOT (of that goal’s color) or is SUPPORTED by more than one goal or a structural part of the field.

SUPPORTED – If the “supporting object” is removed, the ball would not remain SCORED or CAPPED and/or the ROBOT would not remain HANGING.

GOALTENDING – A ROBOT cannot interfere with a SMALL ball on its downward flight toward a goal or within a goal.

HANGING – A ROBOT is considered HANGING from the Pull-Up Bar if it is directly SUPPORTED by the horizontal bar and is not touching the carpet, platforms, or goals.

AUTONOMOUS PERIOD - During this 15-second period, the ROBOTS operate and react only to sensor inputs and to commands programmed by the team into the onboard robot control system. Human control of the ROBOT will not be possible during this time. During this period, ROBOTS may perform any activities that would be permissible when operated under human control. All ROBOT operation and safety rules applicable during the operator control period are also applicable during this period.

BONUS BALL – A SMALL ball which, when SCORED, is worth ten points. Two BONUS BALLS, accessible by any team, are initially positioned on BALL TEES at each side of the field.

BALL TEE– A post which SUPPORTs the BONUS BALL at the start of the match. BALL TEES are associated with the ball release closest to each BALL TEE. If the BONUS BALL is removed from the BALL TEE during the AUTONOMOUS PERIOD, the ball release associated with that BALL TEE is activated.

STRADDLE – A ROBOT is considered STRADDLING the white line on the field if the ROBOT makes simultaneous contact with the playing field floor in at least one point on either side of the line.

4.3.2 Match Format

A match is 2 minutes long. At the start of the match, all HUMAN PLAYERS, DRIVERS and COACHES must stand on the Team Zone Starting Line, 3 feet away from their Driver’s Station. An AUTONOMOUS PERIOD starts the match and lasts 15 seconds. Following the AUTONOMOUS PERIOD, the Driver Station controls will be activated and students may remotely control and operate their ROBOTS for the final 1 minute and 45 seconds of the match.

4.4 RULES

4.4.1 Scoring

- <G01> A SCORED SMALL ball is worth the point value printed on the ball (5 or 10 points).
- <G02> A LARGE ball CAPPING a goal doubles the SMALL balls SCORED within that goal. Small Balls may only be doubled once.
- <G03> A ROBOT HANGING from the Pull-Up Bar at the end of a match is worth 50 points.

4.4.2 Safety

- <G04> If a ROBOT goes out-of-bounds (outside the playing field) to the point where it has to apply force to any out-of-bounds surface to rejoin play, its control system will be disabled and the ROBOT will be disabled. For purposes of this rule, the BONUS BALLS and BALL TEE are considered part of the playing field.
- <G05> ROBOT mechanisms used to remove the BONUS BALLS may extend beyond the playing field border as long as they are within the vertical pipe structure surrounding the BALL TEES. If a BONUS BALL is removed from the BALL TEE by a ROBOT that violates this rule, a 25 point penalty will be deducted from that alliance's final score.
- <G06> A ROBOT will be disabled if the ROBOT operation is deemed unsafe.
- <G07> Two Emergency Stop (E-Stop) buttons are located in each alliance station, one for each team. Pressing an E-Stop button will cause the corresponding team's ROBOT to be disabled for the remainder of the match. The E-Stop buttons are intended for remote shut down during a match in the event of safety hazards and will not otherwise affect match scoring or duration.
- <G08> Mechanisms which interact with the Pull-Up Bar are limited to a maximum tip velocity (relative to the ROBOT) of 10 feet per second.
- <G09> Team members may not extend any part of their bodies into any part of the playing field. Violating this rule will result in the disabling of the team's ROBOT and the team will be disqualified.
- <G10> HUMAN PLAYERS may be passed or handed balls but otherwise cannot be aided by any object or other person. Violating this rule will result in the disabling of the team's ROBOT and the team will be disqualified.

4.4.3 General Match Rules (GM)

- <G11> At the beginning of a match, each ROBOT must not exceed a 30 inch by 36 inch footprint by 60 inches tall, must STRADDLE the white line on the playing field floor, and touch the diamond plate on the Wall. An offending robot will be removed from the match at the Head Referee's discretion. A ROBOT can start in either Alliance starting position; drivers must setup under their team number.
- <G12> Each team will include one HUMAN PLAYER, two DRIVERS, and one COACH.

- <G13> No team member may pass the Starting Line in their Team Zone until the conclusion of the AUTONOMOUS PERIOD. All team members must stay within their alliance's designated Team Zone during the match. A team that passes the Starting Line before the autonomous period ends, except to save their controls from a violent collision of a robot into the diamond plate, or leaves their Team Zone during the match, will be assessed a 10-pt penalty unless such action was deemed by the referee to be so serious to have affected the outcome of the match, in which case the team will be disabled and DQ'd.
- <G14> Team members may not touch any balls during the AUTONOMOUS PERIOD. HUMAN PLAYERS may use any balls in the Team Zone once the AUTONOMOUS PERIOD ends. If a ball is touched during the autonomous period, the team will be assessed a 10-point penalty.
- <G15> During the AUTONOMOUS PERIOD, the Ball Release will release an alliance's SMALL balls when a BONUS BALL is removed from either of that alliance's BALL TEEs. If the Ball Release is not activated during the AUTONOMOUS PERIOD, the balls will be released 45 seconds into the match. Teams may remove BONUS BALLS after the AUTONOMOUS PERIOD, however that action will not trigger the Ball Release. Each alliance Ball Release acts independently from the other alliance's Ball Release.
- <G16> ROBOTS can only pass the SMALL balls into the Team Zone via the Ball Chute. Any team member may handle or pass SMALL balls to either HUMAN PLAYER on their alliance.
- <G17> SMALL balls may only be SCORED by the HUMAN PLAYER's direct throw or by SMALL balls falling unabated from the Ball Release into a Mobile Goal. If any other team member throws a SMALL ball into the field during a match, that team's ROBOT will be disabled and the team will be disqualified.
- <G18> ROBOTS cannot SCORE or de-SCORE SMALL balls.
- <G19> If an alliance ROBOT assists any SMALL ball into either of their goals, the referee will throw a red or blue 10-point penalty flag for each occurrence
- <G20> ROBOTS cannot GOALTEND either the Mobile or Stationary Goals. If a ROBOT GOALTENDS or de-SCORES any SMALL ball, the referee will throw a red/green or blue/green 10-point penalty flag for each occurrence
- <G21> In the case of goal tending and assisting, while the ROBOT is manipulating a large ball, it is considered an extension of the ROBOT.
- <G22> SMALL balls that leave the playing field or team zone are considered out of play and will not be deliberately returned to play.
- <G23> Any LARGE balls that leave the playing field during a match will be returned to the playing field as soon as possible. The LARGE ball will be placed near the location where it exited the field as quickly as practical.
- <G24> ROBOTS can only grab a Mobile Goal by the top metal edge of the goal platform perimeter. No part of a ROBOT can extend under the base of the Mobile Goals. ROBOTS may never grab or attach to the poles. Provided there is no damage to the field, a robot may push against the mobile goal base, the PVC pipes, or the Large Ball to maneuver the Mobile Goal. If a ROBOT grabs any other part of the Mobile Goal or extends under the base of the Mobile Goal, the referee will give one warning. If the referee decides that the team is disregarding that warning, the team's ROBOT will be disabled and the team will be disqualified.
- <G25> If ROBOTS intentionally tip over any Mobile Goal or damage the poles of a Mobile or Stationary Goal, that team's ROBOT will be disabled and the team may be disqualified.

- <G26> A ROBOT can only block 1 Ball Chute at a time. A referee will throw a 10-point penalty flag for violating this rule and has the option of throwing additional penalty flags if the robot continues to violate this rule.
- <G27> A robot cannot pin (inhibit the movement of another robot while on the carpet) for more than 10 seconds. If a robot has been pinned for 10 seconds, the team with the pinning robot will be told by the referee to release the robot and back away approximately 3 feet. Once the pinning robot has backed off by 3 feet, it may again attempt to pin its opponent and, if successful, the 10 second count starts over. If a referee determines this rule to be violated, a 10-point penalty flag will be thrown for each violation.
- <G28> If any part of a robot is in a Ball Corral (breaks the vertical plane of the diamond plate of the Wall), a referee will throw a 10-point penalty flag. The robot operator and the human player have a shared responsibility to avoid contact. If a team member touches the offending robot, that teams' robot will be disabled. If a robot pushes another robot to break the plane, the pushing robot will be assessed the penalty. If a human player touches a robot that has been pushed into the Ball Corral, the pushing robot and the pushed robot will be disabled.
- <G29> If a human player touches a mobile goal that has been pushed into the Ball Corral, his / her team will be assessed a 10-point penalty for each occurrence.
- <G30> During a match, the robots may be remotely operated only by the students and/or by software running in an on-board control system. If a coach touches his/her team's controls anytime during a match, that team will be disabled and DQ'd.<G31> A referee may disable a robot that has damaged the playing field / carpet, barriers or another robot, if the referee feels that further damage is likely to occur. The referees may require a corrective action, such as eliminating a sharp edge, before the robot will be allowed to compete in subsequent matches. Repeat offenses will result in that team being disqualified.
- <G32> Strategies aimed solely at the destruction, damage, tipping over or entanglement of robots are not in the spirit of the FIRST Robotics Competition and are not allowed. Accidental tipping over of a robot is not considered damaging and may be allowed at the discretion of the referees. Intentional stabbing, cutting, etc., is illegal. If a breach of this rule occurs, the team will be disqualified for that match. Repeated offenses could result in a team being disqualified from the remainder of the regional competition and/or championship event.
- <G33> A Robot may not impede the opening of the Ball Release door to prevent the release of small balls.

4.4.4 Field Reset

You will be able to tether your robot to disconnect from the Pull-up Bar and you will be asked to demonstrate your means of disconnect as part of the robot inspection process.