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THE 2002 FIRST ROBOTICS COMPETITION MANUAL

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1. THE GAME

1.1 Introduction

The Game section of the 2002 FIRST Robotics Competition Manual provides a comprehensive description of the game, playing field layout and construction, competition rules, and match scoring.

1.2 Game Description

Section 1.2 provides an overview of the 2002 FIRST Robotics Competition Game. *See Appendix A for the complete list of rules.*

1.2.1 Competition Structure

The competition is composed of two phases: Qualification Matches and Elimination Matches. All matches are two minutes each. In each match, two teams work together as an alliance against another 2-team alliance to collect and score balls into goals as well as position the goals and robots on the field.

PHASE I: Qualification (Seeding) Matches

During qualification matches, randomly assigned teams are partnered to form alliances. Alliances last only for the duration of a match.

- *At Regional events*, teams may be randomly allied with any other team at the event.
- *At The Championship Event*, each team is assigned to one of four divisions and participates only with other teams in the same division.

Teams are ranked based on an equal number of qualification matches. Following the conclusion of the qualification matches, the top ranked teams form alliances and go on to compete in the elimination matches. *See the Tournament Rules in Appendix A for details.*

PHASE II: Elimination Matches

Alliances formed for the elimination matches stay together for the remainder of the event. Each alliance is composed of *three* teams. One of the teams serves as an alternate in each match. Each team must compete in at least one elimination match in each series (quarterfinals, semi-finals, and finals) unless a team's robot is unable to move along the carpet under its own power.

Each series is best 2 out of 3.

- *At Regional events*, eight (8) alliances compete in a series of elimination matches until one alliance is declared the event champion.
- *At The Championship Event*, thirty-two (32) alliances (8 per Division) compete in a series of elimination matches, resulting in four Division Champion alliances and one Grand Champion alliance. *See the Tournament Rules in Appendix A for details.*

1.2.2 Basic Gameplay

During a match, the alliance scores points by:

- Placing balls into goals and positioning robots and/or goals in the scoring zones at the end of the match.

See section 1.2.4 for more information on scoring.

Each alliance is comprised of two teams with each team having three students and one mentor. Each team competes using one team-built robot. There are sixty (60) size 5 soccer balls. ***Balls will be inflated to the manufacturer's specifications for pressure.*** There are three (3) goals with casters wheels around the bases that may be moved around the playing field. All goals start equally spaced across the center of the playing field. The playing field is broken up into 5 zones.

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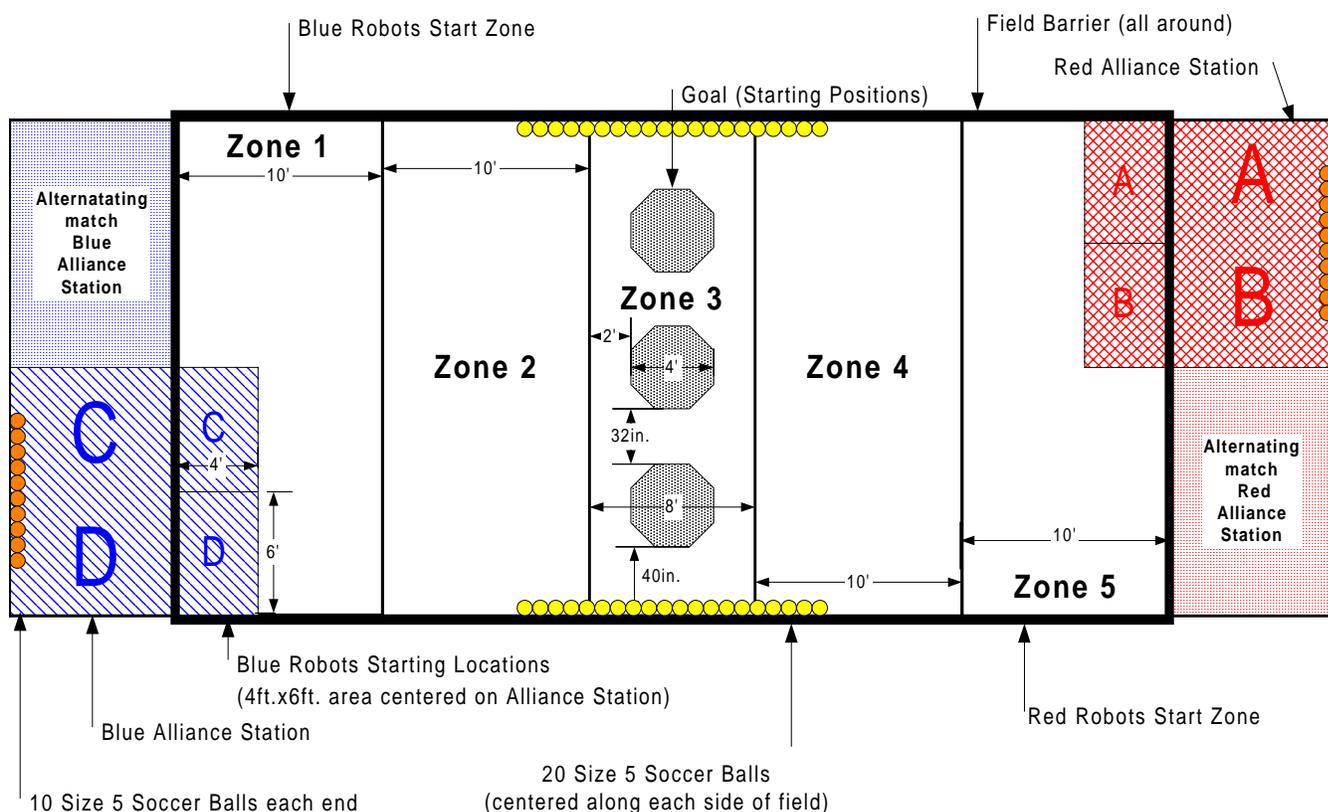
Information on construction of the playing field is included in the field parts list documentation that is supplied with the manual at the Kick-Off Workshop.

The robots must compete within the bounds of the playing field while the students are located at stations just outside the playing field. Only students may return balls from the Alliance station to the playing field. See Section 1.2.3 for information on playing field layout.

1.2.3 Playing Field Layout

At the start of each match, each alliance station contains ten (10) orange soccer balls. Twenty (20) yellow soccer balls will be centered along each side of the playing field. All balls may be used to score points.

Placement of the alliance stations, goal starting positions, scoring zones, and robots, as well as the starting locations of all balls, are shown in Figure 1.1. Please note that Figure 1.1 is not drawn to scale and is not intended for use during playing field construction. For playing field dimensions, please refer to the field parts list documentation supplied with the manual at the Kick-Off Workshop.



Scoring Key		Scoring Zone				
		1	2	3	4	5
RED	balls	x	x	no		
	goals		x	no		
	robots			no		x
BLUE	balls			no	x	x
	goals			no	x	
	robots	x		no		

Figure 1.1: Playing Field Layout

1.2.4 Match Scoring

At the end of each match, points are awarded as outlined below. *The complete list of scoring rules is contained in Appendix A.*

- One (1) point for each ball if all conditions below are true:
 - Contained in or supported by a goal
 - Not in contact with or supported by your or your partner's robot (opposing alliance touching balls in a goal does not negate their value.)
 - Not in contact with the carpet
 - The goal is "in" your ball zone (the proper ball scoring zones are Zones 1, 2, 4, and 5)
- Ten (10) points for each goal in your goal zone (Zone 2 or 4)
- Ten (10) points for each robot in your robot zone. (Zone 1 or 5)

1.2.5 Point Accumulation and Qualification

During the qualification matches, all teams accumulate Qualification Points (QPs) that will later be used to help rank the teams.

For a given match, each team in the winning alliance receives triple the match score of the **losing** alliance in QPs. Each team in the losing alliance receives their match score in QPs.

At the conclusion of the qualification matches, each team drops its lowest QP score and the teams are then ranked according to total QPs accumulated. *Please read Appendix A for the complete list of game rules including team ranking and ranking tiebreakers.*

2. PLAYING FIELD CONSTRUCTION

2.1 Playing Field Description

The playing field is a carpeted, rectangular area with three moveable goals. At each end of the field are the alliance stations for the students and mentors. Prior to the start of each match, balls and goals are placed in specific starting locations on the playing field and in the alliance stations as shown in Figure 1.1.

2.2 Playing Field Border

The 2002 playing field is of the same dimensions as the 2000 and 2001 fields but there have been some field border changes. These changes were implemented to make the FIRST competition fields easier to transport. The main difference from the old design to the new design is that the vertical border pipes are 13/16" closer to the field. *Please refer to the field drawing included in your manual.*

The perimeter of the field is defined by an aluminum welded rail system. The bottom of the rail system that sits directly on the carpet is 3"x 3" x 1/4" angle aluminum covered with a 3/16" strip of aluminum diamond plate facing the playing field. The rail system is "fastened" to the carpet with Velcro.

The exact dimensions and locations of the various sections, the assembly, and special hardware required are shown in the field parts documentation supplied with the manual at the Kick-Off Workshop.

2.3 Alliance Station

The alliance stations are located outside the perimeter of the playing field as shown in Figure 1.1. There are two openings in the alliance station wall for ball return. The alliance station wall is comprised of a transparent safety shield mounted on top of a diamond plate sheet on the field side of the station and

serves as protection for the alliance members. There is a 1-foot by 12-foot shelf made of 3/16-inch Aluminum Diamond Plate, three feet off the carpeted floor where the robot control equipment may be placed. Each alliance station shelf has a set of 15 pin cables that provide power and control signals to the Operator Interfaces (OI), and is plugged into the Competition Port of the OI. Teams must bring their own control systems, including radios, to the field. No power outlets will be available.

The students and mentors are permitted free movement within the alliance station. All alliance members are allowed contact with the balls.

Mentors are not allowed to return balls to the playing field.

If a student or mentor has a special need (i.e., requires the use of a wheelchair, etc.), please contact FIRST prior to the events. A raised platform will be made available at events as required.

2.4 Playing Field Notes

The carpet used for the playing field surface is available from S.S. Mills, Inc., in Dalton, Georgia. The carpet used on the playing field surface is Brassfield 20, Color-Black Coal. Contact information for S.S. Mills, Inc., is included in the supplier contact listings in “The Robot” section of the manual. The playing field carpet rests directly on the floor or a protective floor covering except where otherwise noted.

All field dimensions listed under playing field construction are specified on the drawings provided with the Manual.

APPENDIX A: RULES

S Safety Rules

Safety comes first. Because FIRST hosts events in which electrical equipment, springs and tools are used, safety will not be compromised.

- S1. **ALL TEAMS ARE RESPONSIBLE FOR PROVIDING THEIR OWN SAFETY GLASSES AT EVERY EVENT.**
- S2. All team members must wear Safety glasses in the alliance stations during matches (Students and Mentors).
- S3. Team members must wear safety glasses when working on their robot in the pit area. They are also highly recommended if adjacent neighboring team(s) are working on their robot(s).
- S4. The Students and Mentors must remain in the alliance stations during the match. They may not reach over the playing field.
- S5. If at any time the referees determine that a robot is likely to cause safety hazards in future matches, the robot must be modified to the head referee's satisfaction or it will not be allowed to compete.
- S6. Soccer balls are the only projectiles that may be launched by a robot. Latex tubing may be used for the purpose of storing energy to launch balls as long as no more than 5' is used for this purpose.
- S7. **Do not tamper with the power supply, batteries, chargers, speed controllers, joysticks or any other control system component except as noted in the control system rules.** Tampering could result in failure or malfunction of the control system, and lead to a safety hazard or damage to the robot.
- S8. Turn off the 60A main circuit breaker while making adjustments to your robot. Since the motors provided in the Kit are quite powerful, it is important to keep all body parts away from all robot mechanisms while your robot is connected to the battery.
- S9. The battery can deliver more than 200 Amperes. Do not let the wires come into contact with any metal surfaces. Route wires carefully to avoid damage and short circuits which may cause serious burns, fire, and/or permanent damage to the batteries.

T Tournament Rules

- T1. Competition at each FIRST Robotics Competition event is composed of two phases, Qualification (Seeding) Matches and Elimination Matches. The qualification matches are open to all teams that pass robot inspection. They consist of a series of matches in which teams are randomly allied with each other. Based on the results of the qualification matches, teams are ranked. The top seeds automatically qualify to advance to the elimination matches. Additional teams are chosen as alliance partners by the top-seeded teams and also advance to the elimination matches.
- T2. All teams start each event with zero qualifying points (QP's) and accumulate these points based on the scores in each of their qualification matches. At the conclusion of the qualification matches, each team's lowest QP score is dropped. *See section SC for complete scoring rules.*
- T3. In general, all teams compete in the same number of qualification matches. However, at some events it may be necessary for up to three teams to compete in one additional match in order to guarantee that all other teams compete in an equal number of matches. If this occurs, any QP's scored by teams competing in an additional match are not counted for ranking purposes. In the spirit of Gracious Professionalism, all teams in such a match are expected to do their best.
- T4. After the qualification matches are over, teams are ranked using the following hierarchy of criteria (in order from most to least important):

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1. Highest qualifying point total
 2. Highest number of matches won during qualification matches
 3. Highest match score
 4. Flip of a coin
- T5. During qualification matches at *Regional Events*, teams may be randomly allied with any other team at the event and will be ranked relative to all other teams at the event.
- T6. Due to the large number of teams at *The Championship Event*, teams will be evenly distributed into four “divisions.” Teams will participate in qualification matches only with other teams in the same division and will be ranked relative to other teams in their division.
- T7. **Elimination Match Alliance Selection.**
Eight (8) alliances at *Regional Events* and thirty-two (32) alliances (8 per division) at *The Championship Event* qualify to advance to the elimination matches. The alliances are formed as follows:
- **For Regional Events:** From the top eight (8) seeded teams, starting in descending rank order, a pre-college student representative selects an alliance partner from among the remaining unpartnered teams. After all eight teams have selected their first partner, the process repeats and a second partner is selected.
 - **For The Championship Event:** Teams are evenly divided up into 4 “divisions.” Within each division, from the top eight (8) seeded teams, starting in descending rank order, a pre-college student representative selects an alliance partner from among the remaining unpartnered teams. After all eight teams have selected their first partner, the process repeats and a second partner is selected.
- T8. Teams may decline an offer when asked to ally for the elimination matches. However, if a team declines, they are no longer eligible to be chosen as an alliance partner. In the event that there are not enough eligible teams to complete the number of alliances needed for elimination matches, teams which have declined may only be chosen after all eligible teams.
- T9. Alliances formed for the elimination matches may not be changed for the duration of the event.
- T10. Prior to the start of the elimination matches, one Student member of the highest seeded team from each alliance must be identified as the Alliance Captain. Alliance Captains must be part of the field crew for the team. Each alliance captain must wear a bib supplied by FIRST to indicate his or her special role in the alliance. Alliance Captains are responsible for selecting which two of the three alliance teams will compete in each match and they are the final arbiters within the alliance.
- T11. Each team in an alliance must compete in at least one elimination match in each series (quarterfinals, semi-finals, and finals) unless a team’s robot is unable to move along the carpet under its own power. Alliance Captains will be the final judges of whether or not a robot is unable to move. FIRST urges all teams to use Gracious Professionalism when making this judgment so as to be fair to both opponents and partners.
- T11. **Competing In Elimination Matches**
Alliances competing in the elimination matches are paired as follows:
- **For Regional Events and Divisions at The Championship Event:** All match series are the best 2 out of 3. The alliance led by the 1st seed competes against the alliance led by the 8th seed in a series of quarterfinal matches; the alliance led by the 2nd seed competes against the alliance led by the 7th seed in a series of quarterfinal matches, etc. Winners of the quarterfinal matches compete against each other in a series of semi-final matches. Winners of the semi-final matches compete against each other in a series of final matches with the winning alliance becoming the Regional Champion. *See Figure T-1 below.*

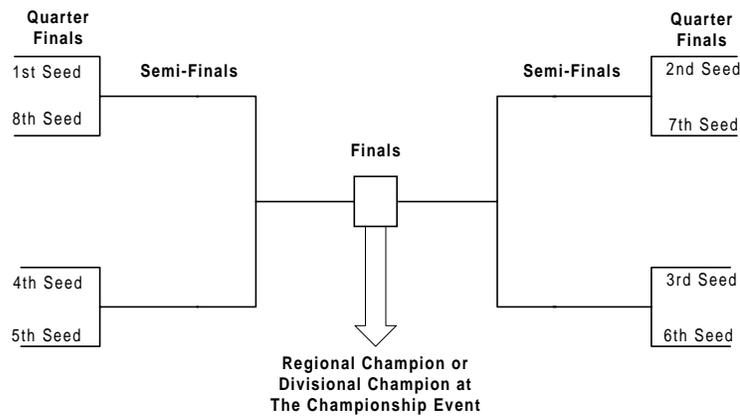


Figure T-1

- For The Championship Event Championship:** All match series are the best 2 out of 3. Division Champions compete against each other in a series of semi-final matches. For the semi-finals, the Division Champions will compete against each other based on the divisions they came from and will not be ranked relative to each other. The exact division pairings will be announced in the future on the FIRST web site after the division names have been finalized. The winners of the semi-final matches then compete in a series of matches with the winning alliance becoming The Grand Champions. See *Figure T-2 below*.

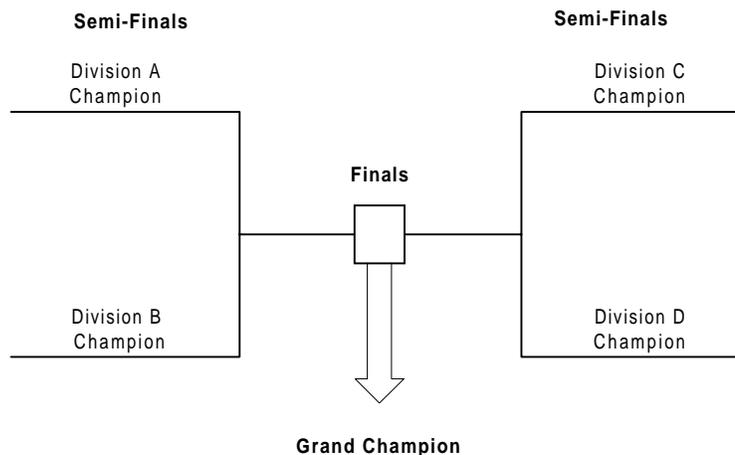


Figure T-2

GM General Match Rules

- GM1. Referees have ultimate authority during the competition—**THEIR RULINGS ARE FINAL!** *The referees will not review any recorded replays.*
- GM2. **ABSOLUTELY NO REMATCHES WILL BE AWARDED.** FIRST reserves the right to **re-play** a match due to *obvious catastrophic failure* of FIRST-provided field materials.
- GM3. **THERE ARE NO TIME-OUTS.**
- GM4. During the qualification matches, teams will not play any matches back to back. During the elimination matches, alliances will have at least four minutes between scheduled matches.
- GM5. Prior to the start of the qualification matches, teams will be randomly assigned to alliances and given alliance colors by FIRST. This color is used to determine the placement of each team's robot, students and mentor around the playing field. *Figure 1.1 in Section 1.2.3 shows the layout of the playing field including starting positions.*

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- GM6. Teams are allowed a maximum of 1 minute to set up their robots on the playing field and a maximum of 1 minute to remove all robot parts from the field following a match. *The Robot control system will not be re-enabled after a match; however, teams may use the tether feature to make any necessary adjustments to the robot in order to release balls or goals. For information on using the tether, please refer to the control system documentation from Innovation First.*
- GM7. During setup for each match, robots must be placed within either of the two designated starting areas for the alliance (one robot per area). The students and mentors may move about within the alliance station but must connect their operator interface to a specific team station within their alliance station as designated by FIRST.
- GM8. During a match, four members per team (3 "Students" and 1 "Mentor") are allowed in the alliance station at the end of the field. The Students must be pre-college students from a team partner school while the Mentor may be an adult or student from a team partner. Mentors who happen to be pre-college students are not considered "students" with respect to rules of Gameplay and may not engage in activities reserved for students. Special badges are supplied by FIRST at each event and must be worn by these team members for field access.
- GM9. During a match, the robots may be operated only by the students and/or by software running in the on-board control system.
- GM10. Two Emergency Stop buttons (E-Stop) 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. Any member of a team may press the E-Stop button corresponding to their own robot. A team that has pressed its E-Stop button may release it, thus re-enabling their robot prior to the end of a match. ***The E-Stop buttons are intended for remote robot shut down during a match in the event of safety hazards and will not otherwise affect match scoring or duration.***
- GM11. Each match lasts for two minutes. Matches begin when the robot control systems are enabled and end when they are all disabled unless the match is whistled dead by the referees. The E -Stop buttons will not be used to end matches.
- GM12. At the beginning of a match, each alliance starts with ten (10) size 5 soccer balls in their section of the alliance station. Forty (40) size 5 soccer balls start on the playing field. *The playing field balls start arranged as shown in Figure 1.1 in Section 1.2.3.*
- GM13. Any balls which leave the playing field or alliance station, such as by rolling, bouncing or being pushed out of the boundaries, will be not be returned to the playing field until the next match.
- GM14. Alliance members may use only their bodies to interact with the balls. Special clothing and/or equipment will only be allowed for those who demonstrate a need based on a physical disability.
- GM15. Contact with the balls by all alliance members in their stations is acceptable but Mentors are not allowed to return balls to the playing field. Balls may only be returned to the playing field by passing them over the front safety shield. Alliance members are not allowed to climb on the alliance station or lift each other in order to gain height.
- GM16. Referees or field staff is not responsible for damage to robots while attempting to retrieve balls and goals. **Please design your robot so that balls may be retrieved and goals released quickly and easily after a match is over.** *Refer to GM4*
- GM17. **Robot Shoving will be allowed and is expected to be quite common.** It is very common for machines to run into each other at full speed, get into shoving matches, and for arms and other mechanisms to experience the resultant forces. This should be taken into consideration when robots are designed and built.
- GM18. The outer field barriers are safety features of the playing field and Robots should not be designed to react against them. Incidental contact with the barriers is acceptable. Pushing a ball against a barrier to allow pickup of the ball or passage of the ball to the students is acceptable if the forces applied are not sufficient to damage the barrier or otherwise deform the playing field.
- GM19. Robots that become entangled in the field barriers or goals will not be freed until after the match has finished unless the entanglement represents a safety hazard.

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GM20. Robots may not intentionally:

- Upend a goal
- Attach to the upper or lower plywood bases of the goals
- Deploy any sort of mechanism below the bottom plywood base
- Grab onto the goal casters, 1" or 3" PVC, the fitting on the top center of the bottom plywood deck that anchors the 3" PVC, and/or push or pull on the 2" angle aluminum on the upper plywood
- Remove the 1" PVC from the goals

GM21. It is acceptable for robots to grab the sixteen metal pipes that are between the upper and lower plywood decks.

GM22. It is acceptable for robots to elastically bend the 1" PVC on the goal. Elastically means that they will return to their original straight shape when released. Bending them so they remain deformed when released is unacceptable.

SC Scoring Rules

Reference Figure 1.1 for clarity when reading the scoring rules, particularly SC4.

SC1. Final scoring begins when all balls, robots, and goals come to rest, approximately 10 seconds after the match ends or upon a referee's decision. Prior to this, the referees may not see all final positions and cannot make accurate scoring decisions. If, while waiting for objects to come to rest, an object on the field changes position once a match ends and the power is turned off (i.e., a goal tips over or moves in and out of a scoring zone, etc.) and such movement causes a change in the score, the post-movement score is recorded.

SC2. The referees make all decisions regarding scoring. Referees have ultimate authority during the competition—**THEIR RULINGS ARE FINAL. The referees will review no recordings of the match.**

SC3. The lines that define the Scoring Zone borders are part of both adjacent zones. Zone borders will be indicated by tape on the carpet.

SC4. Each alliance receives:

- One (1) point for each ball that meets all of the following conditions:
 - The ball must be "in" a goal such that it is held above the carpeted surface of the playing field either by direct contact with the goal or by other balls that are "in" the goal.
Example: Balls wedged between the PVC pipes are "in" if they are not touching the carpet. Balls sitting on the top or sides of a tipped-over goal are "in" if they are not touching the carpet.
 - The ball must not be in contact with either or your own Alliance's robots. Contact with a ball by the opposing Alliance's robots does not negate its value.
 - The goal that the balls are "in" must be "in" the Alliance's ball scoring zone (From Figure 1.1, the Red Alliance ball scoring zones are Zones 1 and 2; the Blue Alliance ball scoring zones are Zones 4 and 5). A goal is defined as "in" a zone if any part of the lower plywood deck is over the zone. In cases where it is not obvious to the naked eye, referees will use a 90° tool and will place its bottom edge against the carpet and its vertical edge against the bottom plywood deck of the goal to determine what Scoring Zone it is in. *See also rule SC3.*
 - Ten (10) points for each goal "in" the proper Goal Zone (From Figure 1.1, the Red Alliance goal zone is Zone 2; the Blue Alliance goal zone is Zone 4). A goal is defined as "in" a zone if any part of the lower plywood deck is over the zone. *See also rule SC3.*
 - Ten (10) points for each robot "in" an alliance's Scoring Zone (From Figure 1.1, the Red Alliance robot zone is Zone 5; the Blue Alliance robot zone is Zone 1). A robot

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is defined as “in” a zone if any part of the robot is in contact with the carpeted surface (including the taped border lines) of the zone. *See also rule SC3*

Example: Three robots are in contact with the field in Zone 1 at the end of the match. This contributes 30 points to the Blue Alliance’s score.

- SC5. In the event that a robot is damaged to the point where parts become detached from the robot, the detached parts are not considered when determining whether or not the robot is “in” a zone or “in contact” with a ball. In the event that large sections of the robot break apart, the section containing the Robot Controller is considered “the robot.” Any part that is still connected to the robot, no matter how tenuously is considered part of the robot.
- SC6. The “minimum robot” that may be used in a match must contain the following components:
- Battery
 - Robot Controller
 - Radio
 - Rotating Light
 - Associated Wiring, Circuit Breakers, and Fuse Panel
 - Team Name/Number signs
- SC7. Teams that do not show up for a scheduled Qualification Match will receive zero (0) match points and zero (0) QPs. Participating teams will receive their match score and QPs as normal. A team is declared a no-show if no member of the team is in the alliance station at the start of the match.
- SC8. The winner of a match is the alliance with the highest score.
- SC9. In the event of a tied score, the following tie conditions will be applied, in the order below, until the tie is broken:
1. The alliance with the least penalties or warnings during the match
 2. The alliance with the most balls in scoring position
 3. The alliance with the most goals in scoring position
 4. The alliance with the most robots in scoring position
 5. The alliance with the most balls on the opposite half of the field
- SC10. All teams start each competition event with zero (0) qualification points (QPs) and accumulate QPs throughout the qualifying matches. At the end of each qualifying match, all teams that participated in the match receive QPs as follows:
1. Each team in the winning alliance receives triple the number of match points of the **losing** alliance in QPs
 2. Each team in the losing alliance receives their match score in QPs
 3. If an alliance is disqualified, the other alliance receives triple the winning alliances score in QPs
- SC11. At the conclusion of the qualification matches, each team will drop the QPs earned in their lowest QP match. Teams will be ranked using the following hierarchy of criteria (in order from most to least important):
1. Highest qualifying point total
 2. Highest number of matches won during qualification matches
 3. Highest match score
 4. Flip of a coin

V Game Violations

- V1. All alliance members must remain in the alliance station during play. If an alliance member steps out of the alliance station for reasons of personal safety, no penalty will be imposed. If an alliance member inadvertently steps over the line and it does not affect the outcome of the match, then they will receive a minor penalty.
- V2. Repeated minor infractions will result in increasingly severe penalties. Referees will indicate penalties by throwing down flags color coded to indicate which alliance is being penalized.
Penalties are given to the alliance and not the individual team.
Minor Penalty #1: Warning

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Minor Penalty #2: Lose one (1) point

Minor Penalty #3: Lose additional three (3) points

Minor Penalty #4: Lose additional five (5) points

Minor Penalty #5 Major penalty: Disqualification of the alliance (score is 0)

Disqualifying Violations:

If a referee disqualifies a team, all robots in the alliance will be turned off and the match immediately ends. The alliance members must cease interacting with balls at the alliance stations and any points scored by the disqualified alliance during that match are forfeited.

DQ1. An alliance may not gain points by breaking a rule, even accidentally.

DQ2. If stepping over the line affects the outcome of the match, such as when throwing a ball that scores or otherwise affects the outcome, then the alliance will be disqualified.

DQ3. 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 alliance will be disqualified for that match.

DQ4. Deliberately damaging the playing field, controls or balls is strictly illegal and will result in disqualification of your alliance. Robot wheels must not, for example, damage the field carpet. This will be checked during robot inspection at registration on the first event day and throughout the competition. Bunching up or puckering the carpet is considered damage to the field.

DQ5. During a match, no team member may intentionally touch any robot, except for reasons of personal safety. If intentional contact is made, the alliance will be disqualified.

DQ6. **No remote communication devices such as air phones, walkie-talkies, etc., may be used by team members at anytime during a FIRST Robotics Competition event.** These devices may cause interference to the remote control signals and malfunction of robots. Teams found to violating this rule will be subject to the following penalties.

1. First offense, you will be asked to turn off and store the device.

2. Second offense, the device will be confiscated for the remainder of the event and the offender will not be able to participate in his/her team's next scheduled match.

Cell phones and pagers are allowed, but not in the Alliance Station. Remote cameras mounted to a robot are also allowed if specific permission is granted by FIRST.

DQ7. A robot may not release any separate part of itself during a match. It must remain whole. If the referee determines that a robot has released a part of itself intentionally, the robot will be disabled.

Disabling Violations:

If a referee disables a robot, the robot is turned off for the remainder of the match and any points scored during that match count. The Students may continue to interact with balls at the alliance station. Their allies may continue to play as normal.

DA1. If a robot accidentally damages the playing field, barriers, balls or another robot, the referees may disable it for the remainder of the match. If the referees feel that further damage is likely to occur, corrective actions (such as eliminating a sharp edge) will be required to allow the robot to continue competing.

DA2. Robots and/or team members may not contaminate the playing field, balls or another robot with lubricants. If this happens, the robot and/or team member will not be allowed to compete until corrective action has been taken and the head referee gives approval.

DA3. Referees may disable any robot that causes a safety hazard during a match.

DA4. If a robot goes out-of-bounds to the point that it has to apply force to any out-of-bounds surface to rejoin play, its control system will be disabled. A machine should not be designed to react with an out-of-bounds surface for any reason.

DA5. For safety reasons, no part of a robot may touch the team members. If this occurs by accident, the robot may be disabled.