RECF INSPIRE

ROBOTICS COMPETITION

PINNACLE

2026-2027

Game Manual Version 3.0

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RECF ROBOTICS COMPETITIONS

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RECF Inspire Robotics Competition Pinnacle

2026-2027

Game Manual Version 3.0

November 10, 2026

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Prefix

Welcome and Thank You

Welcome to the Robotics Education & Competition Foundation (RECF) Inspire Robotics Competition!

RECF Inspire provides an exciting, hands-on environment for college students to explore core engineering concepts and create unique solutions to competitive challenges. Students competing in RECF Inspire will develop and apply essential workforce skills in design, manufacturing, programming, documentation, and engineering.

Students are at the center of everything we do, and they are encouraged to take ownership of their ideas while working collaboratively with teammates and solving real-world problems.

RECF Inspire provides broad robotics access for all collegiate students. We encourage student resourcefulness and outside-the-box thinking with an open system for structural robot parts, including unlimited custom plastic, unlimited 3D printing, custom-designed parts, and basic off-the-shelf consumer parts.

We are grateful that you have chosen the RECF as your robotics program provider. With so many opportunities available, we are honored that you selected our program to support your students' learning and growth.

Thank you for joining our community. We cannot wait to see what your teams achieve this season!

About the RECF

The Robotics Education & Competition Foundation is a registered US 501(c)(3) non-profit organization that exists to spark interest in science, technology, engineering and math by engaging students in hands-on, sustainable, and affordable curriculum-based robotics programs.

Our global mission is to provide every educator with competition, education, and workforce readiness programs to increase student engagement in science, technology, engineering, math, and computer science. We see a future where every student designs and innovates as part of a team, overcomes failure, perseveres, and emerges confident in their ability to meet global challenges.

As a company, we embrace the core values of passion, integrity, and excellence, which we try to embody in everything we do.

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Revision History

RECF will release updated game manuals through the season, as listed below. Each event or league session must use the latest rule set published before the start of the event. Answers in the official Q&A system are effective immediately unless stated otherwise in the answer.

Schedule of Planned Releases

- June 10, 2026 - Initial v1.0 release
- July 10, 2026 - Minor release
- September 29, 2026 - Major v2.0 release with changes to gameplay
- November 10, 2026 - Major v3.0 release with changes to gameplay
- December 22, 2026 - Possible release with minor updates
- February 2, 2027 - Possible release with minor updates
- March 16, 2027 - Major v4.0 release with changes for the RECF World Championship

Version 1.0 - June 10, 2026

- Initial release

Version 1.1 - July 10, 2026

- Added links to official Q&A system (games.recf.org)
- 1.5.2 - Suggested locations for tape lines
- 1.6 - Added examples for fouls and penalties
- 2.0 - Clarified that robots cannot participate in matches while breaking robot rules
- 2.2.3 - Added minimum license plate size, and specified that a robot must include exactly two license plates
- 2.2.4 - Increased battery limit for other electronics from 12V to 13V
- 2.2.4 - Added additional robot-to-robot communication methods as legal electronics
- 2.2.4 - Clarified range of legal raw materials, and options for outside manufacturing of custom structural and electronic parts
- 2.2.5 - Added resin printing to the list of disallowed items
- 3.3.2 - Added new figures to demonstrate legal and illegal possession
- 5.3.7 - Clarified that accidentally knocking down a protected stack while removing objects from neutral goals will result in a red card
- 5.5 - Added information about tiebreakers for alliance match rankings
- 7.4.7 - Added information about leagues
- Minor corrections throughout

Version 1.2 - July 28, 2026

- 5.3.1 - Clarified that teams can't use controllers during the autonomous period
- 5.3.4 - Added some protection to the goals in the neutral zone: limited descoring from the tops of the stacks only, and only during the first 90 seconds of the match

Version 2.0 - September 29, 2026

- Definition of roller - Expanded to better describe starting roller orientation and assembly
- 1.5.2 - Added AprilTag locations to figure 1.5.2
- 2.2.4 & 2.2.5 - Clarified language for allowed sensors and additional electronics

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- 3.0, 4.0, & 7.4.1 - Changed solo match allocations from 3 of each match type to a flexible "pool" of 5 attempts
- 3.3.4 - Clarified that all loaders must start in "down" positions
- 3.5 - Added tiebreaker criteria for solo match rankings
- 5.1.3.1, 5.1.3.3, & 5.1.6 - Increased value of visible scored halfpins on neutral goals from 5 points to 7 points
- 5.1.5 - Specified that referees should not use paper tests to decide whether robots are in contact with loaders
- 5.3.6 - Revised and expanded guidance for defensive engagements between opposing robots
- 5.5.3 - Renamed "win points" to "match ranking points" for clarity
- 7.4.2 - Revised guidance for match counts
- Updated figures for improved clarity
- Minor corrections throughout

Version 3.0 - November 10, 2026

- 1.6 - Clarified that a scorekeeper referee can ground a robot in solo matches if necessary
- 3.1.1 - Added new rule requiring the robot to move away from the loader to earn a solo match score
- 3.3.7 - Removed field control effective November 17, 2026
- 4.1.1 - Updated to address early/late robot actions
- 5.2.5 - Added new rule to correctly define preload pins for alliance matches
- 5.2.6 - Added new rule to specify penalties for early/late play
- 5.3.1 - Updated to specify that drivers can't hold the controller during autonomous periods
- 5.3.3 - Expanded to address fouls for early/late play
- 5.3.9 - Added new rule to address match play without field control
- 7.3.1.2 - Removed field control effective November 17, 2026

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Section 1: The RECF Inspire Robotics Competition

1.1 About the RECF Inspire Robotics Competition

The RECF Inspire Robotics Competition (RECF Inspire) provides a hands-on educational STEM experience focused on robot design, construction, strategy, programming, and problem-solving. The program emphasizes teamwork, critical thinking, communication, documentation, and real-world application of concepts. Because each RECF Inspire team brings two robots to each match, they have a unique opportunity that isn't available to other RECF programs and grade levels: they can specifically design and code a pair of robots that work together to solve the problems of the game. This depth of strategy leads to unique and well-considered design concepts and match strategies.

RECF Inspire teams consist of students who have graduated secondary education and are enrolled in post-secondary courses. Student team members make all of the decisions about their robots' design, construction, and programming—from blank paper all the way to the world championship.

The RECF Inspire season consists of local qualifying events, which qualify teams for assigned event region championships. Event region championships then qualify teams for the RECF World Championship. For more information on the qualification structure, refer to the RECF Qualifying Criteria.

1.2 The 2026-2027 RECF Inspire Game: Pinnacle

In collegiate Pinnacle matches, each team brings two robots that navigate a 12'x12' field to collect and stack pins and cups onto goals, turn rollers, and maximize their score with specific orientations of pins, cups, and rollers. Robots can push, lift, rotate, stack, spin, or plow pins and cups, but must follow the rules of each specific match type.

In some matches, team members drive the robots. In others, the robots drive themselves based on pre-programmed code written by the students. Not every robot and team will play the game the same way, and there are some ways to score that are easier than others. Your strategies, and your robots, may change over time. As long as you follow the rules in this game manual and the official RECF Inspire Q&A system at games.recf.org, you can play the game however you like!

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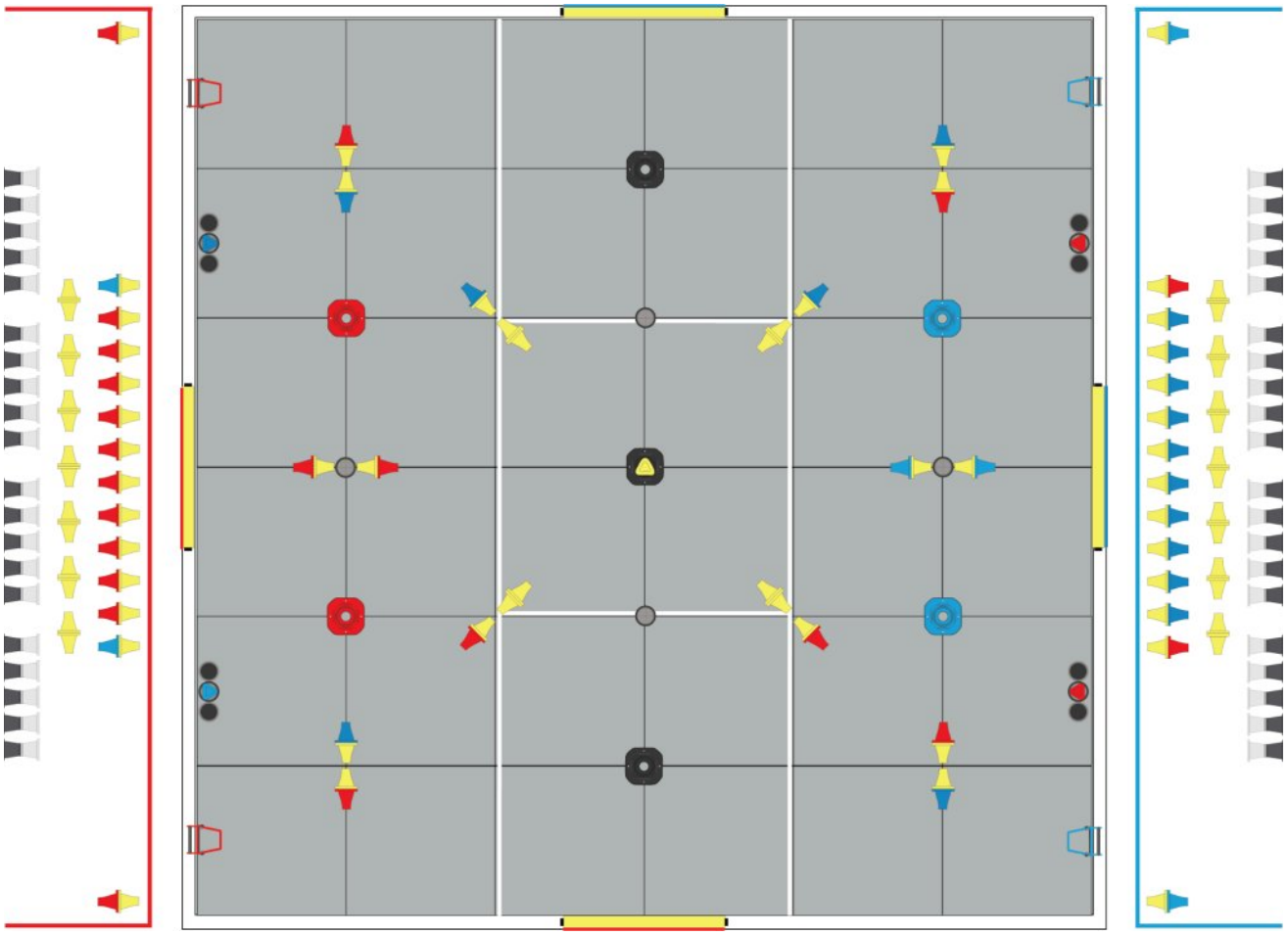


Figure 1.2: Starting field layout for Inspire Pinnacle

1.3 Five RECF Inspire Competition Challenges

- Design, Build, and Code Robots (see section 2) - Using the engineering design process, work with your teammates to design, build, and test robots to score points in matches
- Solo Driving Matches (see section 3) - Up to six (6) members of your team work together at the field to score points with two robots responding to input by remote control
- Solo Coding Matches (see section 4) - Up to six (6) members of your team work together at the field to score points with two robots operated entirely by segments of code—no controller!
- Alliance Matches (see section 5) - Your team's two robots work together in an attempt to outscore an opposing team's robots
- Judging (see section 6) - Document and share your use of the engineering design process in an engineering notebook throughout the season, and describe your work to judges during interviews

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1.4 RECF Program Rules

1.4.1 RECF Policies

All participants must follow the guidelines and rules in this game manual, the official RECF Inspire Q&A system at games.recf.org, and these additional official RECF policies.

- RECF Organizational Policy
- RECF Student-Centered Policy
- RECF Code of Conduct
- RECF Qualifying Criteria
- RECF Guide to Judging
- RECF Youth Protection Policy
- RECF Commitment to Coach Excellence
- RECF Commitment to Event Excellence

1.4.2 RECF Inspire Teams & Students

Teams must be registered in RECFevents.org for the RECF Inspire program to participate in RECF Inspire qualifying events.

Each RECF Inspire team has one or more students. To compete in Inspire, a student must have graduated from secondary school, not be dual-enrolled in secondary and post-secondary coursework, and be enrolled in post-secondary coursework and working toward a certificate or degree -or- have earned a post-secondary degree during the six months preceding the RECF World Championship.

Team structure must follow the RECF Organizational Policy. Teams must be student-centered and follow the RECF Student-Centered Policy and the RECF Code of Conduct at all times, including at practices and when attending events.

1.4.3 Supervision & Release Forms

If no team member is over the age of 18, the team must be accompanied by a responsible adult over the age of 18 for the duration of the event. All participants in RECF events must complete an RECF Participant Release Form each season.

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1.5 Definitions

1.5.1 General Definitions

- **Alliance Match** - A 1-team versus 1-team match that is used to determine ranking for the elimination bracket; consists of a 30-second autonomous period followed by a 90-second driver-controlled period
- **Coach / Mentor** - A person who helps students learn concepts used in RECF competitions, and who helps create and organize teams, but who cannot contribute to the students' work used at competitions
- **Drive Team** - 2-6 students who participate in a match as representatives for their team
- **Driver Box** - An area near the field where a drive team must stand during a match (driver boxes are highlighted in blue in figure 1.5.1)
- **Elimination Bracket** - A series of matches that includes a designated number of the highest ranked teams from alliance matches, and identifies the tournament winners (see section 7.4.5)
- **Engineering Notebook** - A physical or electronic document that records a team's use of the engineering design process, and their work during a competition season
- **Foul** - The act of breaking a rule during a match or event (see section 1.6 for more details)
- **Foul Card** - A tracking system for repeated rule infractions (see section 1.6 for more details)
- **Grounded** - Description of a robot that has broken a safety rule and is no longer allowed to participate in the match; the robot is not allowed to drive, and the controller should be placed on the floor or another nearby position (not on the field)
- **Robot** - A machine designed and built by students from parts that are legal for use in the RECF Inspire competition
- **Solo Coding Match** - A one-minute match with two robots and one drive team, during which the robot operates only by code created by the students
- **Solo Driving Match** - A one-minute match with two robots and one drive team, during which students operate the robot by remote control
- **Student** - A team member who meets all requirements of the program, is within the age bracket, and who contributes to a team's notebook, robot design, build, code, and/or strategies or serves as a drive team member; a student can only participate on one RECF Inspire team during a season.
- **Team** - Consists of any number of students who are enrolled in an officially recognized post-secondary educational institution and working toward a degree or certification, and who work together to build two or more robots.
- **Tournament** - An official RECF Inspire event that meets the requirements of the RECF Qualifying Criteria, and includes alliance matches, solo driving matches, solo coding matches, and optional judging

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Figure 1.5.1 highlights the following defined locations and objects:

- Blue = drivers boxes
- Green = rollers
- Orange = loaders
- Pink = goals

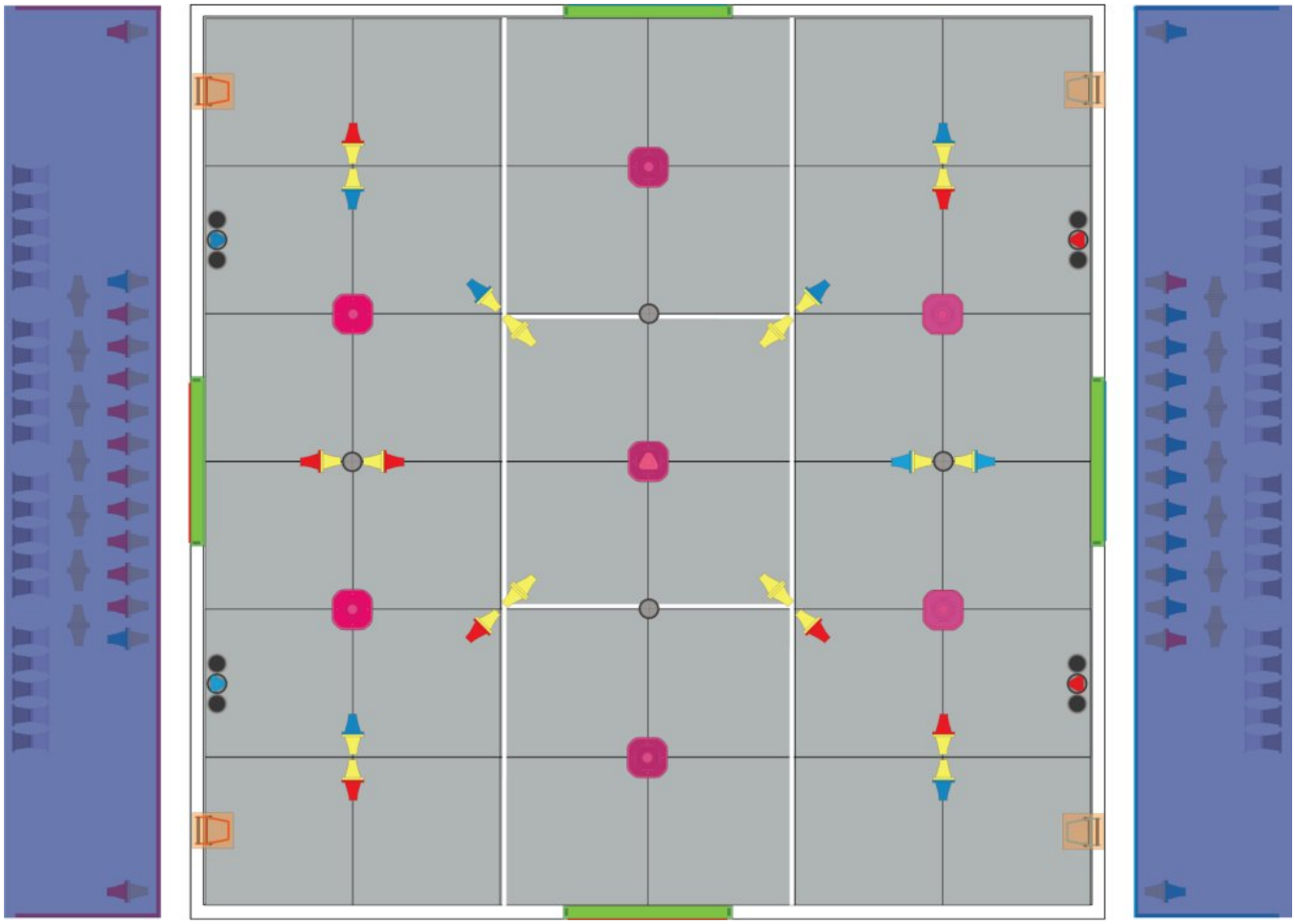


Figure 1.5.1: Inspire Pinnacle field with highlighted locations and objects

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Figure 1.5.2 shows AprilTag locations and highlights the following defined zones:

- Red = red zone, including red alliance goals
- Blue = blue zone, including blue alliance goals
- Yellow = neutral zones, including neutral goals
- Green = center zone, including center goal



Figure 1.5.2: Inspire Pinnacle field with AprilTag locations and highlighted zones

1.5.2 Pinnacle Definitions

- **AprilTag** - A visual reference marker used to mark locations on the field that can be identified with computer vision. The AprilTag family used in RECF Pinnacle is tagCircle21h7. AprilTags were created by the APRIL Robotics Laboratory at the University of Michigan and more information can be found at april.eecs.umich.edu/software/apriltag.
- **Cup** - A plastic, two-segment object that is roughly 6.48” by 3.16”; each cup has a transparent half and an opaque half
- **Goal** - A structure on the field, mounted to an under-tile plate, where robots can score pins, cups, and stacks (goals are highlighted in pink in figure 1.5.1)
    - **Alliance goal** - A red (AprilTag 2) or blue (AprilTag 3) plastic structure, roughly 3.25” high, in the corresponding red or blue zone.
    - **Center goal** - A black plastic structure (AprilTag 0), roughly 8.77” high, in the center zone

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    - **Neutral goal** - A black plastic structure, roughly 5.77” high, in neutral zone 1 (AprilTag 1) or 2 (AprilTag 4).
- **Loader** - One of four structures attached to the field perimeter in a location adjacent to a driver box; used to introduce team-loaded cups and pins into the field (loaders are highlighted in orange in figure 1.5.1). All loaders must be in the "down" position at the start of matches.
- **Nested** - A description for a connection between a cup and a pin, or a pin and a goal, in which a convex halfpin fits securely inside of the opening on a goal or one concave half of a cup. A halfpin can be nested into a cup or a goal. A cup can be nested onto a halfpin.
- **Pin** - A plastic, two-segment object that is roughly 6.5” by 3.02”; each pin is described by the color(s) of its two segments (yellow/yellow, yellow/red, yellow/blue, or red/blue)
    - **Halfpin** - One segment of a pin, described by its color; when a pin is part of a stack, each of its halfpins will be hidden or visible
    - **Hidden** - Description for a portion of a pin that is not visible when the pin is nested in a cup; can apply to one or both ends of a nested pin, based on the transparency/opacity of the cup its nested into
    - **Visible** - Description for a pin color that is showing when a pin is nested in a cup; can apply to one or both ends of a nested pin, based on the transparency/opacity of the cup its nested into
- **Pinnacle** - A two-object stack that consists of one pin nested to one cup
- **Roller -** A complex structure, mounted to the field perimeter with the flat face of the roller facing out of the field, which includes a 3-sided length of plastic that can be manipulated and set by a robot to display red, blue, or yellow on the side facing up and into the field (rollers are highlighted in green in figure 1.5.1); Initial roller orientations are:
    - Neutral zone 1 (head referee side of field, with the red zone to the right): Blue facing out, red facing down
    - Neutral zone 2 (audience side of field, with the blue zone to the right): Red facing out, blue facing down
    - Red zone: Red facing out, blue facing down
    - Blue zone: Blue facing out, red facing down
- **Stack -** A group of nested pins and cups
- **Supply** - A set of pins and cups that begin a match in a driver box
- **Zone** - 5 defined areas of the field; neutral zones 1 & 2 and the center zone are also collectively referred to as “the neutral zone”; tape lines should always be placed fully on the tile closer to the center of the field (see figure 1.5.3)
    - **Red zone** - The 4’ W x 12’ L section of the field closest to the red alliance drivers box, containing both red alliance colored goals (the red zone is highlighted in red in figure 1.5.2)
    - **Blue zone** - The 4’ W x 12’ L section of the field closest to the blue alliance drivers box, containing both blue alliance colored goals (the blue zone is highlighted in blue in figure 1.5.2)

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- **Neutral zone 1** - The 4’ W x 4’ L section of the field in the center of the head referee side of the field, containing one of the neutral goals (the neutral zones are highlighted in yellow in figure 1.5.2)
- **Neutral zone 2** - The 4’ W x 4’ L section of the field in the center of the audience side of the field, containing one of the neutral goals (the neutral zones are highlighted in yellow in figure 1.5.2)
- **Center zone** - The 4’ W x 4’ L center section of the field, containing the tall center goal (the center zone is highlighted in green in figure 1.5.2)

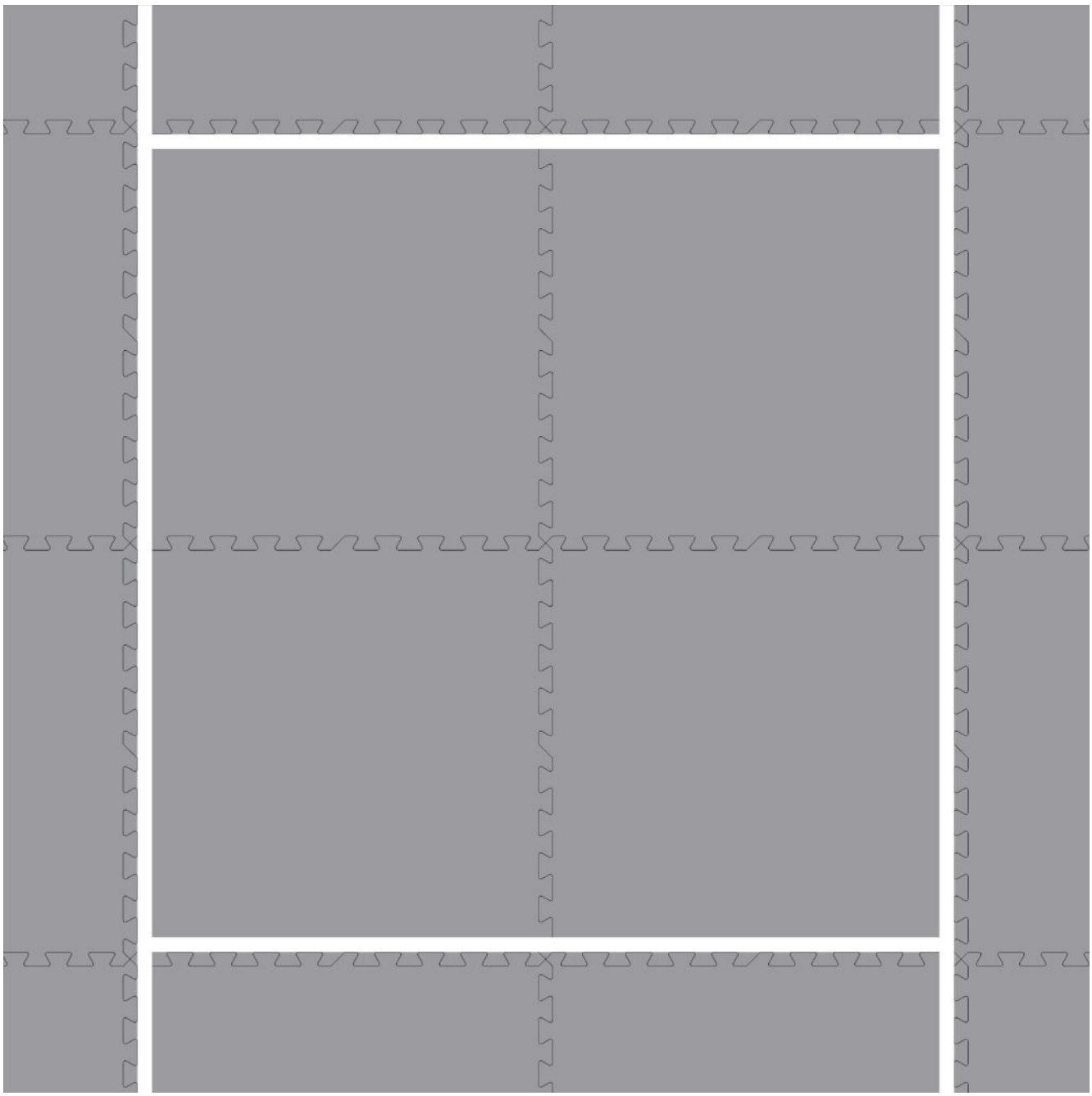


Figure 1.5.3

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1.6 Fouls & Penalties

Fouls are decided by a head referee during a match and occur when a rule of gameplay or safety is broken. Fouls may also occur when the RECF Code of Conduct is violated during an event, as determined by the event partner or the head referee. Teams should not be penalized if they're forced into a foul by an opponent.

Penalty cards serve as a tracking system for fouls. Penalties are announced verbally by a head referee after a match and are recorded in the event management software. All penalties stay with the team for the entire tournament.

For fouls that involve damage or potential damage to the field, people, or other robots, a head referee (or in a solo match, a scorekeeper referee) may also require that the drive team stop operating the robot and put their controller on the ground. This is called grounding.

Head referees should focus on helping teams avoid fouls before they happen, by calling out actions that may lead to a foul. Advance warnings like these do not count as official warnings, and are not recorded by referees.

1.6.1 Official Warning

An official warning is given to an alliance, team, or team member verbally by the head referee the first time they break a specific rule, provided the foul does not affect the outcome of a match. This official warning helps students learn how to prevent future fouls before they lead to penalties. Future violations of the same rule should result in a yellow card for that rule. For example, the first time a team accidentally removes a pin from the field, they will receive an official warning.

1.6.2 Yellow Card

A yellow card is given to an alliance, team, or team member the second time they break a rule (after they have received an official warning for breaking that specific rule). For example, the second time a team accidentally removes a pin from the field, they will receive a yellow card foul.

1.6.3 Red Card

A red card is given to an alliance, team, or team member the third time they break a rule (after they have received a yellow card for breaking that specific rule). For example, the third time (and any additional times) a team accidentally removes a pin from the field would earn a team a red card.

A team that receives a red card will earn zero points for the current match. In an alliance match, a team that does not receive the red card will receive the actual score of the match. The opposing alliance will receive two match ranking points for the match when a red card is awarded, regardless of the final score, unless they also received a red card in that match.

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Any foul that affects the outcome of the match will receive a red card for each offense, although in cases where both alliances violate the same rule a head referee may determine that they cancel each other out in terms of their impact on the match. Fouls related to the RECF Code of Conduct, the RECF Student-Centered Policy, or safety rules may also receive a red card for each offense.

1.6.4 Fouls affect eligibility for elimination matches

Any team that receives three or more red cards during an event cannot be part of the elimination bracket. Eligibility for judged awards may also be affected.

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Section 2: Design, Build, and Code Robots

Pinnacle robots are primarily created using VEX V5® electronics and non-electronic parts from any major robotics provider, simple commercial off-the-shelf (COTS) items, and custom-created parts (see rules 2.2.3 and 2.2.4 for details). Each robot must pass a brief inspection before it can participate in matches at an official RECF event. Robots may change during the competition, but should be reinspected. Intentionally breaking a robot rule for improved performance may be handled as a violation of the RECF Code of Conduct. A robot may not participate in a match if it is in violation of a robot rule.

2.1 Robot design

2.1.1 Teams design their own robots

A team's student members get to decide what their robots look like, and what they do.

2.1.2 Outside references are okay as starting points

Teams can use someone else's design as a starting point, but should modify it to make it their own. They should be able to explain their design process and original ideas when asked. Outside references should be appropriately credited and described in teams' engineering notebooks.

2.2 Robot build

2.2.1 Basic requirements

- Your robots must be safe, and can't damage the field, people, or other robots
- Your robots must pass an inspection before competing at an event and are subject to reinspection at any time during the event
- Your robots should be able to be quickly and safely powered down, either by having easy access to the power button or to easily unplug the battery.
- Your robots can't have parts or mechanisms that intentionally detach during the match
- Your robots can't be larger than 18" wide by 18" long by 18" tall at the start of the match
- Your robots can't ever be larger than 24" wide by 24" long during the match
- There is no limit to how tall your robots can be during the match
- You may bring any number of robots to an event, but may only field 2 robots during each solo, alliance, or elimination bracket match
- Your robots can only include legal materials as listed below

2.2.2 Modifying parts

- Pneumatic components and VEX V5® electronic components cannot be modified in any way, other than labelling and/or external decorations. Other commercially-produced or custom electronic components can be modified as long as they meet all requirements in this game manual. See 2.2.4 for more information. External controller accessories (such as controller scuffs) are allowed, as long as the controller itself remains unmodified.
- Non-electronic parts may be modified.

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2.2.3 Required parts

	Required Parts
Robot Brain	VEX V5® Robot Brain
Controller	VEX V5® Controller* **Teams may use up to two controllers for a single robot.*
Radio	VEX V5® Robot Radio
Battery	VEX V5® Robot Battery Li-Ion 1100mAh (*to power the VEX V5® Robot Brain*)
License Plates	• Your official registered RECF Inspire team number must be clearly visible from two sides of your robot on red or blue plates (to be changed depending on your alliance color). Only the current license plate color can be visible during a match. • Plates must be between 2.48” x 4.48” in height and 3” x 7” in width, and use a text font and color that is legible from a distance. License plates can be up to 0.75" thick. You may use VEX V5® Competition License Plates, AndyMark FTC® Alliance Robot Signs, or create custom license plates using 3D printing or other means. • License plates matching your alliance color must be securely attached to your robots before the start of your match. Failure to have the appropriate license plates on your robots is a foul.

2.2.4 Optional parts

	Electrical / Pneumatic optional parts
Motors (unlimited)	• VEX V5® Smart Motor 11W • VEX V5® Smart Motor 5.5W
Sensors	• VEX V5® AI Vision Sensor • VEX V5® Bumper Switch & Bumper Switch v2 & Bumper Switch 6N • VEX V5® Distance Sensor • VEX V5® GPS Sensor • VEX V5® Inertial Sensor • VEX V5® Line Tracker • VEX V5® Limit Switch • VEX V5® Light Sensor • VEX V5® Optical Sensor • VEX V5® Rotation Sensor • VEX V5® Vision Sensor • Other commercially available sensors, which must be directly or indirectly connected to and controlled by the VEX V5® Robot Brain
Cables	• VEX V5® Smart Cable

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	• VEX V5® Power Cable • VEX V5® 2-Wire, 3-Wire and 4-Wire Extension Cable • VEX V5® 2-Wire and Serial Y-Cable • Other commercially-available cables or custom cables from COTS materials that are compatible with VEX V5® Smart Motors, VEX V5® Robot Brain, VEX V5® Sensors, other commercially available sensors, or 12V Pneumatic Solenoids (if used).
Pneumatics	Commercially manufactured pneumatic components including cylinders, actuators, valves, gauges, storage tanks, regulators, manifolds, solenoids, and tubing • All components must be rated for 100 psi or higher • Pneumatic devices may only be charged to a maximum of 100 psi • Compressors or other forms of onboard charging are not permitted • Pneumatic components may not be modified from their original state, other than cutting tubing or wiring to length; assembling components using pre-existing threads, brackets, or fittings; or applying minor cosmetic labels.
Batteries	External lithium iron, lithium ion, or nickel metal hydride batteries may only be used only to power other electronics that are not VEX V5® parts, and may not exceed 13 volts each. Only one battery is allowed for each other electronics device.
Other electronics	The other electronic components listed in this rule are legal for robots in the Inspire competition. Electronic components that aren't listed here or elsewhere in this table are not currently legal. If you believe there's a component we should include, email details to us at gdc@recf.org or submit a question in the official RECF Q&A system. Legal other electronics: • Any microcontroller or single-board computer (e.g., Arduino or Raspberry Pi) • 12V pneumatic solenoids • Cooling fans • LED strip lights • Custom electronic devices designed by your team • Additional robot-to-robot communication methods; note that non-standard communication methods may result in unintended results or feedback, and may be disallowed if they interfere with other robots or the event You **must** document your use of custom electronic devices in your engineering notebook. Undocumented custom electronic devices are not considered legal. Custom electronic devices must be designed and/or customized by student team members, but can be manufactured by an outside entity (e.g., PCBWay)
Mechanical / Structural components	RECF Inspire has an open system for robot structure and hardware. Non-electronic parts from any major robotics provider, COTS items, and custom-created parts are permitted. Examples of providers/systems with

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	parts that are legal for RECF Inspire include, but are not limited to, VEX V5®, Robits® by AndyMark, Pitsco Education TETRIX® MAX, Rev Robotics DUO®, goBILDA®, and Robosource®. You may modify these parts by cutting, bending, drilling, routing, machining, welding, painting, or dyeing. Student team members may create custom parts using raw materials such as aluminum (sheet, tube, bars, angle, U-channel, C-channel), wood (plywood sheet, planks, boards), plastic (sheet, PVC pipe, filament), and others. Molded plastic parts may be created from polyurethane or silicone. You **must** document your use of custom fabricated parts in your engineering notebook. Undocumented custom parts are not considered legal. Custom parts must be designed and/or customized by student team members, but can be manufactured by an outside entity (e.g., SendCutSend).

Important notes:

1. Some product kits from major robotics providers include prohibited parts, including electronics, motors, servos, controllers, batteries, etc. Please take this into account when making purchasing decisions for your robot build. If you are unsure whether a part is prohibited, please submit a question to the official RECF Inspire Q&A system.
2. If you are utilizing a pre-designed robot system kit, such as a chassis, lift kit, launcher expansion kit, claw kit, etc. you must appropriately document and credit that part of your robot AND modify it to make it your own in some capacity.
3. Please note that not every part will be compatible with other parts when combining robotics systems, COTS parts, and custom fabricated parts.
4. Please note that all materials must be safe, both on their own and in combination with other materials in your robot builds.

	Decorations and misc. parts
Decorations	Decorations are permitted as long as they have no function and do not mimic game objects or field components in a way that would confuse sensors on other robots.
Misc.	• Hot glue to secure cable connections • Non-aerosol-based lubricants or grease, when used sparingly; lubricants or grease may not be used on any components that will come into contact with any part of the field, game objects, or other robots • Anti-static compound, when used sparingly in a way that will not leave residue on any part of the field, game objects, or other robots • One micro-SD card installed in the VEX V5® Robot Brain • Tape, glue, epoxy, or other adhesives for any purpose

2.2.5 Disallowed items

- Controllers or robot brains that are not part of the VEX V5® system

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- Motors that are not part of the VEX V5® system, except in the case of small, unmodified motors that are contained within sensors and allowed additional electronics
- Any electronics other than those specified in 2.2.4
- Sensors that are not either directly connected to the robot brain or connected to an external processor that is directly connected to the robot brain.
- Electromechanical assemblies that are not created by the team
- Materials which may shatter
- Real flames of any kind
- Anything that compromises the safety of people, other robots, the field, or game pieces
- 3D-printed parts created from a UV photopolymer using the SLA, MSLA, DLP, or similar process (resin printing)

2.3 Robot Code

2.3.1 Students create their own code

A team's student members get to decide what their robots' code looks like, and what it does. Coaches/mentors may teach coding concepts, but may not tell students what should or should not be included in their code.

2.3.2 Coding libraries are okay as starting points

Teams can use coding libraries as a starting point, but should modify the resulting code to make it their own. They should be able to explain how their code works and how it has been modified from the original ideas when asked. Outside references should be appropriately credited and described in teams' engineering notebooks.

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Section 3: Pinnacle Solo Driving Matches

In Pinnacle solo driving matches, student drive teams have 60 seconds to score as many points as possible while operating their robots with a remote controller. Solo matches aren't pre-scheduled, and each team will have up to five total solo match attempts per competition that can be allocated across the two solo match types however the team likes. Some awards consider a team's solo coding score, so it is advised that teams complete at least one solo coding match. The field setup is shown in figures 3.0.1 and 3.0.2 below. The rules for solo driving matches represent the basic rule set for Pinnacle. Once students master solo driving matches, they only need to learn a few more rules to understand how other match types work.

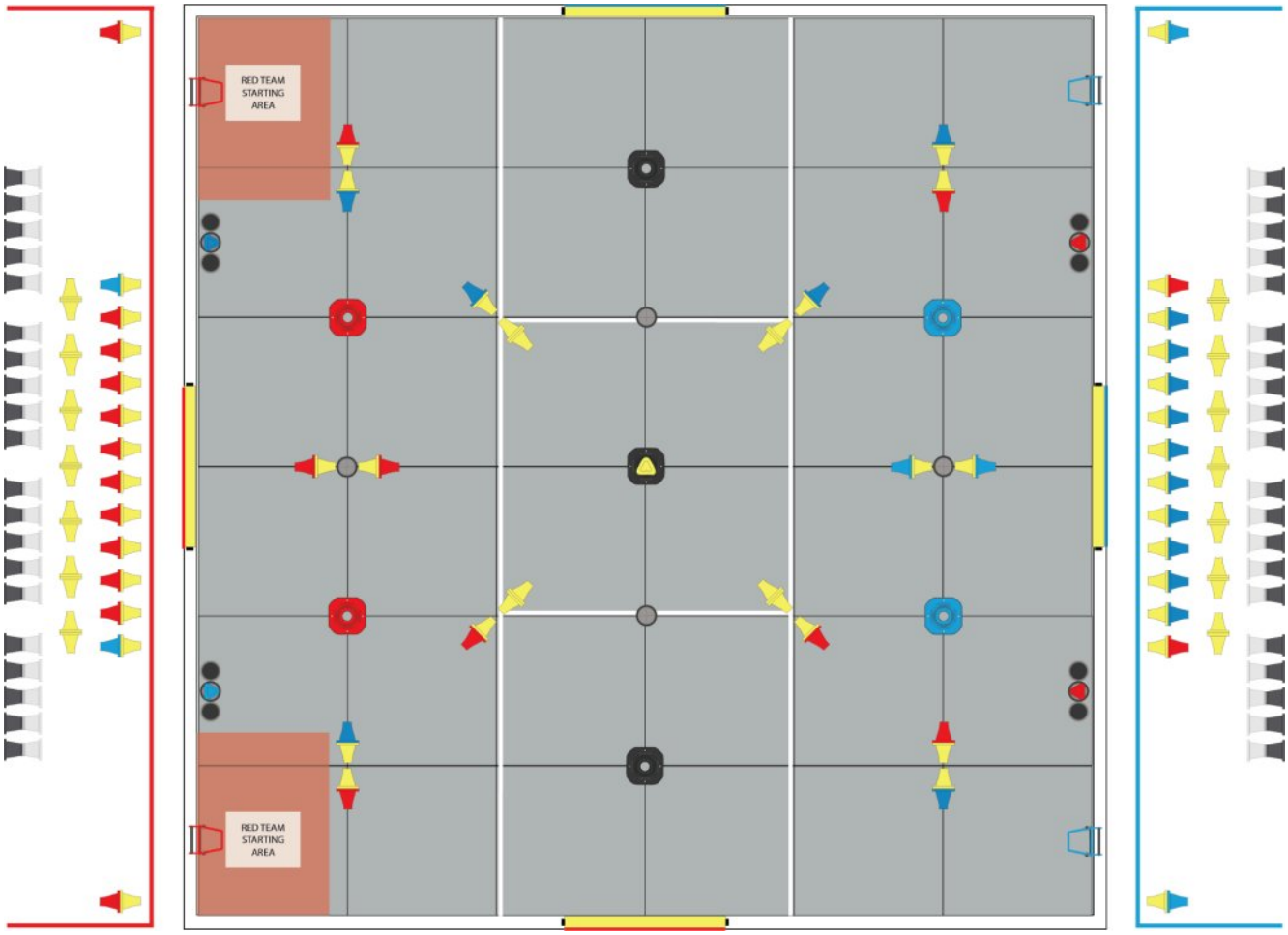


Figure 3.0.1: Field layout and robot starting positions for Inspire Pinnacle solo matches

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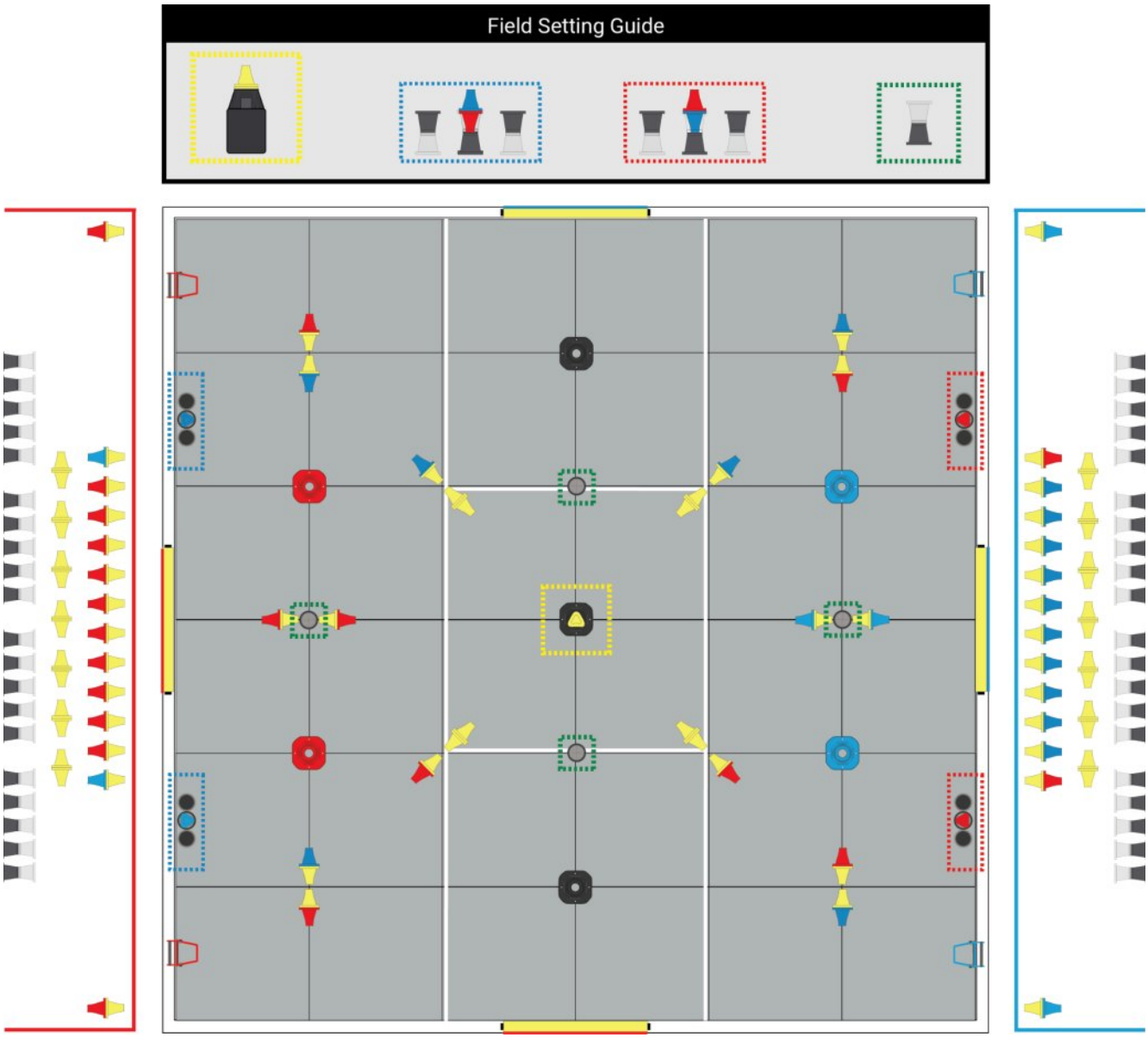


Figure 3.0.2: Field setting guide for Inspire Pinnacle matches

Object	Quantity & Location
Cup	Total = 56 • Supply in red driver box = 20 • Supply in blue driver box = 20 • On-field positions = 16
Red/Blue Pin	Total = 4 • On-field positions = 4
Red/Yellow Pin	Total = 20 • Red alliance preloads = 2 • Supply in red driver box = 8

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	• Supply in blue driver box = 2 • On-field positions = 8
Blue/Yellow Pin	Total = 20 • Blue alliance preloads = 2 • Supply in blue driver box = 8 • Supply in red driver box = 2 • On-field positions = 8
Yellow/Yellow Pin	Total = 19 • Supply in red driver box = 7 • Supply in blue driver box = 7 • On-field positions = 5

3.1 Solo Match Scoring

Solo Match Scoring Category	Points
Scored cup	1 point per cup
Scored red or blue halfpin in a color-matching or neutral goal	5 points per visible halfpin
Scored yellow halfpin on a red or neutral goal, with a roller set to red	5 points per visible halfpin
Scored yellow halfpin on a blue goal, with a roller set to blue	5 points per visible halfpin
Any scored halfpin on the center goal	10 points per visible halfpin

3.1.1 A robot must move away from the loader to earn a solo match score

To earn any points in a solo match, the robot must move away from the loader at some point during that match.

3.1.2 Cups and pins must be nested to count as scored

To count as scored, a pin must be nested into either a goal or a scored cup.

To count as scored, a cup must be nested onto a scored pin. A scored pin worth zero points (e.g., no visible halfpins, or no value based on goal or roller color) still counts as scored for this requirement.

3.1.3 Scored cup on any goal

Each cup scored on a goal earns one point.

3.1.4 Scored red halfpin on a red or neutral goal

Each visible red halfpin that is scored on a red or neutral goal earns 5 points.

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3.1.5 Scored blue halfpin on a blue or neutral goal

Each visible blue halfpin that is scored on a blue or neutral goal earns 5 points.

3.1.6 Scored yellow halfpin on a red or neutral goal

Each visible yellow halfpin that is scored on a red or neutral goal earns 5 points only if the roller in that goal's zone is set to red.

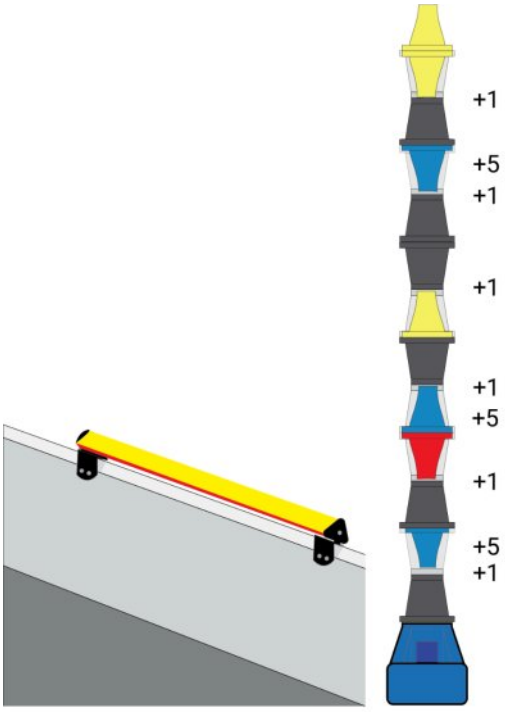
3.1.7 Scored yellow halfpin on a blue goal

Each visible yellow halfpin that is scored on a blue goal earns 5 points only if the roller in that goal's zone is set to blue.

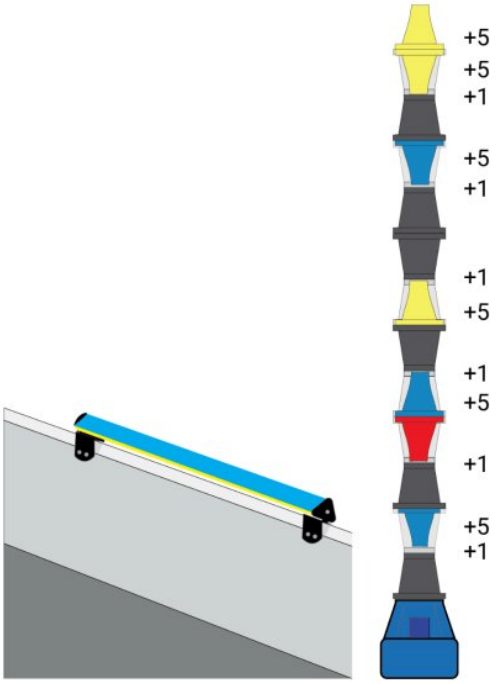
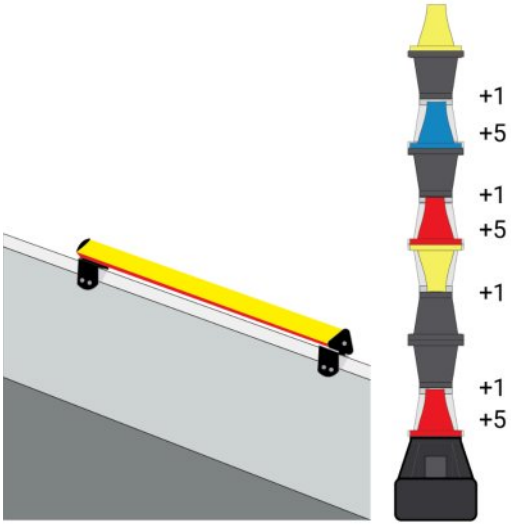
3.1.8 Scored halfpin of any color on the center goal

Each visible halfpin that is scored on the center goal earns 10 points.

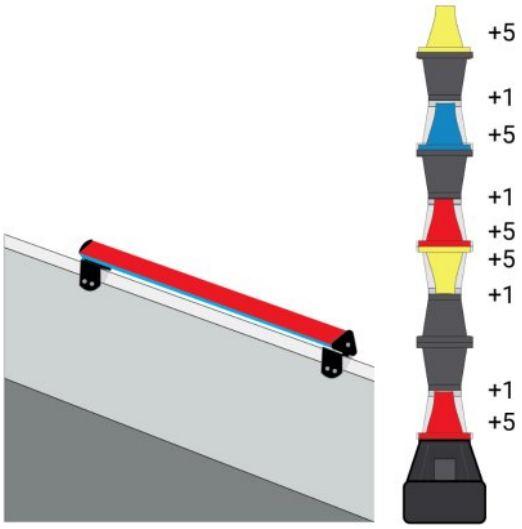
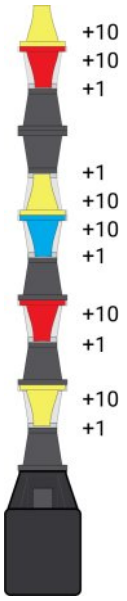
3.1.9 Solo Match Scoring Examples

Example 1: Blue goal with the roller set to yellow or red ● Six cups at 1 point each = 6 ● Three blue halfpins at 5 points each = 15 ● Red halfpins can't score on blue goals ● Because the roller in this zone isn't set to blue, yellow halfpins are worth 0 ● Total score for this goal = 21	

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Example 2: Blue goal with the roller set to blue ● Six cups at 1 point each = 6 ● Three blue halfpins at 5 points each = 15 ● Three yellow halfpins at 5 points each = 15 ● Red halfpins can't score on blue goals ● Total score for this goal = 36	
Example 3: Neutral goal with the roller set to yellow ● Four cups at 1 point each = 4 ● Two red halfpins at 5 points each = 10 ● One blue halfpin at 5 points = 5 ● Because the roller in this zone isn't set to red, yellow halfpins are worth 0 ● Total score for this goal = 19	

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Example 4: Neutral goal with the roller set to red ● Four cups at 1 point each = 4 ● Two red halfpins at 5 points each = 10 ● One blue halfpin at 5 points = 5 ● Two yellow halfpins at 5 points each = 10 ● Total score for this goal = 29	
Example 5: Center goal (has no corresponding roller) ● Five cups at 1 point each = 5 ● Six visible halfpins at 10 points each = 60 ● Total score for this goal = 65	

3.2 Starting Positions

3.2.1 Driver boxes for solo matches

Up to six student team members (the drive team) can come to the field for each solo match. Two drive team members can use the blue driver box and the blue loaders, but must remain in the blue driver box for the entire match. All other drive team members must remain inside of the red team driver box during the match unless they are interacting with their robot as allowed in 3.4.1. Only the drive team members can operate the robot during the match.

Drive team members can't wear headphones or communicate with anyone beyond the field during the match, and spectators or non-drive team students can't coach the drive team. Sitting or standing on chairs/stools for support or elevation is only allowed if approved by the RECF through an accommodation request.

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3.2.2 Robot starting positions

Each robot must begin the match within the 18” x 18” x 18” starting size limit, in contact with a red loader that is not in contact with another robot (as shown in the first image in section 3), and not in contact with any pins or cups other than their preload pin (3.2.3).

3.2.3 Preload pin

Each robot must start the match in contact with one yellow/red pin.

3.2.4 Eye protection

Every drive team member has to wear some form of eye protection. Eyeglasses meet the requirement, but we recommend safety glasses with non-shattering lenses and side shields.

3.3 Match Play

3.3.1 The robots can only operate while the match timer is counting down

Robots can’t be in motion (except certain “other electronics,” such as fans, sensors, etc. whose motion does not propel any part of the robot itself) before the match timer begins counting down from 60 seconds, and have to stop when the timer hits 0. Points scored after the timer reaches 0 will be deducted before the score is submitted, and the team will receive a foul.

3.3.2 Each robot can carry one pin, one cup, and one stack at a time

Each robot can carry up to one unstacked pin, one unstacked cup, and one stack of any height at any time.

A team can avoid a foul for this rule by stopping all other match play until they’ve removed the extra cup(s)/pin(s)/stack(s). If they can’t remove the extra objects, they should consider grounding their own robot for the rest of the match. Playing the game while carrying extra objects after being asked to stop driving by a head referee will result in a foul.

The first three examples in figure 3.3.2 show a robot legally carrying up to one cup, one pin, and one stack simultaneously. The 4th example in figure 3.3.2 shows a robot illegally carrying 2 stacks.

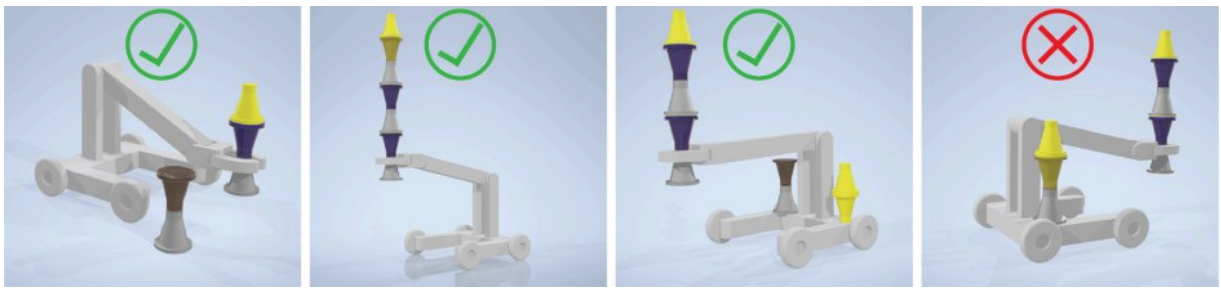


Figure 3.3.2

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3.3.3 Cups and pins stay in the game

Removing a cup or pin from the field is a foul. Intentional or egregious fouls will receive red cards.

A cup or pin that leaves the field will be returned by the nearest field volunteer when and if they're able to safely and reasonably do so, in a position against the field wall close to where it left the field. Cups or pins that are leaving the field cannot be deflected back into the field by humans, or by anything outside of the field.

3.3.4 Team-loaded objects

Any drive team member can move cups, pins, and pinnacles from the supply in their driver box into one of the two adjacent loaders during the match (not before!). Only the objects that begin the match in a driver box can be added, and they can only be added to the adjacent loaders. Any unused preloads (3.2.3) can be added to the supply and used as team-loaded objects.

A loader can only contain one cup, one pin, or one pinnacle at any time. The drive team member must let go of the object before a robot is allowed to touch it.

3.3.5 Don't reach into the field

Before a match, students can only reach into the field to place their robots. Referees can adjust objects if they're more than 1" out of position or in an incorrect orientation.

During a match, students can only reach into the field to add team-loaded objects (3.3.4) or to troubleshoot their robot if it hasn't moved during the match (3.4.1). Teams should exercise caution when reaching into the field, especially if any robot is moving in the vicinity.

3.3.6 How to stop a match early

If a drive team wants to end a match early, they should stop driving, put their controller(s) on the ground, and give a clear signal such as "Stop Time!" For improved accuracy, drive team members may notify the referee before the match or provide a countdown before the stop signal. The time remaining on the match timer will be recorded as the stop time.

3.3.7 Robot control

Beginning on November 17, 2026, robot controllers will not be attached to a field control system; teams must ensure that their robots move only during the match as required by rule 3.3.1.

Drive team members must not drive the robot or move any mechanisms before the match begins, and must stop all robot mechanisms when the match ends. The recommended way to stop the robot at the end of the match is to exit the robot's program by holding down the controller power button.

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3.4 What Happens When Things Go Wrong

3.4.1 Robot hasn't moved during the match

If a team's robot hasn't moved during the match, drive team members are allowed to troubleshoot it during the driver-controlled period of the match. They can't make mechanical/structural repairs or changes, and can only interact with the robot brain, battery, and/or radio. They should pay attention to other robots on the field to avoid safety hazards.

3.4.2 Match replay

The head referee and event partner may decide to replay a match due to technical issues outside of the team's control that affect the outcome of the match.

3.4.3 Field damage

If a robot damages a field, it may be grounded by the head referee for the rest of the match. If the head referee decides that damage caused by a student or robot is intentional, the team may earn a red card and a zero score for the match.

3.4.4 Appealing a decision

If the drive team members disagree with a decision made or score recorded by a referee, they should remain at the field and notify the referee immediately. Drive team members and referees should be prepared to show specific rules and/or Q&A answers that back up their opinions, and should remember that referees can only make rulings based on the game manual and their own observations and perspectives of the match. Referees and drive team members may never view video or photos from the match while at the field or during discussions that affect match outcomes or scoring, and team members who were not at the field for the match are not allowed to approach the field. The head referee will determine when the discussion is over, and will announce their final and binding decision.

3.5 Solo Match Ranking and Tiebreakers

Teams will be ranked for solo matches using the total points from their best solo driving and solo coding match at the event.

Tiebreakers:

1. Highest solo coding match score
2. Highest solo driving match score
3. Highest solo coding match stop time in highest scoring solo coding match
4. Highest solo driving match stop time in highest scoring solo driving match

If teams are still tied, the 2nd highest of each in category 1-4 will be used, followed by 3rd highest.

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Section 4: Pinnacle Solo Coding Matches

In Pinnacle solo coding matches, teams have 60 seconds to score as many points as possible using only pre-written code to operate the robots. Solo matches aren't pre-scheduled, and each team will have up to five total solo match attempts per competition that can be allocated across the two solo match types however the team likes. Some awards consider a team's solo coding score, so it is advised that teams complete at least one solo coding match.

Rules from Section 3: Solo Driving Matches apply unless they're specifically changed by a rule in this section.

4.1 Changes From Solo Driving Matches

4.1.1 No driving the robots

Robot controllers will not be attached to a field control system; teams must ensure that their robots move only during the match.

In solo coding matches, robots operate autonomously. Drive team members must place their controller(s) on the ground or (if available) on an event-provided table in the driver box. They can press a button on the controller at the beginning of the match to start robot operation, and can press a button to stop the robot at any time during the match. Otherwise, drive team members cannot touch their controllers or control the robot in any way during a solo coding match.

At the end of the match, all robot mechanisms must stop. Teams are recommended to design their robot code such that the robot does not attempt to drive for more than the length of the match.

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Section 5: Pinnacle Alliance Matches

In Pinnacle alliance matches, teams have 120 seconds to score as many points as possible. Each match includes one team designated as the red alliance and one team designated as the blue alliance. Each team uses two robots during the match in an effort to outscore the other team. Skipping an alliance match will be considered a violation of the RECF Code of Conduct.

All rules from Section 3: Solo Driving Matches apply to alliance matches unless they're specifically changed by a rule in this section.

5.1 Alliance Match Scoring

5.1.1 Cups and pins must be nested to count as scored

To count as scored, a pin must be nested into either a goal or a scored cup.

To count as scored, a cup must be nested onto a scored pin. A scored pin worth zero points (e.g., no visible halfpins, or no value based on goal or roller color) still counts as scored for this requirement.

5.1.2 Scoring on alliance goals

5.1.2.1 Alliance-color halfpin scored on a matching alliance goal

An alliance earns 5 points for each visible halfpin of their alliance color scored on either of their alliance goals.

5.1.2.2 Cup scored on an alliance goal

An alliance earns 1 point for each cup scored on either of their alliance goals.

5.1.2.3 Yellow halfpin scored on an alliance goal

An alliance earns 5 points for each visible yellow halfpin scored on an alliance goal only if the roller in that zone matches their alliance color.

5.1.3 Scoring on neutral goals

5.1.3.1 Alliance-color halfpin scored on a neutral goal

An alliance earns 7 points for each visible halfpin of their alliance color that is scored on a neutral goal.

5.1.3.2 Cup scored on a neutral goal

An alliance earns 1 point for each cup scored on the neutral goal when the roller in that zone is turned to their alliance color. Neither alliance earns points for cups when the roller in that zone is turned to yellow.

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5.1.3.3 Yellow halfpin scored on a neutral goal

An alliance earns 7 points for each visible yellow halfpin scored on the neutral goal when the roller in that zone is turned to their alliance color. Neither alliance earns points for yellow halfpins when the roller in that zone is turned to yellow.

5.1.4 Scoring on the center goal

5.1.4.1 Alliance-color halfpin scored on the center goal

An alliance earns 10 points for each visible halfpin of their alliance color that is scored on the center goal.

5.1.4.2 Cup scored on the center goal

The alliance who has scored the highest number of visible alliance-colored halfpins on the center goal earns 1 point for each cup scored on the center goal. In the case of a tie, neither alliance earns points for cups scored on the center goal.

5.1.4.3 Yellow halfpin scored on the center goal

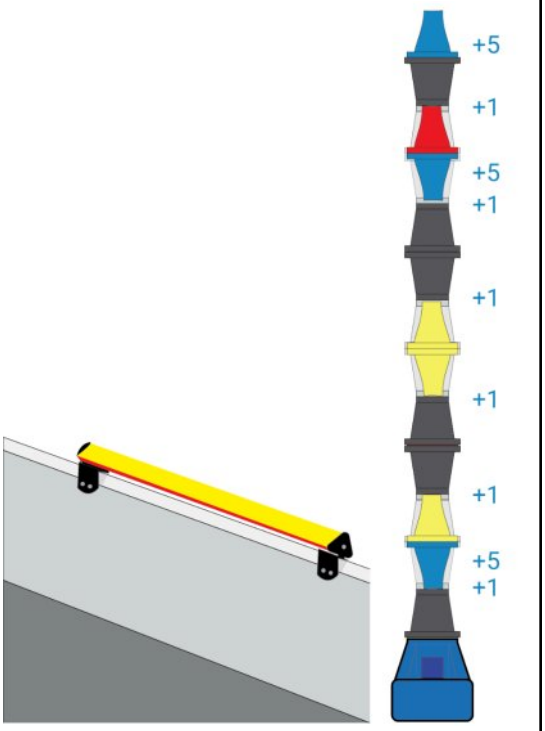
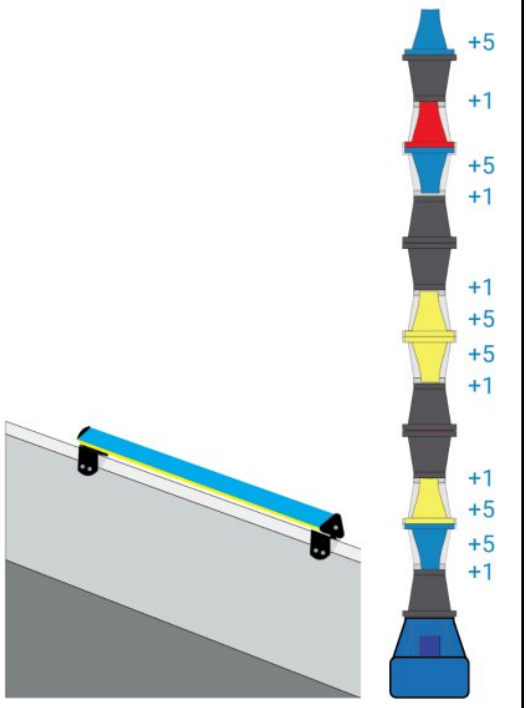
The alliance who has scored the highest number of visible alliance-colored halfpins on the center goal scores 10 points for each visible yellow halfpin on the center goal. In the case of a tie, neither alliance earns points for yellow halfpins scored on the center goal.

5.1.5 Parked robot

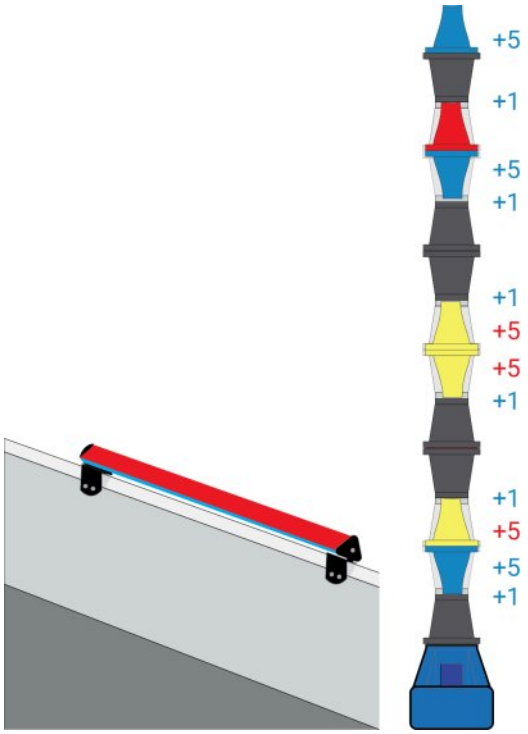
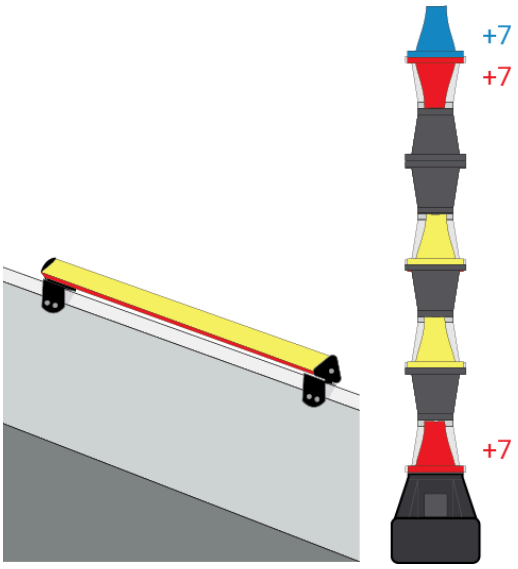
Each Robot in contact with one of their alliance's loaders at the end of the match earns 21 points, with a maximum of one robot per loader. If a robot is close enough to make determining contact difficult for the head referee, the robot should be considered parked and the points should be awarded (no paper test).

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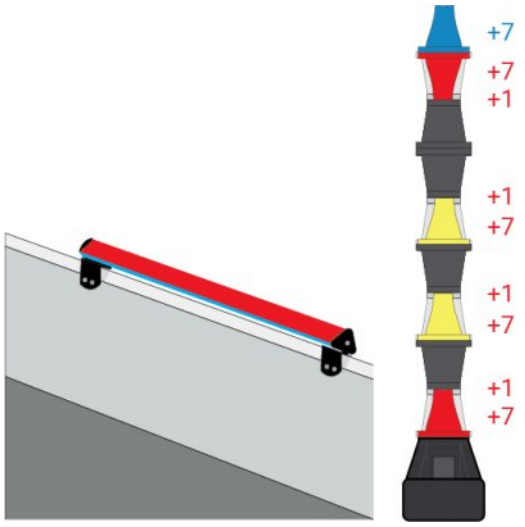
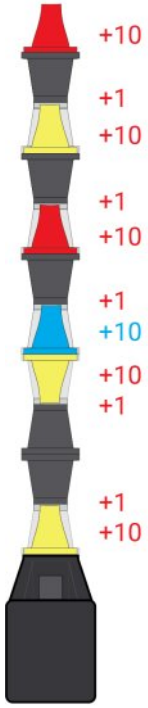
5.1.6 Alliance match scoring examples

Example 1: Blue goal with the roller set to yellow • Six cups at 1 point each = 6 to blue • Three blue halfpins at 5 points each = 15 to blue • Red halfpins can't score on blue goals • Because the roller is set to yellow, yellow halfpins are worth 0 Total score for this goal: • 0 points to the red alliance • 21 points to the blue alliance	
Example 2: Blue goal with the roller set to blue • Six cups at 1 point each = 6 to blue • Three blue halfpins at 5 points each = 15 to blue • Three yellow halfpins at 5 points each = 15 to blue • Red halfpins can't score on blue goals Total score for this goal: • 0 points to the red alliance • 36 points to the blue alliance	

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Example 3: Blue goal with the roller set to red • Six cups at 1 point each = 6 to blue • Three blue halfpins at 5 points each = 15 to blue • Three yellow halfpins at 5 points each = 15 to red • Red halfpins can't score on blue goals Total score for this goal: • 15 points to the red alliance • 21 points to the blue alliance	
Example 4: Neutral goal with the roller set to yellow • Two red halfpins at 7 points each = 14 to red • One blue halfpin at 7 points = 7 to blue • Because the roller in this zone is set to yellow, neither alliance earns points for scored cups or yellow halfpins. Total score for this goal: • 14 points to the red alliance • 7 points to the blue alliance	

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Example 5: Neutral goal with the roller set to red • Two red halfpins at 7 points each = 14 to red • One blue halfpin at 7 points = 7 to blue • Because the roller in this zone is set to red, the red alliance also earns points for scored cups and yellow halfpins in this goal. • Four scored cups = 4 to red • Two scored yellow halfpins = 14 to red Total score for this goal: • 32 points to the red alliance • 7 points to the blue alliance	
Example 6: Central goal (no corresponding roller) • Two red halfpins at 10 points each = 20 to red • One blue halfpin at 10 points = 10 to blue • Because red has more visible scored halfpins than blue, the red alliance also earns points for scored cups and yellow halfpins in this goal. • Five scored cups = 5 to red • Three scored yellow halfpins = 30 to red Total score for this goal: • 55 points to the red alliance • 10 points to the blue alliance	

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Example 7: Central goal (no corresponding roller) ● Two red halfpins at 10 points each = 20 to red ● Two blue halfpins at 10 points each = 20 to blue ● Because the two alliances have an equal number of visible, scored, alliance-colored halfpins in this goal, neither alliance earns points for the scored cups or yellow halfpins. Total score for this goal: ● 20 points to the red alliance ● 20 points to the blue alliance	

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5.2 Changes From Solo Driving Matches

5.2.1 Driver boxes for alliance matches

Because an alliance match includes two teams, one is designated on the match schedule as the red alliance and will use the red driver box. The other is designated as the blue alliance on the match schedule and will use the blue driver box. See figure 5.2.1 for more details.

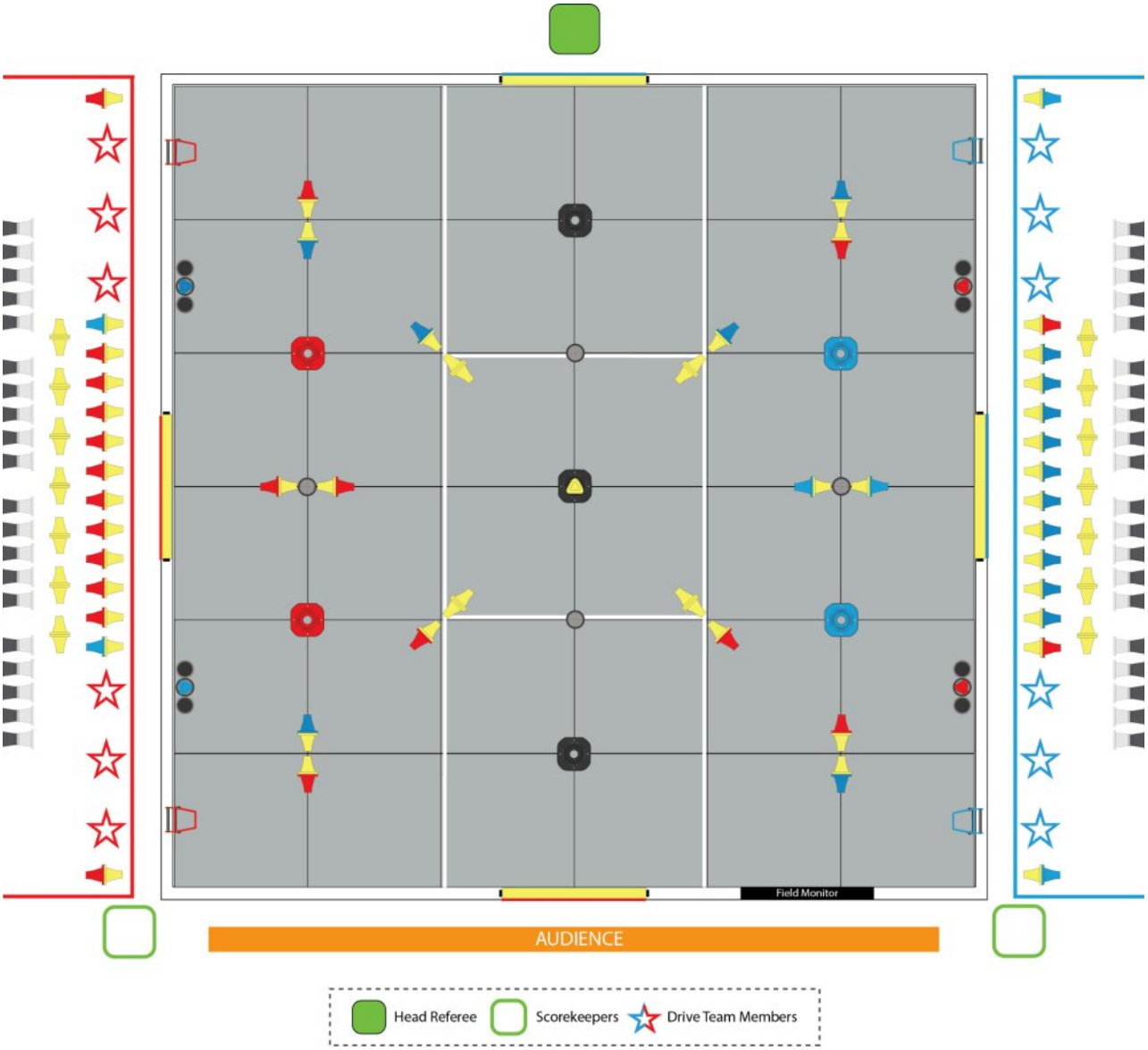


Figure 5.2.1: Inspire Pinnacle driver boxes and volunteer locations

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5.2.2 Robot starting positions

Each robot must begin the match within the 18” x 18” x 18” starting size limit, in contact with one of their alliance-colored loaders that is not in contact with another robot, and not in contact with any pins or cups other than their preload pin (3.2.3), as shown in figure 5.2.2.

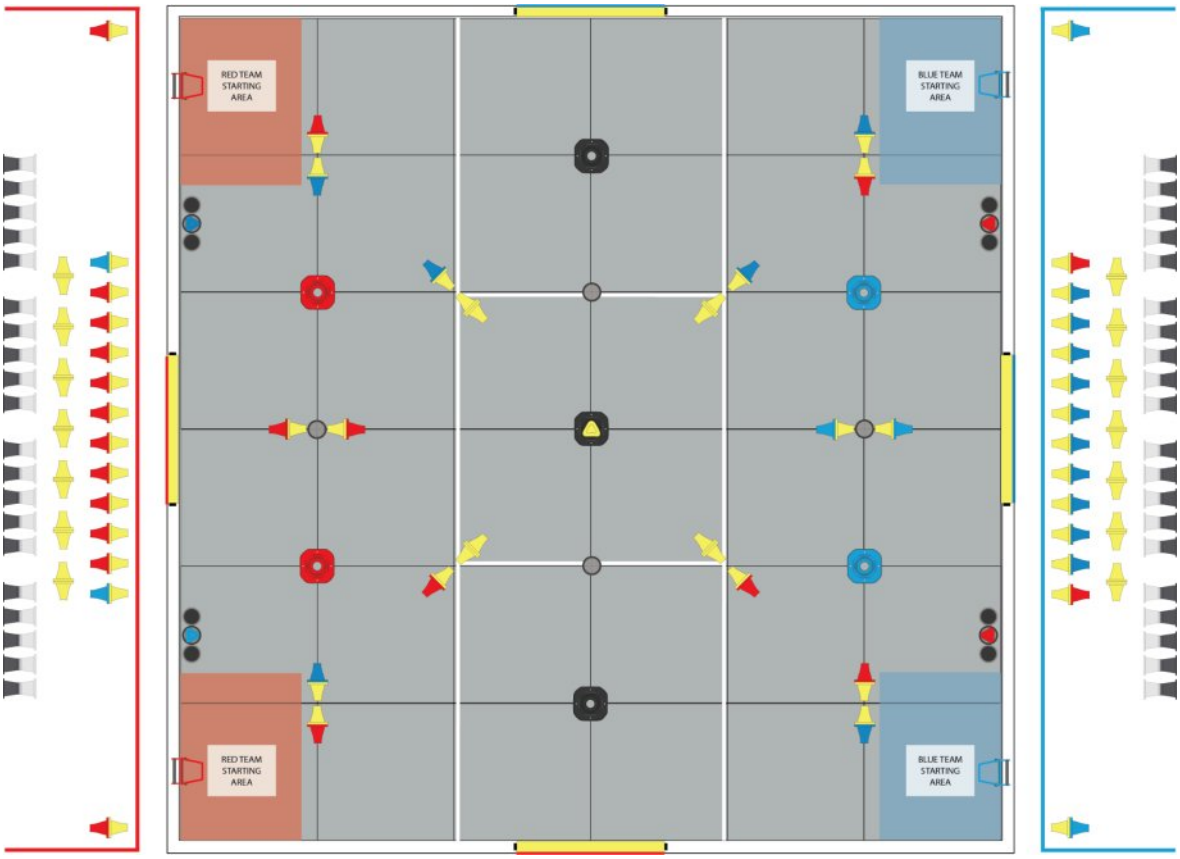


Figure 5.2.2: Inspire Pinnacle alliance match robot starting locations

5.2.3 Team-loaded objects

Drive team members can add objects from the supply in their driver box into their alliance-colored loaders during both periods of the match, but not before the autonomous period begins and not while the timer is stopped between the match periods.

5.2.4 Stopping a match early

An alliance match can end early if everyone agrees, but no match stop time will be recorded.

5.2.5 Preload pins

Each red alliance robot starts the match in contact with one yellow/red pin. Each blue alliance robot starts the match in contact with one yellow/blue pin.

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5.2.6 Robots can only operate while the match timer is counting down

Robots can't be in motion before the match timer begins counting down for the autonomous or driver-controlled period of the match and must stop at the end of each match period (see rule 5.3.9 for more information).

Teams that continue to play the game after the end of the autonomous period will earn a foul and become ineligible to receive an autonomous ranking point (see rule 5.3.3). Teams that start playing the game before the timer resumes for the driver-controlled period begins, or continue to play the game after the time reaches zero, will earn a foul. Motion solely as the result of inertia is not a violation.

Any game play before or after the match periods that result in a change to the score for either alliance will result in an immediate red card.

5.3 Additional Rules for Alliance Matches

5.3.1 Alliance matches begin with a 30-second autonomous period

Robots aren’t allowed to contact anything on the opponent’s side of the neutral zone. They can contact anything in their own alliance-colored zone, and anything in the neutral zone including all tape lines. During the autonomous period, rule 4.1.1 applies. Drive team members can't hold their controllers, and can only press buttons to start or end the robot's autonomous routine.

5.3.2 Robots in the neutral zone give up some protection during the autonomous period

Robots in the neutral zone are likely to encounter other robots in the neutral zone, and unless the head referee decides that an entanglement, tipping, or trapping interaction (see 5.3.6) was intentional or strategic, most interactions won’t result in fouls .

5.3.3 Fouls are handled differently during the autonomous period

Violations of rule 5.2.6 (starting early or playing after the auton period ends) that occur during the autonomous period will result in a foul. If a team breaks any rule during the autonomous period of a match, they can’t receive an autonomous ranking point. Fouls that occur during the autonomous period are only recorded and tracked if they’re related to rule 5.2.6 or the RECF Code of Conduct or result in a red card; other fouls should not result in foul cards or affect the overall match score.

5.3.4 Goals in the neutral zone have some protection

Any robot can add pins, cups, or stacks to the three goals in the neutral zone at any time during a match.

Any robot can remove a single pin, single cup, or pinnacle from the top of a stack on any of the three goals in the neutral zone during the first 90 seconds of a match (if there’s only one object

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on the goal, it can be removed). During the final 30 seconds of a match, objects cannot be removed from the goals in the neutral zone.

If there is not a match timer visible to the teams, the head referee or another volunteer is encouraged to call out the beginning of the end game period.

Breaking this rule (e.g., removing too many objects or removing any object during the final 30 seconds of the match) will result in a red card, unless the robot was forced into the penalty by a robot from the other alliance.

5.3.5 Alliance-colored goals are protected

Alliances can't interact with the goals in their opponent's alliance-colored zone, including adding or removing nested pins or cups. Breaking this rule will result in a red card, unless the robot was forced into the penalty by a robot from the other alliance.

5.3.6 Interactions with opponent robots are limited

Teams may not use their robots in ways that prevent other robots from gameplay for extended periods of time. A defensive engagement occurs whenever a robot prevents an opposing robot from moving freely about the field. Defensive engagements are permitted but are limited to an audible 4-second referee count. If a robot is able to move away, even if it is not the direction they want to go, or does not attempt to move away, the referee should not begin a count.

The referee will stop the count when the defensive robot no longer prevents the opposing robot from moving freely about the field and will begin a silent 4-second reset count. If the defensive robot re-engages before the reset count expires, the original count resumes where it stopped. If the reset count expires, further engagements begin a new 4-second count.

A defensive engagement that lasts longer than a 4-second count is a foul, and can result in a red card at the head referee's discretion. Referees will generally interpret this rule in favor of robots attempting to continue gameplay over those that are impeding opponents.

Unintentional entanglement of opposing robots may result in the involved robots being grounded for the rest of the match to prevent damage to the robots.

Intentional use of strategies that entangle, damage, or disable another robot may result in a red card and the offending robot may be grounded for the rest of the match if needed to prevent damage.

5.3.7 Robots can't use game objects to break rules

Teams can't use cups, pins, stacks, or any part of the field to directly or indirectly break a game or robot rule. Game objects are effectively extensions of a robot while a robot is interacting with them, although they don't count toward robot size limits. For example: a team can't use a stack to knock down the opposing alliance's stacks or pins. If a team knocks down a stack on an opposing alliance goal as a side effect of legally removing pins and/or cups from a neutral goal, they will receive a red card.

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5.3.8 Each alliance in the elimination bracket gets one time out

Time outs are available between matches in the elimination bracket, but can only be used immediately before a match that includes the alliance who calls it. Each time out can be up to three minutes, but can end early if that alliance's teams and head referee agree.

5.3.9 Robot control and match phases

Beginning on November 17, 2026, robot controllers will not be attached to a field control system; teams must ensure that their robots operate autonomously and under driver control at the appropriate times.

During the autonomous period, rule 4.1.1 applies. Drive team members can't hold their controllers, and can only press buttons to start or end the robot's autonomous routine.

After the autonomous period ends, drive team members can pick up their controllers and prepare to drive, but no robot mechanisms can move until the match resumes.

At the end of the match, all robot mechanisms must stop. The recommended way to accomplish this is to exit the robot's program by holding down the controller power button. Teams must then place their controllers on the floor or other surface provided by the event.

5.4 What Happens When Things Go Wrong

5.4.1 Missed match or late to a match

If a team isn't at the field with at least one robot for an alliance match before its scheduled start time (or, for elimination and finals matches and/or when the event is running behind schedule, when the match is otherwise ready to begin), the team will be marked as absent from that match. They will not earn points for that alliance match; the score for the other team in their alliance is not affected.

If a team's robot is not ready to play at the scheduled match time (or, for elimination and finals matches and/or when the event is running behind schedule, when the match is otherwise ready to begin), the head referee may ask the team to remove the robot from the field. Robots cannot be added to a match after the pre-match time countdown.

If at least one robot is at the field for the entire match, whether it is on the field or not, the team is eligible to receive a score for that match.

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5.5 Ranking Points

Alliances earn ranking points for achieving tasks throughout the course of scheduled alliance matches, and for winning or tying a match. These ranking points are added together to determine the overall rank of individual teams for alliance selection.

Rankings and tiebreakers will be determined as follows:

1. Average ranking points per match
2. Average autonomous ranking points earned by team
3. Average endgame ranking Points earned by team
4. Average win points earned by team
5. Random electronic draw

5.5.1 Autonomous Ranking Point

Each alliance earns 1 ranking point for ending the autonomous period of an alliance match with all of the following tasks completed:

- At least 4 cups and 6 halfpins scored across at least 2 goals
- Alliance zone roller showing the matching alliance color

5.5.2 Endgame Ranking Point

Each alliance earns 1 ranking point for ending an alliance match with all of the following tasks completed:

- Scoring two or more stacks that have at least 5 scored, visible halfpins of their alliance color
- At least one roller showing their alliance color
- At least one robot in contact with an alliance loader

5.5.3 Match Ranking Points

- Alliances earn 2 match ranking points for ending an alliance match with the highest score
- Alliances earn 1 match ranking point point for ending an alliance match with a tied score

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Section 6: Judging and Awards

At events that offer judging, RECF Inspire teams will give a 10-15 minute presentation to judges that explains key aspects of their team, robot design/construction, code, and strategies; each team must be offered an equal opportunity to give their presentation. These typically take place in a quiet room in between a team's matches. Teams must also provide a design process abstract / summary document, which must sometimes be submitted in advance of the event they are attending. This information will be found on the event's page on RECFEvents.

See the RECF Guide to Judging for more information about the judging process and awards.

6.1 Documentation

Teams must provide a design process abstract / summary of no more than 15 pages long, which includes an overview of the team's design process, key developments, testing, research, findings, and conclusions.

Teams must also document any custom parts, including conception, fabrication, and all iterations through their current implementation, including the dates of development and the names of students involved in that development. Teams may be asked to provide this documentation to robot inspectors and/or judges upon request.

Teams can maintain an engineering notebook to help supplement and formulate their design process abstract / summary, and to document custom parts, but engineering notebooks are not required for any awards and are not formally evaluated by judges.

6.2 Team Presentation

Each team should prepare a design presentation of 10-15 minutes, which will be followed by a Q&A period with judges. This should cover their design process, including testing/debugging of any significant custom parts, robot functionality, coding, and systems engineering. Judges may do additional walk-throughs of pit and competition areas in order to inspect robots up close, ask follow-up questions, and gather additional information as needed for awards.

6.3 Award Deliberation

Award deliberation is the last step in the judging process. In this step, judges work with the judge advisor and one another to select candidates for each award. Award descriptions should be used as the basis for determining which team is the best fit for each award. Judges will choose winners of each award based on the specific award criteria in the RECF Guide to Judging. No team may receive more than one judged award at an event.

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Section 7: Event Personnel, Processes, & Guidelines

7.1 Event Personnel

7.1.1 Event Partner

An event partner is a certified volunteer who runs an event using the guidelines in RECF's policies and game manuals. RECF event partners must be at least 18 years old, and can't serve as a head referee or judge advisor at their event. Event partners oversee the activities in this section of the game manual, and can add specific rules based on their site and event. Event partners cannot make decisions about match scores or rulings, cannot determine penalties for fouls, and cannot influence who receives judged awards. Event partners have the final decision on non-match and non-robot decisions at an event.

7.1.2 Head Referee

A head referee is a certified volunteer who has been assigned by the Event Partner to oversee matches using the guidelines in the game manual. RECF Inspire head referees must be at least 20 years old. Head referees work with team members to prevent and avoid fouls, and communicate fouls and penalties to teams when they occur. Head referees have the final decision on all match and robot rules, and should train robot inspectors and scorekeeper referees at events as appropriate.

Every alliance and elimination match must be watched by at least one head referee, and a head referee must be available to assist at robot inspection and solo matches as needed. See this article and related content in the RECF Library for more information.

7.1.3 Scorekeeper Referee

Scorekeeper referees score all varieties of match, and can oversee solo matches independently. RECF Inspire scorekeeper referees must be at least 15 years old. Every solo match must be watched by at least one referee. If there's a question about scoring or match play that doesn't have a clear answer in the game manual, scorekeeper referees should consult a head referee before answering. See this article and related content in the RECF Library for more information.

7.1.4 Judge Advisor

A judge advisor is a certified volunteer who trains and oversees volunteer judges at an event using the guidelines in the RECF Guide to Judging. RECF Inspire judge advisors must be at least 21 years old. See this article and related content in the RECF Library for more information.

7.1.5 Judge

A judge is a volunteer who reviews teams' engineering notebooks and/or interviews teams about their processes, then deliberates with other judging volunteers to identify award

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candidates and select award winners. RECF Inspire judges must be at least 20 years old and cannot be current RECF Inspire team members. See this article and related content in the RECF Library for more information.

7.1.6 Robot Inspector

A robot inspector is a volunteer who confirms that teams' robots meet the requirements in the game manual. If there's a question that doesn't have a clear answer in the game manual, robot inspectors should consult a head referee. See this article and related content in the RECF Library for more information.

7.1.7 Field Resetter

A field resetter is a volunteer who ensures that all objects on the field are in the correct positions at the beginning of each match. Field resetters should not begin to reset a field after a match until a referee directs them to do so. See this article and related content in the RECF Library for more information.

7.1.8 Queuer

A queuer is a volunteer who ensures that the correct teams are at the correct alliance matches. If time allows, they can attempt to locate teams who haven't checked in for upcoming matches, but they are not required to do so. See this article and related content in the RECF Library for more information.

7.1.9 Emcee

An emcee is a volunteer who provides play-by-play information for the audience during alliance matches. Emcees should avoid suggesting strategies, and cannot simultaneously serve as referees. See this article and related content in the RECF Library for more information.

7.2 Event Processes

7.2.1 Team Check In

Each team must check in when they arrive at the event, and confirm that at least one adult will remain onsite to supervise team members for the entire event. Some events use team check-in as a way to distribute event hand-outs like nametags, site maps, general schedules, and lunch order forms. Team check-in often occurs at a visible location just inside the main doors of the venue.

7.2.2 Robot Inspection

Each robot must pass an inspection before it can be used in any type of match at an event. Volunteer inspectors will confirm that robots meet the requirements in the game manual, and will mark passed inspections in the event management software. Robot inspection often occurs at a set of tables near the competition fields or in the team pit area.

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7.2.3 Creating the Alliance Match Schedule

If any teams have not checked in, or any robots haven't passed inspection, the event partner should resolve them before creating the alliance match schedule in the tournament software. The alliance match schedule should only include teams who will participate in alliance matches. See rule 7.4.2 for more information.

7.2.4 Queueing

Teams should check in at the queuing table(s) before their scheduled alliance match time, and will be routed to the correct field by volunteer queuers. Queueing generally occurs at a set of tables near the alliance match fields, with two tables (one for each alliance) for each named competition field. Providing tables gives teams a safe place to put their robots while they wait for upcoming matches. Tables are also recommended at the line for solo matches.

7.2.5 Running Matches

To display a match timer on a connected display, a referee or emcee can select an alliance match by match number in the tournament software, or a solo match by team number and match type. The referee or emcee should confirm that the drivers are ready, then activate the match timer from their mobile device.

After the match completes, referees should score the match and confirm object counts for each scoring category with the drive team members before submitting the match score and moving to the next match.

7.2.6 Creating Alliances for the Elimination Bracket

At the end of alliance matches, the event partner should identify any teams that are unavailable or ineligible to participate in the elimination bracket and mark them in the tournament software. Once teams are removed from the list, the event partner can determine the number of teams that will participate in the elimination bracket and generate the match list. See rule 7.4.4 for more information.

7.2.7 Entering Award Winners

After the judging volunteers have selected the winners of all judged awards listed for the event, the judge advisor and event partner should work together to enter winners in the tournament software. They should confirm the base number and team letter for each winner, and ensure that no team is marked to receive more than one judged award. Winners of performance awards are automatically marked by the software.

7.2.8 Finalizing an Event

After matches and awards conclude, the event partner should finalize and upload the tournament information to RECFevents.org. Some events (e.g., multiple divisions) may need to work with RECF staff to finalize their results.

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7.3 Field Parameters

7.3.1 Equipment

All of the fields used for alliance matches at an event should have the same setup and modifications, and all of the fields used for solo matches at an event should have the same setup and modifications. For example, an event could put all of the alliance match fields on identical risers and all of the solo match fields on the ground.

7.3.1.1. Field perimeter types

Pinnacle is played on a 12x12 field consisting of field tiles and a field perimeter. Approved field perimeters are the AndyMark FIRST Tech Challenge Perimeter Kit (am0481), the VEX® Portable Competition Field Perimeter (276-8242), and the VEX® Metal Competition Field Perimeter (278-1501).

GPS code strips are not required, and teams should be prepared for different legal field perimeters that may not come equipped with GPS code strips. If GPS code strips are present, the zero locator should be opposite the audience.

7.3.1.2 Field control options

Beginning on November 17, 2026, robot controllers will not be attached to a field control system. Qualifying events cannot use field control of any kind, and teams are responsible for ensuring their robots only operate while the match timer is running for the autonomous and/or driver controlled period(s) of a match. For more information about how teams can use the built-in timer for matches, visit this article in the RECF Library.

Until November 17, 2026, robots must be connected to the field via field control.

Solo matches: Approved field control methods are the VEXnet® Field Controller Kit (275-1401), VEX® Smart Field Controller (276-7577), a VEXnet® Competition Switch (276-2335), OpenFC (more details coming soon), or utilizing the timed run option on a VEX V5® Controller (476-4820).

Alliance matches: Approved field control methods are the VEXnet® Field Controller Kit (275-1401), VEX® Smart Field Controller (276-7577), OpenFC (more details coming soon), or a VEXnet® Competition Switch (276-2335).

7.3.2 Variances

Although fields and setups should be as identical as possible, teams have to be prepared for some amount of variance. Goals, walls, rollers, loaders, and other field-mounted parts may vary slightly, up to ±1” (25.4mm) in any direction. Starting locations for cups and pins may also vary up to ±1” (25.4mm) in any direction.

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Lighting conditions at fields will vary from event to event. Teams with optical or vision sensors should work with the event partner to calibrate their sensors at the field before matches begin.

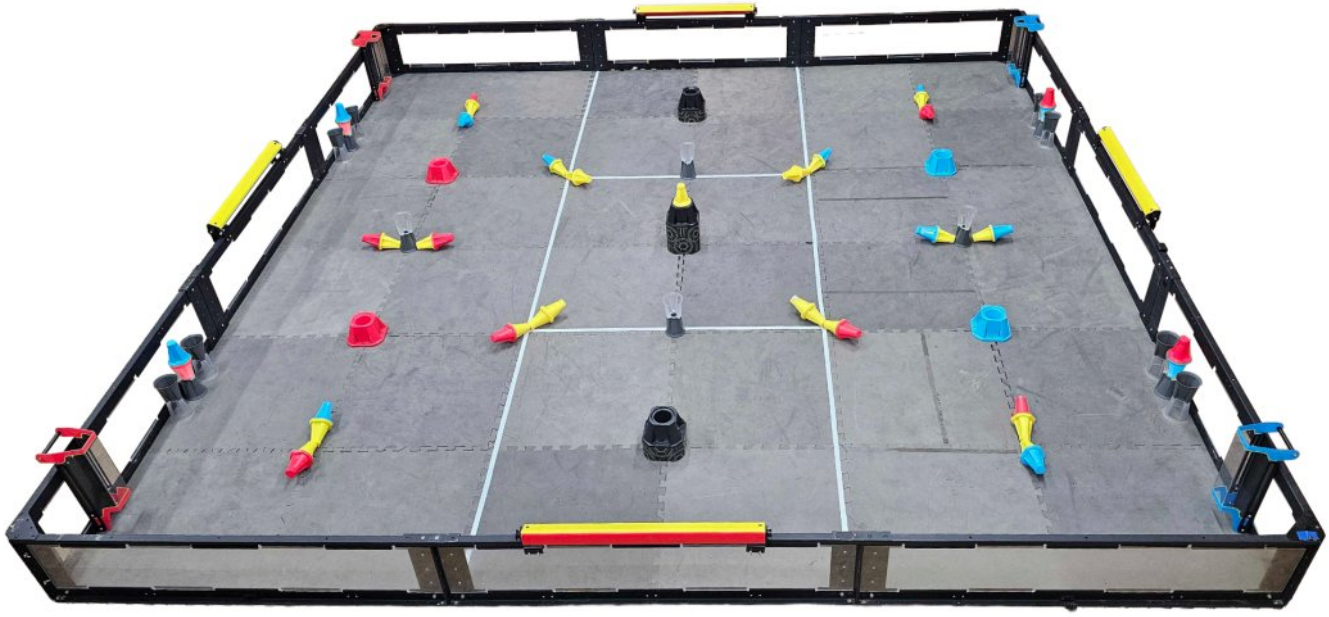


Figure 7.3.2

7.4 Match Parameters

7.4.1 Solo Matches

Each team can attempt up to five total solo matches at an event, and can allocate their attempts across the two solo match types however they like. These matches aren't scheduled, and teams can make these attempts whenever their event schedule permits. Solo match fields should open early in the event, and remain open long enough to give each team an opportunity to complete their maximum number of solo matches. As a general rule, solo match fields should remain open until alliance matches have ended. The team with the highest combined sum of their single highest solo driving and single highest solo coding match scores will be named the solo match champion.

7.4.2 Alliance Matches

Each team should have 5-8 matches at a qualifying event or 8-10 matches at a championship or signature event, which will appear on the match schedule generated by the tournament software. Variances must be approved by your RECF Regional Support Manager. The software will assign match times, fields, and team colors as needed. Matches can only run early if the head referee and all teams are checked in for the match and ready to play.

If a team is marked with an asterisk (*) for one of the last matches on the schedule, any points and/or ranking points earned will not affect their ranking at the event. This occurs when extra matches are necessary to provide each team with the same minimum number of matches. Teams should remember that the RECF Code of Conduct includes supporting alliance partners, and do their best even though it won't affect their ranking.

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7.4.3 Practice Matches

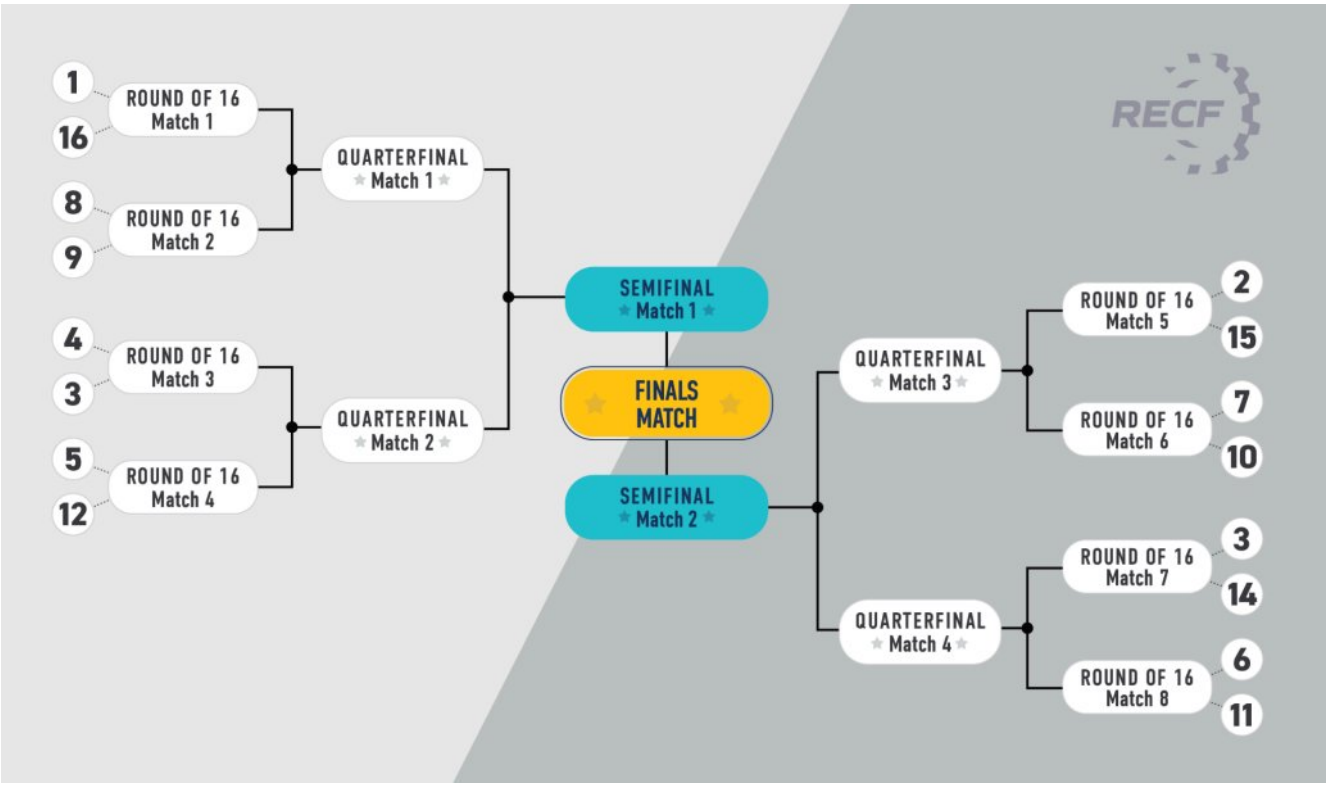
Some events choose to include scheduled practice matches that occur before official alliance matches begin. Practice matches aren't required, and the scores don't affect teams' rankings.

7.4.4 Elimination Bracket

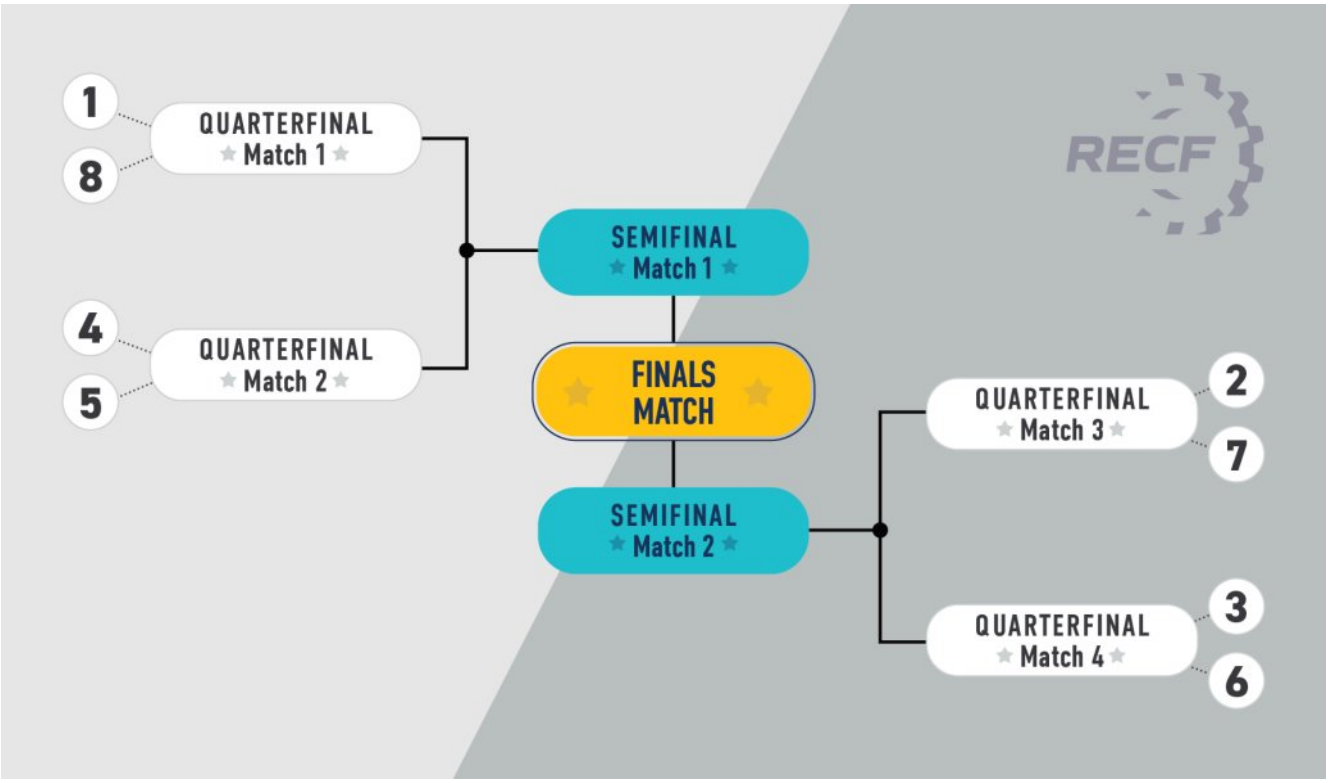
Top teams compete in a traditional single elimination bracket to determine the tournament winners. Event partners can decide how many teams will participate in the elimination bracket, but are encouraged to include a full 16-team bracket when possible.

Teams are seeded based on the highest-ranked team after qualifying matches (see 5.5 for details and tiebreakers). There are several rounds of elimination matches; the number of rounds will be based on the number of teams participating. Higher-ranked alliances may receive byes if there is an unbalanced bracket. The winning alliance from each match will advance to the next round of matches until only two alliances remain. If an elimination match results in a tie, the two teams will play up to two tie-breaker matches; if the 3rd match is also a tie, the higher-seeded alliance will be recorded as the winner.

The figures below show how alliances flow through 16-alliance and 8-alliance brackets, with the winner of each match progressing to the next level.



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7.4.5 Finals Matches

When only two teams remain, they will advance into the finals match(es). For events that do not qualify to the RECF World Championship, a single finals match will determine the tournament champions. For events that qualify to the RECF World Championship, there will be up to five finals matches; an alliance generally has to win two matches to be crowned the tournament champions. The Competition Control software will apply the following logic in cases with tied matches in a multi-match finals series:

- If the two alliances have 1 win each in other matches in the set, the higher seed will be named the overall winner with a 3rd tie
- If only one match in the set has had a winner, the alliance that won that match will be named the overall winner with a 3rd tie
- If no matches in the set have had a winner, the higher seeded alliance will be named the overall winner with a 3rd tie

7.4.6 Leagues

Information on how leagues qualify for your Event Region Championship or for the RECF World Championship may be found in the Qualifying Criteria for RECF Robotics Competition Events.

Leagues are events that are scheduled over multiple sessions spread across several weeks, and some match parameters differ for teams competing in leagues.

Minimum participation: A minimum of two alliance matches per team are required at each league session, and teams will be ranked by the number of matches played and their average

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ranking points. Teams that play in at least 60% of the sessions will be ranked higher than those who play in fewer sessions.

Fouls: Because a league is considered a single tournament, all fouls and foul cards stay with the team across all league sessions. Any team that receives three or more red cards throughout sessions for a single league cannot be part of alliance selection at the league championship elimination bracket.

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