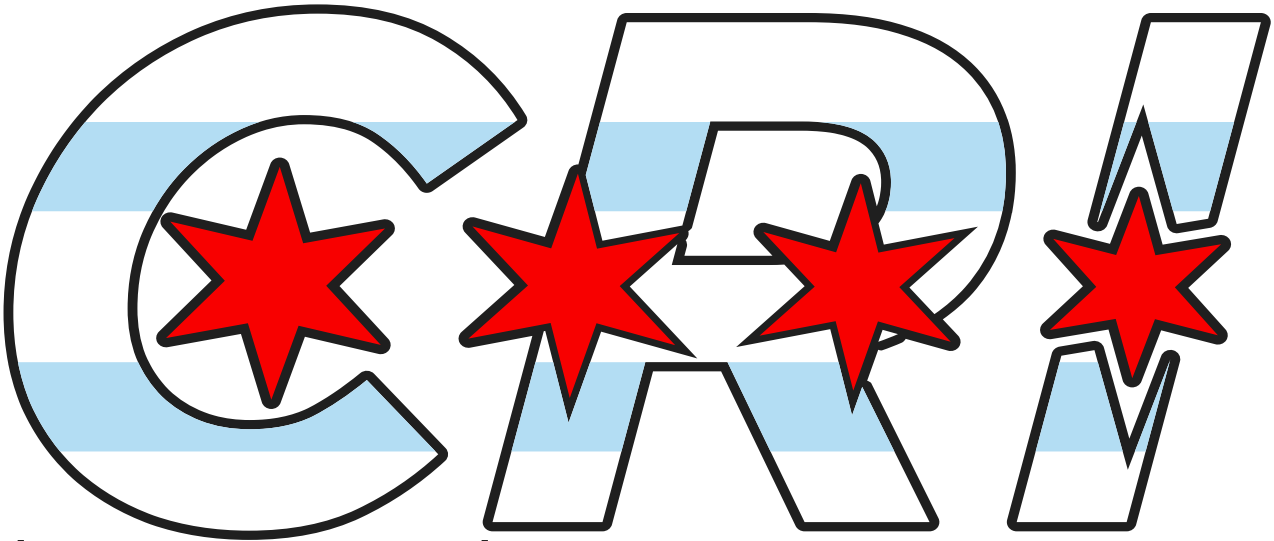


Chicago Robotics Invitational
Premier Event

2026 Rules for
DECODE™

The following rules are in addition or modification to the most recent version of the *FIRST*® Tech Challenge 2025-2026 Game, DECODE, and its Competition Manual. Refer back to the Competition Manual, the Field Assembly and Setup Guide, and the Field Mitigation Guide for details not explicitly listed here.

Contents

1 Introduction . . . 3
1.7 This Document & Its Conventions . . . 4
1.9 CRI Modifications and Updates . . . 4
1.10 CRI Questions and Answer System . . . 4
6 Awards (A) . . . 4
6.1 Team Judged Awards Overview and Schedule . . . 5
6.2 Team Judged Award Rules . . . 6
6.3 Team Judged Award Descriptions . . . 7
6.3.1 The Golden Bean Award . . . 7
6.3.2 The Loop Award . . . 7
6.3.3 The Mies Van Der Rohe “Less is More” Award . . . 8
6.3.4 The Tom Skilling Accuracy Award . . . 9
6.3.5 The CTA - Creative TELEOP Award . . . 10
6.3.6 The Enrico Fermi Discovery Award . . . 11
6.3.7 The Walter Payton Team of the Year Award . . . 12
6.3.8 The Clark Street Bridge Builders Award . . . 13
6.3.9 The Water Tower Award . . . 14
6.3.10 The Star Image Award . . . 15
8 Game Overview . . . 16
9 Arena . . . 17
9.1 Dimensions and Accuracy . . . 18
9.2 FIELD . . . 19
9.3 Areas, Zones, & Markings . . . 20
9.4 TILE Coordinates . . . 21
9.5 ALLIANCE AREA . . . 22
9.6 OBELISK . . . 22
9.7 GOAL . . . 23
9.9 SCORING ELEMENTS . . . 23
9.10 AprilTags . . . 24
9.13 PRISM . . . 24
10 Game Details . . . 25
10.1 MATCH Overview . . . 26
10.3 Setup . . . 27
10.3.1 SCORING ELEMENTS . . . 27
10.3.4 ROBOTS . . . 28
10.5 Scoring . . . 28
10.5.1 ARTIFACT Scoring Criteria . . . 29
10.5.2 PATTERN Scoring Criteria . . . 30

10.5.4 HUE Scoring Criteria . . . 30
10.5.5 SPECTRUM Scoring Criteria . . . 30
10.5.6 Point Values . . . 35
11 Game Rules (G) . . . 35
11.3 Pre-MATCH . . . 36
11.4 In-MATCH . . . 38
11.4.1 AUTO . . . 38
11.4.3 SCORING ELEMENT . . . 39
11.4.4 ROBOT . . . 39
11.4.5 Opponent Interaction . . . 41
13 Tournament (T) . . . 42
13.7 Playoff MATCHES . . . 43
13.7.1 Alliance Selection Process . . . 43
13.7.2 Playoff MATCH Bracket . . . 44
13.7.7 BACKUP TEAMS . . . 44
13.7.8 BACKUP POOL . . . 45
16 Glossary . . . 46

Revision History		Date
V1	• Initial release	June 5th, 2026

1 Introduction

1.7 This Document & Its Conventions

The 2026 Chicago Robotics Invitational (CRI) Competition Manual serves as an expansion to the 2025-2026 *FIRST* Tech Challenge DECODE Competition Manual. Unless otherwise specified in this manual, all rules present in the unmodified game are still applicable to CRI.

CRI Modifications to the DECODE Competition Manual are indicated using the following formatting:

- Additions are highlighted in light red. This is an example.
- Deletions are indicated with a strikethrough. ~~This is an example.~~
- Large blocks of additions will have a light red bar on the left of the section. This section is an example of this.
- "…" indicates large blocks of unchanged text for the rest of a section.

Warnings, cautions, and notes appear in blue boxes.

This is an example.

1.9 CRI Modifications and Updates

Additional updates to the CRI Competition Manual may occur as needed. No updates to the CRI Competition Manual will occur after July 22, 2026.

Any updates will come with an accompanying Team Update Document detailing the changes included within. A summary of these changes will also be present in the Revision History table above. Inside of these Team Updates, changes are indicated using the following formatting:

- Additions are bold and dark blue. **This is an example.**
- Deletions are bold, dark blue and indicated with a strikethrough. ~~**This is an example.**~~

1.10 CRI Questions and Answer System

Please also refer to the CRI materials below:

- Q&A Forum for more detailed information about the rules: https://cri.fyi/qa
- For more detailed information about the event: https://cri.fyi/2026
- For any problems with the Q&A Forum or other unanswered questions, please email us at info@chicagoroboticsinvitational.com

6 Awards (A)

Judging at CRI will be very similar to judging at a traditional *FIRST* Tech Challenge event, with the main distinction being the awards. Awards at CRI are all Chicago themed and are unique to CRI. The awards at CRI aim to celebrate all of the hard work teams have put in throughout the season, especially in areas that the traditional *FIRST* Tech Challenge awards do not recognize. JUDGES understand that the awards given at CRI are different from traditional *FIRST* Tech Challenge awards and teams might not have specific content for all award categories.

In addition to the modifications presented below, here are some clarifications about judging at CRI:

- On Saturday morning, teams will have a structured interview with a panel of 2-3 JUDGES in a classroom. Each team will have 5 uninterrupted minutes to present to the JUDGES. Following the presentation, JUDGES will ask each team questions for 5-10 minutes.
- On Saturday afternoon and Sunday, there will be pit interviews where JUDGES will ask teams additional follow-up questions.
- Teams will submit hard copies of their PORTFOLIO during their structured interview on Saturday morning. Teams are *highly* encouraged to submit two hard copies of their PORTFOLIO at this time.

6.1 Team Judged Awards Overview and Schedule

Teams will receive their structured interview schedule at check-in. Structured interviews start promptly at 8:00 a.m. Central Time on Saturday morning.

6.2 Team Judged Award Rules

A201 ***Team PORTFOLIOS have limits.** Teams ~~have the opportunity to~~ must submit a team PORTFOLIO to be used as part of the judging process. No other printed or digital content not directly included in this document will be collected by the JUDGES to consider during deliberations. PORTFOLIOS must meet the following requirements:

A. must consist of 1 cover page including the team number and optionally: team name, PORTFOLIO table of contents, team organizations, sponsors, logo, motto, and picture of the ROBOT and/or team,
B. no more than ~~15~~ 17 pages of content,
C. use only US Letter (8.5” x 11”) or A4 (210 x 297 mm) size paper,
D. font minimum of 10 point or larger, and
E. ~~if submitted digitally, the competition submission must be less than 15MB in size, and~~
F. must only include progress, challenges, and accomplishments which have taken place since January 1, 2025

6.3 Team Judged Award Descriptions

The following awards are listed in no particular order. These awards fully replace the in-season awards.

6.3.1 The Golden Bean Award

Inspired by the iconic Cloud Gate sculpture (known more commonly as The Bean) in Millennium Park, the Golden Bean award recognizes a team who brought a ROBOT with an iconic design to the Chicago Robotics Invitational.

This award is looking at the overall form and function of the ROBOT. Every aspect of the ROBOT should be well thought out and cohesive, just like the seamless mirror finish that makes up Chicago's Bean.

The Golden Bean Award Criteria		
Required	1	The PORTFOLIO must include all of the following: A. How the team utilized the design process for at least one component of their ROBOT B. Breakdown of the subsystems and features of their ROBOT C. Drawings (CAD or hand-drawn) of their ROBOT
Required	2	Robot must have a cohesive design with all components of the ROBOT designed to work well with each other. The ROBOT must have a clean and iconic design.
Required	3	ROBOT must feature intentionally placed control system components/electronics and a wiring management system. Wires should be secure and neatly routed. Electronics should be placed in a manner designed to protect components and improve serviceability.
Encouraged	4	Teams should be able to discuss, describe, display, or document their design philosophy and how they balanced form and function when designing their ROBOT.
Encouraged	5	Teams should be able to discuss, describe, display, or document the design iterations and improvements made to their ROBOT as the season progressed.

6.3.2 **The Loop Award**

Success does not occur in one step but many iterative improvements. The Loop Award celebrates the process of building upon your previous designs to create better ROBOTS. Like a CTA (Chicago Transit Authority) train transiting from station to station, the winner must explain the various steps they took and show how those decisions led to their current ROBOT. Ultimately this award is about the journey and not the final destination and can be applied to a single component/feature of the ROBOT, rather than the whole.

The Loop Award Criteria		
Required	1	Teams must submit a PORTFOLIO. The PORTFOLIO must include all of the following: A. How the team utilized the design process for at least one component of their ROBOT B. How the team iterated on this design C. Documentation of various versions of this component / sub-system and lessons learned along with improvements made throughout the season
Required	2	ROBOT must have a component that was iterated upon throughout the season, with different versions of the same type of sub-system used at multiple tournaments.
Required	3	The component should be one that has improved since initially used in competition, whether in form, function, or a mix of both.
Encouraged	4	Iterations should be summarized with motivation for the new design, why the new design was chosen, and how it performed compared to previous iterations.
Encouraged	5	Team can show examples of old versions of a component whether via photos or physical past versions that the team created.

6.3.3 **The Mies Van Der Rohe “Less is More” Award**

The Mies Van Der Rohe “Less is More” award is named in honor of a pioneer of Modernist architecture. Ludwig Mies Van Der Rohe is well known for his work as dean of the School of Architecture and architect of the Illinois Institute of Technology campus, located here in Chicago, including buildings such as the world renowned S.R. Crown Hall. Utilizing simple materials or off-the-shelf products, many modernist buildings look very utilitarian at first glance with simple looking construction methods, but they have beauty and creativity in the details. Similarly, this award recognizes teams that utilize MECHANISMS that are constructed with off-the-shelf COMPONENTS and little custom manufacturing but still perform well in the competition.

For the purposes of this award, open source designs (such as Open Odometry or the Loony Claw) that are still primarily constructed by a team, or designs sold directly for the *FIRST* Tech Challenge market (such as goBILDA’s Odometry Pods or the SWYFT Drive system) will typically not fit the spirit of this award. However, creative or exceptional uses of the aforementioned or similar products may be an exception to this guidance. This award focuses on ROBOT MECHANISMS, and as such, COTS software (such as Roadrunner) does not fit the criteria of this award.

The Mies Van Der Rohe “Less is More” Award Criteria		
Required	1	Must submit a PORTFOLIO, which includes details about a simple MECHANISM.
Required	2	The PORTFOLIO must explain how this MECHANISM is constructed, utilizing few if any manufacturing tools.
Encouraged	3	The MECHANISM should be well constructed and be effective at its goal. This does not mean the MECHANISM does not fail or is the highest performing, but it should still achieve the intended purpose of the MECHANISM.
Encouraged	4	The PORTFOLIO should include details about other solutions the team investigated or compared to arrive at their MECHANISM’S design.

6.3.4 **The Tom Skilling Accuracy Award**

Chicago's local TV station, WGN, was home to beloved meteorologist Tom Skilling who retired in 2024. He was known for adapting new technologies throughout his career for highly accurate weather forecasts which gained him a cult following over the many years he was on the air. This award named in his honor recognizes a team with a highly accurate AUTO routine. While the AUTO routine doesn't need to be the most complex or high scoring, it needs to consistently work just about every MATCH.

The Tom Skilling Accuracy Award Criteria		
Required	1	The PORTFOLIO must include all of the following: A. hardware and/or software control COMPONENTS on the ROBOT B. which challenges each COMPONENT or sub-system is intended to solve, and C. how does each COMPONENT or sub-system work
Required	2	Team must use one or more hardware or software solutions to improve ROBOT functionality by using external feedback and control during the AUTO period.
Required	3	The control solution(s) should work consistently during most MATCHES.
Encouraged	4	Team could discuss, describe, display, or document how the solution should consider reliability either through demonstrated effectiveness or identification of how the solution could be improved.
Encouraged	5	Use of the engineering process to develop the control solutions (sensors, hardware, and/or algorithms) used on the ROBOT, including lessons learned.

6.3.5 **The CTA - Creative TELEOP Award**

Chicago's public transit operator, the Chicago Transit Authority, can only operate the hundreds of thousands of trips it provides each day with automation working hand-in-hand with the operators and employees of the CTA. CRI's CTA, the Creative TELEOP Award, similarly recognizes a team that goes above and beyond with the control of their ROBOT during the TELEOP period.

For this award teams should be able to drive their ROBOT efficiently and score with ease. Teams should incorporate pre-programmed routines into TELEOP and other advanced programming into their controls. The ROBOT code and design should mean that humans never have to take the "L." Code does not need to be submitted.

The CTA - Creative TELEOP Award Criteria		
Required	1	The PORTFOLIO must include all of the following: A. hardware and/or software control COMPONENTS on the ROBOT B. which challenges each COMPONENT or sub-system is intended to solve, and C. how does each COMPONENT or sub-system work
Required	2	Team must use one or more hardware or software solutions to improve ROBOT functionality by using external feedback and control during the TELEOP period.
Required	3	The control solution(s) should work consistently during most MATCHES.
Encouraged	4	Team could discuss, describe, display, or document how pre-programed routines assist team drivers during the TELEOP period.
Encouraged	5	Use of the engineering process to develop the control solutions (sensors, hardware and/or algorithms) used on the ROBOT includes lessons learned.

6.3.6 **The Enrico Fermi Discovery Award**

Enrico Fermi, Nobel Laureate in Physics, created the world's first nuclear reactor at the University of Chicago (under their football field of all places). Fermi's first projects were in the field of statistical mechanics. Today the Fermi National Accelerator Laboratory (Fermilab) in the suburbs of Chicago continues to honor his name through its many research projects in the field of physics. In honor of his many discoveries, the Enrico Fermi Discovery Award honors a team's dedication to and proficiency in scouting, MATCH strategy, and game analysis.

Enrico Fermi Discovery Award Criteria		
Required	1	There are no PORTFOLIO requirements for this award. A team should be able to discuss, describe, display, or document some of the following: A. Scouting methods used B. How scouting data is both collected and analyzed
Required	2	Team should be able to discuss, describe, display, or document how collected data is applied to serve their needs during competitions, including, but not limited to, individual MATCH strategy and ALLIANCE selection pick-lists. This can include planning for complementary AUTO routines, complementary sub-systems, defensive strategies, and / or general MATCH strategy.
Encouraged	3	Team could have an innovative scouting experience to engage student scouters through an app, spreadsheet, printed worksheets, or another unique medium.
Encouraged	4	Team shows how automated systems or code is used to simplify or enhance the team's strategy decisions.

6.3.7 **The Walter Payton Team of the Year Award**

In the National Football League (NFL), the Walter Payton Man of the Year Award recognizes a player who demonstrates a commitment to service, philanthropy, and impacting one's community. Walter Payton, a long-time player for the Chicago Bears, was a superb American football player and the model for giving back to one's community. His foundation continues to give back to the City of Chicago to this day. We honor his legacy with the Walter Payton Team of the Year Award to celebrate a team's commitment to community outreach and *Gracious Professionalism*®, and to make it loud to those outside of *FIRST*.

Walter Payton Team of the Year Award Criteria		
Required	1	The PORTFOLIO must include all of the following: A. Teams must submit a PORTFOLIO with a designated community outreach section B. Teams must document both the events/activities and should discuss the impact of the team's efforts C. Must have documented hours committed to outreach and amount of people impacted cited within the PORTFOLIO
Required	2	Team must be active in their local community and beyond through outreach and other areas.
Required	3	Team must embody the principles of *Gracious Professionalism* throughout the tournament weekend.
Encouraged	4	The PORTFOLIO should detail how the team ensures that these programs and objectives will be sustained beyond any given student's involvement.

6.3.8 **The Clark Street Bridge Builders Award**

Chicago is well known for its sweeping river that runs through the heart of downtown and branches off to the North / South, eventually reaching the Mississippi River if one goes far enough. Thirty-seven moveable bridges span the downtown and adjacent areas, with over 300 other bridges dotting the city, making Chicago a city of many bridges. The Clark Street Bridge is a few miles south of the CRI venue and helps connect both sides of Chicago's downtown area. The Clark Street Bridge Builders award is awarded to the team who best "builds a bridge" to connect the next generation of students to *FIRST*.

Clark Street Bridge Builders Award Criteria		
Required	1	The PORTFOLIO must include the following: A. How the team is helping to build the next generation of *FIRST* students
Required	2	The outreach that is presented must have an actionable impact on teams, whether that be through efforts to start or sustain teams directly, or other means that have a less direct impact such as support programs, open source designs, software, online resources, workshops or more.
Required	3	Team must follow the *FIRST* Tech Challenge Outreach Terms and Definitions. (https://info.firstinspires.org/hubfs/web/program/ftc/outreach-terms-and-definitions.pdf)
Encouraged	4	Team should discuss, describe, display, or document how the team ensures that these programs and objectives will be sustained beyond any given student's involvement.

6.3.9 **The Water Tower Award**

When Chicago burned down during the Great Chicago Fire in 1871, only one building was left standing among the rubble: The Water Tower. This building still stands today as a testament to the city's perseverance in the face of adversity. This award celebrates a team that refused to give up when faced with significant and unforeseen challenges. Whether technical, logistical, personal, or environmental, this team tackled obstacles with resilience, resourcefulness, and determination. Just like the City of Chicago, which is known for its history of rebuilding stronger after adversity, this team should embody perseverance and keep pushing forward, showing what it truly means to rise against all odds.

Teams are encouraged to reflect on how their season's challenges shaped their identity, strengthened their collaboration, and helped them grow as individuals and as a team.

The Water Tower Award Criteria		
Required	1	There are no PORTFOLIO requirements for this award. A team should be able to discuss, describe, display, or document the following: A. One or more significant and unforeseen challenges they encountered during the season
Required	2	Team must clearly articulate how they responded to these challenges and what actions they took to overcome them.
Encouraged	3	Team demonstrates a positive attitude and determination throughout their season, especially during times of adversity.
Encouraged	4	Team describes how the challenge helped them grow closer, more skilled, or more confident as a result.

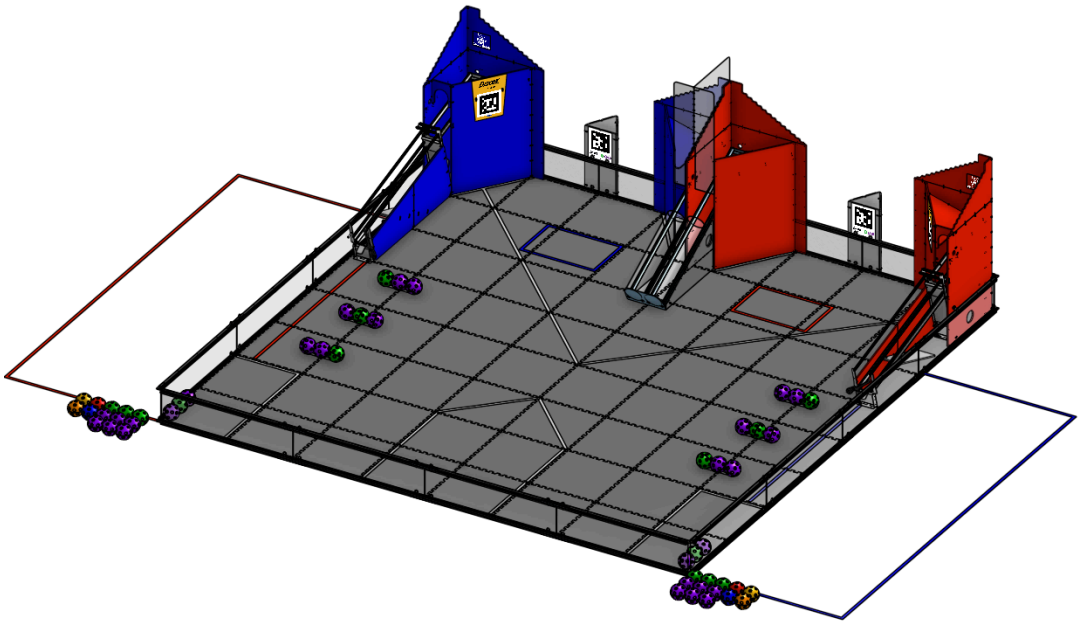
6.3.10 **The Star Image Award**

Chicago is known for one of the most iconic city flags in the world. The flag features four red stars, representing historic events in Chicago, in between two blue stripes, representing the iconic Chicago River and Lake Michigan. The four stars represent its founding with Fort Dearborn, both of its historic world's fairs, and the great fire that burned down most of the city in 1871. You'll see this flag all over Chicago, even embedded in the CRI logo, in a point of civic pride like no other.

Just like the Chicago flag, the Star Image Award recognizes the team with a brand that is seen throughout all aspects of their team. The team's ROBOT, uniform, and pit have a visual image that is part of a cohesive theme that transcends a simple logo.

The Star Image Award Criteria		
Required	1	The team's image must align with and be supportive of *FIRST* Core Values.
Required	2	Team has a cohesive theme between team apparel, pit, and ROBOT.
Encouraged	3	The team's image must be original and representative of the team's history, character, or environment.
Encouraged	4	A team should be able to discuss, describe, display, or document some of the following: A. Mission / purpose / values of the team and how they guide the imagery B. A team mascot, hand signals / handshakes, signs / imagery used C. The robots design, side panels, and / or team numbers match the team's branding D. Process of determining team name / team branding. Teams are allowed to use their branding from previous seasons and can describe how logos / colors / the outward brand of their team has evolved over the years

8 Game Overview



In the CRI version of DECODE™ presented by RTX, 2 competing ALLIANCES of ~~2~~ 3 teams each score ~~purple and green~~ multi-colored ARTIFACTS in their GOALS, build PATTERNS and SPECTRA, and race back to their BASE before time runs out.

Just before the MATCH starts, ~~the~~ two OBELISKS ~~is randomized to show one of 3 MOTIFS~~ are rotated to show the same randomized MOTIF, out of three options. The MOTIF for the MATCH defines what color PATTERN ROBOTS try to create on their RAMPS.

During the first 30 seconds of the MATCH, the ROBOTS operate autonomously. ROBOTS can use sensors to decode the randomized MATCH MOTIF. ROBOTS can earn points by scoring ARTIFACTS in their GOAL and building a PATTERN on their RAMP based on the MOTIF. ROBOTS also earn points for moving off the LAUNCH LINE.

During the remaining 2 minutes of the MATCH, human DRIVERS take control of their ROBOT. ROBOTS collect and continue to score ARTIFACTS in their GOALS to earn points. DRIVE TEAM members can retrieve ARTIFACTS from the ALLIANCE'S LOADING ZONE and help their ROBOTS by loading them with ARTIFACTS.

As time runs out, ALLIANCES can work together to return ~~both~~ as many of their ROBOTS to the BASE as they can. ALLIANCES that build PATTERNS based on the MOTIF and SPECTRA in the PRISM at the end of the MATCH earn additional points.

The ALLIANCE that earns the most points wins the MATCH and additional RANKING POINTS can be earned though completing other scoring achievements.

9 Arena

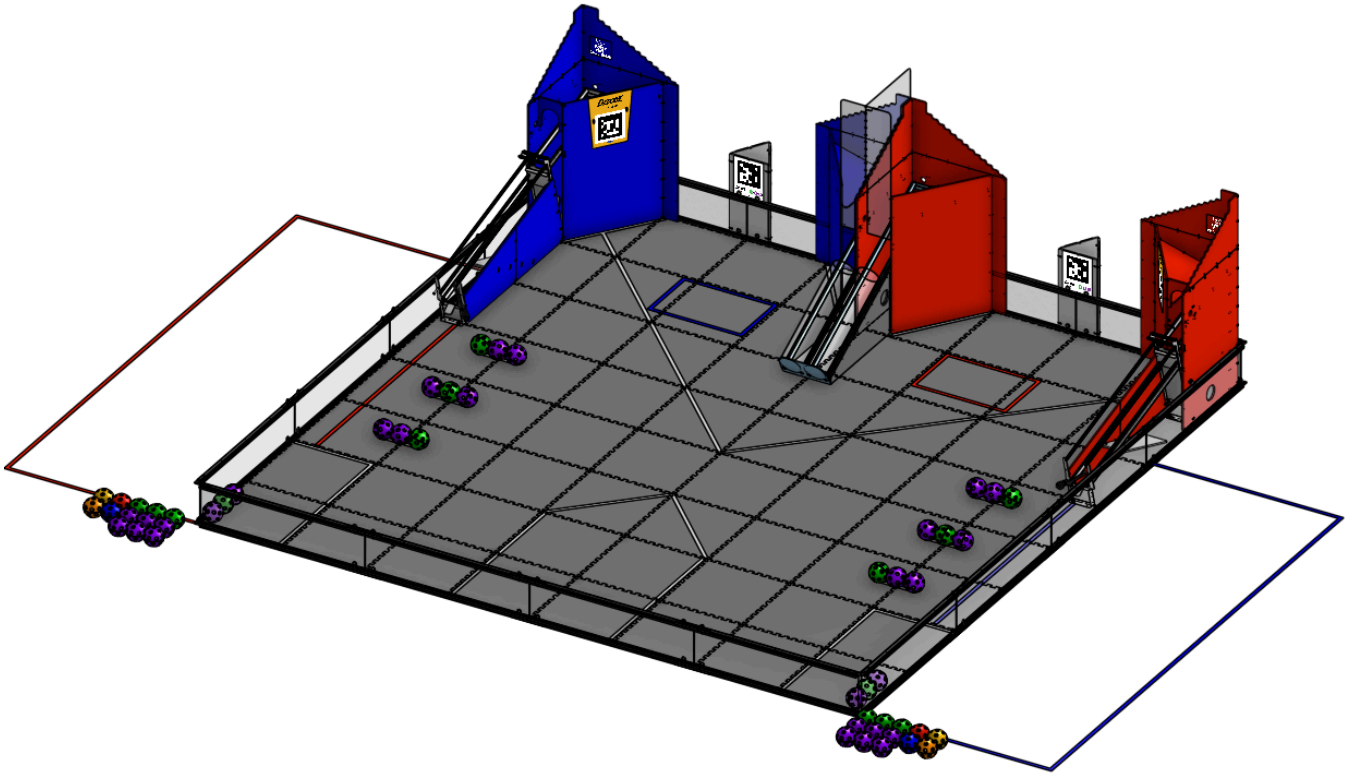


Figure 9-1: CRI DECODE ARENA (queue area, field display, and optional media area not pictured)

9.1 Dimensions and Accuracy

The specifications for the DECODE FIELD can be retrieved from a few locations:

- The 3D CAD model is the official representation of the CRI DECODE FIELD and how it is constructed. Measurements may be taken from this model with a general tolerance of +/- 1 in. (+/- 2.5 cm). The CRI CAD can be found at this Onshape link.
- Illustrations included in the Competition Manual are for a general visual understanding of the DECODE ARENA, and any dimensions included are nominal. Unless specifically noted, all these dimensions carry a tolerance of +/- 1 in. (+/- 2.5 cm).
- ~~The Event FIELD Setup Guide includes instructions on how to build the FIELD, and along with showing the ways construction type will influence the field tolerances, it also includes many of the key dimensions which are listed in the Official FIELD Drawings.~~ There is no FIELD Setup Guide for CRI. Please refer to the CAD for details about how the FIELD is assembled. The GOALS in each FIELD corner and the CLASSIFIERS are constructed the same as in-season. Please see the CAD for details on the center GOALS and PRISMS.

- ~~The FIELD Acceptance Checklist includes the controlled dimensions (with relevant tolerances) which will be regularly inspected by event staff.~~ There is no FIELD Acceptance Checklist for CRI. Please refer to the CAD for general dimensions, and most tolerances listed in the in-season FIELD Acceptance Checklist also apply to their CRI counterparts.
- The FIELD Mitigation Guide provides FIELD STAFF recommended mitigation measures for issues with the FIELD during an event.

The complete list of DECODE FIELD resources are posted on either the Playing FIELD Resources page on the *FIRST* website or on the Game page of the CRI website.

9.2 **FIELD**

Each FIELD for CRI DECODE is an approximately ~~144 in. by 144 in. (365.75 cm by 365.75 cm)~~ 188 in. by 188 in. (477.52 cm by 477.52 cm) area bounded by the inside surface of the walls of the FIELD perimeter. The flooring surface of the FIELD is made of ~~36~~ 64 interlocking soft foam TILES which are each approximately 24 in. by 24 in. by 0.59 in. (60.95 cm by 60.95 cm by 1.50 cm) nominally sized.

The CRI FIELD is populated with and surrounded by the following FIELD elements:

- 1 CLASSIFIER per ALLIANCE which consists of a SQUARE, a RAMP, and a GATE
- 1 PRISM structure per ALLIANCE
- ~~1~~ 2 GOALS per ALLIANCE
- 1 OBELISK per ALLIANCE

…

9.3 **Areas, Zones, & Markings**

...

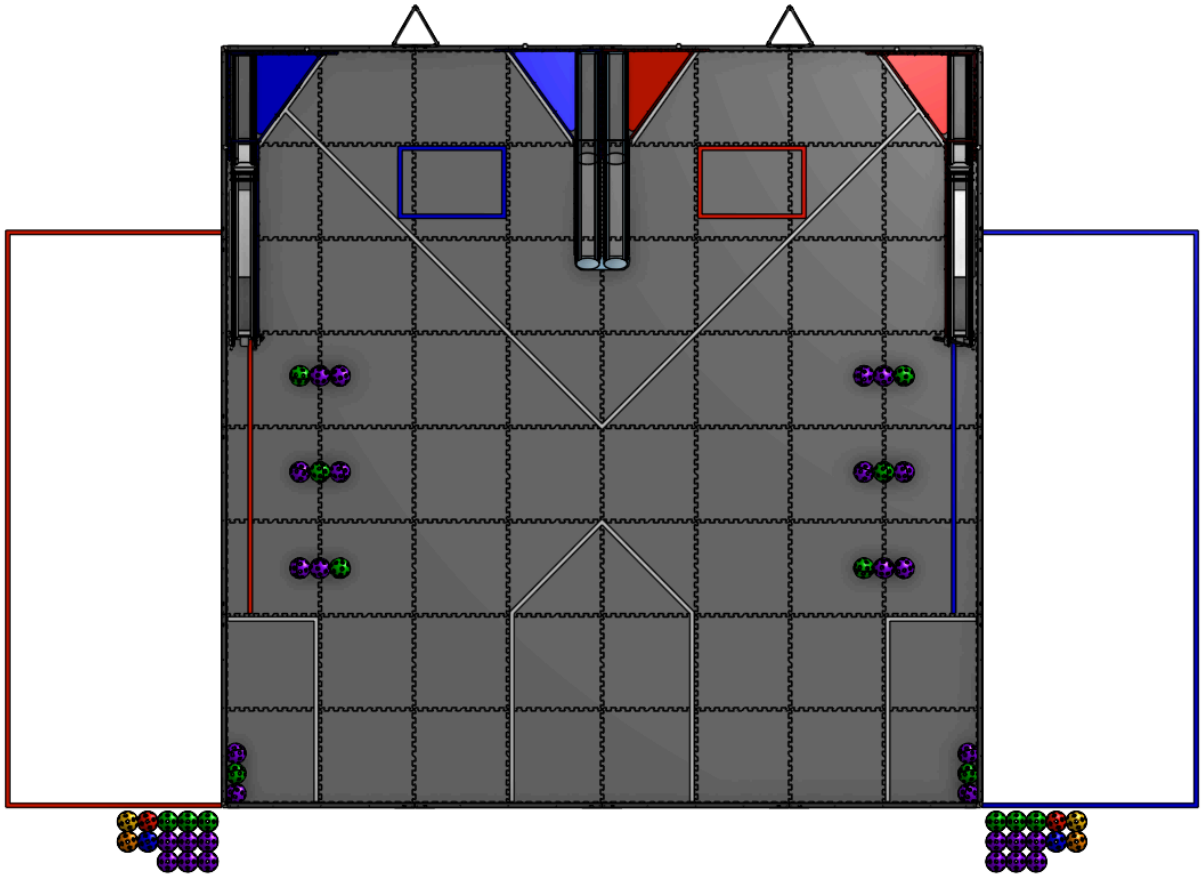


Figure 9-2: CRI Areas, markings, and zones

- ALLIANCE AREA: a ~~96 in. (243.85 cm)~~ 144 in. (365.76 cm) wide by 54 in. (137.15 cm) by infinitely tall volume formed by placing ALLIANCE colored tape onto the flooring surface outside of the FIELD. The ALLIANCE AREA includes the taped lines (Figure 9-2).
- LAUNCH LINE: the white tape which bounds 2 triangular LAUNCH ZONES, as well as ~~2~~ 4 segments of white tape located at the base of the GOAL.(Figure 9-2).
- LAUNCH ZONE: infinitely tall ~~triangular~~ volumes bounded by LAUNCH LINES and the FIELD perimeter. There are 2 LAUNCH ZONES: the LAUNCH ZONE on the audience side of the FIELD spans a section 2 TILES wide and ~~1~~ 3 TILES deep and the LAUNCH ZONE on the GOAL side of the FIELD spans a section ~~6~~ 8 TILES wide by ~~3~~ 4 TILES deep. The LAUNCH ZONES include the tape that defines the LAUNCH LINES (Figure 9-2).

...

- BASE ZONE: an 18 in. +/- 0.125 in. (45.70 cm +/- 0.30 cm) wide by ~~18 in. +/- 0.125 in. (45.70 cm +/- 0.30 cm)~~ 27 in +/- 0.125 in (68.58 cm +/- 0.30 cm) deep infinitely tall

volume bounded by ALLIANCE colored tape. The BASE ZONE is an ALLIANCE specific zone belonging to the matching color ALLIANCE. The BASE ZONE includes the tape lines (Figure 9-3).

- ~~GATE ZONE: a 2.75 in. (7.00 cm) wide by 10 in. (25.40 cm) long infinitely tall volume bounded by 2 parallel 10 in. (25.40 cm) long ALLIANCE colored tape segments adjacent to each GATE. The GATE ZONE includes the tape lines (Figure 9-3).~~
- LOADING ZONE: an approximately ~~23 in. (58.40 cm)~~ 47 in. (119.38 cm) wide by 23 in. (58.40 cm) deep infinitely tall volume bounded by white tape and the adjoining FIELD perimeters. The LOADING ZONE includes the tape lines (Figure 9-3). The LOADING ZONE is an ALLIANCE specific zone belonging to the ALLIANCE with the adjacent ALLIANCE AREA.
- SECRET TUNNEL ZONE: an approximately ~~46.5 in. (118.10 cm)~~ 68.5 in. (173.99 cm) long by approximately 6.125 in. (15.55 cm) wide infinitely tall volume bounded by ALLIANCE colored tape, the GOAL assembly, the LOADING ZONE, and the adjoining FIELD perimeter. The SECRET TUNNEL ZONE includes the ALLIANCE colored tape lines and excludes the white tape (Figure 9-3). The SECRET TUNNEL ZONE is an ALLIANCE specific zone belonging to the matching color ALLIANCE.

9.4 **TILE Coordinates**

TILE coordinates are used to assist with FIELD setup. Figure 9-4 defines the intersections of each of the TILES on the FIELD where the TILE tabs interlock. Figure 9-5 defines the grid coordinate system for each of the TILES.

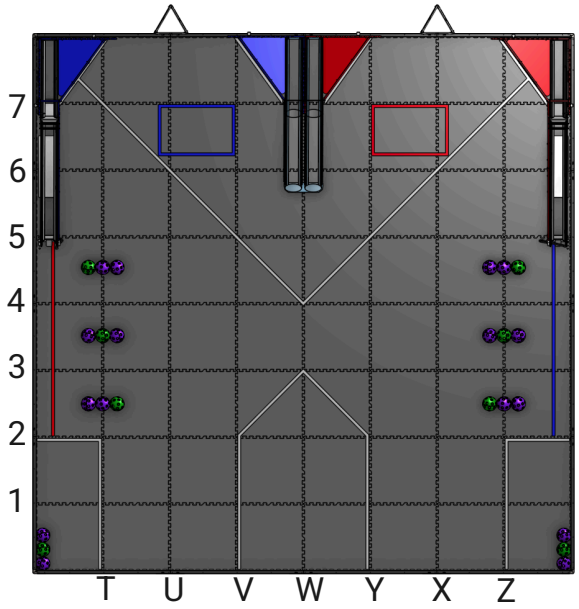


Figure 9-4: CRI TILE tab-line locations

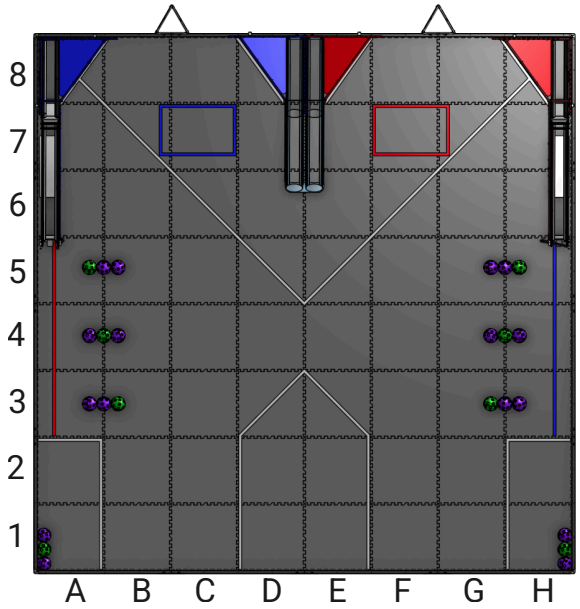


Figure 9-5: CRI TILE locations

9.5 **ALLIANCE AREA**

...

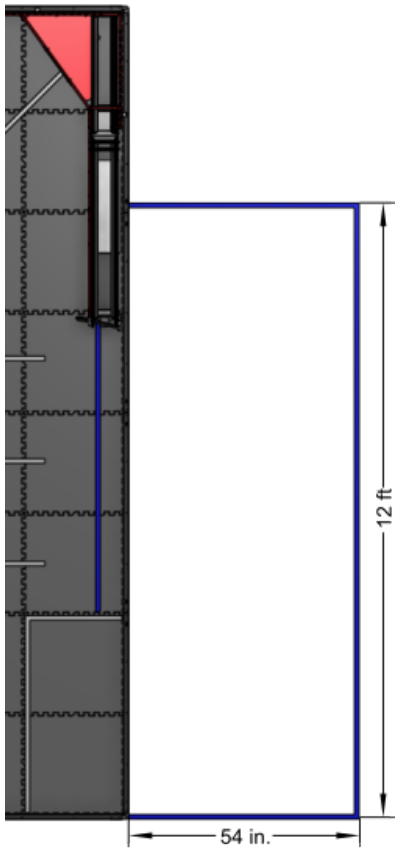


Figure 9-6: CRI ALLIANCE AREA

9.6 **OBELISK**

...

There are two OBELISKS on the outside edge of the rear of the FIELD. ~~The~~ Each OBELISK orientation is randomized by the FIELD STAFF using the event management software after DRIVE TEAMS have set-up for the MATCH (G304). The event management software will determine which face of the OBELISKS should face towards the FIELD, and the FIELD STAFF will put ~~it~~ them in place. Both OBELISKS will have the same face directed toward the FIELD at the end of randomization. ~~The location of the OBELISK will be approximately centered along the outside edge of the FIELD perimeter~~ Each OBELISK will be approximately centered on TILE Seams U and X (see Figure 9-4) on the outside edge of the FIELD with the face containing the AprilTag approximately parallel to and contacting the FIELD perimeter wall.

9.7 GOAL

~~The~~ A GOAL is an approximately 27 in. (68.60 cm) by 27 in. (68.60 cm) by 54 in. (137.15 cm) tall structure primarily composed of 0.39 in. (1.00 cm) thick polypropylene corrugated plastic sheet. ~~The~~ A GOAL is a 3-sided structure with a horizontal triangular shaped opening at the top. On the side where the CLASSIFIER connects to the GOAL there is an exit archway (Figure 9-8).

> Each ALLIANCE has two GOALS, one connected to a CLASSIFIER and one connected to a PRISM structure. There is a set of clear panels that is part of the center GOALS which are attached to the PRISM structures, which are described in greater detail in Section 9.13 PRISM.

9.9 SCORING ELEMENTS

SCORING ELEMENTS are ALLIANCE neutral ARTIFACTS. ARTIFACTS are 5 in. (12.70 cm) nominal Gopher ResisDent™ polypropylene balls in purple (am-3376a_purple), ~~and~~ green (am-3376a_green), red, orange, yellow, and blue (Gopher 42-552). The red, orange, yellow, and blue ARTIFACTS are a subcategory of ARTIFACTS called GEMS. There are ~~24~~ 28 purple (P) ARTIFACTS, ~~and~~ ~~12~~ 14 green (G) ARTIFACTS and two each of red, orange, yellow, and blue GEMS total in a CRI DECODE MATCH.

> Whenever a rule or other text in this manual refers to ARTIFACTS, all six colors are included. Green and purple ARTIFACTS are not GEMS.
>
> The green and purple ARTIFACTS can be found in both the Gopher set of six linked above, as well as in standard DECODE game sets sourced from AndyMark. These sources provide identical performance and will likely be mixed on CRI FIELDS. When ordering from Gopher, please ensure you are ordering the 5-inch diameter models.

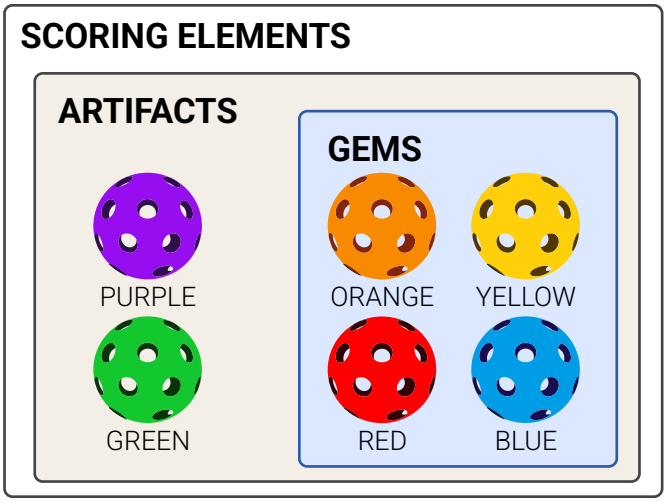


Figure 9-20: A Venn diagram of ARTIFACTS and GEMS

9.10 **AprilTags**

..

AprilTags are placed on the front face of the GOAL to help aid in ROBOT navigation and targeting. The corner red ALLIANCE GOAL has ID 24, and the corner blue ALLIANCE GOAL has tag ID 20. The center red ALLIANCE GOAL has ID 14 and the center blue ALLIANCE GOAL has tag ID 10. Each marker has an identifying “TAG ID” text label (Figure 9-19).

...

Exact details about the placement and materials of the AprilTags used at CRI will be shared at a later date.

9.13 **PRISM**

GOALS in the center of the FIELD each have an attached structure, similar to a CLASSIFIER. Each of these structures has a RAMP made of aluminum extrusion, and a clear tube mounted on the RAMP at the bottom of the structure called a PRISM. ARTIFACTS that are LAUNCHED into one of these GOALS flow into the PRISM via the RAMP; however, there is no GATE on a PRISM, such that ARTIFACTS remain in the PRISM for the duration of the MATCH.

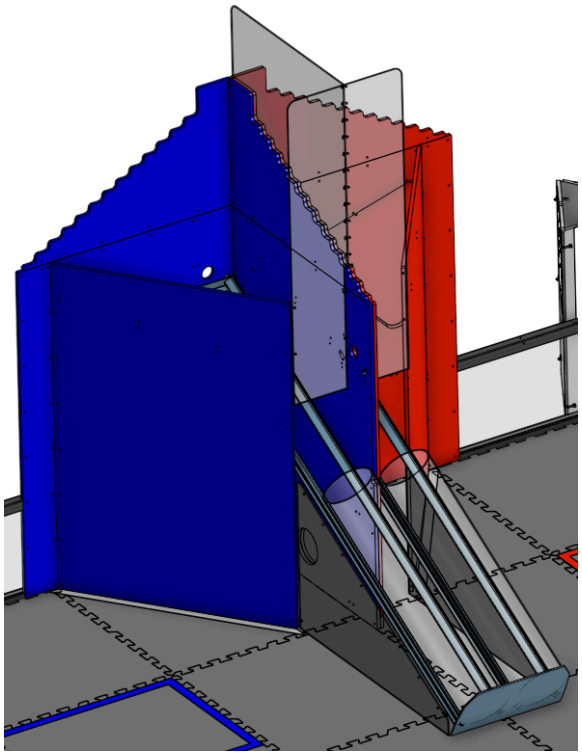


Figure 9-21: Both PRISMS, shown attached each to a GOAL.

If an ARTIFACT enters the GOAL but does not enter the PRISM for any reason, it is not an ARENA FAULT under T301.

The clear panels on the PRISM GOALS are intended to prevent ARTIFACTS from accidentally being LAUNCHED into the incorrect ALLIANCE'S PRISM.

10 Game Details

In the CRI version of DECODE, two (2) ALLIANCES (an ALLIANCE is a cooperative of ~~2~~ 3 *FIRST* Tech Challenge teams) play MATCHES, which are set up and implemented per the details described below.

10.1 MATCH Overview

MATCHES run on a typical 5- to 12-minute cycle time per FIELD, which consists of pre-MATCH setup, a 30-second AUTO period, an ~~8-second~~ 15-second transition period between AUTO and TELEOP, and a 2-minute TELEOP period, followed by the post-MATCH reset.

During the MATCH, ROBOTS collect ARTIFACTS and score them into their GOAL to CLASSIFY and create the randomly selected MOTIF. ROBOTS can then open their GATE to continue CLASSIFYING additional ARTIFACTS. ARTIFACTS which do not drop into the RAMP will count as OVERFLOW.

> For CRI, each ALLIANCE starts with a new SCORING ELEMENT, GEMS. GEMS are collected by ROBOTS to score into their PRISM to form a SPECTRUM.

ROBOTS conclude the MATCH by returning to their BASE.

10.3 Setup

10.3.1 SCORING ELEMENTS

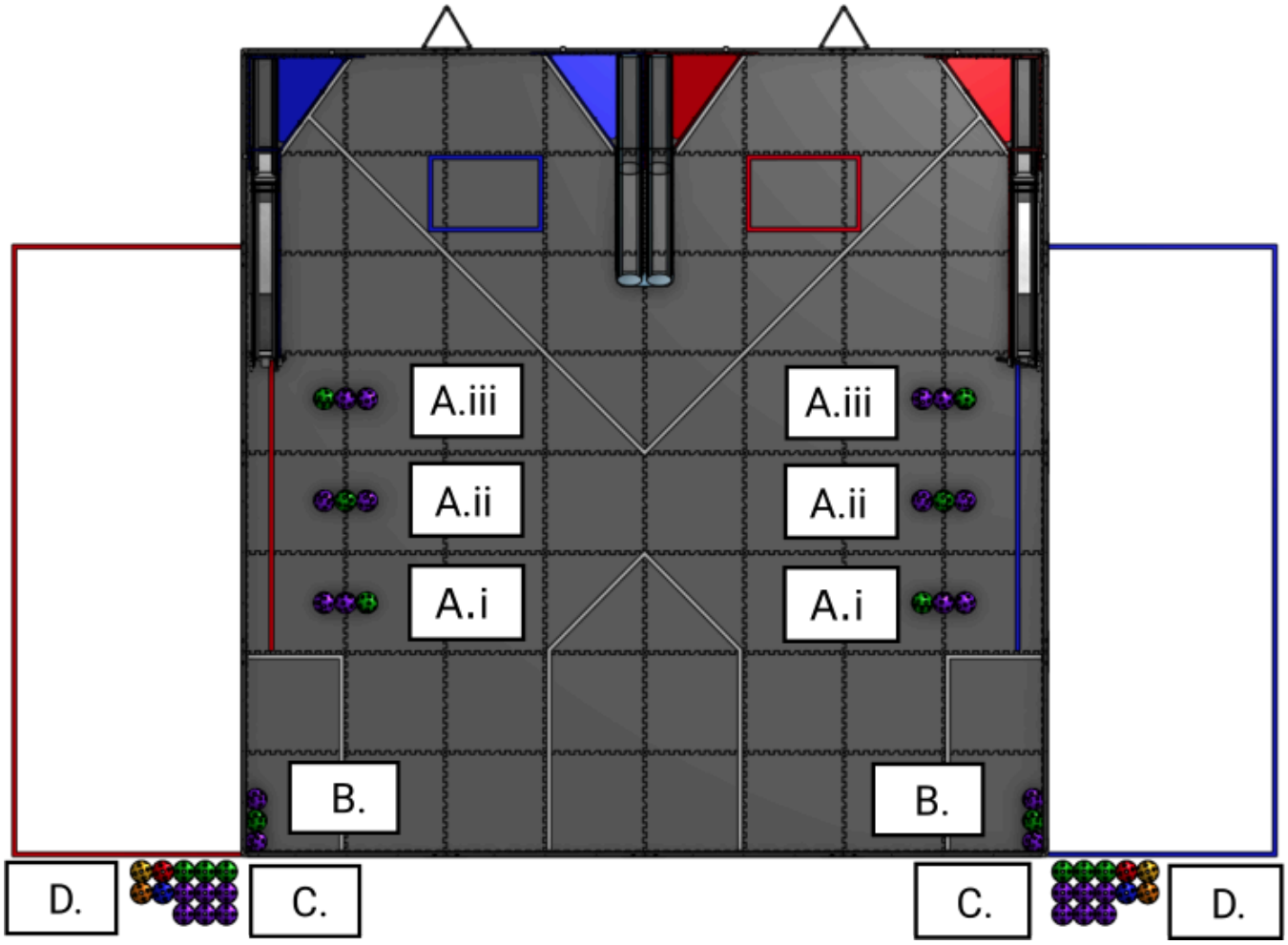


Figure 10-2: SCORING ELEMENTS staging positions

~~24~~ 28 purple (P) and ~~12~~ 14 green (G) ARTIFACTS and are staged on the FIELD as follows, with the MOTIFS starting from the middle of the FIELD and continuing toward the FIELD perimeter:

A. 3 ARTIFACTS on each SPIKE MARK arranged as follows:
    i. Near (audience side): GPP
    ii. Middle: PGP
    iii. Far (GOAL side): PPG
B. 3 ARTIFACTS (2P, 1G) in each LOADING ZONE biased against the FIELD perimeter adjacent to the ALLIANCE AREA and closest to the corner arranged PGP.
C. ~~6~~ 9 ARTIFACTS (4~~6~~P, ~~2~~3G) in each ALLIANCE AREA (may be organized in provided ARTIFACT tray or similar container) with no set order.
D. 4 GEMS (one of each color: red, yellow, orange, and blue) in each ALLIANCE AREA (may be organized in provided ARTIFACT tray or similar container) with no set order.

Each ROBOT may be pre-loaded with up to 3 purple or green ARTIFACTS from their own ALLIANCE AREA pre-staged ARTIFACTS in C such that each ARTIFACT is in direct contact with the ROBOT.

> If the ALLIANCE starts with more than 6 ARTIFACTS outside the FIELD before TELEOP, the first action of the ALLIANCE in TELEOP must be to introduce ARTIFACTS so that no more than 6 ARTIFACTS remain out of play in accordance with G434.

10.3.4 **ROBOTS**

DRIVE TEAMS stage their ROBOT in accordance with G303. A DRIVE TEAM obstructing or delaying ROBOT setup requirements is at risk of violating G301.

If order of placement matters to either or both ALLIANCES, the ALLIANCE notifies the Head REFEREE or their designee before set up for that MATCH, and the Head REFEREE instructs ALLIANCES to alternate placement of ROBOTS. REFEREE instructions are that ROBOTS are placed in the following order:

A. first red ROBOT
B. first blue ROBOT
C. second red ROBOT
D. second blue ROBOT
E. third red ROBOT
F. third blue ROBOT

In qualification MATCHES the ROBOT assigned to Red 1 or Blue 1 places first within their ALLIANCE. In playoff MATCHES the ALLIANCE CAPTAIN decides which ROBOT places first within their ALLIANCE.

> FIELD STAFF may ask teams to indicate their intended location and are not required to wait for a team to stage their ROBOT in its exact location before moving to the next team.

10.5 **Scoring**

...

All achievements are updated by FIELD STAFF throughout the MATCH. Scoring achievements are assessed as follows:

A. Assessment of ARTIFACTS as either CLASSIFIED or OVERFLOW occurs throughout the MATCH and continues until all ARTIFACTS have come to rest following the conclusion of

the MATCH. ARTIFACTS that meet scoring criteria prior to the start of TELEOP are assessed as part of AUTO.

B. Assessment of AUTO PATTERN scoring occurs at when all ARTIFACTS have come to rest following the conclusion of AUTO or the start of TELEOP, whichever comes first.
C. Assessment of TELEOP PATTERN scoring occurs when all ROBOTS and ARTIFACTS have come to rest following the conclusion of the MATCH.
D. Assessment of DEPOT scoring occurs at the end of TELEOP when all ROBOTS and ARTIFACTS have come to rest following the conclusion of the MATCH.
E. Assessment of LEAVE scoring occurs at the end of AUTO.
F. Assessment of BASE scoring occurs at the end of the TELEOP.
G. Assessment of HUE scoring occurs when all ROBOTS and ARTIFACTS have come to rest following the conclusion of the MATCH.
H. Assessment of SPECTRUM scoring occurs when all ROBOTS and ARTIFACTS have come to rest following the conclusion of the MATCH.

LEAVING the LAUNCH LINE, ARTIFACT scoring, and return to BASE points are all evaluated and scored by human volunteers. Teams are encouraged to make sure that it is obvious and unambiguous that the criteria are met.

Achievements scored before the MATCH starts, during the AUTO-to-TELEOP transition, and after the MATCH ends at 0:00 are subject to penalties.

10.5.1 **ARTIFACT Scoring Criteria**

...

> Even though there are two GOALS in the center of the FIELD connected to the PRISM structures, since there is not a SQUARE none of the ARTIFACTS scored through those GOAL score as OVERFLOW or CLASSIFIED, nor do they contribute to the GOAL RP.

10.5.2 **PATTERN Scoring Criteria**

...

Since the MOTIF only contains green and purple ARTIFACTS, GEMS cannot be a part of the PATTERN. Any GEM directly on the RAMP of the CLASSIFIER will not score any PATTERN points for its index, regardless of the MOTIF.

The following diagram is an example of PATTERN scoring using a combination of GEMS and purple and green ARTIFACTS:

Index	1	2	3	4	5	6	7	8	9
GATE	 GREEN	 BLUE	 RED	 PURPLE	 GREEN	 ORANGE	 PURPLE	 GREEN	 GREEN
MOTIF	 PURPLE	 GREEN	 PURPLE	 PURPLE	 GREEN	 PURPLE	 PURPLE	 GREEN	 PURPLE
PATTERN Scored	✗	✗	✗	☑	☑	✗	☑	☑	✗

10.5.4 **HUE Scoring Criteria**

ARTIFACTS enter through the GOAL and flow into the PRISM. ARTIFACTS must be completely in the PRISM to score for HUE.

The PRISM can only hold six ARTIFACTS (see Section 9.13 PRISM), and any ARTIFACTS in the GOAL beyond six do not score for HUE and/or SPECTRUM. ARTIFACTS that entered the GOAL but did not enter the PRISM do not score for HUE and/or SPECTRUM.

ARTIFACTS in PRISMS are evaluated for HUE points as follows:

- An ARTIFACT in each PRISM of a unique color, for a maximum of six HUE points.

See Table 10-4 for examples.

10.5.5 **SPECTRUM Scoring Criteria**

SPECTRUM scoring is assessed based on the order of ARTIFACTS that are scored in each PRISM. ARTIFACTS must be completely in the PRISM to score for the SPECTRUM achievement.

A SPECTRUM is a sequential order of two or more ARTIFACTS, regardless of the ARTIFACT color at the start and end of the sequence, length of sequence, or the "direction" of the sequence that follows a "rainbow" order:

- red, orange, yellow, green, blue, purple, …, or,
- purple, blue, green, yellow, orange, red, …

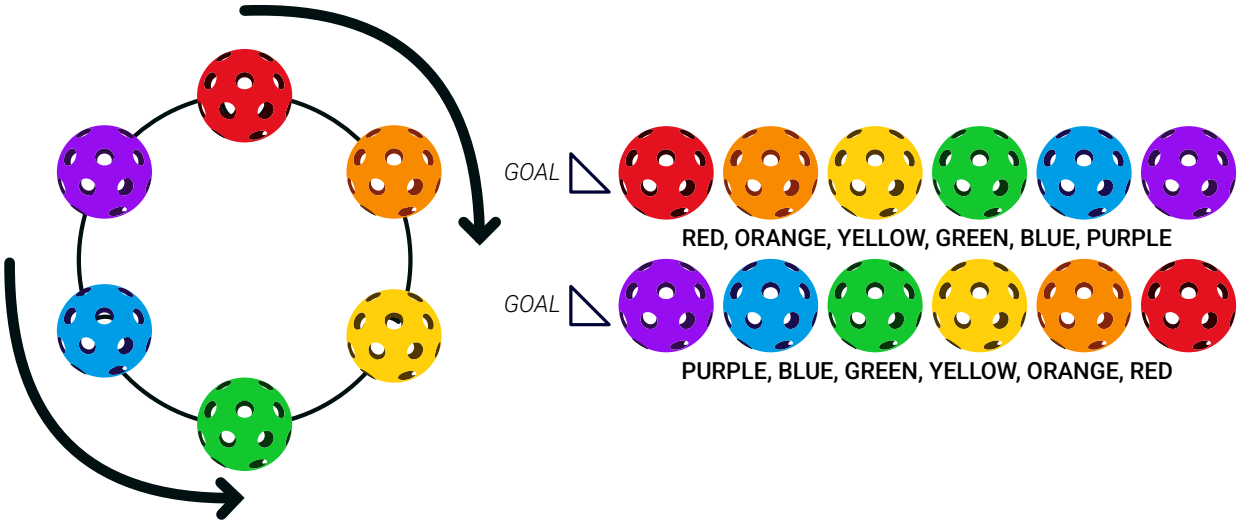


Figure 10-3: Example SPECTRUM order

Points are awarded exponentially for every ARTIFACT in each SPECTRUM, with the following qualifications:

- A SPECTRUM must have two or more ARTIFACTS. A single ARTIFACT in the PRISM scores no points for SPECTRUM achievements.
- An individual ARTIFACT may only be scored as part of a single SPECTRUM.
- Multiple distinct SPECTRA can score in one PRISM.
- The maximum points from distinct SPECTRA in each PRISM are assessed when determining the SPECTRUM scoring achievement.

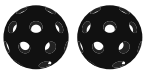
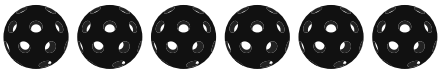
If n ARTIFACTS are scored in a SPECTRUM, 2^n points are awarded.

For example:

- 3 ARTIFACTS are in a SPECTRUM order are awarded $2^3 = 8$ SPECTRUM points
- 2 ARTIFACTS in a SPECTRUM order and 3 ARTIFACTS are in a different SPECTRUM order in the same PRISM are awarded $2^2 + 2^3 = 12$ SPECTRUM points

See Table 10-4 for more examples.

Table 10-3: SPECTRUM point values

SPECTRUM Size	SPECTRUM Points
 *	0
	4
	8
	16
	32
	64

A single ARTIFACT cannot be a SPECTRUM. The first entry is included in the table for completeness.

Table 10-4: Example PRISM scoring scenarios

ARTIFACTS in PRISM	SPECTRUM Points	HUE Points
 RED	0	3
 PURPLE PURPLE PURPLE	0	3
 RED ORANGE	4	6
 ORANGE RED	4	6
 GREEN BLUE	4	6
 RED ORANGE YELLOW	8	9
 GREEN YELLOW BLUE RED ORANGE	8	15
 BLUE GREEN YELLOW ORANGE RED	32	15
 PURPLE RED PURPLE RED PURPLE	8	6
 GREEN BLUE PURPLE RED ORANGE YELLOW	64	18
 GREEN YELLOW GREEN BLUE PURPLE	16	12

In this example: 

Note that this set of ARTIFACTS could be viewed as having 2 SPECTRA:

2 ARTIFACTS 

and 3 ARTIFACTS 

.

However, the combination of 2 ARTIFACT and 3 ARTIFACT SPECTRA would result in fewer SPECTRUM points ($2^2 + 2^3 = 4 + 8 = 12$) awarded compared to the SPECTRUM of 4 ARTIFACTS ($2^4 = 16$) in the above example. The distinct combination of SPECTRA in the PRISM that results in the maximum SPECTRUM points will be determined when awarding SPECTRUM POINTS.

The single yellow ARTIFACT does not constitute a SPECTRUM.

10.5.6 **Point Values**

Table 10-1: CRI DECODE point values

		MATCH Points		RANKING Points
		AUTO	TELEOP	
LEAVE		3		
ARTIFACT	CLASSIFIED	3	3	
	OVERFLOW	1	1	
	DEPOT		1	
PATTERN	ARTIFACT matches MOTIF	2	2	
PRISM	HUE		3	
	SPECTRUM		2^n	
BASE	Partially returned to BASE		5	
	Fully returned to BASE		10	
	Additional Bonus: 2 ROBOTS fully returned to BASE.		10	
MOVEMENT RP	Combined LEAVE + BASE points earned at or above threshold			1
GOAL RP	The number of ARTIFACTS scored through the SQUARE at or above threshold			1
PATTERN RP	Combined SPECTRUM + PATTERN points earned at or above threshold			1
WIN	Completing a MATCH with more MATCH points than your opponent			3
TIE	Completing a MATCH with the same number of MATCH points as your opponent			1

Table 10-2: CRI DECODE RP Thresholds

RP Type	CRI
MOVEMENT RP	29
GOAL RP	90
PATTERN RP	30

11 Game Rules (G)

11.3 Pre-MATCH

G304 ***ROBOTS must be set up correctly on the FIELD.** ROBOT must be positioned on the FIELD such that it meets all of the following requirements:

A. is over a LAUNCH LINE,
B. is either touching its own ALLIANCE's GOAL or the FIELD perimeter,
C. is fully contained on its own ALLIANCE's side of the FIELD (FIELD columns A, B, C, D for blue, or FIELD columns ~~D,~~ E, F, G, H for red) (Figure 9-5),
D. not attached to, entangled with, or suspended from any FIELD element,
E. confined to its STARTING CONFIGURATION (see R101 and R102), and
F. in contact with no more than the allowed pre-load possession limit as described in Section 10.3.1 SCORING ELEMENTS.

Violation: The MATCH will not start until all requirements are met if there is a quick remedy. DISABLED if it is not a quick remedy.

G304.A and G304.C require A ROBOT may start over any LAUNCH LINE on its own side of the FIELD, which includes either of the 2 DEPOTS.

G304.C requires the ROBOT to be fully contained within the FIELD perimeter and not overhang the FIELD perimeter wall.

Figure 11-1 shows examples of several possible legal ROBOT starting locations.

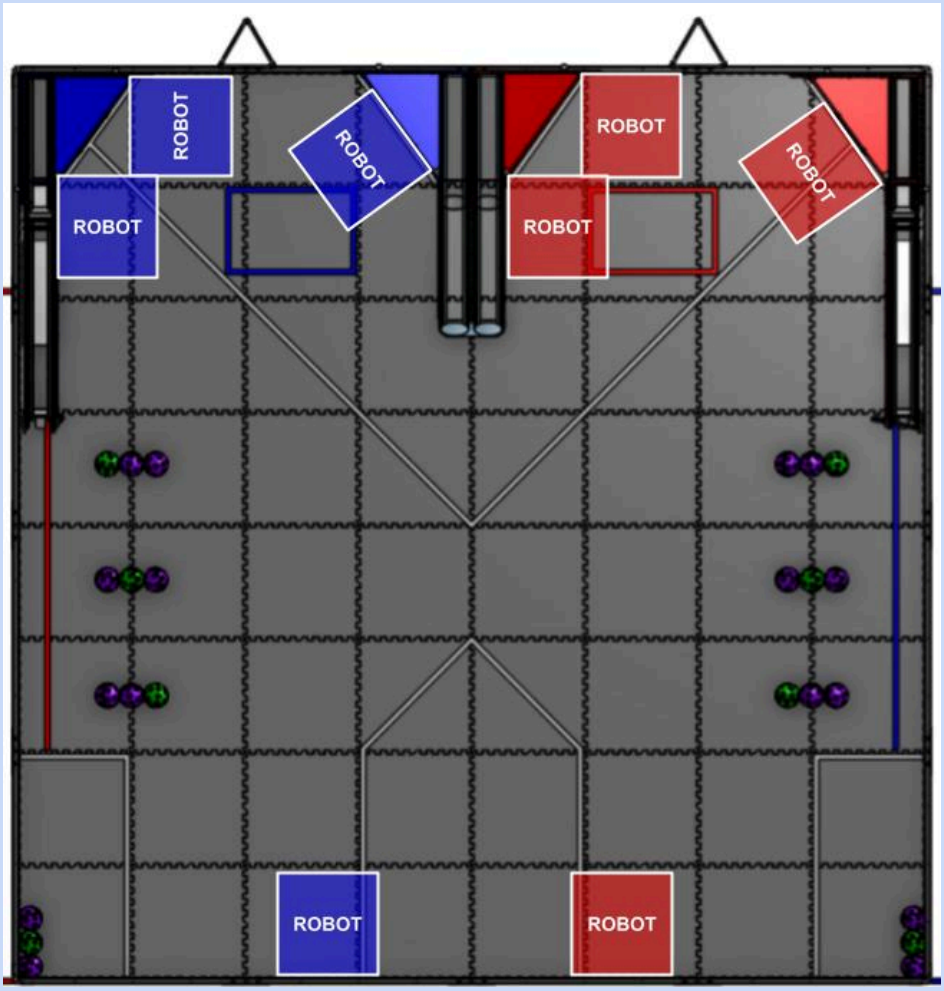


Figure 11-1: Examples of allowed ROBOT starting locations

11.4 In-MATCH

11.4.1 AUTO

G401 ***Let the ROBOT do its thing.** In AUTO, a DRIVE TEAM member may not directly or indirectly interact with a ROBOT or an OPERATOR CONSOLE, with the following exceptions:

A. to press the (▸) start button at the start of the MATCH.
B. to press the (■) stop button before the end of AUTO either at the team's discretion or instruction of the Head REFEREE per T202.
C. for personal safety or OPERATOR CONSOLE safety

Violation: VERBAL WARNING. MAJOR FOUL plus the ALLIANCE is not eligible for PATTERN points in AUTO if the ROBOT LAUNCHES an ARTIFACT such that it enters the open top of the GOAL after the interaction and before the end of AUTO, if subsequent violations occur during the event.

FIELD STAFF will not re-randomize the OBELISK due to violations of this rule prior to MATCH start.

Teams do not have to start an OpMode if they choose not to run an AUTO OpMode.

The intent of G401.A is for teams to start AUTO on time, accounting for the variability in human factors. Strategic violations of G401.A will be considered egregious behavior under G211.

Examples of strategic G401 violations include, but are not limited to:

A. intentionally starting a ROBOT late in AUTO to prevent a collision with an ALLIANCE partner
B. providing an input to indicate the correct MOTIF on the OPERATOR CONSOLE

G402 **No AUTO opponent interference.** During AUTO, FIELD columns A, B, C, D constitute the blue side of the FIELD, and columns ~~D,~~ E, F, G, H (Figure 9-5) constitute the red side of the FIELD. During AUTO, a ROBOT may not:

A. contact an opposing ALLIANCE'S ROBOT which is completely within the opposing ALLIANCE'S side of the FIELD either directly or transitively through an ARTIFACT, or
B. disrupt an ARTIFACT from its pre-staged location on the opposing ALLIANCE'S side of the FIELD either directly or transitively through contact with an ARTIFACT, or by LAUNCHING an ARTIFACT directly into it.

Violation: MAJOR FOUL per instance of ROBOT contact in G402.A and MAJOR FOUL per ARTIFACT in G402.B.

11.4.3 SCORING ELEMENT

G408 **No more than 3 at a time.** A ROBOT may not simultaneously CONTROL more than 3 ARTIFACTS.

Violation: MINOR FOUL per SCORING ELEMENT over the limit. YELLOW CARD if excessive.

Examples of interaction with a SCORING ELEMENT that are not "CONTROL" include, but are not limited to:

A. "bulldozing" (inadvertent contact with a SCORING ELEMENT while in the path of the ROBOT moving about the FIELD)
B. "deflecting" (being hit by a SCORING ELEMENT that bounces into or off a ROBOT)
C. inadvertent contact with a SCORING ELEMENT while attempting to acquire a SCORING ELEMENT from the LOADING ZONE.
D. SCORING ELEMENTS that have been LAUNCHED by a ROBOT that are no longer in contact with the ROBOT.

It is important to design your ROBOT so that it is impossible to inadvertently or unintentionally CONTROL more than the limit. Excessive violations of CONTROL limits include, but are not limited to:

A. frequent (i.e., 3 or more separate violations in a MATCH), simultaneous CONTROL of 5 or more ARTIFACTS, ~~or~~
B. ~~frequent (i.e., 3 or more separate violations in a MATCH), greater-than-MOMENTARY CONTROL of 4 or more ARTIFACTS.~~

REPEATED excessive violations of this rule do not result in additional YELLOW CARDS unless the violation reaches the level of egregious to trigger a G211 violation.

Strategic violations of G408 (e.g., a strategy to CONTROL and LAUNCH 4 ARTIFACTS) will be considered egregious behavior under G211.

11.4.4 ROBOT

G414 **ROBOTS have horizontal expansion limits.** ROBOTS must comply with the horizontal expansion limits outlined in R105.A during the MATCH. Exceptions:

A. If the over-expansion is due to damage and not used for strategic benefit.

Violation: MINOR FOUL. MAJOR FOUL if the over-expansion is used for strategic benefit, including if it impedes or enables a scoring action.

ROBOTS are allowed to have moving parts that extend outside its STARTING CONFIGURATION, but these extensions must stay within the expansion limit as described in R105.

Over-expansion violations must be obvious to the REFEREES during the MATCH. REFEREES will give benefit of the doubt to the teams.

Intentionally designing a ROBOT to violate expansion limits is considered egregious behavior under G211.

G415 **ROBOTS have vertical expansion limits, with exceptions.** ROBOTS must comply with the vertical expansion limits outlined in R105. ROBOTS may only expand above 18 in. (45.70 cm) up to 38 in. (96.50 cm) if both of the following conditions are true:

A. during the final 20 seconds of the MATCH, and
B. ~~when not in any LAUNCH ZONES~~ while a ROBOT is in its BASE ZONE.

Exceptions:

C. If the over-expansion is due to the ROBOT tipping over unintentionally.

Violation: MINOR FOUL. MAJOR FOUL if the over-expansion is used for strategic benefit, including if it impedes or enables a scoring action.

ROBOTS are allowed to have moving parts that extend outside its STARTING CONFIGURATION, but these extensions must stay within the expansion limit as described in R105.

Over-expansion violations must be obvious to the REFEREES during the MATCH. REFEREES will give benefit of the doubt to the teams.

Intentionally designing a ROBOT to violate expansion limits is considered egregious behavior under G211.

G418 **ROBOTS may not meddle with ARTIFACTS on RAMPS or in PRISMS.** ~~ROBOTS may not contact, either directly or transitively through a SCORING ELEMENT CONTROLLED by the ROBOT, ARTIFACTS on a RAMP, including their own RAMP. Additionally,~~ ROBOTS may not:

A. remove an ARTIFACT from their own RAMP except by operating the GATE, or
B. remove an ARTIFACT from the opponent's RAMP by any means.
C. remove an ARTIFACT from either PRISM by any means.

Violation: MAJOR FOUL ~~per ARTIFACT~~ per instance, and the ALLIANCE is ineligible for the PATTERN RP if G418.A, or the opposing ALLIANCE is awarded the PATTERN RP if G418.B.

Exceptions are granted for inconsequential and inadvertent contact made by a ROBOT while operating a GATE.

Example 1: A red ROBOT that contacts an ARTIFACT on the blue RAMP is in violation of this rule and is assessed 1 MAJOR FOUL under G418.

Example 2: A red ROBOT that LAUNCHES an ARTIFACT at an ARTIFACT on the red RAMP, removing it from the RAMP is in violation of this rule. The red ALLIANCE is assessed 1 MAJOR FOUL and is ineligible for the PATTERN RP under G418.A.

Example 3: A red ROBOT contacts and opens the blue GATE, causing 5 ARTIFACTS that were on the blue RAMP to leave the RAMP and return to the FIELD. Red is assessed a total of ~~6~~ 2 MAJOR FOULS – 1 under G417.A and ~~5~~ 1 under G418.B – in addition to blue being awarded PATTERN RP under G417.A/G418.B.

G419 **ROBOTS LAUNCH into their own GOAL.** ROBOTS may not:

A. intentionally place or LAUNCH ARTIFACTS directly onto their own RAMP or into their own PRISM, or
B. place or LAUNCH ARTIFACTS into one of the opponent's GOALS or onto the opponent's RAMP or PRISM.

Violation: 3 MAJOR FOULS per ARTIFACT and the opposing ALLIANCE is awarded the PATTERN RP if G419.B. There is a total maximum of 8 MAJOR FOULS for G419 violations per ALLIANCE per MATCH.

The intent is for ROBOTS to score by LAUNCHING into the open top of their own GOALS. Attempts to intentionally score points with actions that enter the ARTIFACT further down on the RAMP are considered violations of this rule.

Attempts to score points for the opponent either through the opponent GOALS or with actions that enter an ARTIFACT further down on the opponent RAMP are also considered violations of this rule.

There is no violation for scoring in an opponent's DEPOT.

11.4.5 Opponent Interaction

~~G424~~ ~~**GATE ZONE is OFF LIMITS.** A ROBOT may not contact, directly or transitively though a SCORING ELEMENT, an opponent ROBOT if either ROBOT is in the opponent's GATE ZONE, regardless of who initiates contact. Exceptions:~~

~~A. A ROBOT in their own ALLIANCE'S GATE ZONE and in their opponent's SECRET TUNNEL ZONE is not protected under G424.~~

ROBOT access to their GATE is enforced with G423 (do not use strategies intended to shut down major parts of gameplay).

G426 **LOADING ZONE protection.** A ROBOT may not contact, directly or transitively through a SCORING ELEMENT, an opponent ROBOT while either ROBOT is in the opponent's LOADING ZONE, regardless of who initiates contact.

Exceptions:

A. An opposing ROBOT in the opponent's SECRET TUNNEL ZONE is not assessed a violation under G426.

Violation: MINOR FOUL.

For the exception in G426.A, G425 is the only violation that applies. Figure 11-5 shows some examples of violations of G425 and G426 in the SECRET TUNNEL ZONE and the LOADING ZONE.

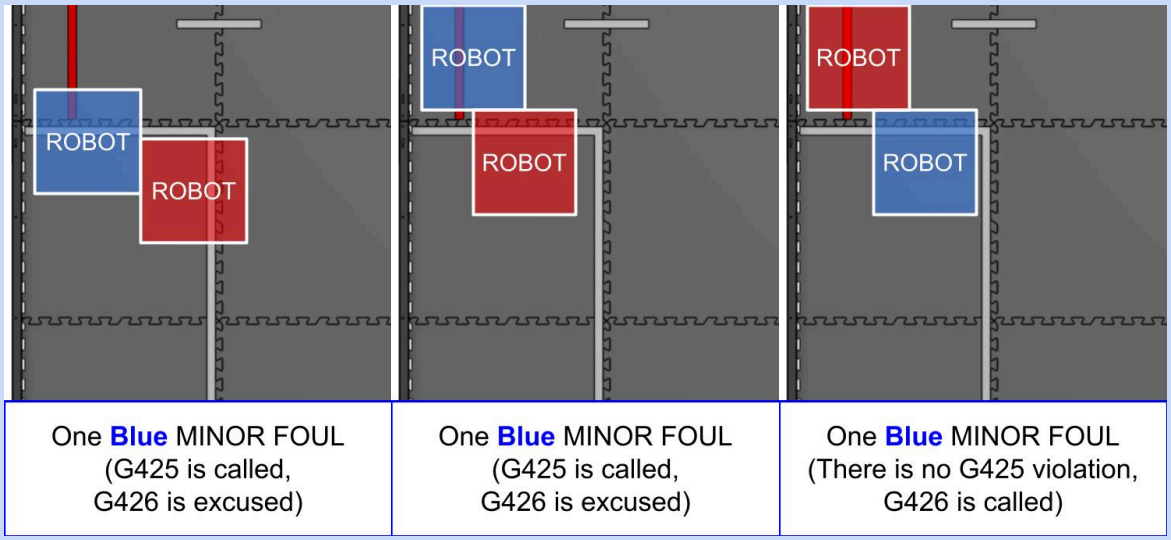


Figure 11-5: Examples of G425 & G426 violations.

13 Tournament (T)

13.7 Playoff MATCHES

T701 ***Send your STUDENT representatives.** Each team must choose and send at least one (1), but not more than two (2) STUDENT team representatives to the ARENA at the designated ALLIANCE selection time (~~typically just after the last scheduled qualification MATCH~~ fifteen minutes after scores are posted from the last qualification MATCH) to represent their team.

Violation: Teams who do not send a representative are ineligible for the playoff tournament.

~~**T703** ***There are no backup teams in Playoff MATCHES.**~~

BACKUP TEAMS for playoff MATCHES may be called as described in Section 13.7.7 BACKUP TEAMS.

T706 **Only 1 STUDENT may use the mic.** Only a single (1) STUDENT from the invited team is allowed to accept/decline an invitation, or invite new teams as an ALLIANCE lead.

Violation: The accept, decline, or invitation will not be accepted until the situation is remedied.

13.7.1 Alliance Selection Process

A break of fifteen minutes (15:00) occurs between the posting of scores from the last qualification MATCH (scheduled or replay, whichever comes later) and the start of the ALLIANCE selection process. The ALLIANCE selection process will begin at this time regardless of whether team representatives have checked in or not.

ALLIANCES at CRI will be formed in the same way they are at the *FIRST* Championship, where a second round takes place immediately after the first round with a reversed selection order, with ALLIANCE 6 picking first and ALLIANCE 1 picking last. This process results in six (6) ALLIANCES of three (3) teams each.

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13.7.2 **Playoff MATCH Bracket**

CRI will be following a regular 6 ALLIANCE double elimination bracket, as outlined in the DECODE Competition Manual, section 13.6.5.

13.7.7 **BACKUP TEAMS**

In the playoff MATCHES, it may be necessary for an ALLIANCE to replace one (1) of its members due to a faulty ROBOT. In this situation, the ALLIANCE lead has the option to bring in the highest seeded team from the BACKUP POOL to join its ALLIANCE. The team whose ROBOT and DRIVE TEAM get added to an ALLIANCE during the playoff MATCHES is called the BACKUP TEAM for this ALLIANCE.

The BACKUP TEAM is then added to the ALLIANCE, forming a four (4) team ALLIANCE for the remainder of playoffs. The BACKUP TEAM must be a part of the three (3) teams who are playing for the next MATCH after the ALLIANCE calls them. After the first MATCH that the BACKUP TEAM is playing is over, the ALLIANCE may play any three (3) of the four (4) teams on the ALLIANCE for any MATCH.

Each ALLIANCE is allotted one (1) BACKUP TEAM coupon during the Playoff MATCHES. If a second ROBOT from the ALLIANCE becomes inoperable, then the ALLIANCE must play the following MATCHES with only two (2) (or even one (1)) ROBOTS. Once a BACKUP TEAM coupon is submitted and accepted by the Head REFEREE, the BACKUP TEAM coupon may not be withdrawn by the ALLIANCE.

T707 **No BACKUP TEAM for replayed MATCHES.** An ALLIANCE may not request a BACKUP TEAM for a replayed MATCH. The sole exception is if, in the judgment of the Head REFEREE, the replay is due to an ARENA FAULT that rendered an ALLIANCE'S ROBOT inoperable.

Violation: The request is denied.

T708 **No BACKUP TEAMS for the first MATCH.** An ALLIANCE may not request a BACKUP TEAM until after their first Playoff MATCH.

Violation: The request is denied.

T709 **BACKUP TEAMS play when called.** A BACKUP TEAM must be playing in the ALLIANCE'S next MATCH following their recruitment.

Violation: The MATCH will not start until the BACKUP TEAM is present for the MATCH.

G301 may still apply if the BACKUP TEAM is not making a good faith effort to report to the MATCH in a timely manner after being called.

T710 **BACKUP TEAMS due 2 minutes before the MATCH start time.** The BACKUP TEAM Coupon must be submitted to the Head REFEREE (or their designee) by the ALLIANCE CAPTAIN no later than two (2) minutes before the expected MATCH start time in which the BACKUP TEAM is to play.

Violation: The request is denied.

If the Head REFEREE is busy, and there is no designee, the ALLIANCE CAPTAIN remains in the Question Box to submit the BACKUP TEAM coupon.

T711 **4 team ALLIANCES in the ALLIANCE AREA.** Once an ALLIANCE has called a BACKUP TEAM, a representative from the team not included in a MATCH may serve in a DRIVE COACH role as an additional DRIVE TEAM member.

The maximum number of DRIVE TEAM members per team and their roles remains unchanged, with the exception of an additional DRIVE COACH from the TEAM not participating in the MATCH. The total number of DRIVE TEAM members on a four (4) TEAM ALLIANCE may be a maximum of 13.

13.7.8 BACKUP POOL

After the top ranked ALLIANCE has made their final pick during ALLIANCE Selection, the lead queuer (or their designee) polls the remaining eligible teams. In rank order, the lead queuer (or their designee) will invite remaining teams to accept or decline a position in the BACKUP POOL, i.e., the group of teams willing and able to join an ALLIANCE during the Playoff MATCHES, if needed, until up to six (6) teams accept.

T712 **Be there to be a BACKUP TEAM.** A team must be present after ALLIANCE Selection to accept the lead queuer's (or their designee) invitation to join the BACKUP POOL.

Violation: Team is ineligible to be a BACKUP TEAM.

T713 **Send a BACKUP TEAM Representative.** The top two (2) ranked BACKUP TEAMS must send at least one (1) STUDENT representative (and optionally one (1) additional STUDENT or mentor) to a designated area near the FIELD for the duration of the playoff MATCHES.

These BACKUP TEAMS should have their ROBOT, batteries, DRIVER STATION, and any other equipment they need to play a MATCH with them at this location.

These (up to) two (2) representatives are available to answer questions and accept invitations to be a BACKUP TEAM from ALLIANCE CAPTAINS. If one (1) of these two (2) teams joins an ALLIANCE or excuses themselves from the BACKUP POOL, the next

highest ranked team in the BACKUP POOL must provide their representative. Once a BACKUP TEAM has declined an invitation to join an ALLIANCE, it is no longer a member of the BACKUP POOL and ineligible to join another ALLIANCE.

Violation: VERBAL WARNING, plus the team is removed from BACKUP POOL if the situation cannot be corrected within a reasonable amount of time.

16 Glossary

ALLIANCE a cooperative of ~~two~~ three (3) *FIRST* Tech Challenge teams

ALLIANCE AREA a ~~120 in. (304.8 cm) wide by 42 in. (106.7 cm) deep~~ 186 in. (472.5 cm) wide by 60 in. (152.4 cm) deep by infinitely tall volume formed by placing ALLIANCE colored tape onto the flooring surface outside of the FIELD.

BACKUP POOL The group of teams willing and able to join an ALLIANCE during the playoff MATCHES, if needed

BACKUP TEAM The team whose ROBOT and DRIVE TEAM replaces another ROBOT and DRIVE TEAM on an ALLIANCE during the playoff MATCHES

BASE ZONE an 18 in. +/- 0.125 in. (45.70 cm +/- 0.30 cm) wide by ~~18 in. +/- 0.125 in. (45.70 cm +/- 0.30 cm)~~ 27 in +/- 0.125 in (68.58 +/- 0.30 cm) deep infinitely tall volume bounded by ALLIANCE colored tape.

FIELD an approximately ~~144 in. (365.75 cm)~~ 188 in. (477.52 cm) by ~~144 in. (365.75 cm)~~ 188 in. (477.52 cm) area bounded by the inside surface of the walls

GEM A red, orange, yellow, or blue ARTIFACT.

HUE A scoring achievement in which points are scored based on the unique color of ARTIFACTS scored in the PRISM.

LAUNCH LINE the white tape which bounds 2 triangular LAUNCH ZONES, as well as ~~2~~ 4 segments of white tape located at the base of the GOAL.

LOADING ZONE an approximately ~~23 in. (58.40 cm)~~ 47 in. (119.38 cm) wide by 23 in. (58.40 cm) deep infinitely tall volume bounded by white tape and the adjoining FIELD perimeters

MATCH a 30 second AUTO period, an ~~8-second~~ 15-second transition period between AUTO and TELEOP, and a 2-minute TELEOP period in which the ROBOT plays the current season game

PRISM A clear tube attached to a center GOAL'S structure which can contain up to six ARTIFACTS.

RAMP ~~A structure that can fit up to 9 CLASSIFIED ARTIFACTS.~~ aluminum extrusion that holds ARTIFACTS. A RAMP is part of a CLASSIFIER or a PRISM structure attached to a GOAL.

SPECTRUM A scoring achievement in which points are scored based on the color order of ARTIFACTS scored in the PRISM. The plural of SPECTRUM is SPECTRA.

TILE flooring surface of the FIELD is made of ~~36~~ 64 (nominal) interlocking soft foam TILES