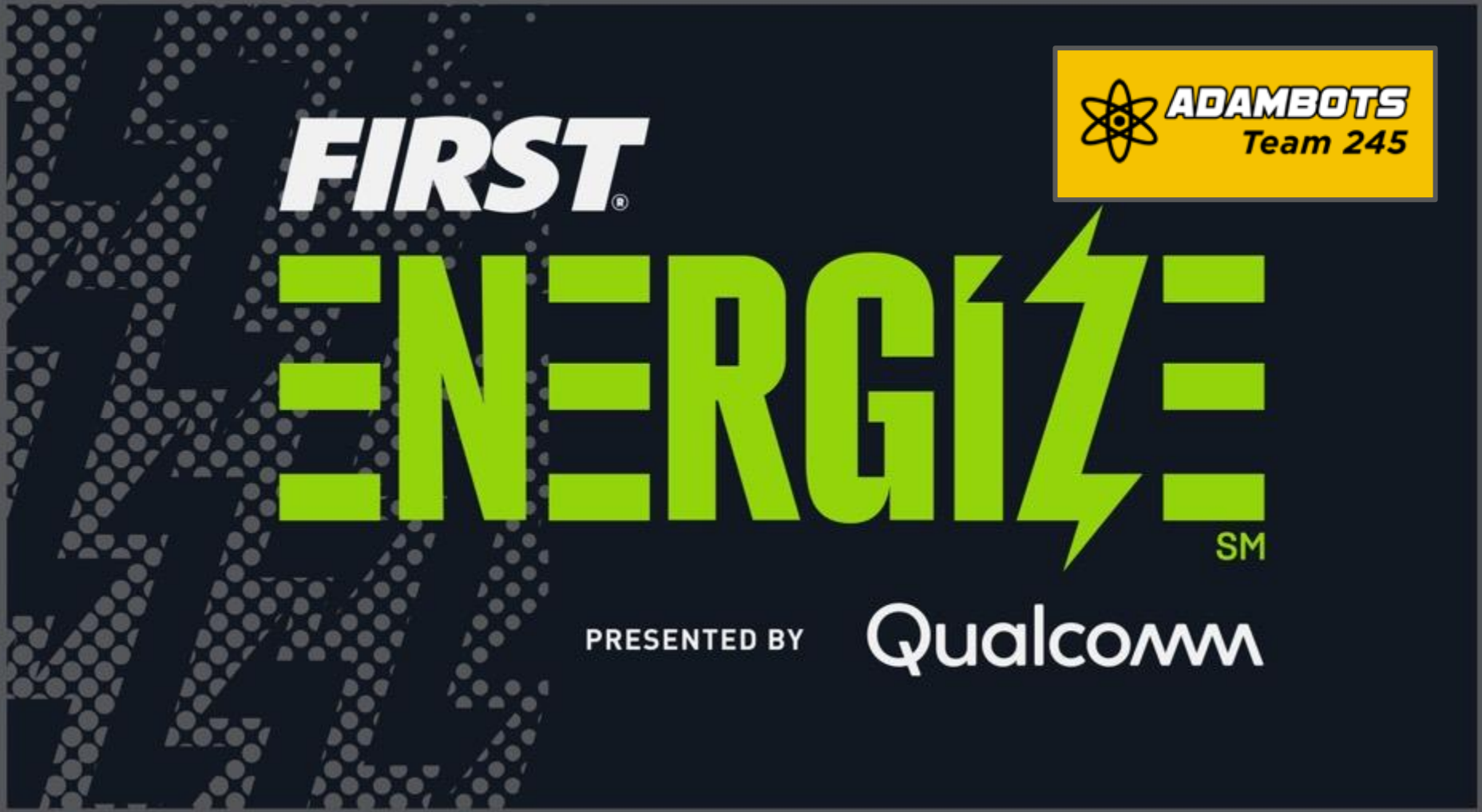

FIRST®
ADAMBOTS
Team 245
ENERGIZE
SM
PRESENTED BY
Qualcomm

# Agenda

1:00 PM – Game Overview Presentation

2:15 PM – Scoring Options and Strategy Discussion
- Strategy Helps Inform Design – Form Follows Function

2:45 PM – Preliminary Design Discussions for Those Who Want to Participate

4:00 PM – Finished

# 2023 Game Overview – Created by the Adambots FRC245

Game Overview
The Arena
Match Play
Game Play Scoring
Rule Violations
Game Play
Human Actions
Tournaments
Considerations
Key Dates
Discussion

**You may ask questions at any time; but try not to ask before the subject is reviewed!**

# Game Overview

In CHARGED UP two competing alliances are invited to process game pieces to bring energy to their community. Each alliance brings energy to their community by retrieving their game pieces from substations and scoring it into the grid. Human players provide the game pieces to the robots from the substations. In the final moments of each match, alliance robots race to dock or engage with their charge station!

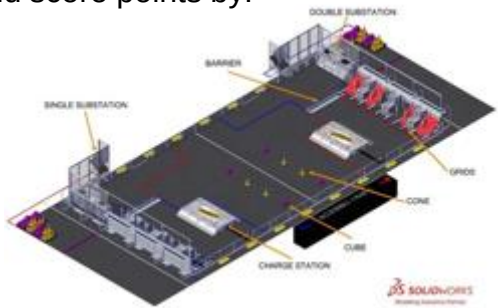
Each match begins with a 15-second autonomous period, during which time alliance robots operate only on pre-programmed instructions to score points by:

- leaving their community,
- retrieving and scoring game pieces onto the grid,
- docking on or engaging with their charge station.

In the final 2 minutes and 15 seconds of the match, drivers take control of the robots and score points by:

- continuing to retrieve and score their game pieces onto the grid and
- docking on or engaging with their charge station.

The alliance with the highest score at the end of the match wins!



# Game Overview - Arena

Field

Game Pieces

Field Management Equipment

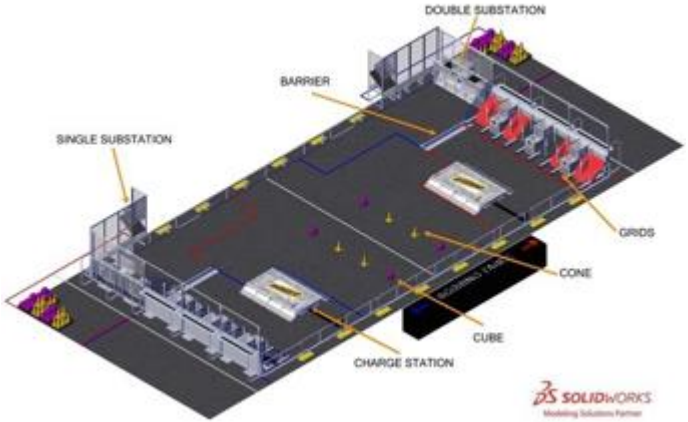
Robot Management Equipment

# Field

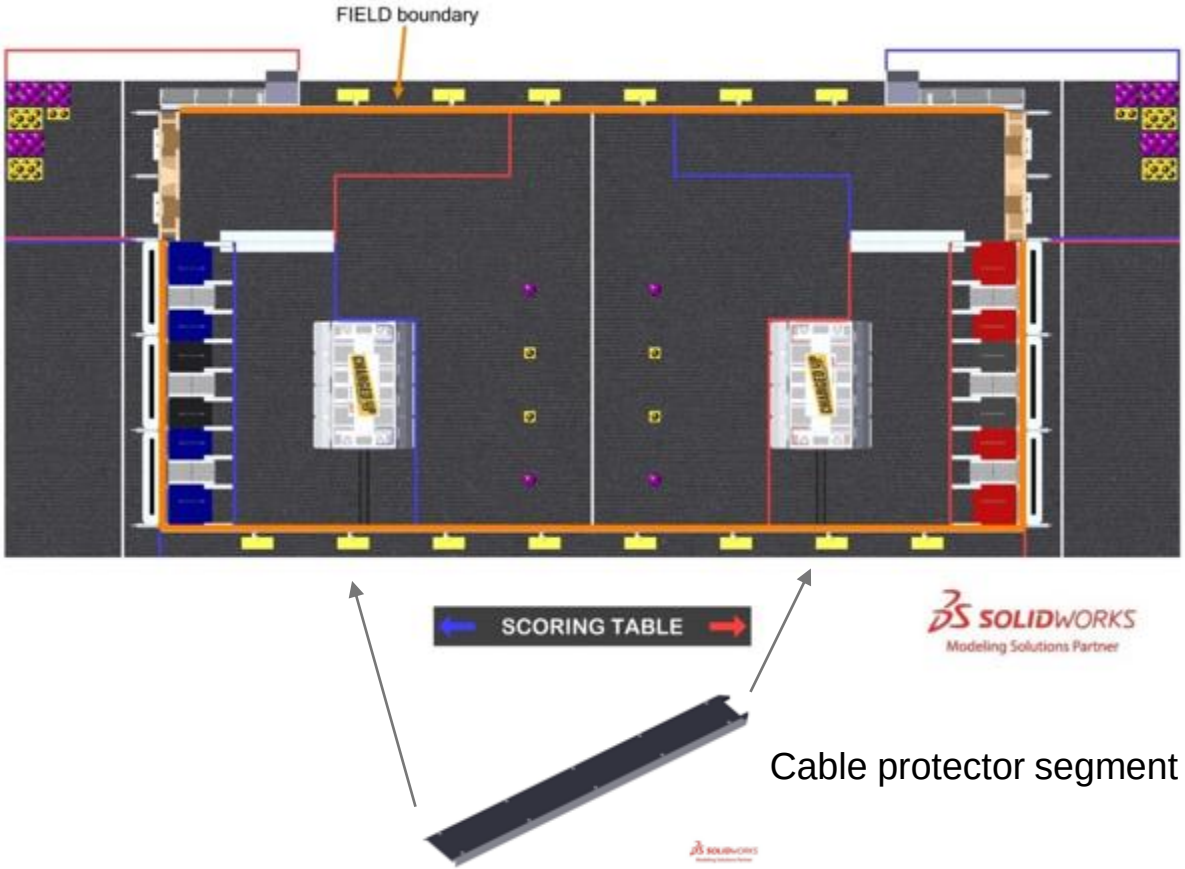
Each FIELD for CARGED UP is a 26 ft. 3 ½ in by 54 ft. 3 ¼ in carpeted area

The FIELD is populated with the following elements:

- 3 red Grids and 3 blue Grids
- 1 red Charge Station and 1 blue Charge Station
- 1 red Single Substation and 1 blue Single Substation
- 1 red Double Substation and 1 blue Double Substation
- 2 Barriers, 1 separating each Community from the opposing alliance’s loading zone

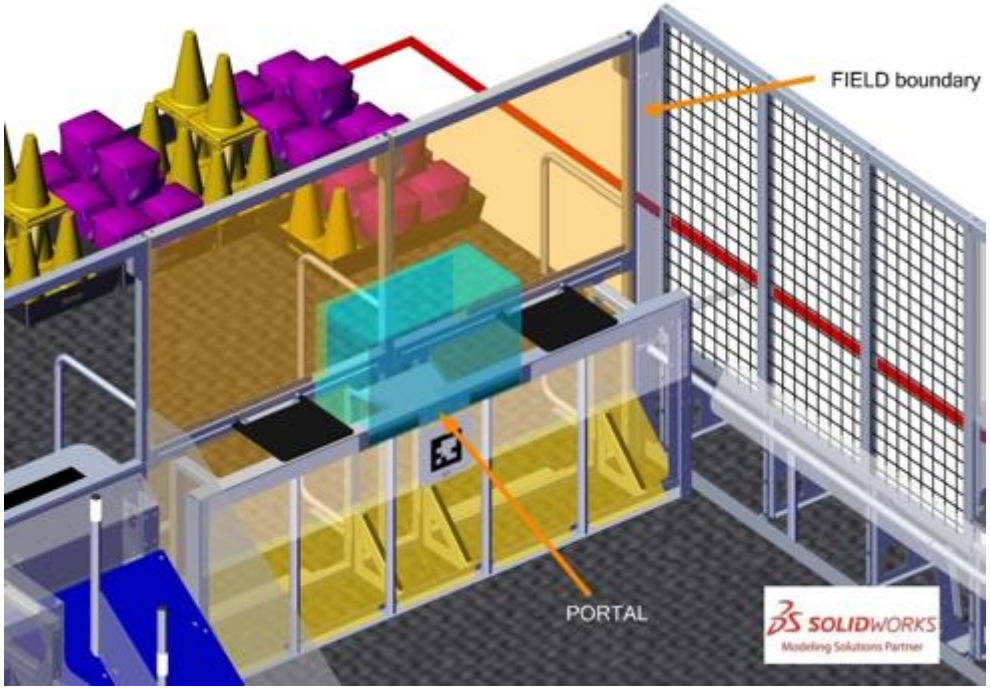


# Field


FIELD boundary
SCORING TABLE
SOLIDWORKS
Modeling Solutions Partner
Cable protector segment

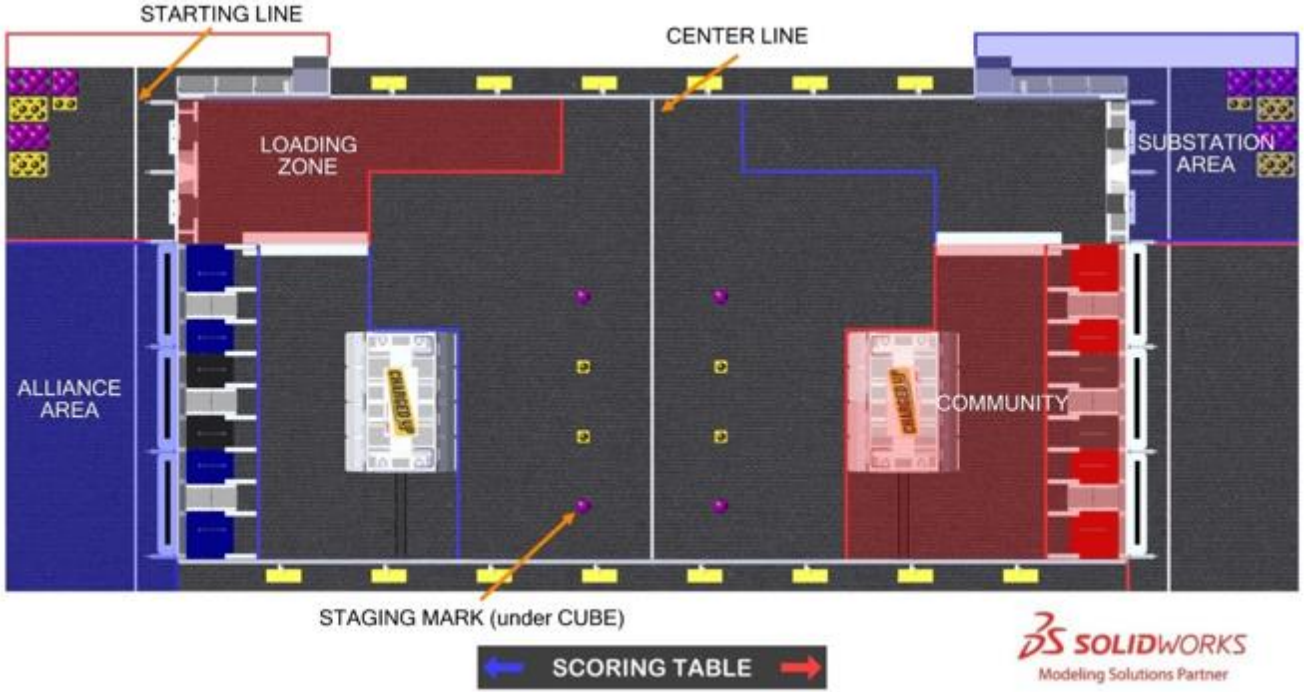
# Field

Double Substation



# Field Areas

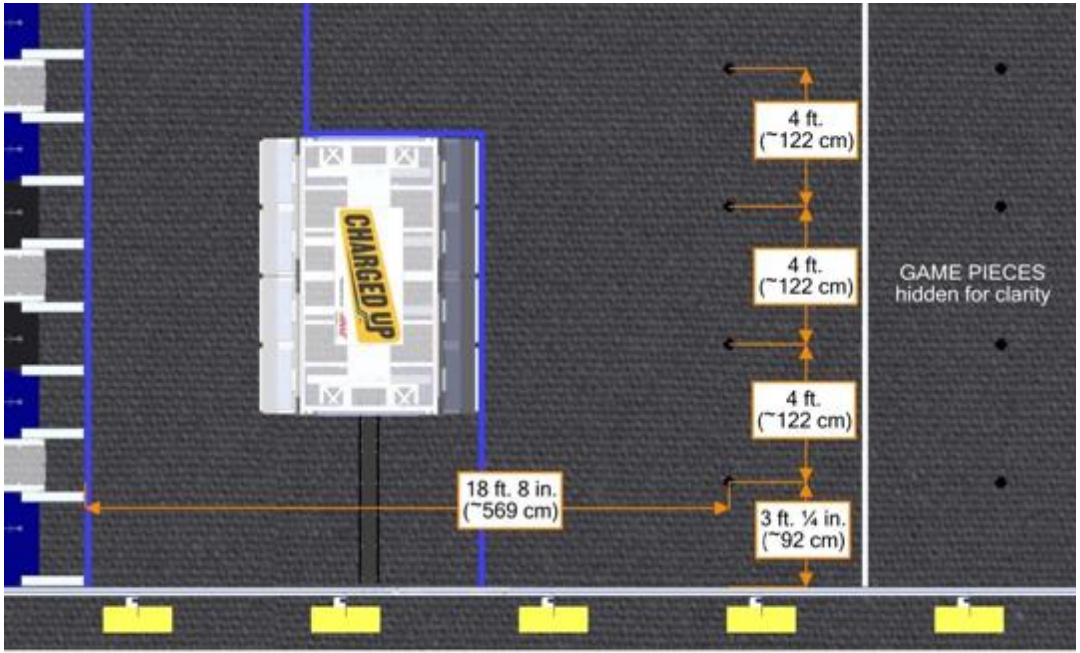
LOADING ZONE: an 8 ft. 3 in. wide by 11 ft. ¼ in. or 22 ft. ¼ in. deep infinitely tall volume formed by the DOUBLE SUBSTATION, the plane defined by the BARRIER plastic, the guardrail, and ALLIANCE colored tape. The LOADING ZONE includes the tape.




COMMUNITY: an 18 ft. wide by 11 ft. ⅜ in. to 16 ft. 1¼ in. deep infinitely tall volume formed by the ALLIANCE WALL, the plane defined by the BARRIER plastic, ALLIANCE colored tape, and the guardrail. The COMMUNITY includes the tape.

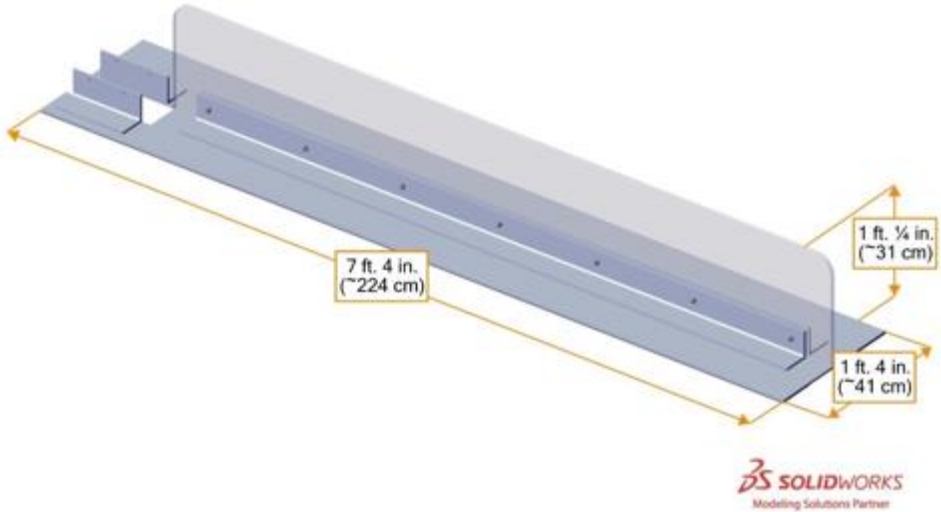
# Field

STAGING MARK: 1 of 8 marks used to identify starting locations for GAME PIECES. Marks are 4 in. by 4 in. (~10 cm) crosses made from black tape. Marks are spaced 4 ft. apart from each other



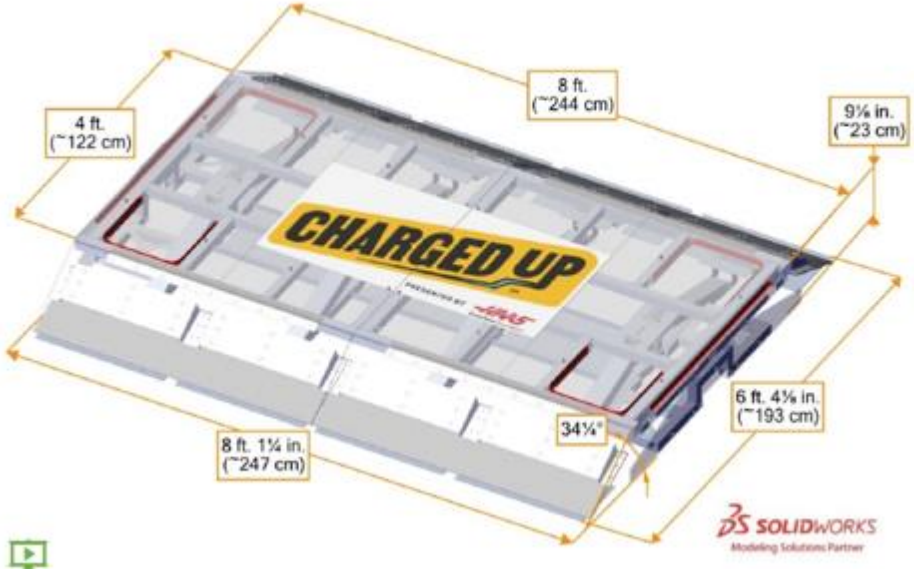
# Field

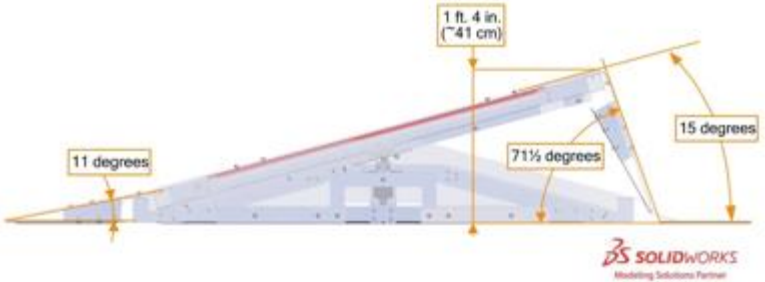
A BARRIER is a 7 ft. 4 in. long assembly that separates each COMMUNITY from its adjacent LOADING ZONE. The BARRIER has a base that is 1 ft. 4 in. wide and ¼ in. tall. The base supports a ½ in. thick, 1 ft. ¼ in. tall polycarbonate wall.



# Field

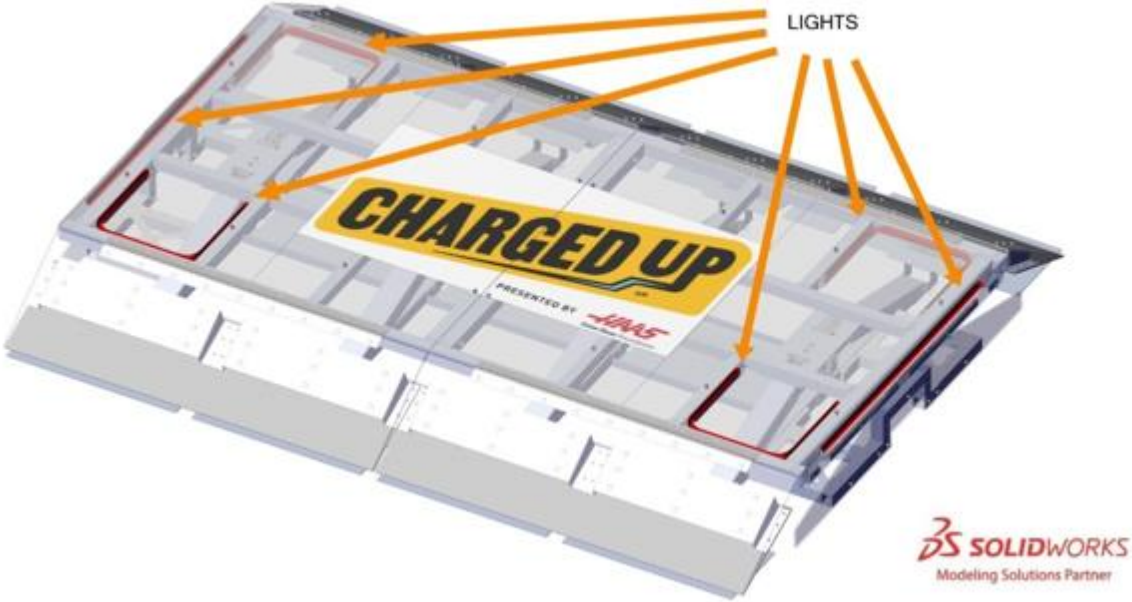
A CHARGE STATION is an 8 ft. 1¼ in. wide, 6 ft. 4⅛ in. deep structure that is located in each COMMUNITY such that its center is 8 ft. 2⅝ in. from the far edge of the GRID'S tape line and centered in the width of the COMMUNITY



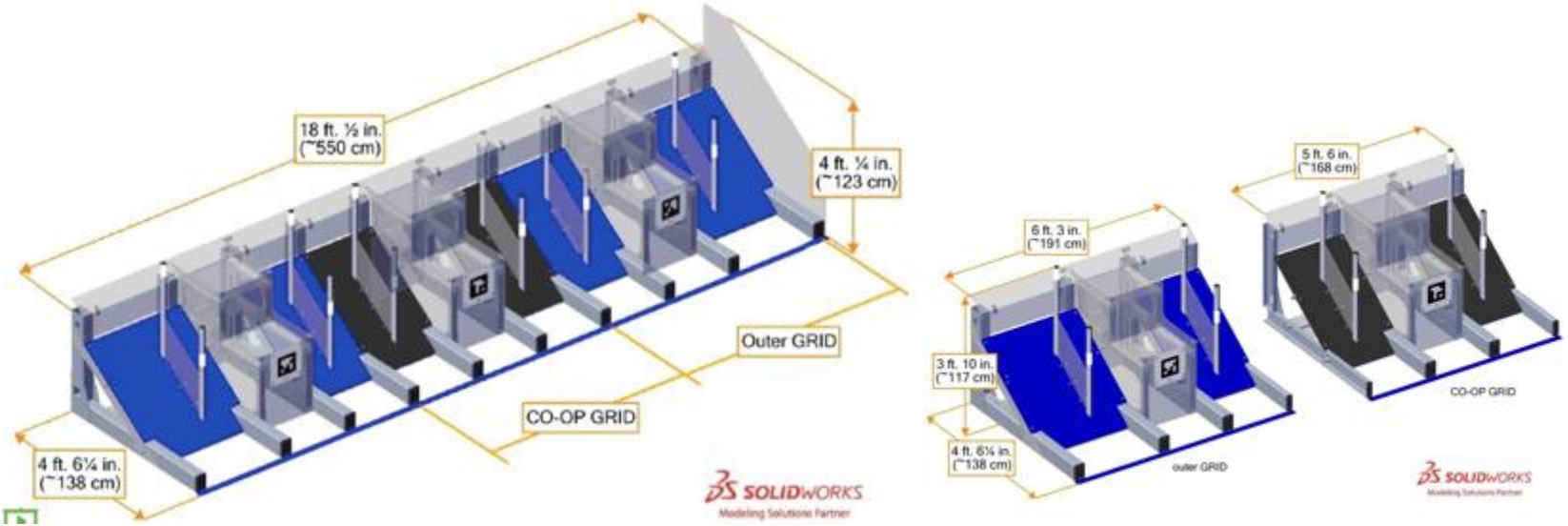
# Field

ALLIANCE colored lights located along the short edges of the CHARGE STATION and at the 4 corners of the top surface indicate if it is LEVEL.



# Field

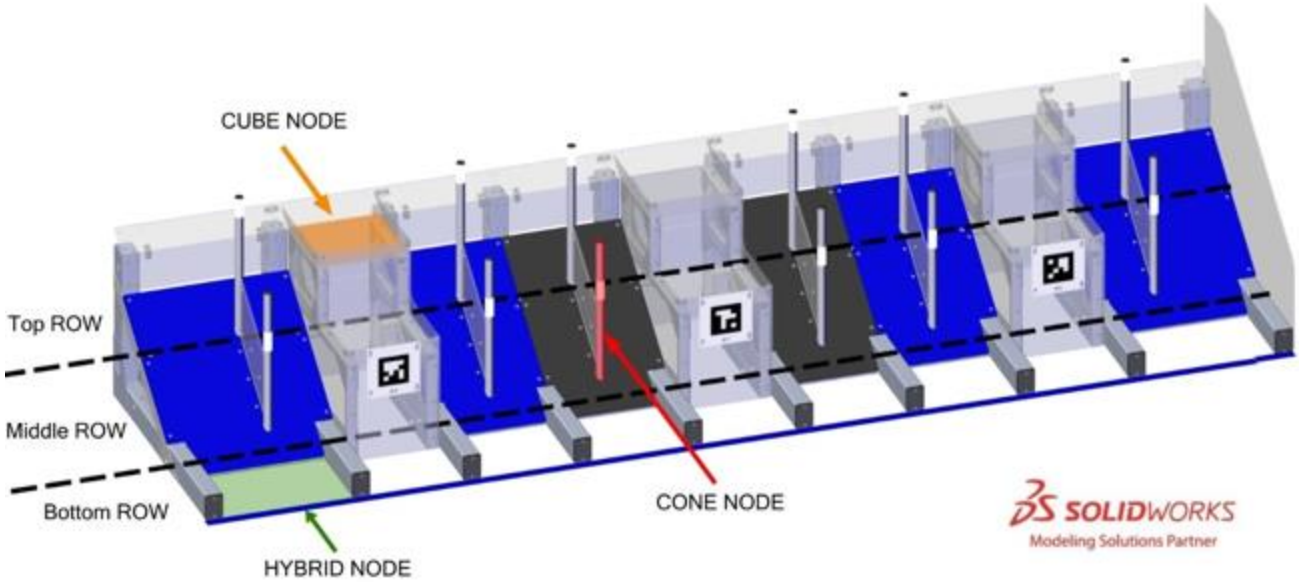
A collection of 3 GRIDS consisting of 2 outer GRIDS and a *Coopertition* (CO-OP) GRID is located in front of each ALLIANCE WALL adjacent to the guardrail and BARRIER. The full structure is an 18 ft. ½ in. wide, 4 ft. ¼ in. tall, 4 ft. 6¼ in. deep assembly. A strip of ALLIANCE-colored tape is included in the GRIDS and defines its front plane.



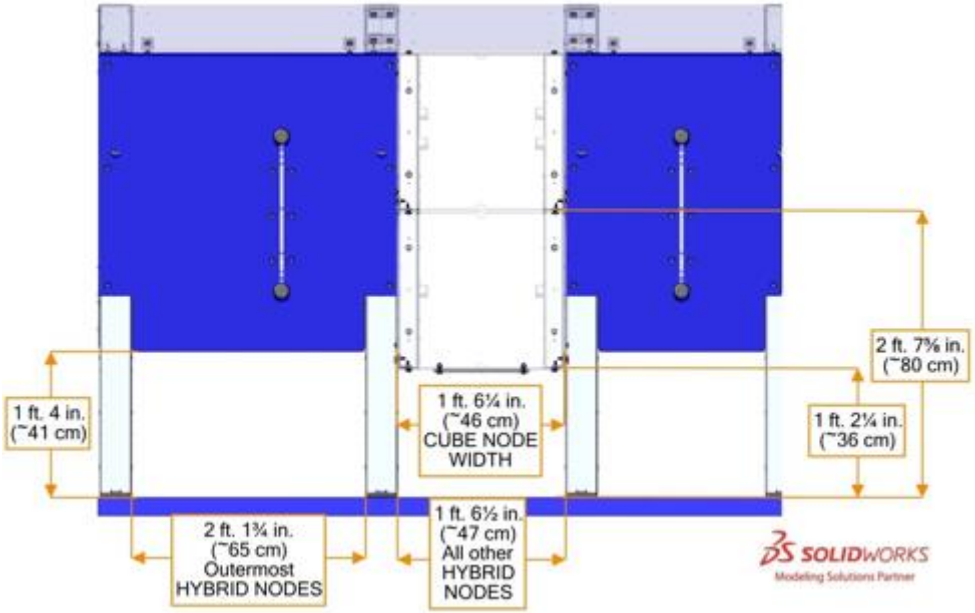
# Field

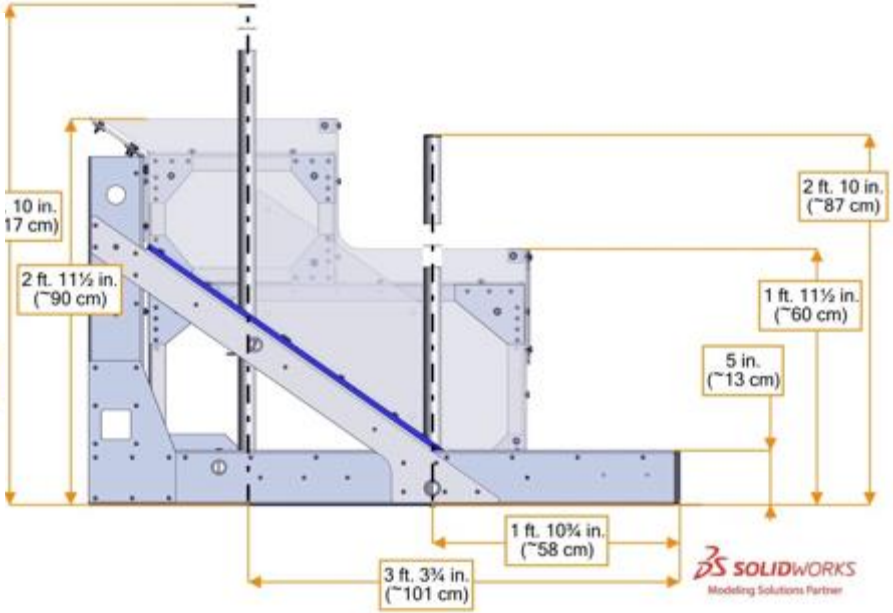
Each GRID contains 9 GAME PIECE scoring locations called NODES:

- 3 HYBRID NODES
- 2 CUBE NODES, and
- 4 CONE NODES.



# Field

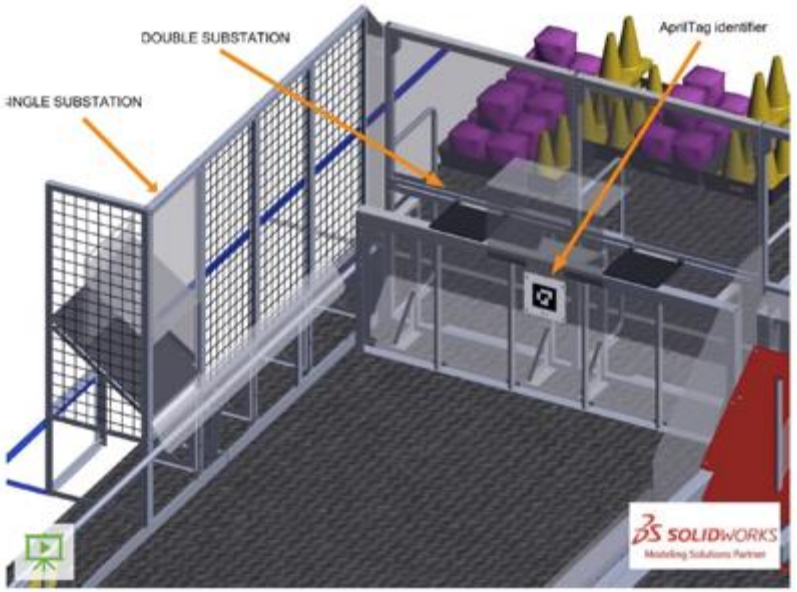

1 ft. 4 in.
(~41 cm)
2 ft. 7⅝ in.
(~80 cm)
1 ft. 6¼ in.
(~46 cm)
CUBE NODE
WIDTH
1 ft. 2¼ in.
(~36 cm)
2 ft. 1¾ in.
(~65 cm)
Outermost
HYBRID NODES
1 ft. 6½ in.
(~47 cm)
All other
HYBRID
NODES
SOLIDWORKS
Modeling Solutions Partner


10 in.
17 cm)
2 ft. 11½ in.
(~90 cm)
2 ft. 10 in.
(~87 cm)
1 ft. 11½ in.
(~60 cm)
5 in.
(~13 cm)
1 ft. 10¾ in.
(~58 cm)
3 ft. 3¾ in.
(~101 cm)
SOLIDWORKS
Modeling Solutions Partner

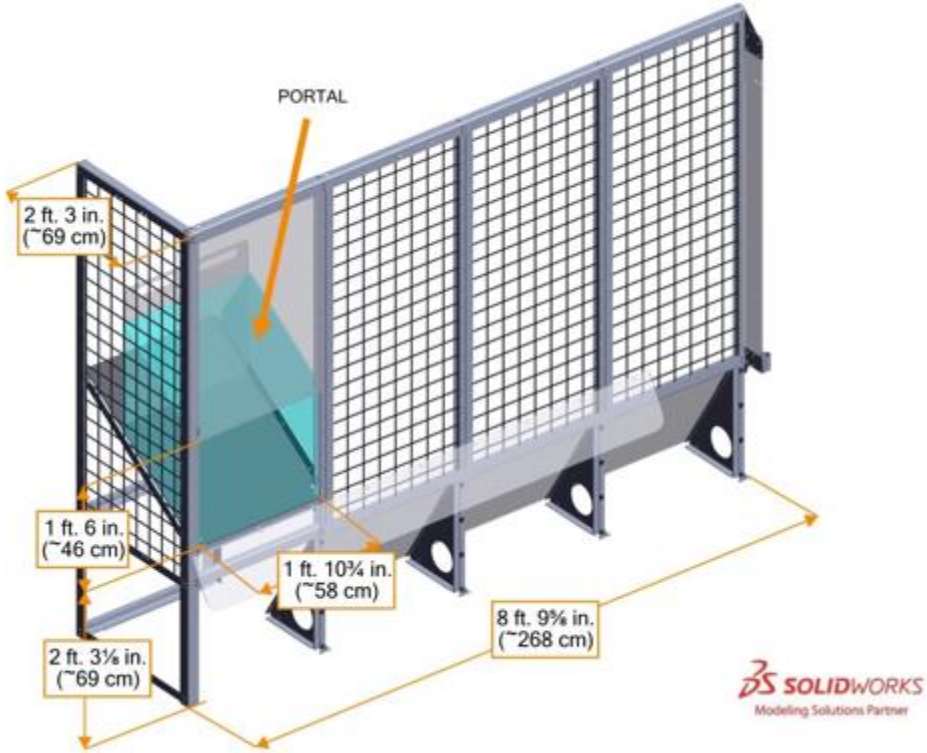
# Field

A SUBSTATION is an assembly used to move GAME PIECES from humans to ROBOTS or onto the FIELD. There are 2 types of SUBSTATIONS in each SUBSTATION AREA: a SINGLE SUBSTATION and a DOUBLE SUBSTATION.

Each SUBSTATION contains a PORTAL - a three-dimensional volume through which humans transfer GAME PIECES to ROBOTS or the FIELD.

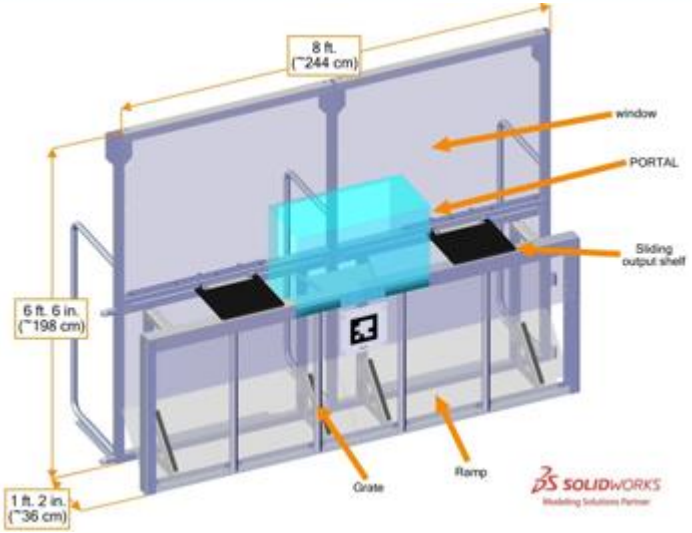


# Field


PORTAL
2 ft. 3 in.
(~69 cm)
1 ft. 6 in.
(~46 cm)
1 ft. 10¾ in.
(~58 cm)
8 ft. 9⅝ in.
(~268 cm)
2 ft. 3⅛ in.
(~69 cm)
SOLIDWORKS
Modeling Solutions Partner

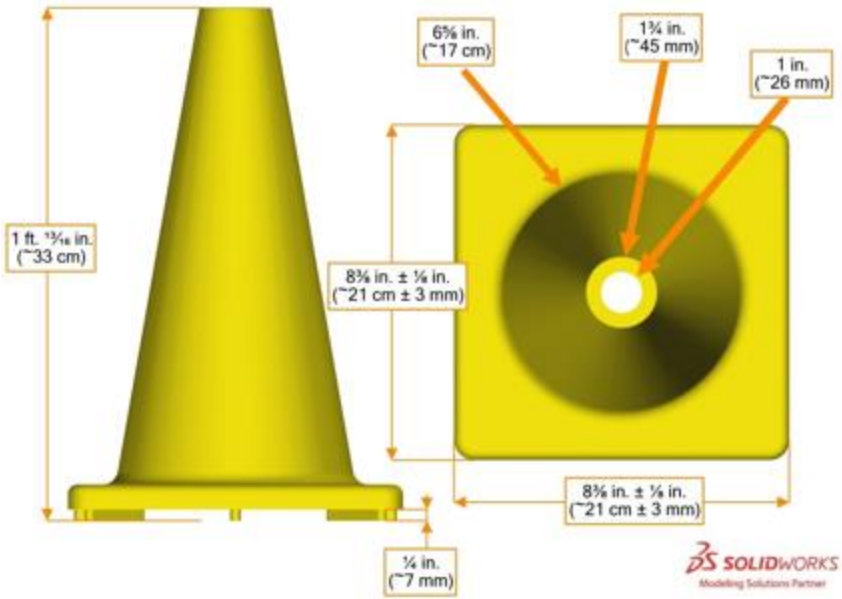
# Field

Sliding shelves made of ½ in. thick textured HDPE may be used to move GAME PIECES out of the PORTAL and make them accessible to ROBOTS. Shelves are controlled by HUMAN PLAYERS using handles. The shelves are 1 ft. 2 in. wide, 1 ft. 1 in. deep and their top surface is 3 ft. 1⅜ in. above the carpet. Each shelf can slide from the PORTAL to an edge of the DOUBLE SUBSTATION.

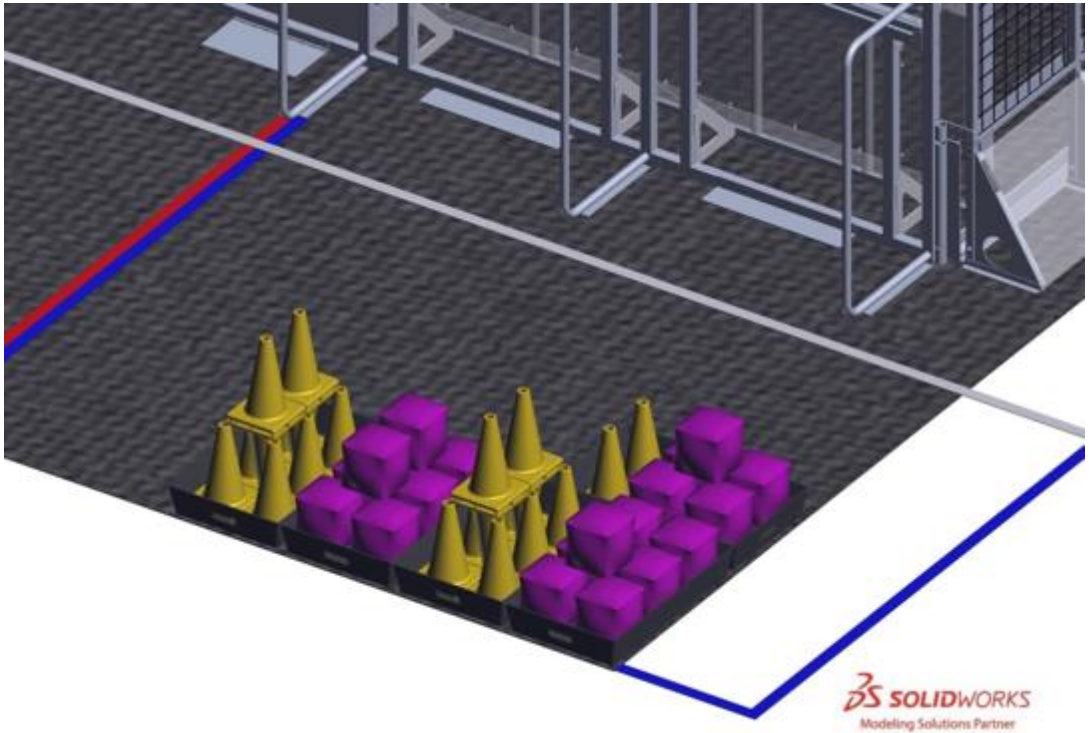



# Game Pieces

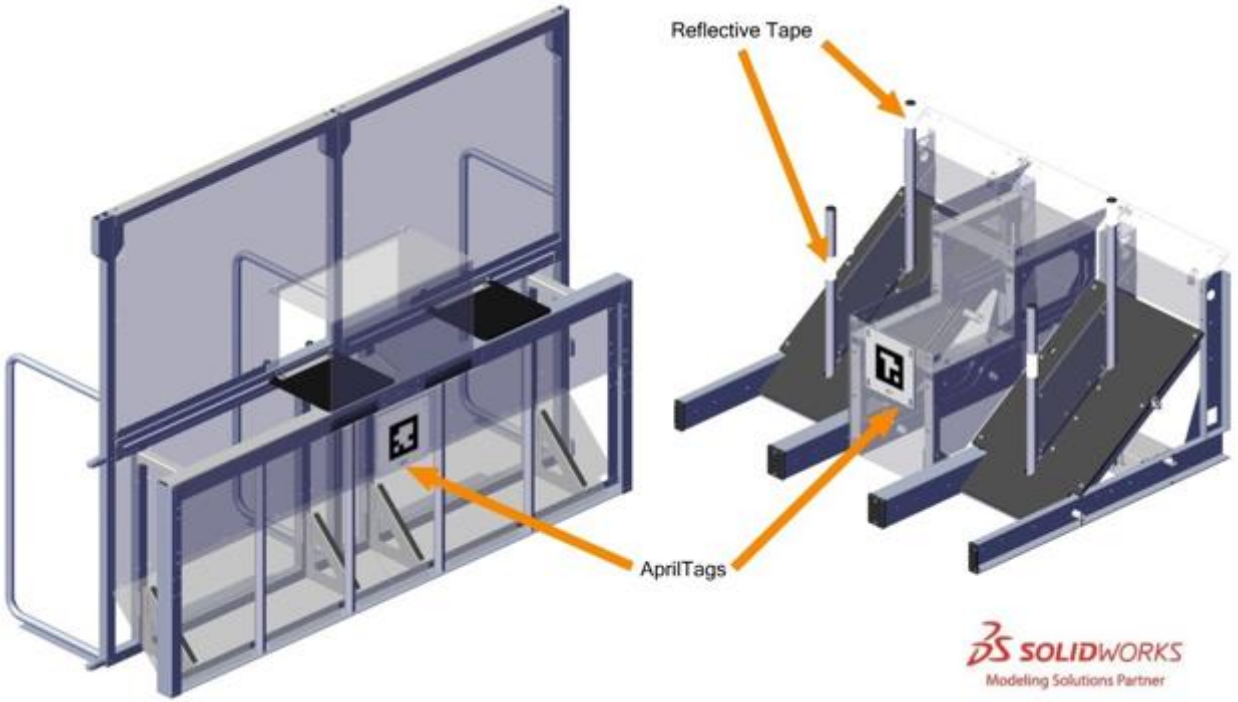
There are 2 types of GAME PIECES: CONES and CUBES.



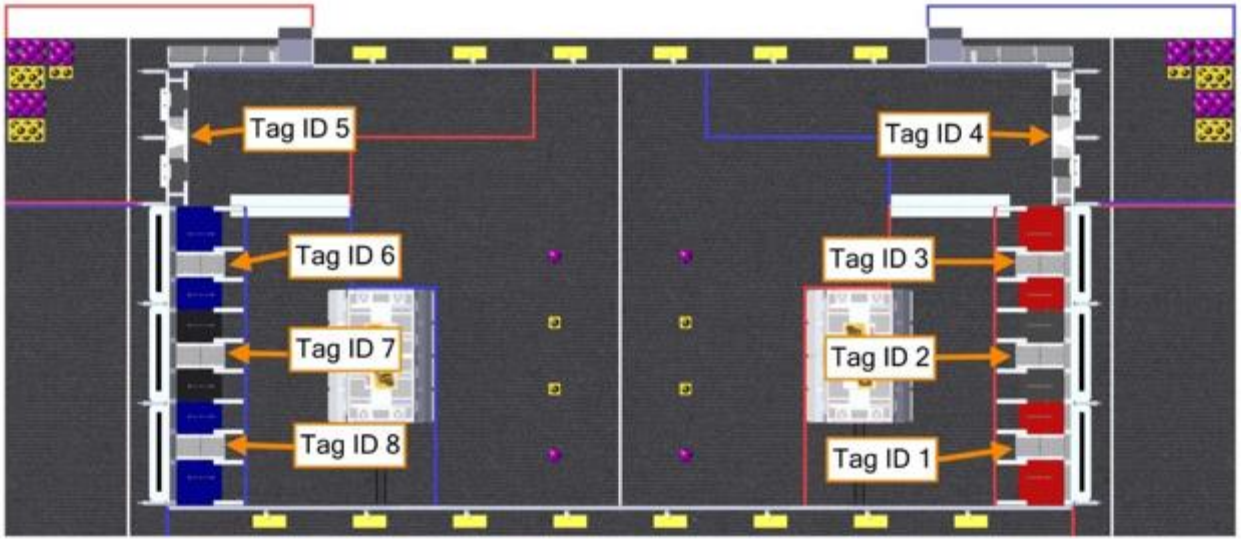

# Game Piece Holders



# Vision Targets



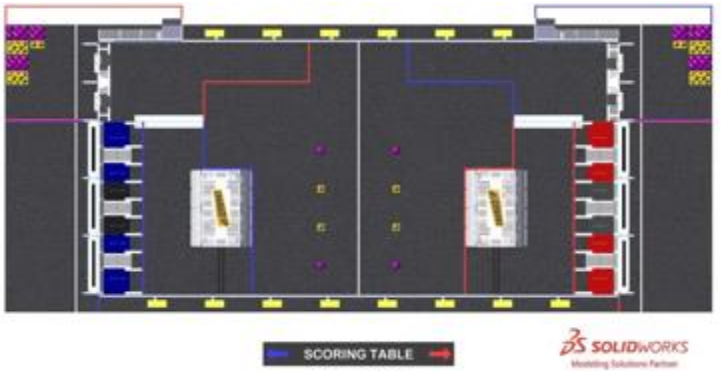
# Vision Targets



# Match Play – Setup

54 CONES and 44 CUBES, divided evenly between the 2 ALLIANCES, are staged as follows:

- each ALLIANCE may preload 1 CONE or 1 CUBE in each ROBOT such that it is fully supported by that ROBOT,
- each ALLIANCE may stage 4 GAME PIECES of their choice on the STAGING MARKS
    - If no team decision, CUBES will be placed on the 2 outer marks and CONES will be placed on the 2 inner marks, and
- depending on decisions made above the remaining CONES (quantity 20 to 27) and CUBES (quantity 15 to 22) are staged in each of the corresponding ALLIANCE SUBSTATION AREAS.



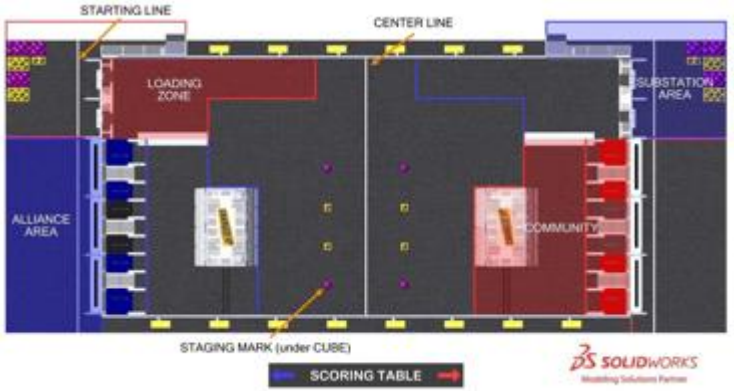
# Match Play – Setup

Each DRIVE TEAM stages their ROBOT such that its BUMPERS are fully contained within their COMMUNITY

Humans stage for the MATCH as follows:
A. DRIVERS and COACHES stage inside their ALLIANCE AREA and behind the STARTING LINE.
B. HUMAN PLAYERS stage behind the STARTING LINE in either their SUBSTATION AREA or ALLIANCE AREA.
C. TECHNICIANS stage in the event-designated area near the FIELD.
.

# Match Play – Autonomous Period

- The first phase of each MATCH is 15 seconds long and called the Autonomous Period (AUTO).
- During AUTO, ROBOTS operate without any DRIVE TEAM control or input.
- ROBOTS attempt to score GAME PIECES on GRIDS, exit their ALLIANCE'S COMMUNITY, retrieve additional GAME PIECES, and DOCK on and/or ENGAGE with their CHARGE STATION before the end of the phase.
- There is a 3 second delay between AUTO and the Teleoperated Period during which time AUTO scores are assessed



# Match Play – Teleoperated Period

The second phase of each MATCH is the remaining two minutes and fifteen seconds (2:15) and called the Teleoperated Period (TELEOP). During this phase, DRIVERS remotely operate ROBOTS to retrieve and score GAME PIECES.

The final thirty (0:30) seconds of the TELEOP stage is the ENDGAME, during which ROBOTS attempt to PARK, DOCK on, and/or ENGAGE with their ALLIANCE'S CHARGE STATION or continue to score GAME PIECES.

# Match Play – Scoring

ALLIANCES are rewarded for accomplishing various actions through the course of a MATCH, including

- demonstrating MOBILITY,
- scoring GAME PIECES on GRIDS,
- completing LINKS,
- DOCKING on and/or ENGAGING with their CHARGE STATION,
- PARKING,
- and winning or tying MATCHES.

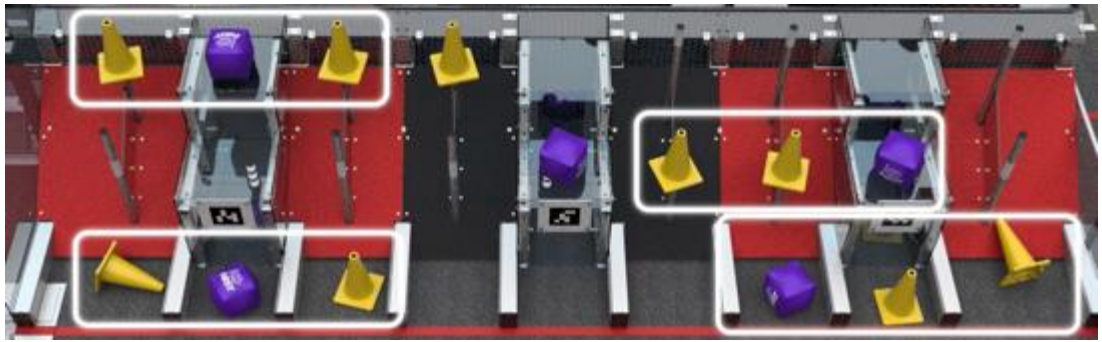
Rewards are granted either via MATCH points or Ranking Points.
All scores are assessed and updated throughout the MATCH, except as follows:

A. assessment of CHARGE STATION scoring occurs 3 seconds after the ARENA timer displays 0 following AUTO
B. GAME PIECES scored in the GRID continues for up to 3 seconds after the ARENA timer displays 0 following AUTO.
C. assessment of CHARGE STATION scoring occurs 3 seconds after the ARENA timer displays 0 following TELEOP
D. GAME PIECES scored in the GRID continues for up to 3 seconds after the ARENA timer displays 0 following TELEOP.

# Match Play – Grid Scoring

Alliances earn points by scoring Game Pieces in Nodes on their Grids. All game pieces scored on the same row are worth equal value. The bottom row can be either cones or cubes, otherwise cones can only be scored on cone nodes and cubes on cube nodes.

A link is formed if 3 adjacent nodes in a row contains a scored game piece. A game piece can only be used for one link.



# Match Play – Charge Station Scoring

A ROBOT earns points for its ALLIANCE by DOCKING on or ENGAGING with their CHARGE STATION

A ROBOT is DOCKED if it is contacting only the CHARGE STATION and/or other items also directly or transitively **fully supported by the CHARGE STATION**.

A ROBOT is ENGAGED if both of the following criteria are met:

- the CHARGE STATION is LEVEL, and
- all ALLIANCE ROBOTS contacting the CHARGE STATION are DOCKED

# Match Play – Point Values

| Award | Awarded for | Auto Points | Teleop Points |
|---|---|---|---|
| Mobility | Each robot whose bumpers have completely left its community at any point during auto | 3 | |
| Game Pieces | Scored on a bottom row | 3 | 2 |
| | Scored on a middle row | 4 | 3 |
| | Scored on a top row | 6 | 5 |
| Link | 3 adjacent nodes in a row contain scored game pieces | | 5 |
| Docked and not engaged | Each robot (1 robot max in auto) | 8 | 6 |
| Docked and engaged | Each robot (1 robot max in auto) | 12 | 10 |
| Park | Each robot whose bumpers are completely contained within its community but does not meet the criteria for docked | | 2 |

# Match Play – Point Values

| Award | Awarded for | Ranking Points |
|---|---|---|
| Sustainability bonus | At least 5 links scored (see note below) | 1 |
| Coopertition bonus | At least 3 game pieces scored on each alliance's co-op grid (The sustainability bonus threshold is reduced to 4 links for both alliances | |
| Activation bonus | At least 26 total **charge station** points earned in auto and/or endgame | 1 |
| Tie | Completing a match with the same number of match points as your alliance | 1 |
| Win | Completing a match with more match points than your opponent | 2 |

# Game Play – Rule Violations

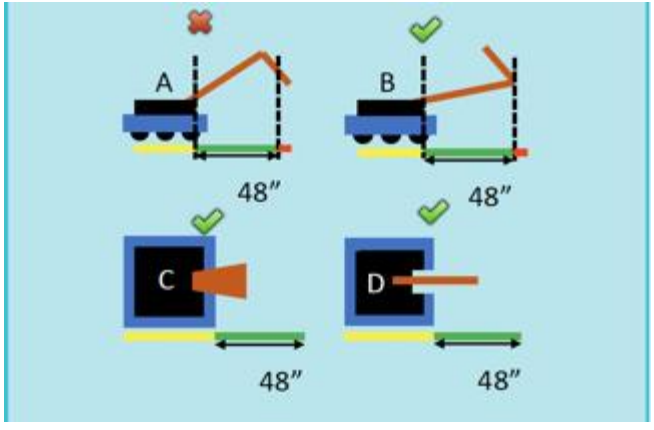
| Penalty | Description |
|---|---|
| **FOUL** | a credit of 5 points towards the opponent's MATCH point total |
| **TECH FOUL** | a credit of 12 points toward the opponent's MATCH point total |
| **YELLOW CARD** | a warning issued by the Head REFEREE for egregious ROBOT or team member behavior or rule violations. A subsequent YELLOW CARD within the same tournament phase results in a RED CARD. |
| **RED CARD** | a penalty assessed for egregious ROBOT or team member behavior or rule violations which results in a team being DISQUALIFIED for the MATCH. |
| **DISABLED** | the state in which a ROBOT is commanded to deactivate all outputs, rendering the ROBOT inoperable for the remainder of the MATCH. |
| **DISQUALIFIED** | the state of a team in which they receive 0 MATCH points and 0 Ranking Points in a Qualification MATCH or causes their ALLIANCE to receive 0 MATCH points in a Playoff MATCH |

# Game Play – Drive Team

| Role | Description | Max/Drive Team | Criteria |
|---|---|---|---|
| Coach | A Guide or advisor | 1 | Any team member |
| Driver | An operator and controller of the robot | 3 | Student |
| Human Player | A game piece manager | | |
| Technician | A resource for robot troubleshooting, setup, and removal from the field | 1 | Any team member |

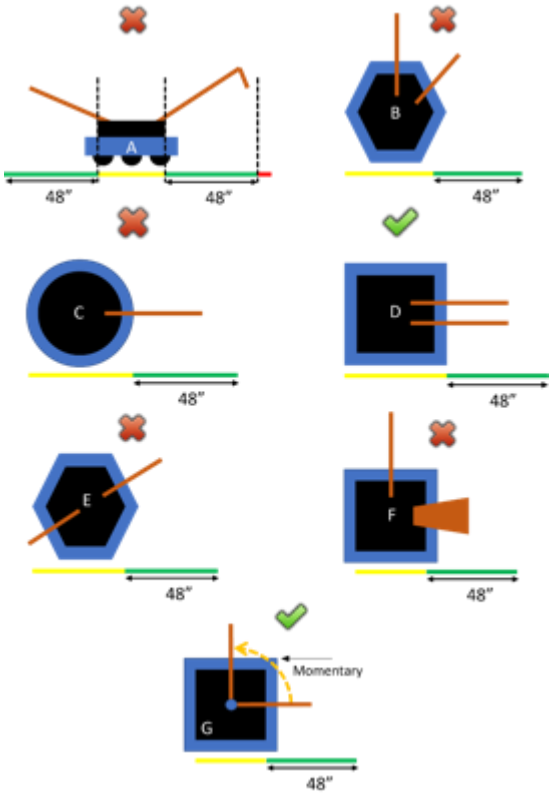
# Game Rules - Robots

- Dangerous robots not allowed
- Robots must stay on the field
- Bumpers must be in the bumper zone
- Bumpers may not fail
- Robots may not intentionally detach or leave parts on the field
- Robot height, as measured when it's resting normally on the flat floor, may not exceed 6 ft. 6 in.
- Robot may not extend beyond the frame perimeter in more than 48 in..

# Game Rules - Robots

- Strategies clearly aimed at forcing the opponent alliance to violate a rule is not in the spirit of FIRST
- Robots my not pin an opponent's robot for more than 5 seconds.
- A robot whose bumpers are intersecting the opponent's loading zone or community may not extend beyond its frame perimeter.
- Robots may not extend beyond their frame perimeter in more than one direction at a time, unless it is momentary.



# Game Rules - Robots

- A robot with any part of itself in their opponent's loading zone or community may not contact an opponent robot, regardless of who initiates contact.


# Game Rules - Robots

During the ENDGAME, a ROBOT may not contact, either directly or transitively through a GAME PIECE, an opponent ROBOT contacting its CHARGE STATION or supported by a partner contacting its CHARGE STATION, regardless of who initiates contact.

A ROBOT in contact with its CHARGE STATION and partially in its opponent’s LOADING ZONE is not protected by this rule.

# Game Rules - Robots

During AUTO, a ROBOT action may not cause GAME PIECES staged on the opposing side of the FIELD to move from their starting locations.

ROBOTS, either directly or transitively through a GAME PIECE, may not cause or prevent the movement of the opponent CHARGE STATION.

# Game Rules - Robots

Only control one game piece at a time.

Robots may not launch game pieces unless any part of the robot is in its own community.

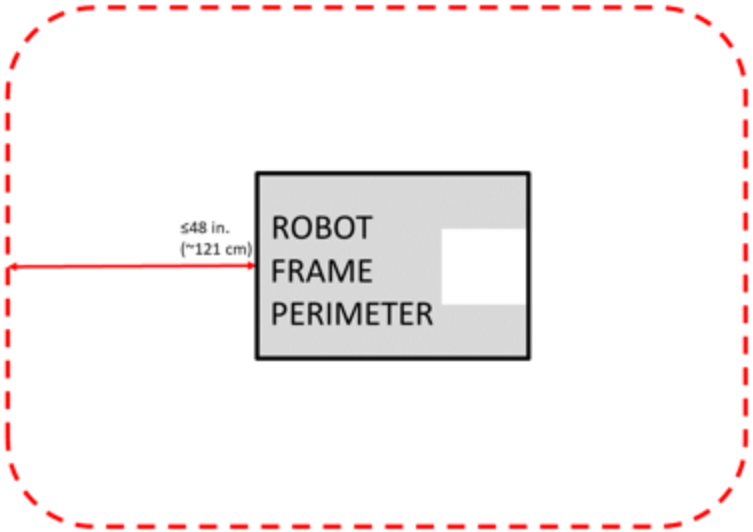
Robots may not move a scored game piece from an opponent’s node.

# Robot Construction Rules

- There are many pages of rules around what is allowed in the construction of the robot and the engineering teams should look at them.
- A robot must have a fixed frame perimeter
- In the starting configuration, no part of the robot shall extend outside the vertical projection of the frame perimeter
- Robot weight must not exceed 125 lbs. (excludes bumpers, battery and its associated Anderson cable quick connect, tags used for location detection systems if provided by the event).

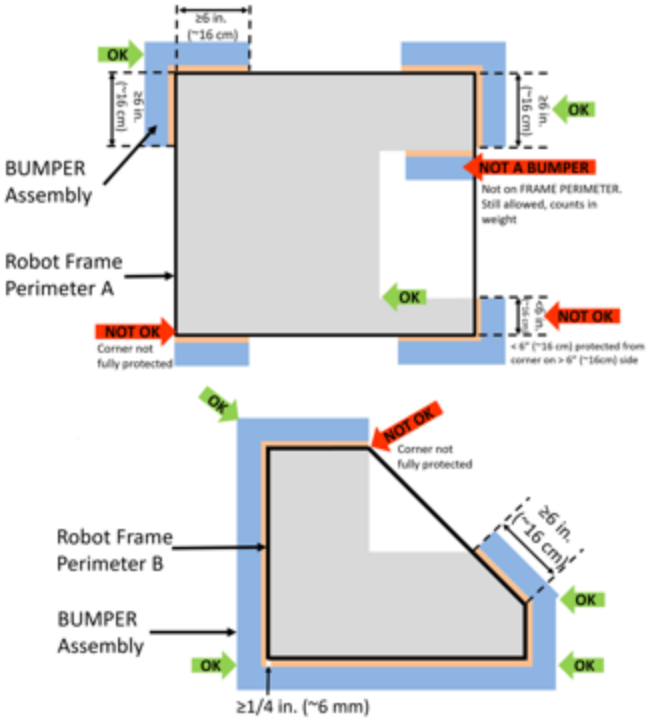
# Robot Construction Rules

- A robot's starting configuration may not have a frame perimeter greater than 120 in. and may not be more than 4 ft. 4 in. tall.
- Robots may not extend more than 48 in. beyond their frame perimeter



# Robot Construction Rules

- Bumpers should protect the corners (similar to past years)



# Tournaments

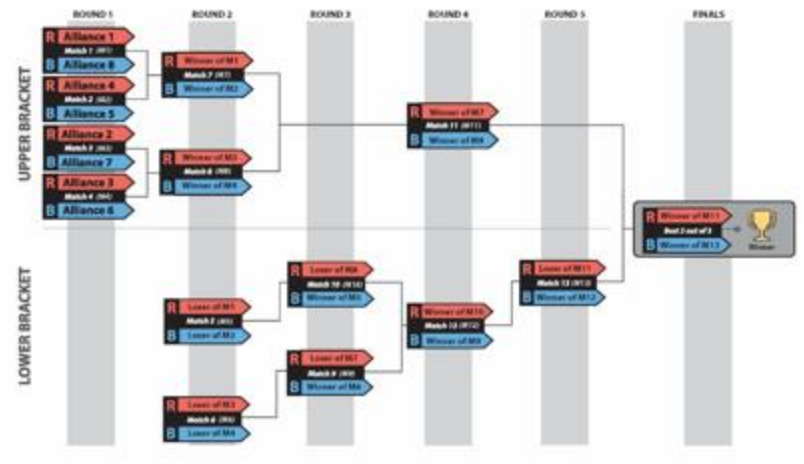
- Michigan Districts have qualification matches to determine seeding
  - Three team alliances play and each alliance member gets the ranking points for that match for their alliance (unless red card or they did not show up)
  - Teams ranked by ranking points with tie breakers

| Order Sort | Criteria |
|---|---|
| 1st | Ranking Score |
| 2nd | Average MATCH points, not including FOULS |
| 3rd | Average ALLIANCE HANGAR points |
| 4th | Average ALLIANCE TAXI + AUTO CARGO points |
| 5th | Random sorting by the FMS |

# Tournaments

- Michigan Districts
  - Following qualification matches, alliances are selected
  - No more ranking points - first alliance to win two matches advances to next round
  - Much more will be explained when we get to our first tournament

| MATCH | Blue | Red | Blue Gap (minutes) | Red Gap (minutes) | Winner moves to | Loser moves to |
|---|---|---|---|---|---|---|
| Upper Bracket – Round 1 – MATCH 1 | ALLIANCE 8 | ALLIANCE 1 | | | Red – MATCH 7 | Red – MATCH 5 |
| Upper Bracket – Round 1 – MATCH 2 | ALLIANCE 5 | ALLIANCE 4 | | | Blue – MATCH 7 | Blue – MATCH 5 |
| Upper Bracket – Round 1 – MATCH 3 | ALLIANCE 7 | ALLIANCE 2 | | | Red – MATCH 8 | Red – MATCH 6 |
| Upper Bracket – Round 1 – MATCH 4 | ALLIANCE 6 | ALLIANCE 3 | | | Blue – MATCH 8 | Blue – MATCH 6 |
| **8-minute Break** | | | | | | |
| Lower Bracket – Round 2 – MATCH 5 | Loser of MATCH 2 | Loser of MATCH 1 | 24m | 31m | Blue – MATCH 10 | |
| Lower Bracket – Round 2 - MATCH 6 | Loser of MATCH 4 | Loser of MATCH 3 | 17m | 24m | Blue – MATCH 9 | |
| Upper Bracket – Round 2 - MATCH 7 | Winner of MATCH 2 | Winner of MATCH 1 | 38m | 45m | Red – MATCH 11 | Red – MATCH 9 |
| Upper Bracket – Round 2 - MATCH 8 | Winner of MATCH 4 | Winner of MATCH 3 | 31m | 38m | Blue – MATCH 11 | Red – MATCH 10 |
| **8-minute Break** | | | | | | |



## Tournaments

- Michigan Events for Adambots
  - Kettering #1 – March 2
  - Standish-Sterling – March 16
  - Michigan State Championship if qualifying – April 6-8
    - 160 teams will qualify for the Michigan State Championship
  - World Championship – Houston if qualifying – April 19-22
    - 82 teams from Michigan will qualify

# Considerations

What is important to do?

- For ranking points
- For auto scoring
- For teleop scoring
- For making it into the Playoff round
- For durability and reliability
- To win engineering awards

Form follows function:

- Decide what function(s) we want to perform (our primary strategy) before deciding on what form to make the robot

# Considerations

- What can be done so that the robots will be done in time to practice (driving a robot after 4 weeks – don't laugh – we can do it)?
- Should we plan to use the camera to either help drivers or use vision targets?
- Think about how you would do it if only humans played
- What is impact of limited size restrictions?
- For each function, consider impact on rest of robot functions, space, weight, balance, etc.
- Decide what we don't want to do and eliminate it from further consideration
- Trying to do everything usually means you sacrifice doing a few things really well

# Considerations

- What worked well in the past that we should repeat?
- What didn’t work well in the past that we should avoid?
- What can be programmed?
- What do we know how to do? (now includes swerve drive option)
- What can be done effectively?
- Are we only building one robot?
- What needs to be done in CAD first vs. done and then use CAD to improve the second robot?

# Considerations

- What is needed to win in week one might not win in week three or State Championship
- The better the robot and drive team, the more we play and the more the robot is used
- What about defense in this year’s game
- Can the same mechanism do more than one function with some modifications
  - Example, same device turns control panel can also sense color

# Strategy and Design Development

1. Taking next couple of days to “really, really, really think about the problem” before we solve the problem.
2. All engineering team leaders are also on the Strategy Team and will be involved in the strategy development in the next week.
3. Today we are gathering information from what we know today.

# Design Selection

Hopefully, by next Saturday we will:

- Complete problem definition (what do we want to do)
- Review various design concepts we want to consider for each problem
- Eliminate things we do not want to do
- Decide how we are breaking up the mechanical teams
- Get started on programming concepts
- Determine any prototypes or CAD models we need to make to determine direction
- Develop a materials list of items we need now
- Decide what field elements we will need  for future uses
- Start fabrication of items (chassis frame for example)

# Robotics Collaboration Meetings on Saturdays

**FRC Collaboration Meetings 2022 Season**

| | Team Number | Team Name | School | Name | email | Event 1 | Event 2 |
|---|---|---|---|---|---|---|---|
| | 201 | FEDS | Rochester HS, Rochester Hills, MI | Ari McEntire<br>Shishir Gupta | ari.mcentire@gmail.com<br>skgupta44120@gmail.com | FIM District Wayne State University March 10-12, 2023 | FIM District Troy March 24-26, 2023 |
| | 245 | Adambots | Rochester Adams HS, Rochester Hills, MI | Rick Drummer<br>John Bueltel<br>John Savage | rickdrumrs@aol.com<br>bueltel.john@gmail.com<br>jrsavage11@gmail.com | FIM District Kettering #1 March 2-4, 2023 | FIM District Standish-Sterling March 16-18, 2023 |
| | 302 | The Dragons | Lark Orion HS, Lake Orion, MI | Tanay Patel | adambots.tanay@gmail.com | FIM District Jackson March 2-4, 2023 | FIM District Standish-Sterling March 16-18, 2023 |
| | 2224 | Renaissance RoboPhoenix | Renaissance HS, Detroit, MI | Dominic Lanni | domLanni55@gmail.com | FIM District Milford March 2-4, 2023 | FIM District Detroit March 16-18, 2023 |
| | 3096 | Village Bulldogs | East English Village Prep High School, Detroti, MI | Keith Buford | keith.buford@gm.com | FIM District Wayne State University March 10-12, 2023 | FIM District Detroit March 16-18, 2023 |
| | 3478 | LamBot | Technologico de Monterrey Campus, San Luis, Mexico | David Bustost<br>Bernardo Fernandez | david.bustost@gmail.com<br>bfl.1691@gmail.com | Regional Monterrey March 1-4, 2023 | Bayou Regional March 19-Aril 1, 2023 |
| | 4735 | DEROF | Torreon, Mexico | | | Regional Puebla March 15-18, 20232 | Regional Laguna March 22-25, 2023 |
| | 5213 | SHIELD | Lasalle HS, St. Ignace, MI | Andrew Long<br>Megan Lamb<br>Merlin Doran | along@eupschools.org<br>mlamb-sis@eupschools.org<br>merdoran@gmail.com | FIM District Escanaba March 2-4, 2023 | FIM District LSSU March 23-25, 2023 |
| | 5436 | Cyber Cats | Stoney Creek HS, Rochester Hills, MI | Lou Begin<br>Keith Rowland<br>Jason Dick<br>Jacob Russell<br>David Carlson | louis.begin@gm.com<br>keithgrowland@gmail.com<br>jason.robert.dick@gmail.com<br>jacob_24@live.com<br>dcarlson0806@gmail.com | FIM District Kettering #1 March 2-4, 2023 | FIM District Troy March 24-26, 2023 |
| | 6121 | RoboVikes | Grayling HS, Grayling, MI | Rick McBride<br>Janet McBride | rickmcbride7@gmail.com<br>janetmcbride3@gmail.com | FIM District Traverse City March 16-18, 2023 | FIM Distirct LSSU March 23-25, 2023 |
| | 6832 | STEAMex | Santa Catarina, Nuevo Leon, Mexico | Jesus Betancourt<br>Miguel Garcia<br>Grecia Pacheco | jafbetancourt@gmail.com<br>miangaro@hotmail.com<br>A01366730@tec.mx | Regional Monterrey March 1-4, 2023 | Green Country Regional April 5-8, 2023 |

# Resources on Adambots Website – www.adambots.com
# Resources Tab – Helpful Documents Section

https://www.adambots.com/resources/helpful-documents/game-rule-summaries/

https://www.adambots.com/resources/helpful-documents/technical%20training/

# Reminders

- Strategy helps inform design (know what we want to do and why before we design it)
- Form follows function – our design form should be based on the functions we want/need to perform
- Quality and robustness – Robot will need to withstand lots of impacts, and maybe some falls, for at least two tournaments and hopefully more
- Our team does not have all the experience we used to have, so we need each other and lots of communications, especially from student leads.

# Mentors support, student leaders, and drive team

- Mentors, please do what you can to be there to help the team, especially mechanical as they are here every nights and Saturday
- Student leadership is being evaluated again
  - If student leaders cannot show up and participate, they will be asked to step down and be replaced
  - Will need a few more leaders for Supply Chain, Field Build, and Mechanical and students will be contacted to see if they are interested and willing to take on these positions
- Drive team try outs and selection will start in a few weeks.  More will be communicated at team meetings by our Team Captain, Andy Priskorn

# Questions and Answers

Time for additional Q & A

Afterwards, will break out into smaller groups and head to robotics rooms for discussions