

Pandemic Pindown 2020

Game Manual

1.11 11/19/2020

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REVISION HISTORY

Nov 7 - Game Manual Released V1.0

Nov 10 - Game Manual Revision V1.1

- End of match pin value (after four pins) reduced from 20 to 15 points

Nov 19 - Game Manual Clarification V1.11

- Scoring table clarification: balls may be placed in the Quarantine Corner at any time during the match, but points are only awarded after the autonomous period *and* at the end of the match

1 - GAME SUMMARY

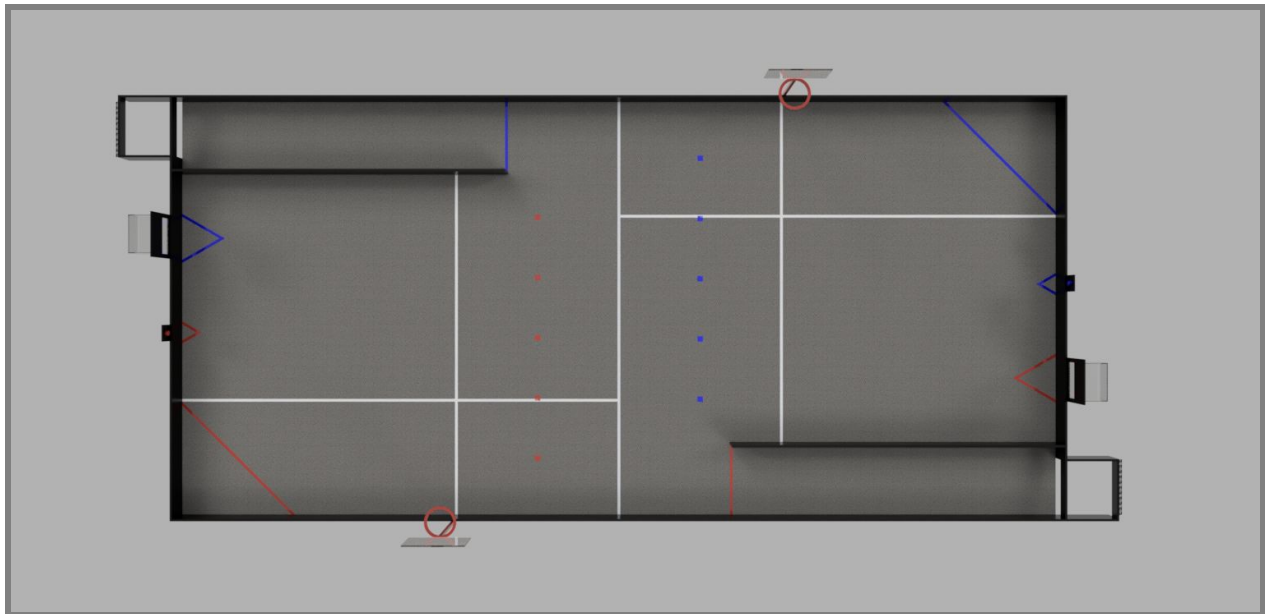
Pandemic Pindown is played on a standard size FRC field with two alliances of three teams each. The game is played with 80 [Skittles](#), 10 Bowling Balls, and 20 bowling pins. Alliances can score points by herding balls into alliance-specific [Quarantine Corners](#) or shooting them into Hoops. Bowling pins are earned after one Bowling Ball or three [Skittles](#) are successfully shot into the Hoops. Human players strategically place the pins to make it difficult for their opponents to knock down the pins with Bowling Balls during endgame.

2 - GAME SETUP

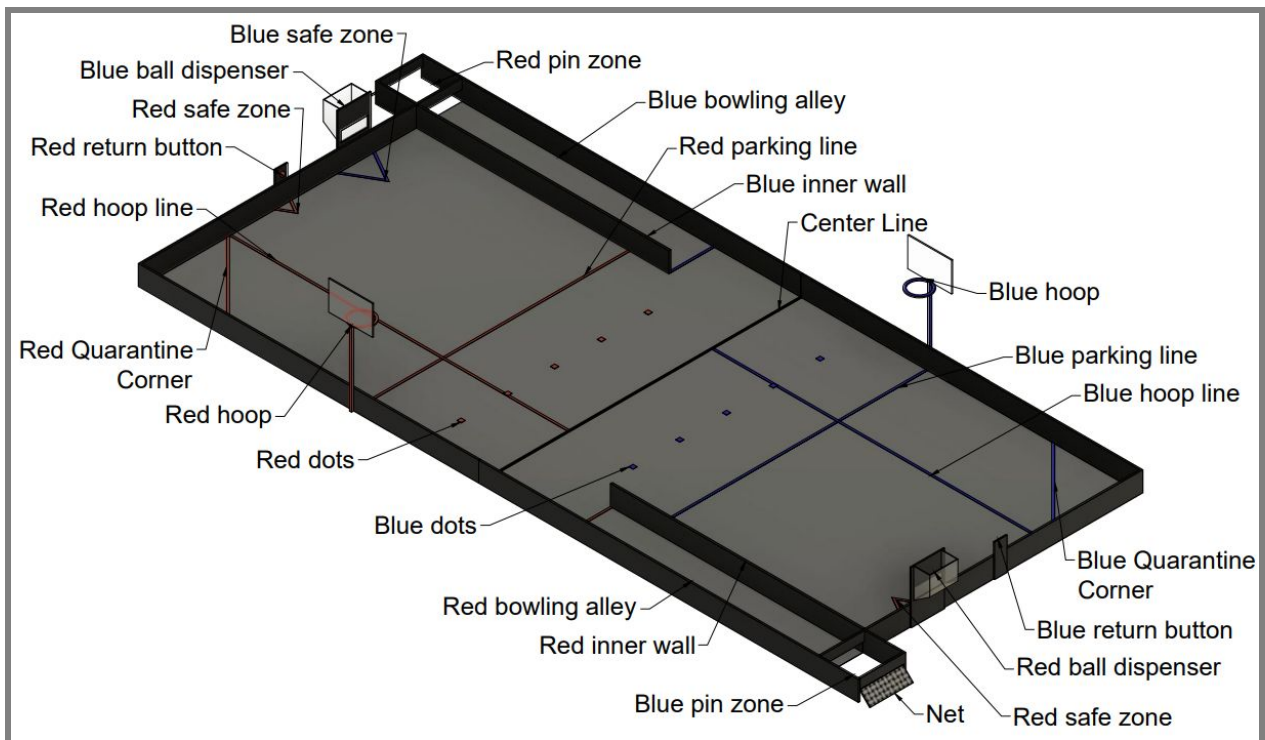
2.1 Field Information

The game is played on a standard FRC field. The center of the field is marked by 2" white gaffers tape. On each side there is a Return Button, Ball Return, Parking Line, [Quarantine Corner](#), Hoop, Hoop Line, and Bowling Alley.

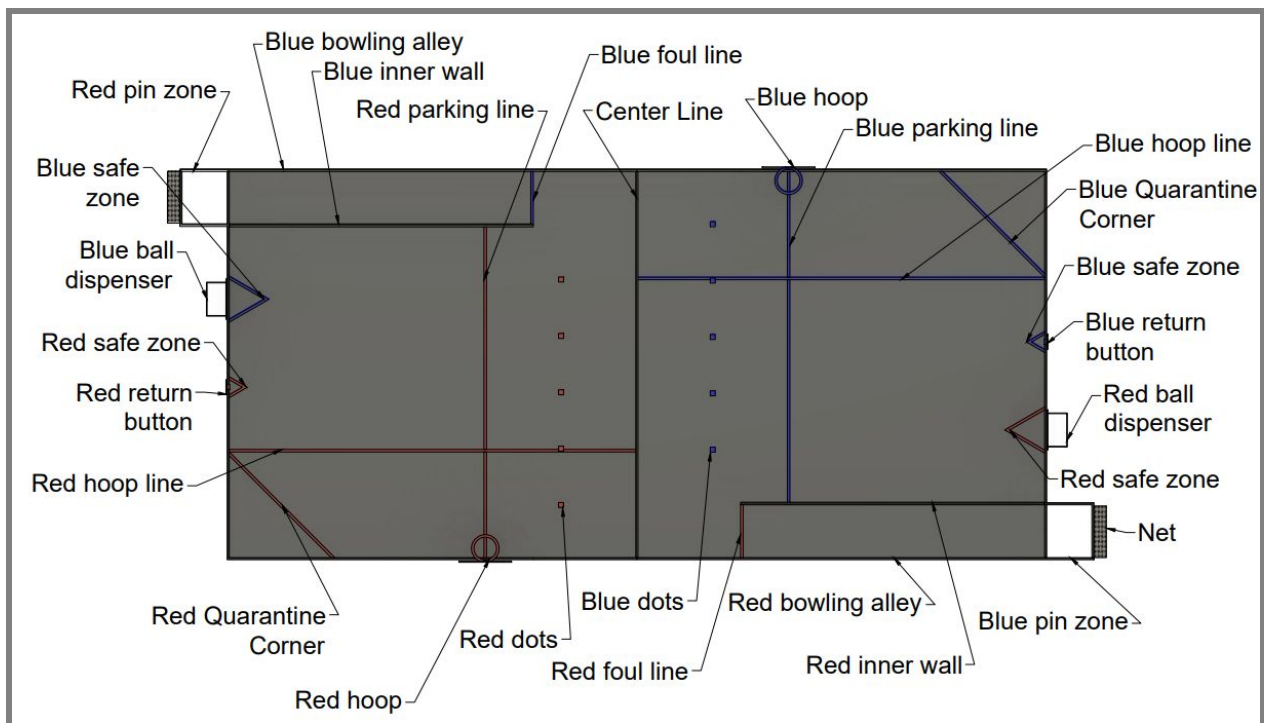
- The Parking Line (marked by 2" gaffers tape) is 202.75" from the alliance station wall
- The [Quarantine Corner](#) is a right-angle triangle with 7' legs (including tape) in the corner of each side of the field
- The Ball Return and Return Button have safe zone triangles in front of them which can only be entered by the corresponding alliance
- The Hoop is above the Parking Line on the same side as the [Quarantine Corner](#)
- The Bowling Alley runs along the wall across from the [Quarantine Corner](#)
- The Pin Zone (42" x 37.66") is located outside of the playing field at the end of the Bowling Alley for easy access for the human player. It has a net as the back wall. The Pin Zone will remain closed until endgame. A team's Pin Zone is on their alliance's side, so that the human player can place pins for the opponents to try to knock over
- The inner wall of the Bowling Alley raises 10" during endgame to function as a gutter
- Drive teams and their human players are on the side of the field with their [Quarantine Corner](#), Hoop, Pin Zone, and Return Button as well as their opponents' Bowling Alley and Ball Return
- See the CAD file for dimensions: <https://a360.co/3kWRjVy>
- All dimensions are in inches unless otherwise specified



▲ General view of field



▲ Isometric view of field

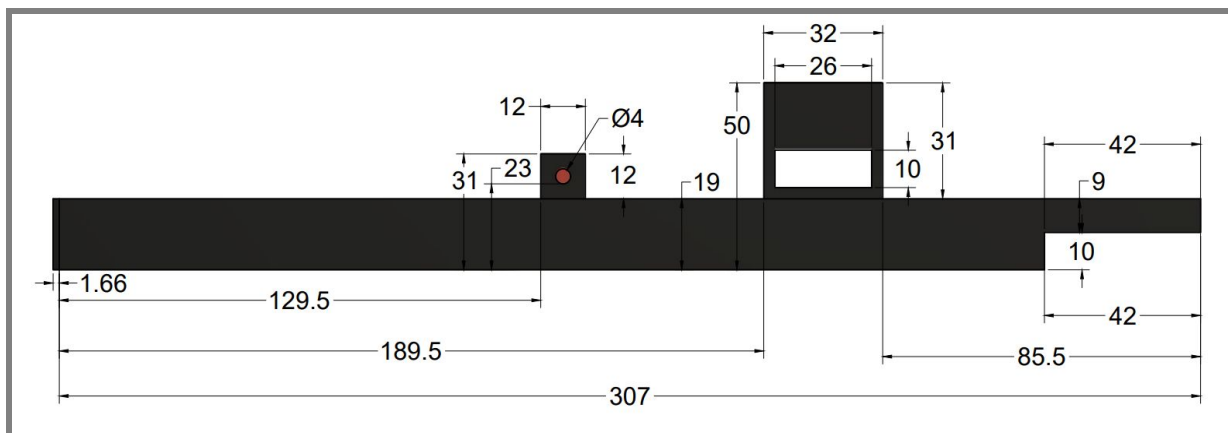


▲ Top view of playing field

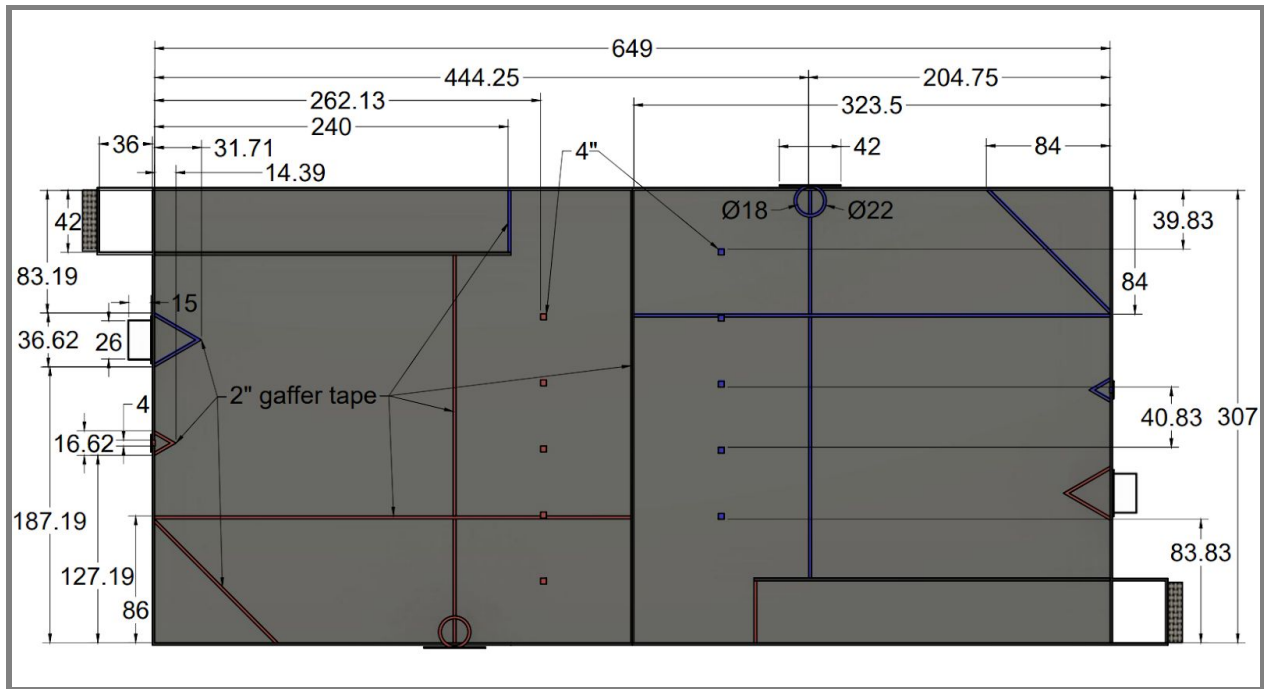
2.2 Starting

Every robot will begin the match with its bumpers at least partially touching their alliance station wall and completely outside of the Bowling Alley and the opposite alliance's ball return zone. These zones include the tape and anything above it.

Each robot can start with either one Bowling Ball or three [Skittles](#) with a maximum of two Bowling Balls per alliance. The rest of the Bowling Balls are placed on five dots evenly spaced between the outside edge of the Bowling Alley and the Hoop wall and midway between the Parking Line and centerline. During the match each robot may hold up to 2 Bowling Balls and 5 [Skittles](#). In addition, teams may choose to push more [Skittles](#).



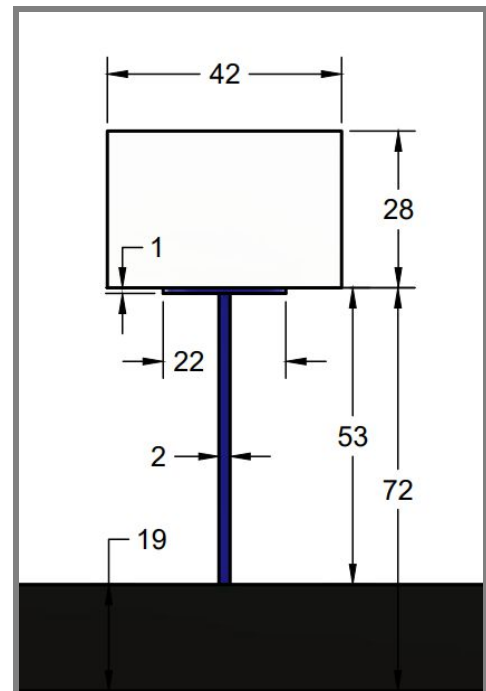
▲ Alliance wall dimensions



▲ Top view dimensions

2.3 Game Pieces

- There are a total of 10 Bowling Balls and 80 [Skittles](#)
- The 80 [Skittles](#) (40 on each side) will be stored in alliance-specific ball returns on the opposite side as each alliance driver station. There is a Return Button on each alliance station wall that will release approximately 20 [Skittles](#) each time the Button is pressed. Robots must wait at least 15 seconds in between pressing the Return Button
- [Bowling Balls](#) are the yellow 7" foam balls from "Infinite Recharge"
- [Skittles](#) are the [5" balls](#) from "FIRST Steamworks"
- [Bowling pins](#) are 11" tall and start in the human player station. There are a total of 20 (10 per alliance)



▲ Hoop dimensions

3 - AUTONOMOUS PERIOD

3.1 Scoring

The first 30 seconds of any *Pandemic Pindown* match is the autonomous period. During this period, robots may earn points using exclusively sensor data and pre-programmed instructions. Drivers may not interact with the robot during this period unless explicitly instructed to do so by referees.

- Robots earn 1 pin for every Bowling Ball successfully shot. Robots earn 15 autonomous points for each pin earned via this method
- Robots earn 1 pin for every 3 [Skittles](#) successfully shot. Robots earn 15 autonomous points for each pin earned via this method (up to 10 pins). Further sets of three [Skittles](#) during autonomous score a team 5 points
- Robots earn 10 autonomous points for being parked on the Parking Line at the end of the autonomous period
- Robots may press the Return Button once during autonomous to release balls for their alliance. Robots earn 15 autonomous points for pressing the Button. In addition, pressing the Button will release approximately 20 [Skittles](#) on the other side of the field
- Robots may transport balls into their [Quarantine Corner](#). 2 points are awarded for each [Skittle](#) inside of the [Quarantine Corner](#) at the end of autonomous, and additional points may also be awarded at the end of the match if balls remain in the corner
- Alliances who earn at least 60 autonomous points will receive 1 ranking point

All standard FIRST Robotics Competition autonomous rules apply unless otherwise stated.

4 - TELEOP SCORING

The teleop period is the two minutes after the autonomous period with a 30-second endgame, drivers are able to control their robot to earn points. All teleop scoring applies during endgame.

- Robots can earn 1 pin per successful Bowling Ball shot (up to 10 pins). After 10 pins, each subsequent Bowling Ball instead earns the robot 15 points
- Robots can earn 1 pin for every 5 [Skittles](#) shot (up to 10 pins). After 10 pins, each subsequent set of 5 [Skittles](#) instead earns the robot 5 points
- Robots can receive balls by pressing the Return Button, which releases approximately 20 balls onto the opposite end of the game field from the ball return. Robots must wait at least 15 seconds before pressing the Return Button again
- Robots can also herd [Skittles](#) into their [Quarantine Corner](#) for points awarded at the end of the match

5 - END GAME

The endgame is played in the last 30 seconds of every match. All Teleop scoring applies during the endgame. Teams roll Bowling Balls down their opponent's Alley in an attempt to knock over their opponent's pins. For each pin standing after the match, teams will receive 15 points. Alliances with four or more bowling pins standing by the end of the match will receive a **ranking point**.

Teams can also earn points by parking in their alliance's [Quarantine Corner](#) at the end of the match to gain 10 points.

6 - ROBOT RULES

All robots that participate in *Pandemic Pindown* must be built according to the robot rules. For more details, see the [Infinite Recharge rules](#) on robot construction.

- Bumpers are required for all robots built according to the Infinite Recharge rules (see pages 73-80). Bumpers are built using wood and pool noodles in order to provide protection for all teams
- Teams are not required to make a Bill of Materials (BOM) but it is encouraged for increasing the learning opportunity. Anything that is a part of the Kit of Parts does not need to be included in the final cost
- A robot's starting configuration may not have a frame perimeter greater than 120", and may not be more than 45" tall. For more information regarding robot sizing constraints and general robot design see Infinite Recharge rules (pages 65-67)
- A robot's vertical frame perimeter excludes bumpers and extends vertically from the drive base
- The robot may not weigh more than 125lbs. This is excluding bumper and battery weight
- For rules regarding, individual electrical and/or mechanical components, see Infinite Recharge rules (pages 81-98)

7 - SCORING SUMMARY

Action	Notes	Pins	Points	Ranking points
1 - Autonomous				
Parking Line	-	-	10	-
Bowling Ball	< 10 pins	1	15	-
	≥ 10 pins	-	-	-
Skittle	< 10 pins	1 per 3 balls	15 per 3 balls	-
	≥ 10 pins	-	5 per 3 balls	-
Button	-	-	15	-
Balls in Quarantine Corner	Per ball	-	2	-
2 - Teleop				
Bowling Ball	< 10 pins	1	-	-
	≥ 10 pins	-	15	-
Skittle	< 10 pins	1 per 5 balls	-	-
	≥ 10 pins		5 per 5 balls	-
3 - Endgame				
Parking (Quarantine Corner)	-	-	10	-
Standing Pins	Per pin	-	15	-
4 - End of Match				
Balls in Quarantine Corner	Per ball	-	2	-
Standing Pins	≥4 pins	-	-	1
60+ Autonomous points	-	-	-	1
Win	-	-	-	2
Tie	-	-	-	1

8 - PENALTIES

Teams can receive penalties for breaking match play rules, safety guidelines, and basic conduct rules. All team members should be familiar with the rules of the game.

Penalty Type	Result(s)	Other
Foul & Penalty Reference Chart		
Foul	3 points to opponent's match score	
Tech Foul	15 points to opponent's match score	
Yellow Card	Warning	Two or more may lead to a red card
Red Card	Disqualification from match	
Disabled	Robot is deactivated for match	
Disqualified	Zero points in qualification match	Zero points in alliance match

8.1 Safety Rules

S1. Dangerous robots are not allowed. (will be **disabled**)

- Uncontrolled motion that cannot be stopped by the drive team
- Robots dragging their battery
- Robots that consistently extend beyond the field

S2. Team members must wait for the green lights before entering the field. (**yellow card** if repeated, **red card** if egregious)

- Ignoring a warning not to enter the field
- Pushing past field reset person

S3. Always leave the field through the designated area. (**yellow card** if repeated)

- Do not step over the guardrail / field border
- Applies to entire team

S4. Robots and game pieces stay on the field during the match. (will be **disabled**)

- No intentional shooting outside of the field
- Robots cannot extend beyond the field

S5. Humans stay off the field during a match. (**red card**)

8.2 Gameplay Penalties

- G1.** Teams may not enable their robot on the field after a match has ended. (yellow card)
- G2.** Robots may not deliberately detach or leave parts on the field. (red card)
- G3.** During auto, the drive team cannot interact with robots or operating systems unless for personal/equipment safety. (foul or yellow card)
- G4.** Robots may not cross the ½ line during autonomous. (foul per event)
- no part of the robot can extend into the vertical volume created by the ½ line
- G5.** A robot cannot hold more than 5 Skittles and 2 Bowling Balls at any given time. (foul per game piece, tech foul if egregious)
- G6.** Robots cannot intentionally eject game pieces from the field. (foul per game piece)
- G7.** Robots cannot contact robots from the opposing alliance in their Quarantine Corner. (tech foul)
- G8.** 5-second limit on pinning. (foul)
- must wait 3 seconds before pinning again
 - robot is considered pinned until there is 6 feet between the robots
- G9.** Pinning for 15 or more seconds is a general violation. (yellow or red card)
- G10.** Two or more robots cannot block off major sections of the field. (tech foul per 5 seconds)
- one robot individually or multiple robots separately can take defensive positions
 - Robots of the same alliance may not block off access to Ball Returns, Quarantine Corners, Hoops, or Bowling Alleys
- G11.** Stay out of other robots. (foul)
- any component, including bumpers, extending beyond the frame perimeter may not contact anything within another robot's vertical frame perimeter
- G12.** Do not damage other robots. (tech foul and yellow card)
- damage within the frame perimeter of other robots is not permitted
 - components extended beyond the frame perimeter (bumper gaps) are not protected by this rule

G13. Robots may not damage, grab, or attach to any parts of the field or game with the exception of game pieces and the Return Button. (tech foul or yellow card)

G14. Robots may not interact with the Bowling Alley (tech foul)

- robots cannot enter the Alley or extend any component into the Alley
- robots may not deliberately put game pieces into the Alley besides bowling balls
- robots cannot interact with the pin box in any way

G15. Robots may not touch robots of the opposite alliance while they are in their Quarantine Corner. (foul)

G16. Robots cannot touch a robot on the opposing alliance which is in a safe zone. (foul)

- Safe zones also include the Quarantine Corner
- Robots can enter the opposing alliance's safe zone

G17. Robots cannot deliberately press the opposite alliance's Return Button. (tech foul)

8.3 Conduct Rules

C1. General Violations (yellow or red card)

- Jumping over the field border
- Playing with or damaging game pieces or field parts
- Inappropriate behavior
- Hiding or exceeding limits with game pieces

C2. Behavioral violations (yellow or red card)

- Assault (throwing an object and hitting someone, even if unintentional)
- Threat or harassment
- Bullying, insulting, or swearing at another person (physical/verbal)
- Yelling at another person in anger or frustration

C3. A team may not encourage an alliance or other team, of which it is not a part, to play beneath its ability. (possible yellow or red card)

C4. Show up at required matches. (if the robot has passed the initial inspection and does not show up at its match, the team gets a red card)

- at least one team member from the drive team must be present even if the robot can not compete

C5. Be safe and prompt when entering and leaving the field. (before match, robot will be disabled. After match, yellow card)

- arriving late or failing to leave before next match
- No major robot maintenance on the field (power tools, pneumatic charging, installing bumpers)

C6. The drive team and operating console must be in the designated player station.

8.4 Endgame Rules

E1. When bowling, robots must stay behind the Foul Line that marks the beginning of the Bowling Alley. (yellow card)

E2. Robots cannot enter the Bowling Alleys. (yellow card)

E3. Robots may block their opponent's Bowling Alley. (tech foul)

- Blocking is defined as preventing another robot from being able to bowl within three feet of the foul line for five or more seconds

E4. Bowling Balls must be shot under the wall of the Pin Zone in order for pins to be counted as down. If pins are knocked down by a Bowling Ball that was shot over the wall, all opponent pins earned during the match will be counted as standing.

9 - ADDITIONAL INFORMATION

[Infinite Recharge Rules](#) can be found here

Contact Information: wlhsfrc@gmail.com

Game Questions Google Form: <https://forms.gle/RDBA28EU2snZU3kq7>

Pandemic Pindown Google Group: <https://groups.google.com/g/pandemic-pindown>