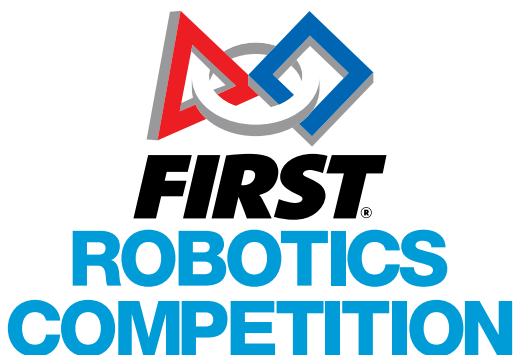


# 3

# Game

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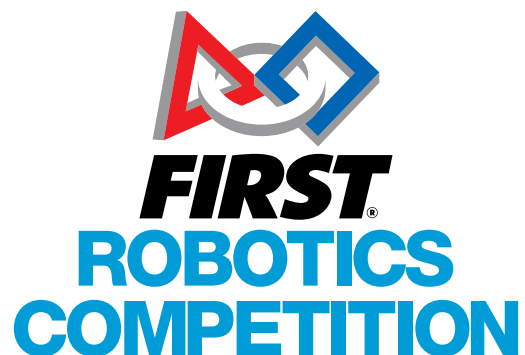


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# 3

## Game

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## 3 GAME

*FIRST STRONGHOLD<sup>SM</sup>* is a medieval tower defender game in which two (2) ALLIANCES of three (3) Teams each select DEFENSES to fortify their OUTER WORKS before competing simultaneously to score points while BREACHING the opponent's OUTER WORKS and CAPTURING the opponent's TOWER.

This chapter contains four sections: the first two describe the setup and play of the game, the third contains the point values for accomplishments, and the final section describes the detailed rules by which competitors must abide.

The *FIRST STRONGHOLD* manual is originally written in English, but is occasionally translated into other languages for the benefit of *FIRST* Robotics Competition Teams whose native language may not be English. In the event that a translation of a rule or description changes its meaning, it shall be enforced according to the English definition, as originally written.

### 3.1 MATCH Play

Details regarding MATCH timing and the process by which the OUTER WORKS are BREACHED and TOWERS are CAPTURED are defined in this section.

#### 3.1.1 DRIVE TEAM

Each Team competing in a MATCH (collectively known as the DRIVE TEAM) is composed of a maximum of four (4) persons consisting of:

- Two (2) DRIVERS, pre-college students who are primarily responsible for ROBOT operation,
- One (1) HUMAN PLAYER, a pre-college student who is primarily responsible for Game Piece management, and
- One (1) COACH, who is identified as the person wearing the designated “COACH” pin or button

#### 3.1.2 MATCH Timing

Each MATCH is two (2) minutes and thirty (30) seconds long. The Autonomous Period (AUTO) is the first fifteen (15) seconds of the MATCH in which ROBOTS operate without any DRIVE TEAM control or input. The Teleoperated Period (TELEOP) is the remaining two (2) minutes and fifteen (15) seconds of a MATCH in which ROBOTS may be directly controlled by DRIVERS and/or HUMAN PLAYERS.

#### 3.1.3 DEFENSES and the OUTER WORKS

The OUTER WORKS impede the passage of ROBOTS and BOULDERS into the COURTYARD. ROBOTS move BOULDERS across the OUTER WORKS into the COURTYARD one-at-a-time.

Each DEFENSE starts the MATCH with two (2) STRENGTH (a measure of progress towards the completion of an objective). Each time a DEFENSE is CROSSED by a ROBOT, its STRENGTH is decreased by one (1). When a DEFENSE'S STRENGTH reaches zero (0), the DEFENSE is DAMAGED. The STRENGTH of a DEFENSE is indicated by DEFENSE lighting as described in [Section 2 \(2.2.2.1 DEFENSES\)](#). Once four (4) out of an ALLIANCE'S five (5) DEFENSES have been DAMAGED, the ALLIANCE'S OUTER WORKS are BREACHED.

A DEFENSE is CROSSED by a ROBOT when that ROBOT

- starts free of contact with the DEFENSE and completely in the NEUTRAL ZONE
- traverses the DEFENSE such that its BUMPERS go fully between the adjacent SHIELDS/GUARDRAIL, and
- ends up fully contained by the opponent's COURTYARD.

ROBOTS can also receive AUTO points for REACHING a DEFENSE. A DEFENSE is REACHED when, at the end of the AUTO period, any part of a ROBOT's BUMPERS are within the opponent's OUTER WORKS. Once a ROBOT CROSSES a DEFENSE in AUTO, any additional REACHES or CROSSES by that ROBOT during the AUTO period will not decrease DEFENSE STRENGTH nor contribute points to the ALLIANCE.

If it is unclear whether a ROBOT has satisfied the requirements for CROSSING or REACHING a DEFENSE, the REFEREES are instructed to not award credit. As such, DRIVE TEAMS should make it very clear that their ROBOT has met the criteria for CROSSING or REACHING a DEFENSE.

A BREACH of the opposing ALLIANCE'S OUTER WORKS earns the ALLIANCE one (1) Ranking Point during Qualification MATCHES (see [Section 5 \(5.3.3 Ranking Score \(RS\)\)](#)) or match points during Playoff MATCHES.

### 3.1.4 The TOWER

A BOULDER is scored in a GOAL if it passes through the opening of a GOAL and exits into the CORRAL.

If a BOULDER becomes jammed in the TOWER, credit for the jammed BOULDER(S) will be granted in the period in which the BOULDER(S) became stuck.

Each TOWER starts the MATCH with eight (8) STRENGTH. Each BOULDER scored in a GOAL decreases the TOWER'S STRENGTH by one (1). A TOWER is WEAKENED if the TOWER'S STRENGTH is at or below zero (0). The STRENGTH of a TOWER is indicated by TOWER lighting as described in [Section 2 \(TOWER\)](#).

As the season progresses, TOWERS may become fortified to increase their starting STRENGTH. While the starting STRENGTH of a TOWER will not change between weeks of Regional or District Competition play, the starting STRENGTH of a TOWER may be changed for District Championship and/or FIRST Championship play. Teams will be notified of changes in the starting STRENGTH of a TOWER no later than the scheduled Team Update prior to the date of the event.

A ROBOT has CHALLENGED the TOWER if, at the conclusion of the MATCH, the ROBOT is fully supported by the TOWER, but hasn't met the criteria for SCALING the TOWER.

Support is transitive through other objects. For example, if a BOULDER is fully supported by the BATTER, and a ROBOT is supported only by the BATTER and the BOULDER, the ROBOT is still considered fully supported by the TOWER.

A ROBOT has SCALED the TOWER if, at the conclusion of the MATCH, the ROBOT:

- A. is in contact with a unique RUNG, and
- B. has all of its BUMPERS fully above the height of the low GOALS.

The GOAL openings are not designed to be weight bearing surfaces. Using these elements to SCALE the TOWER is not only in violation of G12, but is also subject to an additional YELLOW CARD for egregious ROBOT behavior as described in the final paragraph of [Section 3.3.2 Penalty Assignment](#).

A TOWER is CAPTURED if, at the conclusion of the MATCH:

- A. the TOWER is WEAKENED, and
- B. the TOWER is surrounded such that each of the three (3) opponent ROBOTS has SCALED or CHALLENGED a unique face of the TOWER

A ROBOT has SCALED or CHALLENGED a unique face of the TOWER if it is the only ROBOT in contact with the attached RUNG and/or associated third of the BATTER below (i.e. a ROBOT may extend over the divider into the space of another face as long as it is not in contact with the RUNG or BATTER in front of that face).

CAPTURING the opponent's TOWER earns the ALLIANCE one (1) Ranking Point during Qualification MATCHES (see [Section 5 \(5.3.3 Ranking Score \(RS\)\)](#)) or MATCH points during Playoff MATCHES.

## 3.2 MATCH Logistics

When a DRIVE TEAM loads their ROBOT onto the FIELD for a MATCH they may elect to:

- A. pre-load one (1) BOULDER in or on their ROBOT such that the BOULDER is fully supported by their ROBOT, or
- B. transfer their BOULDER to a HUMAN PLAYER in their CASTLE.

BOULDERS that exit the FIELD over a GUARDRAIL during a MATCH are placed back into the FIELD approximately at the point of exit by FIELD STEWARDS (REFEREES, FTAs, or other staff working around the FIELD) at the earliest safe opportunity. BOULDERS that exit the FIELD over a CASTLE WALL during a MATCH are returned to the COURTYARD at the corner of the GUARDRAIL and CASTLE by FIELD STEWARDS at the earliest safe opportunity. BOULDERS that exit the FIELD through the CASTLE (including the holes in the HUMAN PLAYER STATION) belong to the ALLIANCE.

Note that ROBOTS may not deliberately cause BOULDERS to leave the FIELD (see [G42](#)).

If a BOULDER becomes stuck within the TOWER, FIELD STEWARDS will free the BOULDERS at the earliest safe opportunity. Damaged BOULDERS will not be replaced until the next FIELD reset period. DRIVE TEAMS should alert the FIELD STEWARDS to any damaged BOULDERS prior to the start of the MATCH. There will not be an ARENA fault called for MATCHES that accidentally begin with damaged game elements.

## 3.3 Scoring

During AUTO, points are earned by ROBOTS that REACH or CROSS a DEFENSE and score BOULDERS in GOALS. During TELEOP, points are earned by ROBOTS CROSSING undamaged DEFENSES, scoring BOULDERS in GOALS, and CHALLENGING or SCALING the opponent's TOWER.

### 3.3.1 Point Values

Point values for the tasks in *FIRST STRONGHOLD* are detailed in [Table 3-1: Point Values](#).

Table 3-1: Point Values

Action	AUTO	TELEOP		Qual.	Playoff
REACHING a DEFENSE	2	-		-	-
CROSSING an UNDAMAGED DEFENSE	10	5		-	-
BOULDER in Low TOWER GOAL	5	2		-	-
BOULDER in High TOWER GOAL	10	5		-	-
CHALLENGE (per ROBOT)	-	5		-	-
SCALE (per ROBOT)	-	15		-	-
BREACH	-	-		1 RP	20
CAPTURE	-	-		1 RP	25

All scores are assessed and updated throughout the MATCH.

The final assessment of BOULDERS scored in GOALS is made five (5) seconds after the ARENA timer displays zero (0) following TELEOP.

The final assessment of ROBOTS having SCALED or CHALLENGED the TOWER is made five (5) seconds after the ARENA timer displays zero (0), or when all ROBOTS have come to rest following the conclusion of the MATCH, whichever happens first.

### 3.3.2 Penalty Assignment

Upon a rule violation, one or more of the penalties listed in [Table 3-2: Penalties](#) will be assessed.

Table 3-2: Penalties

Action	Penalty
FOUL	5 points credited towards the opponent's total score.
TECH FOUL	FOUL + STRENGTH of opponent's TOWER is increased by one (1)
YELLOW CARD	A warning issued by the Head REFEREE for egregious ROBOT or <i>FIRST</i> Robotics Competition Team member behavior or repeated rule violations. A subsequent YELLOW CARD within the same tournament phase will lead to a RED CARD.
RED CARD	A penalty assessed for egregious ROBOT or <i>FIRST</i> Robotics Competition Team member behavior, or repeated rule violations, which results in a Team being DISQUALIFIED for the MATCH.
DISABLED	ROBOT will be commanded to deactivate all outputs, rendering the ROBOT inoperable for the remainder of the MATCH.

Although the FIELD lights will only show a maximum STRENGTH equal to the starting STRENGTH and a minimum STRENGTH equal to zero, there is no maximum or minimum STRENGTH for a TOWER.

For example, if a Red ROBOT violates a rule that results in the ALLIANCE'S first TECH FOUL, but the Blue TOWER has not yet been scored upon, the Blue TOWER'S STRENGTH will be nine (9), one (1) higher than indicated by the FIELD lights.



In addition to rule violations explicitly listed in [Section 3.4 Rules](#), the Head REFEREE may assign a YELLOW or RED CARD as a result of egregious ROBOT actions or Team member behavior at the event, per [Section 5 \(5.5.4 YELLOW and RED CARDS\)](#).

## 3.4 Rules

The rules in this section legislate game play and define the consequences for rule violations as enforced by the REFEREES.

### 3.4.1 Safety Rules

**G1** ROBOTS whose operation or design is dangerous or unsafe are not permitted.

*Violation: If before the MATCH, the offending ROBOT will not be allowed to participate in the MATCH. If during the MATCH, the offending ROBOT will be DISABLED.*

Examples include, but are not limited to:

- A. Uncontrolled motion that cannot be stopped by the DRIVE TEAM
- B. ROBOT parts “flailing” outside of the FIELD
- C. ROBOTS dragging their battery
- D. ROBOTS that consistently extend beyond the FIELD

**G2** DRIVE TEAMS may only enter the FIELD if the PLAYER STATION LED strings are green, unless explicitly instructed by a REFEREE or an FTA.

*Violation: YELLOW CARD*

**G3** ROBOTS and anything they control, e.g. a BOULDER, may not contact anything outside the FIELD with the exception of brief incursions into the GOALS.

*Violation: Offending ROBOT will be DISABLED*

Please be conscious of SPIES, REFEREES, and FIELD STEWARDS working around the ARENA who may be in close proximity to your ROBOT.

**G4** DRIVE TEAMS may not extend any body part into the FIELD during the MATCH. Momentary encroachment through the hole in the HUMAN PLAYER STATION behind the BRATTICE while placing a BOULDER into that hole is an exception to this rule.

*Violation: FOUL. Violations of this rule are likely to escalate to YELLOW or RED CARDS rapidly (i.e. the threshold for egregious or repeated violations is relatively low)*

Examples of egregious violations include, but are not limited to, walking onto the FIELD during a MATCH or intentionally reaching into the FIELD and grabbing a ROBOT during a MATCH.

**G5** DRIVE TEAMS may not climb over, step over, or walk over/across DEFENSES or PLATFORMS, with the exception that teams may carefully step on DEFENSES or PLATFORMS in order to remove the robot from the DEFENSE.

*Violation: YELLOW CARD*

**G6** DRIVE TEAMS may only enter or exit the FIELD through open gates.

*Violation: YELLOW CARD*

### 3.4.2 Pre and Post-MATCH

**G7** When placed on the FIELD for a MATCH, each ROBOT must be:

- A. in compliance with all ROBOT rules, i.e. has passed Inspection (for exceptions regarding Practice MATCHES, see [Section 5 \(5.5.2 Eligibility and Inspection\)](#)),
- B. not in contact with a BOULDER staged on the MIDLINE,
- C. the only item left on the FIELD by the DRIVE TEAM,
- D. confined to its STARTING CONFIGURATION,
- E. fully contained by the opposite half of the FIELD from their TOWER, and
  - i. breaking the plane of the AUTO LINE, or
  - ii. inside the COURTYARD, in contact with both the CASTLE WALL and GUARDRAIL. Only one (1) ROBOT per ALLIANCE, known as the “spy bot,” is allowed to start each MATCH in this position.

*Violation: If fix is a quick remedy, the MATCH won't start until all requirements are met. If it is not a quick remedy the offending ROBOT will be DISABLED and, at the discretion of the Head REFEREE, must be re-inspected.*

If a ROBOT is BYPASSED prior to the start of the MATCH, the DRIVE TEAM may not remove the ROBOT from the FIELD without permission from the Head REFEREE or the *FIRST* Technical Advisor (FTA).

**G8** DRIVE TEAMS may not cause significant or repeated delays to the start of a MATCH and/or to the FIELD reset at the conclusion of the MATCH.

*Violation: If prior to the MATCH, the offending DRIVE TEAM'S ROBOT will be DISABLED. If after the MATCH, YELLOW CARD*

DRIVE TEAMS are expected to stage their ROBOTS for a MATCH, and remove it from the FIELD afterwards, safely and swiftly. DRIVE TEAM efforts that either intentionally or unintentionally delay the start of a MATCH or the FIELD reset are not allowed. Examples include, but are not limited to:

- A. Late arrival to the FIELD
- B. Failing to exit the FIELD once the PLAYER STATION LED strings have turned off (indicating MATCH ready)
- C. Installing bumpers, charging pneumatic systems, or any other ROBOT maintenance, once on the FIELD
- D. Use of alignment devices that are external to the ROBOT
- E. Failing to remove OPERATING CONSOLES from the PLAYER STATIONS in a timely manner

**G9** DRIVE TEAMS must be in their CASTLE and behind the STARTING LINE prior to the start of the MATCH, with the exception of one (1) DRIVER or HUMAN PLAYER per ALLIANCE who may elect to start in the SPY Box as outlined in [Section 2 \(2.1 Zones & Markings\)](#).

*Violation: MATCH will not start until the situation is corrected*



- G10** ROBOTS will not be re-enabled after the conclusion of the MATCH, nor will Teams be permitted to tether to the ROBOT except in special circumstances (e.g. during TIMEOUTS, after Opening Ceremonies, etc.) and with the express permission from the FTA or a REFEREE.

*Violation: YELLOW CARD*

Tethering includes any wired or wireless connection used to electrically energize and/or control elements on the ROBOT. The safety of Teams and FIELD STEWARDS in close proximity to ROBOTS and ARENA elements on the FIELD is of the utmost importance, therefore ROBOTS or ROBOT COMPONENTS may not be energized or powered in any way on the FIELD once the match has concluded.

### 3.4.3 General Rules

- G11** Strategies aimed solely at forcing the opposing ALLIANCE to violate a rule are not in the spirit of FIRST Robotics Competition and not allowed. Rule violations forced in this manner will not result in an assignment of a penalty to the targeted ALLIANCE.

*Violation: FOUL. If egregious or repeated, YELLOW CARD*

G11 does not apply for strategies consistent with standard gameplay, e.g. a TEAM obtaining a BOULDER from their SECRET PASSAGE, CROSSING an opponent DEFENSE, etc. G11 requires an intentional act with limited or no opportunity for the TEAM being acted on to avoid the penalty. Examples include:

- A. A Blue ROBOT, with twenty (20) seconds left in the MATCH, is parked in front of the middle face of the Blue TOWER. A Red ROBOT, attempting to SCALE that face, runs into the blocking Blue ROBOT. This results in a violation of G28 by the Blue ROBOT. Because the Red ROBOT was not solely making an attempt to cause that Blue ROBOT to violate G28, but rather to complete a Game Action (a SCALE), they are not in violation of G11.
- B. A Red ROBOT is parked in the NEUTRAL ZONE near the Blue SECRET PASSAGE. A Blue ROBOT pushes the Red ROBOT into the Blue SECRET PASSAGE, then drives away. There is no violation of G21 by the Red ROBOT, as the Red ROBOT was forced by the Blue ROBOT into the SECRET PASSAGE. The Blue ROBOT has violated G11 by forcing the Red ROBOT into the SECRET PASSAGE for the sole purpose of causing them to violate G21.
- C. A Red ROBOT is parked completely within the Blue SECRET PASSAGE. A Blue ROBOT, attempting to reach the Blue BRATTICE, makes contact with the Red ROBOT. The Red ROBOT receives a G21 penalty. There are no violations of G11 because the Blue ROBOT was trying to access their BRATTICE and not solely trying to cause the Red ROBOT to violate G21.

- G12** The following actions are prohibited with regards to interaction with ARENA elements (items A-E exclude any DEFENSE, RUNGS, and BOULDERS)

- A. Grabbing
- B. Grasping
- C. Attaching to (including the use of hook-and-loop tape against the FIELD carpet)
- D. Grappling
- E. Hanging
- F. Becoming entangled
- G. Damaging

*Violation: FOUL. If the Head REFEREE determines that further damage is likely to occur, offending ROBOT will be DISABLED. Corrective action (such as eliminating sharp edges, removing the damaging MECHANISM, and/or re-Inspection) may be required before the ROBOT will be allowed to compete in subsequent MATCHES.*

BOULDERS are expected to undergo a reasonable amount of wear and tear as they are handled by ROBOTS, such as scratching or marking. Gouging, tearing off pieces, or routinely marking BOULDERS will be considered in violation of this rule.

**G12-1** ROBOTS may not use FIELD elements, e.g. BOULDERS, to interfere with the operation of other FIELD elements, e.g. DEFENSES.

*Violation: FOUL. For every five (5) seconds in which the situation is not corrected, FOUL*

### 3.4.4 AUTO Rules

**G13** During AUTO, ROBOTS may not enter the volume above the MIDLINE.

*Violation: FOUL. If contact is made with an opponent ROBOT beyond the MIDLINE, an additional FOUL is assessed and the opponent ROBOT is immediately awarded the CROSSING of the closest DEFENSE from the point of contact.*

**G14** During AUTO, DRIVE TEAMS may not directly or indirectly interact with ROBOTS or OPERATOR CONSOLES unless for personal safety, OPERATOR CONSOLE safety, or pressing an E-Stop for ROBOT safety.

*Violation: FOUL and YELLOW CARD*

**G15** During AUTO, DRIVE TEAM members in the CASTLE may not contact anything in front of the STARTING LINE, unless for personal or equipment safety.

*Violation: FOUL*

Pointing, gesturing or otherwise extending across the STARTING LINE such that contact is not made with carpet or other ARENA elements is not a violation of this rule.

**G16** Any control devices worn or held by the DRIVERS and/or HUMAN PLAYERS during AUTO must be disconnected from the OPERATOR CONSOLE.

*Violation: FOUL*

### 3.4.5 ROBOT Rules

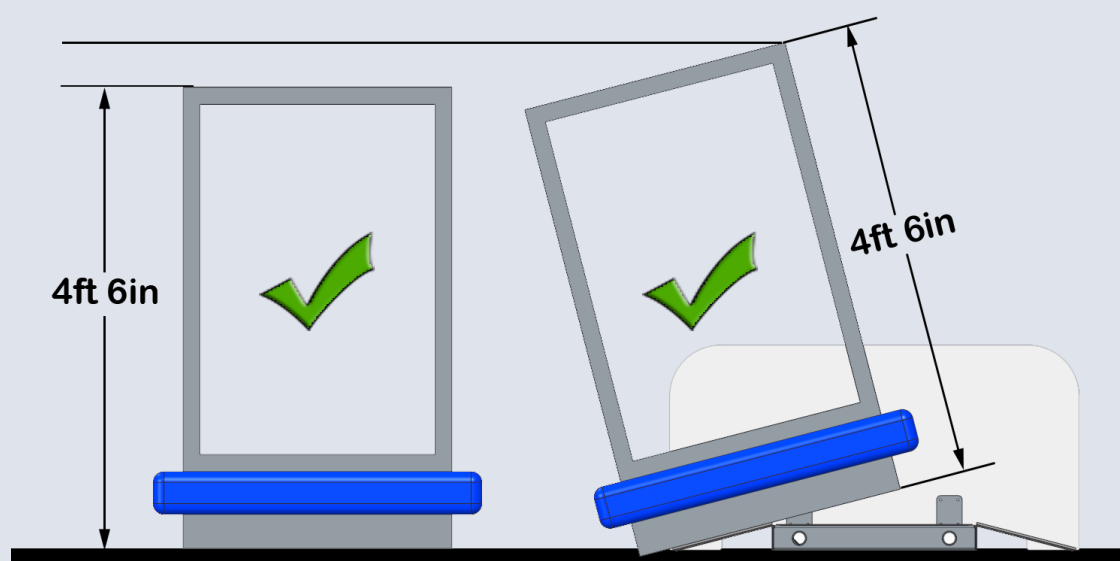
- G17** ROBOT height, as measured when it's resting normally on a flat floor, may not exceed 4 ft. 6 in. during the MATCH, except during the final twenty (20) seconds of TELEOP where there is no height limit when a ROBOT is fully contained by the opponent's COURTYARD.

*Violation: FOUL. If strategic, offending ROBOT will be DISABLED.*

This measurement is intended to be made as if the ROBOT is resting on a flat floor, not relative to the height of the ROBOT from the FIELD carpet.

For example, a ROBOT that is at an angle while traversing a DEFENSE may actually exceed the height limit when compared to the carpet of the FIELD.

Figure 3-1: ROBOT Height



Teams should be mindful of safety if designing their ROBOTS to extend beyond the height of the CASTLE WALL.

- G18** ROBOTS may not extend more than 15 in. beyond their FRAME PERIMETER.

*Violation: FOUL. If repeated, offending ROBOT will be DISABLED.*

- G19** ROBOTS may not intentionally detach or leave parts on the FIELD.

*Violation: RED CARD*

This rule is not intended to penalize ROBOTS that encounter accidental breakage (e.g. a failed MECHANISM that falls off), as those actions are not intentional.

- G19-1** ROBOTS must be in compliance with [Section 4 \(4.7 BUMPER Rules\)](#) throughout the MATCH.

*Violation: DISABLED*

### 3.4.6 ROBOT to ROBOT Interaction

- G20** ROBOTS may only enter or exit their opponent's SECRET PASSAGE from/to the opponent's COURTYARD. A ROBOT is considered to be within the SECRET PASSAGE once the only carpet the ROBOT is in contact with is the carpet inside the SECRET PASSAGE.

*Violation: FOUL. If repeated, TECH FOUL*

- G21** A ROBOT contacting carpet in the opponent's SECRET PASSAGE may not contact opposing ROBOTS, regardless of who initiates the contact.

*Violation: TECH FOUL*

TEAMS should take note that they are putting themselves at great risk for TECH FOULS if they choose to enter their opponent's SECRET PASSAGE

- G22** ROBOTS may not pin an opponent's ROBOT for more than five (5) seconds. A ROBOT will be considered pinned until the ROBOTS have separated by at least six (6) feet. The pinning ROBOT(s) must then wait for at least three (3) seconds before attempting to pin the same ROBOT again. Pinning is transitory through other objects. If the pinned ROBOT chases the pinning ROBOT upon retreat, the pinning ROBOT will not be penalized, and the pin will be considered complete.

*Violation: FOUL. For every five (5) seconds in which the situation is not corrected, FOUL. If extended and egregious, RED CARD*

- G23** Fallen (i.e. tipped over) ROBOTS attempting to right themselves (either by themselves or with assistance from a partner ROBOT) have one ten (10) second grace period in which they may not be contacted by an opponent ROBOT. This protection lasts for either ten (10) seconds or until the protected ROBOT has completed the righting operation, whichever comes first.

*Violation: FOUL. If intentional, YELLOW CARD*

- G24** Strategies aimed at the destruction or inhibition of ROBOTS via attachment, damage, tipping, or entanglements are not allowed.

*Violation: FOUL and YELLOW CARD. If harm or incapacitation occurs as a result of the strategy, RED CARD*

Initiating deliberate or damaging contact with an opponent ROBOT on or inside the vertical extension of its FRAME PERIMETER is not allowed.

### 3.4.7 ROBOT Gameplay

- G25** A ROBOT may not attempt to stop or impede the flow of the MATCH in any of the following ways:

- A. intentionally tipping over
- B. coordinating a blockade of the FIELD with ALLIANCE members
- C. blocking GOAL(S) while in contact with its own BATTER using anything outside its FRAME PERIMETER

*Violation: YELLOW CARD for the ALLIANCE*

An example of a blockade would be two (2) or more ROBOTS on the same ALLIANCE working together to "box" an opponent ROBOT into a corner of the FIELD using the GUARDRAIL and the CASTLE WALL.

A single ROBOT blocking access to a particular DEFENSE is not considered impeding the flow of the MATCH.

- G26** At any given time, only one (1) ROBOT may contact the carpet or BATTER inside their COURTYARD.  
*Violation: FOUL. For every five (5) seconds in which the situation is not corrected, TECH FOUL*
- G27** A ROBOT may not transfer BOULDERS from the NEUTRAL ZONE to the opponent's SECRET PASSAGE.  
*Violation: TECH FOUL per BOULDER*
- G28** During the final twenty (20) seconds of TELEOP, ROBOTS in their COURTYARD may not contact an opponent ROBOT.  
*Violation: The contacted ROBOT is considered to have SCALED an open side of the TOWER at the end of the MATCH.*

Teams are encouraged to consider rule [G11](#) when developing their strategies, such as attempting to draw violations of this rule.

The ARENA will play a warning sound when thirty (30) seconds remain in TELEOP as a reminder that violations for this rule will soon be enforced. When twenty (20) seconds remain in TELEOP, an additional sound will be played.

### 3.4.8 Human Actions

- G29** During a MATCH, DRIVE TEAMS may not use electronic devices which have the capability of receiving communications from persons outside of the CASTLE (e.g. cell phones or wearable technology).  
*Violation: YELLOW CARD*
- G30** Only DRIVE TEAMS for the current MATCH are allowed in their respective CASTLES.  
*Violation: MATCH will not start until the situation is corrected. Those not displaying identification must leave the ARENA.*
- G31** DRIVE TEAMS must wear proper identification while in the ARENA. Proper identification consists of:
- A. All DRIVE TEAM members wearing their designated buttons above the waist in a clearly visible location at all times while in the ARENA.
  - B. The COACH wearing the identification button bearing the contrasting colored dot.
  - C. During a Playoff MATCH, the ALLIANCE CAPTAIN clearly displaying the designated ALLIANCE CAPTAIN identifier (e.g. hat or armband).
- Violation: MATCH will not start until the situation is corrected. Those not displaying identification must leave the ARENA.*
- G32** Teams may not interfere with any automated scoring hardware.  
*Violation: RED CARD for the ALLIANCE*

Examples of violations of this rule include, but are not limited to, tampering with the sensors, blocking BOULDERS from exiting the TOWER, or attempting to feed BOULDERS backwards through a TOWER.



**G33** BOULDERS may only be introduced to the FIELD

- A. during TELEOP,
- B. by a DRIVER or HUMAN PLAYER, and
- C. through one of the holes in the HUMAN PLAYER STATION.

*Violation: FOUL per BOULDER*

**G34** No more than six (6) BOULDERS may remain in a CASTLE at any time. If the BOULDER count ever exceeds six (6), excess BOULDERS must be introduced to the FIELD immediately.

*Violation: FOUL per excess BOULDER*

**G35** A ROBOT shall be operated solely by the DRIVER and/or HUMAN PLAYERS of that Team.

*Violation: Offending ROBOT will be DISABLED*

Exceptions may be made before a MATCH for major conflicts, e.g. religious holidays, major testing, transportation issues, etc.

**G36** COACHES may not touch BOULDERS unless for safety purposes.

*Violation: FOUL*

**G37** DRIVE TEAM members may not contact anything outside the zone in which they started the MATCH (either the CASTLE or SPY box) for the duration of the MATCH, unless for personal safety.

*Violation: FOUL. If strategic (i.e. for a net points gain), RED CARD for the ALLIANCE.*

### 3.4.9 BOULDER Rules

**G38** ROBOTS may not control more than one (1) BOULDER at any time.

*Violation: FOUL per extra BOULDER*

Moving or positioning a BOULDER to gain advantage is considered “control.”

Examples include, but are not limited to:

- A. “carrying” (holding BOULDERS inside a ROBOT)
- B. “herding” (intentionally pushing or impelling BOULDERS to a desired location or direction)
- C. “trapping” (holding one or more BOULDERS against a FIELD element in an attempt to shield or guard them)
- D. “launching” (shooting BOULDERS into the air or throwing in a forceful way)

Examples of interaction with BOULDERS that are not “control” include, but are not limited to:

- A. “bulldozing” (inadvertent contact with BOULDERS while in the path of the ROBOT moving about the FIELD)
- B. “deflecting” (being hit by a BOULDER that bounces into or off of a ROBOT).

If a BOULDER becomes lodged in or on a ROBOT, it will be considered controlled by the ROBOT. It is important to design your ROBOT so that it is impossible to inadvertently or unintentionally control more than the allowed maximum.

**G39** ROBOTS are prohibited from launching BOULDERS unless they are in contact with the opponent’s TOWER or carpet in the opponent’s COURTYARD, and not in contact with any other carpet.

*Violation: TECH FOUL per BOULDER*

Actions such as “carrying”, “herding”, and “trapping” are not violations of this rule.

**G40** A ROBOT may not cause a BOULDER to move from the NEUTRAL ZONE into the opponent’s COURTYARD unless:

- A. the ROBOT contacts the BOULDER within OUTER WORKS, and
- B. the ROBOT completes its CROSSING (i.e. doesn’t completely back out of the OUTER WORKS into the NEUTRAL ZONE)

*Violation: TECH FOUL per BOULDER*

Examples meeting the requirements of this rule include, but are not limited to:

- A. A ROBOT picks up a BOULDER in the NEUTRAL ZONE, and CROSSES a DEFENSE carrying the BOULDER
- B. A ROBOT, starting in the NEUTRAL ZONE, bumps a BOULDER through a DEFENSE, contacting the BOULDER within the OUTER WORKS at least once. The ROBOT then completes the CROSSING itself.

Examples NOT meeting this rule include, but are not limited to:

- A. A ROBOT fully in the NEUTRAL ZONE lobs a boulder over a DEFENSE, then CROSSES a DEFENSE (this violates the rule because the ROBOT did not contact the BOULDER within OUTER WORKS)
- B. A ROBOT fully in the NEUTRAL ZONE rolls a BOULDER over a DEFENSE, then CROSSES a DEFENSE (this violates the rule because the ROBOT did not contact the BOULDER within OUTER WORKS)
- C. A ROBOT attempts to CROSS a DEFENSE with a BOULDER, drops the BOULDER so it rolls into the opponent's COURTYARD, backs fully out of the OUTER WORKS to get a running start, then CROSSES a DEFENSE (this violates the rule because the ROBOT completely backed out of OUTER WORKS into the NEUTRAL ZONE)

**G41** During each CROSSING, a ROBOT may not cause more than one (1) BOULDER to move from the NEUTRAL ZONE into the opponent's COURTYARD.

*Violation: TECH FOUL per additional BOULDER*

For example, if a Red ROBOT is CROSSING the Blue OUTER WORKS and a Blue ROBOT causes a BOULDER to bounce off of the Red ROBOT and through the OUTER WORKS, there is no violation of this rule as the action was caused by the Blue ROBOT.

**G42** ROBOTS may not intentionally eject BOULDERS from the FIELD other than through the GOALS.

*Violation: FOUL per BOULDER ejected*

### 3.4.10 DEFENSE Rules

**G43** ROBOTS on the same half of the FIELD as their ALLIANCE TOWER may not interfere with opponent ROBOTS attempting to traverse OUTER WORKS (regardless of direction). A ROBOT is considered traversing the opponent's OUTER WORKS if any part of its BUMPERS are within the opponent's OUTER WORKS.

*Violation: FOUL. For every five (5) seconds in which the situation is not corrected, FOUL*

Interference includes, but is not limited to, pushing, bumping, or restricting a ROBOT trying to traverse their opponent's OUTER WORKS or obstructing the operation of a DEFENSE (such as holding the Sally Port doors closed).

This rule protects a ROBOT so long as their BUMPERS are within the OUTER WORKS whether a traversal attempt is successful or not.

**G44** A ROBOT may not use the SHIELD(S) to circumvent a DEFENSE.

*Violation: FOUL and YELLOW CARD*

The DEFENSE SHIELDS are not intended to be weight bearing and are not to be used as a strategy for avoiding the challenge of the DEFENSE.

For example, a ROBOT that “bounces” off of a DEFENSE SHIELD while traversing the DEFENSE is not in violation of this rule as their strategy was not to use the SHIELDS to avoid the DEFENSE. In contrast, a ROBOT “leapfrogging” or “spider climbing” across a DEFENSE by applying force to the SHIELDS and lifting itself over the DEFENSE is a violation of this rule.

**G45** A ROBOT may not pass completely over the Low Bar.

*Violation: FOUL and YELLOW CARD*

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