FIRST® GAME CHANGERS®SM powered by Star Wars: Force for Change

2020-2021 FIRST® Tech Challenge

Forum Answered Questions - Remote
Table of Contents

1. Robot Inspection and Build Rules
   a. Robot Mechanical Parts and Materials Rules
      i. General Robot Rules
      ii. Commercial Off the Shelf Components
      iii. Raw and Post Processed Materials
   b. Robot Electrical Parts and Materials Rules
      i. Miscellaneous Robot Electrical Parts and Materials
      ii. Motors and Servos
      iii. Control System
      iv. Sensors
   c. Robot Software Rules
2. Game Rules
   a. Game Play – All Match Periods
   b. Scoring
   c. Pre-Match
   d. Autonomous Period
   e. Driver Controlled Period
   f. End Game
3. Competition Rules
4. Field Setup
5. The Judging Process
   a. Engineering Portfolio
   b. Judges Interview
6. Advancement

How to Use This Document

The FIRST Tech Challenge Official Q&A Forum is a place where teams can ask questions and receive official answers from game expert moderators. The official FIRST Tech Challenge Question & Answer Forum rulings take precedence over all information in the game manuals.

Moderators will answer team questions beginning each Monday, and close on Thursday at 12:00pm eastern time. The forum answered questions are then converted to PDF (this document) to be easily read by teams and volunteers. This takes place every week for the entire season, so teams should ensure to access the new forum printout each Thursday.

For Remote Teams

Teams competing in remote gameplay must use the rules that apply when their specific event started. For example, if a team’s remote event starts on Monday, 11/30/2020, the team would use rules from that date and prior. New rules or clarifications that are posted after the window opens do not apply until the next competition. Make sure to check the date of the forum post.
Forums Articles

New Topics FIRST Tech Challenge Blog Calendar Who's Online

General Robot Rules

09-22-2020, 10:52 AM

Answers to questions about General Robot Rules.

Tags: None

Stuck Edit Quote Flag Like 0

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

10-20-2020, 08:31 PM

This reply by Broadway Joe has been deleted by Broadway Joe

10-20-2020, 08:29 PM

Launch Distance

Originally posted by FTC12533

Rule <RG08> in Game Manual Part 1 states that “Teams must only launch the elements with enough velocity to score”, and that if a robot is deemed to be launching with too much velocity, they should be re-inspected and that “Robots must then show that a launched scoring element cannot travel in the air more than a 16 ft. (4.88 m) distance or more than 5 ft. (1.52 m) in elevation”. Noting that this game requires the rings to be launched in the launch zone, this means that some positions on the field, when being shot from, will be in violation of the 16ft rule (as shown in https://www.reddit.com/r/FTC/comment...me_renders_of/).
Q1: Noting that this game requires rings to be launched with high velocity and spin, does the rule limit the construction of the robot so that it could not possibly launch further than 16 feet?

Q2: In addition, with many teams competing in remote events, where inspection will be just an honesty check, to what extent will <RG08> be enforced this season?

A1: If a Referee feels the Robot is Launching rings in excess of the requirement, then Teams must demonstrate that the Robot as configured, cannot Launch Rings exceeding the limits imposed by <RG08>.

A2: There will be no checks of Robots that compete in Remote events. We are relying on Teams to be honest and to follow all the Rules. At traditional events, Rule <RG08>, along with all the other rules will be strictly enforced.

Q1: Noting that this game requires rings to be launched with high velocity and spin, does the rule limit the construction of the robot so that it could not possibly launch further than 16 feet?

Q2: In addition, with many teams competing in remote events, where inspection will be just an honesty check, to what extent will <RG08> be enforced this season?

A1: If a Referee feels the Robot is Launching rings in excess of the requirement, then Teams must demonstrate that the Robot as configured, cannot Launch Rings exceeding the limits imposed by <RG08>.

A2: There will be no checks of Robots that compete in Remote events. We are relying on Teams to be honest and to follow all the Rules. At traditional events, Rule <RG08>, along with all the other rules will be strictly enforced.

Maximum Ring Launching Distance

Q:

Originally posted by FTC3805

In rule <RG08> it says that "Robots must then show that a launched scoring element cannot travel in the air more than a 16 ft. (4.88 m) distance or more than 5 ft. (1.52 m) in elevation." does this refer the maximum distance/height the launcher can launch or does it include software limitations such as slowing down the motor/s?

A: A software limit is acceptable.
Forums

Articles

New Topics
FIRST Tech Challenge Blog
Calendar
Who's Online

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Commercial Off the Shelf Components
09-22-2020, 10:53 AM

Answers to questions about Commercial Off the Shelf Components.

Tags: None

Stuck

Edit
Quote
Flag
Like 0

Broadway Joe
Game Design Committee Member

Join Date: Sep 2010
Posts: 942

PITTSCO Motor 385

Q:

Originally posted by FTC10095
Is a PITTSCO Motor 385 an allowed DC motor? We were not sure if this is considered a Tetrix motor (listed as legal under the rules).

A: No, this is not a legal motor.

Last edited by Billie Jean; 10-29-2020, 02:36 PM.

Universal Joints

Originally posted by FTC12533

Broadway Joe
Game Design Committee Member

Join Date: Sep 2010
Posts: 942

10-26-2020, 02:21 PM

11-17-2020, 01:07 PM

12/17/2020
Commercial Off the Shelf Components - FTC Forum

Messages 4
Billie Jean
Edit Site: Off

Search

Forums
Articles

New Topics
FIRST Tech Challenge Blog
Calendar
Who's Online

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Commercial Off the Shelf Components
09-22-2020, 10:53 AM

Answers to questions about Commercial Off the Shelf Components.

Tags: None

Stuck

Edit
Quote
Flag
Like 0

Broadway Joe
Game Design Committee Member

Join Date: Sep 2010
Posts: 942

PITTSCO Motor 385

Q:

Originally posted by FTC10095
Is a PITTSCO Motor 385 an allowed DC motor? We were not sure if this is considered a Tetrix motor (listed as legal under the rules).

A: No, this is not a legal motor.

Last edited by Billie Jean; 10-29-2020, 02:36 PM.

Universal Joints

Originally posted by FTC12533

Broadway Joe
Game Design Committee Member

Join Date: Sep 2010
Posts: 942

10-26-2020, 02:21 PM

11-17-2020, 01:07 PM
Q: What is the legality of universal joints, specifically the gobilda universal joint? (https://www.gobilda.com/4003-series---to-6mm-d-bore/). Universal joints were ruled legal in a forum post last year and we wanted to verify that they were still legal.

A: Yes, universal joints are legal.
Miscellaneous Robot Electrical Parts and Materials

09-22-2020, 11:40 AM

Answers to questions about Miscellaneous Robot Electrical Parts and Materials.

Tags: None

Billie Jean
Senior Member
Jump Date: Nov 2013
Posts: 216

Pierluigi Collina
Game Design Committee Member
Jump Date: Sep 2010
Posts: 1101

Originally posted by FTC14470

Subject: Interconnect Only PCB

Question: Hello!

I believe this is allowed based on previously asked questions, but wanted to make sure. Is a custom PCB that has no electrical components on it besides connectors that is used strictly to connect things like motors, encoder, sensors, etc. allowed?

A similar question is asked here: https://www.firstinspires.org/sites/...-questions.pdf
(use ctrl + f and type "pcb" to find it)

Answer: Yes. Be sure to have a circuit diagram for the PCB and be prepared to discuss/describe/explain the PCB to inspectors at your events (if attending Traditional Events)
**Subject: Robot Controller Phone LED Light**

**Question:** Game manual part 1 <RE13> neither explicitly allows nor disallows use of the camera flashlight. It can be helpful with computer vision tasks. Rulings regarding its use in prior seasons have been:

2017-18 -- allowed  
2018-19 -- initially disallowed, then allowed  
2019-20 -- allowed  

**Will use of the camera flashlight be allowed for the 2020-21 season?**

**Answer:** Yes, the LED built in to the robot controller phone may be used as a light source.

---

**Subject: USB Control of LED strip**

**Question:** Our team would like to add controllable RBG light strip for aesthetics and for signaling purposes in TeleOp and Autonomous. Adafruit's DotStar LED strips (https://www.adafruit.com/product/2238) were permitted in the past with I2C to SPI bridge. Can we use USB to SPI bridge (https://www.adafruit.com/product/2264) chip to connect RGB strip to powered USB hub? The board is not user programmable and available in COTS package (datasheet https://www.ftdichip.com/Support/Documents/DS_FT232H.pdf).

**Answer:** In short, No. An I2C to SPI bridge would be acceptable. The USB to SPI bridge to control the LEDs violates RE13.c

---

**Subject: Blinkin LED Driver**

**Question:** Could you confirm if Blinkin LED Driver is legal for Ultimate Goal season (and explain if possible)? Latest FTC SDK includes Blinkin Driver sample OpMode which implies that Blinkin LED Driver is
Answer: RE12.b allows light sources controlled by compatible ports of the REV Expansion Hub or REV Control Hub. The Blinkin LED Driver connects to and is controlled by a servo port and is included in the sources allowed by RE12.b.

---

Original posted by FTC11129
Subject: COTS LED Module
Question: COTS LED Modules with integrated ATTiny85 microcontroller were approved for 19/20 completion season (original post). Could you confirm if this decision is applicable for 20/21 competition season?

Answer: As long as the processor in the LED module is not user programmable, the LED module would be allowed as long as it meet the requirements in RE13.
Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

Billie Jean
Senior Member
Join Date: Nov 2013 Posts: 216

Motors and Servos
09-22-2020, 11:40 AM
Answers to questions about Motors and Servos.

Tags: None

Stuck
Edit Quote Flag Like

Pierluigi Collina
Game Design Committee Member
Join Date: Sep 2010 Posts: 1101

11-10-2020, 01:09 PM

Originally posted by FTC9999
Subject: Servo Power Module Device Limits

Question: Section 7.2.1 [Robot Technology Definitions] of Game Manual Part 1 defines a REV Servo Power Module as "An electronic device that boosts the power supplied to 3-wire servos. A REV Servo Power Module has 6 input servo ports and 6 matching output ports. It draws power from a 12V source and provides 6V power to each output servo port. A REV Servo Power Module can provide up to 15A of current across all output servo ports for a total of 90 Watts of power per module."

The stall current of the VEX EDR 393 is rated as 3.6 amps at 7.2 volts (or 3 amps at 6 volts), but when connected to the VEX "Motor Controller 29" the stall current is limited to 3 amps at 8.5 volts (or 2.2 amps at 6 volts).

The stall current of the goBILDA 2000-0025-0002 (25-2) servo is rated as 3 amps at 7.4 volts and 2.5 amps at 6 volts. Thus, teams are allowed to power six (6) goBILDA 25-2 servos from a single REV Servo Power Module (SPM).

Even though teams are allowed to power six (6) goBILDA 25-2 servos...
per SPM, and even though the VEX 29/393 draws less current at stall than the goBILDA 25-2, teams are only allowed to power two (2) VEX 29/393s per SPM.

Like most teams, after the season is over our competition bot becomes an outreach bot. Since the SPM can safely power six (6) VEX 29/393s we reduce the number of SPMs on the bot from the 5 to 7 required for competition to at most 2 SPMs as allowed by the specifications. We use the 4 to 5 SPMs recovered from the previous season's bot on next season's competition bot so that the team need not have to purchase any more SPMs than necessary in the long run.

Nevertheless, in the interests of reducing congestion, debugging complexity, and points of failure on a competition bot, we request that the restriction of two (2) VEX 29/393s per SPM be removed. As with any other servo, the SPM's over-current shutdown feature will safely inform teams in the event the team miscalculates the max current draw of the mix of servos, VEX and non-VEX, connected to any given SPM.

**Answer:** Thank you for the thoughtful analysis. We do not plan to make any changes to the Servo Power Module limits for this season.
Billie Jean
Senior Member

Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

Control System
09-22-2020, 11:41 AM

Answers to questions about the Control System.

Tags: None

Edit Quote Flag

Billie Jean
Senior Member

Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

Stuck

Pierluigi Collina
Game Design Committee Member

10-13-2020, 01:31 PM

Originally posted by FTC12533

Subject: External Mechanisms Attached to Gamepads

Question: Are external attachments to legal controllers, such as this 3D printed joystick that snaps onto an XBox 360 controller legal? This attachment does not directly modify the controller in any way.

Answer: Yes.

Edit Quote Comment Flag

Pierluigi Collina
Game Design Committee Member

10-29-2020, 06:58 PM

Originally posted by FTC12533

Subject: 3rd-Party Gamepads & Gamepad Modifications

Question 1: Is a modified PS4 controller, such as those from:
Answer 1: No

Answer 2: No. Only the controller is allowed.

Answer 3: Modifications that do not require the disassembly of the Gamepad would be acceptable (painting, stickers, etc)

Question 2: Is this officially sold PS4 back button: https://direct.playstation.com/en-us...4aAuebEALw_wcB legal?

Question 3: Are purely aesthetic button and shell mods legal?
Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

09-22-2020, 11:41 AM

Answers to questions about Sensors.

Tags: None

Stuck

#1

Pierluigi Collina
Game Design Committee Member

Join Date: Sep 2010
Posts: 1101

10-13-2020, 01:24 PM

Originally posted by FTC16626

Subject: Intel T265 RealSense Camera w/ 3rd Party VSLAM Library

Question: According to a reply by the GDC last season, the T265 was ruled legal as it is and can function solely as a UVC camera. https://ftcforum.firstinspires.org//...5207#post75207

Just as a quick summary, the Intel Realsense T265 camera performs VSLAM (Visual Simultaneous Localization and Mapping) allowing one to localize and get relative pose. It is not directly programmable and all the processing is done onboard.

Since then, a member of the FRC community has ported his T265 wrapper from FRC for FTC use (https://github.com/pietroglyph/ftc265). The camera transmits the pose data through UVC. The T265 still functions like a webcam. So no external USB/other connection is made. It just uses the same USB connection as any other webcam and transmits the same UVC data. It should be legal by all FTC standards.

Just wanted to re-establish legality on the Intel RealSense T265 for this season and clarify if extracting pose data from the UVC stream is legal. Essentially, are we allowed to use the T265 and that library specifically in competition for localization?
Answer: Yes. Make sure to pay attention to power needs ... the T265 likely needs to be plugged into a powered USB hub.

Note that in general, ruling from prior years do not automatically apply to the current season. It is always a good idea to ask via the Forum if/when there are questions about component legality.

---

**Pierluigi Collina**
Game Design Committee Member

Join Date: Sep 2010
Posts: 1101

10-29-2020, 07:06 PM #3

Originally posted by FTC8813

Subject: Microcontroller as Sensor

**Question:** An ATTiny85 works great as a hardware pulse counter. This can chip can be made non-programmable. We want to use the ATTiny85 as a voltage sensor for the signal coming from an encoder. In this way, we will have a sensor (encoder) connected to a sensor (voltage sensor). The ATTiny will be set as non-programmable. Is this allowed on a robot?

**Answer:** No. The ATTiny85 is inherently a programmable system and must be programmed at least once before it can be used. The limit on programmability is not a question of can it still be programmed, but rather of was it ever capable of being user programmed.

---

**Pierluigi Collina**
Game Design Committee Member

Join Date: Sep 2010
Posts: 1101

11-18-2020, 05:41 PM #4

Originally posted by FTC16514

Subject: Interfacing 5V Analog Sensors with a Rev Hub

**Question:** In past seasons 5V analog sensors have been legal when connected to a Modern Robotics Core Device Interface Module (which is no longer legal this season). We'd like to continue using such sensors this season, so are wondering:

1. Can 5V analog sensors legally be connected to a 5V power port on the REV hub? (This appears to be acceptable under <RE12(a)>)
2. Does a voltage divider, consisting of two resistors to lower the sensor output signal from 5V to 3.3V, fall under passive electronics in <RE12(c)>?
3. If (1) or (2) are prohibited, can you suggest a legal way to use a 5V analog sensor that doesn't work with a 3.3V signal?

**Answer 1:** Yes
**Answer 2:** Yes. Make sure to select resistor values appropriately! And
remember to have a simple schematic ready in case your robot inspector has questions!

**Answer 3**: n/a

---

**Pierluigi Collina**  
Game Design Committee Member

Join Date: Sep 2010  
Posts: 1101

11-18-2020, 05:53 PM

*Originally posted by FTC8813*

**Subject: I2C Encoder Interface Device**

**Question**: As a follow-up item to the question about counting encoder pulses (quoted below), if one were to find a supplier of a legal pulse counter off-the-shelf, is it acceptable to use such a device with an encoder? The reason for asking is that there are only 8 encoder ports and i2c doesn't handle the pulse rate of typical encoders.

**Answer**: Under current rules, this would be considered in the bucket "Additional Electronics" and is not allowed.
Gameplay – All Match Periods

09-22-2020, 11:53 AM

Answers to questions about Gameplay – All Match Periods.

Tags: None

Air Jordan
Game Design Committee Member

11-02-2020, 10:11 AM

Originally posted by FTC9999

Subject: Rings that Exit the Playing Field Boundary, Impact an Object, and Bounces Back Into the Playing Field Boundary

Question: Are Rings that come to rest inside the Playing Field Boundary after bouncing off an object outside the Playing Field Boundary, such as the garage wall, eligible to be scored?

Answer: Yes

Air Jordan
Game Design Committee Member

11-16-2020, 07:20 PM

Originally posted by FTC12524

Subject: Rule <RG08> Launching Game Scoring Elements

Hello! We are FTC Team 12524 and we have a big discussion about


Referees at our today League Meet told that our shooter is not legal because Rings travel more than 16 ft with the elevation of 3 ft.

**Question:** So, the question is: Could a Scoring Element travel in the air more than 16 ft if it doesn't elevate higher than 5 ft. Or both limitations should be respected for the shooter to be legal?

Thank you

---

**Air Jordan**  
Game Design  
Committee Member  
Join Date: Sep 2010  
Posts: 540

12-15-2020, 10:15 PM

Originally posted by FTC16219

**Subject: Resetting Power Shot Targets**

**Question 1:** Is the Human Player allowed to reset the Power Shot Targets during the autonomous period?

**Question 2:** Is the Human Player allowed to reset the Power Shot Targets during driver-controlled period?

**Answer 1:** No

**Answer 2:** The Human Player may reset Power Shot Targets to an un-Scored state during the first 100 seconds of the Driver-Controlled Period (the 90 seconds before the start of the End Game plus a 10 second grace period following the start of the End Game).
Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Pre-Match
09-22-2020, 11:52 AM

Answers to questions about Pre-Match setup.

Tags: None

Stuck
Edit
Quote
Flag
Like
0

Air Jordan
Game Design Committee Member

Join Date: Sep 2010
Posts: 540

10-19-2020, 07:35 PM

Originally posted by FTC12533
Subject: Pre-Loading a Wobble Goal - Is Completely Supported by the Robot Allowed?

In Game Manual 2, rule 4.5.1, it states that the robot needs to pre-load the wobble goal at the start of the match. Looking at the definition of “pre-load”, it says that the robot only needs to be touching the game element. However, I feel like it is unclear on whether or not the wobble goal needs to also be in contact with the ground.

Question 1: Does the wobble goal need to be touching the ground at the beginning of the match?

Question 2: Can it be completely supported by the robot?

Answer 1: No
Answer 2: Yes

Edit
Quote
Comment
Flag
Like
0
Section 4.5.1 does a great job of describing the setup for a Remote match for the Robot, Wobble Goals, Starter Stack Rings, and YOUR Robot's pre-load Rings. However, there is no mention of your "Ghost Partner's" Rings - the Rings that WOULD have been optionally pre-loaded onto your partner's Robot if you actually had a partner playing. Your partner's Wobble Goal is specifically mentioned and accounted for, but nothing about what happens to their optional Pre-Load Rings. Without mention of these Rings, it seems that there are only seven (7) total Rings available for play during the Driver-Controlled period in Remote play - the three (3) you may optionally pre-load, plus the four (4) that randomly get configured for the Starter Stack. However, under the definition of Game Element in Section 4.4, it lists a quantity of 10 Rings.

Question: Do the three (3) Rings that your "Ghost Partner" would have optionally pre-loaded get placed in the Low Goal during Pre-Match setup along with any Rings not pre-loaded onto YOUR Robot or used in the random Starter Stack? This seems to be the only means to account for the disparity in Rings between sections 4.4 and 4.5.1.

Answer: Yes. Thank you for identifying this pre-Match setup step that is missing from the Game Manual Part 2 - Remote Events. A future release of the Game Manual will include instructions for the three Rings referenced in the question.

Answer 1: Yes, provided that the Robot is motionless while the Robot and Driver Station are in the required hands-off state before the start of the Match.

Answer 2: Yes
Answer 1: Yes

Answer 2: Yes, provided that the test can be performed safely. Nearby humans should be aware that the Robot is going to move before the "wiggle" test is performed.

For a Traditional Competition, additional requirements are that the Robot must be Completely Inside the Playing Field Wall and the test does not delay the start of the Match.

Last edited by Air Jordan; 12-15-2020, 04:55 PM.
Autonomous Period

09-22-2020, 11:52 AM

Answers to questions about the Autonomous Period.

Tags: None

Stuck

09-29-2020, 09:38 PM

Originally posted by FTC2901

Subject: Ring Returns to the Playing Field After it Impacts a Power Shot Target

Question: During the Autonomous period, after the robot uses a ring to shoot down a power shot target, if that ring bounces back onto the playing field, is the robot allowed to shoot that ring again?

Answer: Yes

09-29-2020, 09:44 PM

Originally posted by FTC2901

Subject: Are Rings in the Starter Stack Eligible to be Scored during the Autonomous Period?
**Question:** During the Autonomous period, can the robot use rings from the Starter Stack to either shoot down Power Shot Targets for points or to score in the Tower Goal?

**Answer:** Yes. Keep in mind that the Ring Control/Possession limits described in rule <GS6> apply to all periods of gameplay.

---

**Original posted by FTC2901**

**Subject:** <G20> Parked at End of the Period - Unpowered Flywheel Motion

**Question:** Is it alright for a flywheel to continue on unpowered motion between the Autonomous and Driver-Controlled periods?

**Answer:** Yes

---

**Original posted by FTC8397**

**Subject:** Wobble Goal Target Zone Scoring - Playing Field Wall/Foam Tile Gap

Two of the three target zones (for a given Alliance Color), are located adjacent to at least one playing field wall. On most fields there is a gap of a millimeter or so between the floor tiles and the playing field wall. So a literal interpretation of the Game Manual Part 2 definition of "Completely In", would indicate that a wobble goal that contacts the perimeter wall is (in most cases) not completely in its target zone. We are uncertain whether it is intended that this strict interpretation be applied. The question below assumes a field that includes an allowed COTS playing field perimeter wall and tiles, and assembled according to the field setup guide.

**Question:** If a wobble goal abuts the perimeter wall (and for that reason may extend a few millimeters beyond the vertical plane of the wall-adjacent tape), but is otherwise located completely within its target zone, should it be considered completely inside of the target zone for scoring purposes?

**Answer:** Yes, in this scenario, the Playing Field Wall marks the border of the Target Zone Goal Area.

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Driver-Controlled Period
09-22-2020, 11:52 AM

Answers to questions about the Driver-Controlled Period.

Tags: None

Air Jordan
Game Design Committee Member

Join Date: Sep 2010
Posts: 540

09-29-2020, 09:15 PM

Originally posted by FTC13474
Subject: Ring Stuck in the Return Rack Question: During the Driver-Control Period, if a ring is placed by the Human Player in the Return Rack AND it gets stuck (does not fall out of playing field side), is the Human Player allowed to reach into the Return Rack to retrieve the stuck ring and attempt to return it again?

Answer: Yes

09-29-2020, 09:33 PM

Originally posted by FTC13474
Subject: <G27> Removing Game Elements from the Playing Field and <G16> Human Player Station - Returning Rings to the Playing Field

Question: For Remote Events, what will occur with the Rings that go
Answer: The answer that you seek is found by reading rules <G27> and <G16> in the Game Manual Part 2 - Remote Events. Field Personnel and the Human Player may return Rings from outside the Playing Field back into the Playing Field.

Rule <G27> states that Rings that go outside the Playing Field Boundary will be returned to the Playing Field by Field Personnel at the earliest safe and convenient opportunity at a non-Scoring location approximately where it left the field. The intent of this rule is to apply to Rings that exit the Playing Field and are out of reach by the Human Player Station.

Rule <G16> allows the Human Player to leave the Human Player Station to retrieve Rings. The Human Player shall use the Return Rack to introduce Rings into the Playing Field.

Originally posted by FTC1999

Subject: Blocked Return Rack

Question: In the event that a human player's ring return were no longer a viable method of getting rings back into the field (i.e. zip tie breaks, disabled robot it, etc.), then what would be the best recourse for them to return their rings to the field? Would they be allowed to toss them back in one at a time from the same height as the ring return? Should they pass them over to the opposing human player to let them return them?

Answer: In the highly unlikely case that a Ring Return Rack is rendered unusable/blocked, the Head Referee can declare the Ring Return Rack obstructed. Once this declaration has taken place, the Human Player may drop/gently toss the Rings back into the Playing Field with a couple of constraints:

- the Ring needs to land in the back portion of the field (i.e. not in the Launch Zone)
- the Ring needs be dropped/tossed with the minimum force required
- the Ring should not be directed towards any Robot or Wobble Goal
- the Ring should be returned in approximately the same location on the field as the Ring Return Rack

Violations of the above constraints should be treated as violations of <GS4> ... i.e. a warning followed by Minor Penalty per infraction for subsequent violations.
Subject: <GS6> Control/Possession Limits of Scoring Elements - Deflecting a Ring that Exits the Return Rack.

**Question 1:** If a ring rolls from the return rack, hits the ground, and bounces off the robot, would it be considered herding/controlling? The game manual’s definition of "herding" is "pushing or impelling one or more Game Elements to a desired location or direction that gains a strategic advantage beyond moving the Robot around the Playing Field," however the robot would not pushing the ring(s) to a location; it would be blocking their path.

**Question 2:** If our robot is in possession of 3 rings and intentionally moves to block the path of another ring rolling from the return rack, would a penalty be incurred?

**Answer 1:** For a Remote competition, no Penalty is assessed if the Robot is Possessing or Controlling two or fewer Rings when Ring contact occurs.

**Answer 2:** Yes, the action described violates rule <GS6>.

---

Originally posted by FTC14433

Subject: <GS6> Control/Possession Limits of Scoring Elements - Inadvertent Contact with a Ring Entering the Playing Field

Based on answer at https://ftcforum.firstinspires.org/f...trolled-period, it said "If our robot is in possession of 3 rings and intentionally moves to block the path of another ring rolling from the return rack, would a penalty be incurred?", answer is "Yes, the action described violates rule".

**Question:** What if the robot does not intentionally moves to block the path of another returned ring, but happens to sit in a location preparing to shoot for the goal with 3 rings on robot, then a returned ring hit the robot. Will that violate the rule and get penalty? It is really hard to avoid hit by returned ring in that case.

**Answer:** The scenario described in the question is Inadvertent contact between the Robot and Ring that does not violate rule <GS6>.
Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Answers to questions about the End Game.

Tags: None

End Game
09-22-2020, 11:51 AM

Air Jordan
Game Design
Committee Member

Join Date: Sep 2010
Posts: 540

Originally posted by FTC9999

Subject: Wobble Goal and Wobble Goal Ring Scoring

Game Manual Part 2 - Remote Events, Section 4.5.4 End Game, 1) Wobble Goal Delivery says: b) Drop Zone - Each Wobble Goal placed over a Barrier and Supported by the Drop Zone at the End of the Match earns twenty (20) points ...

Statement 1: Thus, the Drop Zone achievement is not possible in the case where the "Playing Field Boundary" is a taped line.

Statement 2: Nevertheless, each ring Completely Supported by a Wobble Goal or another Ring Completely Supported by a Wobble Goal earns five (5) points. A ring could be BOTH Inside the Drop Zone AND Inside the Playing Field yet still earn 5 points for the "Wobble Goal Rings" achievement.

Question 1a: In the case where the "Playing Field Boundary" is a wall, one or more of the rings could be in contact with a wall, but would otherwise be Completely Supported by a Wobble Goal or another Ring Completely Supported by a Wobble Goal. How would a ring that is in contact with a wall be scored?
Response to Statement 1: The Wobble Goal Delivery to the Drop Zone task requires placing the Wobble Goal over a Barrier. A Team using a taped Playing Field Boundary must add a physical Barrier to the Playing Field Boundary if the Wobble Goal Delivery to the Drop Zone task is part of the Team's Scoring strategy. See the definition of Barrier in section 4.4 of the Game Manual Part 2 - Remote Events. The DIY Field Element Guide published on the FIRST Tech Challenge website contains instructions for building a legal Barrier using cardboard and tape.

Response to Statement 2: The End Game Wobble Goal Ring task description in the Game Manual Part 2 clearly states that "any Wobble Goal location and orientation are allowed for this achievement."

Answer to Question 1a: A Ring contacting a Playing Field Boundary wall is eligible to be counted as Scored for the End Game Wobble Goal Ring achievement if it satisfies the Scoring requirements. For example, to count as Scored, the Ring must be Completely Supported by a Wobble Goal or another Ring that is Completely Supported by a Wobble Goal. Keep in mind that a Ring Supported by a Playing Field Boundary wall is not able to be Completely Supported by a Wobble Goal and therefore has zero Score value.

Answer to Question 1b: If the Ring contacting the Playing Field Border wall is Completely Supported by the Wobble Goal (i.e., it is not Supported by the Playing Field Boundary wall), additional Rings that it supports are eligible for the End Game Wobble Goal Ring achievement.

Question 1b: How would a ring that is in contact with a ring that is in contact with a wall be scored?
**Subject: May a Robot move a Wobble Goal Into a Target Zone or to Outside the Launch Zone Any Time up Until the Start of the End Game Period?**

**Question:** The End Game rules state that a wobble goal in a target zone or NOT in the launch zone is eligible for scoring during the end game. If our robot scores the wobble goal that we preload during autonomous, can we move the other wobble goal at any time before the end game? In other words, can it also be moved during autonomous? Can it be transported across the launch line during driver-controlled (before the start of the end game) in order to be eligible for scoring during the end game?

**Answer:** Yes to all three questions.
Answer: First of all, thank you for the very clear description of your thought process and the specific game manual references. The scenario described in steps 1 through 4 result in a violation of rule <GS6>(1)b. Rings returned to the Playing Field are required to be directly Supported by the Playing Field Floor before they are eligible to be Controlled by a Robot. If the subject Wobble Goal and Ring(s) are Controlled by a Robot, the Penalties described in rule <GS6>(1)b should be applied per Ring.

So which is it? I'm betting the whole "supported by the floor" sounded like an easy win, but transitive support is a stinker. <grin>

Thanks!

Note 1: The scenario described in the question is less likely to occur when the new guidance provided in the Remote Event Requirements Guide, Appendix B - Power Shot stability is followed. Appendix B was added to the document in the November 24, 2020 update. The document is located here:
https://www.firstinspires.org/sites/...quirements.pdf
**Note 2:** Consider reducing the Robot's Ring Launch energy to reduce the likelihood of this scenario.

**Answer 1:** No

**Answer 2:** No

**Answer 3:** Yes

**Answer 4:** No

**Answer 5:** No additional effect on Scoring and Penalties. The original Score and Penalty assigned are the only points attributed to the actions described in the scenario (+15, +15, -30).

---

**Air Jordan**  
Game Design Committee Member

Join Date: Sep 2010  
Posts: 540

**Originally posted by FTC13474**

**Subject: Section 4.5.4 End Game - Wobble Goal Location**

**Question:** At the start of end game (Section 4.5.4), "At the start of the End Game, Wobble Goals In a Target Zone or not located in the Launch Zone are eligible for the following..." Launch Zone "A" has the Launch Line going through the middle of that Target Zone. Does a Wobble Goal within Target Zone "A" have to be beyond the Launch Line (Goal side of Launch Line)?

**Answer:** No.
Forums | Articles

New Topics | FIRST Tech Challenge Blog | Calendar | Who's Online

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Competition Rules
09-22-2020, 01:10 PM

Answers to questions about Competition Rules.

Tags: None

Stuck

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Originally posted by FTC9978
Subject: Remote Field Size

Q: Is it required that we use a half field for a remote league meet? (12 x 8)

A: Remote fields must be 12ft x 8ft to be competition legal.

11-02-2020, 10:45 AM

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Originally posted by FTC9978
Subject: Red or Blue Remote Field

Q: Does it matter which half field we use for a remote league meet, Red or Blue?

11-02-2020, 10:49 AM
A: No. Teams may choose either a red or a blue half field.

---

Billie Jean
Senior Member

11-30-2020, 01:06 PM

Originally posted by FTC4950

Subject: Non-team member as Human Player

Q: Because of high school and community regulations our students may not enter the robotics lab at school nor may they meet in-person. Are we allowed to use a mentor as the Human Player if social distancing rules affect the amount of students allowed to play a match remotely?

A: The Game Manual Part 1 - Remote has been updated to reflect that, under circumstances where the whole team cannot gather, thereby decreasing the number of students playing in a match, a mentor or other adult may stand in as the Human Player. This exception is only for remote gameplay.

---

Billie Jean
Senior Member

12-08-2020, 09:26 AM

Originally posted by FTC9999

Subject: Competing in Concurrent Events

Rule <C05>.c says teams are not allowed to "register and attend concurrent competitions with a second Robot." Would teams be allowed to:

Q1: register and attend concurrent competitions with the same Robot?
Q2: register and attend concurrent competitions that are not completely overlapping in time frame?

A1: Yes
A2: Yes
Forums   Articles
New Topics   FIRST Tech Challenge Blog   Calendar   Who's Online

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 216

Field Setup
09-22-2020, 01:21 PM
Answers to questions about Field Setup and Assembly.

Tags: None

Big Red Machine
Game Design Committee Member
Join Date: Sep 2010
Posts: 427

Originally posted by FTC7253
Subject: Double wobble target in single team remote auton

Q: Are both wobble targets to be placed on the field and available for scoring in auton for single team remote events? Meaning a single team can deliver the initially "possessed" wobble target and then the wobble target located on the other same-alliance start line?

A: Yes, both wobble goals should be placed on the field and available for scoring.

Big Red Machine
Game Design Committee Member
Join Date: Sep 2010
Posts: 427

Originally posted by FTC12762
Subject: Using net for remote field?
Q: The GA FTC head ref suggested we ask on this forum: should the net be used for a remote field setup?

A: The net is not required, but it is recommended that it be used to protect people around the field.
Forums  Articles
New Topics  FIRST Tech Challenge Blog  Calendar  Who's Online

Billie Jean  
Senior Member  
Join Date: Nov 2013  
Posts: 216  

Engineering Portfolio  
09-22-2020, 01:44 PM  
Answers to questions about the Engineering Portfolio.  

Tags: None  

Billie Jean  
Senior Member  
Join Date: Nov 2013  
Posts: 216  

09-22-2020, 01:44 PM  
Answers to questions about the Engineering Portfolio.  

Billie Jean  
Senior Member  
Join Date: Nov 2013  
Posts: 216  

12-01-2020, 10:29 AM  
Originally posted by FTC1000  
Subject: Engineering Portfolio Size Rules  
Q: What are the rules for the Engineering Portfolio? Are the 15 pages and the Portfolio separate categories?  
A: The 15 pages is the entire engineering portfolio. Teams may use on side of the first page as a cover sheet. In total, the engineering portfolio would amount to 8 sheets of 8.5 inch x 11 inch paper (U.S.) or 210mm x 297mm (EU), if printed on both sides of the paper.  
For remote events, this content must be saved as a PDF file.
A: Judges will rely heavily on the quality of the engineering portfolio to make their decisions about the Think Award. The criteria is listed in Game Manual Part 1 and from the perspective of the judges, the portfolio should cover examples and narrative to cover the criteria (this is true for all awards).

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 216

12-01-2020, 12:35 PM
Originally posted by FTC1999
Subject: Preferred Engineering Portfolio Format

Q: Is there a preferred format for the engineering portfolio that is most helpful for the judges?

A: The judges are looking for evidence of the award criteria in the portfolio. Organizing the portfolio with a focus on award criteria is helpful and makes it easier for the judges to locate in the portfolio. Making it easy to read (e.g. font size, font or paper color can help or hinder readability) is also helpful to consider.

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 216

12-01-2020, 12:39 PM
Originally posted by FTC1999
Subject: Uploading the Engineering Portfolio

Q: When should my team upload the engineering portfolio for our remote event?

A: After a team is invited to an event, the Lead Coach 1 of the team will receive instructions on how, when, and where to upload the engineering portfolio.

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 216

12-01-2020, 12:44 PM
Originally posted by FTC1999
Subject: Meeting Entries in the Engineering Portfolio

Q: Would you encourage that we continue to do meeting entries in the engineering portfolio?

A: Teams will have better content for their engineering portfolio if they continue to create entries in their engineering notebook. Remember, the engineering portfolio should be made up of the best examples of content from the engineering notebook.

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 216

12-01-2020, 12:47 PM
Originally posted by FTC1999
Subject: Judge Requests for Additional Info

Q: In what situations might the judges need more information from my team?

A: Judges will ask for more information in the same situations that they would request more information at a traditional event. For example, if the portfolio and interviews are not sufficient to help answer the questions to determine which teams are most deserving for an award.

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 216

12-01-2020, 12:51 PM
Originally posted by FTC1999
Subject: Engineering Notebook Requests

Q: Will judges still request to see our engineering notebook as well as our engineering portfolio?

A: The judges may request specific pages of content from the engineering notebook, but it is highly unlikely that judges will request the entire engineering notebook.
A: The engineering portfolio can include a table of contents and a summary page, and those pages are counted as part of the 15 pages.

Q: Are things like cover pages, table of contents, and the summary page part of the 15 pages? Or is it 15 pages of documentation plus the cover page and table of contents?

A: The engineering notebook is used to capture the entire season in detail. The engineering portfolio is a concise subset of the information included in the engineering notebook. You could think of the engineering portfolio as the executive summary of the engineering notebook. Most awards require a team to turn in the engineering portfolio to be considered for the award. The engineering notebook is highly encouraged. Teams will pull the best content from their engineering notebook to create the engineering portfolio. Also keep in mind that the judges may request more details from the engineering notebook that aren't included in the engineering profile.

Q: I was looking through the remote game manual and I see two sections. One for the engineering notebook and the other for engineering portfolio. I sort of understand the difference, but do we do both? Are they supposed to be separate or in the same file/binder?

A: There are no recommendations for the amount of pages in each section.

Q: Aside from what FIRST sets as minimum requirements for both the engineering notebook and the engineering portfolio, are the judges more concerned with the format requirements and presentation, or the content?

A: The judges who review the engineering portfolio are instructed that content is most important. Teams should still ensure the engineering portfolio is well formatted. If the portfolio is hard to read, not well organized, etc., it could make it difficult for judges to adequately focus on the content.

Q: Do you think the engineering portfolio will be a permanent change for future seasons?

A: We expect that the engineering portfolio will continue to be the content submitted to the judges in future seasons.
Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

Billie Jean  Judges Interview  09-22-2020, 01:45 PM
Senior Member
Join Date: Nov 2013  Posts: 216
Answers to questions about the Judges Interview.

Tags: None

Stuck  Edit  Quote  Flag  Like 0

Billie Jean  12-01-2020, 10:13 AM
Senior Member
Join Date: Nov 2013  Posts: 216
Originally posted by FTC1000  
Subject: Remote Robot Presentation - Videos

Q: Can a team show videos of the robot in the presentation to the Judges? Are there rules about the presentation?

A: The presentation portion of judging interview is exactly 5 minutes, and must be presented "live". Teams may show a video of their robot during the 5 minute presentation period, but the video must not include sound and team must narrate the video during the interview.

Last edited by Billie Jean; 12-02-2020, 10:43 AM. Reason: Corrected post to allow video during the 5 minute presentation.

Edit  Quote  Comment  Flag  Like 0

Billie Jean  12-01-2020, 10:16 AM
Senior Member
Join Date: Nov 2013
Originally posted by FTC1000
Subject: External Materials

Q: Will the Judges be able to or allowed to reference external materials (web sites, youtube videos, etc.) that are mentioned in the Engineering Portfolio?

A: Like at a traditional event, judges will not access materials that are not presented as part of the judging interview. Judges are instructed to only use information that is presented to them and are generally instructed not to follow links, etc. The only exception is for the Control Award submission which specifically calls out a video link that will demonstrate the control features that the team wants to highlight.

Last edited by Billie Jean; 12-02-2020, 10:45 AM. Reason: Added exception for Control Award

---

Subject: Remote Pit Judging

Q: Will teams be allowed to reference their own Engineering Portfolio during "pit judging" as if they were referencing their pit display (posters, pictures, etc.)? With remote events, teams won't have the ability to showcase things in their pits.

A: Teams will be permitted to reference their own engineering portfolio, engineering notebook, pictures or video to answer judges questions during the second interview phase of judging.

Last edited by Billie Jean; 12-02-2020, 10:50 AM.

---

Subject: Video versus Live Presentation

Q: Could a team submit a pre-recorded video as their judging presentation?

A: Teams cannot submit a video in place of their live judging presentation.
Subject: Streaming During Remote Interview

Q: During the judging interview or pit interview, will students be able to stream video to show or demo their robot?

A: The technical capability for this will exist, but we do not recommend it. Trying to get the streaming to work during the interview could take up precious time that a team would need with the judges. We encourage using photos or pre-recorded video to show the judges the robot when needed.