FIRST® GAME CHANGERS™ powered by Star Wars: Force for Change
2020-2021 FIRST® Tech Challenge

Forum Answered Questions - Remote
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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.
Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

General Robot Rules

09-22-2020, 10:52 AM

Answers to questions about General Robot Rules.

Tags: None

10-20-2020, 08:31 PM

This reply by Broadway Joe has been deleted by Broadway Joe

10-20-2020, 08:29 PM

Broadway Joe
Game Design
Committee Member

Join Date: Sep 2010
Posts: 942

Launching 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?

A: A software limit is acceptable.

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.
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

Broadway Joe
Game Design Committee Member
Join Date: Sep 2010
Posts: 942

PITTSCO Motor 385
10-26-2020, 02:21 PM
Q:
Originally posted by FTC10095
Is a PITSCO 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
11-17-2020, 01:07 PM
Originally posted by FTC12533
Q: What is the legality of universal joints, specifically the gobilda universal joint? ([https://www.gobilda.com/4003-series...to-6mm-d-bore/](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.
Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

Miscellaneous Robot Electrical Parts and Materials
09-22-2020, 11:40 AM

Answers to questions about Miscellaneous Robot Electrical Parts and Materials.

Tags: None

Stuck

Pierluigi Collina
Game Design Committee Member

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

11-10-2020, 01:06 PM #3

Originally posted by FTC8397  
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?  

Thank you.

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

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

11-18-2020, 05:49 PM #4

Originally posted by FTC11129  
Subject: USB Control of LED strip  


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

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

12-01-2020, 12:59 PM #5

Originally posted by FTC11129  
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.

Legal, but explanation for legality of USB/SPI bridge appear to rule Blinkin out of compliance since it is not connected to the components listed in <RE12>b.

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**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.

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**Pierluigi Collina**  
Game Design Committee Member

Join Date: Sep 2010  
Posts: 1101

12-03-2020, 11:59 AM  
#6

*Originally 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.
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

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
Join Date: Nov 2013
Posts: 216

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

Answers to questions about the Control System.

Tags: None

Stuck

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

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.

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

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:
Control System - FTC Forum

https://ftcforum.firstinspires.org/forum/ultimate-goal-presented-by-qualcomm/robot-build-rules/traditional-and-remote/answers-robot-mechanical-parts-

Question 1: Is this officially sold PS4 back button: https://direct.playstation.com/en-us...4aAuebEALw_wcB legal?

Question 2: Are purely aesthetic button and shell mods legal?

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
09-22-2020, 11:41 AM
Stuck
Sensors
Answers to questions about Sensors.

Pierluigi Collina
Game Design Committee Member
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.

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

**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.

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

**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

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

11-18-2020, 05:53 PM  

Originaly 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

-- Billie Jean --
Senior Member

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
**Answer:** A Launched Ring that travels in the air more than 16 feet violates rule <RG08>. A Launched Ring that travels more than 5 feet in elevation violates rule <RG08>.

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**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
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

Air Jordan
Game Design Committee Member

Join Date: Sep 2010
Posts: 542

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
Air Jordan
Game Design
Committee Member

Join Date: Sep 2010
Posts: 542

Originally posted by FTC12789

Subject: Section 4.5.1 Pre-Match - Placement of the Three Rings that are not Used During the Autonomous Period

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

Autonomous Period
09-22-2020, 11:52 AM
Answers to questions about the Autonomous Period.

Tags: None

Air Jordan
Game Design Committee Member
Join Date: Sep 2010
Posts: 542

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

Air Jordan
Game Design Committee Member
Join Date: Sep 2010
Posts: 542

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.

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**Air Jordan**
Game Design Committee Member

Join Date: Sep 2010
Posts: 542

10-28-2020, 12:48 PM

Originally 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

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**Air Jordan**
Game Design Committee Member

Join Date: Sep 2010
Posts: 542

11-10-2020, 09:12 PM

Originally 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.
Answers to questions about the Driver-Controlled Period.

**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

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**Air Jordan**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 542

09-29-2020, 09:15 PM

**Originally posted by FTC13474**

**Subject: Ring Stuck in the Return Rack**  
**Question:** During the Driver-Controlled 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

---

**Air Jordan**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 542

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.

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/block, 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 to 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.
Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

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

End Game
09-22-2020, 11:51 AM
Answers to questions about the End Game.

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

Tags: None

Stuck

Air Jordan
Game Design Committee Member
Join Date: Sep 2010 Posts: 542

10-18-2020, 11:29 PM

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 Boundary 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.

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**10-23-2020, 01:41 PM #3**

**Originally posted by FTC12789**

**Subject: Section 4.5.4.1 - Wobble Goal Delivery - Starting End Game Tasks**

**Question:** As per Section 4.5.4, "End Game tasks started and/or completed prior to the start of the End Game will earn zero (0) points for those tasks." At what point is an End Game task considered "Started"? Specifically, I'm concerned about the Wobble Goal Delivery task. If the Robot were to pick up the Wobble Goal above 18 inches and be poised just outside the Launch Zone prior to End Game to make a beeline for the Barrier as soon as End Game started (or better yet timed it so that the robot is in motion but would not allow the Wobble Goal to cross into the Launch Zone until after End Game has started), is that considered "Starting the End Game Task" prior to End Game? All other rules up to this point can be considered to be faithfully adhered to.

**Answer:** The Robot actions described in the question are not starting the Wobble Goal Delivery End Game task early. A Possessed Wobble Goal that is Outside the Launch Zone or In a Target Zone when the End Game Period starts is eligible for the End Game Wobble Goal Delivery tasks.
**Air Jordan**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 542

10-24-2020, 10:38 PM

**Originally posted by FTC9808**  
**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.

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**Air Jordan**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 542

11-16-2020, 01:27 PM

**Originally posted by FTC12789**  
**Subject:** Ring Return to the Playing Field Path = Ring --> Return Rack --> Ring Completely Supported by a Wobble Goal  

**Question:** We've been debating on whether or not this scenario is 100% penalty-free:  

1. During Endgame, the Robot brings a Wobble Goal to directly under the Return Rack.  
2. The Human Player feeds Rings through the Return Rack  
3. One (1) Ring somehow manages to fall perfectly onto the Wobble Goal such that it is perfectly skewered and supported by the Wobble Goal. Note that this Ring NEVER becomes directly supported by the Floor, as described per <GS6>(1)b.  
4. The Robot then grabs the loaded Wobble Goal, and drags it to the Start Line for additional points.  

Since Support/Supported does not have the concept of "transitive support" included in the definition, the Rings are never actually supported by the floor (the Wobble Goal is supported by the Floor, but the Wobble Goal supports the Ring, so the Ring is supported by the Wobble Goal but not the Floor). Therefore, when the Robot controls the Wobble Goal the Robot is technically in control of a Ring that has not yet been supported by the floor, and should get a penalty.  

However, if there is no "transitive support" allowed then there’s another problem - only one ring in a perfect stack on the Wobble Goal can ever be fully supported by the Wobble Goal. If there are multiple rings, the ring on the bottom of the stack is fully supported by the Wobble Goal, but the ring above it is supported by the Bottom Ring, and not the Wobble Goal, and thus the second ring (and all rings above it) cannot score.  

However, if "transitive support" is definitely allowed, then it breaks the
End Game - FTC Forum

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.

The intent of <GS6>(1)b without a Robot exception - if a Robot catches a Ring coming out of the Return Rack, the robot is fully supported by the Floor so the Ring is technically fully supported by the Floor, too.

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!

---

Air Jordan
Game Design Committee Member
Join Date: Sep 2010
Posts: 542

Originally posted by FTC14320
Subject: <GS13> Illegal Power Shot Scoring - Ring Impacting a Power Shot Target Causes a Second Target to Change Scoring State

Hello!

Due to the nature of the Power Shot structure, 2 Power Shot Targets are often knocked down with one shot that contacts a singular Power Shot Target. This occurs because the force of one Power Shot Target being knocked over and hitting the reset bar causes another Power Shot Target to unintentionally fall.

Question 1: Are both of these Power Shot Targets scored with no penalties? (+15, +15)

Question 2: Is the singular contacted Power Shot Target scored with no penalties? (+15)

Question 3: Are both Power Shot Targets scored with a penalty accrued under GS13? (+15, +15, - 30)

Question 4: Is the singular Power Shot Target contacted scored with a penalty under GS13? (+15, - 30)

Question 5: If, under reasonable assumptions, the trajectory of a later shot would have hit the now unintentionally knocked down Power Shot Target, what would the scoring be?

Thank you!

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).
Competition Rules

09-22-2020, 01:10 PM

Answers to questions about Competition Rules.

Tags: None

Billie Jean
Senior Member

Stuck

11-02-2020, 10:45 AM

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.

Billie Jean
Senior Member

11-02-2020, 10:49 AM

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?
A: No. Teams may choose either a red or a blue half field.

---

**Billie Jean**
Senior Member

Join Date: Nov 2013
Posts: 216

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

Join Date: Nov 2013
Posts: 216

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

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- **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

  [Stuck]

- **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.

  [Edit] [Quote] [Comment] [Flag] [Like 0]

- **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.
Billie Jean
Senior Member

Engineering Portfolio
09-22-2020, 01:44 PM

Answers to questions about the Engineering Portfolio.

Tags: None

Billie Jean
Senior Member

12-01-2020, 10:23 AM

Originally posted by FTC1000

Subject: Engineering Notebook Organization

Q: Have teams organized their Engineering Notebook by award before? Is it a viable option?

A: Some teams have presented an engineering notebook organized by award. The notebook can be arranged in a way that makes it easy to show the additional supporting content if the judges have questions.

Last edited by Billie Jean; 12-02-2020, 10:55 AM.

12-02-2020, 10:57 AM

This reply by Billie Jean has been deleted by Billie Jean
Billie Jean  
Senior Member  

Join Date: Nov 2013  
Posts: 216

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.

Billie Jean  
Senior Member  

Join Date: Nov 2013  
Posts: 216

Originally posted by FTC1000  
Subject: Think Award Judging

Q: How will Think Judging be different with the introduction of the Engineering Portfolio?

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

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.

Last edited by Billie Jean; 12-02-2020, 12:01 PM.  
Reason: Added recommendations for format
A: After a team is invited to an event, the Lead Coach of the team will receive instructions on how, when, and where to upload the engineering portfolio.

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

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.

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

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 if the portfolio and interviews are not sufficient to help answer the questions to determine which teams are most deserving for an award.

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 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.

---

12-01-2020, 12:54 PM

*Originally posted by FTC1999*  

**Subject: Engineering Portfolio Requirements**

**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 portfolio can include a table of contents and a summary page, and those pages are counted as part of the 15 pages.

---

12-01-2020, 01:05 PM

*Originally posted by FTC1999*  

**Subject: Engineering Notebook/Portfolio**

**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:** 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.
Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

12-01-2020, 01:25 PM
#12

Originally posted by FTC1999
Subject: Sections of Portfolio

Q: Are there any recommendations for the amount of pages in each section (engineering, team plan, etc.) for the portfolio?

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

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

12-02-2020, 02:51 PM
#13

Originally posted by FTC1999
Subject: What is more important, content or formatting?

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.

Billie Jean
Senior Member

Join Date: Nov 2013
Posts: 216

12-07-2020, 01:12 PM
#14

Originally posted by FTC1999
Subject: Engineering Portfolio for Future Seasons?

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.
Billie Jean  
Senior Member

Join Date: Nov 2013  
Posts: 216

Judges Interview  
09-22-2020, 01:45 PM

Answers to questions about the Judges Interview.

Tags: None

Billie Jean  
Senior Member

Join Date: Nov 2013  
Posts: 216

12-01-2020, 10:13 AM  
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.

Billie Jean  
Senior Member

Join Date: Nov 2013

12-01-2020, 10:16 AM  
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.

---

Originally posted by FTC1999
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.
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Billie Jean    Senior Member
Join Date: Nov 2013    Posts: 216

Judges Interview
09-22-2020, 01:45 PM
Answers to questions about the Judges Interview.

Tags: None

Stuck

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

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

Billie Jean    Senior Member
Join Date: Nov 2013

Originally posted by FTC1000

12-01-2020, 10:13 AM

12-01-2020, 10:16 AM
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