Forum Answered Questions - Traditional
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. Any rule clarifications or changes will apply to events happening that weekend.
General Robot Rules

09-22-2020, 09:52 AM

Answers to questions about General Robot Rules.

Tags: None

Stuck

10-20-2020, 07:31 PM

This reply by Broadway Joe has been deleted by Broadway Joe

10-20-2020, 07:29 PM

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/).
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?

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.
Stuck

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

Answers to questions about Commercial Off the Shelf Components.

Tags: None

PITTSCO Motor 385

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, 01:36 PM.

Universal Joints

Originally posted by FTC12533

Original post by FTC12533

Universal Joints

11-17-2020, 12:07 PM

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

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

FTC10095
Game Design Committee Member
Join Date: Dec 2009
Posts: 297

FTC12533
Game Design Committee Member
Join Date: Sep 2010
Posts: 942
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.
Billie Jean
Senior Member

09-22-2020, 09:54 AM

Answers to questions about Raw and Post Processed Materials.

Tags: None

Stuck

Broadway Joe
Game Design Committee Member

01-07-2021, 10:41 AM

Tread

Originally posted by FTC13178

Q: In the legal and illegal parts book, it says that you are not able to use rough top treads because it can scratch and ruin the game floor. If we are just using it on the arm of our robot and it wouldn't touch the floor would we be able to use it?

Thank you!

A: Yes. The intent of the rule is to prevent damage to the floor tiles from spinning wheels. Rough top tread may be use for other applications provided their use does not damage the field, field elements, or scoring elements.

Plaster of Paris
Q: Our team is having weight distribution problems and we need a ballast to fix this problem. Is it legal to use hardened plaster of pairs as a weight on our robot?

A: Yes, providing it is sufficiently protected to not leave debris on the field.

Last edited by Broadway Joe; 01-26-2021, 05:48 PM.
Billie Jean  
Senior Member

Join Date: Nov 2013  
Posts: 220

Miscellaneous Robot Electrical Parts and Materials  
09-22-2020, 10:40 AM

Answers to questions about Miscellaneous Robot Electrical Parts and Materials.

Tags: None

Pierluigi Collina  
Game Design Committee Member

Join Date: Sep 2010  
Posts: 1128

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)
**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.

---

**FTC11129**

**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](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](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/Doc.../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

---

**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.

*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.

*Originally posted by FTC12090*

Subject: GoBLIDA Battery

Question: Is the GoBLIDA battery allowed this season? It is just a different physical layout to the same battery cells used in the Matrix and Rev batteries, so it does not provide any capacity or power benefits.

Answer: No. The only batteries that are allowed for use are listed in <RE03>.

*Originally posted by FTC12731*

Subject: HDMI Monitor in Robot

Question: Is it legal to have an HDMI monitor connected to the Control Hub?
Answer: No. HDMI monitors would fall under <RE18> Additional Electronics.

Answer: No. No modifications to the REV grounding strap are allowed.

Answer: No. The only allowed electrical connection to the robot frame is via the REV Resistive Grounding Strap (per <RE15>.k)

Question: Assuming the resistor stays intact, is lengthening, shortening, switching out either the XT30 or ring terminal on, or changing out the cable on the REV grounding strap legal?

Question: Is grounding a shielded cable’s drain wire to the robot frame legal?
Stuck

Motors and Servos
09-22-2020, 10:40 AM

Answers to questions about Motors and Servos.

Tags: None

Billie Jean
Senior Member

09-22-2020, 10:40 AM

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.

---

**Pierluigi Collina**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 1128

12-26-2020, 06:31 PM  
Originally posted by FTC14433  
Subject: Servo Legality?

**Question:** Can we use this servo [https://www.servocity.com/sg12-serie...0-80-sec-60/](https://www.servocity.com/sg12-serie...0-80-sec-60/)? It has feedback from a potentiometer located on the final shaft of the Servo Gearbox so that the rotation is not limited or effected by the ratio chosen. The servo has input from potentiometer. When we buy it, the servo already has that input. We do not modify anything.

**Answer:** No. The servo used in this gearbox assembly has been modified, post-manufacturing. As such, it violates <RE16>

---

**Pierluigi Collina**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 1128

12-31-2020, 01:04 PM  
Originally posted by FTC12611  
Subject: Servo/Gearbox Legality

**Question:** 1. [https://www.servocity.com/servo-gear...in-0-32-sec-60](https://www.servocity.com/servo-gear...in-0-32-sec-60) These servo gearboxes have the goBILDA servo altered by the manufacturer.
2. https://www.servocity.com/sg12-serie...z-in-31-3-rpm/
These servo gearboxes don't have any modifications on the servo.

Are any of these servo gearboxes legal?

Answer: In general, it is not possible for us to make rulings on all servos.

For Servo #1 - this servo is not a legal servo. It has been modified from its original configuration to add an additional potentiometer output

For Servo #2 - these appear to be legal servo combinations. The servos appear to be digital servos that have been programmed to control their range of motion.

Originally posted by FTC12533

Subject: Servo Power

Question: Is powering a servo with a stall current above 2A at 4.8V, via the 4.8V ports on the rev hub legal if a 2A fuse is added by the manufacturer or by a team?

Answer: No. Servos may only be connected to/powered by the servo ports on a REV Expansion Hub, the servo ports on a REV Control Hub or the servo outputs on a REV Servo Power Module
Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

Control System
09-22-2020, 10:41 AM
Answers to questions about the Control System.

Tags: None

Pierluigi Collina
Game Design Committee Member
Join Date: Sep 2010
Posts: 1128

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: 1128

Originally posted by FTC12533
Subject: 3rd-Party Gamepads & Gamepad Modifications

Question 1: Is a modified PS4 controller, such as those from:
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)
Stuck

09-22-2020, 10:41 AM

Answers to questions about Sensors.

Tags: None

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: 1128

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

*Originally posted by FTC8813*

**Subject:** Microcontroller as Sensor

**Question:** An ATTiny85 works great as a hardware pulse counter. This 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: 1128

11-18-2020, 04:41 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: 1128

11-18-2020, 04:53 PM  
#5

*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.

---

**Pierluigi Collina**  
Game Design  
Committee Member  
Join Date: Sep 2010  
Posts: 1128

01-07-2021, 12:47 PM  
#6

*Originally posted by FTC8397*  
**Subject: COTS Potentiometer as Sensor**

**Question**: This question has to do with the interpretation of rules <RE12>a ("Compatible sensors from any manufacturer may be connected to the REV Expansion Hub or REV Control Hub.") and <RE18> ("Electronic devices that are not specifically addressed in the preceding rules are not allowed.").

Rev Robotics markets a potentiometer for use as a sensor (by connecting to an analog port on the Expansion Hub).

Would other COTS potentiometers (of appropriate total resistance and connected to the Expansion Hub in the appropriate manner) be considered legal for use as sensors?

**Thank you.**

**Answer**: Yes.
Answers to questions about Gameplay – All Match Periods.

**Billie Jean**

Senior Member

Join Date: Nov 2013
Posts: 220

Gameplay – All Match Periods

09-22-2020, 10:47 AM

Answers to questions about Gameplay – All Match Periods.

**Air Jordan**

Game Design Committee Member

Join Date: Sep 2010
Posts: 526

11-16-2020, 06:20 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 <RG08> rule from the Game Manual Part 1. The rule states that Robots must 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. The main problem is with the definition of the word "or".

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

**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>.
Question 1: Is the Human Player allowed to reset the Power Shot Targets during the autonomous 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).

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

Answers 1 and 2: The referee will require a re-inspection for rule <RG08> compliance if a height or distance violation is observed, or if the Launched Ring clearly has excessive velocity that is likely to result in exceeding the rule <RG08> constraints if the Ring had not impacted an object.

The scenario described in Question #1 violates rule <RG08>.
Originally posted by FTC16461

Subject: Power Shot Target Dynamics

Statement 1: The Ultimate Goal Field's power shot structure has been extremely finicky throughout the season, with power shots occasionally falling when a power shot next to them is hit or bouncing back from the scored position immediately after being scored. Our team has been experiencing trouble with this since the very beginning of the season, as well as many other teams (9527, 14531, 16461, 10641 have all proofread this forum post). 10641 kindly provided this example match video, at 3:01 you can see some of the issues with power shots occur: https://youtu.be/t-VwyFs__TI?list=PL...9iy_o-ya&t=181

Statement 2: Due to the ruling of GS13, these issues result in many teams receiving major penalties often due to the unpredictability of the power shot structure, which leaves them feeling unfairly penalized, and we feel that some sort of change is needed. The advice given in the Remote Field Guidelines document for securing the power shot structure very slightly assists in reducing major penalties, but seems to increase the chance of power shots descoring. Our team personally has tried securing the power shot assembly to a chair, a weighted box, and a cinderblock assembly padded with foam, but none of these solutions have prevented major penalties and descoring entirely. Our team also has complete compliance to RG08, with rings shooting approximately 12 feet at the velocity we use to score power shots. As far as we understand, GS13 was primarily updated to counteract intentional scoring of power shots by shooting into the frame: the wording and implementation of the rule seems to unjustly penalize teams for normal scoring actions.

Now, onto our specific questions:

Question 1: Are teams permitted to attach foam to the power shot reset bar as a mitigation tactic for descoring?

Question 2: Can a change be considered to GS13 and/or Game Manual 2 4.5.4 3d that would enable teams to score power shots without worry of an undeserved and unpredictable major penalty?

We suggest an approach be taken where only power shots directly scored by a ring score, but teams are not penalized for indirect scoring (we feel that the penalty of being unable to score that power shot again is enough). An alternate approach could be reducing the penalty for indirectly scoring a power shot to a minor penalty, which effectively negates 2/3rds of your points for that specific power shot, which also seems sufficient. It would also be wonderful if power shots were scored solely by being hit, similar to the DIY field: this would fix any issues with descoring that teams have. This would require a change to 4.5.4 3d in Game Manual 2, which we understand may be too much to ask, but we'd like a change to power shot penalties and scoring to be considered in order to prevent unwarranted penalties for all teams: it's a horrible feeling when you did everything right and implement a routine to do power shots, but you get penalized due to the unpredictability of remote fields.

Answers 1 and 2: No, the requested modifications affect gameplay.
Note: Rule <RG08> Launching Game Scoring Elements comes into play when a Referee at a Traditional event or Field Personnel at a Remote event believe that launched Scoring Elements have excessive velocity to achieve the Scoring task. The distance and elevation constraints in rule <RG08> provide an objective measure of what the Game Design Committee designates as the maximum safe and sufficient "launching" ability to accomplish the game's Scoring tasks. These linear distance constraints do not guarantee that the resulting launch energy does not cause, in the Team's viewpoint, undesired outcomes.

Recommendation: Reducing the Robot's Ring Launch energy and adjusting the launch angle will likely prevent the scenario described in this post. By design, FIRST Tech Challenge Game Element dynamics should be a major consideration when designing and operating a Robot to play the game.

---

Air Jordan
Game Design Committee Member

03-02-2021, 02:38 PM

Originally posted by FTC12533
Subject: <GS6> Control/Possession Limits of Scoring Elements - Robot Arms that Aid Ring Collection

Question: Recently there have been some questions about penalties for a strategy of blocking rings so that they are in the front of the field to shoot. So the question is if a robot sits where rings come out of the return rack but also shoots in that position does the robot get a penalty if another ring from the return rack is blocked by the 18" of the robot and/or an arm designed specifically to block rings when the robot already possesses/controls 3 rings? Such as seen here: https://youtu.be/JCv7zwYPTOs. The reason for this question is that rings are deflected on the bot when driving to and shooting from a single spot but the strategy of deflecting them is intentional. (Permission was granted by 6323 to use their video for the example).

Answer: There is nothing inherently illegal in the usage of Robot arms. How the arms are used determine potential rule violations. The risks are different for each rule, but managed by the Drive Team, the arms could be used without Penalty.

In this scenario, Rings returning to the Playing Field that impact the "core" of a Robot that hasn't extend its arm(s) are not subject to the rule <GS6> Ring Control/Possession constraint.

A Robot that deploys part of its mechanisms [arm(s)] into the path of Rings is subject to rule <GS6> Control/Possession Limits of Scoring Elements. Ring impacts anywhere on a Robot with its arm(s) extended are subject to the rule <GS6> constraints.
Billie Jean  
Senior Member  
Join Date: Nov 2013  
Posts: 220

Pre-Match  
09-22-2020, 10:48 AM

Answers to questions about Pre-Match setup.

Last edited by Billie Jean; 09-22-2020, 10:54 AM.

Tags: None

Air Jordan  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 526

10-19-2020, 06:35 PM  
#2

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: 526

Originally posted by FTC9999

Subject: Section 4.5.1 Pre-Match Robot Setup - Game Element Extension Outside the Playing Field

<G14> [Robot Starting Volume] says "Before the start of a Match, the Robot in its starting location must not exceed a volume of 18 inches by 18 inches by 18 inches ... A Pre-Loaded Scoring Element may extend Outside the 18-inch cube volume constraint..."

Question: Since the Robot must be touching the Playing Field Wall at the start of the match, may a Pre-Loaded Scoring Element, such as a Wobble Goal or Ring, be partially extended over the Playing Field Wall and outside the Playing Field Boundary the at the start of the Match?

Answer: No. Section 4.5.1.1.a in the Game Manual Part 2 - Traditional Events requires the Robot to be Completely Inside the Playing Field Perimeter. Rule <G4> states that Scoring Elements that are Controlled or Possessed by a Robot are part of the Robot. Therefore, Pre-Loaded Game Elements are required to be Completely Inside the Playing Field Perimeter when the Robot is setup for the start of a Match.

---

Air Jordan  
Game Design Committee Member

Join Date: Sep 2010 Posts: 526

Originally posted by FTC9999

Subject: Pre-Match Robot Setup - Does a Game Element Touching the Playing Field Wall Satisfy 4.5.1.1.b?

Section 4.5.1.1 [Pre-Match/Starting Location] of Game Manual Part 2 (Rev 1.3) says "... a) Drive Teams must place their Robots and Possessed Scoring Elements, in any orientation, Completely Inside the Playing Field Perimeter. b) The Robot must touch the front facing Playing Field Wall. ..."

<G4> [Robot Manipulation of Scoring Elements] says "Scoring Elements that are Controlled or Possessed by a Robot are part of the Robot except when determining the location of the Robot or otherwise specified by a Game-Specific rule."

A recent ruling states that the exception "except when determining the location of the Robot" does not apply to section 4.5.1.1 [Pre-Match/Starting Location].

Question: Therefore, if the only part of the Robot touching the front facing Playing Field Wall is a Scoring Element Possessed by the Robot, is 4.5.1.1.b is satisfied?

Answer: No
Originally posted by FTC12533

**Subject: Operation of Motors and Servos during Pre-Match Setup**

**Question 1:** Are robots allowed to have motors and servos powered during initialization in order to fit within the 18 inch cube starting size requirement?

**Question 2:** Are teams allowed to manually operate motors and servos with the gamepad (such as pressing a button to activate a motor PID loop or move a servo) during the initialization period, in order to grasp game elements and/or ensure robot mechanisms are within the 18x18x18" sizing cube, provided that manual control would cease before randomization?

**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, provided that the actions do not unnecessarily delay the beginning of a Match.

Originally posted by FTC8397

**Subject: Section 4.5.1 Pre-Match - Robot Controller Initialization**

Game Manual Part 2, 4.5.1 (Pre-Match) states: "Pressing the driver station init button is not required unless it is needed for the Robot to satisfy the Match start size constraint." There are other reasons why a team might wish to press the init button during pre-match setup. For example, this could be useful to ensure that the BNO055IMU in the Rev Expansion Hub initializes successfully (we have seen occasional failures).

**Question 1:** Is it legal to press "Init" during pre-match setup to ensure successful initialization of a hardware item (such as the BNO055IMU), and to re-initialize if there is a failure?

**Question 2:** if (1) is legal, would it be legal, during pre-match setup, to confirm successful initialization by "wiggling" the robot slightly (to confirm changes in gyro readings) before leaving it in its final setup position?

**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.

---

**Air Jordan**  
Game Design Committee Member  
Join Date: Sep 2010  
Posts: 526

02-08-2021, 04:31 PM  
#7

Originally posted by FTC12762  
Subject: USB-powered display to view the output of a Robot Mounted UVC Camera During Pre-Match Setup

Our team switched to the new REV Control Hub for this season. One major difference between the Control Hub and the Android Robot Phone options is the lack of screen on the Control Hub compared to the phone.

**Question:** Our team would like to be able to align their camera during the pre-Match portion of a match. With the Android Robot Phone option, they would have used the display on the phone to do so. Without a display on the Control Hub, is it legal to attach a USB-powered monitor during the pre-Match, then remove it after aligning the camera (still during pre-Match)? Rule <G15> states in part “The Drive Team may align its Robot during pre-Match setup if they do so with legal components that are part of the Robot and can be reset to be within the 18-inch (457.2 mm) cube starting volume constraint”, however there is no mention of monitors in Game Manual Part 1 Section 7.3.3. Small commercially-available monitors (~phone screen size) that we could mount permanently inside of the robot are not generally available. Not using a monitor at all would seem to put teams with the REV Control Hub at a disadvantage compared to teams with the Android Robot Phone option.

**Answer:** As stated in the question, rule <G15> requires Robot alignment devices to be constructed with legal components. The legality of a USB-powered monitor is determined by Robot Electrical rule <RE18>. A USB-powered monitor is not specifically addressed by other rules, therefore it is not allowed.

Drive Teams may legally view the output of the onboard UVC camera during pre-match setup by using the Driver Station App’s built-in camera preview capability. The FIRST Tech Challenge Robot Controller Github Wiki describes how this is done: [https://github.com/FIRST-Tech-Challenge-Control-Hub](https://github.com/FIRST-Tech-Challenge-Control-Hub).
Billie Jean
Senior Member

Autonomous Period
09-22-2020, 10:49 AM
Answers to questions about the Autonomous Period.

Tags: None

Air Jordan
Game Design Committee Member

09-29-2020, 08:38 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

Air Jordan
Game Design Committee Member

09-29-2020, 08:44 PM

Originally posted by FTC2901
Subject: Are Rings in the Starter Stack Eligible to be Scored during the Autonomous Period?
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.

Originally posted by FTC2901
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

Originally posted by FTC8397
Question: Is it alright for a flywheel to continue on unpowered motion between the Autonomous and Driver-Controlled periods?

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

Originally posted by FTC8397
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.
Subject: Possessed Wobble Goal Outside the Launch Zone

Question: If the robot is holding a wobble goal during the autonomous period and the robot is completely in the launch zone, but the wobble goal is over the line, is it still legal to launch rings into the Mid and High Tower Goals? The robot itself is completely in the launch zone, but the wobble goal is over the line.

Answer: Yes, per rule <G4>.

Subject: Power Shot Scoring

Question 1: Our ring hit the power shot, and it moved from Forward to Back, but then bounced back to Forward position, does it count as scored? It happened more than once during our game, and especially on the 2nd power shot target. Our question is mainly raised by the sentence in the game manual: “Power Shot Targets are Scored at Rest.”

Question 2: The 3rd power shot (far from the tower) sometimes is stiff to move (you can feel by hand), and there is one case, our ring hit it, but was only able to move it to vertical position (not exactly Back), and it stayed in that status until the end of autonomous period. Does it count as scored?

Answer 1: No.

Note: Reducing the Robot's Ring Launch energy is likely to prevent the scenario described in the question.

Answer 2: The Power Shot Target must be oriented away from the field to count as Scored. Any orientation beyond vertical in the direction away from the field should be counted as Scored. It is not necessary for the Power Shot Target to be in the full back orientation to count as Scored.

Note: The "stiff" movement of the Power Shot Target described in the question is not normal. Adjust the Power Shot Target assembly so that it easily moves between the Forward and Back states.
In the autonomous period, with a stack of four rings, after launching the three preloaded rings, the robot does a series of turns and drives to deliver the preloaded wobble goal to the target zone goal, pick up a second wobble goal, and deliver the second wobble goal to the target zone goal. In so doing, the robot happens to run into the stack of four rings twice: once during a turn (this just kind of knocks the stack over), and once during a straight drive to get the second wobble goal (this displaces all four rings by about three feet). There is no attempt to pick up these rings during the autonomous period. The movement of the rings is incidental to the attempt to deliver and pick up wobble goals. It also is not intended to place the rings in a favorable position for the subsequent driver-controlled period.

Question: Should this be interpreted as legal plowing of the four rings, or illegal control of more than three rings (i.e., herding)?

Thank you.

Answer: The Robot actions in this scenario are legal Plowing.

Note: Rule <GS8> consequences will be applied if the Robot Interferes with the opposing Alliance’s Starter Stack.
Billie Jean
Senior Member

09-22-2020, 10:49 AM

Answers to questions about the Driver-Controlled Period.

Tags: None

Driver-Controlled Period

Billie Jean
Senior Member

Air Jordan
Game Design Committee Member

09-29-2020, 08:15 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

11-16-2020, 06:40 PM

Originally posted by FTC12524

Subject: Rule <GS9> Wobble Goal Constraints - Controlling an Opposing Alliance Wobble Goal

Hello! We are FTC Team 12524 and we have a question about Moving opposing Alliance Wobble Goal during the Driver-Controlled...
Driver-Controlled Period - FTC Forum

Period.

Today at the Traditional Event we have a situation in a match. During the Driver-Controlled Period, before the start of the End Game, we moved the opposing Alliance Wobble Goal, that was neither in the Target Zone nor outside of Launch Zone, to the far corner of the Launch Zone. Rule <GS09> does not prohibit Controlling Opponents Wobble Goals in this case.

But Referees gave us a warning (with potential Yellow Card if the action will be repeated next time) for this, telling that this tactic is against the concept of Gracious Professionalism.

Question: So, the question is: is it allowed to take away the opposing Alliance Wobble Goals during the Driver-Controlled Period, before End Game, that are not completely in a Target Zone.

Answer: Yes, provided that no other rules are violated. The Robot's actions described in the question do not violate rule <GS9> and no warning should be issued.

---

Air Jordan
Game Design Committee Member
Join Date: Sep 2010
Posts: 526

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.
DRAFT ANSWER

Originally posted by FTC12533

Subject: Rule <G28> - Pinning, Trapping, or Blocking Robots - Robot Denying Access to Rings Exiting a Return Rack.

Question: According to <GS6>1)b, "Strategies for Controlling Rings that deny all access by other robots are not allowed." How much would a ring have to roll out of the return rack before it is considered accessible by all robots? If I'm in front of the return rack for the sole purpose of picking a ring right after it hits the floor, is this allowed?"

Answer: First of all, Rule <GS6>1)b applies to Controlled and/or Possessed Rings. The primary rule that applies to this scenario is <G28> for Blocking Access to an Area or Game Element.

The answer is not as simple as specifying a Robot keep out Area or linear distance from the Return Rack. The following guidance applies to this scenario:

1) Return Racks are assigned to Human Players from specific Alliances. For Robot gameplay, the Return Racks and the Rings that are returned to the Playing Field Floor are both Alliance Neutral.

2) Does an opposing Alliance Robot's actions and/or location indicate an intent to collect Rings that exit from a Return Rack? An opposing Alliance Robot actions that signal an intent to access Rings exiting from a Return Rack is necessary for rule <G28> to apply. If an opposing Alliance Robot is not nearby and signaling the intent to access Rings, the Robot is not violating rule <G28>.

3) How many Rings are Possessed by the Robot? In general, a Robot possessing two or fewer Rings is free to Park with the intent to collect the next Ring to exit the Return Rack without risking a rule <G28> violation. A Robot that Possess or Controls three or more Rings is expected to move and yield the expected Ring Rack Return area to another Robot. Keep in mind, that this is not permission for a Robot to violate other rules such as, Blocking Access to a Robot Alliance Specific Wobble Goal, Blocking Access to a Tower Goal, Blocking Access to Rings On the Playing Field Floor, etc.

4) Two Robots on the same Alliance that "tag team" to prevent an opposing Alliance Robot from accessing Rings returning to the Playing Field Floor from a Ring Return Rack violates the intent of rule <G28>.

5) A Robot occupying the likely location where Rings return to the Playing Field with the intent of deflecting Rings: a) towards their Alliance Partner Robot, b) away from an opposing Alliance Robot, c) towards a preferred location, violates the intent of rule <G28>.

6) In summary, a Robot in position to collect a legal number of Rings to "play the game" (i.e. collecting a legal number of Rings for its own use and then moving away) is unlikely to be viewed by referees as violating rule <G28>. A gameplay strategy primarily aimed at Blocking access to Rings returning to the Playing Field Floor will likely be viewed by referees as violating rule <G28>.
**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>.

---

**Question:** Is it legal for the human player to apply pressure to the return rack to control where rings fall?

**Answer:** No

---

**Question 1:** If a ring leaves the return chute, is completely supported by the playing field, and then ends up completely supported by another ring, is that ring still eligible for scoring? (Rule GS6, 1B)

**Question 2:** If a ring is placed by the robot on top of another ring, is that ring still eligible for scoring?

**Answer 1:** Yes

**Answer 2:** Yes, provided that the top Ring was eligible to be Scored before the Robot placed it on top of another Ring that is on the Playing Field Floor..
Answer: The intent of the rule is to address both scenarios. The Human Player is required to return Rings to the Playing Field as quickly as practical for both Traditional and Remote Events.
Answers to questions about the End Game.

**Tags:** None

---

**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.
Subject: Section 4.5.4 End Game Wobble Goal Rings and Rule <G29> Illegal Usage of Game Elements

In Ultimate Goal, it is possible to starve the Field of Rings very quickly during End Game with a well-built Robot by collecting Rings and placing them on a Wobble Goal and then storing more in the allowed storage within the Robot.

Question: During End Game, if a Robot can LEGALLY consistently collect all of the field’s Rings within a VERY short period of time on a Wobble Goal, thus amplifying the difficulty for other Robots to score Rings in the Tower Goal, for example, would G29 possibly be invoked?

Answer: No

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 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!

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.

Air Jordan

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.

Air Jordan

Subject: Power Shot Scoring

In recent remote league meet, my team experienced two situations that we would like to clarify with the Game Design Committee:

Question 1: Our ring hit the power shot, and it moved from Forward to Back, but then bounced back to Forward position, does it count as scored? It happened more than once during our game, and especially on the 2nd power shot target. Our question is mainly raised by the sentence in the game manual: "Power Shot Targets are Scored at Rest."

Question 2 The 3rd power shot (far from the tower) sometimes is stiff
Answer 1: No.

Note: Reducing the Robot's Ring Launch energy is likely to prevent the scenario described in the question.

Answer 2: The Power Shot Target must be oriented away from the field to count as Scored. Any orientation beyond vertical in the direction away from the field should be counted as Scored. It is not necessary for the Power Shot Target to be in the full back orientation to count as Scored.

Note: The "stiff" movement of the Power Shot Target described in the question is not normal. Adjust the Power Shot Target assembly so that it easily moves between the Forward and Back states.
Forums | Articles
---|---
New Topics | FIRST Tech Challenge Blog | Calendar | Who's Online

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

09-22-2020, 12:10 PM

**Competition Rules**

Answers to questions about Competition Rules.

Tags: None

**#1**

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

**#2**

12-08-2020, 08:26 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: No

A2: Yes - ONLY if the dates of the event do not overlap.

*Last edited by Billie Jean; Yesterday, 09:12 AM. Reason: Answer to the first question was updated to no, with a clarification to answer #2. Teams may not attend concurrent events (events that have the same start and/or end date)*
12-08-2020, 08:30 AM
This reply by Billie Jean has been deleted by Billie Jean

12-08-2020, 08:26 AM
Stuck

Field Setup
09-22-2020, 12:20 PM

Answers to questions about Field Setup and Assembly.

Tags: None

Big Red Machine
Game Design Committee Member

10-20-2020, 11:05 PM

Originally posted by jlevy2017
Subject: Exact placement of the Launch Line

Q: In the Field Setup Guide, page 12, the placement of the Launch Line is defined with "The front edge of the Launch Line should measure approximately 80" to the Audience Perimeter Wall".

"Front edge" is not defined. Is it the edge closest to the Tower Goals, making the Launch Zone 80 inches in length, or is it the edge closest to the audience, making the Launch Zone 82 inches in length?

A: The front edge of the Launch Line is the part of the tape that is closest to the Audience Perimeter wall.
Q: To clarify: before each match begins, are all four rings in each stack to be placed on their respective spots, and does this happen before teams place robots on their field?

A: You place all four rings on their spots prior to the robots are placed and then adjust them after the randomization takes place as described in the Field Setup Manual as well as Game Manual Part 2.
Forums Articles
New Topics FIRST Tech Challenge Blog Calendar Who's Online

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

Engineering Portfolio
09-22-2020, 12:43 PM
Answers to questions about the Engineering Portfolio.

Tags: None

Edit Quote Flag Like 0

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

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, 09:56 AM.

Edit Quote Comment Flag Like 0

Billie Jean
Senior Member
Join Date: Nov 2013
Posts: 220

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 one 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.

Billie Jean  
Senior Member  
Join Date: Nov 2013  
Posts: 220  
12-01-2020, 10:32 AM

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: 220  
12-01-2020, 11:35 AM

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.
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.

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.

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.

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: 220

12-01-2020, 12:25 PM

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: 220

12-02-2020, 01:51 PM

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.