



FRC Q&A

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Game - The Arena

Q274

Q.What criteria will be used by the field supervisor to determine that a tote or recycling container should be permanently removed from play? Example 1: totes have features (flanges, handles) below the lid on the container base. If those features are cracked or missing, will a tote be considered playable? Example 2: the handle on a recycling container is cracked completely through, but still attached to the container. Is it playable?

A.*Section 2.3* describes major feature damage as cause for a TOTE or RECYCLING CONTAINER to be rendered unsuitable for gameplay. Handles are considered a major feature, and if gone or severely damaged, will render a game element unsuitable for gameplay. "TOTES will be removed from play if, in the judgment of the Head Referee, the TOTE is unsuitable for gameplay. Examples include but are not limited to: lids broken off, large cracks that weaken rigidity, and large holes" and "RECYCLING CONTAINERS will be removed from play if, in the judgment of the Head Referee, the RECYCLING CONTAINER is unsuitable for gameplay. Examples include but are not limited to: lids broken off, large cracks that weaken rigidity, and large holes." We can't answer your question precisely, because it depends on the exact condition of the TOTE or RECYCLING CONTAINER and the judgement of the Head Referee. In general, if a feature has minor cracks or damage, the element itself will still be considered eligible for gameplay.

Q149

Q.Follow-up to Q57. Do you have a source where we can purchase pre-cut HDPE (ideally the same source as for the field components used in competition, like NASA has in the past for other fields). We can use our source otherwise, but having an exact replica would be better.

A.We normally don't answer non-rules questions in the Q&A. Questions like these are best directed to frcteams@usfirst.org. That being said, we do want to be as helpful as we can. In this particular case, though, we're not comfortable recommending a specific source for the HDPE. Many sources are likely to be able to supply you with material that meets the specification, some likely closer to you that will reduce your shipping costs.

Q100

Q.Rule 2.1.6 States the landmark is 15 ft 7 in from the alliance wall. The picture immediately below cites the distance as 13 ft 7 in. Which is the correct measurement?

A.The Game Manual was corrected in *Team Update 2015-01-06* to reflect the correct dimension of 13 ft. 7 in.

Q57

Q.My supplier for HDPE says that there are two types of surfaces -- totally smooth and "orange-peel like." Could you let us know which surface type is used for Recycle Rush?

A.Good question, apologies for the omission. The answer is both. The HDPE used for the Chute Plastic (GE-15017 and GE-15018) is "smooth". The HDPE used for all other elements is "orange-peel". The drawings will be updated to include this detail and announced in an upcoming Team Update.

Field

Q295

Q.Team Version Drawings - I believe the drawings for the Scoring Platform Assembly are incomplete. Model Number TE-15027 Fixed balloon leaders, Items 10-15. There are no drawings showing how to construct the colored item (parts 1 and 2 in the drawing). We need to know how to construct the supportive base of the Scoring Platform Assembly.

A.Items 1 and 2 in the BOM of TE-15027 are GE-15019 and GE-15020, and they are detailed in the [Game Specific Field Drawings](#) package.

Q238

Q.The Platform Top for the scoring platform specifies a dimension 20" X 80". On the "Scoring Platform Assembly" it specifies that two of these are needed. Is it really 160" plus long? There is nothing in the drawings that specify the material that the Platform Top is secured to. I am assuming that it is ¾" material that is used since the backstop base is ¾". Please verify this. Also what is the specs to manufacture those components?

A.Yes, as assembled, the Plywood Base for the Scoring Platform consists of two (2) GE-15019 "Scoring Platform" sub-assemblies and one (1) GE-15020 "Small Scoring Platform" sub-assembly. Together, these three (3) parts are 181.625" long. Remember that the previously mentioned dimension does not include the White HDPE that gets adhered to the top of Scoring Platform assembly. We believe that the full assembly drawings of GE-15025 and TE-15027 show all of the detail needed to properly manufacture one of those assemblies. Finally, the base of TE-15027, the Team Version of the Backstop, slides under and into the gaps in the bottom of the Scoring Platform so that the 2 x 4 uprights, TE-15026-01, butt up against the end of the Scoring Platform. Please see the assembly drawing and parts drawings for TE-15026 on how to properly cut and assemble those items.

Q237

Q.On the drawing page titled "Tote Chute Wall", item #5 - Tote Chute Door Wall specifies ¾" plywood. When I go to the drawing for the "Tote Chute Door Wall" it specifies 5/8" plywood. I am assuming that it is ¾" and it really does not matter, but I want to be sure.

A.You are correct, and sorry for the confusion. The Tote Chute Wall is 3/4" Plywood. The Team Version Drawings will be updated to reflect the changes, and the change will be announced in *Team Update 2015-01-27*.

Q95

Q.Is the carpet used in this years game the same as the carpet used last year?

A.The carpet used in RECYCLE RUSH is similar to the carpet used in AERIAL ASSIST, but is a different color. The exact carpet is described in the first paragraph of *Section 2.1*: "Shaw Floors, Philadelphia Commercial, Neyland II 20, 50510, 'Polar Express' and 'Capital Red'"

Q88

Q.We believe the bottom surface of the tote shoot is to be covered with HDPE. GE15017 and GE15018 are drawings of these parts (red and blue plastic chute). However Tote Slide Assembly drawing GE15004 does not include these parts. We cannot find any drawing which calls for the HDPE parts. Should th

A.The assembly of GE15017 and GE15018 can be seen as Item No 18 and 19 in drawing FE-00038 contained in the [Arena Layout and Marking](#) document.

Guardrail

Not Available

Alliance Wall**Q430**

Q.Is totes regularly falling sideways along their longer side when coming out of the chute considered normal operation of the field?

A.Please see [Q127]. If this does not answer your question, please post again with additional information.

Q124

Q.What is the angle of the angled wall (where the human player station is) relative to the alliance wall or the guard rail? I'm not seeing it on any of the drawings.

A.Major dimensions are provided in drawings in documentation. Any additional geometry must be derived as needed.

Scoring Platforms

Q244

Q.The Scoring platforms plans call for adding the Velcro between the plywood base and the HDPE around the outside perimeter of the flat section of the scoring platforms. This would create a slight void (Velcro thickness) between the two materials for the majority of the flat section of the scoring platforms. Is this how the competition field should be and will be fabricated?

A.You are right. There will be a Velcro thickness void at the center of the Scoring Platforms between the Plywood and HDPE. Please remember that there may be minor differences between events as the FIELDS are assembled and disassembled by teams of volunteers, in different venues, with other varying conditions. As outlined in the paragraph under Figure 2-1, "Successful Teams will design ROBOTS that are insensitive to these variations."

Q243

Q.The Scoring platforms plans call for 1.75" of wood and 0.250" of HDPE, what would be the total height when Velcro is added to the underside to provide slip resistance on the carpet and also for mounting the HDPE to the wood platform? The field video and game manual state the entire assembly should be 2.0 inches. Our team believes the scoring platform will be greater than 2" (by the thickness of the Velcro) if built to the drawings.

A.All dimensions can be derived from the [Official Field Drawings](#). The "thickness" added by the hook and loop tape is nominal and there may be minor differences between events as the FIELDS are assembled and disassembled. As outlined in the paragraph under Figure 2-1, "Successful Teams will design ROBOTS that are insensitive to these variations."

Q68

Q.Can a robot travel over the scoring platforms during the match?

A.Yes, there are no rules that prohibit that.

Q37

Q.Are the scoring platforms HDPE (as specified in the drawings and 2.1.3), or polycarbonate, as specified in the glossary?

A.Thank you for the question! The *Glossary* will be corrected to reflect that the scoring platforms are HDPE. Edits will be in *Team Update 2015-01-09*.

Q1

Q.Team Built Field - In the team prints, is there a page missing that suggests how to make the steps 2 " High?

A.To help in answering the question, we're going to assume that you mean "Scoring Platform" when you used "Step." Given that, we don't think there is a page missing. The assembly is illustrated in drawing number TE-15027: a stacked set of a platform (at 1.75 in.) plus a Scoring Platform Top (at 0.25 in). Note that, because the Scoring Platforms are already low cost wood construction, the assembly references the parts GE-15019 and GE-15020 from the Game Specific Field Drawings.

Step**Q263**

Q.Section 1.1 states that "each alliance competes on their respective 26 ft. by 27 ft. side of the field". However, the field is stated to be 27 ft. by 54 ft, and the step is stated to be 2 ft. 1 in. wide. I realize that the difference is not much, but these dimensions are an inch off; which one is correct?

A.The dimensions stated in the Game Manual are to be considered nominal, official dimensions are provided in the [Official FIRST Field Drawings](#). The nominal dimension of 25 ft. 11.5 in. is rounded to 26 ft. in *Section 1.1*.

Q50

Q.It appears that the sentence in 2.1.4, "Mounted to the sides of the STEP facing each ALLIANCE WALL is a 0.25 in. thick by 6.375 in. tall HDPE sheet..." should read as 6.63 in tall (which would be consistent with the stated lip height, as well as the part drawing. Is this the case?

A. Thank you for pointing out the discrepancy. *Team Update 2015-01-09* has corrected the dimension in *Section 2.1.4* to 6.625 in.

Q30

Q. Are the pieces of HDPE on the alliance faces of the step considered part of the step?

A. Yes, the Red and Blue plastic sheets are part of the STEP (per the *Glossary*, which states that the STEP is "the wooden and plastic structure which bisects the FIELD" and Step Assembly Model GE-15014).

Zone Markings

Q53

Q. What are the dimensions of the AUTOZONE, since the Glossary (which includes ramps), 2.1.5 (which is inconsistent with the tape), and the Field Drawings (which is probably what was intended) are inconsistent?

A. Thank you for pointing out this discrepancy. The dimensions in the Arena Layout and Markings document (drawing FE-00038) are correct. *Team Update 2015-01-09* will correct *Section 2.1.5* to the correct dimension (6ft. 2in.).

Q52

Q. Is the white tape included in the LANDFILL ZONE (As specified in the Glossary), or not (As specified in 2.1.5 and the Field drawings)? In either case, what is the specified width?

A. The tape is not included in the LANDFILL ZONE. This will be corrected in *Team Update 2015-01-09*. In case of inadvertent conflict between the Glossary and other sections of the Game Manual, the Game Manual shall prevail. Thank you for the heads up.

Q35

Q. We would like clarification on the Auto and Landfill zones. 1) With respect to G7-C, where starting configuration of the robot must be completely outside of these two zones, does this also mean that no parts of the robot can start in the airspace above these zones?

A. We believe the answer to [Q5] answers this question. If it does not, please ask again with additional detail.

The Landmark

Not Available

Vision Guides

Not Available

Alliance Stations

Not Available

Player Stations

Q102

Q. Can you have a camera on top of a pole that is connected to your computer within the drivers station, giving you a birds eye or wide view point of the arena? This camera would be entirely within your drivers station area and would be connected through wiring to a laptop.

A. We believe that the response to [Q7] answers this question. If not, please ask a follow up question.

Human Player Station

Q306

Q. The specific field drawings for the chute door (part GE-15035) and the assembly (GE-15034) show the handles (GE-15038) installed on the top of the door. However, in the Field Tour Video with Matt and Derek, the handles appear on the bottom. Should expect the handles at the top or the

bottom at competitions?

A.The Field Tour Videos are intended to show exactly what teams can expect at their event. However, there are a few occasions when the ARENA is modified after the Field Tour Videos have been created. In the rare occasion where the Videos differ from the Drawings, the Official Field Drawings supersede the Videos.

Q251

Q.In the Field Video- the dudes had a bit of trouble getting the tote in the chute. It seemed to have a minimal clearance. In the chute we built from the dimensions on the drawings- the chute had lots of clearance. The tote slid out of the chute on it's bottom in the video, and ours it drops out on its end- I think due to the difference in the chute sizes. Is the chute in the video representative of the chutes we will encounter at the tournament?

A.All FIELD elements (including TOTE CHUTES) used at events will be constructed within the tolerances of the [Official Field Drawings](#). We think you may also be interested in [Q127], but essentially the FIELD Tour videos are representative of the real interactions with the FIELD, but are not guarantees of the way physics will behave in every scenario.

Q154

Q.The bottom of the chute is aluminum on the diagram. There are many finishes on the aluminum that will have different frictional aspects. Different standard finishes are M-mill, P - preferred mill, SB - short brush, LB - long brush, and C - coated. Can you tell me what the finish is on the aluminum?

A.Thanks for your follow-up question. While the Tote Slide, GE-15008, is a mill finished aluminum part, it gets covered with a piece of Blue or Red, smooth HDPE, GE-15017 or GE-15018. Please see updates to the Arena Layout and Markings drawings for more information on where those parts get placed on the Tote Slide.

Q127

Q.Our team-built tote chute lands totes on their nose 100% of the time, but with tweaking land totes in their normal orientation 100% of the time. Can the GDC provide their intent on what orientation the totes are suppose to land in the field? If not, can a percentage nose-dive be provided? Thank you.

A.We cannot guarantee a TOTE will exit the TOTE CHUTE in any particular pattern, nor is the construction of the TOTE CHUTE intended to guarantee a particular "landing style". The orientation of the TOTES upon exiting the TOTE CHUTE is dependent on factors such as flatness of the venue floor, assembly tolerances, and manner in which the DRIVER or HUMAN PLAYER feed the TOTE.

Q120

Q.In regards to the chute plastic (GE-15017 and GE-15018), the only reference to installation is that it is included in the parts list for FE-00038. There are no dimensions for installation and no features (holes, etc.) that would line up with anything else. Where does the plastic start and end?

A.Vertically, the top edge of the Chute Plastic (GE-15017 and GE-15018) is aligned to the top edge of the Tote Slide (GE-15008). Horizontally, the Chute Plastic is centered on the Tote Slide. Views depicting these alignments will be added to the Arena Layout and Marking drawing (FE-00038) for *Team Update 2015-01-13*.

Q59

Q.What material is the bottom of the Tote Chute made of?

A.It appears you are referring to the HDPE Chute Plastic, which are part numbers GE-15017 and GE-15018 in the [Game Specific Field Drawings](#). These parts are assembled on the Tote Slide Assemblies (GE-15004) as shown in the [Arena Layout and Markings](#) document.

Human Player Zone

Q443

Q.Is an interpreter for a deaf student allowed to be in the alliance station?

A.Yes, this is allowed, as long as the interpreter does nothing else except interpret for the deaf

student. In other words, the interpreter may not contribute to strategy discussions or provide any other support other than interpreting. As this is an unusual situation not covered clearly in any rules, please bring a copy of this Q&A with you to your event to show event personnel if necessary.

Q434

Q.Is there two holes, in two pieces, that litter has to be fed through in the litter chute? One on the inside near the human player and one hole in the panel adjacent to the player station. Or is there only one?

A.We're not sure exactly how to answer your question, but the LITTER CHUTE is a 'chute' with openings both at the front and back. You can see the details at [this web page](#). Please click the 'Game Specific Field Drawings' link. If this doesn't help, please rephrase and ask again.

Game Elements

Q87

Q.Can we contain the totes within our robot (a box) and allow the totes to stack "in" our box robot before reaching the staging/scoring area or do we have to stack at the staging/scoring area?

A.A ROBOT may stack TOTES first and then bring them to the SCORING PLATFORM (either within their ROBOT or externally to their ROBOT). A ROBOT does not have to bring TOTES individually to the SCORING PLATFORM and stack them there.

Q79

Q.Is the robot allowed to hold the totes and recycling containers inside of itself or stack the totes in itself before reaching the staging area?

A.We're not sure of your question. Can you please follow up using additional specific terms used in the Game Manual? Thank you.

Totes

Q379

Q.What is the distance between the tote chute and either side's autonomous box?

A.If you are interested in specific dimensions, they can be derived by referencing the Official Field Drawings. The purpose of this Q&A is to answer questions related directly to the rules for RECYCLE RUSH. We want to be helpful, but your question is more of a technical one, and if we started answering questions like these this Q&A would get very long indeed, and rules-related questions could get lost in the shuffle.

Q342

Q.Similar to question 322, we were having dimension discrepancies with the gap. The totes are listed as 26.9" x 16.9". Using these dimensions, the totes would overhang the gap by 2.8" on each side. Is the gap actually smaller?

A.We believe the answer to [Q322] addresses your question.

Q322

Q.We have tried to recreate the step with totes and recycling bins per Figure 2-16. Drawings indicate the gap in the middle of the step, between the grey totes, should be 53". When we place 12 totes and 4 recycling bins on our step, the largest gap we can create is 45". Can you confirm that this gap should be 53"? Or it possible this is in error?

A.Good catch! Please accept our apologies. The 4ft. 5in. dimension in Figure 2-16 is incorrect and will be fixed in *Team Update 2015-02-10*.

Q191

Q.Is the field staff allowed to position yellow totes "upside down" within the staging zones?

A.No. The Yellow TOTES and RECYCLING CONTAINERS are setup for each MATCH as demonstrated in various figures throughout the Game Manual (particularly *Sections 2.2 and 2.3.1(d)*). Also, as a reminder, Per G13, "DRIVE TEAMS may not rearrange TOTES or LITTER prior to the start of the

MATCH.

Q158

Q.In what orientation and configuration will the zip ties on the totes be? For example, will they inbound, outbound, trimmed, etc?

A.[Q62] states that placement of the cable ties will be documented and announced in a future Team Update. Thank you for your patience.

Q89

Q.Are YELLOW TOTES worth points if they're scored on the SCORING PLATFORM similarly to GREY TOTES? Cont: Do YELLOW TOTES contribute to stack levels when calculating Container Score if they're used in combination with GREY TOTES?

A.No, there are no point values defined for Yellow TOTES on the SCORING PLATFORM. And No, Yellow TOTES do not contribute to the RECYCLING CONTAINER level - remember, "A RECYCLING CONTAINER is scored if it is fully supported by **only** scored Gray TOTES."

Q15

Q.Are the Yellow TOTE placements in the ALLIANCE STATION intended to be asymmetric for the Red and Blue sides? Since the position of the Scoring Table is the criteria for the positioning of Yellow Totes, it may provide a bias to an alliance depending on whether they are red or blue.

A.Yes, they are positioned such that the Head REFEREE can easily verify the correct number of Yellow TOTES are in the ARENA prior to the start of the MATCH.

Recycling Containers

Q435

Q.In follow up to Q179, what is a reasonable tolerance from center to expect / ask the field crew to position the recycling containers "approximately centered on the step"? They can physically vary ~+/- 3.25 inches which we would not consider "approximately centered".

A.The field crew should be making a reasonable effort to visually center the RECYCLING CONTAINERS on the STEP. If you see a RECYCLING CONTAINER you believe is not approximately centered on the STEP, you should bring it to the attention of a REFEREE before the match starts.

Q201

Q.When positioning the four recycling containers on the step at the beginning of each match are they touching the grey totes, or is there a gap between them?

A.The RECYCLING CONTAINERS are approximately adjacent to the TOTES and may or may not be in contact with the TOTES. If there is a gap, it is minimal.

Q179

Q.During match set up, will the recycling containers be centered on the step in addition to having the handles facing the driver stations?

A.RECYCLING CONTAINERS will be approximately centered on the STEP, as depicted in Figure 2-16, between the two HDPE Lips.

Q175

Q.Will the lip/handle ("lift here") of the recycling container LID be lined up with the handle of the BOTTOM of the recycling container during the entire match?

A.The details regarding game element preparation will be documented and announced in a future Team Update. Thank you for your patience.

Q147

Q.When the recycle bins are placed before autonomous will the handles be facing towards us or will it be random?

A.Please see the paragraph before Figure 2-20: "Each RECYCLING CONTAINER is oriented such that the handles point at the ALLIANCES' PLAYER STATIONS"

Q62

Q.Can you specify the size and location of the cable ties used to secure the lid to the recycling container, to ensure they don't interfere with pickup systems? Pictures would be a big help.

A.The cable ties used to secure the lids of the TOTES and RECYCLING CONTAINERS are 50 lb Nylon 6-6 cable ties, 11.1" long by .18" wide. Placement of the cable ties will be documented and announced in a future Team Update.

Litter

Q419

Q.Followup to Q414: I would like to confirm that if a LITTER is separated into 3 pieces, with each piece having one tape ring, that it is no longer possible to score that LITTER in the Landfill or RC, and if the LITTER has the other team's color, the LITTER would score as unprocessed litter, even if all 3 pieces of the LITTER are in the Landfill or RC.

A.LITTER, separated into 3 pieces, with each piece having one tape ring, is ineligible to score in any situation. For scoring purposes, it effectively no longer exists, and can't contribute to the score of either ALLIANCE under any circumstances, regardless of where those 3 pieces of LITTER end up. Please note that strategies where an ALLIANCE damages LITTER to negate the points that would otherwise be credited to the other ALLIANCE is prohibited per G16.

Q414

Q.2/20/15 Game Update, Section 2.3.3, the new sentence reads "... tape rings in place". That seems to imply that, if a LITTER is cut in two pieces, the longer piece is the one that is eligible for scoring. In the unlikely event that a piece of LITTER is cut into 3 or more pieces, is it no longer possible to score that LITTER? "at least two of the tape rings in the landfill" would allow for scoring. Note: This has implications for UNPROCESSED LITTER if severely damaged LITTER cannot be scored.

A.As long as the LITTER has two of the three tape rings in place, it is eligible for scoring, and since this is only possible for one section of LITTER that has been separated into multiple pieces, only that section may score. This does not mean that LITTER cut in three or more pieces can't score, though, as those smaller pieces could have been cut from a section already ineligible to score. This has implication for all LITTER, not just UNPROCESSED LITTER. Please keep G16-G in mind. Intentionally damaging LITTER will result in a foul. The phrase "at least two of the tape rings in the landfill" does not appear in the manual. If you are suggesting a rule change, once again, we would remind you that the intention of this Q&A is to answer rules-specific questions. Rules suggestions may be emailed to frcteams@usfirst.org

Q4

Q.Is it legal to place the litter inside the recycling container before you place the recycling container on top of a grey tote and still receive all the points for all the levels of totes stacked under the recycling container and get the litter points as well?

A.There are no rules that restrict the order in which ROBOT actions must be completed. Per Section 3.1.2.4, "TELEOP scores, with the exception of Coopertition, are assessed based on the state of the FIELD when the ARENA timer displays zero (0), or, if not all elements have come to rest, five (5) seconds after the ARENA timer displays zero (0)."

Field Management System

Not Available

Game - The Game

Q451

Q.Why is the penalty for G6-1 an automatic yellow card? That seems harsh, especially if completely accidental, or if caused by a field fault, which happened to us in one match.

A.The purpose of this Q&A is to answer questions about the rules of RECYCLE RUSH. If you have comments, you can send them to frcteams@usfirst.org.

Q450

Q.In relation to Q404, at some events the referees were not allowing human players to load litter over the wall, even when explicitly shown the Q&A response to 404 and 411. Can we get a rule update to explicitly allow this in the rules, and not just a Q&A response?

A.Please send any concerns you have about rules clarity and the implementation of rules at specific events to frcteams@usfirst.org. Please include as much detail as you can, to help us understand and address the issue.

Q433

Q.In regards to question number 164, how long must the chute door be open with a tote inside to be considered propped?

A.G6-1 includes no time limit, so as soon as the CHUTE DOOR is propped, that is a violation.

Q428

Q.During match setup, are teams allowed to actuate pneumatics by pushing the control switch/button on the solenoid?

A.There are no rules that would prohibit this, however please ensure you are doing so safely.

Q401

Q.The answer to Q26 says that litter does not have to be thrown from the human player zone. If two drive team members are behind the alliance wall, can one be on top of the other's shoulders and throw the litter?

A.No, this presents an unacceptable safety risk.

Q400

Q.I understand that the robot cannot be in contact with the tote chute, can the robot be in contact with the chute door? For example if the robot is in front of the tote chute and the totes are not quite lined up with each other or the robot, can the robot push the totes up against the closed chute door?

A.Yes, a closed CHUTE DOOR is equivalent to a FIELD wall.

Q384

Q.If the human player throws the litter out of the playing field is that a foul?

A.There are no rules that prohibit this.

Q370

Q.It has been previously clarified that you can load recycling containers directly from the human player station. How would these containers get outside the field? Would they be outside at the beginning of the match?

A.We don't think we said that RECYCLING CONTAINERS can be loaded from the HUMAN PLAYER STATION. Can you ask again, and reference the question number you think we answered that way? This one has us scratching our heads, seriously.

Q289

Q.Can robots apply weak adhesive tape like packing/painters tape to the field floor? The purpose of the tape would be to attach a component to the robot remotely without having an obstruction on the field. The tape in question does not damage the field tape when removed, and would be able to be removed within the 1 minute for getting into transport config. The tape would serve the same purpose at the tether in Q56, but would be connected to a completely passive mechanism using tape.

A.This is not permitted per G16 (a ROBOT cannot attach to the FIELD). Further, this would likely result in a violation of R8 as the tape is likely to be picked up by ALLIANCE partner ROBOTS.

Q196

Q.If placing yellow totes on the step and they fall into the opposing alliance side, this would be a foul. Would it

receive a single penalty for the event or a penalty for each item that falls completely onto the other side?

A.Each item that is completely transferred would result in a FOUL.

Q162

Q.May we use a hand or foot to hold the yellow TOTE firmly in place while we attach to it? What if we are lining up near the Yellow TOTE and bump it a little? Will it be reset by FIELD staff or can we move it back into the STAGING ZONE approximately where it started?

A.You can hold a Yellow TOTE in place with your foot as long as you do it without actually stepping on the tote (G3: "DRIVE TEAMS may not ... step on game elements..."). Also, there are no rules prohibiting you from holding the Yellow TOTE with your hand while positioning your ROBOT. Regarding bumping Yellow TOTES, G13 prohibits the movement of TOTES prior to the start of the MATCH. The violation for G13 is that the MATCH will not start until the situation is corrected. As such, the FIELD staff will re-position the Yellow TOTE and RECYCLING CONTAINER to be in compliance with the FIELD reset process if it is re-positioned by the DRIVE TEAM (or their ROBOT) during setup. If the process of staging your ROBOT for the MATCH is causing FIELD staff to have to correct the Yellow TOTE or RECYCLING CONTAINER, G10 ("DRIVE TEAMS may not cause significant or repeated delays to the start of a MATCH") may be enforced.

Q151

Q.when can you place the noodle in the recycle can?

A.We believe the answer to [Q4] answers this question. If it does not, please ask again with additional detail.

Q148

Q.If your robot is parked at the tote chute, and a tote is released from the tote chute, and as it exits the tote chute the tote starts to fall and is touching the robot but still hasn't completely exited(i.e. the chute door isn't completely closed) the chute. Would this be a violation of G27?

A.Please see [Q83]. If this does not answer your question, feel free to post again with more detail.

Q119

Q.If the TOTE is stuck or jammed in the TOTE CHUTE, can the ROBOT dislodge or move the TOTE to get it free?

A.Please see [Q83]. Also, per G27, a ROBOT may not contact the TOTE CHUTE as it is outside the FIELD. If this does not resolve your question, please ask again with additional detail. Thank you.

Q104

Q.Does a tote have to be placed right side up in the chute or can it be upside down? The video mentions only one orientation but it is not specified in the rule book.

A.There is no rule requiring a TOTE be entered in the TOTE CHUTE "right-side up", however the design of the TOTE CHUTE will not allow a TOTE to be entered "upside-down" without damage.

Q103

Q.If a pool noodle is laying across the top of two recycle containers would both containers receive a litter score? The rule (page 21 of game manual) says a maximum of one litter per container which would still be true in this scenario.

A.We believe the answer to [Q16] answers this question. If it does not, please ask again with additional detail.

Q83

Q.Would a robot taking control of a game piece as it is being introduced through the alliance wall be considered a violation of G27. (For example, could a tote be controlled by a robot as it is exiting the chute.)

A.*(edited, 1/14/15, apologies for any confusion, and thank you for your patience!)* No, per the revised G27 (as of *Team Update 2015-01-13*), a ROBOT controlling a TOTE in the TOTE CHUTE (or LITTER in the LITTER CHUTE) is permitted.

Q58

Q.Can a team clamp a mechanism to an autonomous Tote before the beginning of the match so long as the

tote remains inside the staging zone as placed by the volunteer staff and the mechanism detaches from the tote prior to the Teleoperated period?

A.Yes, a ROBOT may attach to a TOTE before the start of the MATCH, provided the TOTE is not moved, in any way, from its position as placed by the FIELD staff. There is no requirement that the ROBOT detach from the TOTE before TELEOP (i.e. no penalty if the ROBOT doesn't disengage), however in order for the TOTE to be eligible for STACKED TOTE SET scoring, the ROBOT must disengage. (edited 1/26/15 to add "STACKED" in front of "TOTE SET.")

Q55

Q.Can more than one recycle bin be scored on the same stack if they are both fully supported by the tote stack?

A.Yes, per *Section 3.1.2.3*, a RECYCLING CONTAINER is scored if it is fully supported by only scored Gray TOTES.

Overview

Q254

Q.The answer for [Q58] states "in order for the TOTE to be eligible for TOTE SET scoring, the ROBOT must disengage." Our reading of the rules indicates that a STACKED TOTE SET requires that "the entire structure is free of contact from ROBOTS" but can find no such requirement for a TOTE SET. Is there a rule update forthcoming for a TOTE SET requiring each tote to be "free of contact from ROBOTS" or did the answer to [Q58] intend to say "... to be eligible for STACKED TOTE SET scoring" instead?

A.Thank you for pointing this out, and please accept our apologies for the discrepancy. The response for [Q58] has been corrected.

Match Timing

Not Available

Scoring

Q490

Q.Our apologies for the poor formatting in Q489, line breaks apparently are not allowed by this system. The last sentence should read: With the definition given in Q487, if a robot is clearly (in the REFEREES' opinion): not holding the RC firmly, not bearing any of the weight of the RC, and not stopping the RC from falling, can the robot be said to not be supporting the RC?

A.If, in the REFEREE's opinion, the ROBOT is clearly not supporting the RECYCLING CONTAINER then the REFEREE will make the appropriate call. However if it is not absolutely clear to the REFEREE then the REFEREE is instructed to assume that the ROBOT is providing support.

Q487

Q.Is there an FRC specific definition of "support?" If so, please provide it. Your response to Q420 indicates that, in the absence of a formal definition of a word, a colloquial definition should be used. If there is no FRC specific definition of support, would the following definition suffice: "to hold something firmly or bear its weight, esp. from below, to stop it from falling." This definition was obtained from <http://dictionary.cambridge.org/us/dictionary/american-english/support>.

A.There is no FRC specific definition of "support". As noted in [Q483], the call lies with the REFEREES. We feel like we may not be fully addressing your concern, though. If you have a concern about what it means for a TOTE, RECYCLING CONTAINER or LITTER to be fully supported by the appropriate object, so allowing it to score, please see the blue box in *Section 3.1.2.3*, under RECYCLING CONTAINERS. If REFEREES are unclear whether or not a TOTE, RECYCLING CONTAINER, or LITTER is being partially supported by a ROBOT, they will assume it is. In this way, your suggested definition of 'support' would not be sufficient.

Q483

Q.We are seeking a clearer definition of the word "support." To clarify this, we would like to know, in general, would the following TOTE (and more generally, stacks in the same scenario) be considered scored: At the end of the MATCH, a ROBOT is contacting a GREY TOTE which is on top of a SCORING PLATFORM. A very accurate scale is placed beneath the ROBOT, and the scale reads only the ROBOT's weight. Furthermore, the ROBOT can clearly be moved away from the TOTE

without moving the TOTE.

A.As stated in the response to [Q479], this call lies with the REFEREES and they are not expected to use precise measurement devices. If there is any question in their mind if a ROBOT is supporting a TOTE in any way, they are instructed to score as if the ROBOT is supporting the TOTE. Teams are strongly encouraged to make sure there is no ambiguity.

Q479

Q.At the end of the MATCH, a RECYCLING CONTAINER has its weight fully supported by scored GREY TOTES. However, part of a ROBOT is resting on the inside of this RECYCLING CONTAINER. The mechanism is not supporting any of the weight of the RECYCLING CONTAINER, and can be removed at the end of the MATCH without moving the RECYCLING CONTAINER. Would this RECYCLING CONTAINER be considered scored?

A.We cannot comment absolutely on this scenario- as there are a lot of other potential factors and the final decision rests with the Head REFEREE. However, the blue box under Figure 3-4 is relevant in this scenario: "When REFEREES are assessing final scores at the end of the MATCH, if it is unclear whether a TOTE, RECYCLING CONTAINER, or LITTER (with the exception of LITTER in the LANDFILL ZONE) is being even partially supported by a ROBOT, the assumption will be that the ROBOT is supporting it(and thus it does not score)."

Q458

Q.In 3.1.2.2, STACK is "supported" by the STEP. In the blue box, it clarifies that "Support" is transitive through other TOTES. Is "Support" transitive through other items, such as LITTER? If a piece of LITTER is sitting between two Totes that would otherwise be considered a single STACK, would that be considered a STACK? The LITTER is only supported by the Lower TOTE. The Higher TOTE is supported by the Lower TOTE on one end, and the LITTER on the other end, and no other items.

A.We believe the answer to [Q439] answers this question. If not, please rephrase and ask again.

Q455

Q.Can two recycling containers scored on the same stack of grey totes both count for point? This is given that they are both only supported by the grey totes (e.g. they may contact each other, but only apply a horizontal force, and therefore do not support each other as described in the answer to Q418). Our understanding of the rules is that both containers would receive 4 points per level. Please let us know if this is incorrect. Thank you!

A.We believe the answer to Q55 addresses your question. If it does not, please let us know.

Q449

Q.As a follow up to Q438, it is reasonable to expect robots making last second stacks at the end of a match to release RECYCLING CONTAINERS and TOTES but not necessarily be free of contact as a portion of the robot may sag and come to rest on top of a stack. If a portion of the robot is clearly not supporting a scored TOTE, but is simply contacting it, will the TOTE still score? This excludes COOPERTITION STACKS. Some Week 1 events said contact was OK, some said contact was not OK.

A.As per the answer to [Q438], it's reasonable to expect that every effort should be made by Teams to ensure the question of support is clear.

Q439

Q.Consider a stack on the Scoring Platform of the following orientation, starting from the bottom (now we're here): Grey Tote 1, Grey Tote 2, Litter, Grey Tote 3, Grey Tote 4, Grey Tote 5, Recycling Container. Assume that the litter did not increase the level of the Recycling Container. How many points would be Scored for each Grey Tote and Recycling Container? Is the intent to have a piece of Litter in a stack disqualify Totes/Recycling Containers from scoring points? Thanks for your time!

A.In this scenario, only the bottom two Gray TOTES score. Gray TOTES 3,4,5 do not score because "support" is only transitive through TOTES and not LITTER. The RECYCLING CONTAINER does not score because it is not supported by only scored Gray TOTES.

Q438

Q.In regards to scoring totes, "A Gray TOTE is scored if it is fully supported by a SCORING

PLATFORM and no portion of the TOTE extends above the top of the BACKSTOP." Does this mean a robot touching the side of a TOTE but not supporting the TOTE is acceptable and the TOTE and any TOTES, RECYCLING CONTAINERS, and LITTER supported by that TOTE being contacted will still score?

A.We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. The only guidance we can offer is from the Blue Box in *Section 3.1.2.3* that reads, "When REFEREES are assessing final scores at the end of the MATCH, if it is unclear whether a TOTE, RECYCLING CONTAINER, or LITTER (with the exception of LITTER in the LANDFILL ZONE) is being even partially supported by a ROBOT, the assumption will be that the ROBOT is supporting it (and thus it does not score). As such, it is highly recommend that DRIVE TEAMS make it very clear that their ROBOTS are not supporting any scored TOTES, RECYCLING CONTAINERS, or LITTER at the end of the MATCH."

Q418

Q.We are seeking clarification for "A RECYCLING CONTAINER is scored if it is fully supported by only scored Gray TOTES." A sideways RECYCLING CONTAINER can be scored where it rolls and contacts another scored RECYCLING CONTAINER on an adjacent stack. The weight of both RECYCLING CONTAINERS are fully supported by the scored Gray TOTES beneath them, but there is significant horizontal contact between the RECYCLING CONTAINERS. Are both RECYCLING CONTAINERS considered scored?

A.If the weight of both RECYCLING CONTAINERS is fully supported by only scored Grey TOTES beneath them, both RECYCLING CONTAINERS would be considered scored. Contact between RECYCLING CONTAINERS that does not support any of their weight will not prevent them from scoring.

Q386

Q.Autonomous scoring requires all robots capable of the same goal (other than a stacked tote set, which is very difficult). If there is one robot not capable, the all-or-none aspect penalizes the entire alliance, and makes what the other teams have done worthless. Any chance FIRST will reconsider Autonomous Scoring to allow points for each robot/tote/container, and not just for sets? Maybe sets could be given a bonus.

A.At this time, we will not be reevaluating or adding individual scoring achievements for AUTO. If you have a different question, please submit it. For other comments, we ask that you contact frcteams@usfirst.org.

Q351

Q.Q177 states that a grey tote supported by two grey totes which are solely supported by the scoring platform will be counted as scored as long as the tote(s) do not extend above the top of the backstop. For clarifications sake, is whether or not a tote is considered scoring independent of configuration? For example, would two or more totes supported by one tote supported solely by the scoring platform would be considered scoring as long as they do not extend above the backstop?

A.Yes, when configurations consist of only scored Gray TOTES, each TOTE is evaluated for scoring potential independent of configuration or TOTE orientation.

Q341

Q.Are coopertition points eliminated for all playoff matches, or only the final match when win/loss/tie matters? Because for quarter and semi finals the number of points still matters for advancement and seeding in the next round.

A.Per Table 3-2 in *Section 3.1.2.4*, COOPERTITION SETS and COOPERTITION STACKS will not receive points during the Playoff MATCHES. This includes all playoff MATCHES, Quarter-, Semi- and Finals.

Q331

Q.According to section 3.1.2.1, "A ROBOT SET occurs when all ROBOTS on an ALLIANCE move themselves to, and are fully contained by, their AUTO ZONE at the end of AUTO." Does the word "themselves" refer to the individual robots, meaning that robots must move to the auto zone of their own volition (i.e. cannot be moved by partners) in order to qualify for a robot set?

A.Yes, your interpretation is correct. ROBOTS must move to the AUTO ZONE under their own power

(i.e. cannot be moved by partners) in order to qualify for a ROBOT SET.

Q91

Q.Is a recycling container and litter scored if the litter is in the container and is placed on two totes, which the robot then picks up and places on the scoring platform? Or does the robot have to put the totes on the platform first, then add the recycling bin, then add the litter for full points?

A.We believe your question is answered in [Q4]. If not, please post again with additional detail.

Q64

Q.Must the totes be right side up in order to score?

A.We believe the answer to [Q41] answers this question. If it does not, please ask again with additional detail.

Q51

Q.Per 2.1.3, the backstop is described as a structure to prevent totes AND bins from falling outside of the field. Would having a bin on top of 6 totes a valid score, even though the few inches of backstop available to prevent the bin from falling outside of the field is unlikely to do so?

A.Yes, a RECYCLING CONTAINER can score on top of a six (6) scored Gray TOTES (as long as the TOTES are not stacked in such a fashion that they extend above the top of the BACKSTOP).

Q36

Q.Is it legal to take yellow totes off of the STEP?

A.Yes, there are no rules that prohibit a ROBOT from removing Yellow TOTES from the STEP.

Q23

Q.Can more than one (Auto) Container Set be scored by the same alliance in the same match?

A.The Game Manual is a bit ambiguous there. Our apologies. *Team Update 2015-01-09* updates the language to clarify that no, each AUTO scoring option (CONTAINER SET, TOTE SET/STACK, ROBOT SET) is a singular opportunity for an ALLIANCE. For example, if six (6) RECYCLING CONTAINERS are present within the AUTO ZONE that would still only count for one (1) CONTAINER SET.

Q22

Q.Can stack F on game manual page 19 be reordered (for example: yellow - yellow - grey - yellow - yellow) and still score a coopertition stack?

A.Yes. Per the Blue Box in Section 3.1.2.2 "Support", for COOPERTITION, AUTO, and TELEOP, is transitive through other TOTES." In your example, all four (4) Yellow TOTES are fully supported by the STEP transitively via the TOTES below.

Q21

Q.If a robot is holding one or more litter at the end of the match, and that litter is fully within the landfill zone, is the litter considered scoring in the landfill?

A.Yes, per *Section 3.1.2.3* "LITTER is considered scored in a LANDFILL ZONE when it is fully contained within a LANDFILL ZONE." There is no requirement that the LITTER be free of contact from ROBOTS. However, the blue box in *Section 3.1.2.3* does seem to contradict this and will be edited in *Team Update 2015-01-09* to clarify that the language does not apply to LITTER in the LANDFILL ZONE. Thank you for bringing this to our attention.

Q20

Q.If a tote and a litter are both stacked on a scoring container side by side such that, if the tote were removed then the litter would fall off the container, does the litter score?

A.We believe the answer to [Q19] answers this question. If it does not, please ask again with additional detail.

Q19

Q.If a tote is stacked on top of a litter, both of which are stacked on a scoring container, and the litter is positioned such that, if the tote were removed then the litter would fall off the container, does the litter score?

A.Yes, the LITTER scores because it is fully supported by a scored RECYCLING CONTAINER. Per *Section 3.1.2.3*, "When a scored RECYCLING CONTAINER fully supports a LITTER that LITTER is considered scored in/on a RECYCLING CONTAINER".

Q18

Q.If a litter is wedged between 2 scoring containers and is not otherwise supported, does that litter score?

A.We believe the answer to [Q16] answers this question. If it does not, please ask again with additional detail.

Q17

Q.If yes to (If a litter is supported by 2 scoring containers which are next to each other (positioned like a bridge, not as in (d)), does that litter score?) then: can another litter be added to one of the two scoring containers in (g) for 2x scoring litter?

A.We believe the answer to [Q16] answers this question. If it does not, please ask again with additional detail.

Q16

Q.If a litter is supported by 2 scoring containers which are next to each other (positioned like a bridge, not as in (d)), does that litter score?

A.No. Per 3.1.2.3 "When a scored RECYCLING CONTAINER fully supports a LITTER, that LITTER is considered scored in or on that RECYCLING CONTAINER". In this scenario, neither RECYCLING CONTAINER fully supports the LITTER.

Q14

Q.If an alliance has two scoring containers in two different stacks and only 2 litter are stacked on only one of those containers (with no other litter or scoring containers), do both litter score?

A.No, per Section 3.1.2.3 a maximum of one (1) LITTER will be scored per RECYCLING CONTAINER.

Q13

Q.If yes to (If a container is stacked on a scoring container, do both containers score?) then: if 2 litter were stacked on top of the top container, would both litter score?

A.We believe the answer to [Q12] answers this question. If it does not, please ask again with additional detail.

Q12

Q.If a container is stacked on a scoring container, do both containers score?

A.No. We believe the response to [Q10] addresses this question. If not, please ask a follow up question clarifying your inquiry. Thank you!

Q11

Q.If a litter is stacked on a yellow or grey tote, on a scoring container, is the litter scoring?

A.The manual was vague on when scoring support is transitive. We've added language to the Blue Box in *Section 3.1.2.2* describing support that clarifies that transitive support is for and via TOTES only. As such, LITTER on a TOTE which is on a RECYCLING CONTAINER is not scored.

Q10

Q.Would the grey tote, container, and litter score in this stack? (Top down) Litter, Container, yellow

tote, grey tote, yellow tote, platform?

A. Assuming this "stack" is being fully supported by a SCORING PLATFORM, the Gray TOTE scores since its support is transitive through TOTES (such as in the scoring example in Figure 3-2(F)). In order for a RECYCLING CONTAINER to score, it may only be supported by scored Gray TOTES (per Section 3.1.2.3, "RECYCLING CONTAINERS"). As a result of the Yellow TOTES, the container in this example does not score. In order for LITTER to score in a CONTAINER, the CONTAINER must also be "scored." Since it is not, the LITTER is not scored.

Q9

Q. If a grey tote is stacked on a yellow tote on the platform, does the grey tote count as scoring?

A. Yes. The Blue Box under 3.1.2.2 is true of Gray and Yellow TOTES: "Support", for COOPERTITION, AUTO, and TELEOP, is transitive through other TOTES. For example, a Yellow TOTE is "fully supported by the STEP" if it is resting on top of another Yellow TOTE that is in turn resting directly on the STEP (and thus both Yellow TOTES are "fully supported" by the STEP)." This is further clarified by example F in Figure 3-2.

Q8

Q. In auto, can yellow totes be combined with other totes/containers in the same stack and still score an Auto Stack? For Example (Top Down) container, y-tote, y-tote, y-tote, g-tote. Or: container, y-tote, container, y-tote, container, y-tote, g-tote.

A. Section 3.1.2.1 states that "the Yellow TOTES are stacked one on top of another in a single column." This excludes Gray Totes, and therefore only Yellow TOTES can be used to score an AUTO STACK.

Q6

Q. Can a scored CONTAINER SET include RECYCLING CONTAINERS which started the match on the STEP?

A. There are no distinguishing features between the RECYCLING CONTAINERS that begin the MATCH in the STAGING ZONES and those that begin on the STEP. As such, a CONTAINER SET requires any three (3).

Penalty Assignment

Not Available

Match Logistics

Q159

Q.3.1.4 Can a tote be within the frame perimeter (or straddled around a tote) before the beginning of the match: touching it but not lifting or possessing it?

A. Please see [Q146]. If this does not answer your question, feel free to post again with additional information.

Game Rules

Q310

Q. As of Q27 you said "as long as no DRIVE TEAM crosses the starting line" does this mean that the starting line is also an infinite tall line or are we allowed to place the totes over the line without touching the floor (e.g. reaching over the line to place totes as far as we can reach without touching the floor)

A. No, the STARTING LINE is not projected vertically. If it helps, think of it as a starting line on a track - as long as contact with the floor is behind that line, your nose, hands, etc. may be in the space beyond the line.

Q160

Q. Team Update 1-13-15 and the answer to Q83 seem to contradict each other. Q83 says a robot controlling a tote in the tote chute is a G27 foul, but the new G27 says that is legal. Should the wording of Q83 been updated for the new G27?

A. Yes, *Team Update 1-13-15* required a revision to the answer to Q83 (and the others similar to it) such

that they would all be in line with each other. Q83 was revised this morning, and there shouldn't be a conflict any more. Thank you for paying attention to this.

Q110

Q.In relation to G27, what is the definition of game piece control? (e.g. would a passive tote slide count as control?)

A.There is no FRC-specific definition of control. Generally, if a ROBOT is directing the position or movement of a game piece, with either active or passive elements, it is considered to be in "control" of it.

Q105

Q.In Q55 you said that "a RECYCLING CONTAINER is scored if it is fully supported by only scored Gray TOTES." I want to know if it is possible to create a stack such as the following (bottom-up). Grey tote, Grey tote, Recycling container, Grey tote, Recycling container. Would both containers score?

A.No. Per *Team Update 2015-01-09*, the Blue Box in *Section 3.1.2.2* has been updated to clarify that support is transitive for and through TOTES only. The Grey TOTE on top of the RECYCLING CONTAINER is therefore not scored, making the RECYCLING CONTAINER above it supported by a non-scored GREY TOTE.

Q94

Q.Since robots have no frame perimeter rules this year and rope is a legal material does that imply robots can start or play the game with rope of any length around game objects?

A.Yes, there are no rules explicitly prohibiting this. However, be sure you meet G7-B and C, which requires you to start on your side, completely outside the AUTO ZONE and LANDFILL, and fully supported by the floor, SCORING PLATFORM, or SCORING PLATFORM ramps. This means you could not put a rope around game objects on the STEP before the match starts or have a rope supported by a Yellow TOTE or RECYCLING CONTAINER, as that rope is part of your ROBOT.

Q93

Q.Is there any rule that prohibits robots from being in contact with totes or containers in/on the Landfill or Step at the start of the match? The blue box under Fig 3-7 states there is nothing preventing teams being in contact with game objects in the staging area but is silent on those elsewhere.

A.Compliance with rule G7-C would prevent any contact with game elements in the LANDFILL ZONE or on the STEP prior to the start of the match.

Q27

Q.Can a human player move litter or totes during Auto? If yes, can human players cause litter or totes to enter a human player zone during Auto as long as said player doesn't cross the starting line?

A.There are no rules that prevent HUMAN PLAYERS from moving TOTES or LITTER once a MATCH begins (even in AUTO) or moving TOTES or LITTER in to the HUMAN PLAYER Zone, provided no one from the DRIVE TEAM crosses the STARTING LINE.

Q26

Q.Must litter be thrown over the alliance wall from only the human player zone, or from anywhere behind the alliance wall?

A.There are no rules that require a person throwing LITTER to be in the HUMAN PLAYER Zone.

Q24

Q.Is there a limit on the number of totes or litter a human player may be in contact with at once?

A.No, there are no restrictions on the number of TOTES or LITTER a HUMAN PLAYER may be in contact with simultaneously. However, the FIELD staff may enforce T1 if they feel it is necessary - for example a person is attempting to carry many TOTES over which they cannot see.

Safety

Q416

Q.Are Human Players allowed to wear gloves. With the speed we are loading, our human players are getting cuts on their hands by the zip ties on the totes.

A.Yes, team members may wear gloves.

Q395

Q.During the MATCH, are DRIVE TEAMS allowed to place GREY TOTES and LITTER outside of the ALLIANCE STATIONS before they are loaded on to the FIELD? Would this be considered a violation of T1?

A.There are no rules that expressly prohibit this, however depending on the circumstances (venue, number of people around the ARENA, etc.) it could present a hazardous scenario. If Referees are concerned about safety, they may ask you to keep the TOTES/LITTER on the ARENA carpet.

Q339

Q.In a case like this, would the following action be considered legal? The Human Player, having released the CHUTE DOOR, reaches in the CHUTE and pushes the TOTE onto the field. Since the player is not in contact with both the CHUTE DOOR and the TOTE at the same time, it would seem to be legal.

A.We can't respond to hypothetical scenarios with conclusive rulings, given the lack of context and other factors. Such calls are at the discretion of the Referees. In general, releasing the CHUTE DOOR completely on a TOTE still in the TOTE CHUTE may be considered propping the CHUTE DOOR and consequently a violation of G6-1.

Q301

Q.What is the purpose of the 1/30/15 Team Update to G5? Is the "Driver's Station" an "element" of the "HUMAN PLAYER STATION"? Do HP's have to be careful not to touch the Player Station (part of the HPS)? Shouldn't each HP for each HPZ be allowed to get totes and litter from the HPS? Q27 says that HUMAN PLAYERS (plural) can move totes in the HPS. G5 would prevent more than one HP from moving totes. Should the "elements of that HPS" be "game elements fully contained in the HPZ"?

A.The intent of the change was to prevent DRIVE TEAM members not in the HUMAN PLAYER ZONE from operating the TOTE CHUTE or otherwise contacting the HUMAN PLAYER STATION. The HUMAN PLAYER STATION is a specific term defined in *Section 2.2.2* of the Game Manual. Per that section the HUMAN PLAYER STATIONS "connect the end PLAYER STATIONS to the GUARDRAILS." and are therefore separate from the PLAYER STATIONS. There is no conflict between the update to G5 and the answer to [Q27] as TOTES and LITTER start in the ALLIANCE STATION, but are completely separate from the HUMAN PLAYER STATION.

Q279

Q.Q119 discusses a tote stuck in the chute. G6 says a Human Player (HP) may not be in contact with both a Tote and the Chute Door simultaneously, directly or through the use of any object. Please consider an exception to G6 when a Tote is stuck in a chute, and the Tote is not in contact with a Robot. It may be necessary for the HP to manipulate both the Tote and the Chute Door in order to free the Tote.

A.No, there is no exception for a stuck TOTE. The TOTE CHUTE is manufactured such that it can be safely operated and a TOTE is unlikely to become stuck under normal operation. If a TOTE becomes stuck due to either a ROBOT action (such as contacting it while it was exiting the chute) or an ALLIANCE Member action (such as closing the CHUTE DOOR while the TOTE was still partially inside), and it cannot be freed by legal actions, it will remain in that state for the remainder of the MATCH. If the TOTE becomes stuck under normal operations and as a result of circumstances beyond the ALLIANCE'S control, please notify the FTA, Field Supervisor or Referee.

Q278

Q.G6 says a Human Player (HP) may not be in contact with both a Tote and the Chute Door simultaneously, directly or through the use of any object. Please consider excluding "the Tote in the Chute" and "Chute Door" from the definition of "object". When opening the Chute Door, the HP would, through the Chute Door, be in contact with the Tote as well as the Chute Door. Similarly

while loading the Tote when the Tote comes to rest against the Chute Door.

A.We believe the response to [Q260] answers your question. If not, please ask a follow up question with additional detail.

Q174

Q.What is meant by "ALLIANCE member" in G5 and G6? Is this referring to a single person or a team that is a member of an ALLIANCE?

A.Each person who is in the ALLIANCE STATION is a member of the ALLIANCE.

Q25

Q.Are robots allowed to drive on top of totes? Or would this constitute a violation of G1?

A.There aren't any rules prohibiting ROBOTS from driving on TOTES, however the circumstances of such an occurrence may result in a violation of T1 or G1 (safety, e.g. precariously near the side border) or G16 (FIELD element damage, e.g. the TOTE lid caves in).

Pre-Match and Post-Match

Q475

Q.Can a hook on a string be placed in a Recycle Bin before autonomous mode starts; specifically which (if any) of these would be legal a) neither the hook nor string are touching the bin, but are inside the bin, b) the hook is not touching bin but the string is resting on the side of the inside lip, c) the string is resting on the inside lip and perhaps at a steep angle just touching the top of the bin, and d) hook in the bin (but not touching the bin) but the string is draped across top of bin

A.We believe that [Q283] answers your questions. If not, please reword and resubmit.

Q472

Q.Is a ROBOT permitted to begin the MATCH partially extended outside of the field, provided that it does not violate G7 or G27?

A.Safety is the top priority at events. There are no rules prohibiting a ROBOT from beginning a match partly extended outside the FIELD, however, please recognize that ROBOTS determined to be unsafe during a MATCH may be disabled per G1. This determination will be made by event staff based on the particular situation. We strongly encourage you to have this discussion with event staff, specifically the Head REFEREE, before matches begin at your event, or as you are placing your ROBOT on the FIELD at the latest.

Q466

Q.Follow up to Q463. When is a robot considered to be "placed" on the field?

A.The ROBOT is considered placed when it is in its intended starting position prior to the MATCH. We feel we may not be getting to the heart of what you are really asking though. If this answer doesn't satisfy, please rephrase again, or, if you have a concern not directly related to the rules, please email frcteams@usfirst.org.

Q463

Q.Per G7, "When placed on the FIELD for a MATCH, each ROBOT must be:", please provide a definition for "placed."

A.The term "placed" in G7 refers generically to the ROBOT being on the FIELD ready for the MATCH to begin.

Q441

Q.According to G7 "...C. completely outside of their AUTO ZONE and LANDFILL ZONE." my team wants to clarify that this does mean that our robot can be overlapping the tap and be practically into the staging zones.

A.There are no rules prohibiting ROBOTS from being within the STAGING ZONE at any time.

Q437

Q. Does G7 supercede G10? For example, if a team has completely expended their ~60 seconds of reasonable setup time per G10, and then is found to be in violation of G7, will they still be given additional time to apply their "quick remedy" to correct the G7 violation?

A. The 'quick remedy' allowed by G7 would not meet the 'significant delay' required before a G10 penalty would be invoked, so G7 would take priority. Note that while 'quick remedy' is not defined, the intent is to allow things such as quickly pushing a robot into position, bending an arm back, or removing an item designed for quick release. A 'quick remedy' should be able to be done safely in a matter of seconds.

Q424

Q. In autonomous section of the game, we have to place our robot between yellow tote and the container. Our robot dimension are such that it can move to place the container between its gripper (pincer in french) without it touching the robot if the yellow tote is moved (to then be back in place by match referee). Can we do that?

A. We think you are asking if you can move a Yellow TOTE temporarily to get your ROBOT in position for the start of a MATCH. The answer to this is yes, in coordination with FIELD Staff. Please see the blue box in *Section 3.1.4*, which reads, in part, "*Section 3.1.4* is not intended to prohibit TEAMS, in coordination with FIELD Staff, from temporarily shifting the position of TOTES and RECYCLING CONTAINERS, if necessary, to get their ROBOTS in position for the start of the MATCH. However, the MATCH will not start until FIELD Staff have verified all TOTES and RECYCLING CONTAINERS are in their designated starting positions". If you are actually asking something different from this, please rephrase and ask again.

Q410

Q. Related to section 3.1.4, rule G7B, Q94, Q283, Q308, and Q380. Is it legal for a robot to apply minimal upward force to a game object before the start of the match provided that the game object does not lift due to this minimal force and is fully in contact with the carpet?

A. Minimal upward force may be applied, as long as the position of the game object does not change. Minimal downward force may not be applied, as this would be a violation of G7-B, as you indicate.

Q398

Q. The blue box in 3.1.4 says: "DRIVE TEAMS may not move ... onto their ROBOT..." and "...as long as those items were not moved from their STAGING ZONE...". Per G13 "DRIVE TEAMS may not rearrange...". I would like to confirm that, when placing a robot, Drive Teams may temporarily move a Tote/RC outside the Staging Zone as long as they replace the Tote/RC in substantially the same position inside the Staging Zone. Such a move would not be "onto" the robot, nor a "rearrangement" of the Tote/RC.

A. Thank you for your question - this will be clarified in *Team Update 2015-02-17*.

Q397

Q. Does the robot need to be able to self sustain itself in transport configuration? In other words, can a second mechanism that attaches to the robot be held by a person inside the size perimeter? Do all mechanisms have to be able to stay inside the transport configuration on their own?

A. The Blue Box under R3 describes using additional aids to help your ROBOT comply with the TRANSPORT CONFIGURATION without violating other rules, particularly G10 and G11. Also please review questions [Q189] and [Q293] as we believe these might offer additional clarification. If you still have questions, please rephrase and post a followup question.

Q382

Q. Rule G13 references section 3.1.4 in the game manual, which states that during the FIELD reset period prior to a MATCH, "yellow TOTES [may] optionally [be] relocated to the designated area in the ALLIANCE STATION." May an ALLIANCE choose specifically which of the three yellow TOTE(S) to remove from the field prior to the MATCH? Or, will the decision of which TOTE(S) to remove be made by some other process once an ALLIANCE has indicated a desire to remove them?

A. Please see *Section 3.1.4, Match Logistics*: "When a DRIVE TEAM loads their ROBOT onto the FIELD for a MATCH they may elect to remove the Yellow TOTE from the STAGING ZONE directly in

front of their PLAYER STATION and instead place it in the ALLIANCE STATION." Each DRIVE TEAM makes the decision about their Yellow TOTE.

Q380

Q. Under section 3.1.4, the blue box at the bottom states that a robot may not move or preload totes or recycling containers. However, it later says the robots may be in contact with those objects. My question is, if our robot is built so loading location for a tote, or recycling container would be contained within our frame perimeter and in contact with our robot, but not grabbed, lifted, or attached to the robot, would that be legal. I guess we wanted more clarification on what preload means.

A. Yes, a TOTE or RECYCLING CONTAINER may be "in" a ROBOT provided that positioning doesn't relocate or support the TOTE or RECYCLING CONTAINER in any way. Conversely, the TOTE or RECYCLING CONTAINER may not be supporting any part of the ROBOT in any way (per G7-B).

Q375

Q. Can a human player rotate green recycling bins prior to autonomous?

A. No. *Section 2.3.2* indicates the starting position of the RECYCLING CONTAINERS, including how the handles are oriented. Once the FIELD staff have reset the game elements (or confirmed their position is correct if they're already in place), they may not be moved.

Q348

Q. Our team is planning on putting a fog machine on our cart. It would not be on the robot, so we don't have to worry about rules for during the match. We just want to know if FIRST would be okay with fog coming out of our cart. We would not let it come out too thick too fast, so we don't think it will be a visual obstruction. Thanks!

A. While there aren't rules expressly prohibiting fog machines, the likelihood that this could be mistaken as smoke and induce concern or panic is high. As a result, team employed fog machines are a safety concern which falls under the jurisdiction of T1 and are not permitted.

Q337

Q. The response to Q214/Q69 says only G9 items may be used on the field to configure the robot. No tethering is allowed. Is there an exception for 5.5.5 Match Replays (restarts)? If not, will teams be allowed time to take their robot back to the pit to put the robot back into starting configuration?

A. Yes, exceptional circumstances, e.g. MATCH Replays or Back-to-back Playoff MATCHES, will result in special accommodations for minor ROBOT maintenance like resetting a ROBOT'S configuration, minor repairs, trading out a battery, etc.

Q329

Q. Our team has modified an battery operated variable speed drill so that it has Anderson connectors. All our robot motors also use Anderson connectors, so our modified drill can drive motors on the robot without robot power. Do customized battery powered hand tools like ours meet the definition of "battery powered hand tools" under rule G9?

A. We believe [Q216] may answer your question. If not, please let us know.

Q303

Q. In regards to the hand tools allowed on the field before and after a match, are items such as zip ties allowed as an extra safety measure for securing robot pieces?

A. We believe the answer to [Q293] answers your question. If it does not, please ask again with additional details.

Q293

Q. Follow up to Q69 regarding rule G9, R3 allows the use additional aids such as bungee cords in order to meet the Transport Configuration size constraints. Are we allowed to bring these aids onto the field? If our additional aid is a 28 x 42 inch rigid frame as opposed to something flexible such as bungee cords, can we bring it onto the field so that we can meet the requirements of G9 and G10 while configuring to meet rule R3?

A.Yes, you are allowed to bring your TRANSPORT CONFIGURATION aids on to the FIELD. If your aids are relatively large, please keep safety in mind, as there will be significant activity on the field just before and just after every match. Also, please be sure that you can safely store them (e.g. on your cart) during the MATCH. *(edited 2/3/15 to correct grammar)*

Q292

Q.How many people are allowed to set up robot on the field? Can coach also assemble the robot during pre-match?

A.Any of the DRIVE TEAM members may assist in configuring the ROBOT for the MATCH. There is no prohibition against an adult member of the DRIVE TEAM assisting.

Q283

Q.Rule G7B states that robots must be "fully supported by the floor". However, in response to question 58, it is proved legal to attach to a tote before the start of a match. In response to question 94, the GDC states that you can't have a rope supported by a yellow tote or recycling container. If we were to attach to a game element, would the attachment need to have a rigid structure? Is it legal to attach to a game element if no downward thrust is exerted? How about a horizontal clamping force?

A.The ROBOT must not exert any downward force on the TOTE or RECYCLING CONTAINER, otherwise it could be thought of as not being fully supported by the floor. Imagine putting a very accurate scale under the game element, then attaching your ROBOT to it by whatever method you intend. If the scale registers added weight, your ROBOT is at least partly supported by something other than the floor, and is in violation of G7-B.

Q214

Q.Before the start of the MATCH, may we tether to the robot to get it from the TRANSPORT CONFIGURATION to the configuration we want to start in (provided we do so within the guidelines of G10)? When are we allowed to have the robot outside of TRANSPORT CONFIGURATION during Pre-MATCH? In the queue when it is our turn to load or only once we are on the FIELD?

A.No, G9 lists the only devices that can aid a DRIVE TEAM in configuring the ROBOT for the MATCH. We believe that [Q61] answers the second part of your inquiry.

Q146

Q.May the robot be touching totes or containers at the start of a match?

A.Yes, there are no rules prohibiting that.

Q130

Q.G10, blue box E: If a field fault or other problem forces a rematch, is on-field maintenance such as pneumatic recharging or battery replacement allowed?

A.In case of an ARENA fault where the MATCH is replayed immediately (instead of at a later time), the FIELD staff will permit teams to reset their ROBOTS on the FIELD, such as charging pneumatic systems or changing batteries. However, G10 still applies: "DRIVE TEAMS may not cause significant or repeated delays to the start of a MATCH."

Q74

Q.Regarding the tote placement, our team would like to know if there is a preset layout for the yellow tote and recycle bin for the autonomous mode setup. In 3.1.4 of the Game Manual, rules say we must comply with tournament personnel, but no further guidelines as to the starting conditions are listed

A.Please see Figure 2-20 and the paragraph that precedes it: "The RECYCLING CONTAINERS in the STAGING ZONES will always be to the left of the Yellow TOTE when viewed from the corresponding ALLIANCE STATION."

Q73

Q.Prematch 3.2.2.C When referring to the placement of the robot, does "completely outside of their AUTO ZONE and LANDFILL ZONE" mean only that part of the robot that touches the floor, or does it mean the plane that extends upward from the tape of each listed ZONE?

A.Apologies for the confusion and thank you for the question. [Q5] addresses this issue. Please follow up if it's still unclear.

Q69

Q.What equipment is allowed on the field for setup such as attaching parts to the robot before the game? Are power tools allowed or strictly Hand tools?

A.Please see G9: "DRIVE TEAMS may only bring hand tools, including battery-operated hand tools, onto the FIELD to configure or disassemble their ROBOTS"

Q48

Q.Is there a starting configuration for the robot at the beginning of each match?

A.No. With the exception of the ROBOT height limit defined in R3-A and G22, there is no prescribed starting configuration for a ROBOT at the beginning of the MATCH. Consider G7, as it implicitly limits ROBOT size.

Q5

Q.Does 3.2.2 mean the robot can support itself anywhere not auto zone or landfill zone and thus can protrude into the airspace above the auto and landfill zone, or does it mean that the robot cannot protrude into the airspace above the auto and landfill zone?

A.Good question. *Team Update 2015-01-09* will update the Glossary to clearly show that the AUTO ZONE and the LANDFILL ZONE are intended to be volumes (three-dimensional spaces) instead of areas (two-dimensional surfaces). Given this update, G7-C prohibits any part of the ROBOT from extending in to the AUTO ZONE or LANDFILL ZONE.

General Rules

Q501

Q.We are competing in St. Louis at the Championship event, and are seeking clarification on how this situation will be called there. A violation of G18 has two penalties: a foul or a red card. Although we are trying to reach over the step, as is explicitly allowed in example B - Figure 3-8, we are NOT strategically trying to contact anything beyond the step. Which penalty applies in this case? We would like to know in advance if we will be red-carded in all our matches.

A.Per G18, and our answer to [Q500], if you contact something beyond the step, while executing a strategic action such as attempting to gather RECYCLING CONTAINERS, and the contact does not fall under the exception of ROBOT to ROBOT interaction over the STEP, the penalty would be a red card.

Q500

Q.Our autonomous crosses beyond the step (<http://bit.ly/1J085cs>). Opponents have attempted to draw contact from us by placing robots on their side of the step. Our intention is always to acquire the bins, and never to strategically or egregiously contact opposing robots. We received a red card where the Head Ref interpreted egregious or strategic as "any" contact beyond the step. Should only a foul should be assessed, as we never strategically or egregiously tried to contact the opposing robot?

A.You seem to be asking a question about a specific call made against your team. The purpose of this Q&A is to answer general questions to help clarify rules, rather than questions about whether or not a rule was correctly interpreted by REFEREES in a specific instance. And as a reminder, no video replays will be reviewed, per *Section 5.5.3*. Generally, an autonomous routine which is known to reach beyond the STEP is a strategic maneuver, and once it contacts any portion of something beyond the STEP, is a violation of G18 (as it is not the result of ROBOT to ROBOT interaction over the STEP, the only exception to G18).

Q499

Q.As a followup to Question 2: How long is momentary contact? As an example, if a ROBOT is pulled over by an opposing ROBOT onto their side of the field, and is stuck on the other side for an extended period of time, what penalties, if any, will be assessed, and after how long?

A.Rule G18 provides an example that covers your exact question: "If a ROBOT becomes inoperable or "stuck" while some portion of the ROBOT is extending beyond the STEP, the ROBOT will not

receive multiple FOULS." Unless deemed egregious or strategic, a normal violation would result in one foul.

Q496

Q.Regarding G18 - In autonomous, if two robots get entangled over the step in an effort by both teams to acquire the recycling containers, and one team pulls the other team's mechanism over the step onto their side of the field and causes it to touch a field element, what (if any) penalties be assessed? Would this ruling change if one of the robots was attempting to keep the four RECYCLING CONTAINERS on the STEP?

A.G18 allows for momentary contact beyond the STEP as long as the reason for the contact (directly or indirectly) is ROBOT to ROBOT interaction over the STEP. It does not matter how many items the ROBOTS are in contact with over the STEP.

Q473

Q.In G18, it says the robot may not contact anything beyond the step. The rule then says momentary robot-robot contact over the step is an exception to this rule. Could you please clarify what you mean by "over the step"? Does it mean physically over it or past the step? If two robots grab a can, and one goes a bit past the step to grab it but goes past the step and only touches the robot, would it be a penalty?

A.The text "over the step" in G18 refers to the space physically above the step. We cannot respond definitively to hypothetical scenarios as there are other factors and contexts that may be relevant and affect the answer. If this information doesn't provide the clarification you're looking for, please reword and resubmit.

Q460

Q.Can the door be legally used to slow the tote down by dropping it before the tote leaves the chute?

A.We believe the answer to [Q260] addresses this question. If it does not, please rephrase with more detail and resubmit.

Q417

Q.If someone student member team is more than 19 years old . he can participate in pit or in the game or is a restriccionm ?

A.There are no age restrictions related to the participation of team members in the pit. To be a DRIVER or HUMAN PLAYER, the student must be pre-college, by which we mean pre-college age and taking classes that will eventually lead to a High School diploma or equivalent.

Q374

Q.In the GLOSSARY, the definition of ALLIANCE STATION states 3 PLAYER STATIONS and 2 HUMAN PLAYER "ZONES". a.) Should that read 2 HUMAN PLAYER "STATIONS"? b.) Is the HUMAN PLAYER ZONE the all-encompassing area at the end outside the FIELD or everything left over after designating the 3 PLAYER STATION (e.g. DRIVERS) area and 2 HUMAN PLAYER STATIONS (i.e. TOTE and LITTER entry) area?

A.a) No, the current wording matches the intent. b) The HUMAN PLAYER ZONES are described in *Section 2.2.3* and the Red Alliance HUMAN PLAYER ZONES are depicted in Figure 2-13, highlighted in yellow.

Q241

Q.Are tote levels based on the actual amount of totes stacked or are they based on a height factor? For example is there any possible way to reach level five with a four tote stack?

A.You seem to be asking how RECYCLING CONTAINERS are scored. Please take a look at *Section 3.1.2.3*. A RECYCLING CONTAINER is scored if it is full supported by only scored grey TOTES. Points are awarded based on the lowest level of the scored RECYCLING CONTAINER. The number of TOTES it takes to get a RECYCLING CONTAINER to that level does not affect the points awarded for the RECYCLING CONTAINER. Nothing in the rules prevents a RECYCLING CONTAINER from reaching Level 5 with only four TOTES under it, but you'll have to determine for yourself if that's possible. If this doesn't answer you question, please ask again.

Q233

Q. If removing/re-positioning LITTER tape is unintentional, does the exception in G16-G for unintentional damage to LITTER take precedence over the rule against removing/re-positioning LITTER tape in G16-I? If said action is caused by driving over the LITTER does the blue box under G16 on damage from driving over LITTER take precedence over G16-I?

A. Yes, G16 means there will be no penalty for unintentional damage of LITTER.

Q223

Q. How far does an object (tote or recycle bin) have to be off of the Step so that the other alliance would be penalized under G18 for touching it? For example a recycle bin tipped on its side half resting on a tote and half resting on the step?

A. Imagine a plane extending upwards from the far edge of the STEP, if a ROBOT part crosses through that plane, it can't touch anything on the other side per G18. So if any portion of the object is still on the near side of the plane, the ROBOT could touch that portion.

Q188

Q. If more than 4 yellow totes are stacked on the step for the co-op. bonus, will the stack still count for co-op. points?

A. Yes, please see *Section 3.1.2.2*, which reads in part "A COOPERTITION SET exists when **at least** four (4) Yellow TOTES are..."

Q187

Q. Are you permitted to rest an arm for support across the step?

A. We aren't able to comment absolutely on this question, as it depends highly on the MATCH and other ROBOTS and final authority at the event rests with the Head REFEREE. However, relevant rules include G17: "ROBOTS may not push or react against the white horizontal surface of the STEP" and G18: "ROBOTS may not contact anything beyond the STEP." In general, if you are not actively picking up TOTES or RECYCLING CONTAINERS, you cannot "rest an arm" on the STEP.

Q177

Q. If you stack two pairs of totes next to each other and place one tote across the top of both of the stacks does it count towards both stacks for score?

A. *Section 3.1.2.3* reads: "A Gray TOTE is scored if it is fully supported by a SCORING PLATFORM and no portion of the TOTE extends above the top of the BACKSTOP." There is no additional requirement or points associated with a TOTE "spanning" stacks, and if a TOTE is "spanning" stacks of TOTES, it has no affect on the points associated with those stacked TOTES.

Q173

Q. Is it possible to put the litter in the recycling container before putting the totes on the scoring platforms?

A. We believe the answer to [Q4] answers this question. If not, please post again with additional detail.

Q156

Q. Video Quote: "Teams will want to maximize their score for each match except for the final matches, WINNERS OF INDIVIDUAL MATCHES WILL NOT BE DECLARED as this has no bearing on tournament. . ." Are Teams scored separately or do all alliance team members get the same points per match?

A. Teams are not scored separately in the MATCH, but they are ranked separately in the context of the event. *Section 5.5.3* describes the process in detail, but reads in part: "Each Team receives MATCH Points equal to their ALLIANCE's final score." The reason the video says "winners of individual matches will not be declared" is that it does not matter if Red ALLIANCE scored higher than Blue ALLIANCE in one particular MATCH during qualification, as each Team on each ALLIANCE is receiving MATCH Points equal to their ALLIANCE's final score. Also, it's important to keep in mind that the game animation is not intended to be a substitute for the rules in the manual. We make the animation as accurate as possible in reflecting the rules at the time the animation is created,

but rules may change over time.

Q112

Q.Answers to Q34 and Q83 seem inconsistent. Is G27 violated by a human player loading litter into a recycling container that is held by a robot if the litter contacts the recycling container while the litter is still in the litter chute?

A.You're correct. [Q83] will be correct as of *Team Update 2015-01-13* where G27 will be updated to state: ROBOTS and anything they control (**except for LITTER in the LITTER CHUTE and TOTES in the TOTE CHUTE**), may not contact anything outside the FIELD. Our apologies for the confusion.

Q77

Q.On scoring the tote set and tote stack in autonomous. It seems as if the points for having a tote set are not supposed to stack with the points for having a tote stack, but it does not clarify this in the rules. Can you score both the points for a tote set and the points for a tote stack in auto?

A.As you suggested, you cannot score both a TOTE SET and TOTE STACK in the same MATCH. Per *Section 3.1.2.1*, "A TOTE SET exists if all three (3) Yellow TOTES from an ALLIANCE are fully contained by the AUTO ZONE, **but do not meet the requirements of a STACKED TOTE SET**, at the end of AUTO." If a TOTE STACK has been assembled, it would no longer meet the requirements for a TOTE SET.

Q65

Q.If litter is placed on a robot, and the robot and litter are moved entirely within the landfill zone, with the litter touching only the robot, but not the floor or a crate, will the litter be considered processed and scored at one point per piece of litter?

A.We believe the answer to [Q21] answers this question as well. If it does not, please ask again with additional detail.

Q43

Q.Can the recycle can be placed on top of one tote and then stacked on other totes, or does it need to be stacked last?

A.We believe the answer to [Q4] answers this question. If it does not, please ask again with additional detail.

Q42

Q.Can the noodle be placed in the recycle can prior to stacking it on top of the totes?

A.We believe the answer to [Q4] answers this question. If it does not, please ask again with additional detail.

Q41

Q.Do totes that are stacked upside down on the scoring platform still count?

A.There is no orientation specified for scored TOTES in *Section 3.1.2.3*, so they may be in any orientation so long as the TOTE "is fully supported by a SCORING PLATFORM and no portion of the TOTE extends above the top of the BACKSTOP."

Q34

Q.Is it legal for the human player to feed the litter, from human player station, into a recycling container held by robot?

A.Yes. There are no rules prohibiting this method. Please be safe.

Q31

Q.Please confirm the word "any" shouldn't be "all" in 3.1.2.1, container set definition.

A.We believe the response to [Q6] addresses this question. If not, please ask a follow up question clarifying your inquiry. Thank you!

Q29

Q. If the actions of one alliance cause the other to violate G18, which alliance will be penalized? For example, if one robot from each alliance has a grasp on a container on the step and the blue alliance robot is pulled over the step by the red alliance robot while pulling on the container.

A. We can't answer your question as there are many different scenarios that could be in play. If the violation is momentary (i.e. the ROBOT is only momentarily in contact with that RECYCLING CONTAINER that is now on the opposite side of the STEP, but lets go quickly and retreats), then there's no violation and neither ALLIANCE is penalized. If, however, the contact is extended, the ALLIANCE with the ROBOT violating G18 will be penalized.

Auto Rules**Q480**

Q. "In reference to G7-B is "fully supported" transitive through like objects (i.e. other alliance robots) as it is in 3.1.2.2? In other words is a starting configuration where part of red robot #1 is "fully supported" by the floor transitively through red robot #2 legal?"

A. No. "Support" - exclusively for the purpose of scoring - is only transitive through TOTES.

Q476

Q. Can a robot be in possession of or holding the Recycling Container that is resting on top of a Stacked Tote Set? As long as the Robot is not in contact with the Stacked Tote Set.

A. We assume you're asking if a STACKED TOTE SET scores if your ROBOT touching or holding a RECYCLING CONTAINER touching, or even set atop, said STACKED TOTE SET (assuming all other conditions are met). We cannot give unequivocal answers to hypothetical situations. Provided that RECYCLING CONTAINER and its ROBOT aren't doing anything to support or preserve the STACKED TOTE SET, and all other criteria are met, then the ALLIANCE will receive points for the STACKED TOTE SET. However, if there's ambiguity, the language in the 2nd Blue Box in *Section 2.1.2.3* will apply. I.e., if a Referee cannot tell if ROBOT or a RECYCLING CONTAINER being supported by the ROBOT is supporting the STACKED TOTE SET, they've been instructed to not award the points.

Q436

Q. During the autonomous period do the judges have an alternative method to check if the tote stack comes in contact with the robot other than visually? We're asking because our robot leaves the stack but it appears to still be in contact Also, can we start autonomous with a recycling bin outside the field like with a yellow tote?

A. For the first part of your question we think [Q392] answers your question; if not, please let us know. For the second part, only Yellow TOTES have the ability to be relocated from the FIELD to the ALLIANCE STATION.

Q392

Q. How will referees determine if the robot/tote/container is fully in the auto zone? Will there be a pause in the time between autonomous and teleop so referees can judge exact location relative to the plane of the auto zone lines?

A. Referees will assess the state of the FIELD to the best of their ability at the end of the AUTO period. There is a small transition time between AUTO and TELEOP, but there will not be an explicit pause for the purpose of scrutinizing the location of ROBOTS or game elements. It is in a team's best interest to make this assessment as clear as possible.

Q361

Q. To score in auton, is a robot fully contained if the robot base is full contained in the autozone but the arms stick over and above the line in autozone?

A. No, the AUTO ZONE is defined as a volume. To be fully contained by the AUTO ZONE all parts of the ROBOT must be inside this volume.

Q325

Q. Follow up question to Q. 254: In AUTO, if points are allowed for TOTE SET while TOTES are still being possessed by a ROBOT(s), if a ROBOT(s) is not fully contained in the AUTO ZONE, but all

three yellow TOTES are fully contained, can 6 pts for the TOTE SET still be earned? e.g. the ROBOT is straddling the line, but the TOTES are fully contained.

A.To earn points for a TOTE SET, only the Yellow TOTES need to be fully contained by the AUTO ZONE. It doesn't matter if a ROBOT that is not fully contained by the AUTO ZONE is holding or contacting one or more of the Yellow TOTES.

Q324

Q.To clarify Q. 254, If there is no requirement that yellow totes be disengaged from the robot(s) during AUTO, then if one or more robots are holding one to three yellow TOTES, for a total of all three TOTES and three ROBOTS being fully contained in the AUTO ZONE, can 6 pts be earned for a TOTE SET and 4 pts for the ROBOT SET?

A.If three Yellow TOTES and three ROBOTS are fully contained by the AUTO ZONE at the end of AUTO, per *Section 3.1.2.1*, points for both a ROBOT SET and a TOTE SET will be earned, regardless of whether or not any ROBOTS are holding or contacting TOTES.

Q318

Q.if we dont start from thew landfield zone, can we pick up containers from the step during the autonomos mode?

A.There are no rules against picking up RECYCLING CONTAINERS (or TOTES) from the STEP during AUTO.

Q308

Q.Can a robot be in contact with the yellow tote and the recycling container at the start of the match

A.Yes, there are no rules prohibiting ROBOTS from being in contact with game pieces at the start of the MATCH - provided the ROBOT is properly within the allowed zones, and no part of the ROBOT is being supported by the game pieces.

Q305

Q.If an alliance teams during autonomous successfully move all six scoring containers (and all 3 robots) to auto-zone, how many points would that be for the alliance? We are asking because of the wording in the game manual putting emphasis on "or" & "and" . "3.1.2.1 During AUTO, each ALLIANCE can earn points for a ROBOT SET, TOTE SET or STACKED TOTE SET, and CONTAINER SET."

A.Please see [Q23], we believe it answers your question. If not, please post again with additional information.

Q284

Q.During Autonomous Period, are human players allowed to push stacks of totes into the human player zone as long as they themselves do not cross the starting line?

A.We believe this has been addressed in [Q27]. Please feel free to ask with additional detail if that does not answer your question.

Q245

Q.In Q56, it is stated that: "it is allowable to have two separate MECHANISMS linked by a flexible tether. This would not be considered two ROBOTS, but one". In reference to this, if two separate ROBOTS on one Alliance are connected by a Tether, would they be considered ONE ROBOT, and thus be allowed to be considered ONE ROBOT for the case of a ROBOT SET in Autonomous? tldr: If two robots are connected by a tether, can they score a Robot Set in the Autonomous Period?

A.Two distinct ROBOTS from separate teams (i.e. two electromechanical assemblies built by two FRC Teams to perform specific tasks when competing in RECYCLE RUSH) do not become one ROBOT simply because they are tethered together. A single ROBOT may have tethers connecting it to its electromechanical subassemblies, which is what [Q56] says.

Q206

Q.3.1.2.1 B states "A STACKED TOTE SET exists if....only the bottom-most Yellow TOTE is in contact

with the AUTO ZONE". Should this be reworded now that the auto zone is a 3 dimensional volume as opposed to a 2 dimensional area?

A. Good catch. This will be fixed via *Team Update 2015-01-20*.

Q186

Q. Is it possible to score more than one recycling container on one stack of totes? If so, how will that be scored?

A. We think [Q55] answers your question. If it doesn't, please rephrase and ask again.

Q183

Q. Is the Robot allowed to utilize Webcams and/or Kinect cameras to make decisions based on pre-programmed algorithms independent of the operator console in autonomous?

A. Yes, ROBOTS can make decisions based on camera input during AUTO. However, we think [Q108] may be of interest to you. Additionally, any wireless functionality of the camera must be disabled (per R52) and no member of the DRIVE TEAM may interact directly or indirectly with the ROBOT (per G21).

Q129

Q. Regarding the scoring of the container set, does the container set have to be touching the ground in the auto zone and free of robot contact in the auto zone to be considered scored?

A. No, the only requirement for a CONTAINER SET is that any three (3) RECYCLING CONTAINERS are fully contained by the AUTO ZONE at the end of AUTO.

Q113

Q. Our question is similar to Q77. Are the autonomous points additive; for instance if an alliance ends autonomous with both a ROBOT SET and CONTAINER SET will they receive points for both?

A. Yes. Per *Section 3.1.2.1*, as revised in *Team Update 2015-01-09*: "During AUTO, each ALLIANCE can earn points for a ROBOT SET, TOTE SET or STACKED TOTE SET, and CONTAINER SET." However, an ALLIANCE cannot earn both a TOTE SET and a TOTE STACK in the same MATCH (see [Q77]).

Q80

Q. Can you have a bin on top of a triple stack of totes during the autonomous mode?

A. Yes, there are no rules that prohibit that.

Q67

Q. Can the litter be placed in a recycling can at any time or only when a recycling can has been placed in scoring position?

A. We believe the answer to [Q4] answers this question. If it does not, please ask again with additional detail.

Q66

Q. Can totes and the recycling bin in the staging zone be manipulated in any way before the match starts as long as they remain in the staging area completely when the match starts?

A. We believe the answer to [Q58] answers this question. If it does not, please ask again with additional detail.

Robot Actions

Q498

Q. If the FIELD is defined as 2D area bounded by the guardrails and alliance walls, would components left attached to or inside game pieces without being attached to a robot at the end of the match be considered as detaching parts? In G25, it states that no components may be left ON the field at the end of the match. However, in our scenario, it wouldn't be on the field but instead it would be attached to a game piece.

A.Apologies for the confusion, the word "area" in the definition of FIELD is used colloquially and was not intended to suggest that only the carpet was included in the FIELD. This means intentionally leaving a part attached to a game piece, but not touching carpet, would still be a violation. Also, please note that G25 states "ROBOTS may not intentionally detach or leave parts on the FIELD." It has not time limit, such as 'at the end of a match'.

Q448

Q.G24 states: ROBOTS may not cause TOTES ... to completely transfer from their side of the FIELD, or from the STEP, onto the opposite side of the FIELD. But it's not clear whether "#their# side of the FIELD" is referring to the TOTE or the ROBOT. It makes a difference. We would like to assemble a 4 tote stack by building a stack of 3 totes on our side of the field, and then remove a tote from the step, add it to our stack and then replace the new 4 stack back on the step. Is this legal?

A.The words "their" and "opposite" in G24 reference the ROBOT(S). Transferring a TOTE (regardless of provenance) from the STEP to your ROBOT'S side of the FIELD, is not a violation of G24.

Q442

Q.G17 (D) indicates that robots cannot be attached to field elements. Would a rubber suction cup stuck to the human player wall by the robot wall be considered a violation of this rule?

A.Yes, a rubber suction cup stuck to the ALLIANCE WALL would be in violation of G16 Part D.

Q421

Q.For purposes of G27, would something that is partly outside of the the FIELD and and partly inside of the FIELD (such as LITTER entering the FIELD over the ALLIANCE WALL) be considered "outside the FIELD"?

A.Under G27, the issue is whether or not the contact point on the object itself is outside the FIELD, not how much of the object is in or out of the FIELD. Consider LITTER draped over a GUARDRAIL. Part of the LITTER is inside the FIELD, part is outside the FIELD. If a ROBOT or something it controls contacts the part of the LITTER inside the FIELD, there is no violation. If the ROBOT or something it controls contacts the part of the LITTER outside the FIELD, that is a violation.

Q420

Q.What is meant by "control" in G27? Specifically, if a ROBOT is touching a stack, does the ROBOT "control" the entire stack or just the element(s) the ROBOT is touching?

A.Given that there is no FRC-specific definition of "control," a general colloquial definition is used. For "control," Merriam-Webster states it's "to have power over (something), to direct the actions or function of (something), to cause (something) to act or function in a certain way." A litmus test for this is if a ROBOT were to change direction, and the object in question changes direction with the ROBOT, the ROBOT is being controlled the object. The ROBOT does not need to be touching the object directly to be controlling it - nor does contact necessarily mean the ROBOT is controlling the object.

Q411

Q.At what point is LITTER considered "loaded"? If 1/3 if the LITTER is in the RC? Can the HP then bend the LITTER to secure the other end in the RC? Or, do both ends have to simultaneously be loaded into the RC if that is the desired condition?

A.We're thinking you are asking about the term 'loaded' as used in the answer to Q404. In reference to this situation, the LITTER is loaded once it's in position and the HUMAN PLAYERS has released it. Yes, the HUMAN PLAYER may bend or otherwise manipulate the LITTER while putting it in the RECYCLING BIN as long as the LITTER is not released by the HUMAN PLAYER. If you were not asking about the term 'loaded' in relation to Q404, please rephrase and ask again.

Q404

Q.G27: Robot cannot contact anything outside the field except for Litter in the Litter Chute. Q54: HP can contact litter in the RC. Q141: HP can feed Litter over the Wall. I believe Q54 presumes Litter is in the Litter Chute, and Q141 presumes Litter not in contact with Robot or something controlled by the Robot. Can a HP, over the Alliance Wall, load litter into the RC (litter is in contact with the HP and RC controlled by Robot, but not in Litter Chute).

A.G27 is only violated when an item in the ROBOT'S control contacts something outside the FIELD. LITTER in the process of being loaded in a RECYCLING CONTAINER is not considered as being controlled by the ROBOT. After the LITTER has been loaded by the HUMAN PLAYER in a RECYCLING CONTAINER, it is considered controlled by the ROBOT, so any subsequent contact by the LITTER of something outside the field, including the HUMAN PLAYER, would be a violation of G27.

Q393

Q.From looking at week zero events and our own experience in the lab it seems likely there will be a great deal of unintentional damage to litter from robots driving over them. If a piece of litter is accidentally cut into multiple pieces by a drive train how is it scored? How much of a piece of litter must be moved to the landfill to count as processed? Some of these could be cut into more than two pieces so more than half may not be workable.

A.Thank you for the question! Please see *Team Update 2015-02-20* for added language on how this will be scored.

Q352

Q.Would a robot that has a conveyor that is elevated above the step and then tilts downward and touches the step as it is offloading yellow totes be in violation of G17?

A.G17 states that ROBOTS may not push or react against the white horizontal surface of the STEP, but gives an exception for incidental reaction while interacting with game pieces. We can't give an absolute answer to your question because it will be up to the referees as to whether or not the contact was incidental. However, if your ROBOT pushes (applies any force to) the top of the STEP as a regular and necessary part of accomplishing a task, it's less likely this contact will be viewed as incidental.

Q314

Q.G27 - Will you please define the 2nd instance of anything in G27: Robots and anything they control, e.g. a Tote, may not contact ANYTHING outside the field? For example - ANYTHING - a solid, liquid, or gas above or beyond the field or a solid above or beyond the field. (Can a robot be beyond the field perimeter without contacting anything but the air and not be in violation of G27). Additionally, where are the referee's scoring tablets and stands likely to be placed outside the field perimeter?

A.Think of 'anything' as 'any object.' It's OK for contact to be made with the air beyond the FIELD. Event personnel have discretion as to where they put the Referee's scoring tablets and stands. Also, please consider that other individuals can be very close to the FIELD at any point. This is a safety rule, intended to protect individuals close to the FIELD. The rule was written this way to avoid nuisance penalties for occasional excursions beyond the FIELD. Please work with us to keep this flexibility in place.

Q311

Q.Is throwing litters by human players the only way to have our litters on the the opponent's side? According to G24, robot cannot throw litters over.

A.You are correct that G24 assigns a penalty if ROBOTS cause TOTES, RECYCLING CONTAINERS, or LITTER to transfer onto the opposing side of the field. However, beyond that, we cannot recommend particular strategies.

Q269

Q.Please provide additional clarification regarding the phrase "ROBOT interaction over the STEP". If two robots both extend beyond the STEP in their respective autonomous, will they both receive G18 fouls for touching objects beyond the STEP, or does interaction over the step extend to robots going beyond the STEP?

A.Interaction is over the STEP if it occurs directly above the STEP, as demonstrated by ROBOTS C and D in Figure 3-8. Interaction that occurs beyond the STEP, such as if both ROBOTS reach beyond the STEP and contact each other with no interaction over the STEP, is not over the STEP and is subject to G18.

Q262

Q.If a team is known to possess an autonomous that momentarily extends beyond the STEP, and

an opposing robot intentionally drives to the STEP with the sole purpose of attempting to draw a G18 foul by inhibiting and entangling the autonomous robot, what foul(s), if any, would be assessed? References: Q29, G18, G26

A.We cannot comment absolutely on hypothetical scenarios. A ROBOT that extends over the STEP and contacts a ROBOT of the opposing ALLIANCE (without any ROBOT interaction over the STEP) would be in violation of G18. Whether or not an action is a strategy aimed at entanglement or not, and therefore a violation of G26, would be determined by the REFEREES at your event, with the final call made by the Head REFEREE.

Q234

Q.If others team's totes were to somehow fall onto our side if the field, would we be able to take those totes and stack it onto our totes to accumulate more points?

A.You betcha. RECYCLING CONTAINERS, too, if they fall on your side of the FIELD.

Q226

Q.In reference to Q29 and Q221 for two robots grabbing the recycling bin from the STEP: What happens if neither robot can be controlled by their drivers, in a situation like the Autonomous period? Would it be the same scenario as Q29, where the robot that is violating G18 would be assigned a foul?

A.Yes, unless explicitly stated (e.g. a Rule is posted in *Section 3.2.4 AUTO Rules*), violations apply whether the MATCH is in AUTO or TELEOP.

Q221

Q.As a robot is attempting to acquire the recycling bins on the center step, it is likely that a robot from the other alliance would do so at the same time. If both robots manage to grab the same recycling bin and pull and one, by pulling only on the recycling bin, manages to pull the other robot over the step, is there a penalty?

A.I believe your question is addressed in [Q29]. If it is not, please let us know how to better address your question.

Q220

Q.Is it legal for a robot on one alliance to pass a yellow tote directly to a robot on the other alliance without setting it down (i.e. Red Robot 1 passes a yellow tote directly to Blue Robot 1)?

A.It depends. Per G24, as long as neither ROBOT has caused the TOTE to "completely transfer from their side of the FIELD, or from the STEP, onto the opposite side of the FIELD" there is no violation. Also consider the answer to [Q223].

Q200

Q.Is it legal to knock down opposing alliance's totes if robot does not come in direct contact with totes/opposing robots? ie. a fan

A.Please see the second paragraph of *Section 3.1.2* "With the exception of UNPROCESSED LITTER, if the actions of one ALLIANCE cause any of the other ALLIANCE'S game elements that are in scoring position to no longer be in scoring position, the affected ALLIANCE will be credited points for the displaced game elements at the conclusion of the MATCH." So, some non-contact method of knocking down game pieces the other alliance has in scoring position isn't necessarily illegal, but does seem like a waste of effort, at least for game pieces in scoring position.

Q190

Q.If a second RECYCLING CONTAINER is stacked atop a scored RECYCLING CONTAINER, does it also score? If so, how is its LEVEL determined?

A.No, In order for a RECYCLING CONTAINER to score, it may only be supported by scored Gray TOTES (per *Section 3.1.2.3*, "RECYCLING CONTAINERS").

Q171

Q.2.1.4 states there is a lip (.375") that is part of the STEP. The interpretation of the STEP in section 6 would include all 3 coloured HDPE. If a robot reacts against this lip, it would not violate

G17, but would it violate G18 if the robot reacts against the lip of the opponent's colour?

A.No, it would not, assuming you don't contact anything on their side in the process. As you stated, the STEP includes the colored HDPE, so reacting against the opposite colored lip of the STEP would not result in a violation of G18.

Q167

Q.Can the situation from Q131 be applied to G23 for grey TOTES, RECYCLING CONTAINERS, and/or LITTER if a robot's action accidentally - directly (tips over and elements fall out of the robot) or indirectly (while scoring, a CONTAINER knocks another CONTAINER out) - causes pieces to leave the field?

A.Yes, it can. G23 reads: "ROBOTS may not cause TOTES, RECYCLING CONTAINERS, and/or LITTER to completely leave the FIELD", there are no exemptions based on the "intent" of the action. G23 is, above all else, a safety rule to help protect the FIELD staff who are around the perimeter of the FIELD. As such, all the actions you have described would result in a violation of G23.

Q150

Q.Regarding rule G24 ,Would a robot that causes an object to fall off the step but the object is still partially supported by step (leaning against it) be penalized under this rule? If there is no foul in this situation, would G18 be in effect if a robot touched such an object?

A.If the object is a TOTE, RECYCLING CONTAINER, or LITTER, there would be no foul assessed in this situation. G24 requires the object to "transfer completely onto the opposite side of the FIELD" which is not met by an object still supported by the STEP. A ROBOT could interact with the portion of the object above the STEP without violating G18.

Q131

Q.If, while attempting a coopertition set or stack, one alliance's yellow tote falls onto the other alliance's side of the field will a FOUL be called?

A.Yes, a FOUL would still be called. If the action is egregious or strategic, a RED CARD will be issued and the offending ROBOT will be DISABLED. G24 does not have an exemption for Yellow TOTES: "ROBOTS may not cause TOTES, RECYCLING CONTAINERS, and/or LITTER to completely transfer from their side of the FIELD, or from the STEP, onto the opposite side of the FIELD."

Q121

Q.If the answer to Q115 is yes, then can you please expand on what constitutes "control" (e.g., G24 in 2013)? For example, would a passive contact mechanism which not only touches but also diverts the motion of the tote be considered "control"?

A.We believe that [Q110] answers your question. If it does not, please post again with additional information.

Q115

Q.Once the tote chute door has been opened, can the tote be in contact with both the robot and the tote chute simultaneously, if the robot is not in contact with the tote chute or alliance wall?

A.Please see [Q83]. If this does not fully answer your question, feel free to post again with additional information.

Human Actions

Q454

Q.Re: Q404/411, please confirm whether G33-B limitation is applicable. LITTER by a HP over the Wall, whether being thrown or loaded into an RC, is a foul during the last 20 seconds of TELEOP. Also, Assuming the 20 second end of Teleop warning sound is working, if the HP is holding the Litter at the moment when the warning sound is heard, is the HP in violation when the sound is first heard (no opportunity to release), or when the sound is over (could immediately release during sound)?

A.The game sounds are not an official indicator of match time- the official timer for the match is displayed in the middle PLAYER STATION and has a white strip of tape on it. As such, a HUMAN PLAYER (or DRIVER) putting LITTER over the ALLIANCE WALL when the timer reads 20 seconds or fewer would be a violation of G33-B.

Q431

Q.Is there any rule preventing HUMAN PLAYERS moving more than one TOTE at the same time? Whether within the HUMAN PLAYER ZONE, outside the HUMAN PLAYER ZONE or from outside the HUMAN PLAYER ZONE into the HUMAN PLAYER ZONE.

A.We believe [Q24] answers your question. If it doesn't, please rephrase your question and resubmit.

Q378

Q.G5 and HUMAN PLAYERS. a.) Does the HUMAN PLAYER ZONE consist of the two HUMAN PLAYER STATIONS that are odd shaped pentagons AND the one, single long rectangle (Fig. 2-13)? i.e. the HUMAN PLAYER ZONE consists of three discrete sub-areas. b. If so, does AUTO and TELEOP consist of one (1) ALLIANCE TEAM member (a HUMAN PLAYER) starting and remaining in one of those three sub-areas for the entire game? (DRIVE TEAM-2 and COACH-1 excluded as they are at the ALLIANCE WALL at their PLAYER STATION.)

A.No, per the definition of HUMAN PLAYER ZONE in the Glossary: "the area bound by the white tape lines, HUMAN PLAYER STATION wall and edges of the carpet." Figure 2-13 shows the HUMAN PLAYER ZONES in Yellow to make them more obvious, but there is no rectangular area that is a HUMAN PLAYER ZONE. The HUMAN PLAYER STATION is different from the HUMAN PLAYER ZONE - Figure 2-13 is highlighting the HUMAN PLAYER ZONES. There are no rules that say a HUMAN PLAYER must start in each HUMAN PLAYER ZONE, and there are no rules that say they must stay in a HUMAN PLAYER ZONE. (G19 actually prevents anyone from being in the HUMAN PLAYER ZONE during AUTO)

Q377

Q.For purposes of G12, G19 and Q97, during the AUTO period, Are HUMAN PLAYERS considered part of the DRIVE TEAM? i.e. Must HUMAN PLAYERS remain behind the STARTING LINE throughout the AUTO period?

A.Per the definition of DRIVE TEAM: "one (1) COACH, two (2) DRIVERS, and one (1) HUMAN PLAYER from the same FRC Team who are responsible for ROBOT operation during a particular MATCH." The HUMAN PLAYER is always a member of the DRIVE TEAM- and any rules that apply to the DRIVE TEAM apply to the HUMAN PLAYER. So, yes, HUMAN PLAYERS must remain behind the STARTING LINE throughout the AUTO period.

Q373

Q.Per G33.B. LITTER may only be introduced onto the FIELD only during TELEOP over the ALLIANCE WALL prior to the last twenty (20) seconds of the MATCH. G33.A. has no time prohibition with regard to the LITTER CHUTE. May LITTER be introduced through the LITTER CHUTE in the last twenty seconds of the MATCH?

A.Sure, as you said, there are no rules that prohibit that.

Q359

Q.In light of Team Update 2015-1-30 G5, is the answer to question 185 now invalid? They seem to be contradicting each other.

A.The answer to [Q185] is true, in spite of the edit to G5. There is no prohibition against two HUMAN PLAYERS being in contact with the same TOTE. A TOTE is not considered an element of the HUMAN PLAYER STATION as the HUMAN PLAYER STATION is defined as "an area on either side of each ALLIANCE STATION that connects the PLAYER STATIONS to the GUARDRAILS, and includes a TOTE CHUTE and LITTER CHUTE that are built into a polycarbonate and metal protective wall."

Q326

Q.Figure 3-7, show the option of the yellow totes starting in the ALLIANCE station, not on the FEILD. a.) May the yellow totes be introduced by the human player in TELEOP play to earn a COOPERTITION set or stack? b.) If so, may either side, left or right of the BLUE ALLIANCE enter the TOTE into play, or just the side closest to the judges' table? (BLUE ALLIANCE, unlike RED, must go over or around a SCORING PLATFORM with regard to initial placement of YELLOW TOTE(s) in the ALLIANCE station.)

A.a) Yes, Yellow TOTES may be introduced during TELEOP by the HUMAN PLAYER. b) There is no restriction on which side of the ALLIANCE STATION may be used to introduce Yellow TOTES, but

please keep safety in mind when moving TOTES between sides of the ALLIANCE STATION.

Q304

Q.Can a Human Player push or carry multiple totes at one time as long as no safety rules are violated.

A.We believe that the answer to [Q24] answers your question. If it does not, please ask again with additional detail.

Q287

Q.Can the human player use a tool (ie a cart) to move totes to the human player station more efficiently?

A.No, this would not meet the requirements of T21, from *Section 5.5.8 - Special Equipment Rules*.

Q281

Q.In the Glossary, it is stated that the Human Player Zone is: "the area bounded by the white tape lines, HP Station and the edge of the carpet." Is the Human Player Zone considered an "area" as written, meaning a 2d plane, or is it a volume like most other field zones? eg. If there was a human player standing in the zone, would it be possible for a different Human player to reach in and assist the first human player with lifting the Tote Chute, bypassing G5?

A.We don't want the HUMAN PLAYER ZONE defined as a volume to avoid nuisance penalties (e.g. a person handing a TOTE to a HUMAN PLAYER in the HUMAN PLAYER ZONE could easily and accidentally violate this rule if it was based on volume). However, you bring up a good point. *Team Update 2015-01-30* revises G5 to prohibit more than one person from interacting with HUMAN PLAYER STATION elements at a time.

Q260

Q.This question touches on Q164 and the recent update to rule G6. Can a HUMAN PLAYER use the CHUTE DOOR to contact and intentionally slow down or manipulate the movement of a TOTE that is in the TOTE CHUTE if the HUMAN PLAYER is only directly contacting the CHUTE DOOR? The update to G6 seems to imply that it is no longer legal to contact the TOTE with the CHUTE DOOR at all.

A.Good catch, apologies for our incomplete edit to G6. G6 will be updated to accommodate the normal operation of the CHUTE and CHUTE DOOR in *Team Update 2015-01-30*, which makes it consistent with the answer provided in [Q164].

Q240

Q.Can a human player hold the tote at the top on the chute, quickly release the tote and as it is sliding down open the chute door? Assuming that the human player is not in contact with the tote and the chute door at the same time.

A.We believe the answer to [Q107] answers this question. If it does not, feel free to post again with more detail.

Q228

Q.Concerning G6: Can the Human player use a pool noodle to shove the tote down the tote chute while also holding onto the chute door as long as they do not touch the tote with their hand?

A.No, G6 will be updated in *Team Update 2015-01-27* to prohibit the use of any object (e.g. LITTER) to touch a TOTE and the CHUTE DOOR simultaneously.

Q225

Q.Can the HUMAN PLAYER deposit LITTER into a RECYCLING CONTAINER around the side of HUMAN PLAYER ZONE wall so long as they do not extend any body part into the FIELD? References: Q5, Q54, Q76, Q141, G4, G30, definition of ALLIANCE STATION.

A.No, G33 specifically provides the allowed methods of introducing LITTER onto the FIELD. Pay careful attention to G33 part B where it specifies, "**over** the ALLIANCE WALL..."

Q210

Q. May the bin of litter be moved from its starting location to be closer to one of the human player stations? If so, may this be done prior to the start of the match?

A. No, the Bin that holds the LITTER in the ALLIANCE STATION is attached to the carpet, and considered part of the FIELD. Removing it / moving it around in the ALLIANCE STATION would be considered FIELD damage under G16.

Q209

Q. Is it legal for the human player(s) to move a majority of the totes to one human player station, or must they remain equally split between the two? If so, may this be done prior to the start of the match?

A. There are no rules that require TOTES to remain evenly distributed between the two PLAYER STATION ZONES while the MATCH is in progress. However, TOTES can not be moved until after the MATCH has started, per G13.

Q185

Q. Is the 3rd human player permitted to make contact with the other two human players in the feeder station zone? For example, can the 3rd human player act as a runner and bring totes/noodles to the other two human players? Can two human players be in contact with one game piece at a time (ie handing over a tote), or must only one human player be in contact with a game piece at a time (ie setting the tote/noodle on the floor next to the human player at the feeder station)?

A. Yes, *Section 2.2.3* defines the HUMAN PLAYER ZONE as the area: "on each end of the FIELD, behind the ALLIANCE WALLS and ... bounded by the edge of the carpet, the HUMAN PLAYER STATION, the STARTING LINE, and White gaffers tape." Per G5, "Only one ALLIANCE member may be in each HUMAN PLAYER ZONE at a time," meaning that one HUMAN PLAYER could pass TOTES to another HUMAN PLAYER, as long as only one person at a time is in the HUMAN PLAYER ZONE.

Q170

Q. In reference to Q166!!! I made a mistake and the question I meant when I said Q164 was actually the following: Since the human player cannot be in contact with the chute door and the tote chute at the same time, could someone make a simple device to do the "being in contact"?

A. No, this device would be a violation of T21 (which restricts items brought to the ALLIANCE STATION). (revised, 1/14/15, 2:10pm)

Q166

Q. If yes to Q164, if such a device is possible, does this mean that the device could be used during the autonomous period to manipulate and insert the game pieces into the game, as long as the human player does not cross the starting line and enter into the human player zone?

A. We believe the answer to [Q170] answers this question. If it does not, please ask again with additional detail.

Q164

Q. Is the chute door allowed to contact the tote as the tote is entering the playing field? If so, can the human player control/touch the chute door while the tote is entering the field?

A. There is no restriction on when / where the CHUTE DOOR can contact a TOTE. However, please keep in mind G6: "A single ALLIANCE member may not be in contact with both a TOTE and the CHUTE DOOR simultaneously." Also consider G6-1: "G6-1 DRIVE TEAMS may not use any object to prop the CHUTE DOOR open." which would prohibit actions such as using a TOTE to prop the CHUTE DOOR open in order to feed multiple TOTES through the TOTE CHUTE without operating the CHUTE DOOR. Depending on the actions of the HUMAN PLAYER or DRIVER, G16 (FIELD damage) may be enforced if the CHUTE DOOR or TOTES are being damaged by the method.

Q163

Q. chute door

A. Yes, Chute Door.

Q141

Q.Is it legal for a human player to feed a pool noodle to a robot from above the wall rather than the litter chute?

A.There are no rules that would prohibit this, but special attention should be paid to G4: "DRIVE TEAMS may not extend any body part into the FIELD during the MATCH" and G1: "ROBOTS whose operation ... is dangerous or unsafe are not permitted."

Q140

Q.Is it legal to bend the pool noodle by a small amount before feeding it through the litter chute ?

A.Generally speaking, bending a noodle by a small amount before feeding it through the litter chute would not be a violation of G16. However, the FIELD staff may request that the action be discontinued (or enforce G16) if the action is causing damage to LITTER.

Q138

Q.In the kickoff video, a robot was shown taking a noodle from the litter chute. Is this allowed or is this a violation of G27? I know you previously clarified that we are allowed to load a recycle bin directly from the human player station, but would this be different?

A.The Kickoff Game Animation is meant to provide a general understanding of RECYCLE RUSH, but is not authoritative or a replacement for the Game Manual. We think [Q83] may answer your question.

Q114

Q.Can a human player just leave multiple totes in the human player zone on the ground next to the human player station? That way the human player does not have to run back and forth between the station and the stack.

A.There are no restrictions on the number of TOTES in the HUMAN PLAYER ZONE, as long as it does not become a safety issue (see T1). Additionally, please be conscious of G5: "Only one ALLIANCE member may be in each HUMAN PLAYER ZONE at a time".

Q107

Q.What is meant by "loaded in to the TOTE CHUTE" from 2.2.2 Human Player Station? Must the tote be all the way up against the back of the chute door before the human player opens it?

A.There are no rules requiring the TOTE to be in any specific position when the CHUTE DOOR is opened. The referenced text in *Section 2.2.2* is provided to explain the operation of the FIELD, it is not a rule.

Q106

Q.Can the human player be in contact with the tote when they open the chute door? Specifically, can the human player apply a force to the back of the tote once the door is opened?

A.No, per G6: "A single ALLIANCE member may not be in contact with both a TOTE and the CHUTE DOOR simultaneously."

Q82

Q.Can the human player use any tools to help them throw the litter or must it be done with only their arms?

A.We believe [Q2] answers your question. If it does not, please post another question with additional details.

Q76

Q.On page 12, it states the boundaries of the human player zones. However, I cannot find anything in the rules penalizing a player for leaving their zone. Are the human players bound by their zones, or can they move out of the human player zones?

A.There is no requirement that the HUMAN PLAYER remains within the HUMAN PLAYER ZONE. However, please be conscious of G5 ("Only one ALLIANCE member may be in each HUMAN PLAYER ZONE at a time") and G30 ("DRIVE TEAM members must remain fully within the ALLIANCE STATION

for the duration of the MATCH, unless for personal safety").

Q75

Q.What is the third human player's job?

A.It is up to each DRIVE TEAM to determine what they do throughout the MATCH. There are no requirements as to what each person, such as the HUMAN PLAYER, must do while the MATCH is in progress.

Q54

Q.Can a human player hold on to litter while it is simultaneously touching the recycle bin ?

A.Yes, there are no rules prohibiting that.

Q39

Q.Does litter scored in the container count if it is loaded by a human player from the loading station?

A.Yes, LITTER would still score in a **scored** RECYCLING CONTAINER if loaded by a HUMAN PLAYER, as there are no requirements outlining how the LITTER gets into the RECYCLING CONTAINER.

Q2

Q.Is it acceptable to create and use a device to aid or enhance the human player in casting litter over the alliance wall?

A.No, a device used to cast LITTER over the ALLIANCE WALL would not meet the requirements of "Special Equipment Rules" as outlined in Section 5.5.8, T21.

Game - The Robot

Q478

Q.After our first regional, we inadvertently bagged a component essential to our practice bot. We had fully intended to keep it from the bag but a miss-communication resulted in the piece being in the bag. Is it legal to open the bag in order to remove the piece?

A.Opening the bag in this way is a violation of *Section 5.4* of the FRC Admin Manual. However, in this unusual circumstance related specifically to your team, please send an email to frcteams@usfirst.org with your request. We will review it and respond.

Q372

Q.On the Build of Material, we used a window motor that we got from FIRST Choice Points last year. Do we say the cost is zero or do we try to determine the cost of the window motor?

A.We believe [Q354] answers your question. If not, please feel free to revise the question and resubmit.

Q347

Q.Battery Charger R20 w/ update says batteries charged in accordance to manufacture's specification.....charger output should not exceed 6 amps. Manufacture specifications for several batteries, the max charge rate is MK ES17-12 5.4A, Power Patrol SLA1116 5.1A. So, the KOP charger exceeds this. We would like to use a configurable microprocessor charger where a profile can match exactly the manufactures specs and this can be displayed for inspection. The charger capacity maybe higher than 6A

A.We're not sure of your specific question. Please note that, per *Section 1.2 - Manual Conventions*, Blue Boxes provide warnings, cautions, or notes and do not carry the weight of actual rules. There are no rules requiring that a battery charger only be capable of a 6A charge rate. Venue power requirements and safety regulations may impose additional restrictions on the type of battery chargers permitted. If a charger is deemed unsafe by Event Staff (per T1), you may be asked to remove it from the facility.

Q338

Q.This is a follow-up to Q139. We've also seen several questions from the perspective of a 78" tall robot. Say the front set of a robot's wheels and the robot's tallest point are on the platform, while the rear wheels remain on the carpet. Does the platform add an effective ~2" to the total height of the robot as seems to be the case in Q139? For a 78" tall robot in this scenario, is the total height of the robot 80", therefore violating [G22]?

A.The height of the ROBOT is not affected solely by it being on a SCORING PLATFORM. Per the Blue Box in G22... For reference, the height restriction matches the height of the ALLIANCE WALL. However, it is expected that ROBOTS that are on a SCORING PLATFORM may actually be slightly taller than the ALLIANCE WALL due to the elevation of the SCORING PLATFORM. This is permitted and not a violation of G22.

Q192

Q.Is it ok to use ballast on the robot to change the CG?

A.Yes, there are no rules that explicitly prohibit this, however please pay special attention to R8, as updated in *Team Update 2015-01-20*.

Q56

Q.If two separate systems, including drive systems and mechanisms, are placed on the field joined by a tether and share the same electrical system, does that meet the definition of a ROBOT and is it legal (provided all other rules are met)? I.e. can you have 2 robots joined over a tether?

A.If all other rules are met, it is allowable to have two separate MECHANISMS linked by a flexible tether. This would not be considered two ROBOTS, but one. As you point out, the two MECHANISMS need to use the same electrical system, along with a single control system, battery, and meet all other requirements. Of course, you will want to make sure your tether does not entangle the other ROBOTS on your ALLIANCE.

General Robot Design

Q486

Q.Rule 5.8.3 states "Teams may ship their robot to any event at their own cost without receiving an approved Robot Transport Exemption from FIRST." Does that apply to shipping to the World Championships? and if so, is there still the 4'x4'x5' size restriction stated in the 2015 SHIPPING CRATE CONSTRUCTION Flyer?

A.No, robots going to Championship must be shipped. We will correct the language in *Section 5.8.3* in *Team Update 2015-03-31*, sorry for the confusion.

Q474

Q.In order to fit our robot in the crate we have to remove a portion of our structure that is too large to fit in the crate. We are planning to carry this assembly into championships as part of our withholding allowance; it falls within the weight limit. Is it within the rules for us to remove this from the robot and leave it unbagged in this manner?

A.Yes, this is an appropriate use of the WITHHOLDING ALLOWANCE. However, if the ROBOT must be unbagged to accomplish this action in a way that's not compliant with 2015 [Administrative Manual Section 5: Robot Packaging and Transporting](#), please contact frcteams@usfirst.org to request a special exemption.

Q429

Q.We are seeking clarification for R4. If a robot has two interchangeable mechanisms such that only one of them can be on the robot at a time. Would that robot be able to be counted under two weights for two different configurations, One weight for mechanism A and one weight for mechanism B? Or would both mechanisms need to be included together in the final robot weight?

A.If your intent is to go through Inspection once, everything must be included, and thus under the weight limit (per R4). Alternatively, you can pass Inspection with the first element, but if you want to switch it out for the second element, you must be reinspected with only that second element and compete with that element (per T10). If you want to go back to the first element, you must be reinspected with the first element again.

Q426

Q.In regards to Q46, has the method for determining transport configuration been finalized since week 1 events have begun.

A.TRANSPORT CONFIGURATION will be checked by using a 42 inch by 28 inch tape box laid out on the ground and a tape measure. The ROBOT will be placed inside the box and visually verified to not exceed the dimensions, height will then be measured with the tape measure.

Q425

Q.What defines a "tether"? Must the tethered portion of the robot be powered or may it be a static component attached by a rope? G25 mentioned you may not intentionally detach - what if the tether were to snap/break off?

A.There's no FRC-specific definition of tether, but in robotics, it's generally used to refer to a leash which is also a carrier for power and/or signal. There are no rules that specifically dictate what can and can't be on the other side of a tether. Also, there is no requirement that two joined components of a ROBOT use a "tether" to connect them. G25 does not penalize accidental breakage, however if a ROBOT part were constructed in way that breakage is inevitable, the team will likely be asked to remove or revise that element.

Q389

Q.Is it legal for us to use hard drives as counter weights as per R18? We have about two dozen hard drives which are wrapped in black tape and cannot be seen. They are not connected, just attached to the chassis.

A.We believe [Q315] answers your question. If not, please feel free to revise the question and resubmit.

Q387

Q.Rule R2 states that the numbers must be within specific dimensions and colors, figure 4-1 shows the numbers arranged horizontally. Can teams list the numbers vertically so that the numbers read from the top to the bottom?

A.Please see [Q207].

Q364

Q.Item F under G16 in Section 3.2.3 of the rules states that the robot is not allowed to "hang" totes, recyclable bins, or litter. Does this mean the robot is not allowed to use field elements to turn itself into a cantilever, or does it mean the robot can't use mechanisms like hooks to hang game pieces off of itself?

A.Thank you for the question, our apologies for the ambiguity. Item F will be revised in *Team Update 2015-02-17* to clarify that ROBOTS may not hang from FIELD elements, including TOTES. Scoring elements may hang from a ROBOT.

Q363

Q.Can a level be placed on the robot so that an attachment may be readjusted via said visual reference to be used again in a particular orientation?

A.The purpose of the Q&A is the help provide clarity to the rules as they're written, and we cannot approve specific ROBOT designs or strategies. Please rephrase your question in reference to a specific rule (or rules) you find unclear, and we'll try to help.

Q357

Q.TRANSPORT CONFIGURATION may not exceed 28" x 42" x 78". WOULD YOU EXPLAIN IN ORDER TO CLARIFY THE RULE WHAT DOES TRANSPORT CONFIGURATIONS MEANS

A.The TRANSPORT CONFIGURATION is the configuration of a ROBOT when it's being transported among competition locations (e.g. the Team's Pit, the Practice Field, Inspection, the ARENA, etc.). When in this configuration, i.e. being moved about an event, the ROBOT's dimensions cannot exceed 2 ft. 4 in. wide x 3 ft. 6 in. deep x 6 ft. 6 in. tall. Once on the FIELD, however, it can be transformed into its competition shape/size before the MATCH starts.

Q353

Q.I understand no exemptions for bolt heads. What about weld beads, that exceed 42"? (I know it is very similar, but I just need to be clear.) Thank you.

A.R3 has no exceptions for any protruding ROBOT parts, bolt heads and welds included.

Q344

Q.Can bicycle chains and door tracks be used on the robot as additional structural parts?

A. Unless there are rules prohibiting items or how they are used, they are permitted in any way you deem appropriate. If you have trouble understanding a specific rule or set of rules, please re-post your question in reference to the rule and its resulting confusion.

Q343

Q. Regarding R2, is it acceptable 1) to place the numbers on the robot such that they will be visible during transportation and at the start of the match but will be periodically obscured on one side during the match due to the motion/position of a mechanism on our robot and 2) to write numbers out on a sign horizontally but then rotate the whole sign 90 degrees so that the sign is vertical (but the orientation of the numbers unambiguously identifies the team number with a slight tilt of the head)?

A. 1) Periodic obstruction of the ROBOT'S team number isn't a violation of R2. However if it's frequent enough that ARENA staff are having trouble identifying your ROBOT'S team number, you will be asked to fix it. 2) The use of the modifier "high" in R2 for numeral height doesn't rotate. Further, vertically aligned team numbers are not unambiguous and do not meet the requirements defined in R2.

Q332

Q. During the past several years screw heads and bolt heads that protruded outside the chassis dimension where allowable. Items such as an axle bolt, chassis assembly screws, and/or bearing flanges where allowed during inspection. Will this be the case for this year? Yes I have read the dimensional constants. I would like to know if past inspection practices will apply regarding dimensions this year.

A. Rules from previous seasons do not apply to RECYCLE RUSH, and we caution the community against making assumptions about how rules, processes, etc. have been done in the past. It is our intent for each season's rules to stand on their own with no reliance on, or reference to, previous competitions. Meanwhile, we believe [Q118] may already answer your question. If not, please let us know.

Q327

Q. Size of the robot. R3B states 42 x 78" as a limit. In years past, the a phrase stating bolt heads that stick out will not be considered part of the dimension. Will the dimensions measured at the tournament include bolt heads as part of the overall measure?

A. We believe [Q118] may already answer your question. If not, please let us know.

Q315

Q. In R18 It states: Hard drive motors or fans that are included in the 2015 Kickoff Kit, 2015 FIRST Choice, are a part of a legal motor controller (including manufacturer provided accessories), or COTS computing device. Our team would like to use a fan that was taken from a COTS computing device. It is similar to the large fans available in First Choice except it has LED lights inside of it. Is this allowed under this rule? New Talons have no way to attach the small fans.

A. No, this is not allowed. The intent of that portion of R18 is to allow the use of COTS computing devices that may include hard drive motors and fans without requiring teams to substitute those components with items listed in Table 4-1 to make the devices legal (which would also not make them COTS anymore). Once those hard drive motors or fans are removed from the COTS computing device, they are no longer permitted to be used because they are no longer part of that device.

Q309

Q. If it meets the size and color requirements, can we use an actual Texas license plate as our numbers on the robot?

A. There are no rules explicitly prohibiting this, however we would caution you to ensure that the background and border rules are being met as most license plates have state names, logos or other markings that would not satisfy the requirements of R2.

Q307

Q. In regards to the intent of R2, assuming my numbers meet the size requirements - can I use white numbers on a black material or do I have to use black lettering on a white background?

A. R2 explicitly requires numbers be "black in color with a white background extending at least 1 in. from the edges of the numbering." There are no exceptions to R2 that would instead allow for white numbers on a black material.

Q300

Q.Two years ago, there was concern that climbing-only robots without a drive train may not meet the definition as a robot, as they were not designed to move around the field. In this year's glossary, the definition has changed from "... Mobility and actuation" to "... movement". Does a machine designed to manipulate and move totes without physically changing its own location on the field meet the new definition of a robot for the purposes of satisfying the rules?

A.Yes, definitely. The requirement for a ROBOT systems to have "movement" does not mean the whole ROBOT must change its location.

Q299

Q.Can teams change the configuration of their robot while in the queue, provided the robot remains within the TRANSPORT CONFIGURATION volume at all times?. Specifically, can a team have a configuration that is short enough to go through doorways easily, and then extend the robot up to 78" while in the queue to save time configuring it on the field?

A.There are no rules prohibiting this.

Q298

Q.R3 defines TRANSPORT CONFIGURATION (TC) and states the robot must be transported about the venue in TC. All of the local High School venues that I have attended in the past have 'Standard Doors' that are just NOT going to be high enough to fit a Robot in TC while mounted on a work cart. Is it the intent of the 2015 rules to force teams to remove their (78 inch tall) robot from a work cart to get thru doors? Or can we temporarily lay the Robot in it's side (on the cart) to pass thru doors

A.As noted in the Blue Box for R3, "Teams should think carefully about how they will transfer their ROBOTS from place to place during the events. Many FIRST Robotics Competitions take place in venues with standard sized doors. Be sure to consider the size of the ROBOT on its cart to make sure it will fit through doors. Also consider the size of the ROBOT to ensure that it will fit into a shipping crate, bag, vehicle, etc." If your ROBOT, in its TRANSPORT CONFIGURATION, is sized such that, while on a cart, it won't fit through a door, please consider redesigning your ROBOT'S TRANSPORT CONFIGURATION, redesigning the cart, or not using a cart, so that the ROBOT (and cart, if used) can fit through standard doors without having to be tilted or reoriented en route.

Q297

Q.Is it permitted to use an expired lead acid battery, which is fully encased, as ballast on the robot?v

A.No, this is not permitted. Please see R21 "No batteries other than those allowed per R20 are allowed on the ROBOT, whether or not they are being used to supply power", and the blue box underneath "This means teams may not use additional batteries as extra weight on their ROBOTS, for example"

Q296

Q.The page www.vexrobotics.com/frc indicates that the VEX 393 motor (276-2177). Also, there are comments on Chiefdelphi that this motor IS legal. However, the rules do NOT list it and I don't see that it can fall under the servo motor list because of the max power limitation. I'm just trying to clarify the question: is the Vex 393 (276-2177) motor legal for RecycleRush?

A.No, as the motor is not listed specifically on Table 4-1, as you said, and it exceeds the PWM COTS servo power rating allowed. As noted on the table, max power rating for a servo may be calculated by multiplying stall torque (in N m) times no load speed ('free speed', in rad/s) to get Watts.

Q277

Q.Rule R3 defines Transport Configuration (TC) as 28x42x78. Q46 implies that protruding screw heads count (fit in a box with the proscribed dimensions). Are aids used to keep the robot in TC counted towards TC? Does only the robot have to fit in the Box, or does the robot plus aids have to fit in the Box? The argument for excluding the nominally sized aids is that the "Box" could be the aid that holds the robot in TC.

A.Only the ROBOT itself must meet the requirements of R3. Aids, such as boxes or straps, used to help the ROBOT meet these requirements will not be considered. However, please ensure any aids you use are reasonably sized and do not pose safety issues of their own.

Q265

Q.Can the robot structure extend beyond the base? For example, our base is 31"x24". Can the other pieces to our robot extend beyond these dimensions, or do they have to maintain within the perimeter of the base?

A.There are no rules defining a "ROBOT perimeter" or "ROBOT base" and therefore no requirements that you must stay inside it.

Q264

Q.Are we going to attach bumper to the Robot's base?

A.We're thinking you are asking if bumpers are required this season. There are no rules requiring bumpers be placed on the ROBOT, though teams may use them if they wish. See the Blue Box at the end of *Section 4.1* for more information. If, on the other hand, you are asking us to guess if your particular team is going to be using bumpers, our Magic 8-Ball says "Cannot predict now."

Q252

Q.Can you use mirrored surfaces in construction of the robot? (For example, our programming team wants to use mirror polycarbonate sheet to construct the electronics board).

A.There are no rules that explicitly prohibit the use of mirrored surfaces, however if it's determined at an event that it interferes with the remote sensing capabilities of another ROBOT, you may be asked to remove or cover it per R8.

Q248

Q.According to R3, the maximum dimensions of a ROBOT are 28" x 42" x 78". In past years there have been allowances for minor excursions outside the frame and the heads of bolts. Will this be carried over to the 2015 season and/or will there be a tolerance for these dimensions? Thanks, Team 1529

A.We'd like to start off by clarifying that the maximum dimensions of a ROBOT actually aren't 28 in. x 42 in. x 78 in. Part A of R3 says a ROBOT can't be more than 78 in. tall. Part B talks about TRANSPORT CONFIGURATION. TRANSPORT CONFIGURATION is the size your ROBOT must be able to be arranged into only during certain situations, as stated in rule T6 within the Tournament section. We believe that [Q118] addresses the second half of your question.

Q246

Q.Is it possible for the robot to use a tethered suction cup in order to obtain a container on the step during autonomous?

A.We don't think we can answer your question the way it is written. This Q&A is intended to answer questions related to specific rules. Can you please rephrase your question so that it asks about a specific rule?

Q232

Q.In the past, when we had to have bumpers, the Team Number had to be on all four sides. This year the rules say, R2, namely "consist of numerals at least 3.5 in. high, at least 0.5 in. in stroke width..." and "be positioned around the ROBOT such that an observer walking around the perimeter of the ROBOT can unambiguously tell the Team's number from any point of view." Does that mean that we need to have numbers on all four sides? Or can they be on 3 sides?

A.Just as R2 says, if you can unambiguously read the team's number from ANY point of view after placing your team number on only three sides of the robot, then it is legal to place numbers on only three sides.

Q231

Q.Can we have flying "quad-copters" that fly around while still being bound to the robot?

A.You can try! There are no rules prohibiting airborne ROBOTS or ROBOT elements. Meanwhile, note R3, which prohibits ROBOTS height from exceeding 78 in. Tethered quad-copters are part of the ROBOT, and so the height limit applies. Also, spinning blades will likely garner extra attention per R8, please make sure they don't pose a safety hazard.

Q218

Q.Can we use VEX materials like claw for instance and attach it to our robot? Our team's fund is limited

and our team are working with VEX Robotics also. So we are wondering if we can use their parts.

A. There are no rules which prohibit materials from any particular VENDOR. We cannot comment on the legality of specific robot designs or components.

Q208

Q. When does the transportation size limit apply? Is this while the robot is moving to and from the field area in the arena or is the movement on and off the field also included? i.e Can we be outside the limit while we move the robot between the field and the cart?

A. The TRANSPORT CONFIGURATION is, above all else, a safety mechanism to prevent carrying and movement of ROBOTS whose size may be hazardous to those in their proximity. As clarified by the Blue Box example on G11(a), the ROBOT must be transformed into its TRANSPORT CONFIGURATION before it is removed from the FIELD.

Q207

Q. In R2, can the team number be vertical on the robot on at least one side?

A. No, a vertical team number could be ambiguous, and doesn't meet the requirements of R2.

Q189

Q. The blue box by R3 says we can have "additional aids such as bungee cords" to get the ROBOT into TRANSPORT CONFIGURATION. Would this also include removable metals pins or ratchet straps? May these only be used to keep the ROBOT in TRANSPORT CONFIGURATION? Are these considered part of the ROBOT or can they be placed with our cart during the MATCH? Do they count toward the ROBOT weight?

A. Yes, items such as removable pins or ratchet straps are allowed to keep your robot in TRANSPORT CONFIGURATION. They can be placed on your cart during the match, and they would not count toward your ROBOT weight, as they are a transportation aid, not part of the ROBOT itself.

Q182

Q. Does the height restriction of 78 inches include only the robot itself or may game elements being held by the robot exceed the 78 as long as no part of the robot does? Example: A forklift type robot is holding a recycling container and the robot tops out at 76 inches but the top of the recycling container is above the top of the robot.

A. The ROBOT height restriction applies only to the ROBOT and not to any other objects being handled by the ROBOT.

Q181

Q. Can the robot length be more than 42" with the chassis of the robot and the forks to pick up field elements during the match?

A. Yes, there are no length or width restrictions for the ROBOT at the start of or during the MATCH.

Q145

Q. 1) in R2 Does the number have to remain unobscured on all sides of the robot throughout the match, or may one side be partially blocked by game elements during portions of the match 2) Can the team number be split across two placards on any given side of the robot (as in 2014)

A. The requirements defined in R2 do not account for game elements. Thus partial obstruction by anything but the ROBOT (e.g. TOTES, other ROBOTS, etc.) do not result in a violation of R2. 2) Yes, there is no requirement that the digits of a team number be co-planar, however R2-B requires that an observer can "unambiguously" identify the team number.

Q139

Q. Per R3 A the robot's height may not exceed 78 inches. Is the height of the robot determined from the lowest point of the robot, from the platform, from the carpet, or from somewhere else to the highest point of the robot?

A. Please see the Blue Box under G22, which reads in part: "For reference, the height restriction matches the height of the ALLIANCE WALL. However, it is expected that ROBOT that are on a SCORING PLATFORM may actually be slightly taller than the ALLIANCE WALL due to the elevation of the SCORING PLATFORM..." The restriction is measured from the lowest point of the ROBOT to the highest point. In

most cases, the lowest point will be the floor, but as the example says, it will be slightly above the floor if the ROBOT is on a SCORING PLATFORM. Inspectors will need to check the height of all anticipated playing configurations of the ROBOT, which will be done with the ROBOT on the floor.

Q123

Q.While still maintaining the other numbering rules, does the team identification number have to only be the team number or can it be part of a team logo? For example: <http://i.imgur.com/l1iHfnq.png>

A.The purpose of this tool is to help provide clarity about the rules as they're written. We cannot pre-inspect or approve specific parts or designs. Please see the criteria in R2, namely "consist of numerals at least 3.5 in. high, at least 0.5 in. in stroke width..." and "be positioned around the ROBOT such that an observer walking around the perimeter of the ROBOT can unambiguously tell the Team's number from any point of view." There is no provision in this rule for additional design or coloring in that space.

Q118

Q.Do bolt heads count for the dimension in the transportation configuration?

A.There are no exemptions for bolt heads in the TRANSPORT CONFIGURATION. Please see R3: "The ROBOT must be able to be arranged into a TRANSPORT CONFIGURATION with dimensions which do not exceed 28 in. wide, 42 in. long, and 78 in. tall."

Q109

Q.Are there any other rules regarding the transport configuration besides the size constraint? For example, do all wheels have to be touching the ground?

A.In addition to the size constraint in T6, ROBOTS must be able to be transported safely per T1. There are no requirements regarding wheels touching the ground, in fact in most cases, the ROBOT is likely on a cart and not touching the ground at all.

Q98

Q.Can we tether our robot to an allied one via thin cable or rope?

A.Yes, there are no rules explicitly prohibiting this. Please only do this if the other team says OK though. Note that per G7-B the entire rope or cable must be "fully supported by the floor, SCORING PLATFORM, and/or SCORING PLATFORM ramps" on your ALLIANCE's side of the field at the start of the match. Also, to be eligible for a ROBOT SET, "all ROBOTS on an ALLIANCE move themselves to" the AUTO ZONE.

Q97

Q.I understand that totes and litter in the human player zone are able to be moved during autonomous, however are they allowed to enter the field in autonomous from the loading zone? As in, are we allowed to feed yellow totes to our robot during autonomous?

A.Per G19: "During AUTO, DRIVE TEAMS must remain behind the STARTING LINE". Given that the CHUTE DOOR is in front of the STARTING LINE and the CHUTE DOOR may only be operated by a HUMAN PLAYER or DRIVER as updated in *Team Update 2015-01-13*, operation of the CHUTE DOOR in AUTO would be a violation of G19.

Q96

Q.May a robot contain a "normal" full pneumatic system set up (such as the one depicted in Figure 4-7) in addition to a completely separate "Working pressure only" system (such as the On-board half of Figure 4-9), if it remains in compliance with R69, R71, R75, and all other rules at apply?

A.No, multiple completely separate pneumatic systems do not comply with R78. R78 requires any pressure vent plug to be "connected to the pneumatic circuit such that, when manually operated, it will vent to the atmosphere to relieve all stored pressure in a reasonable amount of time."

Q92

Q.Can a "robot" actually consist of multiple smaller devices connected by a wire or string? According to G25 ROBOTS may not intentionally detach or leave parts on the FIELD but does having them connected by the slightest of means (and potentially spread across the field) satisfy that rule?

A.We believe your question is answered in [Q56]. If not, please post again with additional detail.

Q90

Q.So building a robot base with modular components

A.Apologies, we don't understand your question. Please draft a question with clear terms and a specific inquiry. Whenever possible, please use specific terms as outlined in the Glossary. Thank you!

Q86

Q.Regarding rule R6. What happens if, at the end of a match, your robot is powered off while lifting totes, making them out of reach for team members. Do we have to bring a stepladder to safely remove the totes from the robot or such item will be available for teams to use on the field ?

A.The consequence for a violation of R6 depends heavily on the context, ranging from a verbal warning, to RED or YELLOW CARD, to being prevented from competing in subsequent MATCHES until the ROBOT is in compliance. The consequence will be at the discretion of the HEAD REFEREE. A stepladder is a violation of G9, as it is is not a hand tool.

Q81

Q.In the rules it does not necessarily state that we cannot have an expanding base for our robot. we just have to be able to get it into transport size after the matches to move it and such. could someone clarify this rule and make sure that we could do something like this?

A.You are correct, there are no rules that would prohibit this.

Q72

Q.Robot Rule R3-B specifies that the robot can be 78 inches tall in the transport configuration. The "Shipping Crate Construction" document does not seem to be linked in the Admin manual to give crate dimensions. Will the height limit of the robot crate accommodate the 78 inch tall robots?

A.Sorry for that omission. The [Shipping Crate Construction](#) document is now posted (and the Admin Manual will be updated in *Team Update 2015-01-13*). Crate height is more restrictive than the ROBOT Rules (although a ROBOT may be disassembled to fit in a crate), and Teams should think carefully about such practical sizing restrictions such as fitting through standard sized doors (likely on a cart), into a shipping crate, bag, vehicle, etc.

Q63

Q.Are we allowed to build modular robots? According to R3, I see nothing wrong - But will inspection consider it okay?

A.We're not sure what you mean by modular ROBOTS, but teams may build ROBOTS made of modular components.

Q61

Q.Does your robot have to stay in transport configuration while in queue? I believe it does but several other mentors after reading the manual several times are not so sure. Thanks

A.Yes, per T6, the TRANSPORT CONFIGURATION applies whenever the ROBOT is being transported, including from the Pit to the FIELD (through the queue). Stopping en route does not mean a ROBOT can expand beyond the TRANSPORT CONFIGURATION. Per G10 it can then be configured on the FIELD prior to the MATCH.

Q60

Q.Is the 28" by 42" listed in R3 as the transportation size restraint also the competition length and width restraint?

A.No, please see elaboration in the response to [Q48].

Q47

Q.What determines width and length? Given a 28 x 42 overall footprint, could the wheels be on the 28" side? Does the wheel placement determine width or length?

A.There is no rule that specifies ROBOT orientation when determining the TRANSPORT CONFIGURATION. The long dimension cannot exceed 3 ft. 6 in. and the short dimension may not exceed 2 ft. 4 in.

Q46

Q.Rule R3 B the "Transport Configuration". How exactly is this rule checked? Last years robot was put in the "BOX" and checked for clearance. The "Transport Configuration" sounds like the robot must fit in a 140" perimeter which would be similar to the string wrapped around the widest points method?

A.The process that will be used by Inspectors to check the TRANSPORT CONFIGURATION is not yet finalized, but will be published before Week 1 events. Meanwhile, the TRANSPORT CONFIGURATION is not determined by ROBOT perimeter. It is a box with a prescribed maximum width, depth, and height.

Q45

Q.Is there any restraint on wheel size?

A.No, there are no constraints on wheel size, so long as no other rules are being broken (such as TRANSPORT CONFIGURATION and others).

Safety & Damage Prevention

Q464

Q.If we were to launch a tethered projectile to retrieve containers off the step, powered by stored energy, would this be in violation of any rules?

A.It is not possible to provide a ruling on such a device sight unseen. However, "tethered projectile" does imply that a variety of rules would need to be satisfied, both Game and Robot Rules. Projectiles and stored energy are both items that will require scrutiny under R8 and R24 by the Robot Inspector at your event(s).

Q445

Q.Shipping to St Louis for Championships Our robot is bagged and barcoded after the regional. Our robot and crate (including the 4" supports for forklift) will exceed the 70" height limitation (60" limitation if shipping airfreight). What are the procedures to use to open the bag in order to take the robot apart so it can fit inside the shipping crate? We would like to avoid a DQ based on improper bag and tag after regional violations.

A.Teams with unusual circumstances like this should email frcteams@usfirst.org explaining the situation. These will be reviewed on a case-by-case basis. If permission is granted to open the bag, instructions will be provided.

Q444

Q.Can you provide a clarification as to how R7 regarding protrusions not posing a hazard to the Arena elements will be handled at inspection. Our robot has a rake like arm to grab containers with rounded tines that are less than 1 sq/inch in surface area. It does/did not damage any elements at our first competition however an inspector informed us we needed to change it for future events to comply with the 1 sq/inch surface area guideline. Do all protrusions need to be 1 sq/inch surface area?

A.The "surface area of less than 1 in. squared" is a guideline for items that may invite additional scrutiny. The rule itself does not impose any requirement on minimum cross-sectional area of a feature, as long as it is determined to "not pose hazards to the ARENA elements (including the LITTER, RECYCLING CONTAINERS and TOTES) or people."

Q271

Q.What does the Game Manual mean by "traction devices" as stated in R5?

A.The second sentence of R5 defines traction devices: "Traction devices include all parts of the ROBOT that are designed to transmit any propulsive and/or braking forces between the ROBOT and FIELD carpet." If this does not answer your question, please submit a new question with more specific phrasing.

Q40

Q.If we are using a chassis other than AM 14U2, do we need an outer plate covering the wheels or can they be exposed?

A.There are no explicit requirements for wheels to be covered.

Budget Constraints

Q354

Q. In the bill of materials do we need to include the KOP items in it?

A. No, per T11, items listed in R9 do not need to be listed on the BOM, and KOP items are listed in R9.

Q302

Q. Why can't I find the BOM template?

A. The BOM Template will be posted shortly and will be linked from *Team Update 2015-02-03*.

Q259

Q. This concerns Budget Constraints and adds to Question Q258 A) If a part was in a previous year KOP, do we account for the cost? B) If a part was in the KOP, and we use more than the number that was in the KOP, do we account for the cost (example, 4 Talons in the KOP, we use 6, do we account for 2)?

A. A) No, KOP items do not have to be on the BOM or have cost associated with them per T11 (as updated in *Team Update 2015-01-27*). B) You don't need to worry about this, per the answer to A. (answer updated 2/12/15 to clarify KOP items are not required on the BOM)

Q258

Q. R9-B allows any quantity of any KOP item to be added to the BOM without having to account for its cost. Since the KOP is defined as "the collection of items listed on any Kit of Parts Checklist, distributed via FIRST Choice or obtained via a PDV" does that mean any item obtainable using the PDV or FIRST Choice is in the KOP? For example: the Talon SRX is in FIRST Choice - is it KOP? This appears to allow almost any AndyMark item to be KOP, plus everything in FIRST Choice.

A. Items in *FIRST Choice* or **acquired** via a voucher do not need to be on the BOM per T11 (as updated in *Team Update 2015-01-27*). (answer updated 2/12/15 to clarify KOP items are not required on the BOM)

Q257

Q. Do kit of parts count towards the \$4,000 budget max. The rules allude to that but are not clear. So if our non kit of parts materials cost \$4,000 we will not be over budget?

A. Per R9-B, the cost of KOP items are not included in the \$4000 cost accounting limit, (nor do they need to be listed on the BOM, per T11 as updated in *Team Update 2015-01-27*). (answer updated 2/12/15 to add parenthetical)

Fabrication Schedule

Q495

Q. R17 says we are allowed to have access to other teams fabricated items now say for instance we use 15 pounds of another team's items does that mean we are only allowed 15 pounds of our own fabricated items or do we still have all 30 because it was another team's?

A. The WITHHOLDING ALLOWANCE is only assessed as each team loads into an event. Should a team gift you additional FABRICATED parts, they will not affect your WITHHOLDING ALLOWANCE. Please remember that FABRICATED parts may only be brought in during the load in period at each event.

Q477

Q. If a team is granted an unbag window for the purpose of disassembling a robot to fit in a legal size crate for champs, is it legal to remove a component from the bag if; -The component is the ONLY item preventing the robot from fitting in the crate. -The component is too long/wide to fit in the crate in any orientation without modifying the component severely. -The team intends to not compete with this component anyway, it is obsolete and no longer desired/needed. Thanks!

A. We believe the answer to [Q445] also answers this question.

Q470

Q. What about if these situations were to happen during build season? What about giving teams manufactured parts that your team designed for your robot. Is this legal? For example what if a team gives and installs a sheet metal battery tray on another team's robot during week 3. Is that part legal for the new team to use, they didn't help build, install, or design it. Would it be legal if they installed it but

didn't help build or design it? Would it be legal if they drilled a random hole in it?

A.Please see revised answer to [Q461]. If you still have a question, please reword and resubmit.

Q462

Q.Since COTS components are not FABRICATED ITEMS by definition and are not excepted in the wording of R14, it is implied that COTS components not bagged with the robot are not legal for use at competition, nor can they be loaned to other teams as well. We do not believe that this is the intent of the rules, can FIRST clarify whether teams have access to unlimited COTS components at competition?

A.Good question, and our apologies for the omission in the *Game Manual*. *Team Update 2015-03-17* will update R14 to include COTS items.

Q461

Q.Are any of the following situations legal: A team gives/loans a Component or Mechanism, to a team, that was: 1. Brought in to the event in the giving team's robot bag? 2. Brought in to the event as part of the giving team's Withholding Allowance? (Does the ruling change if the receiving team has unallocated weight remaining in their own withholding allowance?) 3. Built at the event by the giving team?

A.Revised answer follows (for added information, please see [Team Update 2015-03-17](#)): R1 requires that the ROBOT a Team uses in competition was built by that Team, but isn't intended to prohibit assistance from other Teams (e.g. fabricating elements, supporting construction, writing software, developing game strategy, contributing COMPONENTS and/or MECHANISMS, etc.). Please remember that the addition of any item to any ROBOT requires re-Inspection prior to any MATCH in which that ROBOT competes per T10. That re-Inspection also requires an update to the Team's BOM reflecting the change in ROBOT parts. Given the feedback received since the first version of this response, internal discussion, and Game Manual changes described in *Team Update 2015-03-17*, the answers to your questions by number are as follows: 1) Yes. 2) Yes. 3) Yes.

Q422

Q.We're going to present our robot in a museum called "National Museum of Emerging Science and Innovation" on February 28th and March 1st. We'd like to exhibit our robot from 10:00 to 17:00 on both of the two days. However, the Admin manual says that display longer than four hours is not concerned as a display. Do we have to bag and tag the robot after 4 hours has passed, and show the bagged robot to the visitors, or could we just keep the robot in the exhibition for the entire 7 hours?

A.This would not be considered a 'brief display' as allowed by the rules. The intent behind allowing only brief displays of robots is to reduce the chance that a display will unintentionally become a practice session, and reduce the chance that something on the robot will break or otherwise need to be tweaked, which could be a temptation for teams to do 'work on' the robot, which is not allowed. One four hour session of out-of-bag time for each day would be allowed, though.

Q415

Q.Hello. About packaging the robot on Stop Build Day, I am uncertain that if there is any other means besides the robot lock-up form to prevent teams from sealing their robots later than the deadline. It is possible for the team to be conspiring with the adult who signs the form and therefore gaining an unfair advantage. Have you taken this situation into consideration and have a plan to differentiate and disqualify such teams, or are you relying on the morality of students and coaches?

A.The Robot Lock-up Form is the designated tool Inspectors at events will use to verify the rules in *Section 5* of the FRC Admin Manual have been followed by the team. This Q&A forum is intended to answer questions about the meaning or implementation of specific rules. If you have editorial comments or suggestions about rules, please send them to frcteams@usfirst.org.

Q356

Q.At bag-n-tag, can any parts be left out of the bag and continued to be worked? Related, can one version of a certain feature be part of the bagged robot, but a new improved version be worked on in parallel outside of the bag and then be used as a replacement at competition time?

A.Yes, you can leave FABRICATED ITEMS, up to 30 pounds, out of the bag to continue to be worked on. This is called the WITHHOLDING ALLOWANCE and you can see all the details in R17 in the manual. And yes, there are no rules against having one version of a feature in the bag, and another version as part of the WITHHOLDING ALLOWANCE.

Q280

Q.Are teams allowed to re-use 3D-printed parts (spacers, PWM holders, etc) from previous years or the offseason? (I believe the answer is a hard "no," but would like to avoid being wasteful if possible. As 3D printers and vouchers are included in the KOP, we thought that they might perhaps be exempt.) Thank you!

A.R12 says that, "physical ROBOT elements created before Kickoff are not permitted" and 3D-printed parts are not listed as an exception to this rule. Therefore, those parts are not allowed to be re-used.

Material Utilization**Q493**

Q.T9 reference What is the procedure when we arrive at FRC St. Louis? Does our team un-bag our robot, make the 30 lb change of fabricated parts, then bring the completed robot to inspection? Or do they take the bagged robot and the 30 lb FABRICATED PARTS to inspection for approval to make changes, then make changes and bring back to inspection?

A.Congratulations on making it to the *FIRST* Championship! The process in St. Louis will be similar to what you experienced at earlier events. You should plan on not unbagging your ROBOT until your Lock-up Form is reviewed by an Inspector per *Section 4.6.1* of the *FRC Admin Manual*. You should then plan on unbagging your ROBOT, incorporating WITHHOLDING ALLOWANCE parts, and making any other adjustments necessary to get it ready for a full Inspection.

Q492

Q.R 17 reference If we connect a COTS item to a fabricated item, does the COTS item become a fabricated item? The question is referenced to if our team connects COTS items to a fabricated electronics board, do the COTS items are now considered a fabricated item?

A.A COTS item incorporated into a FABRICATED ITEM becomes part of that FABRICATED ITEM, and ceases to have its own identity as a COTS item. If the item were to be removed in such a way that it was returned to its original COTS state, it would again be considered a COTS item.

Q453

Q.Our team used donated, used hockey sticks, and we broke them in half and placed them on the robot. Do we put the estimated hockey stick price before or after we modified them? Do we even have to put a price if they were donated?

A.The Bill of Materials should reflect fair market value for the raw materials before any fabrication (such as breaking in half). Assuming the labor was performed by a team member, the value of the labor does not need to be accounted for per R11. However, per T11, the Bill of Materials must still list "all items on the ROBOT except those listed in R9-A and -B" (in this case, the value of the hockey sticks).

Q452

Q.According to R17: "At an Event, Teams may have access to a static set of FABRICATED ITEMS, not bagged per R14, known as the WITHHOLDING ALLOWANCE...." The glossary defines what is meant by FABRICATED ITEMS. If we use a COTS gear box (VersaPlanetary) and perform the welding recommended by their engineering department to overcome a known flaw and do no other modification to the gear box, does this gear box now become a FABRICATED ITEM, and as such count towards our withholding allowance?

A.No, given the manufacturer's instructions are intended to restore the item to its intended COTS state, this repair does not make the item a FABRICATED ITEM.

Q396

Q.For the BOM, do we put the original price or the price after we've modified an object?

A.The Blue Box under R11 provides several examples that seem like they would apply to your question. If one of the examples doesn't help answer your question, please post a follow-up question with more specific detail.

Q371

Q.air tanks: are any "E" series (larger ones) allowed on an FRC robot for comp? The air tank we have in mind fits within the drive train frame. Also, can we use the older elc's (C-Rio, PDB, digital side cars) for comp?

A.Regarding the air tank, the purpose of the Q&A is the help provide clarity to the rules as they're written, and we cannot approve specific components, designs, or strategies. Please rephrase your question in reference to a specific rule (or rules) you find unclear, and we'll try to help. For the second part of your question, it depends... per R45, the roboRIO is the only main controller permitted, however you could use a cRIO as a co-processor. R37 requires each branch circuit be sourced from one PDP, but there's no restriction on having a PDB as part of a CUSTOM CIRCUIT.

Q369

Q.After robot is bagged and tagged, may we bring fabricated parts up to 30 pounds of weight with us to robot check-in in addition to the bagged robot if the robot weighs 120 lbs? or is the robot only allowed to weigh 90 lbs at check-in in addition to fabricated parts of maximum of 30 lbs. so we are not over weight limit?

A.There is not weight limit on the bagged ROBOT. The FABRICATED ITEMS you bring with you to your event outside the bag must be limited to 30 lbs. and the weight limit of the ROBOT once it goes to Inspection is limited to 120 lbs, but there is no weight limit on what's secured in the bag.

Q335

Q.Regarding R3: Our robot is 78" tall, and our robot cart is 12" tall. When the robot is on the cart the top of the robot maybe greater than the door height at the various competitions. Can we tilt the robot to go through the door or other overhead obstacles?

A.We believe we have answered this question in [Q298]. If you feel this does not address your question, please reword and ask again.

Q334

Q.Regarding R17: Is the 30 lbs withholding allowance in addition to the 120lbs robot weight limit?

A.The WITHHOLDING ALLOWANCE in R17 is independent of the ROBOT weight limit in R4. However, this doesn't mean you can construct a 120 lb ROBOT then add whatever FABRICATED ITEMS you brought in as part of the WITHHOLDING ALLOWANCE to your ROBOT, and so end up with a ROBOT weighing more than 120 pounds. The WITHHOLDING ALLOWANCE is intended to be used to repair and/or upgrade your ROBOT. No matter how you choose to use your WITHHOLDING ALLOWANCE, your ROBOT may not weight more than 120 pounds.

Q319

Q.KOP items are not required to be listed on the BOM. Are items that were acquired through FIRST CHOICE considered KOP?

A.Yes, per the definition of Kit of Parts in *Section 6 - Glossary*: "the collection of items listed on any Kit of Parts Checklist, distributed via FIRST Choice, or obtained via a Product Donation Voucher (PDV)."

Q239

Q.Does the Kit of Parts, as defined in the glossary, include the items listed from any year or just the current year, in relation to R10?

A."Any Kickoff Kit Checklist" refers to any checklist from any season. The other two clauses similarly apply to all parts distributed via these mediums in any year.

Q198

Q.We believe the part under question is a COT. However, is a component considered a COT if there is no standard length? The purchaser must specify the length. See link below for part under question. http://www13.boschrexroth-us.com/Framing_Shop/Product/View_Product.aspx?category=11301&subcategory=1

A.Yes, if a team orders a COTS part that requires a length to be specified by the customer when ordered, it is a COTS part.

Q70

Q.For the past 3 years we have used connectors from www.mercotac.com, the Model 430, Four Conductors, 2@4amps, 2@30amps connectors. Are they legal this year again?

A.The purpose of this tool is to help provide clarity about the rules as they're written. We cannot pre-inspect or approve specific parts or designs. Generally speaking, devices that contain hazardous

materials are prohibited per R8 and the examples cited in the Blue Box (specifically, reference part H, "Switches or contacts containing liquid mercury").

Q49

Q. Does a motor included in a COTS vacuum pump have to be a motor listed in the acceptable motor list?

A. Yes, the only motors legal in RECYCLE RUSH are listed in Table 4-1. However, if the supplied motor is removed and replaced with a motor from Table 4-1, the vacuum pump may be used.

Motors & Actuators

Q432

Q. We would like to remove one of the mounting tabs on the DENSO Window Motor 262100-3030. Per R19 A, this modification seems legal, but at the same time this seems to violate R19 because the mounting tab SEEMS (not necessarily is) integral to the mechanical design. Per R19, is it legal to remove one of the mounting tabs on the window motor?

A. Modification of physical mounting traits (brackets, tabs) is permitted per R19-A and the elaboration in its associated Blue Box (provided such modifications do not affect the structural integrity of the motor or its integral gearbox).

Q409

Q. R18 allows BaneBots motor "M7-RS775-18/RS775PH-6221." Motors received from Banebots with an M7-RS775-18 sticker have RS775WC-8514 printed on the case, and the M7-RS775-12 motor pictured on BaneBots' website has RS775PH-6221 printed on the case. Was FIRST's intent to allow both the M7-RS775-18 and -12 motors? If so, please update R18 to include the correct part numbers for each, as not all Banebots motors ship with stickers. If not, please clarify which motor is allowed per R18.

A. Thank you for pointing out this discrepancy! While the original intent was to only allow the M7-RS775-18 part number for the 2015 season, due to this issue *Team Update 2015-02-20* revises Table 4-1 in R18 to include both the M7-RS775-18/RS775WC-8514 and the M7-RS775-12/RS775PH-6221 as legal motors.

Q407

Q. If a COTS item meets the requirements listed in section 4.1 of the Game Manual (e.g. standard part available for purchase by any team from a distributor) but is not listed as a specific category of part (e.g. motor or actuator), how do we ensure or document its legality? For background, the part in question is a magnetic particle brake. I don't see brakes and clutches mentioned anywhere in the rules. I infer these devices are OK as long as safety and power rules are satisfied.

A. A brake or clutch that operates without causing readily discernible motion (as opposed to a mechanical or electro-mechanical brake such as a disc brake) would not be considered an actuator and would therefore not need to meet the requirements of R18. Such a device would be considered a CUSTOM CIRCUIT, and must follow all the rules required of that classification.

Q406

Q. Are the AndyMark am-0914 motors legal as they are run by the am-2161 motor?

A. Yes, the AM-2161 is legal as it is listed in Table 4-1. You may add any gearbox to the motor, or use the AM-0914 as purchased with the gearbox already included.

Q394

Q. Is there a maximum number of motors allowed on the robot? The kit of parts gave the team a motor, AM-2194. May we order another one and use in addition to the one we have?

A. Per Table 4-1 in R18, AM-2194 is allowed in unlimited quantity.

Q388

Q. Could we use a magnetic actuator like the one described here <http://www.precisiontork.com/magnetparticle/gallery/magneticparticle.html> as a brake as long as its rated power input is less than 10 watts as specified in table 4-1?

A. The purpose of this Q&A is to answer questions related directly to the rules for RECYCLE RUSH. We cannot make definitive rulings on the use of individual parts. If you have a rules specific question related

to the use of this part, please rephrase and resubmit. If you believe an item meets the requirements of a rule, but you're concerned about the rare nature of the item, please bring manufacturer's documentation with you that validates the item meets the requirements of the rule.

Q368

Q.R18 lists the permitted motors and actuators, but does not prescribe how they are connected to robot's electrical system. R41 lists permitted power regulating devices for actuators (and motors, implied but not stated), but does not require their use. R42 lists permitted interconnections between loads (including actuators and motors) and the power regulating devices, but does not require their use. Under what circumstances are power regulating devices required to connect loads to the robot?

A.Thank you for your question, and our apologies for the ambiguity. *Team Update 2015-02-17* will update R41 to require power regulating devices for motors and actuators (except for legal fans in Table 4-4 not already part of a COTS computing devices). This has always been the intent, and as far as we can tell, the practice, however it hasn't been explicitly required. If you still have questions after *Team Update 2015-02-17*, please re-post.

Q345

Q.Where do I get Jaguar firmware version 109 for the tan Jaguars? All I can find is black Jaguar firmware.

A.The purpose of the Q&A is to answer game rules about RECYCLE RUSH. For technical support, please see the [FIRST Forums](#). Our technical staff monitor these forums and should be able to provide you with assistance there on any technical questions you have.

Q320

Q.Are the 12 in stroke DART linear actuators legal?

A.We aren't able to review individual products for legality because of the sheer number we could be presented with. In addition, devices need to be used legally on ROBOTS, and we can't make blanket statements about that, as many devices legal per the rules could be used in an illegal way (for example, unsafely). Generally, there are no explicit rules prohibiting linear actuators, but motors used in such actuators must be listed in R18. If a rule is such that you can't decide for yourself if a device is legal, please use this Q&A to ask for help understanding the rule, and we may be able to be more helpful.

Q268

Q.The blue box under states that "for the previous KOP Window motors...the gearbox is considered integral to the motor, thus the motor may not be used without the gearbox". However, would it be considered legal to use the gearbox without the motor, and mount another legal motor from to the previous KOP Window motor gearbox?

A.Yes, the use of this gearbox with another motor is not a violation of R19.

Q266

Q.According to R37, motor controllers must be powered off of a breaker with a value of "Up to 40A." This implies that a motor controller for a small motor could be powered off of a 20A or 30A breaker on the PDP. Is this the case?

A.Correct, this is allowed per R37.

Q256

Q.Just to clarify your answer. If I have a motor that was donated from and ARA automotive recycling yard and it meets the requirements that the unit was used as a window, door or an other automotive use as listed, the donated unit can be used for the 2015 season. If it can not what donated motors from an ARA yard can be used? Would a convertible top motor be allowed.

A.Automotive window, door, windshield wiper or seat motors from any source, including ARA, are allowed per R18 and Table 4-1. A convertible top motor is not listed in Table 4-1 and therefore would not be allowed.

Q255

Q.Are ARA donated motors allowed this year as long as they are used for the purpose as stated in motor list? If so do they meet the condition of various as stated in the motor list?

A.ARA motors are not explicitly prohibited or permitted. Motors that meet the descriptions of those listed on Table 4-1 are the only motors permitted in the 2015 FRC season.

Q229

Q.Is it legal to modify the end bell of the CIM motor to facilitate access to the shaft so that we can add a shaft encoder?

A.No, this is not an allowed modification per R19.

Q219

Q.We want to use a vacuum cup and a small vacuum pump to grip the recycle bin. The vacuum pump is an off the shelf item from SparkFun Electronics, a supplier recognized by FRC. <https://www.sparkfun.com/products/10398> The motor that powers this small vacuum pump is identical to the AndyMark 9015 motor except that the shaft has been modified by the manufacturer to fit the vacuum pump mechanism. Is this pump allowed to be used?

A.We cannot comment on the legality of specific ROBOT designs or COMPONENTS. If the part number for the motor does not match any listed in Table 4-1, then the motor is not legal.

Q204

Q.Would we be allowed to use a Hydroworks linear actuator. It is functionally the same as the Andymark product but is available COTS. 12 inch stroke 12V DC 135lbs max load Link <http://www.princessauto.com/en/detail/12v-dc-12-in-stroke-135-lb-linear-actuator/A-p8489098e>

A.No. The only electric linear actuators that are permitted for use in FRC are ones that use legal motors from R18 and Table 4-1.

Q172

Q.Table 4-1 lists door motors as allowed for use on the robot. Does that include the door motor for power locks?

A.Yes, *Team Update 2015-01-16* will update the description of the Window, Door, Windshield Wiper, and Seat motors to specify that they must be from an automotive application (i.e. from an automobile). Motors used in or for automotive doors meet the revised criteria.

Q152

Q.Are we allowed to use the RS775 motor with the Part Number RS-775-8513DF-R/90? (Here is the specifications of motors, as a reference. (specification of RS-775-8513DF-R/90 is in Japanese, so I translated it for better understanding.)) <http://pastie.org/9829567>

A.R18 lists the legal motors for FRC in 2015. If the motor is not described in Table 4-1, as this one is not, it is not legal for use in competition.

Q142

Q.Is it legal to use a COTS computer fan on our robot, or does it have to be one from FIRST Choice or the KOP? There is a statement about fans in the legal motor chart, but the wording is rather confusing. Thanks

A.Only if the fan is a part of a COTS computing device. Fans allowed per R18 include those:

- Included in the 2015 Kickoff Kit
- Included in 2015 *FIRST* Choice
- Part of a legal motor controller (including manufacturer provided accessories)
- Part of a COTS computing device

Q71

Q.Per rule R18, teams are allowed to use drive motors or fans that are part of a motor controller or COTS computing device. Would a sensor that comes with and requires an integrated motor (ex. a pan/tilt camera or a 360 degree laser scanning lidar) be considered a COTS computing device under this rule and thus be legal for teams to use?

A.No, if the integrated motor in the COTS computing device is not a hard drive motor or fan, it is not permitted per R18.

Q38

Q.Thank you. But some electric actuators are NOT solenoid actuators (based on a screw driven motion). Are they allowed in any size? Table 4-1 is not forbidding these.

A.No, R18 specifies that "The only motors and actuators permitted on 2015 FRC ROBOTS include" those listed in Table 4-1. Electric actuators that are not solenoid actuators are not listed in Table 4-1 and are therefore not legal.

Q3

Q.Are we allowed to use electric actuators that are not solenoid actuators?

A.Electric actuators permitted for 2015 are listed in Table 4-1. The row that permits electric solenoid actuators allows any product that meets the listed specifications and is sold as an electric solenoid actuator.

Power Distribution

Q423

Q.We are powering a pair of LED strips using the VRM with a 500 mA/12V source. If we have a 20 AMP breaker/fuse in a SPIKE, but the SPIKE power is sourced from a 500 mA/12V source on the VRM, is #18 AWG wire still required? Our electrical leads and mentors believe that, given the lower level of power, a #20 AWG wire for the ground return is safe for level of current, but we recognize that R38 makes no such distinctions. Could you confirm if a #20 AWG wire for these returns is acceptable?

A.Please note that per R37, the Relay Module must be protected by a breaker in the PDP of 20A or less and **no other electrical load (such as a VRM) may be connected to that branch circuit.** Also, minimum wire size requirements in R38 must be followed regardless of intended load. A short in the circuit downstream of the wire may result in current draw well above the intended load and this requirement ensures that the wire is sized appropriately to handle that current.

Q376

Q.Can you use 12V-5V power converters from the old control system?

A.The purpose of this Q&A is to answer questions related directly to the rules for RECYCLE RUSH. We cannot make definitive rulings on the use of individual parts. If you have a rules specific question related to the use of this part, please rephrase and resubmit.

Q367

Q.R37 valid branch circuits does not include Motors. CUSTOM CIRCUIT excludes Motors. R18 defines Motors to include Fans. R55C allows fans to be connected to the power input terminals of motor controllers, which are directly connected to the PDB. Can other fans be directly connected to the PDB that are not attached to a Motor Controller? I want to power a fan to cool the compressor and would like to directly connect it to the PDB so that it runs continuously.

A.Thank you for your reasoned and thorough question! R37 does not include motors, but does include power regulating devices, which, per an update to R41 in *Team Update 2015-02-17*, are required for all motors and actuators, except for fans permitted per Table 4-1 but not already part of a COTS computing device (admittedly always the intent and mostly the understanding, but not actually stated explicitly). R37 will also be updated to include a row specifically for fans permitted per Table 4-1 but not already part of a COTS computing device (with a breaker limit of up to 40A and no legal limit on the number of fans on that breaker). Long story short, given the revisions described above, yes, there is no prohibition on connecting a legal fan directly to the PDP.

Q313

Q.Can I extend the factory wires on a CIM motor with same gauge wire (14) to the output of a Talon even though the input to that Talon, connected to a 40A breaker circuit, will be wired with 12 gauge wire as per R38.

A.No, an extension is not an exemption to R38.

Q294

Q.We're an FRC Team from Germany. We live in a metric world over here. Wire gauges are a problem for us. Can we use the metric equivalents. AWG Number Ø [Inch] Ø [mm] Ø [mm²] 12 0.0808 2.05 3.31 14

0.0641 1.63 2.08 18 0.0403 1.02 0.823 22 0.0253 0.644 0.326 26 0.0159 0.405 0.129 28 0.0126 0.321 0.081

A. Per *Section 4.1 - Overview*, we acknowledge that "some of these rules make use of English unit requirements for parts. If your team has a question about a metric-equivalent part's legality, please e-mail your question to frcparts@usfirst.org for an official ruling." Thank you.

Q267

Q. Is the Axis M1013 ip camera supported by the new 2015 voltage regulator? It needs 5.0V, 1.5A, but on the 5.0V there are 500mA (underpowered) and 2A (blow out electronics?) options... according to an AndyMark technician, we could use the 2A side because it's pulling UP TO 2A but doesn't necessary have that full load on all of the time... but the game rules indicate that only the radio can use that power rail... Should we use a different camera model instead to get around this power issue?

A. You are correct that the radio must be the only load connected to the 5V 2A supply on the primary VRM connected to the dedicated connectors on the PDP. There are no rules prohibiting the use of an additional VRM or other 12V-5V convertor. For assistance with the technical portion of your inquiry, please use the [FIRST Forums](#).

Q216

Q. Concerning Q205 If the robot has a multipin connector in the power lines to a motor, can a control box be plugged in to actuate a mechanism after a match? I.e: once the driver control is disabled, can a team member walk onto the field with a handheld control box that they connect to the robot that then allows them to electrically retract a mechanism?

A. No, per G14, teams may not tether to their ROBOT after the MATCH, which includes any wired connection used to electrically energize and/or control elements on the ROBOT. Team Update 2015-01-23 will add a Blue Box clarification to G14.

Q213

Q. Table 4-4 does not list the Denso Throttle Control motors power regulating devices or the number of motors per controller.

A. Thank you for pointing this out. Denso Throttle Control motors will be added to the "Yes, up to 2 per controller" section of Table 4-4 in *Team Update 2015-01-20*.

Q205

Q. QU1: Is it permitted to include a switch or switches on the robot that facilitate manual control of robot mechanisms (but never the drive train) for the express purpose of bringing the robot into 'transport-configuration' dimensions? I.e: At the end of a match, can a team member actuate a bypass switch on the robot that then allows them to electrically retract a mechanism (using other switches/control device and the onboard battery)?

A. No, this is a "Custom Circuit" and regulated by R44. R44 states that CUSTOM CIRCUITS shall not directly alter the power pathways between the ROBOT battery, PDP, motor controllers, relays, motors, or other elements of the ROBOT control system (items explicitly mentioned in R55).

Q193

Q. Is energy stored via compression of a gas spring prior to the start of a match considered "deformation of a robot part" and thus legal per R24 paragraph C?

A. No, compression of gas springs is not considered deformation of a ROBOT part. However R24 will be updated in *Team Update 2015-01-20* to allow energy stored in gas springs at the start of the MATCH.

Q153

Q. We recently purchased new 120 amp breakers from Powerwerx What they offer is the: 285120F as opposed to the 185120F which is in the kit of parts. The site states: "Model CB285 is a direct replacement for CB185". Can this breaker be used on the robot?

A. No, the CB185-120 is the only main breaker permitted on the ROBOT per R25.

Q111

Q. How do I return a malfunctioning power distribution board?

A.Please contact Cross the Road Electronics for assistance, support@crosstheroadelectronics.com.

Q85

Q.Can multiple 30A rated slip ring legs be combined and connected to a 40A protected circuit? This configuration was recommended by slip ring supplier.

A.Yes, a parallel connection of two (2) 30A elements would be considered appropriately gauged/rated for a 40A breaker.

Control, Command, & Signals System

Q405

Q.Regarding R62, is it permissible to wrap one turn of each motor wire around a ferrite bead to attenuate motor brush noise? It is less invasive than connecting a capacitor in parallel with the motor, and it may be better at attenuating high frequency noise. This modification has been approved in the Q&A at least once in the past.

A.There are no rules prohibiting the use of ferrite beads.

Q362

Q.Is it legal to use limit switches in series (as in both need to be pressed for the signal to become true)? If the number of limit switches matter, we want to use two connected in series.

A.Yes, there are no rules prohibiting this.

Q349

Q.Does the RoboRIO count as a FABRICATED ITEM? Could one remove the RoboRIO from the robot as a spare part and count it towards the 30lb limit if code is being tested on the RIO?

A.No, the roboRIO by itself, even with code on it, is not a FABRICATED ITEM, particularly because R55 prohibits any modification to the device. Deploying code to the roboRIO is not considered a modification that would transition its status from COTS to FABRICATED. If the roboRIO is part of a MECHANISM (e.g. a control board assembly), it must be considered part of the WITHHOLDING ALLOWANCE. If the roboRIO is removed from a MECHANISM, it alone is again a COTS item and doesn't count toward the WITHHOLDING ALLOWANCE.

Q336

Q.What programming languages are supported on the RoboRIO? Specifically, is python supported?

A.Officially supported languages are LabVIEW, C++, and Java. Other languages are not prohibited, and we understand some teams have had success using Python, but we can provide no technical or other support for these languages.

Q285

Q.Can the output of the PCM be used to control LED signal indicators in addition to the solenoid valves? We will abide by the 500ma max load.

A.CUSTOM CIRCUITS (e.g. an LED signal indicator) and pneumatic solenoid valves may be driven from the same PCM. However, a CUSTOM CIRCUIT may not be connected to the same channel as a pneumatic solenoid valve or another CUSTOM CIRCUIT (see R42 as it will be updated in *Team Update 2015-02-03*).

Q272

Q.Considering R40 - would a pre-wired multi-pin connector be considered a legal device and therefore exempt from the wire color rule?

A.If the multi-pin connector is used for signal level wiring, R40 does not apply to the color of the wire insulation.

Q261

Q.We tried to run our Robot Code yesterday. But it wont work, it has a red color under Robot code?

A.The purpose of this system is to answer questions about the FRC Game Manual. For technical assistance please see the [FIRST Forums](#).

Q253

Q.For the purposes of R40, is the output of the Robot Signal Light port on the RoboRIO considered "Signal Level" wiring, and exempt from polarity color coding requirements?

A.Yes, this output is "signal level" wiring. However, in the event that your RSL is not functioning during inspection, a standard Black/Red wire pair would aid in diagnosing the problem.

Q249

Q.Can the signal pathway between the RoboRIO PWM pins and servos/motor controllers include PASSIVE CONDUCTORS on a printed circuit board which contains additional active circuitry, if this circuitry is completely electrically isolated from and does not interact with the PWM signal pathway in any way? We would make every effort to make it visually obvious that this is the case, and supply supporting documentation to our inspectors.

A.No, per R57, because every relay module, servo, and PWM motor controller *shall be connected to a corresponding port on the roboRIO* or via a legal MXP connection (per R58). There is no allocation for intermediate devices.

Q215

Q.We are trying to wire a bimba MRS-.087-B. The wire coming from the roboCRIO has 3 wires (red,white,black) but the bimba MRS switch has a black and red wire. Can someone help us wire it?

A.We cannot answer questions guiding ROBOT design. The purpose of the Q&A is to help the FRC community better understand the rules of RECYCLE RUSH. For technical support or advice, please use the [FIRST Forums](#).

Q194

Q.Configuring the D-Link radio for untethered communication to the driver's station. What is or how do we generate a password for the DLink?

A.Please post technical support/assistance questions to the [FIRST Forums](#). Thank you!

Q180

Q.Can I de-solder the wire pigtails from the Talon SRX/Victor SP and replace them with a different (but equivalent) wire?

A.No, modifications to these devices are prohibited per R55. De-soldering the wire pigtails is not one of the exceptions listed in items A-M of R55.

Q178

Q.Do we need to use the "Green/Yellow twisted cable" to connect the CAN parts? or it's possible to use any other cable of the same AWG??

A.There currently is no rule covering color code for signal/CAN wires. Green and Yellow will make it easier for you and others to identify the CAN bus wiring.

Q168

Q.Having carefully considered rules R9, R10, R20 and R48 my question is: In addition to the laptop used for the driver station, can I use a second COTS laptop (specifically, the 2014 Classmate) securely mounted to robot, and connected to the wireless bridge, for vision processing?

A.There are no rules that explicitly prohibit the use of a laptop as a co-processor on-board the ROBOT.

Q157

Q.In order to be approved for a custom expansion board, you have to submit a proposal by November 14. Is that deadline still enforced, or may we submit a new proposal?

A.The deadline for submitting proposals for approved ACTIVE DEVICE boards (listed in R58-C) for the 2015 season was November 14th, 2014 in order to give FIRST time to review and approve devices before kickoff. No additional ACTIVE DEVICES will be approved for the 2015 season, and we have not yet determined what the rules will be for ACTIVE DEVICES for the 2016 season.

Q136

Q.Are suction cups, devices which USE but don't CREATE a vacuum, allowed? (They were once supplied in the KOP)

A.There are no rules prohibiting the use of devices which use or create a vacuum. Unless explicitly noted (such as in R66) the distribution of a part in a previous Kit of Parts has no relation to its legality for 2015.

Q135

Q.Per rule R66 H: Is Bimba's 1/2-turn rotary actuator (PT-017 090-M) allowed? Don't know if its considered a "cylinder". (It used to be in the KOP)

A.If this item was previously distributed via PDV (and PT-017 090-M was) and meets the requirements of R64 it is legal per R66-A.

Q133

Q.R66 F: Are exhaust mufflers allowed? (They were supplied in KOP years ago)

A.If the item was listed on a previous KOP checklist and meets the requirements of R64, it is allowed per R66-A.

Q132

Q.Are KOP items from previous years acceptable? If not, why say "except ad noted in I" where I talks about a storage tank supplied ONLY in previous year's KOP?

A.It depends... just because an item is or has been a KOP item (per Section 4.1 and the Glossary, the Kit of Parts is "the collection of items listed on any Kit of Parts Checklist, distributed via FIRST Choice, or obtained via a Product Donation Voucher (PDV)") doesn't necessarily mean it's legal in the 2015 competition. Regarding your example, the White Clippard tanks (P/N:AVT-PP-41) were distributed via FIRST Choice and thus fit the definition of KOP. This means they would be legal per R66A, but in I they're explicitly prohibited. The reason for the paranthetical in A is to alert the reader that there's an exception later in the list.

Q126

Q.May our robot be equipped with an NFC reader/writer?

A.The purpose of this tool is to help provide clarity about the rules as they're written. We cannot pre-inspect or approve specific parts or designs. Generally, sensors are not prohibited, however R52 prohibits any form of wireless communication used to communicate to, from, or within the ROBOT, except those required per R46 and R51.

Q125

Q.Is the CAN bus a "Branch circuit" for R39 purposes?

A.No, the term "branch circuit" is intended for and used only to reference power pathways.

Q108

Q.Microsoft Kinects on robots have been legal in the past. Are they a legal sensor for use on robots this year?

A.The purpose of this Q&A tool is to help provide clarity about the rules as they're written. We cannot pre-inspect or approve specific parts or designs. There are no rules that prohibit the use of Kinect-like sensors, however please note that R43 requires that "Servos be directly connected to the PWM ports on the roboRIO," which applies to servos contained within COTS devices.

Q99

Q.May the cover for the Talon SRX data port be removed? It is not listed as an approved modification in R55.

A.This would be allowed per R55-E as the connector under the cover is a standard connection point for the device.

Q44

Q.What gyro would work best with mecanum drive?

A.We cannot answer questions guiding ROBOT design. The purpose of the Q&A is to help the FRC community better understand the rules of RECYCLE RUSH. For technical support or advice, please use the [FIRST Forums](#).

Pneumatic System

Q446

Q.R66(D), a solenoid valve "rated for a maximum working pressure that is less than 125 psi" versus a relief valve "set to a lower pressure than the maximum pressure rating". According to the manufacturers we have contacted and NFPA definitions MWP and MPR are 2 unrelated requirements. A valve is safe up to its MPR but only rated to "work" (the solenoid would actuate the valve normally) at it's MWP. If the MPR is >125 (ours is 215) is it acceptable without additional relief? Our MWP is 115.

A.Thank you for the question. This is legal, and the language will be updated in the *Game Manual in Team Update 2015-03-17* to be consistent with this answer.

Q402

Q.I heard a mention of using a shorting device to top-up/supercharge pneumatics. The device is a hand tool, and would be permitted on the field per G9. R69 mentions off-board compressors being controlled by the Robot. There is no corresponding mention for on-board compressors. I suggest modifying R70 to require Stored air pressure to come from a compressor under the control of the Robot. Then any air created with a device would need to be dumped prior to starting the match.

A.You seem to be making a statement that using a tool such as this would not violate any rules. The ROBOT Rules are constructed such that a pneumatic circuit is only charged as a result of the prescribed pressure switch sensing and reporting a drop in pressure to the roboRIO and the roboRIO in turn sending a command to the compressor's power regulating device to turn the compressor on. These rules are intended to be specific to minimize the risk of injury. Using a conductor to power the compressor directly is a violation of R45 (bypassing the roboRIO as control). Using a conductor to short the terminals on the pressure switch is a violation of R67 (requires using the pressure switch as prescribed). Using any method to "overcharge" the pneumatic circuit is a violation of R70. Also, please keep in mind the purpose of this Q&A is to answer specific rules-related questions. If you have rule change or procedural change suggestions, please send them to frcteams@usfirst.org.

Q385

Q.Can a spike be used to power the compressor in combination with the Pneumatics Control Module (PCM)? In this configuration, the PCM would still control the compressor based on the pressure switch input. The PCM compressor out will be the control input to the spike, and the spike would be powered by a normal 20A port on the PDP.

A.No, per R77-C, a compressor must be controlled via a Spike controlled by the roboRIO or a PCM, but not both.

Q381

Q.Is it legal for us to curl our own pneumatic tubing?

A.No, that is not an exception in R65.

Q366

Q.The Viair 90 compressor has a steel fitting that comes installed in preexisting threads (1/8in NPT). It can be seen here: <http://www.andymark.com/product-p/am-2005.htm> Must this steel fitting remain installed on the compressor? Or may it be removed and replaced with brass fittings? Specifically, R[65] and R[65]C are what concerns us.

A.Per the response to [Q360], if the steel fitting is considered part of the compressor by the manufacturer and required for operation it must remain in place. If it is provided simply to ease connection to other devices and installed for convenience, you may remove it per R65-C.

Q360

Q.Are check valves integral to the operation of a compressor legal? Specifically, the VIAIR 250C IG compressor, requires a provided in-line check valve to be attached in order to cooperate correctly. It's 12V, 0.88 CFM, and is rated for 150 PSI working pressure.

A. Per R66-J, any parts or devices that are required by the manufacturer for intended operation are considered in the definition of the whole part. In this case, the check valve is considered part of the compressor and as a pneumatic part may not be modified (that is to say 'removed'). This even holds true, for example, for those legal compressors that require the compressor to be used with the supplied stainless steel hose.

Q355

Q. Can check valves be used in this year's pneumatic system?

A. No, check valves are a pneumatic component not listed in R66 and are, therefore, not allowed.

Q350

Q. Rule R66-I specifically disallows the White Clippard tanks P/N: AVT-PP-4 that were apparently the ones used in the 2013 kit (AndyMark part number AM-2007). Much of the discussion outside of this forum seems to lump ALL white tanks into this category. AndyMark has a white tank (am-24790) that does not identify Clippard as the manufacturer and does appear to comply with all other FRC pneumatics rules. Would these currently available AndyMark tanks be legal under R66-I?

A. Yes, per R66-I, the only prohibited tanks are white tanks marked with the Clippard logo.

Q340

Q. Must air cylinders be controlled by a solenoid valve? Or can air cylinders be used in such a manner where they are always charged in a specific state (i.e. used as a constant-force spring) without any control valves?

A. There are no rules requiring that a pneumatic actuator be controlled by a solenoid valve.

Q330

Q. What is the PSI rating for Bimba cylinders? After reviewing Bimba specs for the "Original Line" of cylinders, which I believe are the series which are available to FIRST teams, the PSI rating is 100 PSI. This appears to contradict the following "R64 All pneumatic items must be COTS pneumatic devices rated by their manufacturers for working pressure of at least 125psi (with the exception of R66-D)." We need to purchase cylinders other than the free ones we received. Please clarify.

A. If you are asking if any Bimba cylinders FRC Teams can order using their Product Donation Voucher through [this page](#) meet the specifications required for use on an FRC ROBOT, yes they do. If you are asking about other cylinders Bimba happens to sell, we can't answer that question, as the purpose of this forum is to answer specific questions about rules in RECYCLE RUSH. We would recommend contacting Bimba if you have questions about the specifications of their products.

Q312

Q. Under section 4.10, rule 66 there is a list of items that ARE NOT considered pneumatic devices, and therefore are not subject to pneumatic rules. Item B on this list is: closed loop COTS pneumatic (gas) shocks. Do pneumatic pistons (such as Bimba) with both ends plugged with brass fittings, and no additional pressurized air applied, count as closed loop COTS pneumatic shocks?

A. No, pistons or cylinders configured after market to behave as pneumatic shocks are still pistons or cylinders, not COTS pneumatic shocks. An item is a pneumatic shock if it is sold by the vendor as a COTS pneumatic shock.

Q247

Q. What should have been asked in Q235 was: Is there anything in the pneumatic system rules that prevent ours inside a plastic box?

A. Thanks for rephrasing the question. There are no rules preventing you from putting your pneumatic system in a box. However, make sure that the system is accessible to Inspectors and vents any generated heat.

Q235

Q. Assuming we follow all rules listed in the game manual, is there anything preventing us from placing our pneumatic system inside a plastic box? It would vent to the atmosphere, the pressure would be within the limits, etc.

A.If you follow all the rules in the manual, you should be fine. But, that answer is probably obvious to you, so we're not sure exactly what you are asking. This Q&A is intended to answer questions about specific rules. Can you maybe rephrase and reference rules you have questions about?

Q227

Q.R66 allows multiple pressure vent plugs in the pneumatic system. Does R78 require that a single pressure vent plug release all of the stored air in the system, or can multiple pressure vent plugs (i.e. 3) be used to vent the air in different parts of the system that may be isolated by solenoid valves? If only one is allowed, must it vent pressure in any state of the solenoid valves or just in the de-energized state?

A.R78 requires that when any pressure vent plug on the ROBOT is manually operated it will relieve all stored pressure. It must do so regardless of the energized state of the solenoids.

Q212

Q.Compressor is not turning off after we used a frc pneumatic code example in our pneumatic bench test. Everything ran fine and the cylinder was able to retract and all but the compressor didn't stop running. Several teams seem to have similar issue . Many seem to point to the PCM. Could FIRST look into this further to get a permanent fix?

A.We'll take a look. However, please keep in mind that the purpose of the Q&A is to answer rules-related questions. Potential technical issues should be reported on the [FIRST Forums](#). Our engineers monitor those forums and will respond.

Q199

Q.According to R66, "The only pneumatic systems permitted on 2015 FRC Robots include the items listed below." In the list, flow control valves are listed. However, are "positional flow control valves" or "proportional flow control valves" permitted, given they meet all other FRC requirements?

A.Good question, our apologies for the ambiguity. *Team Update 2015-01-20* will be updated to specify that permitted flow control valves are specifically passive "needle valves." However, positional control and proportional flow valves are not permitted per the updated version of R66.

Q165

Q.As per R66I, the white clippards from 2013 is illegal. Will there opportunities to replace those at competitions this year?

A.There is no formal trade-in program for tanks at events, however there will be a limited supply of legal tanks stocked in the Spare Parts cases. These are consumed throughout the season so there is no guarantee that they will still be there for your event. It's recommended that you plan to replace them before your event.

Q144

Q.Are rodless air cylinders considered "pneumatic cylinders" per R66?

A.Yes, there are no requirements that cylinders employ rods.

Q134

Q.Per rule R79, Can the output of one valve be plumbed to the input of the other? (This does NOT create the kind of flow-increasing "parallel" joint they're clearly trying to rule out...)

A.Plumbing the output of one valve to the input of another is not a violation on R79. Note that, per R78, all stored pressure must be relieved when the pressure vent plug is operated regardless of valve state.

Q84

Q.Can we substitute a model 98c compressor for the 90c compressor?

A.The purpose of this tool is to help provide clarity about the rules as they're written. We cannot pre-inspect or approve specific parts or designs. Generally speaking, to be legal a compressor must comply with all ROBOT Rules, but R68 contains specific requirements about compressor specifications: "Compressor specifications may not exceed nominal 12VDC, 1.05 cfm flow rate."

Operator Console

Q468

Q. Does R82 preclude the use of a single USB to Ethernet adapter (for use when a laptop's ethernet port is broken or on laptops that do not have an ethernet port) or is it limited to hubs/switches/other devices that allow multiple devices connect to the field network?

A. We believe that the revised language published in [Team Update 2015-03-17](#) helps clarify that Ethernet converters are permitted.

Q365

Q. R83 says that operators are allowed to wear devices that are attached to the Operator Console. Is there any prohibition of a member of the drive team using an Oculus Rift attached to the Operator Console? > > An Oculus Rift is a wearable head mounted display device, and blocks the user's true vision completely. We are conscious of the possible safety issues. The device is easily mounted and unmounted (1 second), and the drive team member will be able to see their surroundings via a camera mounted on the Rift where their eyes would normally be, and will wear safety glasses while using the device. Further steps could be taken to ensure the user's safety if required by FIRST (such as using a face shield). > > Additionally, the safety manual states that "... your eyes must be clearly visible to others". We believe that having a visible camera mounted on the device meets the spirit of that requirement. >

A. Thank you for doing your homework in regards to this question. Just as you are conscious of the possible safety issues, so are we. The tunnel vision caused by device restricts the wearer's ability to avoid and respond to obstacles and people around them. Also, this device does not result in the wearer's eyes being clearly visible to others, and we don't think being able to see the camera is equivalent, as it could hinder full communication with event personnel. For these reasons, we would consider use of devices like this a safety issue and not allowed.

Q286

Q. If the driver is wearing controls and thus is tethered to the Operator Console, does he/she violate R83 if he/she moves around the Alliance Station (i.e. farther than 60 inches away)?

A. R83 is not violated, however T6-1 (just added recently, and as revised by *Team Update 2015-02-03*) requires that the OPERATOR CONSOLE must be used in or in close proximity to the PLAYER STATION to which the Team is assigned.

Q270

Q. Can drivers swap Driver Stations with an Alliance Partner? Could an extension Ethernet cable be used so that the teams remain connected to the proper cord?

A. The answer is no, and while it was implicit based on the definition of PLAYER STATION, we now see that it's not explicitly prohibited in the Game Manual. *Team Update 2015-01-30* will include a new rule explicitly stating the OPERATOR CONSOLE must be used in the PLAYER STATION to which the Team is assigned, as indicated on the Team sign.

Q184

Q. Can the driver's station contain more than one monitor?

A. Yes, however if you're using the AC outlet in the PLAYER STATION, please be mindful of the current limit described in *Section 2.2.1*.

Q155

Q. Do motors that are connected with the Operator console need to follow all rules that apply to motors mounted on the robot?

A. No, there are no rules that explicitly legislate motors used in the OPERATOR CONSOLE, however please consider T1 and make sure that the implementation doesn't pose risk to people.

Q78

Q. Can an operator console be designed so that it clamps to the driver station shelf? Not in any way that damages it but more like a small spring clamp or c-clamp, just to add a little more security than what the velcro can provide.

A.Yes, as long as the attachment device is not damaging and can be quickly removed.

Q7

Q.The OPERATOR CONSOLE doesn't have a max height in the rules. Can teams extend their console above the driver station glass? This would mostly be for mounting a camera for an over head view of the field.

A.There is no legislated maximum height of the OPERATOR CONSOLE. However, be aware that some venues and production setups may have basketball hoops, lighting fixtures, or other installments that can not be moved and may inhibit exceptionally tall OPERATOR CONSOLES.

Game - The Tournament

Not Available

Overview

Q317

Q.Sec 5.1 states that "...require ALLIANCES to alternate placement of their ROBOTS, starting with the Red ALLIANCE.", implying that the order of ROBOT placement is Red, Blue, Red, Blue, Red, Blue. Sec 5.4.4 states that during Playoff MATCHES "The higher seeded ALLIANCE will always be assigned to the Red side of the FIELD" This implies that the lower seeded alliance (blue) is given the advantage of placing last and reacting to their higher seeded opponent (red). Is this the intent of the rule?

A.Sections 5.1 and 5.4.4 are correct as written, and as you have described in your question.

Match Schedules

Not Available

Practice Matches

Not Available

Schedule

Q33

Q.Please clarify if rule 5.5.2 "Not showing up for a match..." applies to practice matches or just qualification matches.

A.Thanks for pointing out this ambiguity! *Team Update 2015-01-13* updates the language to clarify that this applies only to QUALIFICATION and PLAYOFF MATCHES. Specifically, you'll see that language in *Section 5.5.2* will state: "If a ROBOT will not report for a **QUALIFICATION or PLAYOFF MATCH**, the Lead Queuer should be informed and at least one (1) member of the DRIVE TEAM should report to the FIELD for the MATCH to avoid receiving a RED CARD, with the exception of a Team that has not passed Inspection, per Rule T8."

Filler Line

Not Available

Qualification Matches

Not Available

Schedule

Not Available

Match Assignment

Not Available

Qualification Average (QA)

Q222

Q.Is there a timeline for when the district point structure will be released?

A.The structure has been finalized, and is being documented now in our standard manual format. We expect we will be ready to publish in less than two weeks. In the mean time, see [this blog](#) for

an outline of what it will look like.

Qualification Seeding

Not Available

Playoff Matches

Not Available

Alliance Selection Process

Not Available

Backup Teams

Not Available

Playoff Scoring

Q101

Q.It is noted that coopertition is not a valid way to score points in the Playoff Matches. However, what isn't clear is their role beyond Auto. Do they become scoreable during teleop similar to Gray Totes? Or are they dead pieces after autonomous?

A.The only changes to scoring in Playoff MATCHES are those noted by the asterisk in Table 3-2. With regards to all matches,we believe that the response to [Q89] answers this question. If not, please ask a follow up question.

Playoff Match Format

Q28

Q.How will the Red and Blue alliances be determined in Playoff Matches? Since the Yellow TOTE starting positions are asymmetrical on the field for Red and Blue, we would like to know this in advance.

A.Good question! The alliance assignment has not been finalized. Once it's set, implemented, and tested, the Game Manual will be updated and we'll include notification in a Team Update.

Pit Crews

Not Available

Tournament Rules

Q465

Q.Follow-up to Q169. The response says "There are no rules prohibiting such a device to assist fellow DRIVE TEAM members in lining up the ROBOT before the start of the MATCH." Clearly such a device cannot be used during AUTO, but are there any restrictions to using a passive target in the ALLIANCE STATION (specifically the HUMAN PLAYER STATION) during TELEOP so the robot may align better to the TOTE CHUTE?

A.We believe [Q230] answers your question. If not, please let us know.

Q242

Q.1. HOW CAN I FIND THE 2015 INSPECTION CHECKLIST 2. The mecanism out the frame of the robot have limit or doesn't matter

A.1. The *2015 Inspection Checklist* has not yet been published, but we will announce its publication in a Team Update when it is posted. 2. We think you are asking if a ROBOT MECHANISM can extend outside the frame of the ROBOT. This year, unlike recent years, we don't have any restrictions related to frame perimeter, and the term is not even defined in the manual, so it doesn't matter. If this is not the question you are asking, please rephrase and ask again.

Safety and Security Rules

Q471

Q.Pursuant to T6-1, suppose this hypothetical: A team in alliance station 2 (center) has a controller

they wish for their human player to operate. The alliance has agreed to allow the alliance member in station 2 to occupy the HP zone for the duration of the match with the controller. Under the current blue box suggestion would referees give a yellow card for this instance? If team with a human player controller in station 1/3 used the adjacent HP zone, would that be legal?

A.As per the Blue Box under T6-1, Teams in ALLIANCE STATION 1 or 3 may have a DRIVER with a ROBOT controller within the HUMAN PLAYER STATION up to 1/2 PLAYER STATION width away from their own PLAYER STATION (being careful not to violate G5). A Team in PLAYER STATION 2 (center) may not have a DRIVER with a ROBOT controller in the HUMAN PLAYER ZONE.

Q408

Q.R18 lists the Part Numbers of the allowable motors. The motor is KOP. The part number is on a label on the side of the motor. The motor is mounted so the label is not visible without disassembling the robot. The Inspection Checklist includes Motors, part number, etc. The BOM does not have motors listed that are KOP. In the past, listing the motor on the BOM was adequate proof of compliance with R18. Can the team be required to disassemble the robot so the RI can see the motor part number label?

A.There is no rule that requires motor labels to be visible for inspection. If the motor is not of an immediately recognizable type (such as a CIM motor), the team should be prepared to identify the motor when questioned by an Inspector.

Q399

Q.T11: BOM excludes R9 items. R9 includes KOP. Some CIM motors are KOP. R18 lists allowable Motors, which include CIM, and the maximum quantity. Please reconsider the KOP exception to T11 so that certain items, such as Motors, would be required to be listed. During inspection, the BOM could be reviewed for compliance, vs trying to read the part number of each motor which may not be accessible. For safety, things like Pneumatics should prove compliance (BOM) and not presume (omission assumes KOP).

A.The purpose of this Q&A is to answer questions regarding the rules of RECYCLE RUSH. If you would like to provide general comments, please contact frcteams@usfirst.org. Thank you.

Q288

Q.Follow up to Q273 - is "tall" in the definition of Transport Configuration in R3 in relation to a horizontal plane, or is it the longest allowable dimension of the robot? I am 6'2" tall, if I lay on my side I am still 6'2" tall (and no, I am thankfully not also 6'2" wide). Your answer says that the orientation of the Transport configuration cannot be changed; orientation in relation to what?

A.Sorry for the continued confusion. "Tall" means in relation to a horizontal plane. Think of the TRANSPORT CONFIGURATION as a featureless box with no obvious top or bottom. Imagine setting this box on the floor. The side touching the floor becomes the bottom, the opposite face becomes the top. The distance between the top and bottom is how "tall" the box is, and it can't exceed 78 in.

Q276

Q.Rule T6 says that a robot must stay in Transport configuration while transferring throughout the event. Question 61 clarified that the robot must stay in Transport Configuration while in the Que. During the Playoff, because of short time between when a robot plays a match, typically the robot returns to the que, and teams are allowed to bring pit equipment to the que area. In those instances, will the robot be deemed in the pit and not transferring for purposes of Rule T6?

A.Yes, if temporary pit spaces are established for the purposes of the Playoff Tournament, teams are not required to keep the ROBOT in its TRANSPORT CONFIGURATION while in its temporary pit space.

Q273

Q.Can the robot be in any orientation when being transported as long as it fits and stays within the transport configuration envelope? Can it be carried on and off the field or placed on a cart with the "tall" side laying down if that is a more stable (safer) orientation?

A.Yes, there are no rules regulating the orientation of the ROBOT while it's in a its TRANSPORT CONFIGURATION. **With that being said, the orientation of the TRANSPORT CONFIGURATION itself cannot be changed (i.e. your ROBOT may be placed on its side for transport, but on its side, it must still fit within the dimensions of the TRANSPORT**

Eligibility and Inspection

Q440

Q.Is there a limit to the number of T10 reinspections? For example, Robot exceeds 120# with Part A and Part B, but only A or B is used, but not both at the same time. Robot passes inspection with Part A. After Match X, Part A is replaced with Part B and reinspected. After Match Y, Part B is replaced with Part A and reinspected. etc. Obviously it is the Team's risk that the reinspection can be completed in time.

A.No, there is no limit, however a Team returning to be re-Inspected frequently cannot count on always being next in line and may have to wait while others are being re-Inspected and risk missing a MATCH.

Q137

Q.Do the various zones include the air above them or only ground space?

A.We believe that [Q5] answers your question. If it does not, please post again with additional details.

Referee Interaction

Not Available

Yellow and Red Cards

Not Available

Match Replays

Not Available

Timeout and Backup Team Rules

Q497

Q.After Semifinals Match 3 in Hawaii, one of our robot components broke, and we requested a timeout after the FIELD TIMEOUT was assessed in order to fix our robot. However, we were told to immediately set up on the field following the FIELD TIMEOUT or risk disqualification without the opportunity to use our timeout card. Our question is: Is a team allowed to call a timeout in order to extend an existing FIELD Timeout? And if not, why would a team be denied the opportunity to call a timeout?

A.We cannot comment absolutely on the first part of your question, as the determination of when a TIMEOUT can be called is based on the FIELD RESET signal from the previous match, which is something the Head REFEREE tracks from their scoring panel. *Figure 5-4* outlines when a TIMEOUT can be called. In the case of cascading TIMEOUTS, the ALLIANCE CAPTAIN would have to hand their coupon to the Head REFEREE within 2 minutes of the FIELD reset signal. If used within that window, it would result in a total of 8 minutes of TIMEOUT. However, if two minutes (or more) had passed since the FIELD reset signal, the Alliance would not be able to use their timeout coupon.

Measurement

Q32

Q.What is the consequence of not being in transport configuration outside on the pit, practice field, or playing field?

A.T6 will be treated much like the rule on safety glasses. If event staff sees a team violating T6, they will remind the team of the rule and insist on compliance. If the team continues to ignore the rule, or is found to be regularly violating it, despite warnings by event staff, this is likely to be considered egregious behavior as defined in *Section 5.5.4*, and the team could receive a yellow or red card. This is a safety issue, teams should treat it very seriously.

Special Equipment Rules

Q230

Q. May a HUMAN PLAYER use a non-powered signaling device (e.g. reflective tape) to help align their robot during TELEOP?

A. Non-powered signalling devices are allowed per T21-B. There are no rules prohibiting the use of these devices to signal the robot in TELEOP. Please note that per T21, you'll have to stop using it if it's suspected that it "interferes with the remote sensing capabilities of another ROBOT" (e.g. to a reasonably astute observer, it mimics the Vision Guides).

Q169

Q. Regarding rule T21, may a HUMAN PLAYER bring a non-powered signaling device into the HUMAN PLAYER STATION? Specifically, we're considering a passive robot alignment target held or placed by the HUMAN PLAYER.

A. Teams may have a non-powered signalling device in the ALLIANCE STATION per T21, however per G21, DRIVE TEAMS may not directly or indirectly interact with ROBOTS or OPERATOR CONSOLES during AUTO. Using a signalling device during AUTO, even if non-powered, is thus prohibited. There are no rules prohibiting such a device to assist fellow DRIVE TEAM members in lining up the ROBOT before the start of the MATCH.

Championship Additions and Exceptions

Not Available

Four Robot Alliances

Not Available

Championship Pit Crews

Not Available

FRC Championship Match Bracket

Not Available

Game - Glossary

Q122

Q. CHUTE DOOR - The polycarbonate shield that separates the TOTE CHUTE from the FIELD.... Per the drawings, parts of the tote chute (chute plastic, tote slide) are located on both sides of the chute door. At what point are they considered part of the field (the chute extends beyond the wall) for G27?

A. The CHUTE DOOR is part of the HUMAN PLAYER STATION per the revised description in *Team Update 2015-01-13*. All elements in the Tote Slide Assembly (GE-15004) are outside the FIELD.

Admin - Introduction

Not Available

Admin - Team Resources

Q195

Q. Why does clicking on the "Download latest copy of Q&A" button on the Q&A site result in a "Not Found - The requested URL /ViewPDF/0/ was not found on this server." error?

A. Thank you for bringing this to our attention. The feature has been fixed.

Admin - Team Organization

Not Available

Admin - At the Events

Q494

Q. Are we allowed to use radio based communication devices ("Walkie Talkie") in the pit area or in queuing? Are only certain types allowed?

A. No, sorry, Walkie-Talkies are not allowed at events per *Section 4.14* of the *FRC Admin Manual*. Walkie-Talkies are used by event personnel for communication, and use by teams or spectators could inadvertently interfere.

Q482

Q.Pit banner: a company will donate \$1,000 to us if we add them to our banner (no problem). The company will donate \$3,000 to us if they can place a banner in our pit that states something like: ETechnologies hires FRC graduates, or ETechnologies seeks FRC graduates for their workforce. Is this allowable? Is there specific language we can/cannot use on pit banners? Thank you!

A.There are no rules against this, and it seems like a great idea to encourage sponsorship. And the hiring of FRC grads! There are no specific wording restrictions, just keep it grandparent-friendly. You know what we're saying.

Q413

Q.What is the intent of the below bullet for section 4.14 of the Admin Manual? -Do not arrange for Internet access or phone lines on the site or attempt to connect to the Internet.

A."Do not attempt to connect to the Internet" sound a little harsh, doesn't it? What, are we planning to confiscate everyone's smartphones as they walk in the door? Sorry, this is an antiquated rule, thanks for pointing it out! We'll fix it in *Team Update 2015-02-24*. What we care about in this context is that teams not make their own phone (sorry dial-up users) or internet arrangements with venues or attempt to use the internet connection intended for the field for their own purposes. All other wireless and networking rules in the manual must continue to be followed, of course.

Q143

Q.Can the robot be locked up in 2 separate bags as long as each bag is sealed with a tag and documented on the lock-up form?

A.There is no specific requirement that teams bag their ROBOT in only one bag, but we saw the ambiguity in the Manual. *Team Update 2015-01-13* included an update to the Admin Manual, Section 5, to specifically define this and allow teams to use two bags if they wish.

Admin - Robot Packaging and Transporting**Q491**

Q.According to Sec 5.8 of the Admin Manual, all teams that are attending the FIRST Championship must crate and ship their robot. Due to the size constraints of the Shipping Crate and the allowable traveling configuration of the robot, are teams allowed to bag a portion of their robot (while following the procedures of Bag and Tag Regulations), and bring it during load in, without this portion being counted against the Team's withholding allowance? The remaining (also properly bagged) portion of the Robot will be shipped to the CMP in the crate.

A.No, sorry. Per *Section 5.8* of the *Admin Manual*, all ROBOTS going to Championship must be shipped. Please contact frcteams@usfirst.org if you have any questions on the process.

Q488

Q.Can we transport our own bagged robot to and from the championship? We would not build a crate.

A.No, sorry. Per *Section 5.8* of the *Admin Manual*, all ROBOTS going to Championship must be shipped. Please contact frcteams@usfirst.org if you have any questions on the process.

Q467

Q.Our team competed at the Alamo Regional last weekend and we finished in the Finals. On the return trip the ratchet strap holding down the tool chest broke and the tool chest fell over and crushed robot. we are competing at the Hub City Regional in two weeks. We are wondering if there is anything we are allowed to do to the robot in this situation (ie remove damaged parts, further evaluate the robot by removing the bag, possibly repair the robot to it's pre-bagged condition)?

A.This questions seem to be mostly related to a specific situation with your team. Please send an email to frcteams@usfirst.org with the details and we will get back to you right away.

Q457

Q.Due to circumstances out of our control, our team will not be able to have access to our robot during the 7 days leading up to our week 4 district competition event. Will we be able to use our 6 hours of out of bag time prior to the 7 days?

A. Team-specific questions such as this one are best directed to the friendly folks at frcteams@usfirst.org. Please email them a full description of the situation and your request. Please be sure to include your team number in the note.

Q427

Q. We're going to present our robot in a national museum this weekend. In the previous question, we got permission to open the bag 4 hours each day (on Saturday and Sunday). However, we will transport our robot to the museum by car, and the bag needs to be opened while it's being transported, since the robot won't fit in with its normal size. Are we allowed to split the 4 hours into 1:30 and 2:30, using 1:30 for transportation and 2:30 for the actual display?

A. Yes, because ROBOT transportation is considered "for display purposes," this is permitted.

Q403

Q. Our question is regarding bag and tag etiquette for displays after stop build. We have 2 displays scheduled for the same day and close together time-wise. Do we need to re-"bag and tag" between the two events? Schedule for the day in question: 2-3 pm display at Professional Automation conference; 3-4 pm student tour at conference; 4-4:30 load robot and travel to public library; 2nd display at public library from 4:30 - 5:30 pm.

A. There is no need for you to re-bag for your short trip to the library between display events. Please be sure to follow all rules in *Section 5.5.3* of the FRC Admin Manual.

Q250

Q. If we use 2 bags, are we allowed 6 hour for unbagging each bag, or total?

A. Total. The time available to teams attending District Events to unlock their ROBOT, per *Section 5.6.2 - Robot Access Period - Schedule*, is per ROBOT per event, not per bag. Additional bags do not result in additional time.

Q161

Q. According to Q72: Teams who can bag their robot and bring it themselves to all events can build a one piece, 78" high robot. Team who ship their robot in a crate by air, are limited to a robot with no piece longer than ~55". This seems to be an unfair advantage. Will FIRST address this issue?

A. There will always be advantages or disadvantages for teams within the rules based on their specific situations. Even some teams that are only planning to compete locally may not have a vehicle large enough to fit a 78" tall robot in one piece. This is one of the reasons we recently added explicit permission in the rules for teams to use two separate bags for their robots. All teams should be thinking ahead, and recognize that if they want to go to Championship they will need to crate their robot, and design appropriately. We recognize this is a challenge, but we're sure you're up to it!

Admin - Awards

Q485

Q. Ref Q484 - T8 states a robot must be inspected for the team to participate in a match. T10 states a robot must be re-inspected for modifications (except A-F). Does this mean a robot in the process of being modified under T10 is (a) no longer considered inspected, or does (b) the prior inspection hold? If the robot is no longer considered inspected (a), does T8 apply regarding the team members participating in the match? And how is "participation" relative to T7.4.1.3 (Q484) impacted?

A. Excellent question. T8 and T10 will be updated in Team Update 2015-03-31 to clarify that a team in the midst of making changes to their ROBOT is still eligible to participate in a MATCH, but the ROBOT cannot participate in a MATCH until the new ROBOT has passed re-Inspection.

Q484

Q. Reference T7.4.1.3 In playoff round performance, "each team on an alliance receives XX points for each match they participated in". Can you define participated in? For example, if one team is in the pits working on their robot, do they receive the points? Does the definition of "participated in" change if the team sends part of their drive team, or does not send any of their drive team?

A. As described in the Blue Box paired with T8, if a Team has at least sent a DRIVE TEAM member to the ALLIANCE STATION, the Team is considered having participated in the MATCH.

Q469

Q.Our team received the Chairman's Award at a regional event. We would like to make updates to our Chairman's Video in preparation for Championships. Can we bring an updated Chairman's Video for Championships? If yes, which video should we post? or can we repost as the video changes? What are the deadlines for posting Chairman's video and the presentation video?

A.Yes, you may make updates to your video and rules require that you bring a video and submit it at the start of your interview. In the same way you may tweak your presentation, you may also tweak your video. Videos may be posted and re-posted through Championship.

Q459

Q.We submitted a video for the Chairman's Award according to the deadline and rules. After presenting at our first regional we decided that we could do sections of the video better. Can we submit a new Chairman's Award video for presentation at our second regional?

A.Yes, you may. The rules only require that you submit a video at the start of your interview at the current event. In the same way you may tweak your presentation, you may also tweak your video.

Q456

Q.Can someone explain what N, R, and alpha mean in section 7.4.1. Also, what is an InvERF?

A.In relation to section 7.4.1, the terms N, R, and Alpha are explained in Section 7.4.1.1 of the Admin manual. The formula used to calculate the District Qualification Ranking Points uses the Inverse Error Function (InvERF), and a document explaining its use in detail is linked from the FRC Blog here: <http://www.usfirst.org/roboticsprograms/frc/blog-Standard-District-Points-System-for-2015>

Q412

Q.I believe that our team has just missed the deadline for submission of the Dean's List Award nomination. All of the parts of the submission have been completed and were ready to submit. Is there any way for us to still submit our nomination?

A.The intent of this Q&A forum is to answer questions related to the rules. However, we suggest you immediately send an email to frcteams@usfirst.org explaining the situation. They will get back to you.

Q391

Q.I read in the Admin Manual that we are allowed to submit our Chairman's video past the 2/19 submission deadline. How does that work? Whenever I submit it by 2/19 should I just leave the field for the video blank? Will I be able to edit my submission later so I can update the video link?

A.The field for the YouTube link will be left open after the submission portion closes on Thursday, February 19 @ Noon ET. Award submitters will be able to update this field through out the season.

Q383

Q.Our team is applying for the Chairman's Award but when we get on the STIMS website there is not a link anywhere to submit Chairman's material. Is there a step we are missing?

A.The Main or Alternate contact for your team must assign at least one (1) and up to four (4) student award submitters in FRC TIMS. Those students will be notified of their status via email and may then log into Youth Team Member Registration System (formerly known as STIMS) and be able to view the awards submission section on their main page and submit for the Chairman's Award.

Q333

Q.Can we use youtube videos of matches from other FIRST teams in our Chairmans award video?

A.Yes, you may. Please pay attention to the copyright requirements in *Section 6.4.3.4* of the FRC Admin Manual though.

Q328

Q.We noticed that new this year, for Regionals and Districts, that the winner of the Chairman's award is requested to submit a video of their presentation for others to use to improve. Please advise on procedures for filming and submitting the video in the event of a team winning the Chairman's Award.

A.We recommend teams film one of their Chairman's Award practice sessions. The video can be very basic, no

special editing is required. The intent is only to allow other teams to get a peek at what successful presentations have looked like. It will not be used for judging. After a team has earned the Chairman's Award, they will be contacted by email with instructions for uploading their presentation video.

Q323

Q.We are about to start writing the deans list award and I had a question about who is eligible for the award. It says only juniors and sophomores are eligible but as we are a first year team we have not had a chance to nominate any seniors. I was wondering if they could make an exemption for us nominate a senior student?

A.We're sorry, but students must be in 10th or 11th grades (or their international equivalents) to be nominated for Dean's List. This is to ensure Dean's List accolades are available for students' college applications.

Q321

Q.We have noticed there are no paragraph separations in the Chairman's essay. Even when we go back and add spaces, they don't show up when we review our essay. We are also not able to bold or italicize words. Is there any way this can be fixed so that our essay doesn't look like one run-on paragraph?

A.The Chairman's Award judges view all submissions in the standard format, so your team will not be disadvantaged by this limitation. We don't intent to make any changes to the existing format for this season.

Q291

Q.How should the Executive Summary of the Business Plan be formatted? Are there questions that should be answered or is it just a typical executive summary?

A.We believe this question is answered in [Q290]. If not, please revise and resubmit. Thank you.

Q290

Q.How should the Business Plan be uploaded? Should it be one document or many documents uploaded to the different categories?

A.For the Entrepreneurship Award, please enter the information in the text boxes on the submission form in STIMS for each field required(listed in the Admin Manual, Section 6.9.2 - Guidelines). You are allowed also to upload images of the Team's Organizational Chart and Financial Statement in those sections, as well as up to four photos in the Pictures section. Teams are welcome to hand the judges their complete business plans at the event, which may include more information than required by the submission in STIMS.

Q282

Q.Can you elect a deceased mentor for posthumous recognition in the Woodie Flowers Award?

A.You are welcome to nominate any mentor you choose, and the Woodie Flowers Finalist Award selection panel reviews all submissions. However, you may wish to consider alternate ways to honor a mentor who has passed and nominate a currently active mentor for the WFFA. WFFA winners go on to the *FIRST* Championship for consideration for the Woodie Flowers Award (WFA), with one WFA winner being identified each year, and WFA winners do have on-going responsibilities.

Q224

Q.in the Entrepreneurship Award last year we've been told to bring a folder to the judges . do we need to do it this year as well ? and what should the folder contain?

A.Judges will be focusing on the information submitted via STIMS, but as they visit teams in their pits to talk to them they will look at additional material given to them. Please know that additional material is optional.

Q203

Q.When our members were working on the Chairman's Award on STIMS, they noticed that when they selected the save button then returned to the award later on in the day, none of the Executive Summaries they had written were in fact saved. Is there any way that this could be fixed? Or were they not properly saving? Luckily they had hard copies of the summaries, but this could prove to be devastating to teams that had not saved their summaries elsewhere.

A.Normally, the most direct way for you to get help with what appears to be a website issue is to send an email to team support at frcteams@usfirst.org, or call them at (800) 871-8326 ext. 0. In this particular case, to our knowledge, no other teams have reported issues saving their summaries, and our IT folks have not been

able to duplicate the issue you reported with your account. Please retry, and contact team support if the issue continues.

Q202

Q.We've noticed for at least the past few years that the character limit on Chairman's Award essays is 10,000 characters, and we struggle to make that cutoff, possibly harming our chances to compete against other similarly qualified teams. Is it an automatic disqualification if you go beyond 10,000 characters, and if not how much "wiggle room" will you give teams?

A.The system will not allow you to enter more than 10,000 characters, so you couldn't go past that limit even if you wanted to. All teams have this same limit, so from that perspective, this is fair. Many teams use abbreviations and symbols (& instead of 'and', for example) to include as much information as possible within that limit.

Q176

Q.When we looked through the Chairmans Video deadlines under 6.4.3.3 in the Admin Manual it states that the link to the official chairman's video does not have to be submitted by Feb 19th, but when we looked through STIMS in the RCA submission area it stated that we required a link. Which is correct?

A.Thanks for pointing this out! The manual is correct. We'll get with our crack IT staff to update STIMS. You don't need to submit your video link by February 19th, and failing to submit a link will not preclude you from earning this award, though you are still required to bring a copy to events.