



## FRC Q&A

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### Game - Introduction

Not Available

#### What is the FIRST Robotics Competition (aka FRC)?

Not Available

#### Gracious Professionalism, A FIRST Credo

Not Available

#### Prominent FRC Awards

Not Available

##### The Chairman's Award

Not Available

##### The Woodie Flowers Award

Not Available

#### Safety: A FIRST Culture

Not Available

#### Robot Design and Built Schedule

Not Available

#### Rebound Rumble Summary

Not Available

### Game - The Arena

**Q.**what 's the easiest way to get over the border in the middle of the game field?

**A.**The purpose of this forum is for specific questions on Game Rules. For technical questions, please post on the [FRC Forums](#).

**Q.**Which Player Station will have access to the USB cable from the Kinect Station? Is it always station 1, 2, or 3? Or is it possible to stretch the USB cable to any Player Station?

**A.**The USB cable from the Kinect Station will reach all three Player Stations.

**Q.**[G33] states "Inbounders must remain behind the Starting Line during the Match." Does this mean their entire body (implying behind the plane), or simply their feet?

**A.**Their feet.

#### Overview

Not Available

#### The Arena

Not Available

## The Court

**Q.**What type of carpet is being used?

**A.**Please see Section 2.2.1.

**Q.**Are there drawings available of the rest of the perimeter of the field (low-cost)?

**A.**No. Low cost options are only presented for the game specific components.

## Court Markings

Not Available

## The Players

**Q.**G33 requires that the Inbounder stay behind the starting line. Are they allowed to reach into the corral for basketballs? May they advance all the way to the inbound slot to re-enter basketballs onto the field?

**A.**Per Rule [G33], Inbounders may not cross the Starting Line during the Match. Body parts may break the plane of the Starting Line, but they may not touch the carpet in front of it.

## The Hoops

**Q.**Can you provide a specification for the color of the basketball hoops (the metal part, not the net), as they are received from the manufacturer, in terms of RGB, CMYK or Pantone?

**A.**I'm sorry, we do not have that information.

**Q.**Can you provide a specification for the color of paint on the actual metal hoop, in terms of RGB, CMYK or Pantone, or a particular manufacturer and color name/number? Something we can use to match the color.

**A.**No part of The Baskets are painted after receipt from the original manufacturer.

**Q.**The official drawings show the 'back boards' material is 1/2" thick smoked polycarbonate. It appears there are different 'smoked' polycarbonates: light, medium, etc. Can you please provide specific specifications?

**A.**Please see Team Update 2012-01-24.

**Q.**Is there a torque rating for the Nut that holds the McMaster Spring(9573K68) on to the Hoops? If not how do you know when the Hoop Spring is properly tensioned?

**A.**The nut is tightened until it is flush with the bolt. The drawing has been updated to illustrate this and included in Team Update 3.

## The Bridges

**Q.**On the second day of competition at Kettering, the field staff used a substance to polish or clean the surface of the bridge. Our driver noted a change in the traction that our robot had on the bridge after the polishing. Could the Q&A state what substance was used to polish or clean the bridge?

**A.**There is no specified substance for cleaning the Bridge decks. Field crews have since been instructed to not clean the Bridge decks.

**Q.**how thick is the lexan on the top of the bridge

**A.**Please see drawing GE-12095.

**Q.**We built a bridge per the Team Drawings, but it doesn't behave the way the "Episode 5 - Bridges" YouTube video clip shows. Instead of remaining balanced with 2 batteries placed at 28", it tips with just one at less than 28". Is there something else we need to do, add more weight or something?

**A.**There are many ways to make your bridge's dynamics match those of the official Bridge. Adding

weight near the center of your bridge would be one option.

**Q.** Does a fully supported robot mean (1) its full weight is supported by the bridge without any other support, or (2) no part of the robot is out of the bridge boundary? i.e., a robot that stands on four wheels on the bridge and has two wheels out of the bridge, in the air, is considered balanced?

**A.1**

**Q.** How much force is needed to be applied to the bridges in order to make the bridge fall.

**A.** Please watch our field tour walkthrough [Episode 5 - The Bridges](#) for information on the dynamics of the Bridges.

**Q.** Can you display a photo of the underside of the bridge including the double hinge?

**A.** Drawings GE-12022 and GE-12017 in the [Game Specific Drawings](#) depict the Bridge hinge and underside.

**Q.** What are the diameters and locations of the holes on the bridge?

**A.** Per Section 2.1, drawings and CAD models of all field elements are available on the [FIRST site](#).

## The Alliance Stations

**Q.** How wide is the smallest driver station? The rulebook states that it is 51 inches but in the Field Tour Video they state that it is 44 inches. Which measurement should we trust?

**A.** The smaller Player Station is 51 in. wide, but the shelf in that Player Station is only 48 in. wide.

## The Inbound Stations

Not Available

## The Corral

Not Available

## The Player Stations

**Q.** I have not found any rules that specifically prohibit the use of 2 computers for the operators console, using an ethernet switch to connect to the FMS cable. Is there anything in the FMS that would prevent the 2nd computer (remote dashboard IP 10.te.am.6) from communicating with the robot/camera?

**A.** Inserting an Ethernet switch in-line between the field Ethernet cable and the device hosting the Driver Station software would be a violation of Rule [R81].

**Q.** Are there any bandwidth limits enforced by the field/FMS on the ports listed in section 2.2.9? Is each team able to access the full 802.11n bandwidth, or is it divided by the 6 teams on the field?

**A.** There are currently no bandwidth limits in place in the field network. In theory, each team has 50Mbps/second (300Mbps/6) available, but that's not actually realistic. In reality, each team is likely to have ~10-12Mbps/s available. This rate will vary depending on the location of the radio on the Robot and the amount of wireless traffic present in the venue at 5GHz. While this information may help give teams an idea of what to expect, note that there is no guaranteed level of bandwidth on the playing field.

**Q.** Is there one specific Player Station on each alliance that is hooked to the Kinect, and if so, which one?

**A.** No. The Kinect pigtail will be able to reach each of the three Player Stations.

## The Kinect Stations

Not Available

## The Basketballs

**Q.**Our team noted that when we weighed 5 different Rebound Rumbles balls the weight varied from 0.66 to 0.61 pounds, and that the game manual implies that the balls will be approximately 0.70 pounds. We are very curious about what the actual mean, median, and variance of weight for the balls will be?

**A.**That data is not available.

**Q.**Our team has discovered variances in ball diameter and compressibility. The balls in the KOP can be compressed approx. ½" more than the balls we got from AndyMark. We wish to know if the balls at competitions will be like the KOP balls, similar to the ones received from AM, or a mixture of both?

**A.**All Balls with the FIRST/Foot Locker Foundation logos are all from the same batch - so, a mixture of both.

## Game - The Game

**Q.**Is there any rules against goal tending the baskets? We were thinking about going in front of the basket and then tilting our blocking device over the hoop. Is there rule against that?

**A.**There are no Rules specifically prohibiting blocking Basketballs that have been shot by a Robot. However, all Game Rules (i.e. Rules [G20] and [G21]) must be followed.

**Q.**Could you please clarify "grab, grasp, grapple, or attach" from rule [G10]? If a robot pushes against multiple surfaces of the bridge, so that it gains leverage to be supported fully by the bridge, but can be removed freely, would this be considered grabbing, grasping, or grappling?

**A.**There are no rules prohibiting pushing against a surface of a Court element. However, if it's done in a way that grabs, grasps, grapples, or attaches to the Court, per Rule [G10] or would be considered a traction device per Rule [R06], it would be prohibited.

**Q.**G10 states "Robots may not grab, grasp, grapple, or attach to any Arena structure. " Is the brdge and bridge structure considered part of the Arena structure".

**A.**Yes.

**Q.**G05 states that "Basketballs allotted to Robots that are not used, will be preset on the Coopertition Bridge." What determines "not used"? Does this mean basketballs for robots that do not come onto the field, or basketballs that a team does not want to use or place on/near their robot?

**A.**Per [G01], each Robot may contain up to 2 Basketballs at the start of the Match. If a Robot does not contain both Basketballs, the extra Basketball(s) are set up on the Coopertition Bridge.

**Q.**Can you confirm that the rules permit a robot to enter the key and/or alley of the opposing alliance so long as it does not touch an opposing robot in contact with those elements?

**A.**Yes.

**Q.**In reference to [G16], may our robot cross fully over onto our alliance station end of the court, while not touching the carpet, by remaining entirely on the bridge? Consequently, if we are in the same situation with regards to the carpet, may we extend to our full 84 inches tall as per [G20].

**A.**The Bridge is not carpet.

## Pre-Match

**Q.**how many balls are there starting out during the game and do the human players start with any?

**A.**Please see Section 3.1.1 for the locations of Basketballs at the start of each Match.

**Q.**Re: [G05] Where specifically are the Basketballs placed on each bridge? Is each alliance allowed to select the position of the 2 balls on their own alliance bridge? Where are unused Basketballs allotted to Robots placed on the Coopertition Bridge? Where are the 2 "regular" Coopertition Bridge

**A.**Balls will be placed in any of the 15 holes in the surface of the Bridge. Exact locations are not

specifically defined and will be determined by the field reset crew at the event.

## G01

**Q.** Can a robot use one or both allocated balls by having them on the ground touching the robot rather than containing the balls within the frame perimeter?

**A.** No. If a Ball is not contained by the Robot, it will be considered unused and placed on the Coopertition Bridge

## G02

**Q.** Per [G02], is the use of a laser relevant only in the context of pre-match alignment? If a Class 1 laser is on the robot, is it subject to arbitrary repositioning, even if not used for pre-match alignment?

**A.** Correct. No.

## G03

Not Available

## G04

Not Available

## G05

**Q.** In a prior Q&A response, you said that prior to the beginning of the match, "The placement [of balls on the bridges] will generally be as close to the center of the Bridge as possible." Is this the center lengthwise, widthwise, or both?

**A.** Both

**Q.** 1) The field reset crew can place the balls in any of the 15 locations that "they" (the field reset crew member) wants or 2) will there be a ball randomizer, similar to 2008? If 1 they could place the balls in the center for all of Team XXXX's matches and on opposite sides for Team YYYY's matches?

**A.** No, there will be no randomizer. The placement will generally be as close to the center of the Bridge as possible."

**Q.** If the ball positions on the Coopertition bridge pre-match are determined by the field reset crew, are they determined on a per-match basis, or a per-event basis?

**A.** Per match.

**Q.** Are there 18 total basketballs in use? I.e. are there 2 balls on the coopertition bridge plus unused balls?

**A.** Yes, each Match will begin with 18 Basketballs on the Court.

**Q.** Please clarify the rule. Is it the robots that are not being used, or the basketballs? If it is the basketballs that are not being used, what are the guidelines used to make that determination?

**A.** If a Team elects to not preload one or both Basketballs per [G01], the Basketball(s) will be placed on the Coopertition Bridge. If a Robot is a no-show for a match, its 2 Basketballs will be placed on the Coopertition Bridge.

**Q.** What is considered possession of the ball during the beginning of the Autonomous period? Do they have to be inside your robot or do they just have to be touching the bumpers? What can you do to make sure the balls do not get put on the coopertition bridge during Autonomous?

**A.** If a ball is not fully supported by the Robot, it will be considered unused and placed on the Coopertition Bridge.

**Q.** Where are the 2 "regular" Coopertition Bridge basketballs placed on the bridge before the start of a match?

**A.**Balls will be placed in any of the 15 holes in the surface of the Bridge. Exact locations are not specifically defined and will be determined by the field reset crew at the event.

## General Rules

**Q.**Can a team ask for a ball to be removed from play?

**A.**While the decision about whether a Basketball will continue to be used for Match play is the FTA and field crew's, teams are encouraged to alert field crew to any potential Arena damage.

**Q.**Under what circumstances will a game ball be removed from play?

**A.**A Basketball will be removed from play if the FTA or field crew determine that it is too damaged for Match play.

**Q.**Please define Grapple.

**A.**There is no formal definition. If a reasonably astute observer would consider what a Robot to be doing as grappling, it's grappling.

**Q.**Please define Grasp.

**A.**There is no formal definition. If a reasonably astute observer would consider what a Robot to be doing as grasping, it's grasping.

**Q.**Please define Grab.

**A.**There is no formal definition. If a reasonably astute observer would consider what a Robot to be doing as grabbing, it's grabbing.

**Q.**Looking at the rules, it seems that one team can hoard 15 of the 18 basketballs at one time. The three robots on the alliance can hold three basketballs each, and the three human inbounders can hold two basketballs each for a total of 15. Is this strategy legal?

**A.**Yes, this situation is within the Rules.

**Q.**How many basketballs are in play for the inbound stations and the feild?

**A.**Please see Section 3.1.1 for the location of Basketballs at the start of a Match.

## G06

**Q.**Is there a maximum muzzle velocity?

**A.**No.

## G07

Not Available

## G08

**Q.**Is it permissible for a Robot to touch the top of the 20" Guardrail around the field, provided the Robot does not attach to the rail, and does not touch anything outside the field perimeter? (i.e., is the Guardrail itself considered to be inside or outside of the Court Boundary)

**A.**The guardrail is considered part of the Court Boundary and is thus not outside it.

## G09

**Q.**If a robot separates into two or more unattached parts, which parts are considered part of that robot? (This is specifically about [G09], but is critical to interpreting other rules, including all that depend on the robot state/size/position. It assumes nothing about the reason for the separation.)

**A.**Per Rule [R01], the Robot must include all of the basic systems required to be an active participant in the game – power, communications, control, mobility, and actuation.

## G10

**Q.**Correction: Can a robot be fully supported by a probe that enters the rectangular tube that is part of the bridge that tips violate G10?

**A.**We will not use the Q&A to allow/disallow certain designs, and cannot rule on Robot actions that may happen in a Match. The Referee will determine if a Robot has grabbed, grasped, grappled or attached to the Bridge and has thus violated [G10].

**Q.**Are the definitions for "Arena structure" and "element of the Arena" the same? If so, are there instances in which a robot "reacting against" an Arena structure might be construed as an instance of a robot grabbing, grasping, grappling, or reacting with an Arena structure of the Arena?

**A.**Yes. Yes.

**Q.**Could devices such as wheel chocks be deployed to lock the wheels and increase friction between the robot and bridge surface?

**A.**No rules prohibit this, but please see Rule [G12] for reference to Arena damage and [R06] for reference to traction devices.

**Q.**Would a passive device applying force to multiple sides of the 2x2 angle on the bridge to partially/fully support robot weight violate [G10] if it didn't actively clamp/grasp/attach to the angle, so that at match end the robot can be lifted off the bridge w/out actuating/releasing any mechanism(s)?

**A.**The purpose of this forum is to answer questions about rules, not to perform design reviews for legality.

**Q.**Is it permissible for a robot on the bridge to extend a device that can also react off the bottom surface of the bridge provided that device does not grasp the bridge firmly?

**A.**Rule [G10] does not put a qualifier on how a Robot may legally grasp the Bridge. It simply says it cannot do it.

**Q.**If a robot attaches suction cups to the bridge, is that considered grappling a field element?

**A.**This would be a violation of Rule [G10].

**Q.**Per update #1, "Robots may not push or react against the top of the fender". Please clarify: can a robot push against a vertical face of a fender? A lack of comma seems to indicate yes, but want to be clear of the intent of the rule.

**A.**The top of the Fender is the slightly sloped face underneath the Hoops. The sentence does not refer to the vertical faces of the Fender.

**Q.**Per this rule, would a device that utilizes a passive "appendage" deployed over the center line barrier (bump) to prevent your machine from being moved or twisted when hit (by applying forces to opposing sides of the barrier be considered a violation of this rule? Please elaborate on rule intent.

**A.**The intent of Rule [G10] is stated in its opening sentence, "Robots may not grab, grasp, grapple, or attach to any Arena structure." While, we cannot comment on the legality of a specific design, holding on to a field element is considered grappling and a violation of Rule [G10].

## G11

Not Available

## G12

**Q.**Does this constitute "routine" or "occasional" marking of the ball? <http://tinyurl.com/79qs976>

**A.**The final call on legality of a Robot and how it interacts with the Court and Court elements is left to the Lead Robot Inspector and Head Referee at each event.

**Q.**Are the markings left by the Gates belts considered "routine" or "occasional?" Are teams allowed to use the Gates belts to lift the ball?

**A.**If the damage occurs regularly, it is "routine". If not, it is "occasional".

## G13

Not Available

## G14

**Q.**If teams on opposing alliances aid and/or inhibit the balancing of the same bridge using balls, will that bridge be considered balanced or unbalanced? (This assumes nothing about which robots are on the bridge, if any.)

**A.**We cannot comment on hypothetical match scenarios. The judgement required for matters like this will come from the Head Referee.

## G15

Not Available

## Hybrid Rules

Not Available

## G16

**Q.**With Regards to rule G16 which states that "Robots must not contact the carpet on the end of the Alliance Station end of the court." does this rule or any rule mean that we are not allowed to move during the hybrid period or are we allowed to move?

**A.**There are no Rules prohibiting Robots from moving during the Hybrid period. Rule [R16] only prohibits Robots from crossing to their Alliance Station end of the Court.

## G17

Not Available

## G18

Not Available

## G19

**Q.**Can a display (not control) device that is worn by an operator and connected to the operator console be worn and connected to the console during Hybrid? The device is for displaying feedback from the robot and can be demonstrated to not control the robot in any way.

**A.**For the purposes of FRC, all devices that are part of the Operator Console are considered control devices and must be unplugged during Hybrid per Rule [G19].

## Robot Actions

**Q.**Our robot's game ball manipulator moves upwards by contacting a curved surface with the bump in the middle of the field. The rules say that metal parts on a robot cannot drag on the carpet, but is it o.k. if ours contacts the metal bump?

**A.**There are no "bumps" on the field, however there are no rules prohibiting metal on Robots contacting the Barrier.

**Q.**Can any robot appendage touch floor to aid in balancing?

**A.**There are no rules that prevent a Robot from touching the carpet, however it may affect whether a Bridge is considered Balanced per Section 2.2.5.

## G20

**Q.**What defines the "Alliance Station End" of the court? Does this include any structure other than the bridges past the center barrier (EX. the key, lane, carpet, and fender)? Please clarify what is included in this rule.



**A.** For a given Alliance, the "Alliance Station End" of the Court is the half of the Court adjacent to their Alliance Wall. This area excludes the Bridges and Barriers, but includes all other surfaces contained within, such as the Key and Alley.

**Q.** In Section 3.1.4, [G20] it is stated: "Robots in contact with the carpet on their Alliance Station end of the Court are limited to 60 in tall. Otherwise, Robots are limited to 84 in tall." Does that mean the part of the court where the red key is for the blue team and vice-versa?

**A.** Yes, the Red Alliance Key is on the same side of the Court as the Blue Alliance Station

**Q.** Does the 60 in. limit occur the instant a robot touches the carpet on their end of the arena? What if a robot is coming back across a bridge? Is there a time period available for the robot to reconfigure from the 84 in, limit to the 60 in. limit? What height limit applies while on a bridge?

**A.** Rule [G20] is pretty clear on this. "Robots in contact with the carpet on their Alliance Station end of the Court are limited to 60 in. tall."

**Q.** Can a robot drive up on top of the fender? If so, is the 84 inch rule applied from the carpet surface or from the surface of the fender?

**A.** No, per Rule [G10].

**Q.** Please define "tall" versus "height" specified in ROBOT R02. Is "height" an absolute measurement from the carpeted floor of the arena whereas "tall" references the robot's height when only on the carpeted surface? Example: A 60" tall robot balanced on top of a 12" bridge is 72" in height.

**A.** The vertical measurement is always in relation to the Robot.

## G21

**Q.** If a part of the robot that is designed to remain in the frame perimeter breaks during a match, and dangles outside the frame perimeter, does it count as an appendage? What if it breaks off completely and falls to the floor?

**A.** No. Any piece that comes detached will be treated per Rule [G09].

**Q.** Can an appendage extend beyond the vertical plane formed by the frame perimeter at a height greater than 24" from the floor if the frame perimeter of the robot was 10" from the floor?

**A.** There are no Rules explicitly limiting the height at which an appendage may be deployed; however, no other Rules must be violated.

**Q.** Our team did not understand which rule can you briefly violate as stated at G21 latest update. can you please clarify it?

**A.** Per Rule [G21], all portions of an appendage that are outside the Frame Perimeter must be contiguous with each other. Very brief violations of the contiguity requirement as a single appendage is being extended or retracted will not be penalized.

**Q.** By definition is a single appendage considered one arm or would two arms operated by one motor on a common shaft still apply as one appendage?

**A.** Please see [Team Update 2012-02-07](#).

**Q.** Recent G21 rulings may make any wheel, gear, roller, etc on an appendage illegal. There will ALWAYS be a moment between when the wheel edge and the center shaft cross the frame perimeter that a discontinuous piece of wheel will be outside the FP. Is this intended? Are all wheels on appendages illegal?

**A.** Please see [Team Update 2012-02-07](#).

**Q.** It seems the appendage definition Q&A started out innocently requesting clarity, but led to being over-scrutinized. I suspect the intent of G21 is that an appendage is simply "a contiguous assembly of parts originating from inside the frame and can extend beyond one frame edge 14". Please confirm.

**A.** There is no formal definition of appendage. All pieces of an appendage outside the Frame Perimeter must be contiguous outside the Frame Perimeter.

**Q.** The appendage confusion stems from two conflicting replies: 1) "an appendage is a contiguous assembly that may extend beyond the frame", and 2) "an appendage, when extended beyond the frame, is a contiguous assembly". It seems reply #1 is your intent and in the spirit of the rules. Please confirm.

**A.** Both answers are the intent of the Rule.

**Q.** Our question is similar to FRC1540. We want to put surgical tubing "whips" on a roller located at the frame perimeter. When this rotates the whips will extend beyond the frame perimeter. Is each "whip" its own appendage or is the assembly considered one appendage?

**A.** If multiple items exit the Frame Perimeter and are not contiguous outside the Frame Perimeter, they are considered multiple appendages.

**Q.** To prevent differing interpretations of G21 and the following Q&As on appendages could you address the legality of a appendage BRIEFLY crossing the frame perimeter in multiple places during deployment? For example, a "H" shaped appendage might cross in two places as it quickly folds out.

**A.** Revised Answer per [Team Update 2012-02-07](#) (our apologies for the confusion: All portions of an appendage that are outside the Frame Perimeter must be contiguous with each other. Very brief violations of the contiguity requirement as a single appendage is being extended or retracted will not be penalized. ~~Any time the appendage is outside the Frame Perimeter, it must be a contiguous piece.~~

**Q.** Thanks for the additional G21 clarification. I would appreciate a bit more clarification, primarily regarding your 2012-01-27 response to FRC0063. Can more than one component of a contiguous appendage assembly outside of the frame be simultaneously crossing one edge of the frame perimeter? Thanks.

**A.** Yes, provided any part of the appendage that is outside the Frame Perimeter is contiguous.

**Q.** In a prior answer it was stated that an appendage can fork outside the frame perimeter yielding a Y shaped appendage. Can an appendage be attached to the frame at 2 points and terminate in 2 points as long as they are joined by a cross member, yielding a single H shaped appendage?

**A.** Yes, but the contiguous part of the appendage must be outside the Frame Perimeter.

**Q.** Will you please either clarify the 'appendage' definition, or state the legality of an appendage design with two separate arms that extend beyond a single frame perimeter edge and driven by a single/common mechanism inside the frame perimeter? The related Q&A responses seem rather ambiguous. Thanks.

**A.** As the other responses indicate, there is no formal definition of "appendage". However, one appendage (as allowed in Rule [G21]) would be one contiguous assembly. The contiguous part of the appendage must be outside the Frame Perimeter.

**Q.** What is the width limit of an appendage? Can an appendage cross the line drawn as an extension of a perimeter edge that is perpendicular to the base edge that the appendage is crossing?

**A.** There is no explicit width limit for a Robot appendage. Per Rule [R21], "Robots may extend one appendage up to 14 in. beyond a **single edge** of their Frame Perimeter at any time."

**Q.** If a robot has a "gap" on one side of a straight perimeter edge, can a single appendage cross down in front of and on both sides of the gap.

**A.** The purpose of this forum is to answer questions about the Game rules, not to perform design reviews for legality.

**Q.** If two members of a mechanism crosses one edge of a robot in two locations but the two members are connected via one axle and are controlled by one motor is this still considered one appendage?

**A.**There is no formal definition of appendage; however, a colloquial definition is "a subordinate part attached to something; an auxiliary part; addition" (courtesy of dictionary.com). To elaborate, an appendage is a contiguous assembly that may extend beyond the Frame Perimeter per Rule [G21].

**Q.**Is there any limit to what may be defined as an appendage?

**A.**Yes. Please refer to Robot Rules and other Q&A responses to understand the constraints.

**Q.**What is the formal definition of an appendage? If you have two linkages that exit the robot together and are rigidly connected, are they defined as one appendage?

**A.**There is no formal definition of appendage, however a colloquial definition is "a subordinate part attached to something; an auxiliary part; addition" (courtesy of dictionary.com). To elaborate, an Appendage is a contiguous assembly that may extend beyond the Frame Perimeter per Rule [G21].

**Q.**Can appendages (one at a time) be used for purposes other than manipulating Basketballs and/or Bridges?

**A.**Yes, as long as no other rules are violated.

**Q.**Is there any limit to the kind or number of functions that can be performed by a single appendage as long as it only extends beyond a single edge of the frame perimeter?

**A.**No.

## G22

**Q.**What is the maximum height that the robot can extend on our opponents side of the field?

**A.**Please see Rule [G20].

**Q.**If we have a spinning roller to suck balls into our sweeper and reverse that roller to reject additional balls when we have 3 balls, would any additional balls contacting that roller and rejected from the robot be considered to be controlled or herded?

**A.**A deflected Basketball is not considered "actively controlled".

**Q.**A robot tips a bridge and this act causes more than 3 balls to roll towards the robot. At the bottom of the ramp the balls stop rolling and come to rest against the tipping robot. Are these balls considered "actively controlled" per [G22]?

**A.**No

**Q.**Do balls positioned behind a robot but not touching it, previously put there by the robot or an inbounder, count as being controlled?

**A.**Hypothetical game situations are highly context dependent. It is not practical for us to provide definitive answers for all individual situations which may be presented.

**Q.**If after tipping a bridge, balls on the bridge "line up" (due to gravity pulling them down the bridge) into a "funnel" created by the bridge which ends up leading into a pickup system of a robot, is that robot considered to be actively controlling (per G22) the balls that line up?

**A.**This forum cannot comment on hypothetical situations. Those decisions will be left up to the Head Referee at each event.

**Q.**What is the definition of actively controlling the basketballs? If the robot is inhibiting the motion of a ball caused by gravity, is that considered actively controlling it?

**A.**Please refer to the Blue Box following Rule [G22], which clearly states the meaning and intent.

**Q.**Are you allowed to place a ball in an opposing-alliance robot in a "undesireable" location as long as there is no damage to the opposing robot?

**A.**This would be a violation of Rule [G27].

**Q.**When a robot attempts to retrieve extra balls (if there are more than 3 balls) off the Coopertition Bridge, if the robot's extended appendage, when it pushes the bridge down, causes the balls to be guided off the bridge and towards the robot, is this considered "active control"?

**A.**No, the act of tipping the bridge causing the balls to move is not considered active control.

**Q.**When is a ball considered "lodged" on a robot? If a ball never becomes stationary and bounces out after several seconds is it considered lodged?"

**A.**Generally speaking, if a Basketball bounces on and or off a Robot, the Robot is not considered actively controlling that Basketball. Please note however that the purpose of this forum is to clarify rules and answer questions about intent behind rules. We can not provide specific answers regarding how rules may be administered in a hypothetical scenario.

## G23

**Q.**If two robots from the same alliance are blocking two bridges ( the cooperation bridge and the opposing alliance bridge) is that considered to be a violation of [G23]? even if the opposing robot can cross the barrier?

**A.**Blocking the Bridges will not be inherently considered a blockade; however, we cannot comment on hypothetical Match situations in this forum.

## G24

Not Available

## G25

**Q.**This question is regarding defending bridge balancing within the spirit of first. As per [G25], robots who are interfering with the bridge should be issued a red card. However, if due to defense, another robot is pushed into the bridge of the opposite alliance inhibiting a balance, the second robot should not be penalized for [G25] under [G44] because it was caused by another alliance. However, if this second robot's battery falls out and becomes disabled [G35] for whatever reason (design placement, aggressiveness on the field) while still being in contact with this bridge, should a red card still be given? If not, what prevents a robot from creating a mechanism (or have a design) that automatically ejects a battery so that their robot becomes disabled right under an opponent's bridge?

**A.**Per Rule [G09], Robots may not intentionally detach parts or leave mechanisms on the Court. Robots may still receive Fouls and Yellow/Red Cards if they are disabled.

**Q.**If a robot is interfered with: 1. Is the Robot or Bridge considered balanced? 2. How is the bridge indicated that it is balanced? Visual or by score? 3. If additional robots are fully supported by the bridge, are they considered balanced on the bridge, even if the bridge is not balanced?

**A.**1. The Bridge is considered Balanced per Rule [G25]. 2. If Rule [G25] is relevant, the score will be adjusted as appropriate. If [G25] isn't relevant, the Bridge is considered Balanced per Section 2.2.5. 3. The Bridge is considered Balanced, not the Robots. Scoring will be assessed per Rule [G40] (and [G25] if applicable).

**Q.**Does rule G25 apply at all times? What happens if a robot is pinned against an opponents bridge (does rule G44 apply)?

**A.**Yes, Rule [G25] applies throughout the Match. The Referee will determine if Rule [G44] applies given the exact circumstances.

## Robot-Robot Interaction

**Q.**Can a robot grab onto another robot, of the same team in a nondestructive manner, in order to help balance on the bridge?

**A.**Yes, provided Game rules are not broken, specifically [G26] and [G27].

## G26

**Q.**Would cooperative mutually-beneficial non-destructive attachment between two robots (e.g. for the purpose of balancing on a bridge) be considered a G26 foul? What if the two robots were from different alliances?

**A.**Please see Team Update 2.

## **G27**

**Q.**Can our appendage legally contact an alliance robot within their frame perimeter in a non damaging way?

**A.**There are no Rules that explicitly prohibit that.

**Q.**If a robot is designed to be contacted inside its own frame perimeter to aid in balancing, could a team request a waiver of G27 for touching inside its own frame perimeter to aid in balancing the coopertition bridge with an opponent?

**A.**No.

**Q.**Can a robot drive and rest on top of an alliance robot without incurring a foul?

**A.**Please see Team Update 02.

## **G28**

**Q.**What is the definition of "in contact with its Key"? Is it one wheel touching the edge of the key, all wheels on the key, a portion of the bumper or frame overhanging the vertical projection of the key?

**A.**There is no formal definition of "contact", so the colloquial definition is valid here, "the act or state of touching" (from [dictionary.com](http://dictionary.com)).

**Q.**Need clarification of G28/G44: Two questions below appear to contardict each other. A robot pushed into opposing robot is a foul but strategy to exploit this rule is a technical foul. How would it be determined whether it is a foul, no foul or technical foul?

**A.**Contact prohibited in Rule [G28] will always result in a Foul. The Referees will make their best determination if contact was a strategic move and call a Technical-Foul and Red Card accordingly.

**Q.**If a blue(B) robot is not entirely in its B alley, and comes in contact with an opposing red(R) robot totally outside the B alley, will the opposing R robot incur a penalty? [We would reasonably expect that B must be entirely inside its B alley for a contact with R to incur a penalty against R.]

**A.**Per Rule [R28], the Robot must only be in contact with its Alley, Key, or Bridge.

**Q.**Please confirm a Red Robot cause a G28 Foul if it pushes a ball against a Blue Robot in contact with its Blue Alley? (Ref: 2012-01-11 G28 Transitory Question)

**A.**Yes.

**Q.**What happens if a blue robot, in it's own key, makes contact with a red robot outside its key, while remaining inside?

**A.**Please see [G28]. Contact is not dependent on which Robot initiates the contact.

**Q.**What happens if a blue-alliance robot gets pushed into the red key by a red-alliance robot?

**A.**Per Rule [G44], the Blue Alliance Robot would receive a Foul if it touched the Red Alliance Robot while the Red Alliance Robot was in the Key.

**Q.**Are the non-movable parts of a bridge considered part of the bridge for purposes of physical contact for rule G28?

**A.**The Bridge consists of all components included in the Bridge Assembly drawing, GE-12017.

**Q.**Does the transitory rule apply to a G28 foul if the only contact between two robots is a ball (and one of the robots is touching their key, bridge or alley)?

**A.**Yes

**Q.**What happens if there is a "Mirror" G28 foul where both robots are touching their respective

alley, key or bridge?

**A.**Both Robots will receive a Foul or Technical-Foul as appropriate

**Q.**Does a robot incur multiple G28 fouls if it rapidly and repeatedly touches an opposing alliance robot (that is in contact with its key, alley or bridge)?

**A.**Yes, and may also receive a Yellow or Red Card for such actions per [T15] and [T17]

**Q.**Once a robot is in violation of G28 does it incur additional fouls or a technical foul if it remains in continuous contact with the robot from the other alliance (that remains in contact with their key, alley or bridge)?

**A.**Continuous contact implies no intent to remedy the situation and will likely be considered purposeful and thus incur a Technical Foul.

**Q.**Can a robot (that is not in violation of G28) touch or enter the key or alley of the other alliance?

**A.**Yes

**Q.**Is a strategy to exploit G28 considered to be a strategy to exploit G44 which would be a technical foul and red card according to G45?

**A.**Yes.

## G29

**Q.**Robot A pins Robot B for 3 seconds, backs away for 2 seconds, and then reengages Robot B in a pin. Does the pin count continue from 3 leaving Robot A 2 seconds before incurring a Technical-Foul or does Robot A receive a Technical-Foul for not satisfying the conditions described in [G29]?

**A.**Robot B is considered pinned until the Robots have separated by at least six feet.

**Q.**Is blocking a robot's attempted exit from the center bridge considered to be a pin? If not, is blocking exit and preventing the bridge to return to balance to allow the robot to exit the other side considered to be a pin?

**A.**No. No.

**Q.**When a robot is pinned against their Alliance Bridge do both rule G28 and G29 apply?

**A.**Yes

## G30

**Q.**If a robot uses the ramp to become completely supported by another robot. Will a foul be called if the ramp momentarily disconnects from the robots?

**A.**There will be no Technical Foul called if the Referee determines that the loss of contact wasn't extended, strategic, or repeated.

## Human Actions

**Q.**Can we use our own computers or do we have to use the regulations computer

**A.**Please see Section 4.1.11 for rule regarding the Operator Console.

**Q.**If during the last 30 seconds of the game in which human players may throw the ball over the wall would it be counted as a score if one of the balls thrown were to land in a goal?

**A.**"Anytime a Basketballs travels through the rim of a Hoop, it will be scored."

## G31

**Q.**Can the human at the ball feeder station drop the ball directly into a waiting robot collection system if they do not touch the ball at the same time the robot touches the ball?

**A.**There are no Rules that explicitly prohibit this, however all other Game Rules must be met.

**Q.**What is the definition of immediately? Suppose that 7 balls are scored in rapid succession. Each inbounder may hold 2 balls at a time, which means that the ball coral cannot be emptied immediately. So, how fast do the inbounders have to empty the coral to be considered "immediate"?

**A.**In that scenario, the Alliance would need to rectify the situation to be in compliance with all Game rules as quickly as safely possible.

### **G32**

**Q.**Can robots pass balls through the InBound Slots?

**A.**No, per [G13].

### **G33**

**Q.**G33 states:...Inbounders must remain behind the Starting Line during the Match." This appears to imply that the inbounders cannot enter the inbound station to place balls through the slot. What happens if the inbounder misses the slot and the ball remains in the inbound station?

**A.**If the Inbounder must break a rule to retrieve a Basketball, the nearest field reset person should be notified and asked to retrieve the Basketball for the Inbounder.

**Q.**Does this rule mean that inbounders cannot step over the Starting line. Or that no part of their body may pass the vertical projection of the line?

**A.**Inbounders may not contact the carpet in front of the Starting Line.

### **G34**

Not Available

### **G35**

Not Available

### **G36**

**Q.**Can a Coach or Inbounder assist a robot operator in connecting a wearable feedback display to the operator console at the start of Teleop (i.e. a quick-connect cable). The display can in no way control the robot and can be demonstrated as such.

**A.**No, this would be considered a violation of Rule [G36].

## **Scoring**

**Q.**Can we score the last 30 seconds of the match from the feeder?

**A.**There is no feeder in Rebound Rumble.

### **G37**

**Q.**When does scoring stop for balls shot to the hoops? Is it when the timer ends? Or if a ball has exited the robot and is in the air can it still score?

**A.**Please see Rule [G37].

**Q.**Which alliance scores when one alliance puts a basketball completely through the hoop above the fender with the color of the other alliance?

**A.**Please see Team Update 2.

### **G38**

**Q.**Can an alliance score on both ends of the field?

**A.**There are no rules that prevent an Alliance from scoring on both ends of the Court, but they will only receive points for those Basketballs scored in their Hoops.

### **G39**



**Q.**If a robot releases a ball prior to the timer hitting zero during the hybrid period, but it completely passes through the top hoop after the timer hits zero, will this ball be worth 3 or 6 points. What is the determining factor? Time of: release, passing through the hoop, passing by the sensors?

**A.**Per Rule [G38], the Basketballs are scored as they pass through the Hoop. So, if a Basketball shot during the Hybrid Period passes through the Hoop before the Hybrid Period ends, it will earn the Hybrid bonus of Rule [G39]. If it passes through the Hoop after Hybrid Period ends, it will not earn the Hybrid bonus.

**Q.**If a robot shoots a ball during hybrid mode that enters the hoop after teleop begins, will the 3pt bonus still apply?

**A.**Any Basketball that enters the Hoop during the Hybrid period will receive the Hybrid bonus.

## **G40**

**Q.**When will changes to Bridge points for the championship be announced?

**A.**Any changes to Bridge points at Championship will be disclosed in *Team UPDATE - 2012-04-17*.

**Q.**According to 2.2.5, "A Bridge will count as Balanced if it is within 5° of horizontal and all Robots touching it are fully supported by it," but I have seen rulings that count the bridge as balanced for one robot (10 points) when another robot was touching bridge and the ground. Please clarify?

**A.**We cannot comment about specific calls at specific events. The intent is that the Rule, as written, will be enforced consistently across all events.

**Q.**Which forces are considered in determining whether something is "supported"? (For example, you might neglect internal forces, frictional forces, force components not aligned with Earth's gravity, transient forces, forces of small magnitude, forces exerted through bumpers and/or inertial forces.)

**A.**The weight of the Robot must be fully supported by the Bridge.

**Q.**If Robots A & B are each partly supported by each other, and the rest by the bridge, will A & B be considered "fully" and "completely" "supported" by the bridge for the purposes of scoring the number of balanced robots and balancing the bridge? (N.B. not a duplicate question.)

**A.**Generally, if a Robot is only supported by another Robot that is only supported by the Bridge and the Bridge, both Robots will be supported by the Bridge. However, the Head Referee at the event will make the final call as to whether or not Robots are supported by the Bridge.

**Q.**If Robot A is partly supported by Robot B, and the rest by the bridge, and B is fully supported by the bridge, will A be considered "fully" and "completely" "supported" by the bridge for the purposes of scoring the number of balanced robots and balancing the bridge? (N.B. not a duplicate question.)

**A.**Generally, if a Robot is only supported by another Robot that is only supported by the Bridge, both Robots will be supported by the Bridge. However, the Head Referee at the event will make the final call as to whether or not Robots are supported by the Bridge.

**Q.**If one of the robots on a balanced alliance bridge has a portion of its bumper in contact with the inner vertical face of the field perimeter wall adjacent to that bridge, will the bridge be considered balanced or would the perimeter wall be considered partially supporting that robot?

**A.**Generally, a Robot only in contact with its Bridge and, via its Bumper, the vertical face of the guardrail system will not be considered supported by the guardrail system. However, the Head Referee at the event will make the final call as to whether or not the Robot is supported by the guardrail.

**Q.**In a Q&A response from 01-17, you said that the Bridge consists of all components included in GE-12017. These drawings include the ball ramp. Between [G40] and Section 2.2.5, it is possible for a robot to be "fully support" simply by driving onto this ramp. Is this this intended interpretation?

**A.**Our mistake and our apologies. The former response will be corrected. No, that was not the intended interpretation.



**Q.**If Robot A is fully supported by Robot B, and Robot B is fully supported by the Bridge, will Robot A be considered to be supported by the Bridge for the purposes of scoring the number of balanced Robots?

**A.**Yes.

**Q.**Does a fully supported robot means (1) its full weight is supported by the bridge without any other support, or (2) no part of the robot is out of the bridge boundary ? i.e., a robot that stands on four wheels on the bridge and have two wheels out of the bridge, in the air, is considered balanced ?

**A.**Option 1

**Q.**What physical parts make up the bridge by definition? Essentially, where does the bridge begin and end? For example, does the welded structure under the bridge that the top connects to count as the bridge? Does the lateral bar that rotates with the bridge that count as the bridge?

**A.**The Bridge is defined as all components depicted in GE-12017, with the exception of the Bridge Base (GE-12022) and the Ball Ramps (GE-12064). Updated per Team Update 2012-02-14. ~~The Bridge consists of all components included in the Bridge Assembly drawing, GE-12017.~~

**Q.**At what point during the match can robots begin to balance on the bridge? Last 30 seconds, or any time during teleop?

**A.**There are no rules regarding when a Robot may begin to Balance.

**Q.**Are there any points scored for bots balanced on the cooperation bridge in an elimination match.

**A.**No

**Q.**Is the scoring in rule G40, balanced bridge point values, in per robot or per alliance?

**A.**Please see Team Update 2.

**Q.**With respect to G40 & G41 is a bridge considered to be balanced if a robot NOT on the bridge is pushing up or down on the bridge to keep it within 5 degrees of horizontal?

**A.**Please see Team Update 2.

## **G41**

Not Available

## **Penalties**

Not Available

## **G42**

Not Available

## **G43**

Not Available

## **G44**

**Q.**Please clarify G44 "Rule [G28] is an exception to this rule." Does this exception mean that a G28 violation that was directly caused by the actions of the opposing Alliance will be credited to the opposing Alliance?

**A.**Yes.

## **G45**

**Q.**Red robot is in its key lining up to shoot. Blue robot approaches close to red robot to block the shot. Red robot intentionally pushes blue robot back to clear the way for its shot, contacting blue robot while red robot is still in contact with its key. Is this a violation of [G45]?

**A.**We cannot make a definitive statement on a hypothetical situation, and the final decision on violations of Game Rules is left to the Head Referee at each event. However, generally, if a Robot is attempting to play the game, not simply create Fouls for the opposing Alliance, Rule [G45] will not be violated.

**Q.**Re: G44 "[G28] is an exception to this rule." [G28] Foul when a robot "touch an opponent Robot in contact with its Key, Alley or Bridge...No matter who initiates the contact see G44." Does Blue while contact with Blue Alley get a [G45] Red Card for purposeful touch of Red?

**A.**That scenario is incredibly situation dependent and cannot be answered on this forum.

**Q.**Is G45 violated if a robot herds balls into their alley and waits nearby so if/when an opposing robot attempts to retrieve said balls they can contact them resulting in a foul as per G44?

**A.**Yes. It could also be considered trapping depending on how the strategy is executed.

## Game - The Robot

**Q.**In the answer to FRC1619's question on 2012-02-08, you stated that [R35] requires that the team number be displayed in four locations, no more, no fewer. Are we limited to exactly 4 locations on the bumpers, or could the team number be displayed two times on one side?

**A.**You are limited to exactly four locations at 90 degree intervals.

**Q.**When a robot must include some part, and the relevant rule uses the singular form consistently, but doesn't give a numerical quantity, does this imply that exactly one of that part is required, or at least one? (If the answer varies for different rules, explain each one.)

**A.**The purpose of this forum is to answer specific questions about specific Rules.

**Q.**Does the R35 requirement of exactly 4 team number locations apply only to the bumpers or to team numbers displayed anywhere on the robot? What if a team number NOT on a bumper isn't visible from 100 feet, etc.?

**A.**Rule [R35] applies to the team numbers on the Bumpers.

**Q.**Can we use Ethernet cords for signal wires for Encoders?

**A.**There are no Rules prohibiting this.

**Q.**can we use a net to block other team's robots from scoring?

**A.**There are no Rules explicitly prohibiting a net, but please refer to all Game and Robot Rules for appropriate Game uses and design implementation restrictions.

**Q.**On the victor and jaguar speed controls can we dynamically during game play change the brake/coast setting by use of a logic/mechanical switch controlled by the drivers?

**A.**There are no Rules prohibiting this.

**Q.**Our team would like to put gas shocks on the robot, but we are unsure if this would be legal. We will replace the gas in the shocks with a non-flammable gas or silicone liquid. With one of these substitutions, are we permitted to put these shocks on the robot?

**A.**There are no Rules that explicitly prohibit closed-loop gas shocks, provided they accommodate all other Robot Rules.

**Q.**What is the Definition of "Appendage"?

**A.**There is no formal definition of appendage, however a colloquial definition is "a subordinate part attached to something; an auxiliary part; addition" (courtesy of disctionary.com). To elaborate, an appendage, when extended beyond the Frame Perimeter, is a contiguous assembly.

**Q.**A robot sits with its wheels on the Bridge and extends an appendage below the surface of the Bridge. Would the Bumper Zone height reference be measured from the Bridge surface (the Robot's wheels, & where the bottom of the robot would be on a flat floor) or from the bottom of the extended appendage?

**A.**The Bumper Zone is measured from the floor when the Robot sits on a flat floor.

**Q.**G22 States "Robots may only actively control three Basketballs at any time." If an active device, such as a spinning wheel or roller, on the robot deflects an approaching ball away from the robot, is that considered "active control"?

**A.**Please refer to the blue box in [G22].

**Q.**The bumper zone height is 2-10 inches above the ground. If the robot wheelies or tips under acceleration or braking, and that distance changes, are we in violation of the bumper rule? And/or frame height requirements? Is there an operational clearance that must be maintained throughout the match?

**A.**Robots with Bumpers outside the Bumper zone as defined in Rule [R01-2] will be considered in violation of Rule [G01]. There is no tolerance included in the specification.

## General Robot Design

**Q.**are lasers allowed in the competition and if they are what are there regulations. I also read that D1 lasers are not allowed what qualifies as a D1 laser.

**A.**Please see the Blue Box of Rule [R08].

**Q.**May a second battery be used as a counterweight, as long as it is not electronically connected to anything, and the weight is counted against the total robot weight?

**A.**Rule [R36] prohibits a second battery.

**Q.**Are teams allowed to design "universal attaching units" so that alliance partners and opponents can latch onto a robot to make balancing easier? I see no rules against such as long as the appendage is less than or equal to 14in. Please Advise. Thanks, 1033

**A.**There are no Rules explicitly prohibiting this.

**Q.**Our team 4031 has a few questions: • Can we use any type of drive wheel? • In alliance, can we shoot, retrieve and block in one match or are we limited to only one function per match (if so how is that function determined?) • Can we shoot or throw the ball over the center

**A.**In the future, please ask one question at a time pegged to the specific rule about which you're asking. 1) There are no explicit restrictions on drive wheels, but please see Rule [R06] for limitations of traction devices. 2) There is no limit on the number of roles a single Robot may play during a Match. 3) There are no Rules explicitly prohibiting a Robot from propelling Basketballs over the Barrier. Please see Rule [G32] for how an Inbounder may enter Basketballs to the Court.

**Q.**Can A robot have a shock system as long as it stays within the height requirements?

**A.**There are no rules prohibiting this, but there are many Rules other than Robot height to which all parts of a Robot must adhere.

**Q.**Can the Kinect be mounted on the robot for target tracking?

**A.**There are no rules prohibiting the use of a Kinect on a Robot, however all other Robot rules concerning additional electronics must be followed, such as [R44] and [R65]

**Q.**Are we allowed to attach retro-reflective tape to our robot? E.g. to be used as a target for passes from an alliance robot. If allowed, are there any constraints on shape or size?

**A.**There are no rules that explicitly prohibit this, however please pay close attention to [R08-C]. If such a component on the Robot is deemed to be a violation of [R08-C] or any other Robot rules, it must be removed.

## R01-1

**Q.**Do motors that are well within the limit of the vertical frame perimeter need to be housed inside a casing or can they be exposed?

**A.**There is no explicit requirement for motors to be shielded.

**Q.**Is there are restriction on the battery that can be used at the competition? I know we received a battery with your koP, but that battery is out of stock and andymark is recommending a different battery...can we use that substituted battery during competition?

**A.**The batteries allowed on a Robot are described in Rule [R36].

**Q.**Do the exterior frame and bumpers need to be coplanar around all the vertices or is it permissible to offset sections (a complete side) of the external frame to a parallel plane so long as it is not articulated.

**A.**Bumpers must be mounted within the Bumper Zone as defined in Rule [R01-2], but there is no requirement that they all be at the same height.

## **R01-2**

**Q.**Is the frame perimeter always a convex polygon? If the robot is U-shaped in the Bumper Zone, is the frame perimeter a rectangle (ignoring the interior vertices) or is it U-shaped? R01-2 says "exterior" vertices, implying it's a rectangle, which conflicts with Figure 4-3 showing it being U-shaped.

**A.**Sorry for the confusion. Please see Team upUpdate 2012-01-24.

**Q.**Can an appendage extend below the original bottom of the robot when the robot is NOT flat on the floor (crossing barrier or bridge) if when the robot is placed flat on the floor the appendage passively reacts against the ground so the bumpers remain within the bumper zone?

**A.**Please see Team Update 2012-01-20.

**Q.**In regards to section R01-2. I assume that means the outer perimeter members need to be solid (ie. non-hinged) pieces to support the bumpers. Can the fixed perimeter elements be attached to elements that can change length, such as a shock absorber or pneumatic cylinder or screw drive?

**A.**Per Rule [R01-2], the Robot must have a Frame Perimeter that is comprised of fixed, non-articulated structural elements of the Robot.

**Q.**R01-2 seems to have the purpose of requiring an arm with gripper for the purpose of collectiing basketballs. Other questions about gaps in the frame perimeter have been asked. If gaps are allowed may we extend a conveyor into this gap for the purpose of collecting basketballs?

**A.**Please see rule [G21] for what a Robot may extend beyond its Frame Perimeter during a Match.

**Q.**Can a robot extend an appendage below the starting configuration height of the robot? If so, would the added length of the appendage actively change the height of the bumper in relation of the robot, thus violating the Bumper Zone rule?

**A.**Revised Answer per [Team Update - 2012-01-20](#) (our apologies for the confusion): There are no rules prohibiting Robots from extending elements below the plane defined by the floor on which the Robot is positioned. For more information, please see the Blue Box in [R01-2] as updated per *Team Update - 2012-01-20*. ~~The Bumper Zone rules must be met throughout the Match and the Bumper Zone is in reference to a Robot flat on the floor. At every point in the Match, no matter what configuration, orientation, or Court position the Robot is in, if the Robot were to be placed flat on the floor, Bumper Zone requirements must be met.~~

**Q.**Can a robot lift its front, back or both with a mechanism, for example in crossing the 4" barrier, which would then raise the top of the bumper above the 10" mark.

**A.**Please see Team Update 2012-01-20.

**Q.**The Robot must have a Frame Perimeter that is comprised of fixed, non-articulated structural elements of the Robot. Does this require the entire Frame Perimeter be comprised of structural elements with no gaps? Ex. is a U-shaped cut out legal if the exterior vertices have 8" of bumper?

**A.**The 8 in. of Frame Perimeter immediately on either side of an exterior vertex must be covered by a Bumper.

**Q.**Is the frame permitted to have an opening? If so what size is the opening allowed to be? Our current interpretation is that an opening of 11 inches on the narrow side or 21 inches on the wide

side.

**A.**The purpose of this forum is to answer questions related to specific rules, not to perform design reviews for legality. There are no rules prohibiting gaps in the frame structure, but please note that any frame must accommodate legal Bumpers per Section 4.1.6.

## R02

**Q.**Will a robot pass inspection if it has an appendage that is not physically constrained from extending beyond 14" past the frame perimeter, but is only constrained from doing this by software?

**A.**We cannot make a definitive statement regarding legality of a Robot on this forum. However, software is a legal method for constraining an appendage to 14 in.

**Q.**The front of our robot is U-shaped. Each arm of the U is 6 inches. The bumper rule says there must be 8 inches of bumper from the vertex of the frame. Does each arm of the U have to be at least 8 inches wide to accommodate the bumper?

**A.**We cannot comment on specific robot designs, however yes, the Frame Perimeter must be designed such that it can accommodate all Robot Rules.

**Q.**Per R02-A and D. Can we have a robot whose frame is 28x38 inches and then have an appendage that is 14in beyond that;meaning that the dimensions become either 28x52in or 42x32in,OR Does this mean our robot must 28x38 at all times including any appendages as long as they are smaller then 14in?

**A.**The former.

**Q.**Can we have more than one appendage extending 14 inches away from the frame?

**A.**No per Rule [R21].

**Q.**If an extension forks outside of the frame perimeter, does it count as a single extension? For example, if 7" away from the frame, the appendage splits into two separate bars.

**A.**Only one appendage may extend beyond the Frame Perimeter. There are no rules prohibiting appendages that fork once outside the Frame Perimeter.

**Q.**Does an extension count as a single appendage if more than one extension originates from the same mechanism within the robot , or is connected within the frame perimeter?

**A.**There is no formal definition of appendage, however a colloquial definition is "a subordinate part attached to something; an auxiliary part; addition" (courtesy of dictionary.com). To elaborate, an appendage, when extended beyond the Frame Perimeter, is a contiguous assembly.

**Q.**Can we have an appendage that sticks off of the front of our rectangular robot, and have it fold out 90 degrees so it crosses the line that you would get if you extended the right (or left) side of our robot (assuming that it is less than 14 inches away from the front at all times)?

**A.**Per Rule [G21], Robots may extend one appendage up to 14 in. beyond a **single edge** of their Frame Perimeter at any time.

**Q.**(R02-D) How is the maximum extension from the frame perimeter defined? Is it the actual length of the appendage from where it exits the frame perimeter or is it as defined in part E, a vertically projected plane 14" regardless if the appendage is above or below the frame perimeter plane?

**A.**Both of those methods lead to the same measurement.

**Q.**Can an appendage that always remains fully within the frame perimeter and total robot height including appendage is less than 60" extend vertically more than 14" (e.g. specifically to balance on a bridge)?

**A.**There are no explicit rules restricting the size of an appendage that remains within Frame Perimeter, however all Robot rules must be obeyed.

**Q.**May the robot's appendage(s) enter the Bumper Zone?

**A.**There are no rules prohibiting this.

**Q.**Must all robot appendages be contained within 38in by 28in horizontal dimensions, or does the 38in by 28in only apply to the robot's starting configuration?

**A.**The size constraints described in [R02-A] apply throughout the entire Match but do not apply to the appendage allowance in [R02-D].

**Q.**Are the dimensions for the frame only or do they include the attached bumpers as well?

**A.**Please see Team Update 2.

**Q.**Is the horizontal dimensions constraint to be met throughout the match, given the exception of a 14" protrusion? More directly, if a robot met this constraint at the start and then rolled down to have horizontal dimensions of 38" x 60" during game play would this be acceptable?

**A.**Yes, the horizontal dimensions listed in [R02] apply throughout the duration of the match. No, a robot that changes orientation as described would be in violation of [R02].

### **R03**

**Q.**At FLR, robots will be outfitted with a different radio. How does the weight of this radio/power cable compare to the current bridge? Which radio will be used to determine the weight of the robot to comply with R03? Thank you!

**A.**Please refer to Team Update - 2012-01-20.

### **R04**

**Q.**There was an original formula that had been given for calculating the force needed to lower the bridge. Has that formula been changed and what is the new formula?

**A.**There was no formula given. Data on the Bridge dynamics have not changed from Kickoff and can be found by watching the Field Walkthrough videos available on the [FIRST website](#).

### **R05**

Not Available

### **R06**

**Q.**Would a non-moving metal skid-plate that contacted the middle barrier or bridge be a violation of rule R06?

**A.**If this piece is used as a traction device, it would be a violation of Rule [R06]. If not, it is not inherently illegal. The part may invite added scrutiny during Inspection to ensure it will not damage the Court.

**Q.**Can traction devices (i.e. wheels, treads, etc) be coated with a smooth, non-abrasive, rubber coating?

**A.**There are no rules explicitly prohibiting this, however all Robot Rules apply.

**Q.**Are tank tracks a violation of rule R06?

**A.**There are no rules explicitly prohibiting the use of tank treads, however based on your team's implementation of certain items, they may or may not be permitted. Please review all rules to determine compliance.

### **R07**

**Q.**The question asked was not answered so I would like to reask it. Are we allowed to use a window motor and assembly from a car that we are taking apart in our auto class or are you saying we have to purchase the same part from a registered ARA auto wreckers? That would require up to a 40 hour drive

**A.**Per Rule [R48-I], a window motor from an old car must be obtained through either the FIRST-Automotive Recyclers Association partnership or from a prior years' KOP to be legal for use.

**Q.**We want to know if we can use a part from a car on our robot, specifically, the automatic window drive to raise and lower the robot arm. We have an auto class and many wrecked cars at the school that the student practice on and get parts off for other projects. Are we able to use a part on car.

**A.**Parts from a used car are not inherently illegal. Any motor used on the Robot must be in compliance with Rule [R48].

## Safety & Damage Prevention

**Q.**Is it legal to have a high intensity, visible LED light or FIRST choice Ring Light (fc 12-60) mounted on the robot for camera-tracking purposes if it will be pointing at the goals (the opponent's Driver's Station), or will this violate rule [R08] by causing interference with the Driver's Station?

**A.**An LED will not inherently break Rule [R08]. However, specific implementation legality will be left to the Lead Robot Inspector and Head Referee at each event, per Rule [T04].

### R08

**Q.4.1.2.R08-D:** Can a COTS laser be modified to be Class 1 compliant if evidence is shown that the outputted power is certified to fall within Class 1 restrictions. If so- what documentation is requested? Is documentation from a metrology lab of a sponsor or commercial entity acceptable?

**A.**No. A modified laser does not meet the general safety regulation of Rule [R08] and is not allowed.

**Q.**Is it legal to have an infrared light source mounted next to the camera to track the reflective tape?

**A.**There are no Rules prohibiting that, but all other Robor Rules must be met.

**Q.**According to R08C, we cannot we cannot have any devices or decorations that interfere or jam other robot's remote sensing capabilities. Would it be in the spirit of the game, to allow for a team to put vision tape on their robot specifically for their alliance to shoot balls into the team's hopper?

**A.**There are no rules that prohibit such a strategy, however if components on a Robot are deemed to interfere with other Robots (instead of assisting), it would be considered a violation of Rule [R08].

**Q.**Per [R08], may a Class 1 laser be employed during Tele-Op to assist in target alignment?

**A.**Yes.

### R09

Not Available

## Budget Constraints

Not Available

### R10

Not Available

### R11

Not Available

### R12

Not Available

### R13

**Q.**if we use elect to use both the Axis 206 (2010 KOP camera) and the Axis M1011 (2011-2012 KOP camera) on the robot, do both of them count as KOP items (i.e. no cost on the Bill of Materials) , or only one?

**A.**One may be counted as a KOP item on the BOM.

**Q.**Is an off board compressor considered part of the robot for cost calculations? It is not specifically excluded in R13, but it is also not specifically excluded from the weight calculation which is the whole reason for having it off board.

**A.**Yes.

**Q.**Rule R13C allows exclusion from total cost of "items ever distributed to the team via FIRST Choice". May a team exclude the cost of an item listed in FIRST Choice but which was not available for distribution due to limited quantities in stock?

**A.**No.

**Q.**Can we mount cameras on our robot to record the robot's point of view for public relations and not count this on our "on robot budget" as long as we do not use the recording during the competition and the data is not sent to the cRIO or driver's station? Also, do mounts to these parts count as well?

**A.**The cameras and their mounts would count towards the budget constraint outlined in Rule [R13] as they do not fall into one of the exemptions listed in Rule [R13A-G].

**Q.**As a Rookie team we received 4 Jaguars in our KOP, do the extra two beyond a veteran team count against our budget constraints?

**A.**No.

**Q.**Is it against the budget constraints to exchange an unused cRIO module that we got in the kit of parts for one we bought? I.E. we bought a cRIO module because we need to use a second sidecar but we do not use the digital output module.

**A.**The KOP included a single NI 9403 module. If an additional NI 9403 module is used, it must be accounted for per Section 4.1.3.

## **R14**

**Q.**Are the specific items listed as exceptions to R13 also exceptions to R14? The answer to FRC0589's question on 1/22/12 seems to imply this but the rules do not say that there are any exceptions to R14 (just R13).

**A.**Yes.

**Q.**Would the operator console apply to this rule, and if so, would it be considered only one component, making its price limit \$400?

**A.**Please refer to the list of exceptions in Rule [R13].

## **R15**

**Q.**When you retrieve parts from a previous year's robot, must those parts be COTS or can they be manufactured/developed in prior years.

**A.**Please refer to Rule [R24] for which parts from previous Robots may be used.

## **R16**

**Q.**How do you record an in kind donation on the BOM and does the value of the inkind donation count toward the total cost for the BOM?

**A.**Please see Rule [R16] for information on costing materials used on the Robot.

## **R17**

Not Available

## **Fabrication Schedule**

Not Available

## **R18**

Not Available



## R19

Not Available

## R20

**Q.**The rule [R20] states teams must stay "hands off" after stop build day, and that they shall not interface with the robot. Does having ""hands off"" quoted imply that ALL contact, including non-hand contact is disallowed (i.e. through-the-bag measurements)?

**A.**Please see Rule [R20-A]. To understand the intent, imagine the Robot sitting in a sealed crate in a drayage facility at your Competition. Act like the Robot in the bag is not there. Please don't read into the quotation marks. *(answer edited, 3/7 to include reference to rule number and fix typo)*

## R21

Not Available

### Material Utilization

**Q.**Hi. We've heard many teams refer to how duct tape is illegal. In the competition manual, however, duct tape, or any tape for that matter, is never explicitly disallowed. Are we allowed to use duct tape on our robot?

**A.**There are no Rules prohibiting the use of duct tape on the Robot.

**Q.**Just found out the optical sensors from 2011 required a rule exception allowing them to be connected to the 24 V solenoid breakout, while signal wire connects to digital sidecar. Wouldn't work otherwise. We wanted to use them to monitor ball position in the robot. Legal this year?

**A.**Please see Rule [R63].

**Q.**Can we use VEX parts on our robot?

**A.**There are no rules expressly prohibiting any particular brand. Please note that there are many rules regarding what specific items may or may not be used on the Robot throughout The Robot section of the Game Manual.

## R22

**Q.**If a COTS item is mounted to an assembly of fabricated components, is the item still considered COTS if it is otherwise unmodified? (ie, no mounting holes drilled in it)

**A.**No. Mounting a COTS item into an assembly is considered modifying it, making it a Fabricated Item. If the COTS item was removed from the larger assembly and otherwise unmodified, it would be considered a COTS item.

**Q.**we have a bad cable, in this years kit. It is the ribbon cable. Can we use previous year cable?

**A.**There is a known issue with the ribbon cables distributed in the 2012 Kits, for which we apologize. There are rework instructions posted on the Kit of Parts site [here](#). Meanwhile, there are no Rules requiring the use of the ribbon cable included in this year's KOP.

**Q.**Are electromagnets legal? I don't see any mention of them. They are not a solenoid as referred to in R48.

**A.**There is no explicit rule prohibiting electromagnets. However, any such device would qualify as a custom circuit/additional electronics. As such, the device must satisfy all applicable custom circuit/additional electronics rules.

**Q.**How large can the robot wheels be?

**A.**There is no limit to Robot wheel size.

**Q.**Can we use cameras not in the Kit Of Parts?

**A.**There are no rules explicitly allowing or disallowing a camera not included in the Kit of Parts, however please note that whatever camera is used must satisfy all other Robot Rules.

## R23

Not Available

## R24

**Q.**My team needs clarification regarding COTS parts from previous years. I have observed portions of cordless drills being used on robots (motor, gearbox/clutch, and chuck). I have also been told that these parts are "grandfatherd" into use. Is this possible for this years game?

**A.**Per [R24], COTS items from Robots entered in previous FRC competitions or COTS items that are no longer commercially available may be used only if they are functionally equivalent to the original condition as delivered from the Vendor. No items are "grandfathered" on this Rule.

## R25

Not Available

## R26

**Q.**Can teams store greater than 30 pounds of prefabricated repair items outside of the competition event building and bring items in as needed as long as the total weight of prefabricated items brought into the building is less than 30 pounds?

**A.**There are no Rules that prohibit that.

**Q.**Can we work on Spare parts counting to 30 pounds after stop build day?

**A.**Yes.

**Q.**Does loading the firmware into a CRIO count as a modified part against the 30 pounds?

**A.**No, loading firmware or software onto a COTS component does not make it a Fabricated Item.

**Q.**if hypothetically you have and assembly with cots (jags and motors) and it weighs 37 pounds and you weigh the cots to be 9 pounds so the net fabricated weight is 28pounds. do you have to take the cots parts off to bring it into competition?

**A.**Teams may bring up to 30 pounds of Fabricated Items items to the competition. COTS parts are not relevant to the 30 lb allowance and may be brought in any number to the competition. However, per the definition of Fabricated Item, once any Component has been modified (including assembly to other COTS items) it is no longer a COTS item and is now a Fabricated Item. If the COTS items were removed from the larger assembly and otherwise unmodified, they would be considered COTS items.

**Q.**Do controls components (cRIO, speed controllers, etc) need to be sealed with the robot until competition, or can they be withheld for development work after Stop Build Day?

**A.**Any Fabricated Item not bagged with the Robot must count against the 30 lb restriction of Rule [R26], except those explicitly excused in Rule [R26].

**Q.**Just to clarify rule [R26], what is considered to be an upgrade part? While replacements/repair parts are self-explanatory, one could argue that any improvement is an upgrade, including addition of an entire sub-system that weighs exactly or less than 30 lbs.

**A.**Rule [R26] allows 30lbs of Fabricated Items, as defined in Rule [R22].

**Q.**Do controls (cRIOs, speed controllers, cameras, etc.) count against the 30lbs withholding allowance?

**A.**COTS items and items explicitly excluded in Rule [R26] do not count against the 30 lb of Fabricated Items that may be brought to each competition.

**Q.**Can we keep the bumpers out to work on them after Stop Build Day?

**A.**If the Bumpers are not bagged with the Robot, they must count as part of the 30 lb limit on Fabricated Items, per Rule [R26].

**Q.**Are the bumpers required to be bagged on Stop Build Day, or can they be included in the 30

pound withholding allowance?

**A.**If the Bumpers are not bagged with the Robot, they must count as part of the 30 lb limit on Fabricated Items, per Rule [R26].

**Q.**R26 limits the weight of fabricated items that can be brought outside of the bagged robot. Is there any weight limit on raw materials or COTS items?

**A.**No.

## Bumper Rules

**Q.**Can the chassis of the robot extend above the bumper by two inches as long as it stays within that vertical frame perimeter? Just to be clear, the frame of the chassis is 12 inches above the ground but it is a vertical line. See image here: <http://tinyurl.com/7k3zhqy>

**A.**The purpose of this forum is to answer specific questions about specific Rules, not to perform design reviews for legality. The Frame Perimeter must be defined within the Bumper Zone, per Rule [R01-2].

**Q.**Is it okay for the bumpers to hang from their fasteners, which hang at 12 inches from the ground. If the bumpers themselves are at the 10-inch height and are within the bumper range, but the fasteners are not wholly within the bumper range, would such bumpers pass inspection?

**A.**The Frame Perimeter must be defined within the Bumper Zone, per Rule [R01-2]. The Bumpers, per Rule [R33], must be rigidly attached to the Frame Perimeter.

**Q.**What, if any, tolerances for perpendicularity, parallelism and coplanarity apply to the bumpers? (Specify the reference datums on the robot and/or the arena, and the tolerance values.)

**A.**There are no listed tolerances.

**Q.**What is the clearance for the robot bumpers.....the height from the bumpers to the ground?

**A.**The Bumpers must be entirely contained within the Bumper Zone, which is identified in Rule [R01-2].

**Q.**where is the bumper zone? and what are its dimensions?

**A.**The Bumper Zone is defined in Rule [R01-2].

**Q.**We have a u-shaped robot, so will have split front bumpers. Can we split the our numbers; say "33" on the right and the "52" on the left or do all of the numbers need to be on one side of the robot? It may be a tight fit with the new number size criteria.

**A.**Per [R35], team numbers must be clearly visible. This means that they may not be inverted, obscured, fragmented, upside down, etc.

**Q.**Can the bumpers be covered at any point by a dynamic appendage on the robot?

**A.**There are no rules prohibiting this.

**Q.**If we have properly covered our robot with bumpers in the start up configuration can we have additional bumpers on other parts of our robot?

**A.**No Rules prohibit teams from adding padding to additional parts of the Robot, but only Bumpers as defined in Section 4.1.6 are excluded from the size and weight restrictions in [R02] and [R03].

**Q.**Referring to Figure 4-3 we are considering using the U shaped body but would like to maximize the opening. Can the perimeter of the robot be slanted in help get the ball into the center. If so, is the 8" perpendicular or along the hypotenuse.

**A.**Please see the definition of Frame Perimeter in [R01-2].

**Q.**Does the 8 in. of bumper required on each side of an exterior vertex have to be a continuous section or would multiple sections be legal as long as they totaled 8 in. per side? Can the "non-plywood backed" portion of the bumper mentioned in [G28] C be counted toward this 8 in. required by 4.1.6?

**A.**The 8 in. of Frame Perimeter immediately on either side of an exterior vertex must be covered by a Bumper.

## R27

**Q.** One side of our robot has only 6 inches of frame next to each of the two exterior vertices, with a space for ball collection between those sections. The bumper plywood completely covers the 6 in section next to each vertex. Is this legal or do we have to redesign the frame?

**A.** Per Rule [R27], there must be at least 8 inches of Bumper on each side of each exterior vertex of the Frame Perimeter.

**Q.** The Bumper must be 8 inches - Is the length of the Bumper (8 inches) defined by the length of the plywood, noodle, or the robot perimeter?

**A.** The full length of the Bumper must include all Bumper components required per Rule [R28].

**Q.** Are bumpers on the inside of the robot, where the ball enters the robot, allowed to have an angle to them? See picture at <http://dcdsteam835.blogspot.com/2012/02/bumper-question.html>  
Thanks, Team 835

**A.** We cannot comment on design legality on these forums. All Bumpers must be attached to the Frame Perimeter. Any part of the Bumper backed by plywood must have a cross-section that matches that shown in Figure 4-8.

**Q.** To clarify (referring to the bottom section of Fig 4-7), if there exists 2 8" bumper sections (instead of one long section) extending from each vertex satisfying the '8" from each exterior vertex rule' is it possible to have this 'non-bumpered' section for ball collection purposes? (under section)

**A.** There are no Rules saying explicitly what gaps in the Frame Perimeter may or may not do.

**Q.** We have a harvester to pick up balls from the court. Is it permissible to bevel the bumpers at the entrance of the harvester to assist with the ball pickup as long as the bumper backing is at least 8 inches long?

**A.** Any cross-section of a Bumper backed by plywood must match that in Figure 4-5 (not beveled). Per Rule [R28-C], cushion material may extend up to 2-½ in. beyond the end of the plywood, which may be beveled.

**Q.** Figure 4-1 shows short segments of bumper on each side of an opening. 4.1.6 says that the minimum length of bumper is 8". But does the 8" include the part of the bumper that overlaps with a bumper on the adjacent side, or only the part that is backed up by the chassis? A measurement added to Figure 4-1 would be really helpful.

**A.** The 8 in. specified in Rule [R27] does not include overlapping sections of bumper material found at an exterior vertex.

**Q.** Does the 8" of bumpers required on each side of vertex include the 3" of the bumper meeting it from the connected side? Or does the bumper need to be 8" of plywood with noodle. In Figure 4-1 it appears that the upper left horizontal bumper is 8", and the vertical is 6" with no plywood on the end.

**A.** Per Rule [R27], the Bumper must be at least 8 in. Per Rule [R28], the Bumper must be backed by plywood. Thus, the plywood must be 8 in. The figures in Section 4.1.6 are for illustrative purposes only and are not drawn to scale.

**Q.** Two teams have asked for the same information and you keep refering us back to the rules. If we have a U-shaped front on the bot can each leg be less than 8"? This appear to be an issue with rule R27. 8" required bumper from each exterior vertice. Please clarify for multiple teams!

**A.** Per Rules [R27] and [R33] Bumpers must be at least 8 in. long and. and backed by rigid members of the Frame Perimeter on each end.

**Q.** Does the 8" of bumper on the "side of each vertex" mean that there have to be 8" of bumper from each corner (16" total), or 8" of bumper on that side total (8" total, 4" from each corner)?

**A.** Please refer to [R27]. At least 8 in. of Bumper must be installed on each side of the vertex.

**Q.** R27 states the bumpers should extend 8" past a vertex, and R28 states bumpers should not

overhang an edge by more than 1". What happens when these conflict? Example- "U" shaped robot with the front edges of the "U" less than 8" wide, which rule takes precedence? Thanks, Team 812 Midnight Mechanic

**A.**Please see Team Update 3, Rule [R33]. Rule [R28] only applies to exterior vertices of the Frame Perimeter.

**Q.**Referring to Figure 4-3 we are considering using the U shaped body but would like to maximize the opening. Does the perimeter extent of the robot have to extend 8" or can it extend a shorter distance say 6" or 4" from the exterior vertex.

**A.**Please see Section 4.1.6, particularly [R27] and [R33], for how much Bumper support is required by the Frame Perimeter.

**Q.**In regards to Bumper Rule R27, when it states that "8" of bumper must be placed on each side of the exterior vertex...to provide adequate protection", does this mean that the bumpers themselves must be 8" long and 5" of the robot be covered or the bumpers be 11" and cover 8" of robot?

**A.**The 8 in. of Frame Perimeter immediately on either side of an exterior vertex must be covered by a Bumper.


**Q.**Does the 8" apply to the distance from the exterior vertex formed by the robot frame or the two bumpers? ie. if it is from the exterior vertex of the two bumpers then it would be 8"-3.5" or 4.5" from the exterior vertex of the robot frame.

**A.**The 8 in. of Frame Perimeter immediately on either side of an exterior vertex must be covered by a Bumper.

## R28

**Q.**Safety inspectors at San Diego Regional said that bumpers must be backed by 8 inches of frame, but the rules say 8 inches of bumper with 1 inch of overhang allowed. Which is true, and what will be enforced at Los Angeles Regional?

**A.**Safety Advisers do not inspect Robots for legality; Inspectors, led by the Lead Robot Inspector at each event, do. Per Rule [R33], each end of the Bumper must be rigidly attached to the Frame Perimeter. Rule [R33] also says that no section of Bumper greater than 8 in. may be unsupported. The one inch of overhang you reference is part of Rule [R28], and deals with extension beyond the Frame Perimeter, not the frame itself. All Robots at every event are inspected to these same Rules.

**Q.**Would a bumper shaped like  whose base is parallel to the ground and maintains a 5" vertical cross section throughout as in Fig 4-5 in [R28] be legal?

**A.**The purpose of this forum is to answer specific questions about specific Rules. We defer inspection of Robots to Inspectors and will not do design review in this forum.

**Q.**R28 c states cushion mat'l can only extend 2-1/2" beyond end of plywood and this is different from last year when it was 3-1/2" allowing for teams to not butt the plywood at the corners. Is 2-1/2" the correct dimension?

**A.**Yes. Rules from previous FRC seasons do not apply to Rebound Rumble.

**Q.**Would vinyl banner material (normally used in outdoor applications) qualify as a "rugged, smooth cloth", provided it meets all other rules? We know it's rugged and smooth, but we know the GDC's occasional persnickiness over what the label says.

**A.**Vinyl is not cloth. Please note that, per Rule [T04], the final decision on Robot legality is left up to the Lead Robot Inspector at each event.

**Q.**We can only find 2.25" pool noodles for the bumpers. Is there a tolerance on the diameter for the pool noodles? Can the 2.25" noodles be used for the bumpers?

**A.**No.

**Q.**According to the "2012 FRC Inspection Checklist Rev A" this is in the checklist "All segments must be  $\geq 8$ " as defined by backing..." Yet Rule R28.B in the rulebook does not define a minimum length for any segment of the bumpers. Which statement should a team follow when making

bumpers?

**A.**The Game Manual is the presiding document for all Rebound Rumble Rules. The Inspection Checklist has been updated. Our apologies for the confusion.

**Q.**Bumper - noodles: what if we cannot find noodles - are there other materials that may be substituted

**A.**No.

**Q.**Can the physical frame of the robot be above the bumper zone as long as the bumpers traced the outline of the frame perimeter? Can the bumpers then be attached to a structure purely for made for the bumpers?

**A.**Per Rule [R01-2], the Frame Perimeter of the Robot must be totally within the Bumper Zone.

**Q.**Does the end of the bumper next to an opening along the frame perimeter have to be perpendicular to the frame or can it be angled? If angled, does the 8" rule from the perimeter vertex apply to the outside face or to the perimeter face?

**A.**Per [R28], the full 2 1/2" pool noodle must be present and thus may not be angled.

## R29

**Q.**To preserve material and time, it is possible to cover the bumper with a white cloth and make red and blue rectangle (reversible) with our number. In this way, only the corners of the robot gone be white. Perhaps, if it not possible, can we make blue and red corners to dissimulate de white corner.

**A.**There are no Rules prohibiting a changeable color cover; however, the entire Bumper (including corners) must be either red or blue during the Match as per [R28-D].

**Q.**We intend to use an angled plate to aid in crossing the bump which will also be bent such that it will have a section perpendicular to the ground in order to mount bumpers. These will be at a different height than other bumpers. It would help if we can upload a drawing to explain but is it legal?

**A.**This forum is for answering specific questions about rules, not performing design reviews for legality. Bumpers must be located within the Bumper Zone. Not all Bumpers have to be at the same height within the Bumper Zone.

**Q.**If the machine tilts causing the bumpers to leave the bumper zone in the process of getting onto the ramp in the center of the field a rule violation? The bottom of the machine we are designing will lift up a bit and cause the bumpers to raise with it.

**A.**Please see Team Update 2012-01-20.

**Q.**Can we use a 4.5 inches tall plywood instead of 5 inches for the bumpers?

**A.**No

**Q.**Bumpers must be constructed with 3/4 in. (nominal) thick by 5 in. tall plywood backing. If we bend then glued together thinner sheets of plywood to form a semicircular bumper 3/4 " in thickness would it pass inspection. We are considering a frame with a semicircular section.

**A.**For the purposes of FRC, thin pieces of plywood glued together is not equivalent to one 3/4" piece of plywood.

**Q.**As long as no other rules are violated, can the various sections of bumpers on a robot be at different heights within the bumper zone? Would this apply to the 2 bumper sections on adjacent sides of a common vertex? Can bumper sections be mounted non-parallel to the floor in the bumper zone?

**A.**There are no rules prohibiting either of these scenarios.

## R30

**Q.**Can a bumper be articulated (eg. with a hinge) as long as it is locked and is completely non-

articulating during the entire game? This hinge could be used for getting the bumper on and off quickly.

**A.** Although we cannot approve of a design in this venue, if the Bumpers are locked and rigidly mounted to the Robot during the Match, they are in compliance with Rule [R30].

**Q.** Related to the question about mechanism pushing against the carpet to lift the robot - is a mechanism pushing on the barrier allowed by R30, and would it be considered to change the height of the robot?

**A.** Revised Answer (our apologies for the confusion): Rule [R30] does not prohibit Mechanisms from pushing down on the Barrier. The overall height limits still apply. ~~The Bumper Zone rules must be met throughout the Match and the Bumper Zone is in reference to a Robot flat on the floor. At every point in the Match, no matter what configuration, orientation, or Court position the Robot is in, if the Robot were to be placed flat on the floor, Bumper Zone requirements must be met~~

**Q.** Bumper may not be articulated in relation to what, the frame or the floor? I always assumed the frame. But our regional judge and inspector both say it is in relation to the floor. I.e. that if you have a mechanism push down against the floor to lift a wheel, R30 is violated even if still under 10in

**A.** The Bumpers may not be articulated in relation to the Robot.

## R31

Not Available

## R32

**Q.** Can one of the bumper covers be made with elastic so that the team can slip the alliance color over the bumper, for quick alliance color change?

**A.** There are no rules that prohibit this method for accommodating Rule [R32].

## R33

**Q.** Does "unsupported" and "supported" of the bumper refer to the presence of attachments points to the frame or the existence of a frame/structure behind the plywood? Can the rigid attachment points of a bumper to the frame exceed 8" apart as long as the gap behind the bumper are < 1/4in, R33, fig 4-7?

**A.** It refers to the presence of frame per the details provided in the parenthetical in Rule [R33]. Yes.

**Q.** How much tolerance is for attaching at the "end" of the bumper? Do we need to attach within 4" of the physical end? 1"? At the infinitesimal point at the end of the bumper? Physical constraints may make it difficult to place two perpendicular fasteners at the same infinitesimal point in space.

**A.** If it appears that a Bumper is rigidly attached at the end to a reasonably astute observer, it will be considered attached "at the end".

**Q.** Where is the end of a Bumper? We have bumpers that are two 8" pieces of plywood rigidly attached perpendicular to each other at the corner, plus noodle cloth, etc. Do we have to attach to the frame perimeter at just the two end points of this L shaped bumper, or at the corner as well?

**A.** If it appears that a Bumper is rigidly attached at the end to a reasonably astute observer, it will be considered attached "at the end".

**Q.** R33 "each end of the Bumper must be rigidly attached to the Frame Perimeter" Does that mean the physical connection MUST be at the end or just that the Bumper is well attached at the end but the connection can be inboard. The Kit frame is exceedingly "busy" with fasteners at the ends.

**A.** There must be rigid attachment of the Bumper ends to the Frame Perimeter, however there is no explicit prohibition on additional attachments located elsewhere.

**Q.** Concerning continuous support of bumper, if the ends are supported top to bottom, and if the top edge of the 5" tall plywood bumper backing is continuously supported by something like a 1" tall structure, does that qualify as meeting the "no gap greater than 8"?

**A.** Yes.



**Q.** Pertaining to R33, namely the (i.e) line about the ends of bumpers needing to be attached to the frame perimeter, does it mean that the vertices of the bumpers need to be attached, or does the rule mean to specify a different type of "end"? If so, how far away from the corner can they be attached?

**A.** The specific part of Rule [R33] referenced means that Bumpers may not extend beyond any segment of Robot frame beyond that which is expressly permitted in [R28] and the rest of [R33] regarding unsupported sections.

### R34

**Q.** Regarding bumper rules (R28-R35), we would like to make the fabric instead of the bumpers interchangeable while maintaining compliance with all of these rules. We see no rules requiring separate red and blue bumpers. Have we missed a rule that would prevent this design?

**A.** There are no Rules regarding how a team chooses to meet the blue and red bumper requirement of Rule [R34].

### R35

**Q.** R35 states "team number ... in four locations" Elsewhere, game rules that specify exact quantities use explicit phrases like "one and only one" (R51,43,44,74). Will R35 be updated to be consistent with the narrower interpretation of Update 2012-03-06 as "exactly four", before the second week events?

**A.** This information was relayed to teams via Team Update 2012-03-06.

**Q.** If one of the four sets of team numbers is temporarily covered by a deployed appendage, is that a violation of ?

**A.** No.

**Q.** I have 1528 on the back and the two sides of our robot. If I put 15 on the front right bumper and 28 on the front left bumper, then I create our team number 1528. The number would therefore be in only one location (the front). Would this not satisfy the rule of having our number in only 4 location?

**A.** Per [R35], team numbers must be clearly visible. This means that they may not be inverted, obscured, fragmented, upside down, etc.

**Q.** Is it permit able for the team number to wrap around the corners, given that they are at 90 degree intervals and are clearly visible from 100ft away

**A.** Per [R35], team numbers must be clearly visible. This means that they may not be inverted, obscured, fragmented, upside down, etc. Bumpers that wrap around a corner are likely to be considered fragmented and not able to be seen in their entirety.

**Q.** The intended purpose of the "approximately 90° intervals" clause is unclear. Given a rectangular robot, if the numbers on a bumper begin/end at the extreme left end, can the numbers on an adjacent bumper be centered horizontally, or must they also be placed at the extreme left end?

**A.** The requirement is that the numbers be viewable from approximately 90° intervals around the Robot. There is no requirement on exactly where, within that 90° interval the numbers are.

**Q.** As it has been stated, it is impossible to fit 4 numbers not containing a 1 within 8 inches. Why do higher number teams have a different minimum bumper width than lower number teams?

**A.** The minimum protection required on each side of an exterior vertex is the same for all teams.

**Q.** Does R35 limit the team number quantity to exactly four locations? For instance, if one side of the robot has two short bumpers separated by a gap, can the complete team number be put on both of those bumpers? Thus, there'd be two complete team numbers on one side of the robot.

**A.** Rule [R35] requires that the team number be displayed in four locations, no more or fewer.

**Q.** R35 states team number in 4 locations at 90 degree intervals. With a U shaped frame the front bumpers are 2 sections 8" wide. With 3/4" stroke, 4" wide font it is impossible to fit 4 numbers in



8". Could we use a smaller font on both sides of the front bumpers as long as its still clearly visible?

**A.No.** Robot designs must accommodate all Robot Rules.

**Q.**We have a short front bumper on the left and one on the right. I understand each short bumper must be at least 8 inches long. With [R35], it is not possible to fit 4 numbers with 3/4" stroke in an 8 inch width and have gaps between the numbers. I don't want to have wider bumper than is required.

**A.**Please ask a Question.

**Q.**We are deciding to use a square U frame. So, we have to split the 4th bumper into 2 sections. Because of this, we can't decide how to place "3490" on our Bumper. Should we place the 4 numbers on 1 side, or should we split 34 and 90 across the Bumper. R35 doesn't explain how to handle this situation.

**A.**Per [R35] team numbers must be "clearly visible from a distance of not less than 100 ft, so that judges, referees, and announcers can easily identify competing Robots." Thus they may not be obscured in any way (disconnected, out of order, rotated, upside-down, mirror imaged, etc).

## Power Distribution

**Q.**Off PD is a smaller old style PD which powers the low amperage items. Is this legal regards the team advisory which stated only 1999 and later PD's can be used?

**A.**Please see Rule [R37].

**Q.**If heat shrink is used to cover splices or connections, does the color of the heat shrink matter? For example, can ordinary black heat shrink be used on all wires even if the wires are positive current (red) wires?

**A.**There are no Rules governing the color of shrink wrap used on a Robot.

## R36

**Q.**Please clarify if we are allowed to use a Yuasa brand as our regional is next week and we need to place this order ASAP. We had batteries explode from last year and need to purchase a large number and do not what to purchase the incorrect ones. Thanks!

**A.**Please see Rule [R36]. Unless the battery meets the criteria defined there, it is not permitted.

**Q.**R36 says that the battery must be a MK ES17-12 12VDC battery. We spoke to a vendor who originally had identical batteries to those in the KOP (Genesis Brand). Now when we are ready to purchase they are different (Yuasa Brand). The vendor says that they are interchangeable and that they are the same.

**A.**Please see Rule [R36]. Unless the battery meets the criteria defined there, it is not permitted.

**Q.**Figure 4-8 says the main battery capacity is 10 A·h. This is inconsistent with [R36], which requires either an MK ES17-12 (18 A·h @ 20 h rate) or an EnerSys NP18-12 (17.2 A·h @ 20 h rate). What is the correct specification for the battery (and at what discharge rate)?

**A.**The text on Figure 4-8 is illustrative only. The Rule takes precedence.

**Q.**Which EnerSys NP18-12\* batteries (where "\*" is a suffix like B, R, FR, BFR, RFR, etc.) are allowable under [R36]? According to the manufacturer, FR is a flame resistant case, and B, R or nothing indicate terminal style. The model number NP18-12 does not have a space. You wrote "NP 18-12" in [R36].

**A.**Any Energys sub-variant of the "NP18-12" model of batteries is acceptable.

**Q.**According to R36 in the line "Batteries integral to and part of a COTS computing device are also permitted (i.e. laptop batteries), provided they're only used to power the COTS computing device." and the box in R65 we are able to use a laptop mounted on the robot for image processing, is this true?

**A.**Yes.

## R37

**Q.**Rule R37B appears to end with the word "and". And what? I don't see R37C.

**A.**We apologize for the confusion. Please see Team Update 2012-02-03.

**Q.**In Section 4.1.7, [R37], it is stated: "The only legal source of electrical energy for the Robot during the competition is (...). This is the only battery allowed on the Robot." Are the teams allowed to use two batteries in parallel?

**A.**Please refer to all of [R37].

**Q.**Regarding rule R37B, are teams allowed to use more than one power distribution board?

**A.**No, per [37-B] teams are permitted a single Power Distribution Board.

## R38

**Q.**The rule R38 states the KOP camera is in a grounded enclosure. The KOP camera we received is all plastic. Isn't the camera electrically isolated if using the supplied mount? Other teams have told us the camera needs to be mounted to a piece of plastic/wood and not directly to the robot frame.

**A.**Per Rule [R38], the camera must be electrically isolated from the frame. For questions about how to isolate the camera or its specs/construction, please use the *FIRST* Forums.

## R40

Not Available

## R41

**Q.**Based upon the rules, I cannot find any rule that disallows the use of split wire loom to route and keep wires neat. Is this allowed or not?

**A.**There are no rules prohibiting this.

## R42

**Q.**Are we allowed to have a second 5v converter connected to separate terminals from the first one that power something other than the wireless bridge?

**A.**There are no Rules prohibiting this.

## R43

**Q.**Is any Snap Action MX5 Type I (i.e. auto reset) 20 A, 30 A or 40 A circuit breaker legal for use on the PDB as an "identical equivalent" "appropriate value auto resetting Snap Action circuit breaker"? (See [R43].)

**A.**The only permitted circuit breakers for the Power Distribution Board are those equivalent to those in the 2012 Kickoff Kit, part numbers VB3-A20-F57, VB3-A30-F57, and/or MX5-A40.

**Q.**Can multiple infrared sensors be powered from one 20A circuit off the PD board using a terminal strip?

**A.**There are no Rules prohibiting that.

## R44

**Q.**If we extended a wire that was part of a supplied device (LED ring), with 22 AWG wire is it legal? Is there a point at which we have to change to 18 AWG.

**A.**Any wiring that is not part of a COTS device must be compliant with all applicable Robot Rules.

**Q.**Fr801-001 motors have 14 gauge wire leads made on to them? Based on first wiring requirements (12g wire for 40 amp circ.) can these be attached to 40 amp breaker? Which if wire to them is 12 or 10 gauge?

**A.**Per Rule [R44], wires that are originally attached to legal devices are part of the device and by default legal as supplied.

**Q.**[R44] lists several sizes which are roughly equal to the standard nominal diameters of solid round AWG wires (per ASTM B258). For non-solid-round or non-AWG wires (e.g. stranded, flat, square, etc.), is equivalence determined by comparing the cross-sectional area of the conductor?

**A.**No. If a flat or square conductor is rated as #14 AWG it is legal; if it is rated as "handling the same current" as a #14 AWG it is not a legal wire.

**Q.**What is the minimum allowed wire size between the Digital Sidecar and the Robot Signal Light?

**A.**There is no minimum listed.

**Q.**Are the wire sizes listed in [R39] & [R44] not "appropriately sized" for any particular compositions of wire?

**A.**No.

## R45

**Q.**Do the wire color schemes and polarity rules apply to the downstream side of the Jaguar speed controller? In a symmetrical built robot with standard motor rotation directions, you have to change the direction of rotation of a motor by swapping positive and negative on the Jaguar.

**A.**Please see Rule [R45], particularly the exceptions listed in parenthesis.

**Q.**Concerning R45. West Marine makes this nice duplex DC power cable. It is Red and Yellow for the two conductors. It is called Safety cable and uses Yellow vs Black so there is no confusion with black in AC circuits. Would this cable be acceptable to use?

**A.**No, per Rule [R45].

**Q.**With respect to R45, would it be acceptable to use black wire for the +24, +12 or +5 Vdc connections that: 1) is wrapped over it's whole length with red, white or brown electrical tape 2) is wrapped with red, white or brown electrical tape at each end 3) has a white stripe painted along it's length

**A.**No.

## R46

**Q.**[R46] allows "Multiple low-load, pneumatic solenoid valves or lights" to be connected to a single relay. In past seasons we have been allowed to wire one lead of the lights directly to a ground terminal on the Power Distribution Board so both Spike outputs may be independent. Is this legal in 2012?

**A.**There are no Rules prohibiting this.

## R47

**Q.**Is it permissible under R47 to attach low current wiring and a connector to the battery, in addition to the 6 AWG wire and Anderson connector, for the purpose of connecting a battery charger to the battery when it is not in the robot.

**A.**No, Rule [R39] does not make exceptions for such circuitry.

**Q.**Can multiple custom COTS circuits (e.g. Kinect and CAN Adapter) be wired to a single 12V switching regulator which is connected to a 20A Breaker on the Power Distribution Board? Total current draw is 1.8A.

**A.**There are no Rules prohibiting that.

## Motors & Actuators

**Q.**How does the GDC define an electromagnetic solenoid? Is it defined as a solenoid or an actuator?

**A.**Electric solenoids are defined as actuators in Rule [R48].

**Q.**How do you connect two Jaguar motor controllers in parallel?

**A.**The purpose of this forum is to answer specific questions on specific Rules. For technical questions,

please go to the [FRC forums](#).

**Q.**When using a jaguar with pwm control can we use the limit switch feature that is built into the jaguar?

**A.**No, this would be a violation of Rule [R61-B]. The limit switch feature may be used if the Jaguar is being controlled via CAN.

**Q.**Can KOP from FTC be used. Specifically Tetrrix 12 volt motors. If not can other parts from the Tetrrix kits be used?

**A.**The FTC KOP is not considered part of the FRC KOP. The only motors allowed on a Robot are listed in Rule [R48]. Other parts from Tetrrix may be used, if those parts satisfy all other Robot Rules.

**Q.**Is there a limit to how many Black Jaguars you can have on a robot? I do not see anything in the rules so I assume it is ok but I want to double check if my assumption is wrong. Thanks

**A.**There are no explicit limits on the number of Jaguars on the Robot.

**Q.**Can we use Banebot p80 2 CIM gearbox?

**A.**There are no Rules explicitly prohibiting this, but all other Robot Rules apply.

**Q.**Regarding the Compact Fan, PN 4212, as found in the Kit of Parts checklist: The only listed legal use of fans is per [R48-K]. This fan is not part of a COTS computing device. Can you clarify the conditions under which this fan would be considered "part of a speed controller", or other legal use?

**A.**Please see Team Update 2012-01-24.

**Q.**Do we have to use a jaguar for every motor or for just the SIMS motor

**A.**Please refer to Rules [R46] and [R50].

## **R48**

**Q.**Can we use a Keyang REAR GATE MOTOR, DC13.5V? I believe it was a KOP for 2001 or 2002?

**A.**It is up to each team to prove each motor used on the Robot is compliant with Rule [R48].

**Q.**We have a sponsor of our team who owns and operates an automotive recycling yard. However he is not a member of the ARA. Are we able to use window motors recycled from vehicles in his yard?

**A.**Per Rule [R48-I], a motor from an old car must be obtained through either the FIRST-Automotive Recyclers Association partnership or from a prior years' KOP to be legal for use.

**Q.**The servo power formula is a pernicious falsehood, because it exaggerates the maximum power of a servo by a factor of 4. (Actually: max. power = 0.5 free speed × 0.5 stall torque.) Does [R48] restrict servos based on their actual maximum power rating, or the incorrect power rating in the blue box?

**A.**The formula you listed is for determining the max power of a motor. The max power formula for a servo is listed in the Blue Box on Rule [R48].

**Q.**Can we use a COTS electromagnet as a release mechanism for a catapult? It is a 12V device that draws less than 5 watts. This is less than the power limit imposed on a solenoid per the rules. Please confirm that this device is not in violation of the 2012 rules.

**A.**There is no explicit Rule prohibiting electromagnets. However, any such device would qualify as a custom circuit/additional electronics. As such, the device must satisfy all applicable custom circuit/additional electronics Rules.

**Q.**Is it legal to use a part of a drill with a fisher price on the robot?

**A.**There are no explicit restrictions on gearboxes. The only motors that may be used are those specifically allowed in Rule [R48].

**Q.**We have a BaneBOT motor attached to the shaft of our throwing wheel. The motor is not

powered, we are using it as a tachometer to generate current for an analog input for our PID feedback control for shaft speed. Is this a sensor or does it need to be 1 of our 4 allowed BaneBOT motors?

**A.**If the motor is on the Robot it must count as a motor, regardless of use.

**Q.**Can the Denso motor from the First Choice Kit of Parts be used (fc12-20)

**A.**Please see Team Update 2012-02-14; our apologies for the confusion.

**Q.**Can I use a COTS motor that is integrated into the design of the device. IE: A scissor lift that is driven by a 12V motor, built in off the shelf?

**A.**If a motor is not explicitly allowed in Rule [R48], it may not be used.

**Q.**In part J, it says that you cannot exceed 10 watts continuous. What we want to know is how many watts intermittent we can have. Thank you.

**A.**Rule [R48-J] defines the specifications of permitted electrical solenoid actuators, not actual usage parameters.

**Q.**We want to use an electromagnetic clutch on our robot. The clutch is a 24v component. 1)Is it legal to have a power converter to convert 12v to 24v 2) Are electromagnetic clutches a legal component since they use no actuator?

**A.**1) Yes, provided all other Robot Rules are met. 2) There are no Rules specifically prohibiting the use of clutch mechanisms on the Robot. However, these devices may not be used if they contain electric motors and/or servos different from, or in addition to, those permitted in the Robot Rules. Simply put: if the device utilizes an electric solenoid to provide mechanical motion for the device, that solenoid must meet the requirements of Rule [R48-J].

**Q.**Vex released an intergraded encoder add on to the 393 motor. Is it legal to install it?

**A.**There are no Rules that explicitly prohibit this device; however, no other Robot Rules must be broken (e.g. Rule [R49]).

**Q.**Please give clarification on the following motor rules; E.up to 2 AndyMark motors (acceptable part # is am-0912), F.up to 2 AndyMark gearmotors (acceptable part # is am-0914), Does this mean a total of 4 AndyMark am-0912 can be used on robot or is item "E" referring to the p74 gearbox??

**A.**Rule [R48-E] and [R48-F] allow two different motors. A team may have up to 2 of each part number (am-0914 and am-0914) on their Robot.

**Q.**Are we permitted to use DC motors not listed in 4.1.8 if they are not being used as actuators (we are driving the motor and measuring the resulting voltage, using the motor as a tachometer)?

**A.**No.

**Q.**Is a globe motor (PN: 409A587) from the previous 2008 KOP in compliance with rule 4.1.8 line I, and therefore usable on this years robot? On the previous years KOP checklist it was not defined as a window lift, seat, windsheild wiper, or door motor.

**A.**The globe motor is not a window lift, seat, windshield wiper or door motor and thus cannot be used.

**Q.**In section 4.1.8 line B it states we may use up to 4 banebot motors provided in the KOP. Does this mean that we can only use 1 of each type of motor provided up to a total of 4 or can you use more than 1 of each model up to a total of 4 motors?

**A.**Teams may use up to four total of the allowed part numbers in any combination the team chooses.

**Q.**Can a 12 volt motor on a linear actuator be used on this year's robot? The linear actuator in question is an AEI "C" Series.

**A.**Please refer to Rule [R48] for the list of approved motors.

**Q.**Per rule 48 we can use: "C.up to 2 window motors ..." "I.up to 2 window lift,... from a prior years' KOP." Does this mean we can use up to 4 window motors? 2 From this years KOP and 2 from a prior KOP(same motors)? If not, what if the part numbers are different on the previous year KOP window motor?

**A.**Yes.

**Q.**Can we use the two windshield wiper motors from the 2012 KOP, and 2 additional windshield wiper motors obtained through either the FIRST-Automotive Recyclers Association partnership or from a prior years' KOP? This would mean a total of 4 wiper motors would be allowed for this years robot.

**A.**There are no windshield wiper motors listed in the 2012 Kickoff Kit Checklist. Per Rule [R48-K], up to (2) of those types of motors may be used via the ARA partnership.

**Q.**Is a 12vdc clutch permissible?

**A.**There are no rules specifically prohibiting a clutch, but all other Robot Rules must be met.

**Q.**R48 does not appear to allow the use of the van door motor available from FIRST Choice in this year's kit of parts. Should FIRST Choice be added as an allowable source in R48.I?

**A.**The van door motor in FIRST Choice was provided in the 2008 Kit of Parts, and therefore is allowed per [R48-I].

## R49

**Q.**The VEX 2 Wire Motor 393 (276-2177) comes with user-replaceable gears to choose one of two speed options. The gearing in many servo and VEX motors can be accessed and modified. Do these modifications violate [R48]? (Please specify which parts of these motors are considered "integral".)

**A.**The complete assembly is considered the motor and may only be modified per Rule [R49] (as elaborated upon in [R49]'s Blue Box).

**Q.**Would putting a spring in a single action electric solenoid with a removable shaft (basically making it into a double action solenoid) break rule 49?

**A.**Yes.

**Q.**Does painting a motor violate rule R49?

**A.**Painting is not listed as an exception to modifying motors in Rule [R49], so it is not allowed.

**Q.**We want to use a worm-gear for a BaneBot RS550, but we are low on budget and time. the gearbox of a window motor is what we need. says that the window motor is not to be used without its gearbox, but can the gearbox be used without the motor? after all, it is just another 80:1 worm-gear.

**A.**Yes.

**Q.**In regards to the AndyMark pg71 Gearmotors (#AM-0914), we understand it is not legal to remove the motor from the gearbox, but can the gearbox itself be modified? Can a stage of the planetary gearbox be locked as to change the internal ratio of the gearbox, which would result in no net power gain?

**A.**No, that would be a violation of Rule [R49].

**Q.**Would removing the attached gearbox from the am-0914 AndyMark Gearmotor (so that a different gearbox could be used) constitute "modifying" the MOTOR thus violating R49?

**A.**Please see Rule [R49] for allowed modifications to motors.

## R50

**Q.**Are non-function decorations exempt from rule [R50]?

**A.**No.

**Q.**Is it legal to put an inline current sensor between a motor and a motor controller? This would be connected in series.

**A.**Please see Rule [R47].

**Q.**Are we allowed to use a real electromechanical relay (not a spike) in one line of a motor, between the motor and motor controller? To this effect the motor could only be enabled or disabled (on/off), and not changed until commanded by the motor controller.

**A.**Please see Rule [R47].

**Q.**R50-A requires all CIM and Fisher Price motors to connect to a speed controller. The rules allow several motors with a higher stall current than a Fisher Price, some that look largely identical to it. Are we allowed to connect these more powerful, virtually identical motors to relays?

**A.**There are no Rules expressly prohibiting that.

**Q.**This section states that servos must be connect directly through the Digital Side Car. How are the VEX motor controllers supposed be connected. It would appear that they should also be connected through the digital side car but there is no reference for this. They cannot take 12 volts.

**A.**There are no specific rules legislating how to power the VEX motor controllers and motors. For more technical help, you may post questions on the [FIRST Forums](#).

**Q.**Can a Jaguar motor controller be placed in a 30A slot if used with a low Amp Motor

**A.**There are no rules that prohibit this.

**Q.**With R50, we are assuming that no 2 Jaguars control 1 Motor. However, it doesn't state that no TWO Motors can be controlled by 1 Jaguar. To save Jaguars, we would like to control 2 drive motors with a single Jaguar, resulting in four motors controlled by 2 Jaguars in total. Would this be legal?

**A.**No, per [R46].

## R51

**Q.**The game manual says that only one type of spike is allowed this year. When I search for the part number I get the new VEX spike that has a green label on it. We were wondering if the spikes that had blue labels from last year were still allowed?

**A.**Any Spike Relay module labeled with the specified part number, or called out by the supplier as an equivalent part number, is permitted.

## Control, Command & Signals System

**Q.**When the field management system signals the switch from Autonomous to Teleop, what happens? We sometimes seem to be stuck in Autonomous and have to reboot the cRIO to continue in Teleop. The message we receive is "No Robot Code". I can provide our Autonomous vi if needed.

**A.**The purpose of this forum is to ask specific questions about specific Rules. For technical questions, please visit the [FIRST Forums](#).

**Q.**We were wondering if we could use the solenoid breakout to power an LED light for the camera.

**A.**There are no Rules prohibiting that.

**Q.**Using Java, robot does not drive straight (it slants slightly to one side), therefore our auto-balancing no longer works. The speed control mode of the Jaguars does not work. There is a problem involving the speed control mode on the Jaguar. Need help re: FIRST programming and CAN Jaguars.

**A.**The purpose of this forum is for specific questions on Game Rules. For technical questions, please post on the [FRC Forums](#).

**Q.**how do you put the program on the CRIO?

**A.**The purpose of this forum is for specific questions on Game Rules. For technical questions, please post on the [FRC Forums](#).



**Q.**Can image processing be performed on the driver station and data be sent back to the cRIO for it to act upon?

**A.**Yes.

**Q.**When we try to format the 8 port cRio we keep getting the following error message: "No cRIO Images found. Expected here: C:\Users\Developer\sunspotfrcsdk\cRIO\_Images" How do we fix this? We have been trying for 7 days!

**A.**This forum is for answering game rules only. Please use the [FIRST Forums](#) for technical questions.

**Q.**Can a netbook or laptop be used purely as a sensor on the robot (I.e. to monitor a camera, do vision processing, then signal the crio over a serial port with results), assuming it adheres to part cost limits.

**A.**There are no rules prohibiting this.

## R52

**Q.**Can an additional cRio be used as a coprocessor?

**A.**Rule [R52] states that a team must use a cRIO to control their Robot. It doesn't prohibit the use of additional cRIOs, but all additional cRIOs are considered "additional electronics." As such, they must not violate any other Robot Rules. Using a 2nd cRIO is no different than using an Arduino, PIC chip, netbook, or some other computing device as a co-processor.

**Q.**For interfacing the Kinect to the cRio, can we use a single board processor (e.g., PandaBoard) for the USB host interface, image processing, and communication with the cRio via ethernet? We feel it's akin to the microcontroller in the KOP Axis camera that acts as an HTTP server for the image data.

**A.**There are no rules specifically disallowing this. However, all other Robot rules must also be satisfied.

## R53

**Q.**Does R53-B prohibit devices other than the cRIO connected to the wireless bridge over ethernet from watching UDP packets on ports 1100 - 1200 sent by the driver's station?

**A.**Yes, per Rule [R53] devices other than the cRIO may not receive UDP packets using ports 1100-1200 except for ports 1130 and 1140.

**Q.**Does R53-B preclude using TCP/IP to communicate between the cRIO and an Ethernet-connected COTS device?

**A.**No.

**Q.**According to R53, if the Bridge must be directly connected to Ethernet Port 1, how do we connect the Web Camera and Ethernet to CAN bridge to the new 4 port cRio which only has one Ethernet port? R62 allows the connection and use of these two devices, but R53 seems to make implementation impossible.

**A.**This forum is for specific questions about rules. For technical questions, please use the FIRST Forums, specifically, the Control System Forum, <http://forums.usfirst.org/forumdisplay.php?f=1338>.

## R54

Not Available

## R55

**Q.**I would like to use the built in web server on the Axis Camera to receive live video on the drivers console via a web browser. I know it's possible, but is it permissible?

**A.**There are no Rules that prohibit this.

**Q.**The first sentence states we are allowed to communicate to our Robot via a D-Link DAP-1522 (both receiving info and sending info). The second sentence states we can only send info to our Robot. This is a contradiction because we need to communicate both ways to our Robot.

**A.**Correct. Two-way communication is permitted per the first sentence of [R55].

## R56

Not Available

## R57

**Q.**If slot 2 of the cRIO is broken (e.g. a bent or busted pin), can the digital module be placed in slot 6 of the old model or slot 4 of the new model?

**A.**Per Rule [R57-B], a Digital Sidecar must be connected to a NI 9403 module in Slot 2 of the cRIO.

## R58

**Q.**"To check the power quality provided to the D-Link WiFi access point. Is it legal during competition matches for a custom circuit or the cRIO with the analog breakout (AndyMark P/N: AM-0867) to connect to and monitor the voltage output of the 'DC/DC Power Converter' (P/N: CLL25-24S05) connected to the 'D-Link WiFi access point' (KOP P/N: DAP-1522) and/or the 12V output that powers the ' DC/DC Power Converter' on the FIRST 'power distribution board' (KOP P/N: A003206 / AM-0265) with or without suitable voltage dividers?"

**A.**Yes, this is allowed per Rule [R47].

**Q.**The 3-position slider switch on our D-LINK DAP-1522 bridge is broken, and we cannot find an exact replacement switch. We could replace the slider switch with a functionally equivalent toggle switch, but need to confirm that this is acceptable under [R58]-M.

**A.**Yes, provided the performance and specifications of the component after the repair are identical to those before the repair.

**Q.**We are using a second cRio to handle image processing, does the prohibition in [R58] against modifying, drilling, or disassembling it still apply?

**A.**Only the primary cRIO is held to the modification requirement of Rule [R58].

**Q.**Some team members decided to mount a shield to protect the cRio by drilling two 1/4 inch holes into the side of the cRio chassis. After seeing R[58], the shield and bolts were removed. Do these holes violate R[58]? Can they be repaired by exception M, or must a new cRio be used?

**A.**Drilling holes in the cRIO is a violation of Rule [R58].

**Q.**Based upon section J., does this allow mechanical limit switches such as supplied with the KOP to be wired directly to the Jaguar without feedback through the sidecar and crio?

**A.**This is allowed for CAN operation, but disallowed per Rule [R61-B] for PWM operation.

## R59

**Q.**R59 Can we monitor the voltage from a "master" jaguar to the analog break out via a voltage divider to control a "slave" jag? This resolves a documented problem with the firmware. The GetOutputVoltage in the CANjag class does not return the proper value when in position mode.

**A.**There are no Rules explicitly prohibiting this; however, all Robot Rules must be met, e.g. Rule [R52].

## R60

Not Available

## R61

**Q.**From two Jaguars can you combine the PWM signal to one port on the Digital Sidecar?

**A.**There are no Rules prohibiting that.

## R62

Not Available

## R63

**Q.**In 2011 Team Update #5, connecting KOP line sensors to a 24V Solenoid Breakout (to avoid sensor brownouts) was explicitly permitted. In 2012, there don't seem to be any rules against this. Are we allowed to connect a sensor's power inputs to a 24V Solenoid Breakout as long as [R63] is obeyed?

**A.**There are no Rules explicitly prohibiting this.

## R64

Not Available

## R65

**Q.**We were wondering if it allowed to use a Banebots part RS-385 as a generator. It is connected to a shaft that is powered by separate motors. The RS-385 is connected to the input ports on the analog breakout, and there is no electrical load as per R50 (power regulating devices).

**A.**This motor is not legal per Rule [R48].

**Q.**Is a custom solenoid breakout board which replaces the stock breakout board supplied in the KOP considered legal under [R65]? It connects directly to the NI 9472 25-pin connector. There are no active components on the board. Its just wires & connectors. Pneumatic components are unmodified.

**A.**This would be a violation of Rule [R65].

**Q.**Can the Digital Sidecar I2C port be used for custom circuits and sensors?

**A.**Yes per Rule [R65-C].

## R66

Not Available

## R67

**Q.**Is it legal to use more than one camera (axis 206/m1011) on the robot?

**A.**There are no Rules prohibiting that.

## Pneumatic System

**Q.**Is there a size limit and number limit on pneumatic cylinders that can be used on the robot?

**A.**There is no explicit limit on the number or size of pneumatic cylinders.

**Q.**How many air storage tanks can be used on the robot?

**A.**There is no explicit limit on the number of storage tanks a Robot may use.

## R68

Not Available

## R69

**Q.**One of our sponsors has provided us 2 festo dsr-25-180-p rotary actuators. These are COTS parts can we use these on the robot? Thank you.

**A.**There are no Rules that explicitly prohibit these; however, all other Robot Rules must be met.

## R70

**Q.**Is it legal to change the secondary pressure regulator settings during live game play using an electric motor? Of course providing the primary regulator is set to 60psi.

**A.**There are no Rules that prohibit that.

**Q.**Can pneumatic components be painted?

**A.**Painting is not listed as an exception to modifying pneumatics in Rule [R70], so it is not allowed.

## R71

**Q.**We would like to add a gas piston to our robot. This gas piston would have a remote hydraulic cable release assembly which we would activate with a small pneumatic cylinder. We would like to find out if this is a legal gas piston assembly.

**A.**Closed loop, COTS, gas shocks are not inherently illegal. However, the specific implementation must satisfy all applicable Robot Rules (e.g. Rule [R08]).

**Q.**Is a quick vent to relieve pressure in a cylinder legal? The one I am interested in is from MSC - part 01976976 (<http://www1.mscdirect.com/cgi/nnsrhm>)

**A.**If the item is not explicitly allowed per Rule [R71], it is not allowed.

**Q.**Can we use a part from a previous year's kit of parts? More specifically, a FESTO# vpLe 18-m5h-4/2-1/4 13026684?

**A.**There are no Rules explicitly disallowing parts from a previous year's KOP, but that part must not break any other Robot Rules.

**Q.**Can the FIRST choice 12 volt pneumatic solenoid be used in this year's robot?

**A.**There are no rules that prohibit that.

**Q.**Are pneumatic actuated shaft clutches allowed? Similar to <http://www.nexengroup.com/products/details/id/856800>

**A.**There are no rules specifically disallowing these, but all other Robot rules must be met (e.g. [R69]).

## R72

Not Available

## R73

Not Available

## R74

Not Available

## R75

**Q.**If we use an Off-Board compressor, does the pressure relief stay with the compressor or the robot? Rule R75 seems to say it stays with the the compressor that comes off the robot. The relief valve would be needed only with a runaway compressor so it should stay with the air compressor.

**A.**Yes, per Rule [R75], the relief valve must be attached directly to the compressor regardless of whether or not the compressor is used on the Robot.

**Q.**Is a relief valve needed in the on-board air system or only with the compressor if it is off-robot?

**A.**Per Rule [R75], the relief valve must be attached directly to the compressor regardless of whether or not the compressor is used on the Robot or not.

**Q.**[R75] states "The relief valve must be attached directly to the compressor or attached by suitable brass fittings connected to the compressor output port." Can an aluminum manifold be in place between the compressor and the relief valve, instead of a brass fitting?

**A.**No.

## R76

Not Available

## R77

Not Available

### R78

**Q.**This rule says that two valves cannot be attached to the same input on one cylinder. Are there any limits on how many cylinders can be attached to one valve?

**A.**No.

**Q.**Can you use two pneumatic cylinders to power 1 part of the robot?

**A.**There are no Rules expressly prohibiting this.

## Operator Console

**Q.**Are teams allowed to connect output devices to the operator console computer that are not controlled by the driver station software? Specifically, could custom USB devices (not the Cypress board) be attached to the operator console that would be controlled by the dashboard software?

**A.**There are no Rules prohibiting this.

### R79

**Q.**can you reuse the frame from a previous years operator console

**A.**The Operator Console is not considered a "Robot element" and thus is not bound by Rule [R18].

**Q.**Are there any limits as to how many joysticks can be used?

**A.**There are no Rules explicitly limiting the number of joysticks that may be used.

### R80

Not Available

### R81

**Q.**(continuation) If the switch and computer are rebuilt into 1 single housing as my R80 device, does it then become legal under R81? What about using 2 NICs in the R80 device that are bridged? Both of these appear to be legal, so my original FMS question still stands.

**A.**If Rules [R80] and [R81] are satisfied, the new device would be legal.

**Q.**By the interpretation of R81 in my previous question (Eth. switch), anything between the R80 device and the FMS cable would be not legal, including the R81 recommended pigtail. Please define a line of legality, i.e.-is a device that requires a USB NIC be not legal? (continued)

**A.**Since the Blue Box included in Rule [R81] explicitly recommends an Ethernet pigtail, it is legal for use.

### R82

Not Available

### R83

Not Available

### R84

Not Available

## Game - The Tournament

**Q.**The bill of materials (BOM) on the website (<http://www.usfirst.org/roboticsprograms/frc/competition-manual-and-related-documents> under "tournament") does not unzip in any usable format. Is this accessible in another form or location?

**A.**The purpose of this forum is to answer specific questions regarding Rules. For technical help, please ask questions on the [FRC Forums](#).

## Overview

Not Available

## Practice Matches

Not Available

### Schedule

Not Available

## Qualification Matches

Not Available

### Schedule

Not Available

### Match Assignment

**Q.**I was wondering if I could have some clarification on the rules concerning the time allowed for alliances before the qualification matches. The rules are very vague on what happens after each alliance is assigned. Do we get a allotted amount of time to plan our strategy? Or do we just jump straight into the setup phase? Also, after the assignment in the elimination phase, how much time is allotted between the alliances being picked and the begining of the first round? Do we have a specific time that we could talk with our alliances?

**A.**The Qualification Match schedule is created and distributed to teams prior to the start of the Qualification Matches. There is no minimum prescribed amount of time between the Alliance Selection Process and the start of Elimination Matches, but there is typically at least 30 minutes between the two.

### Qualification Score (QS)

Not Available

### Coopertition Score

Not Available

### Match Point Exceptions

Not Available

### Qualification Seeding

**Q.**It appears that the FMS ranking display of TP is including both the teleop points and foul points, and not just the teleop hoop points as defined in the section 5.3.6. Which value is actually being used for tie-breaking, the FMS TP display, or the actual teleop hoop points?

**A.**"Teleop Points" include all points earned in Teleoperated mode, which includes points earned from Fouls and Technical Fouls.

**Q.**Under rule 5.3.6 it states that the FMS will sort teams by their QS, Cumulative sum of Hybrid Hoop points, Cumulative sum of Bridge points, and Cumulative sum of Teleop Hoop points. Are the totals for the cumulative sorting fields include the entire alliance or just the individual team.

**A.**FMS will use the Hybrid Hoop points, Bridge points, and Teleop Hoop points scored by the entire Alliance.

## Elimination Matches

Not Available

### Alliance Selection Process

Not Available

### Backup Teams

**Q.**Is a team that has already declined an invitation to join an Alliance, but does not captain its own

alliance (e.g. it finishes outside the top 8 after selections), eligible to be a backup robot?

**A.No.**

## Elimination Match Ladder

Not Available

## Elimination Scoring

Not Available

## Tournament Rules

**Q.**Can the camera display images on the driver station during competition?

**A.**Yes

### T01

Not Available

### T02

Not Available

### T03

Not Available

### T04

Not Available

### T05

Not Available

### T06

Not Available

### T07

Not Available

### T08

Not Available

### T09

**Q.**On the BOM template, it specifically says "Non- Kit of Parts Bill of Materials." Do we need to submit a separate KOP BOM, or should the entire BOM be listed as one?

**A.**Thank you for bringing this to our attention. The [BOM template](#) has been updated. The BOM should include all parts on the Robot, including parts from the KOP.

**Q.**KoP Items are not included in the BOM costs per R14, but the BOM worksheet provided by FIRST indicates says "Any item that was included in the Rookie KOP but not the Veteran KOP should be considered a KOP item and indicated on the BOM". Do KoP items have to be listed on the BOM?

**A.**Yes, all KOP items should be listed on the BOM.

### T10

Not Available

### T11

Not Available

### T12



Not Available

**T13**

Not Available

**T14**

Not Available

**T15**

Not Available

**T16**

Not Available

**T17**

Not Available

**T18**

Not Available

**T19**

Not Available

**T20**

Not Available

**T21**

Not Available

**T22**

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**T23**

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**T24**

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**T25**

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**T26**

Not Available

**T27**

Not Available

**T28**

Not Available

**T29**

Not Available

**T30**

Not Available

## **T31**

Not Available

## **T32**

Not Available

## **T33**

Not Available

## **T34**

Not Available

## **Championship Additions**

Not Available

### **Championship Pit Crews**

**Q.**We understand that 5 people are allowed to work in the pit on the robot at one time on Wednesday night. Are members allowed to switch out, like as one subteam for another subteam? If so what would be the proper procedure for this?

**A.**There are no rules against this, as long as no more than 5 team members - including at least one adult - are in the pit area at one time. We will not be using wrist bands this year, so there is no set procedure for switching out. Teams in the pit will be monitored to ensure they don't exceed the limit.

### **Championship Backup Robot**

Not Available

### **FRC Championship Match Ladder**

Not Available

## **Administrative - Introduction**

Not Available

### **What is the FIRST Robotics Competition (aka FRC)?**

Not Available

### **Gracious Professionalism, A FIRST Credo**

Not Available

### **Prominent FRC Awards**

Not Available

#### **The Chairman's Award**

Not Available

#### **The Woodie Flowers Award**

Not Available

#### **The Dean's List Award**

Not Available

### **Safety: A FIRST Culture**

**Q.**A question on the no open toe shoe rule - Vibram Fivefingers do not have "open" toes and are completely covered as well as closed heels. Are they classified in the open toe category? We have 2 students and 1 mentor that were them all the time.

**A.** Hello Team: Thank you for writing. Vibram Fivefingers are okay to wear at your team's Competition Event. Thank you, FRC Team Support

## Administrative - Communication

Not Available

### Overview

Not Available

### FIRST Headquarters - Contact Information

Not Available

### Team Support

Not Available

### Emails and Subject Lines

Not Available

### Please Do Not Duplicate Efforts

Not Available

### Control System Support

Not Available

### Software Contact Information

**Q.** I am wondering how does our team go about registering the NI Labview software. We could not find it on any file located on our software drive nor on the packaging it came in. Please advise. Thanks

**A.** This forum is for answering specific questions on Game Rules. For technical help, please ask on the [FRC Forums](#).

### FIRST Robotics Competition Website

Not Available

### Getting Answers to Your Competition Questions

Not Available

### FRC Q&A Forum

**Q.** Please clarify whether the responses published in the FRC Q&A Forum are formal/official interpretations of the published rules or simply opinions.

**A.** Hello team: Thank you for writing. The responses published in our FRC Q&A Forum are official interpretations of the published rules. Thank you, FRC Team Support

### Email Blasts

Not Available

### Bill's Blog

Not Available

### The TIMS - Supplying Information to FIRST

Not Available

### Judges' Information

Not Available

## **Event Specific Information**

Not Available

## **Regional Events and Championship Hotel Information**

Not Available

## **FIRST Logos**

Not Available

### **Logo Use**

Not Available

## **Administrative - Team Organization**

Not Available

### **Getting Started: Guides, Handbooks, and Other Helpful Resources**

Not Available

### **Suggested Leadership Roles**

Not Available

#### **Main Contact Responsibilities**

Not Available

#### **Alternate Contact Responsibilities**

Not Available

#### **Shipping Contact Responsibilities**

Not Available

## **Recommended Additional Contacts**

Not Available

### **Corporate / University Contact Responsibilities**

Not Available

### **Public Relations Contact Responsibilities**

Not Available

### **Scholarship Contact Responsibilities**

Not Available

### **School Contact Responsibilities**

Not Available

### **Technical Contact Responsibilities**

Not Available

### **Travel Contact Responsibilities**

Not Available

## Other Important Team Positions

Not Available

## Game Rules Monitor Responsibilities

Not Available

## Safety Captain Responsibilities

Not Available

## Administrative - At the Events

Not Available

### Overview

Not Available

### FIRST Safety

Not Available

### Safety Recommendations

**Q.**Are ladders/small step stools allowed in the pits to aid with pit set-up?

**A.**There are no rules prohibiting the use of ladders/small step stools in the pits. The FRC Safety Manual (which can be found here: <http://www.usfirst.org/roboticsprograms/frc/safety-video-and-manual>) gives tips on using ladders and specifically tells teams they should not climb on objects such as tables or chairs, which are not designed for the task a ladder can accomplish. However, teams should recognize that any tool - including ladders - can be used in an unsafe way. If a team is using a ladder unsafely, or the ladder itself is unsafe in some way (for example, by being too large to safely handle in the pit or maneuver through the crowd to the pit in the first place), you can expect a Safety Advisor to ask the team to correct the situation

### Robot Carts

Not Available

### Safety Recognition Program

Not Available

### Courtesies and Rules

Not Available

### Root Wireless Control

Not Available

### Staff / Volunteer Badges

Not Available

### Competition Overview

Not Available

### Practice Matches

Not Available

### Competition Matches

**Q.**During matches, how will penalty points be shown? Will there be an announcement of the penalty and team by the play-by-play or will there be a penalty category shown on the screen during the match?

**A.**The total number of Foul Points earned by an Alliance due to Fouls and Technical Fouls committed by the opposing Alliance will be listed on the Match results screen with the final score after the Match. Referees will signal when a Foul is called. Play-by-play will vary Match to Match

and event to event.

## Competition Agendas

Not Available

## Load In Procedures

**Q.**Team members may only make one trip with load-in materials; Does that mean we can only take into the pit what we (5 people) can carry in one trip, or that materials can only come in once? That is, you cannot remove a thing and return it later?

**A.**Hello Team: Teams may bring their robot into the venue during load in on Wednesday evening. Teams will be able to bring additional materials to their Pit on Thursday morning. Thank you, FRC Team Support

## Bag and Tag

**Q.**At the regional is there a limit to the number of loads of equipment we can deliver to our pit, as long as we don't grow outside our pit?

**A.**Hello Team: Thank you for writing. There are no limits to the number of loads of equipment you can bring, but your team must make sure that your equipment stays confined to the pit area. Thank you, FRC Team Support

## At Championship

Not Available

## Event Check In

**Q.**4.6.2 states that 5 team members, 1 adult and 4 students or adults, can come in on Wednesday evening. For Regionals that are allowing teams to bring in their robots and materials on Wednesday evening, does the same 5 people, 1 adult and 4 students or adults rule apply?

**A.**Hello Team: Thank you for writing. Yes, the same rule applies to both circumstances. Thank you, FRC Team Support

## Consent and Release Form

Not Available

## Event Check In Envelope

Not Available

## The Pit

Not Available

## Pit Admin Station

Not Available

## Team Pits

Not Available

## Spare Parts Station

Not Available

## Inspection

Not Available

## Machine Shop

Not Available

## Team Provided Machine Shops

Not Available

## **Machine Tools at Events**

Not Available

## **Suggested Equipment**

Not Available

## **First Aid Station**

Not Available

## **Traffic Flow**

Not Available

## **Announcements**

Not Available

## **Queuing Your Team**

Not Available

## **Property Security**

Not Available

## **Lost and Found**

Not Available

## **Ceremonies**

Not Available

### **All Teams Should Attend**

Not Available

### **Pit Manners / Rules During the Ceremonies**

Not Available

## **Pit Closing Etiquette**

Not Available

## **Team Socials**

Not Available

## **Championship FIRST Finale**

Not Available

## **Team Spirit and Team "Look"**

Not Available

### **Team Giveaways**

Not Available

### **Mascots and Team Costumes**

Not Available

### **Competition Spirit**

Not Available

### **Banners and Flags**

## Bleacher Rules

Not Available

## Site Restrictions

Not Available

## Considerations

**Q.**I was wondering if we are allowed to use the DSR INC-812A battery charger at competitions. To my knowledge, there are no rules regulating battery chargers however we want to confirm. The link for this specific charger is: <http://www.batterychargers.com/ProductDetail.aspx?ProductName=94080037>. Thanks

**A.**There are no rules regulating battery chargers.

## Administrative - Robot Transportation

Not Available

### Overview

Not Available

### Stop Build Day

Not Available

### Bag and Tag

**Q.**After Bagging our bot at the end of our last event and ready for CMP, we would need to bolt our bot to the crate's superstructure to ensure that the bot is secured within the crate for transpo. This would mean puncturing the bag with the bolt in order to do so. Is this an allowable intrusion?

**A.**Yes, small bag punctures for the purpose of securing the robot are acceptable. Inspectors are trained to allow these types of small defects in the bag.

**Q.**Sorry if this has already been asked. Michigan teams are allotted 6 hours of open bag time while teams attending 3 day events have from 8:30 am - 8:00 pm for "open bag" work. This seems unfair to teams attending 2 day event.

**A.**This forum is for asking specific questions regarding rules. We're happy to receive feedback from teams, but please send it by email to [frcteams@usfirst.org](mailto:frcteams@usfirst.org).

**Q.**Is there no way for FIRST to check if each team has actually stopped building on Stop Build Day with the new Bag and Tag system?

**A.**Teams sign the Robot Lock Up form certifying that they have followed all the lock-up rules, and those forms are verified at each event by Robot Inspectors.

## Requesting an Exemption

Not Available

### Instructions for Bag and Tag

**Q.**Will regionals allow for unbagging of robots and unloading of pit equipment on Wednesday nights prior to traditional regionals?

**A.**Hello Team: Thank you for writing. Teams are only allowed to drop off their robots and pit equipment on Wednesday night prior to a traditional regional. This will be noted in the event agendas when they become available. Thank you, FRC Team Support

## Robot Lock and Unlock Instructions

**Q.**Can the robot be unlocked for donor demonstration?

**A.**Robots may be unlocked for demonstrations if approval is received from *FIRST* HQ. Approval is granted on a case-by-case basis. Send the request to unlock your robot to [frcteams@usfirst.org](mailto:frcteams@usfirst.org). Be sure to detail



the date, time, and nature of the demonstration. Under no circumstances is 'work on' or 'practice with' the robot allowed during the unlock period.

**Q.**What is the process for a team that needs extra red serial numbered tags at an event? Will pit admin have extras?

**A.**Greetings Team: Pit Admin does have a limited quantity of bags and tags available. However, you can also purchase Bag & Tag seals from American Casting via our "Where to Get More" document: [http://www.usfirst.org/sites/default/files/2012\\_Where\\_To\\_Get\\_More\\_RevA.pdf](http://www.usfirst.org/sites/default/files/2012_Where_To_Get_More_RevA.pdf). Thank you, FRC Team Support

## **Completing the Robot Lock-Up Form**

Not Available

## **When the Robot Lock-Up Form is Used**

Not Available

## **"Robot Access Period" - For Teams Attending 2-Day Events**

Not Available

## **"Robot Access Period" - Permitted Actions**

Not Available

## **"Robot Access Period" - Schedule**

Not Available

## **Robot Shipping - For Teams Granted an Exemption or Attending Championship**

Not Available

## **In You Have Been Granted an Exemption to Ship to a Bag and Tag Event**

Not Available

## **If You Are Attending Championship**

**Q.**If we wish to ship a separate tool crate to Championships, who do we contact to make shipping arrangements? Does the tool crate need to be shipped at the same time as the robot crate?

**A.**Hello Teams: If teams wish to ship a tool crate to Championship, they will need to contact Shepard Exposition Services directly. In order to contact SES directly, please call them at 832-799-5700. Please let them know that you are a FIRST Robotics Competition team and your team number. They will assist you with pricing quotes and other details such as when to ship the tool crate. Sincerely, FRC Team Support

**Q.**What is the deadline to ship the robot to Championships after a team's final Regional Competition?

**A.**Greetings Teams: The deadline for shipping your robot to Championship is the Tuesday after your final event. Sincerely, FRC Team Support

## **Important Shipping Contacts**

Not Available

## **FIRST is Your First Contact**

## FedEx

Not Available

### Administrative - Awards

Not Available

#### FIRST Robotics Competition Awards

**Q.**Do we have to submit anything in advance of our regional competition for the Rookie Allstar award?

**A.**Hello Team: Thank you for writing. Teams do not need to submit anything in advance for the Rookie Allstar Award. Please note: Rookie teams who have received a NASA grant must provide a hard-copy Chairman's Award submission at their event. For more information on the Chairman's Award, please visit: <http://www.usfirst.org/roboticsprograms/frc/awards>

**Q.**Where is the information regarding the Engineering Inspiration Award criteria and submission process? We have looked in TIMS, STIMS, and the awards section of the administrative manual but have not had any luck.

**A.**Hello Team: Thank you for writing. Submissions are not required for the Engineering Inspiration Award. You can find details on our FRC Awards [here](#). Thank you, FRC Team Support

#### Complete Awards List

**Q.**Unable to submit Chairman's award and Woodie Flowers award by deadline. The server was completely tied up. Will grace time be added so that these can be submitted

**A.**Hello Team: Thank you for writing, and I am sorry for the inconvenience. Due to a technical issue, we extended the award submission deadline to 2/17/12 at 12 noon ET. Thank you, FRC Team Support

#### Awards Submission Process

Not Available

#### Chairman's Award

**Q.**Regarding the video to be submitted to Championship Chairman's Award Judges: May Regional Chairman's Award recipients make changes to their original Regional video submission or must Championship CA judges receive the original video submission unaltered?

**A.**Hello Team: Yes, Regional Chairman's Award recipients may make changes to their original Regional video submission. If you do change your video, please be sure to bring a copy with you to Championship. Sincerely, FRC Team Support

**Q.**Can you please elaborate on the Championship Chairman's Award judging process? Documentation simply notes that judges will review submissions of all Regional CA recipients. Will teams take part in on-site interviews (as happened in previous years at Championships) and be required to submit a video?

**A.**Hello Team: Thank you for writing. There will be on-site interviews for the Championship Chairman's Award. Teams will also need to submit a video. Thank you, FRC Team Support

**Q.**In the Chairman's executive submission requirements says describe "team's communication methods and results" does it mean communication within the team or outside the team? By that I mean, communication among team members or communication with sponsors, partners, the community, etc. Thank you

**A.**Hello Team: Thank you for writing. The Chairman's Award pertains to your team's relationship with the community and other external individuals. You may want to read over submission requirements here: [PDF Link](#) for detailed information on the submission process. Thank you, FRC Team Support

**Q.**When the Chairman's submission says "describe the strength of your team's partnership", does it mean to describe our partnerships with other organizations or a specific partnership? It is confusing because of the lack of the letter 's' at the end of partnership.

**A.**Hello Team: Thank you for your message, and I apologize for the confusion. The Chairman's Award pertains to your partnership with the community. You may discuss your team's partnership with the

## Overview

**Q.**when writing my chariman's submission can I use shortcuts such as: and=& you=U are=R or will it count as low level language/ the judges will see less of my submission?

**A.**Hello Team: Thank you for writing. We discourage using shortcuts in the submission. Thank you, FRC Team Support

## First-Year (Rookie) and NASA Grant Teams

**Q.**how do i assign an awards submitter?

**A.**Hello Team: Thank you for writing. Award submitters can be selected by your team's main or alternate contact. In order to select an awards submitter, the team's main or alternate would need to login to TIMS and navigate to the team summary page. Here, they would be able to click on the "edit/view" button in the student/roster section to designate student award submitters. Please note that the award submission deadline was on 2/17/12 at 12 pm EST. Thank you, FRC Team Support

## Submission Information

**Q.**When is the Chairman's video due - Feb16 or at the Regional event?

**A.**Hello Team: Teams submitting for the Regional Chairman's Award must provide a DVD to the judges at the event. Thank you, FRC Team Support

## The Allaire Medal - Leadership Exemplified

Not Available

## Coopertition Award

Not Available

## Excellence in Design Award, Sponsored by Autodesk

Not Available

### Purpose of Award

Not Available

### Award Overview

Not Available

### Award Specifics

Not Available

### Award Judging

Not Available

## FIRST Dean's List

**Q.**The online form for Dean's List submssion will not accept a GPA higher than 4.0. The school registrar does not and will not calcualte un-weighted GPA's, so I cannot get an accurate GPA for the students. How can should I handle this?

**A.**Hello Team: Thank you for writing. We have made provisions addressing weighted GPAs for next season. We suggest writing in 4.0 and explaining the situation in the text of the award submission. Thank you, FRC Team Support

## Overview

Not Available

## Submissions

Not Available

## Criteria

Not Available

## Judging

Not Available

## The Founder's Award (Championship Only)

Not Available

### Website Award

**Q.**Can we add content to our team webpage after Feb 16th?

**A.**Hello Team: Thank you for writing. Yes, your team can add content to your team webpage after Feb. 16th. Thank you, FRC Team Support

## Submission and Deadline Information

Not Available

### Woodie Flowers Award

**Q.**Does the character count of 3,000 for the Woodie Flower's Award include Spaces

**A.**Hello Team: Thank you for your message. Yes, the 3,000 character count includes spaces. Thank you, FRC Team Support

### Eligibility

**Q.**In the Woody Flowers Award Criteria document it says "re-submit that mentor in the current year in ADDITION to nominating a mentor for the WFFA if they wish." But in the manual it says "re-submit that mentor in the current year INSTEAD of nominating a mentor for the WFFA". Which document is correct?

**A.**Greetings Team: Thank you for writing. The following is correct: "re-submit that mentor in the current year in ADDITION to nominating a mentor for the WFFA if they wish". I apologize for the confusion. We will be updating the manual shortly. Thank you, FRC Team Support

## Spirit of the Award

Not Available

## Award Eligibility Requirements

Not Available

## Judging Criteria

Not Available

## Entry Requirements

Not Available

## Submission Deadline

Not Available

## Entry Process

Not Available

## Prior Year Regional WFFA Recipient Re-Submission

Not Available