

Q0 Clarification about 4 NOTE max during AMPLIFICATION period

Q: 6.5.3 AMPLIFICATION says "which AMPLIFIES their SPEAKER for 10 seconds or until 4 NOTES are scored". Does NOTE scoring in the AMP or TRAP count against the 4 NOTE max, or just SPEAKER scores?

A: Thank you for your question. Please see [Team Update 02]
(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>).

(Asked by **857** answered Jan 12th 24)

Q1 Scoring in TRAP not at endgame

Q: Can you score in the TRAP and have it count for your score in any time other than the last 20 seconds? Can you score in the TRAP autonomous?

A: There are no rules that limit when a team can score a NOTE into the TRAP during the MATCH.

(Asked by **5507** answered Jan 10th 24)

Q2 Can robots push on the chain in directions other than down?

Q: Is there anything in the rules (eg G416 or its intent) that prevents a robot from attaching to the chain at 2 points and then raising the robot by pushing those attachment points in a direction other than down, assuming that the length of chain between the robot attachment points, and the length of each chain section between the robot attachment points and the STAGE truss legs all remain unchanged.

A: The Q&A does not address "is this design legal" style of questions. Please rephrase your question with regards to the rule and any need for clarification and resubmit. Please consult [Section 1.10]
(<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>) for additional information on Q&A scope.

(Asked by **199** answered Jan 10th 24)

Q3 AMP scoring during Auto counting towards amplification and Co-Op

Q: Does scoring in the AMP during Autonomous count towards amplification and cooperation? I don't believe this was mentioned in the game manual. Does it carry over to Tele-Op?

A: Yes.

(Asked by **6000** answered Jan 10th 24)

Q4 Can a HUMAN PLAYER introduce a NOTE to the field during AUTO?

Q: Is it a violation of any rule if, during AUTO, a HUMAN PLAYER introduces a NOTE to the field (through the SOURCE) and a ROBOT from his ALLIANCE retrieves it (without contacting opposing ROBOTS or staged

NOTES in the opponent's WING)? For example, would this be considered an indirect interaction with the ROBOT in violation of G402?

A: HUMAN PLAYERS may not cross the STARTING LINE in AUTO per !G401.

(Asked by **199** answered Jan 10th 24)

Q5 ROBOT mechanism entering the AMP?

Q: When a ROBOT is attempting to score a NOTE in the AMP, are there any limitations on parts of the ROBOT breaking the plane of the AMP opening and entering the AMP itself? In this scenario the ROBOT is assumed to not violate any extension limits.

A: Per the definition of the FIELD in Section 5.1, as illustrated in Figure 5-2, the inside of the AMP pocket is considered part of the FIELD. There are no specific restrictions regarding interaction with the AMP pocket beyond those that apply to all FIELD elements such as !G415.

(Asked by **451** answered Jan 10th 24)

Q6 Impact Award Video Link Submission

Q: Can the Impact Award Video Link be submitted after the deadline of 2/15/24?

A: No, if a team wishes to provide a *FIRST* Impact Award video, the link must be included in the initial submission which must be submitted prior to [the deadline](<https://www.firstinspires.org/node/11156>). Teams can consider entering a link during the submission process that will later redirect to their *FIRST* Impact Award video if they wish, but *FIRST* provides no guarantees about when videos will be downloaded for each event. Additionally, the video link must be hosted on one of these three (3) file sharing sites (Dropbox, Box, and Google Drive) and be made public to allow video downloads to be entered into the *FIRST* Impact Award Portal.

(Asked by **5484** answered Jan 11th 24)

Q7 Extension of the robot below the wheels.

Q: The rules state “a robot must not exceed four feet when resting normally on the ground”. Can that change during the match? Could the top of a robot be above four feet via a lift through the robot base (something extending below the wheels to lift the robot)?

A: No, the ROBOT height limit persists throughout the MATCH and applies regardless of the ROBOT's position on or above the FIELD, which is what the "as measured when it's resting normally on a flat floor" language means. This includes any MECHANISM and not just the ROBOT'S wheels.

(Asked by **6696** answered Jan 11th 24)

Q8 What is the definition of "working length" for G416?

Q: Is the "working length of chain" referred to in G416 the total length that is "working" to support the robot? So for example, if there was a length of chain that was slack between 2 points of contact with the chain, then that length would not be counted in the "working length"?

A: Yes, that is the intended meaning of working length. Creating slack between ROBOT contact points would be

one method of reducing the working length and therefore prohibited by !G416.

(Asked by **199** answered Jan 11th 24)

Q9 Note Control

Q: If a Note gets lodged under the robot and the robot is dragging it around the field during the match is that considered control? Would that robot still be able to pick up and shoot other Notes without penalty?

A: *Updated Jan. 12, 2024* We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. However the intent of CONTROL is not considered when determining violations of !G403 *(part A or a NOTE lodged in a ROBOT)* and !G409

(Asked by **4655** answered Jan 11th 24)

Q10 Coop and Amp light behavior

Q: This question seeks clarity on the behavior of the amplification and cooperation lights. If, at some point during the match before either button has been pressed, there are three notes in the amp and the cooperation button is pressed, does that decrement the amp light by 1, 2 or none at all? Alternately, if there are three notes in the amp and the amplification button is pressed, does one more note need to be added to the amp after the amplification to be able to press the cooperation button?

A: Thank you for your question; please see [Team Update 02] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). In your first example, the AMP lights decrease from 2 to 1 when the *Cooperation* button is pressed, and an additional NOTE must be scored before an AMPLIFICATION can happen. In your second example, the AMP lights decrease from 2 to 0. In order to perform *Cooperation* an additional NOTE must be scored after the AMPLIFICATION ends.

(Asked by **4028** answered Jan 12th 24)

Q11 What exactly is the intent of the G416 rule against "choking up"?

Q: In G416, what is a "dynamic version of a rigid bar"? It says that the intent is to "limit ROBOTS to interactions with the chain as if it were a bar i.e. engaging via 1 or more contact points and pushing down on the chain to raise the ROBOT." Does pushing on the chain in a direction other than down violate the intent of G416? Note: A robot hanging from 2 points is pushing "inward" as well as down. Is the intent to limit the *movement* of the contact points in some way? Or just prevent choking up?

A: "Dynamic version of a rigid bar" is intended to express that ROBOTS should not grasp the chain and move contact points closer together or further away in an effort to gain height by manipulating the effective chain length. It is expected that ROBOTS may exert forces towards or away from the STAGE core, as well as incidental forces horizontally across the chain length.

(Asked by **199** answered Jan 11th 24)

Q12 Does your bumper shape have to be convex?

Q: R101 defines the frame perimeter with a taut string. It shows the example of a V-shaped robot and explains that it has a triangular frame perimeter. R401 says that the bumper must protect "the entire frame perimeter". So

would that V shaped robot need a bumper that crosses that gap along the line of the string (also forming a triangle), or can its bumper wrap around and line the inside of the V? Put another way, is the shape defined by your bumper required to be convex?

A: Yes, BUMPERS must be located outside the FRAME PERIMETER and therefore form a convex shape.

(Asked by **2834** answered Jan 11th 24)

Q13 Intentional violation of G408 (robots no high notes) - would spotlighting still count if s

Q: If a robot were to score a HIGH NOTE on a MICROPHONE (thereby violating G408) would the HIGH NOTE on the MICROPHONE count for the purposes of SPOTLIGHTING? G406 starts by addressing gamepieces, but the language in the rule switches to NOTES (violation: tech foul per NOTE), so by the letter G406 seems not to apply (although intent may be another matter)

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). The manner in which the ROBOTS are SPOTLIT is not considered, however if a ROBOT is the reason the HIGH NOTE is on the MICROPHONE, the ALLIANCE is ineligible for the ENSEMBLE.

(Asked by **5934** answered Jan 12th 24)

Q14 Climbing touching Trap Flap

Q: Does the trap flap count as a chain facing vertical surface and touching it will still count as being onstage per 6.5.2?

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **5010** answered Jan 12th 24)

Q16 Tracking my team's kickoff kit

Q: Where could I find the Kickoff Kit tracking code?

A: The scope of this Q&A system includes and is limited to questions about the [Game Manual]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards]

(<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings]

(<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) are posted to the Q&A System (for questions about other topics, please contact Team Support at [firstroboticscompetition@firstinspires.org]

(mailto:firstroboticscompetition@firstinspires.org).

(Asked by **7459** answered Jan 11th 24)

Q17 Coopertition not used

Q: Rule 6.5.5 describes how to activate the Coopertition button. What if the other alliance does not press their Coopertition button (assuming they had planned to)? Would the team that pressed the button be able to "deselect"

the button? And what happens to their Note in the Amp? For example, do they get to use it towards Amplification, or has it been "used"?

A: No, once a scored NOTE has been used for *Coopertition* it cannot be used again regardless of whether the opposing ALLIANCE completes *Coopertition* or not.

(Asked by **4509** answered Jan 11th 24)

Q18 Where can HIGH NOTES be thrown from?

Q: In G430 it says "HIGH NOTES may only be entered on to the FIELD during the last 20 seconds of the MATCH by a HUMAN PLAYER in front of the COACH LINE." Does "in front of the COACH LINE" include the entire side of the field, or is it further restricted to a specific area in front of the COACH LINE?

A: Per !G425-C HUMAN PLAYERS that start in the ALLIANCE AREA may not contact anything outside the ALLIANCE AREA.

(Asked by **6223** answered Jan 11th 24)

Q19 Are "Rounded" Bumper Corners Allowed?

Q: In R409 ("Fill BUMPER Corners"), Figure 8-7 illustrates allowed and disallowed methods of filling the corners, but does not include the "rounded" corner as illustrated in the 2023 manual Figure 9-8. The language between the 2023 rule and the 2024 rule are otherwise identical. Shall "rounded" corners (in which teams bend the pool noodle around the corner without cutting it) be an allowed method of creating bumpers for the 2024 game?

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **1339** answered Jan 12th 24)

Q20 Can robots climb either STAGE? What about G424?

Q: We haven't found any rule preventing robots from climbing the Stage on the opposing side of the field. Assuming that's permitted, G424 is confusing. In the case where a red robot climbs the blue Stage, any blue robot that contacts it would receive two tech fouls (G424A). However, if that contact happened in the last 20 seconds the red robot would also receive a foul (G424B). Would both robots receive tech fouls in this case?

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **5406** answered Jan 12th 24)

Q21 Can you confirm that robots can achieve HARMONY even if they contact stage surfaces

Q: Section 6.5.2 is a bit confusing. It says for ONSTAGE points, robots must only be contacting the surfaces listed in the 3rd paragraph. However for HARMONY it says robots must be ONSTAGE "via direct or transitive

support from a single chain". Can you confirm that "direct support" doesn't mean "fully, or exclusively supported" by the single chain? Can robots in HARMONY touch the surfaces listed in paragraph 3?

A: Yes, "direct or transitive support" from the chain may be partial, the ROBOT may be touching or supported by other elements listed in the lettered list in 6.5.2. while qualifying for HARMONY.

(Asked by **5406** answered Jan 11th 24)

Q22 Does G206 penalize otherwise legal conduct that helps both alliances get a ranking point?

Q: The text of G206 prohibits situations in which *both* alliances violate a rule to gain RP, but the blue box presents a situation in which one or both alliances have *not* broken rules. e.g., If all teams on both alliances agree that alliance A will feed extra rings through their source to improve alliance B's cycle times, it doesn't violate G203/204 because all alliance members have agreed. Is the intent of G206 to ban all coordination between alliances to gain RP, even if no rules are broken?

A: Thank you for pointing out that the !G206 Blue Box example is a poor representation of the rule's text and see [Team Update 03](<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate03.pdf>) for updated language. In a scenario where all teams in a MATCH agree to feed NOTES to opponents, the teams are encouraging and simultaneously being encouraged to play beneath their abilities and thus violating !G203, !G204, and !G205. No, the intent is not to ban all coordination between ALLIANCES, as ALLIANCES are expected to engage in some coordination to achieve the *Coopertition* reward. Please also see the answer to !Q23 for additional context.

(Asked by **6662** answered Jan 19th 24)

Q23 Is coordination with opponents to prevent collisions during auto legal?

Q: Does coordinating with a team on an opposing alliance before a match to avoid a collision during autonomous violate G203/204 (because theoretically a collision could benefit your alliance) or G206 (because avoiding a collision may help both alliances get the melody RP)? Does this change if both teams have the consent of their alliance partners? If it violates G206, would it be legal during playoff matches, since ranking points are irrelevant?

A: Generally, coordinating autonomous modes with the opposing ALLIANCE, or even just letting the opposing ALLIANCE know which CENTER LINE NOTE you plan to go after, is not a violation of !G203, !G204, or !G205. Conversely, an ALLIANCE could choose to not want to discuss their Autonomous strategy with the opposing ALLIANCE. This is each ALLIANCE'S right to decide and completely within the spirit of the game. Where this could get messy is if one ALLIANCE tries to encourage a team on the other ALLIANCE to play beneath its ability. For example, a Red ALLIANCE team could tell a Blue ALLIANCE team "You shouldn't go for the middle CENTER LINE note because we're going to go for it." That would be a violation of !G203. A Red ALLIANCE team could also say "If you let us get the NOTES on the CENTER LINE, we have a better shot at winning the MATCH and seeding first. If you let us win, we'll pick you." This would be a violation of !G203 for Red and a violation of !G204 if Blue follows through with it. Just like the round robin qualification structure and ALLIANCE Selection process, this is a situation that is part of *FIRST* Robotics Competition that could lead to poor behavior. In areas like this, we rely on the *FIRST* Core Values and our ethos of *Coopertition* and *Gracious Professionalism* to guide us.

(Asked by **6662** answered Jan 19th 24)

Q24 Placement of NOTES during setup

Q: How does the NOTE needs to be staged at the start of the match in reference to the SPIKE MARKS? Do you only need to cover or touch the SPIKE MARKS with the NOTE? Or does it need to fully enclose the SPIKE MARK?

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **2877** answered Jan 12th 24)

Q25 How are drive teams notified if the other alliance has activated Coopertition?

Q: Rule 6.5.5 talks about activating the Coopertition bonus. Will the human player on one alliance be notified if the other alliance has activated the Coopertition, and if so, how?

A: The opponent's *Coopertition* light will be solid.

(Asked by **753** answered Jan 11th 24)

Q26 TRAP scoring and climbing stage

Q: Are you able to climb on the stage and score a note in the trap, then leave the stage and climb on a different side to score a note in a second trap?

A: There are no rules limiting the number of TRAPS a ROBOT can score in.

(Asked by **1802** answered Jan 11th 24)

Q27 Scoring in AMP during Amplified count towards coopertition?

Q: If you score a note in the amp while the speaker is amplified, can that note be used for coopertition?

A: No. In order for the *Coopertition* button to be used there must be at least 1 NOTE accumulated. When a HUMAN PLAYER uses an AMPLIFICATION both accumulated NOTES are used and a new NOTE cannot be accumulated until the current AMPLIFICATION ends.

(Asked by **5507** answered Jan 11th 24)

Q28 Can you activate the coopertition button while AMPLIFICATION is active?

Q: In section 6.4.3, it says that notes scored while amplification is active do not count towards the next amplification, but do score match points, but do they count for the coopertition activation requirement (6.5.5)?

A: Please see !Q27. If that does not answer your question, please rephrase and resubmit.

(Asked by **1540** answered Jan 11th 24)

Q29 Can a bumper on one side of the robot be higher than the other 3 sides?

Q: Can a bumper on one side of the robot be set higher than the other sides of the robot while still being within the bumper zone to allow a game piece to enter below the bumper?

A: There are no rules requiring all BUMPERS to be at the same height so long as they are all compliant with !R402

(Asked by **8841** answered Jan 11th 24)

Q30 How is the flap for the TRAP kept closed?

Q: It is stated that the flap for the TRAP is initially closed, and the robot needs to open it before dropping a note into the TRAP. How is the trap kept closed? Is it a mechanism that requires significant pressure before it opens?

A: The flap is hinged and weighted such that gravity results in it needing to be pushed for TRAP access. For full details, please refer to the FIELD assets (drawings, CAD models, etc.) available on the [Playing Field webpage] (<https://www.firstinspires.org/robotics/frc/playing-field>).

(Asked by **6223** answered Jan 12th 24)

Q31 Clarification about FMS behavior in auto

Q: "The AUTO period is the first 15 seconds of the MATCH, and the FMS blocks any DRIVER control" - this wording appears to be new this year. In the past, joystick states (like from toggle switches) were read before auto but do not update during auto. Is this still the case?

A: Yes.

(Asked by **857** answered Jan 11th 24)

Q32 Is CHUTE Definition Missing From The Glossary?

Q: The term "CHUTE" appears in the manual in all capital letters. However, it is not defined in the glossary, as section 1.7 suggests that such words should be. Should it be added to the glossary? Also, does it have a door?

A: Please see [Team Update 02] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit. No, there is no CHUTE door.

(Asked by **3419** answered Jan 12th 24)

Q33 HIGH NOTE vs Regular NOTE Controlling 1 game piece

Q: G409 speaks on robots controlling only 1 NOTE in Tele, but says nothing about HIGH NOTES. G408 speaks specifically about robots scoring HIGH NOTES, but nothing about controlling them. Should a HIGH NOTE go

under the control of a robot, either by being lodged or in some other way defined as controlled, per the manual, can a robot still control a regular NOTE without foul?

A: HIGH NOTES CONTROLLED by a ROBOT do not do not count towards the 1 NOTE limit listed in !G409.

(Asked by **4272** answered Jan 11th 24)

Q34 G207, Can Technician Signal for A-stop if they have cause for concern after match start?

Q: In regards to G207, *Don't abuse ARENA access, the rules states the technician is not allowed to use signaling with the drive team or robot, but exeptions will be granted for inconsequential infractions and concerning safety. Will the technician be allowed to signal the drive team to use the A-stop button?Section 6.2 states technician can provide team with robot connectivity information. Does this include a technician who understands the auto may be a cause for concern and signals for A-stop.

A: No, the TECHNICIAN may not signal the DRIVE TEAM to use the A-Stop button unless a safety concern exists, and in which case an E-Stop press is likely a better option.

(Asked by **95** answered Jan 12th 24)

Q35 Conflict between G416 and its blue box?

Q: The answer to Q8 means that grabbing the chain at 2 points and then pulling those points closer together (not moving them along the chain) would not violate G416 because it would not reduce the length of chain that is working to support the robot. But the answer to Q11 means it would violate G416 because the blue box prohibits non-incidenta! horizontal force. Correct? If so, Sections 1.7 and 1.10 say blue boxes and Q&A do not supersede rule text. Will the rule text be updated to clarify?

A: Apologies that our answer to !Q8 was unclear. Decreasing the distance between two points on the chain is what the blue box is intended to describe as reducing the working length of chain.

(Asked by **199** answered Jan 16th 24)

Q36 When does AMPLIFICATION end once 4 NOTES enter the SPEAKER?

Q: If 4 NOTES enter the SPEAKER while AMPLIFIED (before the 10-second limit runs out), when does it again become possible to accumulate more NOTES in the AMP toward the next AMPLIFICATION? From a visible perspective, once 4 NOTES enter the SPEAKER, when does the blue AMP stack light go from 2Hz-blinking to off again? Additionally, once 4 NOTES have been processed while AMPLIFIED, do additional NOTES processed within the next 3 seconds earn AMPLIFIED or not-AMPLIFIED points?

A: Once 4 NOTES have been processed by the SPEAKER during an AMPLIFICATION the AMPLIFICATION immediately ends. NOTES processed after that are counted as not-AMPLIFIED until the next AMPLIFICATION is activated. As soon as an AMPLIFICATION ends the AMP light stops blinking and NOTES scored in the AMP can be accumulated for future AMPLIFICATIONS or *Coopertition*.

(Asked by **695** answered Jan 12th 24)

Q37 Extending beyond the 12" rule

Q: Can a robot extended beyond the 12" rule momentarily when obtaining or delivering a note?

A: No.

(Asked by **8112** answered Jan 11th 24)

Q38 Minimum length of BUMPER segment?

Q: Is there a minimum length for a BUMPER segment (e.g. at a corner) beyond the 1/2" required by R408? My literal reading of the current rules would allow (otherwise legal) BUMPERS to consist exclusively of 1/2" segments separated by 1/2" gaps, including at corners.

A: There are no rules requiring a specific minimum BUMPER length. BUMPERS of very short length are unlikely to maintain the cross-section required by !R408.

(Asked by **199** answered Jan 16th 24)

Q39 Accumulate 3 NOTES in the AMP and both achieve AMPLIFICATION and engage in Coopertition?

Q: Is it possible to "accumulate" 3 NOTES in the AMP (ie after any preceding AMPLIFICATION ends) for the purposes of both achieving AMPLIFICATION and engaging in Coopertition? If so, does it matter which order the HUMAN PLAYER hits the Coopertition and AMPLIFICATION buttons? The answer to Q27 does not seem to address this.

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **199** answered Jan 12th 24)

Q40 Is it possible to drive over a node.

Q: Do you think it is possible to drive over a note if the bumpers are made legal height and mounted correctly at the 7.5 height? Basically will it fit under the bumpers?

A: As a friendly reminder, the purpose of this Q&A is to answer questions regarding the [Game Manual]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards]

(<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings]

(<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>). Any measurements or materials information beyond what's already provided in [official Field Drawings]

(<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) and other tools available on the [Playing Field page](<https://www.firstinspires.org/robotics/frc/playing-field>) must be derived by the team.

(Asked by **5547** answered Jan 12th 24)

Q41 Language of ONSHAPE qualification

Q: In section 6.5.2, the scoring criteria for being ONSTAGE includes: C. chain-facing vertical surfaces of the core (with regards to the chain used by the ONSTAGE ROBOT, green shaded elements in Figure 6-3), D. carpet facing surfaces of the core (blue shaded elements in Figure 6-3) Is the intent of D to be only the surfaces of the core that face the carpet are allowed to be contacted to qualify for ONSTAGE, or the carpet surface that faces the core?

A: Please see [Team Update 02]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate02.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **4276** answered Jan 12th 24)

Q42 Is intention considered when evaluating CONTROL?

Q: The answer to Q9 says "the intent of CONTROL is not determined when considering violations of G403 and G409", however G403B and the glossary's definition of CONTROL both say a ROBOT is in CONTROL if it "intentionally pushes a NOTE to a desired location or in a preferred direction". Please clarify. Is a NOTE-carrying ROBOT that is intentionally moving to a desired location or in a preferred direction with an additional NOTE that is unintentionally lodged under it in CONTROL of the second NOTE?

A: You're right, thank you for following up. REFEREES are expected to infer intent with respect to !G403, part B, as you state. However a NOTE lodged in a ROBOT *is* considered CONTROLLED by that ROBOT as clarified in the blue box under Rule !G403, and intent is not relevant. !Q9 has been updated accordingly.

(Asked by **199** answered Jan 12th 24)

Q43 What is the definition of completely crossing the center line?

Q: G405 states "whose BUMPERS have completely crossed the CENTER LINE" - what is the definition of completely crossed with regards to the tape width?

A: A ROBOT with BUMPERS that overlap any part of the CENTER LINE tape has not completely crossed it.

(Asked by **8089** answered Jan 12th 24)

Q44 Robot contact in Auto

Q: In G405 it states " may contact neither an opponent ROBOT nor NOTES staged in the opponent's WING." . Does this mean contacting a robot in any part of their side of the field and Notes staged in their wing, or contacting robots and Notes only in the wing?

A: The sentence is to be parsed such that the ROBOT that has completely crossed their CENTER LINE may not contact 1) an opponent ROBOT or 2) NOTES staged in the opponent's WING.

(Asked by **8089** answered Jan 12th 24)

Q45 Maximum high notes

Q: What is the maximum number of high notes that can be thrown?

A: There are no rules explicitly limiting the number of HIGH NOTES that can be used in game play. Please see

Section 6.3.4 for details on how many HIGH NOTES are available at the start of the MATCH.

(Asked by **6639** answered Jan 12th 24)

Q46 Spotlight Bonus

Q: Does the spotlight bonus get applied ONCE or is it per robot on stage?

A: We believe the second sentence of Section 6.5.4 answers your question. If not, please rephrase and resubmit.

(Asked by **6639** answered Jan 12th 24)

Q47 Do notes in AUTO count towards melody bonus?

Q: Do notes in AUTO count towards the melody bonus?

A: Yes.

(Asked by **6639** answered Jan 12th 24)

Q48 Continuous Robot Frame

Q: Does the robot frame need to be completely continuous (no gap for intake, like in the past) or can the frame have a gap (for intake) as long as the bumpers protect the frame (same as previous games)?

A: We believe !R401 and Figure 8-3 answer this question. If not, please rephrase and resubmit.

(Asked by **7220** answered Jan 12th 24)

Q49 Is there a limit to the amount of 1/2" openings in frame perimeter?

Q: Rule R401 states that, "ROBOTS are required to use BUMPERS to protect the entire FRAME PERIMETER. Gaps of less than 1/2 in. between adjacent segments are permitted as long as all corners are filled per R409." Is there a limit to how many 1/2" inch gaps you can have as long as they aren't over a corner in the frame?

A: There are no rules limiting the number of 1/2" gaps between BUMPER segments. However when constructing BUMPERS teams should be aware of !R404 and !R407

(Asked by **753** answered Jan 16th 24)

Q50 Section 6.5.3 Applification

Q: I feel I'm over-analyzing this. So, according to the rules ("...AMPLIFIES their SPEAKER for 10 seconds or until 4 NOTES are scored in that SPEAKER, whichever comes first..."): If we Amplify our speaker, then our alliance scores 4 notes in 5 seconds (for example) we could then reamplify. Is this correct? Thanks in advance!

A: If an AMPLIFICATION is ended early by reaching the limit of 4 NOTES scored in the SPEAKER, the ALLIANCE will immediately be able to begin scoring NOTES in the AMP to accumulate the necessary 2 NOTES to AMPLIFY the SPEAKER again.

(Asked by **5863** answered Jan 13th 24)

Q51 Robot Frame

Q: Does the Metal Frame of the robot have to be continuous?

A: There are no rules that specifically regulate the "frame" of the ROBOT. !R101 describes how to determine the FRAME PERIMETER of a ROBOT, !R401 dictates the BUMPER requirements relative to that FRAME PERIMETER and !R404 specifies backing requirements for those BUMPERS.

(Asked by **7138** answered Jan 13th 24)

Q52 Coopertition Notes

Q: If two notes are banked in the amp and the human player presses the coopertition button, does this clear both notes or does it only clear one note and the remaining note can then be applied towards one of the two needed for amplification?

A: When an ALLIANCE uses a NOTE to engage in *Coopertition*, they are just using one NOTE and another one that is "banked" will not be used upon hitting the *Coopertition* button.

(Asked by **3284** answered Jan 15th 24)

Q53 Match replays due to radio disconnects.

Q: In 10.2, the second blue box states that "scenario E occurring before the last 20 seconds of the MATCH" would be an example of an ARENA FAULT that does not lead to a MATCH replay. Is the intent that radio disconnections that affect other teams are only potential replay causes if they occur during the last 20 seconds of the match? Does this mean that a disconnection causing an impairment that lasts for 40 seconds in the middle of the match is not cause for a replay?

A: The examples listed in the blue box are not an exhaustive list of all scenarios in which an ARENA FAULT is not considered to have affected the outcome of the MATCH. The exact circumstance is evaluated by the Head REFEREE, likely with input from FIELD STAFF, and the Head REFEREE has final authority to determine if the outcome of the MATCH was affected.

(Asked by **1540** answered Jan 16th 24)

Q54 Further clarification regarding CONTROL when NOTE lodged *under* a ROBOT?

Q: Is a NOTE that is lodged *under* a ROBOT treated the same as a NOTE lodged *in* a robot (ie. fully supported by a ROBOT per G403A, so intention is not considered), or the same as a NOTE being pushed by a ROBOT (ie G403B, so intention is considered). Q9 was specifically asking about a NOTE lodged *under* a ROBOT, but the answer implies that it would be treated like a NOTE lodged *in* a ROBOT. For consistent enforcement in this common scenario, will G403 and the definition of CONTROL be revised?

A: For the purposes of assessing CONTROL, there's no distinction between a NOTE lodged in a ROBOT vs one lodged under a ROBOT.

(Asked by **199** answered Jan 16th 24)

Q55 Intention *never* considered regarding CONTROL during TELEOP?

Q: The revised answer to Q9 says "intent ... is not considered when determining violations of ... G409". But G409 refers to CONTROL, and one form of CONTROL as defined in the Glossary and G403 remains "*intentionally* pushing a NOTE ...". Please clarify. Note that if intent is not to be considered under G409, the "greater-than-MOMENTARY" clause in G409B helps reduce the impact, but G409A does not have such a clause. Unintentionally pushing a NOTE when leaving the SOURCE with 1 would violate G409A?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Per the Blue Box on !G403B, "bulldozing" a NOTE as a ROBOT leaves the SOURCE would not be CONTROL and thus not a violation of !G403 (in AUTO) or !G409 (in TELEOP). Conversely, a ROBOT "herding" one NOTE on the floor while carrying another NOTE would be a violation of !G403 (in AUTO) or !G409 (in TELEOP).

(Asked by **199** answered Jan 16th 24)

Q56 Team Logo/Avatar

Q: Second year coach, and I was wondering how to get our team's logo submitted so it's linked to our team name and number. Last year I noticed many teams had a logo/avatar, we did not. I would like to make sure we can do this this year. I noticed the option to add an Avatar under Passwords/Vouchers on my FIRST dashboard. However, I keep getting an error message when I try to submit. Any help is greatly appreciated.

A: As a friendly reminder, the scope of this Q&A system includes and is limited to questions about the [Game Manual](<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards] (<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) are posted to the Q&A System. For questions about other topics, please contact Team Support at [firstroboticscompetition@firstinspires.org] (<mailto:firstroboticscompetition@firstinspires.org>).

(Asked by **6528** answered Jan 16th 24)

Q57 360 Bumper Coverage, No openings for Intakes

Q: Following the vein of Q49. Can you confirm bumpers must now provide 360 coverage around the robot, and approximately 100% of the frame perimeter established with the solid black line in figure 8-3 (R401)? Eg. Bumpers can no longer have openings for intakes or other mechanisms. If so, for the interest of absolute clarity, could you please add a footnote to R401 to address specifically frame openings for intakes or other mechanisms being not allowed.

A: We believe !R401 adequately states the requirements for BUMPER coverage (and we avoid using using the Q&A to restate manual content).

(Asked by **5518** answered Jan 16th 24)

Q58 Reaching Beneath Robot with Frame Perimeter

Q: Can a robot have a mechanism within the frame perimeter that extends beneath the robot, but does not cause the robots overall height to exceed 4'0" (max build height)? Eg. Collecting a note from the floor (roomba-style) with an intake that skims along the carpet within the frame perimeter.

A: There are no rules that prohibit a ROBOT from contacting the carpet within its FRAME PERIMETER. Please note that any reaction against the carpet cannot cause a ROBOT to violate !G411, part E.

(Asked by **5518** answered Jan 15th 24)

Q59 Handheld Device to Assist Human High Note Throw:

Q: Following in the vein of Q13's answer, "The manner in which the robots are spotlight is not considered..." Would a human player be allowed to use a handheld device to introduce high notes to the field to score on the microphone?

A: We believe !G302 answers your question. If not, please rephrase and resubmit.

(Asked by **5518** answered Jan 15th 24)

Q60 What is the Max number of Human Players allowed in the Source and Amp at one time?

Q: In regards to Table 6-1 DRIVE TEAM Roles, the table under the column Role says Driver and Humans Player, where in the Max./ Drive Team column, it states that there can only be 3 in total between the two. Our question is can multiple human players be in either the Source Zone or the Amp zone at one time from different Teams, as well as the maximum number of Human Players allowed in either zone at one time? For example, can multiple Human players from multiple teams be in the Source or Amp Zone?

A: There are no explicit limits on the number of HUMAN PLAYERS (or DRIVERS for that matter) that can occupy the space behind the AMP or that can be in the SOURCE AREA during the MATCH.

(Asked by **4118** answered Jan 16th 24)

Q61 Does a ROBOT supported entirely by a GAME PIECE qualify as ONSTAGE?

Q: Section 6.5.2 states that a ROBOT qualifies for ONSTAGE points if it is only contacting, among other things, GAME PIECES. Therefore, If a ROBOT were to therefore sit on a NOTE such that it was no longer making contact with the field carpet, it seems it would qualify as ONSTAGE. Is this correct?

A: Please see !G406 and Example B in its blue box.

(Asked by **2175** answered Jan 15th 24)

Q62 FMS communication of AMPLIFICATION

Q: Will the FMS send information about whether AMPLIFICATION mode is active/inactive via NetworkTables? If not, is there another method for the ROBOT to be able to determine the current AMPLIFICATION state via code?

A: No.

(Asked by **6377** answered Jan 16th 24)

Q63 ONSTAGE points qualification without contacting a STAGE chain

Q: Can a robot qualify for ONSTAGE points without contacting a STAGE chain (on their STAGE) either directly or transitively through another robot contacting a STAGE chain (on their STAGE) exclusive of any ALLIANCE ROBOT being awarded the ENSEMBLE RP.

A: There are no requirements that a ROBOT be in contact with chain to be ONSTAGE.

(Asked by **1241** answered Jan 16th 24)

Q64 Qualification of ONSTAGE without contacting anything within the ONSTAGE criteria

Q: Since 6.5.2 provides only a list of items a ROBOT may only contact in order to qualify for ONSTAGE points, can a robot qualify for ONSTAGE points without contacting anything within the ONSTAGE criteria list exclusive of any ALLIANCE ROBOT being awarded the ENSEMBLE RP.

A: There is no requirement that the ROBOT contact anything on the list in Section 6.5.2. to qualify for ONSTAGE points.

(Asked by **1241** answered Jan 16th 24)

Q65 Qualification of ONSTAGE 5 seconds after the ARENA timer displays 0:00

Q: In reference to the ONSTAGE criteria in 6.5.2 in combination with the assessment of STAGE points being made 5 seconds after the ARENA timer displays 0:00 according to 6.5 C, can a ROBOT qualify for ONSTAGE points if it does not meet the ONSTAGE criteria at the end of a MATCH, but does meet ONSTAGE criteria 5 seconds after a MATCH.

A: Yes, however TEAMS should be aware of letter F in the blue box of !G212 and letter A in the blue box of !G411 while designing their ROBOT.

(Asked by **1241** answered Jan 18th 24)

Q66 Clarification on rule G413

Q: Rule G413 states that the Robot's height cannot exceed 4 feet or may not extend 1 foot beyond the frame perimeter. We want to confirm, does that mean the 4 foot height is a hard limit, and that you cannot extend up to 1 foot beyond in that direction like you can in other directions?

A: Correct.

(Asked by **1708** answered Jan 16th 24)

Q67 Grabbing or grasping the TRAP while scoring a NOTE

Q: In reference to G415, is exerting a downward force on the TRAP, while in the process of scoring a NOTE in the TRAP, considered grasping or grappling? Does the duration of this interaction or if the duration continues at the end of a MATCH affect the determination?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Generally, only pushing down on the top of a surface is not considered grasping or grappling, but may be considered "suspending from" depending on the magnitude of the force. Additionally, Please see !G415 as updated in [Team Update 04] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate04.pdf>) for additional consideration for interaction with FIELD elements.

(Asked by **1241** answered Jan 19th 24)

Q68 Qualification of ONSTAGE with contact of the inner surfaces of the TRAP

Q: Can a ROBOT be considered ONSTAGE if it meets all criteria specified in 6.5.2 along with contacting the inner surfaces of the TRAP that are perpendicular to the chain-facing vertical surfaces of their core or the nearest flap specified in 6.5.2 C.

A: No.

(Asked by **1241** answered Jan 15th 24)

Q69 I101 clarification

Q: I101 defines a MAJOR MECHANISM as something that addresses ROBOT movement among other things. If there is an attachment device built by team A that is mounted to team B's ROBOT, that allows team A to attach to team B, that gives no extra functionality other than attachment. Given that both robots will climb together with team A's climber. Would the attachment device attached to Team B be considered a major mechanism under I101 because of ROBOT movement?

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally, a MECHANISM which does not accomplish any of the items listed in !I01 on its own is not a MAJOR MECHANISM.

(Asked by **2240** answered Jan 16th 24)

Q70 Scoring Qualification for Spotlighting

Q: Hi FIRST, we were wondering what qualifies as a scored HIGH NOTE? Does the HIGH NOTE have to fully encircle a MICROPHONE to SPOTLIGHT ROBOTS? Would a NOTE resting partially on the top surface of a MICROPHONE without being fully around the MICROPHONE be eligible for SPOTLIT points?

A: Updated Jan. 19, 2024 ~~There is no requirement that the HIGH NOTE be fully seated such that it surrounds the MICROPHONE. A HIGH NOTE perched on top of the MICROPHONE is on the MICROPHONE.~~ Please see [Team Update 04](<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate04.pdf>). Yes. No.

(Asked by **5347** answered Jan 15th 24)

Q71 Length of TE-24211

Q: Hi FIRST, we had a question about the length of part TE-24211 for the at home version of the STAGE. The cut list and the drawings list different lengths for this part. According to the cut list, the part is 56.25 inches long, but the drawings list the part as 52.625 inches long. Do you know which one is correct?

A: Thank you for pointing out this error. The drawing is the correct dimension. The [READ ME with the cutlist for TE-24211](<https://firstfrc.blob.core.windows.net/frc2024/FieldAssets/2024TeamVersion-TE-24000-SOURCE-ReadMe.pdf>) is updated in [Team Update 03] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate03.pdf>).

(Asked by **5347** answered Jan 16th 24)

Q72 ONSTAGE Eligibility: What is considered the chain?

Q: Hi FIRST, we noticed in figure 6-3 that the two end links that hang off the chain on the other sides of the carabiner are not highlighted like the rest of the chain. We were wondering if this was a mistake or if it was intentional; if the end links of the chain on the outwards side of the carabiner are contacted, can the ROBOT be eligible for ONSTAGE points? Additionally, can the carabiners be contacted during a climb?

A: The end links are considered part of the chain, and thus may be contacted per Section 6.5.2. Note that per Section 5.5, only the end points of the chain and the lowest droop point of the chain are guaranteed. The number of end links may vary to achieve the specified chain droop. While there are no rules prohibiting contact with the carabiners that attach the chain to the rest of the STAGE, they are not included in the list in Section 6.5.2, and so a ROBOT in contact with a carabiner is ineligible for ONSTAGE points.

(Asked by **5347** answered Jan 16th 24)

Q73 U-Shaped Bumper

Q: Hello, I just wanted to check that U or C Shaped bumpers are allowed this year. The technical resources referred to by the manual describes the U Shaped bumper as "Small wood segments are attached on either end of a larger segment. The small pieces may be symmetric or asymmetric." It lists those as one of the options. I just wanted to make sure that would be allowed since our design relies on it.

A: There are no explicit prohibitions of U or C shaped BUMPER sections, however once on the ROBOT, the requirements in !R401 (and all other BUMPER rules) must be met.

(Asked by **5857** answered Jan 16th 24)

Q74 Which dimension in TE-24316 is correct?

Q: On pages 20 and 21 of TE-24300-SPEAKER-Drawing.pdf, there is a drawing and a cut sheet for TE-24316. The drawing and cut sheet measure the top corner as 25.5" from two different ends. Which of these is correct?

A: Thank you for pointing out this error. Please see [Team Update 03] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate03.pdf>) for the correction. If that doesn't answer your question, please rephrase and resubmit.

(Asked by **8513** answered Jan 16th 24)

Q75 Can the human player score high notes to the speaker?

Q: According to rule G408: Robots may not cause high notes to leave the field, including through an amplifier or speaker. Can the human player score high notes to the speaker? And if so, does it count towards the 18-note threshold?

A: Section 6.5 presents no rewards for HIGH NOTES in a SPEAKER.

(Asked by **5554** answered Jan 15th 24)

Q76 Human player interaction

Q: Can A human Player put a high note on the robot?

A: There are no rules prohibiting this.

(Asked by **5436** answered Jan 16th 24)

Q77 Cooperation bonus

Q: Can you score in your opponents amp to gain the Coopertiton Bonus?

A: There are no rules restricting a ROBOT from placing a NOTE in the opposing ALLIANCE'S AMP. Only the HUMAN PLAYERS of that ALLIANCE may press the *Coopertition* button.

(Asked by **5436** answered Jan 16th 24)

Q78 Amplification

Q: While the amplification is cooling down, can you still score and charge it while the speaker is resetting from amplification?

A: There is no "cool down" for AMPLIFICATION. A SPEAKER is either AMPLIFIED or not AMPLIFIED. If a SPEAKER is *not* AMPLIFIED (either because 10 seconds have elapsed or because the ALLIANCE has reached the max number of NOTES described in Section 6.5.3), the ALLIANCE is able to build up the next pair of NOTES needed to AMPLIFY the SPEAKER. If the SPEAKER is AMPLIFIED, the ALLIANCE may score NOTES in the AMP, but the NOTES do not accrue for the next AMPLIFICATION.

(Asked by **5436** answered Jan 16th 24)

Q79 Question about defense

Q: If we are defending and if the other team shoots at us does that count as a penalty on the team that shoots a note at us or does it go against us?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. If your question is based on

confusion about a particular rule or set of rules, please rephrase to be more specific (i.e. reference the rule(s)), and resubmit.

(Asked by **5436** answered Jan 16th 24)

Q80 Exceeding Frame Perimeter

Q: According to G413, "A ROBOT may not expand beyond... B. it may not extend more than 1 ft. (~30 cm) from its FRAME PERIMETER." Does this 12" limit have to be a physical limit of the ROBOT either by its mechanism's reach or a hard stop, or can it be a combination of physical limit and software implementation of a limit of travel?

A: Per the Blue Box on !R105, "Constraints may be implemented with either hardware or software."

(Asked by **2028** answered Jan 16th 24)

Q81 Can a human player reintroduce a note that left the field through the source?

Q: Section 6.8 says "NOTES that leave the FIELD are not returned to game play." If a note leaves the field and lands in the source area, can a human player reintroduce that note through the source?

A: There are no rules that prohibit this but teams should keep in mind !G425.

(Asked by **6662** answered Jan 19th 24)

Q82 Rev and Date on Game Manual Title Page

Q: Would it be possible to put the revision number and date on the title page of the Game Manual?

A: The scope of this Q&A system includes and is limited to questions about the [Game Manual] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards] (<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) are posted to the Q&A System. Feedback may be provided via Team Support at [firstroboticscompetition@firstinspires.org] (<mailto:firstroboticscompetition@firstinspires.org>).

(Asked by **58** answered Jan 16th 24)

Q83 CONTROL of a damaged NOTE

Q: If a NOTE becomes damaged to the point that it breaks into multiple pieces, and a ROBOT has CONTROL of one of those pieces, would that ROBOT gaining control of an additional, undamaged NOTE be a violation of G409 (1 NOTE at a time)? Would the size of the damaged NOTE piece affect this ruling? If instead of a piece of a damaged NOTE, the ROBOT was in CONTROL of a damaged NOTE that was still intact, would that affect this ruling?

A: Please see [Team Update 04] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate04.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **177** answered Jan 22nd 24)

Q84 G413 - When are extensions from the robot measured?

Q: In G413 it explains that the 4-foot height of the robot is measured when it's resting normally on a flat floor. If the robot is tilted the height measurement stays the same. The rule does not explain how to measure the 1-foot extension of the robot. Is it done when the robot is resting on a flat floor and that measurement stays the same if it is tilted, or is the measurement done from the outer-most point when the robot is tilted?

A: The extension measurement can be thought of similarly to the "normally on a flat floor" measurement of the height. The extension limit in !G413-B is measured from the FRAME PERIMETER. Per !R101, the ROBOT's FRAME PERIMETER is established in the ROBOT's STARTING CONFIGURATION. As the ROBOT rotates, the FRAME PERIMETER rotates with it.

(Asked by **6223** answered Jan 17th 24)

Q85 TRAP Shooting

Q: If a NOTE is placed in the TRAP, through the cutout above the AprilTag, by a ROBOT that is not ONSTAGE i.e not climbed on the chains, will it count as scored in the TRAP?

A: There is no requirement that a ROBOT be ONSTAGE to score a NOTE in the TRAP.

(Asked by **900** answered Jan 17th 24)

Q86 KOP problem

Q: We have discovered a problem with the KOP drive base when assembling the centre drive wheel. The provided 10/12 1.5 screws are too long and bottom out to each other from opposite sides. Will FIRST provide a corrective action to this problem for this drive base and make a correction for future drive bases?

A: The scope of this Q&A system includes and is limited to questions about the [Game Manual] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards] (<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) are posted to the Q&A System (for questions about other topics, please contact Team Support at [firstroboticscompetition@firstinspires.org] (<mailto:firstroboticscompetition@firstinspires.org>)).

(Asked by **854** answered Jan 18th 24)

Q87 BUMPERS extending to within a certain distance of FRAME PERIMETER corner

Q: In the 2023 manual, R401 and Figure 9-3 shows that the plywood must extend to be within 1/4 in. of the FRAME PERIMETER corner. In this year's manual, this illustration is not shown. Is this year's R401 stating that the plywood must extend within 1/2 in. of the FRAME PERIMETER corner as long as the pool noodles fill the corner? For example, can two separate BUMPER segments meet at the corner of the FRAME PERIMETER, or is it required that the corner be wrapped by one continuous BUMPER segment?

A: The 1/2 in. gap allowance applies whether at a FRAME PERIMETER corner or not. Pool noodles must fill a

corner per !R409, regardless of if a 1/2 in. gap exists in the corner. There's no requirement that a single BUMPER segment "wrap" around a corner. The requirement of !R409 can be met in a few ways, including but not limited to two BUMPER segments meeting in a corner (as shown in the top-right example illustrated in Figure 8-4 and the center-bottom example illustrated in Figure 8-7) or by overlapping (as illustrated in the lower-right example illustrated in Figure 8-7).

(Asked by **1468** answered Jan 19th 24)

Q88 Clarification about district points in Finals matches

Q: 11.1.3 Playoff Performance says district teams get 5 points per Finals match win, whereas last year's manual listed a total of 20 points for Finalists and 30 points for the Winners. If the finals goes 2-1, does that mean the Finalists earn 25 district points (and the Winners 30)?

A: Please see [Team Update 05] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate05.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **857** answered Jan 23rd 24)

Q89 Coopertition clarification

Q: If a team puts a note in the amp and presses the coopertition button, but the other alliance does not, can the first team continue to put two notes in the amp and use the amplification button? Or, does the first team have to wait for the other alliance to use the coopertition button before it can amplify?

A: Yes. Use of the *Coopertition* button does not limit the ability of an ALLIANCE to accumulate NOTES and activate AMPLIFICATIONS. However an accumulated NOTE will be used when the *Coopertition* button is pressed.

(Asked by **1051** answered Jan 18th 24)

Q90 Bumper Coverage?

Q: Do the bumpers have to completely cover the robot frame vertically? For example, can the bottom of the robot frame be 2 inches from the floor while the bottom of the bumpers is higher (without violating the 7.5" maximum height)?

A: There are no rules requiring that the BUMPERS cover the entire vertical section of the ROBOT frame, however please take note of the requirements defined in !R410.

(Asked by **3624** answered Jan 18th 24)

Q91 Using a ratchet?

Q: Can you use a ratchet in your climb mechanism?

A: There are no rules against using a ratchet on the ROBOT.

(Asked by **6110** answered Jan 18th 24)

Q92 Chain Needed for TRAP

Q: Do you have to hang on the chain in order to score in the TRAP?

A: There are no rules requiring a specific ROBOT position to score in the TRAP.

(Asked by **2199** answered Jan 18th 24)

Q93 R625 Power Paths

Q: R625 states "CUSTOM CIRCUITS shall not directly alter the power pathways between the ROBOT battery, PDP/PDH, motor controllers..." A printed wiring board which contains no active electrical components would not be considered a CUSTOM CIRCUIT as defined in Section 14 and instead would meet the considered a PASSIVE CONDUCTOR. Thus, is it permissible to attach a printed wiring board that is a PASSIVE CONDUCTOR to the screw terminals on a Kraken X60 motor for the purpose of adding a connector?

A: Yes, a PASSIVE CONDUCTOR is not a CUSTOM CIRCUIT and would not violate !R625. All traces and connectors must be appropriately gauged/rated per !R623.

(Asked by **971** answered Jan 22nd 24)

Q94 Does pushing against the stage core wall while on the chain violate rule G415?

Q: Does pushing against the vertical surfaces of the stage core wall while climbing on the chain violate rule G415? Is doing this considered grasping the vertical surface of the stage core wall?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Generally, simply pushing against the vertical surface of the STAGE core is not considered "grasping".

(Asked by **3890** answered Jan 18th 24)

Q95 Does pinning a note against a field element count as control?

Q: G403. "1 Note at a time" states that "In AUTO, ROBOTS may not CONTROL more than 1 NOTE at a time, either directly or transitively through other objects. A ROBOT is in CONTROL of a NOTE if: A. the NOTE is fully supported by the ROBOT or B. it intentionally pushes a NOTE to a desired location or in a preferred direction (i.e. herding). Examples of interaction with a NOTE that are not "CONTROL" include, but are not limited to: A. "bulldozing" (inadvertent contact with a NOTE while in the path of th

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. *Generally,* a NOTE pressed between a ROBOT and a FIELD element is not considered CONTROLLED by that ROBOT.

(Asked by **694** answered Jan 18th 24)

Q96 From where does the human player throw the Note to Spotlight?

Q: From where does the human player throw the Note to Spotlight? And what is the distance from that place to the microphone?

A: We believe !G430 answers your question. If not, please rephrase and resubmit. Any measurements or materials information beyond what's already provided in [official Field Drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) and other tools available on the [Playing Field page](<https://www.firstinspires.org/robotics/frc/playing-field>) must be derived by the team.

(Asked by **7671** answered Jan 19th 24)

Q97 Bumper Segments

Q: Can a single side of the robot be covered by 3 different bumper segments? If that is not permissible, can a bumper have a cutout in it so parts of it are 4-1/2 inches tall and parts of it are 5-1/2 inches tall?

A: There are no rules explicitly limiting the number of BUMPER segments that may be used to cover a single FRAME PERIMETER side.

(Asked by **6223** answered Jan 19th 24)

Q98 Amp Zone width

Q: Hi FIRST, we noticed that on the layout and marking diagram that the width of the AMP ZONE seems to be 18 inches wide, but the game manual seems to say that AMP ZONE is only 17.75 inches wide, do you know which measurement is correct?

A: Please see [Team Update 05] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate05.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **5347** answered Jan 23rd 24)

Q99 Filling of corners where unconnected BUMPER segments meet?

Q: If 2 unconnected BUMPER segments meet at a corner, can the corner be filled by having the soft parts of one or both segments extend into the corner, or would that violate R408A because those portions would not be backed by wood on the same segment. For example, if the wood of the unconnected segments were arranged like any of the OK examples in Figure 8-4, could the soft portions be arranged like either of the last 2 OK examples in Figure 8-7? The figures don't say if the segments are connected.

A: Any of the corner types shown in !R409 may be used regardless of whether BUMPER segments connect at the corner or not.

(Asked by **199** answered Jan 19th 24)

Q100 Regarding instances of Autonomous "Intimidation" or other un-GP acts in violation of G203

Q: Regarding the answer of Q23: If a "messy" situation were to occur (where one alliance attempts to dissuade another alliance to play to their potential through verbal or text-based communication) such that the alliance on the receiving end of the communication suspects a violation of G203 has occurred. What is the proper procedure

to bring this to the attention of the Head Referee? Is the Question Box BEFORE the match in question the correct avenue?

A: The Question Box is one option, however the team can also bring it to the attention of event staff (e.g. the LRI, FTA, Pit Admin Supervisor, or Program Delivery Partner), and they will assist with connecting with the Head REFEREE.

(Asked by **5934** answered Jan 22nd 24)

Q101 Wiring on the game field

Q: Is there any wiring that is on and or crosses the game field?

A: There are no FMS elements (sensors, wiring, etc.) within the FIELD boundary.

(Asked by **4935** answered Jan 22nd 24)

Q102 Source dimensions

Q: What is the measurement (in inches) from the bottom of the front of the source to the ground? What is the measurement (in inches) from the bottom of the back of the source to the ground?

A: Any measurements or materials information beyond what's already provided in [official Field Drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) and other tools available on the [Playing Field](<https://www.firstinspires.org/robotics/frc/playing-field>) page must be derived by the team.

(Asked by **9307** answered Jan 22nd 24)

Q103 Can the stage chain be used as an electrical conductor?

Q: Can the stage chains be used to conduct an electrical signal? If so, are there any voltage or current limitations? The intent is to determine if the chain is contacting two climbing hooks simultaneously (assuming the conductive part of said hooks is isolated from the frame, per R611).

A: No, intentionally exposed electrical conductors would be a violation of !R203 and could be a violation of !G411, part F.

(Asked by **1540** answered Jan 23rd 24)

Q104 Can we have an RFID reader on robot for battery identification?

Q: Rule R707 states “No other wireless allowed.” Would it be possible to exclude NFC Near-field Communications to enable teams to collect data like What Battery is currently installed in their robot using the WPILib data logging features by adding a RFID tag to each battery with unique ID’s and low power RFID reader. Could a system like this be installed and disabled during the match to adhere to the rule similarly to rules of software robot extension limits?

A: The scope of this Q&A system includes and is limited to questions about the [Game Manual] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards] (<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>) are posted to the Q&A System. For

feedback, please contact Team Support at [firstroboticscompetition@firstinspires.org] (mailto:firstroboticscompetition@firstinspires.org).

(Asked by **4607** answered Jan 22nd 24)

Q105 TE-24300 Speaker Read-me shopping list doesn't match cut list

Q: The shopping list for TE-24300-readme lists 2"x4"x8' - 12 Pieces. The cut diagram has 13 boards (total of the repetition column). There are two rows for layout C. Should there only be one?

A: Please see [Team Update 05]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate05.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **6114** answered Jan 23rd 24)

Q106 Can video devices span alliance stations?

Q: Would it be a violation of G302 for a wired tool (consisting of a camera and monitors) used by an alliance for planning/communicating strategy, not connected to the OPERATOR CONSOLE, to span across/rest upon all three of an alliance's ALLIANCE STATIONS?

A: Please note that there are no rules that prohibit teams within an ALLIANCE from sharing a wired strategy tool, however an ALLIANCE partner may choose to not allocate space in their DRIVER STATION for additional equipment. Devices brought to the ARENA must not be, or used in a way that could be considered, a risk to personal safety. A tether that spans DRIVER STATIONS could be considered a tripping or engagement hazard depending on its implementation. Additionally, please keep in mind !G301 to ensure there is no delay of the MATCH.

(Asked by **1540** answered Jan 24th 24)

Q107 Does scoring change based on the number of high notes scored on a microphone?

Q: Rule 6.5.4 specifies scoring for high notes. Do points scored increase based on the number of high notes per microphone? For example, if there are two high notes on one microphone, would the spotlight bonus be different for the bonus for a microphone with one high note?

A: No.

(Asked by **753** answered Jan 22nd 24)

Q108 G411 violations during AMP scoring

Q: G411 states “the ROBOT or anything it CONTROLS contacts anything outside the FIELD (except for MOMENTARY contact inside the CHUTE)”. The sloped ramp behind the AMP (GE-24121 and GE-24122 on blue AMP) is outside the FIELD as defined. It is possible for a NOTE to be in contact with a ROBOT which itself is fully inside the FIELD and these AMP parts at the same time, resulting in a DISABLE. Is our understanding of G411 correct? Or should these surfaces of the AMP be considered part of the FIELD?

A: Please see [Team Update 06]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate06.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **9140** answered Jan 26th 24)

Q109 Frame cutting for driving over notes

Q: We would like to cut about a half inch off of the front of our Andy mark frame at the bottom so that we can drive over notes. The bumpers will be solid and will pass over notes, we just wanted to check that such a modification was OK.

A: We cannot comment on part/design legality or questions that are overly broad, vague, and/or include no rule references. Please consult [Section 1.10]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>) and, if needed, resubmit a different question that seeks clarity on a rule or combination of rules.

(Asked by **6859** answered Jan 23rd 24)

Q110 Grapple Hook

Q: Can a robot fire a hook with pneumatics to grab onto the chain as long as the length of the rope connecting the hook to the robot does not exit the allowed extension ranges?

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally, a ROBOT with a grapple hook may be scrutinized to ensure it complies with !R203 and at no time violates !G411.

(Asked by **5590** answered Jan 23rd 24)

Q111 Are multiple COTS USB power packs allowed?

Q: R602 allows COTS USB power packs for certain applications within certain power and connection requirements. Is there a limitation to a single COTS USB power pack or may multiple packs be used? (Just verifying for the sake of certainty that the plural form of the sentence applies to number of batteries and not only types being described.)

A: There is no limit on the number of COTS USB power packs permitted.

(Asked by **1622** answered Jan 23rd 24)

Q112 Small Event Exceptions Details

Q: Hi GDC and FIRST staff, just a couple of quick questions about how small event exceptions interact with other rules. Does a small event "bye-MATCH" / "null MATCH" (10.6.6) count as an alliance's "first Playoff MATCH" for T604? Does participation in a "bye-MATCH" / "null MATCH" count towards "Playoff MATCHES won by [an] ALLIANCE" for evaluating Playoff Performance points (11.1.3)? Thanks in advance!

A: No. Yes.

(Asked by **401** answered Jan 25th 24)

Q113 Banking Notes in Amp after Nominal Amplification Time

Q: Hi FIRST, we just wanted to clarify our interpretation of Amplification and when teams can bank notes in the Amp. It is our interpretation that after the ten nominal seconds of Amplification, Notes can be banked in the Amp even during the three extra seconds when the Speaker is still counting notes as Amplified. Is this interpretation correct? Thanks.

A: Correct. At the end of the 10 second AMPLIFICATION, the AMP stack light will stop blinking and NOTES placed in the AMP can begin accumulating for a subsequent AMPLIFICATION, even though the SPEAKER is still counting NOTES as AMPLIFIED for an additional 3 seconds.

(Asked by **5347** answered Jan 23rd 24)

Q114 Note Scored in Trap during auto count as stage points

Q: Does a NOTE scored into the TRAP during auto count as stage points for the sake of the ENSEMBLE ranking point?

A: Yes, all items in the STAGE section of Table 6-2 are "STAGE points" for the assessment of the ENSEMBLE. There is no restriction on when NOTES may be placed in the TRAP, however all STAGE scoring will be assessed after the conclusion of the MATCH per item C in Section 6.5.

(Asked by **4290** answered Jan 24th 24)

Q115 R201 clarification regarding wheel tread surface features

Q: Regarding R201 Would a wheel, whose primary function is to provide propulsive force for the robot when contacting the field carpet (drive-train wheel) be legal given the following: 1) the wheel circumference is covered in hundreds of short (<1/4"long, <1/16" in diameter) cylindrical, tapered, or pyramid shaped "nubs", longer than they are wide 2) the primary intent of these nubs is to interface *into* the carpet nap 3) these "nubs" are >= 85A durometer plastic (hard on Shore hardness scale).

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event.

(Asked by **5934** answered Jan 24th 24)

Q116 Collecting Notes from SOURCE in AUTO

Q: Can robots collect notes from the SOURCE during the AUTO period?

A: No, both the SOURCE and the NOTES staged in the SOURCE AREA are in front of the STARTING LINE so a HUMAN PLAYER contacting either to enter a NOTE into the FIELD would be a violation of !G401.

(Asked by **2907** answered Jan 24th 24)

Q117 Regarding R201

Q: R 201 has a "title" of no digging into carpet. Drive wheels are not exempt from this rule. The rule seems to be included to prevent damage to the carpet. The rule explicitly gives hard plastic studs as a prohibited feature. "Roughtop" is not a stud and has been allowed for years despite interlocking with carpet nap. Other materials of

harder plastics could "dig in" to carpet. There is no definition of "hard plastic" in the manual. Could you elaborate on what is a "hard plastic stud"?

A: Please see [Team Update 06]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate06.pdf>). We acknowledge that some plastics described as "hard" may not actually be a threat to the ARENA and have revised the language to better reflect that the example in the rule's parenthetical is meant to evoke a stud that could pull at the carpet. There is no discrete transition from flexible to inflexible, and the ultimate assessment is related to its risk in causing ARENA damage. The final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event.

(Asked by **5934** answered Jan 26th 24)

Q118 Driver Eligibility

Q: We have a team member that will be 19 before our first competition. In the Canadian school system, you can 'graduate' after 4 years, but still return to complete extra courses in a 5th year. Our team member has returned for the 5th year. Is he eligible to drive even though he has technically received a diploma? The rule in section 6.2 indicates that a "student is a person who has not completed high school as of September 1 prior to Kickoff". This student is still taking classes.

A: A student enrolled in high school has not completed high school.

(Asked by **7475** answered Jan 26th 24)

Q119 Clarification about Harmony points

Q: Does having three robots on the chain give all the robots two points making it 6 points total or do only two robots get points making it a total of 4 points?

A: We believe the last sentence of Section 6.5.2 addresses your question. If not, please rephrase and resubmit.

(Asked by **2907** answered Jan 29th 24)

Q120 Meaning of subsequent in G414

Q: Hi FIRST, we were wondering about the wording in rule G414. When it says plus Tech Foul for subsequent violations in the Match, does that mean that the additional Tech Foul is added for any further violations regardless of the robot that commits the violation? Ie: if Robots A and B are on the red Alliance and A violates G414 and receives a foul, and then Robot B violates G414, would they receive the added tech foul? Also, does an action count as "Repeated" if a different robot commits it?

A: !G414 legislates behavior of an individual ROBOT; if partner violates the same rule, it's not a "subsequent" violation. No, "repeated" modifies the behavior of an individual ROBOT.

(Asked by **5347** answered Jan 29th 24)

Q121 Is Wireless Tethering okay per E303

Q: Hi FIRST, we noticed that the blue box on page 55 of the manual says that tethering can include wireless tethering. Does this also apply for E303, ie: can a robot be tethered wirelessly outside of the Field?

A: No, as clarified in [Team Update 07]
(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate07.pdf>).

(Asked by **5347** answered Jan 30th 24)

Q122 Can ATM size circuit breakers be used in a REV MPM?

Q: Can ATM size circuit breakers be used in a REV MPM (Mini Power Module) in a custom circuit? We have contacted REV and they stated, "ATM circuit breaks should fit and should work electrically with the MPM. However, if you intend to use this in FRC, you should check with FIRST Q&A to check legality."

A: We cannot comment on part/design legality; the Q&A is not a tool for "pre-inspection" of a ROBOT or part. We believe !R619 and !R620 answer your question, but if not, please rephrase and resubmit.

(Asked by **3461** answered Jan 29th 24)

Q123 Size of Accessibility Aid for Human Player

Q: What are the size limits for an accessibility aid (such as step stool or small platform) that allows a student of short stature (such as 4ft. 7in.) proper usage and operation of the AMP, SOURCE and HIGH NOTE that stays within the confines of the human player area?

A: As noted in Section 5.6.2, there may be a ramp available at events for DRIVE TEAMS with limited mobility. There are no size limits defined, and the size of areas for DRIVE TEAM members are described in Section 5.2 and on the [Layout and Marking Diagram] (<https://firstfrc.blob.core.windows.net/frc2024/FieldAssets/2024LayoutMarkingDiagram.pdf>). Per the blue box of !G302, stools will generally not be allowed due to safety hazards. Per Section 13, "If a participant needs an accommodation for an event, please talk to a volunteer at the event or contact your local leadership before the event so they can help ensure the accommodation is provided. Local leadership may make exceptions to event rules to allow for reasonable accommodations given the exceptions do not create an undue hardship or cause safety concerns."

(Asked by **2357** answered Feb 1st 24)

Q124 Legal Batteries for FRC

Q: Rule R601, part F, specifies "Terminals: Nut and bolt style". All of the example batteries in the blue box have SLA terminal style T3 (<https://www.canbat.com/battery-terminals/>). However, there are otherwise legal batteries with terminal style T12. The difference being T12 has the nut integrated into the battery. Are batteries with terminal style T12 legal for an FRC Robot in competition if they also comply with the other parts of R601?

A: The list of examples in the blue box is not exhaustive, and there are legal batteries that meet the criteria listed in the rule, but aren't included in the blue box as an example.

(Asked by **3132** answered Jan 29th 24)

Q125 Clarification of Violation of G424

Q: In the violation section of G424, it states "Violation: 2 TECH FOULS plus the opponent ALLIANCE os awarded the ENSEMBLE RP if a Qualification MATCH" With this violation the receiving alliance will receive

10 points for the 2 tech fouls plus an automatic RP. Why are there 2 tech fouls assessed for this violation?

A: The Q&A is a tool provided to teams to help clarify rules, and questions asking "why" certain rules or violations are the way they are will not be addressed. If you have a question about what a rule or violation means, please rephrase and resubmit.

(Asked by **3284** answered Jan 29th 24)

Q126 4 foot height limit

Q: Is it legal if our robot can break the 4-foot barrier but is programmed in a way that is unable to do so?

A: There is no language prescribing how a ROBOT complies with !G413.

(Asked by **8081** answered Jan 29th 24)

Q127 Running Motor Controllers using PDH fused channels

Q: Under R621 and R625, motor controllers must have unmodified power pathways connected to a breaker up to 40A. The blue box states that this rule does not prohibit the use of smaller value breakers. Is it prohibited to run a motor controller off of a fused slot on the PDH?

A: Please see [Team Update 08]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate08.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **6443** answered Feb 2nd 24)

Q128 Follow Up on Q90 and Q109: Frame Profile and Bumper Support

Q: These questions ask specifically about the “side view” of the robot frame: restrictions on frame height/thickness (dimension of frame perpendicular to the carpet) and backing of the BUMPER. The answers point to R410 with figure 8.8 which is a “top view” of the frame and describes the support needed in the horizontal direction. Are there rules that define a minimum dimension for the height/thickness of the frame or minimum dimension of BUMPER that has to be supported in the vertical direction?

A: There is no prescribed minimum dimension of vertical overlap between the BUMPER and the backing elements of the structure/frame to meet !R410. The Blue Box describes the intent of the rule. Just as the example in the Blue Box describes very flexible elements not meeting the criteria of "structure/frame", exceedingly small vertical overlaps may not meet the criteria of "supported" and thus would be evaluated against the gap criteria. Teams are encouraged to ensure backing elements overlap a sufficient height of the BUMPER to prevent the BUMPER from rotating and make it clear to INSPECTORS that the BUMPER is supported.

(Asked by **6300** answered Feb 1st 24)

Q129 Is there a limit to the number of High Notes that can be thrown at a time?

Q: Would there be rules preventing two High Notes, with one being squished slightly, from being arranged in such a way that they can be thrown at the same time?

A: There are no rules restricting the number of HIGH NOTES that a HUMAN PLAYER may simultaneously enter on to the FIELD provided they do not violate !G430. However manipulation of a GAME PIECE to ease a challenge associated with another GAME PIECE is a violation of !G428.

(Asked by **1405** answered Feb 1st 24)

Q130 Bumper Fabric

Q: We have used Marine Vinyl Fabric - Flexa from <https://www.marinevinylfabric.com/products/marine-vinyl-fabric> for the last 2 seasons. We see the word cloth has been used this year in R408 D. Does the material we are using meet the guideline. It has proven to be very durable.

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally materials labeled as "vinyl" are similar to the examples in the blue box of items not considered cloth: "Non-woven materials such as leather or pleather are not considered cloth."

(Asked by **2654** answered Feb 1st 24)

Q131 Does any team have the Kitbot 3D printable spacers in .stl format?

Q: Does any team have the Kitbot 3D printable spacers in .stl format?

A: The purpose of this Q&A is to answer questions regarding the rules of CRESCENDO. For technical assistance, please visit the [*FIRST* Forums](<https://forums.firstinspires.org/forum/general-discussions/first-programs/first-robotics-competition>).

(Asked by **4314** answered Jan 30th 24)

Q132 Entering Notes from the Alliance Area Strategy

Q: Hi FIRST, we had a question regarding a strategy and if it would be considered within the spirit of the game or not. We understand G429, however we were wondering, if in a situation where a Human Player was willing to accept the Tech Foul for G429, could they enter a Note from behind the Amp to aid in strategy such as trying to achieve the Melody Ranking Point, or would this be against the spirit of the game?

A: Yes, breaking any rule for strategic gain is against the spirit of the competition, and subject to a YELLOW or RED CARD per the last paragraph in the blue box in !G212, and as updated in [Team Update 11] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate11.pdf>).

(Asked by **5347** answered Feb 13th 24)

Q133 Harmony clarification

Q: Hi FIRST, we just wanted to ask a clarifying question about Harmony points. We understand that Harmony is applied per extra robot. Our interpretation of this is that when two Robots are sharing a chain and are Onstage, collectively the Alliance would receive 2 points for Harmony, and that when three Robots are Onstage on the

same Chain, that the Alliance would receive 4 points for Harmony. Is this interpretation correct?

A: Correct.

(Asked by **5347** answered Jan 30th 24)

Q134 Further clarification on G414 (subsequent vs repeated)

Q: Hi FIRST, in reviewing the game manual and Q120, we still have a further question regarding how we should interpret rule G414. We noticed that the rule uses the word "subsequent" instead of "Repeated" unlike most other Robot rules. We were wondering what the difference between "subsequent" and "repeated" were, or if there is no difference. Have a nice day. - Team 5347

A: Updated Feb 9... The language used in the !G414 violation is used to indicate that the Team gets a TECH FOUL ~~instead of, not~~ in addition to~~,~~ a FOUL for the subsequent **** (i.e. REPEATED) **** violation. ~~The "if repeated" language used in other violations indicates cases where the Team receives both things.~~

(Asked by **5347** answered Jan 30th 24)

Q135 Self Right extension beyond 12" limit

Q: If a robot tipped over during a match, but and overextended beyond the 12 inch frame perimeter in order to self- right. Would this be called as a Foul or a Tech Foul under G413. The self-righting would not directly enable or impede scoring but could potentially allow for scoring later in the match.

A: Updated Feb 6, 2024... !G413 does not provide an exception for a ROBOT over-expanding so it can reorient itself**, which is considered strategic benefit**.

(Asked by **2582** answered Jan 30th 24)

Q136 Distance to Amp discrepancy

Q: Hi FIRST, when looking at the manual and fielding documents we seemed to have noticed a discrepancy. The layout and marking diagram seems to imply that the Amp is 49.09 inches from the Alliance Wall, however the Manual says that the Amp is 49.5 inches from the Alliance Wall. Do you know which measurement is correct? All the best, - Team 5347

A: The dimensions are slightly different because the reference used for the ALLIANCE WALL in the [Game Manual](<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>) is the diamond plate, while the [Layout and Marking Diagram] (<https://firstfrc.blob.core.windows.net/frc2024/FieldAssets/2024LayoutMarkingDiagram.pdf>) references the ALLIANCE WALL top rail.

(Asked by **5347** answered Jan 31st 24)

Q137 Bumper transitioning from horizontal to sloped

Q: Can a bumper on a single side of a robot transition from being horizontal to being sloped at an angle? Sample CAD from a Chief Delphi post is attached. If this is allowed, can one long pool noodle bend through this vertical transition? Or would cuts need to be made to miter the pool noodle, similar to R409 Figure 8-7 (bottom center image)?

A: There are no rules requiring a single BUMPER segment to be straight, or regulating the exact way pool noodles are shaped to accommodate BUMPER segments which may have curves or angles along their length so long as the cross section at any point along the FRAME PERIMETER meets the requirements of !R408, including resembling Figure 8-6. However, we cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event.

(Asked by **4188** answered Feb 1st 24)

Q138 COTS USB battery packs "and 5V"

Q: R602 states: "*Other batteries for cameras or computers only. COTS USB battery packs with a capacity of 100Wh or less (20000mAh at 5V) and 5V, 5 Amp max output per port" Modern USB battery packs will often negotiate power delivery at higher than 5V. It may not be possible to tell what voltage is provided. Cables can not be modified to allow voltage measurement. Are USB battery packs supporting PD or QC protocols allowed, given the uncertainty of the output voltage?

A: No, a battery pack which outputs greater than 5V, or outputs an unknown voltage, in the configuration used on the ROBOT is not permitted.

(Asked by **4143** answered Feb 1st 24)

Q139 AMP face thickness

Q: Since the official version of the AMP is made of a different material, is there a difference in thickness between the official version's front panel and the one found in the element documents?

A: Please refer to the [2024 Field Drawing Package] (<https://firstfrc.blob.core.windows.net/frc2024/FieldAssets/2024FieldDrawings.pdf>) to find dimensions of official field elements. In particular, the Amp front panels are part numbered GE-24114 and GE-24115.

(Asked by **8116** answered Feb 2nd 24)

Q140 Can you shoot notes into other robots

Q: Can you shoot notes into other robots?

A: There are no explicit rules regarding shooting NOTES into other ROBOTS provided the team is not violating !G211, !G404, !G406, and !G414.

(Asked by **6548** answered Feb 4th 24)

Q141 What is the expected carpet compression?

Q: According to Section 5.1, the surface of the FIELD is low pile carpet, Shaw Floors, Philadelphia Commercial, Neyland II 20, "66561 Medallion." Are the measurements provided in the manual for field element heights off of the carpet provided based on the compressed or uncompressed carpet nap? Important examples would include 5.5 STAGE.

A: Measurements provided in the manual for field element heights off the carpet are to the carpet when it is not

compressed.

(Asked by **1339** answered Feb 4th 24)

Q142 Minimum age for eligibility

Q: Team is currently comprised completely of 8th graders. 8th grade is in the high school building under the same administration. Section 1.1 indicates FRC as for grades 9-12, ages 14-18, but context makes that seem descriptive rather than prescriptive. 6.2 seems to indicate that they'd all be eligible, given the glossary definition of a student. 13.1 E103 says children under 12 must be accompanied by an adult, but I find no other lower bound. Would I be safe in presuming they're eligible?

A: Age is not part of the criteria for a STUDENT.

(Asked by **5225** answered Feb 3rd 24)

Q143 Legality of WAGO 221 Inline Splicing Connectors

Q: Hi FIRST, In 2022's Q&A specifically Q139, WAGO 221 Inline Splicing Connectors were said to be legal to use on 40A circuits because of REV Robotics rating of "Rated for robot circuits up to 12 AWG" being sufficient to qualify these connectors for use anywhere a 12 AWG wire may be used. We just wanted to confirm this is still the case in 2024. Thank you.

A: We cannot rule absolutely on specific components, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally, a VENDOR rating an item for either the current limit of the circuit breaker (or higher) or the gauge of wire permitted on that circuit (or larger) would qualify as "appropriately gauged/rated" per !R623.

(Asked by **1601** answered Feb 5th 24)

Q144 HP Extending into the field while throwing high notes?

Q: G427 prohibits the HUMAN PLAYER in the SOURCE area from extending into the CHUTE, and G430 and G425.C specify what a HUMAN PLAYER in the ALLIANCE area can't interact with and where they may stand while introducing a HIGH NOTE to the FIELD, but there is no rule governing possible extension into the FIELD by a HUMAN PLAYER in the ALLIANCE area. Is the intent of this to not penalize a HUMAN PLAYER whose hand extends across the plane of the FIELD barrier while throwing a HIGH NOTE?

A: Hands entering the vertical projection of the FIELD would be considered entering the FIELD and thus be a violation of !G101

(Asked by **694** answered Feb 5th 24)

Q145 Air Nozzle to Open TRAP Door?

Q: Are teams allowed to utilize pneumatic mechanisms (e.g. an air nozzle) to apply the 2 oz. of force necessary to open the TRAP door as long as all rules for pneumatic mechanisms are followed?

A: There are no rules that prohibit use of compressed air to manipulate a FIELD element.

(Asked by **8531** answered Feb 5th 24)

Q146 Trap force criterion: 2oz to barely move, or to fully open?

Q: Seeking clarification on the force criterion for opening the trap flap. The wood field building instructions for TE-24200 (sheet 6 of 9) say: "It should only take about 2 oz of force applied to this location to move the flap." Is that 2oz of force to begin moving the flap from its closed state? Or 2oz of force to successfully open the flap all the way to the limiting stop on the back?

A: More detailed specifications beyond those already published are not available.

(Asked by **4188** answered Feb 5th 24)

Q147 District team criteria (meaning of Highest Qualification Round Seed)

Q: Hi FIRST, we had a question about table 11-2. When criteria number for lists "Highest Qualification Round Seed", does this refer to the ALLIANCE CAPTAIN points in table 11-1, or does this refer to Qualification Round Performance in table 11-1?

A: Either the ALLIANCE CAPTAINS points or the Draft Order Acceptance, whichever is higher.

(Asked by **5347** answered Feb 5th 24)

Q148 Displaying Note on Robot

Q: If our team has a dynamic display on the robot that would show a NOTE in about the correct proportions (not size) and color during teleop, does that break R203c? Our intent would be for our strategic benefit, and isn't intended to trick sensors.

A: We can rule absolutely on hypothetical ROBOT designs. Generally, a device that interferes with remote sensing capabilities of another ROBOT is a violation of !R203, regardless of intent. The final decision as to legality of a particular ROBOT lies with the LEAD ROBOT INSPECTOR (LRI) at each event.

(Asked by **2832** answered Feb 5th 24)

Q149 Multizone Note Shot with Collision

Q: A robot sitting in the opponents wing takes a shot to the center area, and that note collides with a note that started in the center area. The center zone note then moves into the alliance wing from the collision. It is clear and obvious that the shot from opponents wing stopped in the center area. Does this break rule G414?

A: !G414 does not require contact or other direct interaction with a NOTE that's traveled into or through their WING; the rule can be violated via transitive influence.

(Asked by **2832** answered Feb 6th 24)

Q150 Can Bumpers have cuts taken out of the noodle and fabric?

Q: As looking from above, can "U" shaped cuts be taken out of the noodle. To specify further, this "chunk" would be taken out of the noodle while leaving the plywood backing intact. The fabric would still be attached in this void in the noodle. In R408, there is nowhere that states that the noodles must be fully continuous, only that the

fabric must enclose all exterior surfaces.

A: No, per R408-C noodles "may not be modified (with the exception of cutting to length or cutting to facilitate mating pool noodles at the corners as required by R409) or deformed".

(Asked by **9500** answered Feb 5th 24)

Q151 We are experimenting with coprocessors on our robot.

Q: One of the options is an Android phone that is used exclusively to read network tables and display the values in a user friendly format. - It will read network tables while the robot is disabled, but will be read-only. The device will remain in airplane mode, connected to network tables via a USB-C to Ethernet adapter connected to our network switch. No wireless communication will be used on this device. - The device will not be used to issues Commands. Is this legal to add to our robot?

A: We cannot comment on part/design legality, previous calls of Head REFEREES or LRIs, or questions that are overly broad, vague, and/or include no rule references. Please consult [Section 1.10] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>) and, if needed, resubmit a different question.

(Asked by **4451** answered Feb 5th 24)

Q152 Chain dimensions

Q: Where do I find the distance between eyebolts given? A 9' chain with only positive 0.5 tolerance is shown on Field Elements drawings. No dimensions for official carabiners. A minimum height at center given for chain but no note that not all of the 9' chain should be necessary. I had to go to Team Elements drawing to find that the chain is meant to be adjusted to give 28.25" minimum at center. Teams shouldn't have to build any part of the element to get critical dimensions/notes like these.

A: Any measurements or materials information beyond what's already provided in [official Field Drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>), Section 5 of [the Game Manual] (<https://frc-qa.firstinspires.org/manual>), and other tools available on the [Playing Field page] (<https://www.firstinspires.org/robotics/frc/playing-field>) must be researched (i.e. searching for a part number referenced on a drawing), replicated onsite, or derived by the team.

(Asked by **9054** answered Feb 6th 24)

Q153 Distance of chain to front of TRAP

Q: Where would I find the distance from the chain horizontally to the face of the STAGE containing the TRAP? This seems a critical dimension to have been left out of the GAME MANUAL. Teams shouldn't have to build a mockup to think through the problem of opening the door.

A: We believe this information is covered in the 2nd paragraph of Section 5.5. If not, please rephrase and resubmit.

(Asked by **9054** answered Feb 6th 24)

Q154 Conflict between intro to section 9 Inspection and Eligibility and E117

Q: E117 says that teams must have passed inspection to use the practice field, while the third paragraph in section 9 says that inspection can be paused for slots on the practice field. For the purposes of E117, what constitutes a "practice field" - does the typical practice field at events, comprised of a small carpeted area and largely wood versions of field elements, count? What about events that provide a full field for practice, including both regionals and champs events?

A: Thank you for pointing out that the Section 9 text is unclear and please see [Team Update 10] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate10.pdf>) for updated language. If that doesn't answer your question, please rephrase and resubmit.

(Asked by **2177** answered Feb 9th 24)

Q155 How is the height of the bumper backing wood measured for unusual bumper shapes?

Q: R408 says that bumpers must be made from '5+-1/2" tall' wood. How is this measured? Ex 1: a segment is made from wood with parallel edges 5.5" apart but is not parallel to the ground. Is it legal, given that its height measured perpendicularly to the ground exceeds 5.5"? Ex 2: A segment is made of a continuous piece of wood with parallel edges 5" apart along its entire length but half the segment is offset from the other (one half is 0.5-5.5" off the ground and the other half 2.3-7.3").

A: The measurements for the 3/4" plywood backing for segments not parallel to the ground is measured perpendicular to the parallel edges of that segment. The measurement for a discontinuous segment would be made independently on each section of the backing.

(Asked by **6662** answered Feb 8th 24)

Q156 Clarification of Q148

Q: There are now 2 standards to judging R203C, which one would teams be held to? R203C states "specifically intended", and the answer of Q148 states "regardless of intent" when decorations interfere with remote sensing capabilities.

A: We apologize that our answer to !Q148 was unclear. However the official ruling of !R203 does not use any language of intent. While the blue box does list an example of intended interference it is not an exhaustive list, and unintended interference can also be a violation of this rule.

(Asked by **2832** answered Feb 6th 24)

Q157 Clarifications on event-specific ruling

Q: I've noticed responses suggesting final decisions are event-specific via being left up to the LRI at your event. But as I understand it, rule disputes can be escalated to co-Chief LRIs for more consistent outcomes between events and a better experience for teams. Do the current Q&A responses risk misinforming teams about their options? Could the Q&A system better communicate the availability of this escalation process to teams?

A: Please see Section 9 as updated in [Team Update 10] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate10.pdf>). The LRI at each event is the final authority regarding the legality of any ROBOT, but may consult with the Chief LRIs or *FIRST* personnel if needed. Any team is invited to contact [*FIRST* Headquarters](<https://frc-qa.firstinspires.org/admin/review/firstroboticscompetition@firstinspires.org>) with concerns (rule related or not)

about their experience, as described in [Section 1.10]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/Sections/2024GameManual-01Introduction.pdf>).

(Asked by **5414** answered Feb 8th 24)

Q158 G405 Clarification

Q: Hi FIRST, we had a clarifying question about rule G405. We noticed that the rule describes Robots whose Bumpers HAVE completely crossed the Centerline. Does this violation apply if a Robot completely crosses the Centerline with its Bumpers, and then goes back on their own side of the Center line, and while fully on their side of the field, contacts and opponent robot? In short, for a G405 violation to occur, is it necessary that a Robots Bumpers have to be actively completely past the line?

A: In order for this violation to occur, the offending ROBOT'S BUMPERS must be completely across the CENTER LINE at the time of the contact.

(Asked by **5347** answered Feb 7th 24)

Q159 Does the compressor HAVE to be mounted on the robot?

Q: We have pneumatic cylinders that only fire a few times per match and are very small bore. We use less air than can be stored in the air reservoirs on the robot. We would like to NOT put the compressor on the robot - meaning the robot would only have the gauges (high pressure and low pressure), the solenoids, and a pressure release valve. The only compressor would be separate from the robot and simply used to "precharge" the system. Is this allowed?

A: Per !R806: "compressed air on the ROBOT must be provided by its 1 onboard compressor only".

(Asked by **2234** answered Feb 7th 24)

Q160 Full Wrap Around Bumpers

Q: Hello, I asked earlier about C/U shaped bumpers and realize that may have been confusing so I wanted to ask a related question. So the technical specifications for the bumpers made in January linked to by the game manual describes full wrap around bumpers as a bumper with a cutout in one side of the bumper where there is also a cutout in the robot frame. So I just wanted some clarification, a yes or no confirming whether cutouts in bumpers are allowed assuming a cutout on the robot frame too.

A: !R401 requires that BUMPERS protect the entire FRAME PERIMETER. While the FRAME PERIMETER is a function of the frame, it doesn't necessarily follow the frame. Please see !R101 and Figure 8-2 for additional information about the relationship between the two.

(Asked by **5857** answered Feb 7th 24)

Q161 HP extening while throwing high notes?

Q: Follow up to Q144. G425C says that an HP "may not contact anything outside the area in which they started the MATCH" with exceptions for actions that are "inadvertent, MOMENTARY, and inconsequential". The zone itself is only 39" deep, making it difficult for humans to make a throw without either stepping out of the zone backward or extending momentarily into the field forward. Will there be any allowances for momentary, but consequential, extensions in either direction?

A: Please see [Team Update 10]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate10.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **694** answered Feb 9th 24)

Q162 Amp Pocket Back Material?

Q: My team hasn't been able to find this information, but we want to know what the material of the back of the pocket on the AMP is made out of. We want to know this because we want to be 100% accurate with how the Note reacts the the field elements.

A: Please refer to the [2024 Field Drawing Package]

(<https://firstfrc.blob.core.windows.net/frc2024/FieldAssets/2024FieldDrawings.pdf>) to find the material of official field elements. In particular, the Amp back panel is part number GE-24111.

(Asked by **6964** answered Feb 7th 24)

Q163 Bumper Pockets for Frame Protrusions

Q: We have protrusions beyond the frame of the robot, which are allowed by R101. We want a fixed solid square bumper installed from either the top or bottom of the robot, but these protrusions prevent us from sliding the bumper onto the frame. We don't want to leave a 1/4inch gap between the bumper and the frame so we're not so close the limit. Can we have a slot in the bumper wood backing that would extend from the bottom (or top) of the bumper backing to the position of the protrusion?

A: We believe !R408A answers your question. If not, please rephrase and resubmit

(Asked by **4361** answered Feb 8th 24)

Q164 Radio power modification

Q: can I modify the power for our radio. Hardwire positive and negative to the radio by soldering wires directly to avoid power issues.

A: No, this modification is prohibited by !R710.

(Asked by **263** answered Feb 8th 24)

Q165 Notes Reentering the Field

Q: According to section 6.8, NOTES that leave the FIELD are not returned to game play by FIELD STAFF. How may teams return notes that have left the field? Can they return notes that are scored in the AMP or SPEAKER?

A: Human Players may return any NOTES which enter the SOURCE AREA to play. Per !G429 NOTES may only be entered through the SOURCE. NOTES scored in the AMP or SPEAKER will not be accessible to HUMAN PLAYERS in the SOURCE AREA.

(Asked by **175** answered Feb 8th 24)

Q166 Modification of a pool noodle

Q: In R408 subsection c, it is stated that pool noodles used in the construction of bumpers must not be modified. Since an exception is made for reducing their length, does the definition of modifying here include taping two shorter pieces together to extend their length?

A: Please see [Team Update 11]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate11.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **8116** answered Feb 13th 24)

Q167 Bumper Hight and Configuration

Q: Hello! I, on behalf of team 5530, am asking for clarification on select bumper rules: According to Rule R402, Bumpers Do not have to be Parallel to the ground. making Figure 1 Legal. According to rule R408, bumpers must be backed by 5 in. TALL plywood. in our interpretation, this does not mean that the backing plywood must be 5 in. wide at all points, meaning that Figure 2 would be legal. For figures please see this link https://docs.google.com/document/d/1DJ_yOfaMomZ-QutRgp00XjUde5eFshOs1KzBK

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event.

(Asked by **5530** answered Feb 12th 24)

Q168 Can robot shoot high note to the microphone?

Q: Can robot control and shoot high note to the microphone and alliance robots get spotlighting points?

A: Yes, and the violation associated with !G408 is applied.

(Asked by **7522** answered Feb 9th 24)

Q169 May the cover may be removed from the Falcon 500 limit switch connector?

Q: Rule !R710 explicitly lists the allowed modifications to control system devices. The list includes "the cover may be removed from the Talon SRX data port." However, the list does not include the cover over the limit switch connector on the Falcon 500 motor. Is it permissible to also remove the cover on the Falcon 500 to access the connector?

A: Please see [Team Update 10]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate10.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **6343** answered Feb 9th 24)

Q170 May the unused connectors on the NI roboRIO be covered with insulating tape?

Q: Rule R710 explicitly lists the allowed modifications to control system devices. The list includes several examples of applying insulating tape or labels to devices. However, the list does not include applying insulating tape for the purpose of preventing debris from entering the roboRIO enclosure through unused connector ports. Some teams have recommended applying tape to the unused ports as a best practice. Is applying tape to the roboRIO for this purpose permissible?

A: Please see [Team Update 11]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate11.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **6343** answered Feb 13th 24)

Q171 Is the Servo Power Module a custom circuit and how does this interact with R621 and R625?

Q: Under the current rules, the Rev Servo Power Module (listed in R506) is a custom circuit because it is not mentioned in R710 or R501. If this is correct, how does it interact with R625, since the servo power module alters the power path between the PDH and servos? If it is incorrect, what are the requirements for powering the Servo Power Module under R621? Can multiple be placed on the same branch circuit? Also R625 has a typo (R701 should be R710).

A: Good question. We believe [Team Update 11]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate11.pdf>) addresses your question. If that doesn't answer your question, please rephrase and resubmit.

(Asked by **6662** answered Feb 13th 24)

Q172 G425 B and the blue box - driver stations 2 and 3

Q: The blue box states "a DRIVE TEAM member located more than approximately half a DRIVER STATION width away from their own DRIVER STATION while using their operator console is likely violating this rule." How should this be applied wrt movement between stations 2 and 3 (the two with the SPEAKER in between)? Can a console using driver from station 3 move up to halfway across station 2 (and vv), or are they restricted to only moving partway behind the SPEAKER (half the width of their own station)?

A: The rule is applied relative to that TEAMS driver station and not in relation to other driver stations. As such a DRIVER moving more than approximately half a DRIVER STATION width away from their own DRIVER STATION is likely in violation of this rule whether or not it is into another DRIVER STATION or behind the SPEAKER.

(Asked by **4828** answered Feb 12th 24)

Q173 Clarification on R408-C bumper requirements

Q: In the blue box of R408-C, the bumper pool noodles are described as follows: "'2 1/2 in. pool noodles' either sold as 2 1/2 in. diameter or that measure between 2 1/8 in. pool noodles and 2 3/4 in. diameter." Does this mean that, if the pool noodles are not sold specifically as being 2 1/2 inches, but are between 2 1/8 and 2 3/4 in. diameter, they are able to be used as bumpers?

A: Yes.

(Asked by **2550** answered Feb 12th 24)

Q175 Does Wing include tape

Q: Hi FIRST, we were wondering if the tape spanning the width of the field adjacent to the Stage is included in the Wing?

A: Please see [Team Update 11]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate11.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **5347** answered Feb 13th 24)

Q176 Linear Actuator Motors

Q: The last line in Table 8-1 allows "Linear actuators rated for 12V and wired downstream of a breaker 20A or less". Does that include any motor attached to a linear actuator, whether supplied with the device or purchased separately and attached by the team? Does it allow for any motors attached to a team designed and constructed linear actuator, or does the whole thing (linear actuator with an integral motor) need to be COTS?

A: Please see [Team Update 11]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate11.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **2177** answered Feb 13th 24)

Q177 Followup on battery voltage...

Q: With respect to Q138: If a USB battery pack has PD or QC protocols allowed, but the negotiated voltage/current is known to be 5V/5A or less (because, for example, the powering or powered device will always negotiate to 5V/5A or less), is that battery pack legal assuming the R602 capacity restriction is met?

A: Updated Feb 23, 2024 ~~Please see [Team Update 12]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate12.pdf>). If that doesn't answer your question, please rephrase and resubmit.~~ Yes, a device that is limited to 5V, 5A as used on the ROBOT meets !R602, but the burden of proof is on the team to show how the battery complies with the rules if higher voltages are indicated on the label.

(Asked by **5607** answered Feb 19th 24)

Q178 About trap scoring

Q: In the last 20 seconds of the game, we would like to know that one team in an alliance can leave a note for 2 or more different traps. Our second question is that we would also like to know that we can throw a note without climbing on the chain, while we still stay on the ground.

A: As a friendly reminder, please search the Q&A prior to submitting a question. We believe !Q26 and !Q85 answer your questions. If not, please rephrase and resubmit.

(Asked by **6436** answered Feb 12th 24)

Q179 Are the situations qualified as ONSTAGE

Q: 1. The robot hangs on the chain with a note half in its body. The robot touches nothing but the chain and the note. But the note touches the field ground. Is this qualified as ONSTAGE? 2. The robot hangs on the chain with a note half in its body. The robot touches nothing but the chain and the note. But the note touches an ally robot, which is not qualified as ONSTAGE. Is this qualified as ONSTAGE?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. If you need clarification on a particular rule (or set of rules), please rephrase and resubmit.

(Asked by **5885** answered Feb 13th 24)

Q180 Robot Extension past the FRAME PERIMETER

Q: Looking at rule G413, the robot cannot extend more than 1ft outside the FRAME PERIMETER. Given the definition of FRAME Perimeter, this requires 1ft from the physical frame. If the extension is higher/lower than the FRAME PERIMETER, does that shorten the distance that the extension can go?

A: No, "beyond the FRAME PERIMETER" refers to the 2D measurement as illustrated in Figure 8-2.

(Asked by **3481** answered Feb 13th 24)

Q181 ONSTAGE robot contact a note

Q: In 6.5.2 the robot is qualified for ONSTAGE by touching "B. GAME PIECES". Does the rule require, the note contacted by the ONSTAGE robot, should also be contacting the things in the list only? If that note touches the ground, is the robot still qualified as ONSTAGE? From 6.5.2 only, looks no limitation for what the note may touch. If you can't give the exact answer, Are there any other rules related to this situation? Which rules will REFEREES possibly use to make decision on this situation?

A: No, the list of what a ROBOT may only be contacting to qualify for ONSTAGE points does not apply to GAME PIECES.

(Asked by **5885** answered Feb 14th 24)

Q182 Team update 10 Human Player Extension

Q: Under team update 10, Exceptions are granted for a HUMAN PLAYER partially outside the ALLIANCE or SOURCE AREA (but not in the opponent ALLIANCE or SOURCE AREA), in cases concerning safety, and for actions that are inadvertent, MOMENTARY, and inconsequential. First, are the three conditions an AND statement or an OR statement? Secondly, is a human player allowed to throw and score with one foot outside their Alliance Zone under the first exception if they are not in an opponent zone or field?

A: The sentence lists 3 exceptional circumstances which are independent of each other, not a single circumstance in which all 3 criteria must be met. Yes, a HUMAN PLAYER may be partially outside their area, however if their positioning poses a safety risk, they're at risk of a violation of !G212.

(Asked by **2240** answered Feb 15th 24)

Q183 Referee Placement

Q: Where are the referee and scoring stands placed around the field? Will referees attempt to not be in the way of a human player trying to throw a high note?

A: Placement of REFEREES is not a formal specification. Generally, a REFEREE is staged next to each of the 4 FIELD quadrants and often next to a gate. A REFEREE is unlikely to interfere with a HUMAN PLAYER action, however if that action reaches outside the ALLIANCE or SOURCE AREA and the REFEREE'S attention is elsewhere and the HUMAN PLAYER contacts the REFEREE, the interaction may be a violation of !G425 part C.

(Asked by **2240** answered Feb 20th 24)

Q184 Score in TRAP conditions

Q: A first note shot from a robot is clamped by the trap door. A second robot shoots a second note to hit the door and it causes the first note enter the trap. Question 1: Is the second robot FOUL or have the risk to be FOUL according to G406 or any other rules? Question 2: The first note is qualified to get the TRAP score according to 6.5.1. But if the process is related to any FOUL action (such as if the action in question 1 is a FOUL), will the TRAP score still be counted?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Generally, using a NOTE to attempt to open the TRAP in order to score a separate NOTE may be a violation of !G406. A NOTE scored in the TRAP would be counted regardless of whether !G406 was violated.

(Asked by **5885** answered Feb 20th 24)

Q185 Clarification on R408, paragraph E

Q: This clarification request is relative to the optional metal angle to clamp cloth allowed per R408E. Is it required to install said metal angle the full length of the internal bumper perimeter, or can partial pieces be utilized or just one side contain the angle?

A: The optional clamping angle permitted by R408-E may be installed on any portion of the BUMPER length.

(Asked by **7166** answered Feb 17th 24)

Q186 WCP Kraken x60 Power pole Adapter board 4 pin jst

Q: Requesting clarification on R621. It states, "only 1 circuit breaker or fuse on the PDP/PDH per Table 8-3. No other electrical load can be connected to the breaker or fuse supplying this circuit with the exception of devices downstream of a Kraken X60 Power pole adapter board." Would powering a CANcoder via the Kraken's 4-pin output be legal under R621? Would powering a CANcoder that way make the Kraken-CANcoder branch a CUSTOM CIRCUIT?

A: Yes, powering a device from the 4 pin "CANCoder port" is "downstream of a Kraken X60 Power pole adapter board" and therefore permitted by !R621. Yes, the CANCoder remains a CUSTOM CIRCUIT per !R614 but is not considered to be altering the power pathway per !R625.

(Asked by **5126** answered Feb 19th 24)

Q187 Clarification about Kraken X60 Powerpole adapter exception to R621

Q: R621 states that "no other electrical load can be connected to the breaker or fuse supplying this circuit with the exception of devices downstream of a Kraken X60 Powerpole adapter board" A) what is considered "downstream" of the adapter board? B) is there any requirement that the adapter board be coupled to a Kraken X60? C) are there any limitations on what electrical loads can be placed downstream? e.g. would a motor controller be permitted downstream?

A: "Downstream of the adapter board" refers to devices connected to the power output of the board (i.e. the +/- terminals on the port labeled "CANCoder port" in the device documentation). There is no requirement that the board be connected to a Kraken X60. A motor controller placed downstream is a violation of !R625.

(Asked by **1024** answered Feb 19th 24)

Q188 Clarification to R501: COTS Brushless Linear Actuator

Q: R501 allows for the use of "COTS linear actuators rated for 12V and wired downstream of a breaker 20A or less". Does this allow for the use of COTS linear actuators with a brushless motor (provided all other rules are followed)?

A: There is no requirement specifying whether the motor in a COTS linear actuator allowed by !R501 must be brushed or brushless.

(Asked by **1024** answered Feb 19th 24)

Q189 Driver Station Numbers

Q: In the game manual (pg. 30), there is a single image of the red ALLIANCE WALL, which shows RED 3 as being the single station. Knowing that the field is mirrored, it was our assumption that the driver station numbers are also mirrored across the center line. At the week-zero event that we attended, BLUE 1 was the single station and 2/3 were grouped together. Can you provide clarity whether the BLUE ALLIANCE WALL should also have 3 as the single station, or is it mirrored and inverted?

A: The ALLIANCE WALLS are numbered left to right from the perspective of the DRIVERS. As such RED 3 and BLUE 1 are the DRIVER STATIONS that are separated from the other 2.

(Asked by **2530** answered Feb 19th 24)

Q190 Robot Bumper on the Starting Line

Q: In the definition of the ROBOT STARTING ZONE, is the starting line part of the ROBOT STARTING ZONE?

A: The STARTING LINE is not on the FIELD, it is in the ALLIANCE AREA. We believe the definition of ROBOT STARTING ZONE addresses if the black tape is part of the zone or not. If not, please rephrase and resubmit.

(Asked by **1939** answered Feb 19th 24)

Q191 goBilda linear slide allowed?

Q: Is it possible to use goBilda Yellow Jacket along with a goBilda linear slide? <https://www.gobilda.com/4-stage-viper-slide-kit-belt-driven-336mm-slides/>

A: We cannot comment on part/design legality, previous calls of Head REFEREES or LRIs, or questions that are overly broad, vague, and/or include no rule references. Please consult [Section 1.10] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>) and, if needed, resubmit a different question.

(Asked by **8767** answered Feb 19th 24)

Q192 Time Between Auto and Teleop

Q: What is the time between auto and teleop? Our interpretation of section 6.4 is "There is a 3-second delay between AUTO and TELEOP for scoring purposes", but at the Week 0 it seemed to be 1 second, even in the late playoff matches.

A: At official events the delay between AUTO and TELEOP will be 3 seconds.

(Asked by **2832** answered Feb 20th 24)

Q193 Auto Defense at Center Line and Spirit of the Game

Q: Hi FIRST, we were wondering about defensive scenarios and strategies in AUTO. If a Robot was designed to sit on or near the Center Line in AUTO (such that it is not violating G405) and detect opponent Robots and try to prevent them from picking up NOTES by bumping them off course, would this be against the spirit of the game per G212, or would it be an acceptable defensive strategy?

A: ROBOT to ROBOT interaction near the CENTER LINE in AUTO is an expected part of gameplay and is not "Egregious behavior beyond what is listed in the rules".

(Asked by **5347** answered Feb 21st 24)

Q194 Strategic violation of G430

Q: Can an ALLIANCE still earn the ENSEMBLE RANKING POINT after a violation of G430 where they enter a HIGH NOTE onto the field before the last 20 seconds of the MATCH? If so, is there any threshold at which repeatedly (i.e. multiple matches in a row) entering a HIGH NOTE early would fall under G212 as an egregious violation?

A: Yes. We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Generally, teams who repeatedly violate a rule may be seen as violating !G212.

(Asked by **1024** answered Feb 20th 24)

Q195 R408 item F - length of metal brackets

Q: The rule states "optionally use metal brackets ... to attach BUMPER segments to each other ..." In the Figure 8-5 right hand image, a metal bracket is shown on the outside of the bumper wood joining two segments. No

dimensions are given for how far across the bumper wood the bracket may extend. The bracket in the image appears to extend about 0.5 inches. Could a bracket extend several inches? Or all the way across the bumper wood segment and around a corner to join with a third plywood segment?

A: There are no limits for the size of any optional brackets used to join BUMER segments.

(Asked by **4828** answered Feb 22nd 24)

Q196 R608 Stored Energy Clarification

Q: Our team is curious about the stipulation that besides five exceptions, "Non-electrical sources of energy used by the ROBOT" are not allowed. We are using a modified version of the [AndyMark Climber in a Box] (<https://www.andymark.com/products/climber-in-a-box>), which fully extends without tension on the springs. Are we permitted to begin the matches with the arms retracted/held in place by our gearboxes, or does this count as stored energy?

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally, springs store energy through deformation of the material, so covered by !R608, item C.

(Asked by **1452** answered Feb 23rd 24)

Q197 Clarification of rule R622 *Use appropriately sized wire. All circuits shall be wired with

Q: Is tinned copper wire legal? It is labelled as "copper wire" but it is tinned so the color is silver. We just want to be sure it is legal. Thank you!

A: Yes, tinned copper wire is "copper wire" per !R622, but you may wish to be prepared with a sample or documentation to show an INSPECTOR that the wire is copper not aluminum.

(Asked by **5863** answered Feb 24th 24)

Q198 G422 and G211 Interaction and Intent

Q: Because intent is not considered when evaluating violations of G422, how does this interact with G211? In my understanding if at any time a red alliance robot is in contact with the red alliance Podium and contacts a blue alliance robot, the blue alliance will receive a Tech Foul. Is there a guideline for when this contact will be considered as part of a strategy, thus giving Red a Foul, instead of normal gameplay?

A: The only guidelines for identifying behavior that violates !G211 are listed in the Blue Box. The assessment is determined by the REFEREES at your event, with the final call made by the Head REFEREE.

(Asked by **6352** answered Feb 26th 24)

Q199 Multiple Instances of G405?

Q: Hi FIRST and GDC, I hope you all are excited and ready for week 1! Can you all please clarify if G405 is applied once per violating robot or once per instance of contact? Could a robot fully cross the center line, contact all opponent robots and all notes staged in the opponent wing and incur just one tech foul? Thanks in advance!

A: Per Section 6.6, any instance of a rule violation results in the specified penalty. The penalty for !G405 is assessed per item contacted.

(Asked by **401** answered Feb 25th 24)

Q200 Do we need a pneumatic air storage tank?

Q: Are teams allowed to have a pneumatic system without an air storage tank? Our team only needs pneumatics for two very small pneumatic cylinders. Rule R805 does not reference a pneumatic air storage tank, and no rule we could find said we need one. Also, the FRC Pneumatic Manual says that "FIRST Robotics Competition pneumatic systems generally have at least one air tank", therefore we could infer that we could have zero pneumatic air storage tanks.

A: There are no rules requiring pneumatic storage tanks.

(Asked by **8866** answered Feb 26th 24)

Q201 Rule R406 Clarification

Q: R406 part A states that team numbers must consist of "only white arabic numerals". Part D says this is intended for unambiguous team identification and visibility. We think there are two interpretations of this rule: A. All the letters must be the same white color, ie. cant have two white and two black letters B Each individual letter must only consist of white coloring, with no other colors Would it be allowed to have a thin black outline around the letters to increase visibility?

A: !R406 requires that all characters are all white and only white. !R406 does not allow for outline or other feature.

(Asked by **2508** answered Feb 26th 24)

Q202 Onstage scoring Criteria G424 in Playoff Matches

Q: Hi FIRST, we understand that a robot can qualify for being ONSTAGE if it is contacting a robot that has been awarded the ENSEMBLE RP per G424. Does this also remain true for playoff matches since there are no RP? IE: if a robot was affected by G424 in a playoff Match, could a robot contact them and still be considered ONSTAGE? Additionally, in a qualification match, if a robot would be awarded the ENSEMBLE RP per G424, but is ineligible for the RP, could a robot contact them and be ONSTAGE?

A: Please see [Team Update 15]

(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate15.pdf>). If that doesn't answer your question, please rephrase and resubmit.

(Asked by **5347** answered Feb 27th 24)

Q203 Interacting with Stage Chain

Q: Can a robot push up on the chain? If a robot with two flat hooks were to push up on the bottom of the chain with no grasping or attachment, just momentarily changing height of the chain there might be a slight sag between the two arms, but there would be no effort to change the working length or any intent to improve hanging as you would be pushing up on the chain, not hanging down.

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. There are no rules that prohibit raising the height of any part of the chain.

(Asked by **6888** answered Feb 26th 24)

Q204 Are connectors recommended by a device manufacturer presumptively legal?

Q: R622 says "Wires that are recommended by the device manufacturer or originally attached to legal devices are considered part of the device and by default legal." However, R623, regarding connectors, does not have a similar exception. Are connectors recommended by a device manufacturer for wiring to a device (but not necessarily permanently connected to the device) legal by default?

A: Yes, a connector recommended by the manufacturer is considered an "appropriately gauged/rated element" per !R623.

(Asked by **6662** answered Feb 26th 24)

Q205 R608 Limit non-battery energy.

Q: R608 lists 5 sources of energy. "non-electrical sources of energy used by the robot (i.e. stored at the start of the match) shall come only from the following sources. In the past we have used surgical tubing to passively pull a part in place. Am I correct that we cannot do that this year?

A: We cannot rule absolutely on hypothetical ROBOT designs, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally, stored energy through deformation of the material (e.g. springs, tubing, etc.) is covered by !R608, item C.

(Asked by **5863** answered Feb 27th 24)

Q206 Five Second Delay for ONSTAGE Points?

Q: According to section 6.5 part C in the manual, "assessment of STAGE points is made 5 seconds after the ARENA timer displays 0:00 following TELEOP". However, according to the glossary in the manual, "ONSTAGE" is "the state of a ROBOT at the end of a MATCH provided it's only contacting..." Are the ONSTAGE points evaluated at the end of the match or five seconds afterward? If our robot is hanging from the chain at the end of the match but falls immediately upon being disabled, is that ONSTAGE?

A: While "ONSTAGE" is the state of the ROBOT at the end of the MATCH, the assessment of STAGE points, which includes ROBOTS being ONSTAGE are assessed 5 seconds after the ARENA timer displays 0:00. While we cannot comment absolutely on hypothetical scenarios and the final call is made by the Head REFEREE at the event. *Generally*, a ROBOT that is hanging from the chain at the end of the MATCH but falls to the floor immediately upon being disabled at MATCH end, would not be considered ONSTAGE.

(Asked by **5535** answered Mar 2nd 24)

Q207 Interior Trap Contact

Q: Would it be legal if a robot scoring a note in the trap had a piece of material (such as fabric, tape, cloth or zip tie) that briefly contacted the interior, vertical surface that is parallel to the chain facing surface. I believe this is

different from Q68, as they refer to the "perpendicular" surface. We also believe this does not violate G415, as it does not meet any of the following: grabbing, grasping, attaching to, becoming entangled with, or suspending from.

A: There are no rules stating a ROBOT may not contact the interior, vertical surface of the TRAP but in order for the ROBOT to be considered ONSTAGE, it may only touch the items listed in Section 6.5.2.

(Asked by **379** answered Feb 29th 24)

Q208 Onstage scoring

Q: Explain final scoring at end of match watching Finals 2 ISR District Event 1 on thebluealliance, With one second to go it appears that team 1690 has pulled up off the carpet in the left foreground and some seconds after. Yet scoring has only +1 for PARK. Also it appears a HIGH NOTE is on the MIC facing that chain. All other TELEOP points are for NOTES in SPEAKER or AMP. Where are the ONSTAGE and SPOTLIGHT points added if 73 is the final total including 5 penalty points? Piece of NOTE penalty?

A: As a friendly reminder, the purpose of this Q&A is to answer questions regarding the [Game Manual] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/2024GameManual.pdf>), [Awards] (<https://www.firstinspires.org/robotics/frc/awards>), and/or [official Field drawings] (<https://www.firstinspires.org/robotics/frc/playing-field#FIRSTDrawings>). We cannot comment on specific scenarios at events and the Head REFEREE rulings are final.

(Asked by **9054** answered Feb 29th 24)

Q209 Can bumper mounting brackets inside the frame perimeter be above the bumper zone?

Q: R408G says "All removable fasteners (e.g. bolts, locking pins, pip-pins, etc.) will be considered part of the BUMPERS". (1) Q12 says bumpers must be outside the frame perimeter. Does this apply to the mounting brackets (that seems unintended to us) or just the wood? (2) Can mounting brackets (permanently affixed to bumper wood), and removable bolts be higher than the bumper zone, provided they are fully inside the frame perimeter? Is it different for minor protrusions (e.g. bolt heads)?

A: The context of !Q12 was to address the question about BUMPERS with relation to a frame with a concave footprint. Yes, removable fasteners considered part of the BUMPER must comply with !R402. Fasteners may extend inside the frame as shown in Figure 8-6.

(Asked by **6662** answered Mar 4th 24)

Q210 R410 corner supports plan view

Q: R410 states "To be considered supported, a minimum of ½ in. (~13 mm) at each end of each BUMPER wood segment must be backed by the FRAME PERIMETER (≤¼ in. gap, ~6mm)." Does the 1/2in dimension refer to the minimum width of the FRAME PERIMETER backing on each end of each segment, or to the location of that backing relative to the exact end of the segment? A plan view diagram indicating where FRAME PERIMETER is required to exist relative to the plywood bumper corner would be helpful

A: The 1/2" dimension refers to the location of the backing relative to the end of the segment.

(Asked by **841** answered Mar 11th 24)

Q211 Amp Note Backup

Q: Can a human player at the AMP strategically avoid moving notes out of the bottom of the chute, causing them to get backed up, in order to effectively bank more than two notes towards amplification? Adding on to this, could they strategically block the exit with their foot for the same purpose?

A: Using GAME PIECES to ease the challenge associated with AMPLIFICATION is a violation of !G428 and also affects the operation of the AMP and its sensor array, thus a violation of !G212 (as described in example G).

(Asked by **1540** answered Mar 5th 24)

Q212 Can bumpers with broken wood still be used?

Q: R408 part A references the structural integrity of the bumper wood, in relation to small pockets or clearance holes. Impacts with other robots or the STAGE have caused bumper wood to break, splitting along the height of the bumper, or buckle, causing it to break apart for a portion of the height. These instances aren't a "small pocket or clearance hole". Can they be patched by reinforcing the bumper (ie with plate or angle), instead of replacing the wood for that segment of the bumper?

A: We cannot rule absolutely on hypothetical ROBOT features, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event.

(Asked by **2177** answered Mar 5th 24)

Q213 Electromagnet Power

Q: Can we power a electromagnet with REV ROBOTICS PDH switchable port 23. 12v 100mA Part link below on Amazon <https://a.co/d/iDfBZVh> 2

A: No, per !R501 electromagnets are considered actuators and per !R504-B-c the PDH switchable channel may be used to control "non-actuator CUSTOM CIRCUITS only".

(Asked by **714** answered Mar 5th 24)

Q214 ROBOT Frame and ESD

Q: The last sentence in R611 says that a ROBOT frame must not be used to carry electrical current. How does this work with ESD? Can we attach something like tinsel to the bottom of our robot to avoid ESD and protect our electronics?

A: !R611 does not prohibit the use of grounding wires or similar elements not part of the robot's electrical system which conduct miniscule amounts of current to prevent the accumulation of charge.

(Asked by **27** answered Mar 5th 24)

Q215 R602 *Other batteries for cameras or computers only

Q: R602 states "...or self-contained camera (e.g. laptop batteries, GoPro style camera, etc.), or coin cell batteries used to power CMOS/RTC features may be used to power COTS computing devices" Would AA or AAA batteries be also considered legal since "coin cell batteries" are? We have a visual limit switch that is powered by AAA batteries, I am trying to make sure they are considered legal. (we accidently destroyed our VEX

limit switch) Thank you in advance!

A: We cannot rule absolutely on specific ROBOT components, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Generally !R602 allows batteries contained within a COTS computing device or camera, or for powering the CMOS/RTC features of such a device.

(Asked by **5863** answered Mar 7th 24)

Q216 Do HPs need to clear scored amp notes?

Q: Does the answer to Q211 imply an obligation for the human player to actively clear notes scored in the amp from the floor? The behavior we observed at our week 1 event was notes naturally backing up inside the amp chute with no intervention. Is it a violation of G212 for the amp human player to accidentally forget to clear the notes?

A: There are no rules requiring that a member of the DRIVE TEAM clear NOTES from the AMP exit (i.e. there's no penalty for not doing so), however it's in the best interest of the ALLIANCE for the exit to remain clear in case NOTES are scored such that they fill the AMP assembly and prevent NOTES from passing by the sensor array. A jam caused by a backup of notes is not an ARENA FAULT.

(Asked by **1540** answered Mar 7th 24)

Q217 Legality of Electromagnet

Q: Can we legally use an electromagnet to hold our hanger hooks in place until we are ready to climb? The electromagnet will be stationary, not moving anything, just applying suction. (DC 12V 100N 22LB/10kg Sucker Electric Magnet Solenoid Lifting Cylinder Holding Round Electromagnet ,30 X 22mm)

A: We cannot rule absolutely on specific robot components, and the final decision as to legality of a particular ROBOT lies with the Lead ROBOT Inspector (LRI) at each event. Electromagnets are considered actuators. !R501 permits some electromagnets provided they meet certain specifications. As an actuator, all relevant rules regarding wiring and control of actuators must be followed.

(Asked by **6865** answered Mar 7th 24)

Q218 What does it mean for a robot to "intentionally" eject a note (G407)?

Q: Does the "intentionally" condition in G407 require that the team wants the notes to leave the field? If in the course of executing a legitimate game action (e.g. attempting to score in the speaker or launching a note from one part of the field to another), a team occasionally launches notes out of the field, are they violating G407? The team *intended* to launch the note, and they knew there was a small chance it would leave the field, but they didn't *intend* for it to leave the field.

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Generally, a NOTE launched in the direction of the team's SPEAKER that leaves the FIELD would not be considered a violation of !G407.

(Asked by **6662** answered Mar 7th 24)

Q219 Qualification Match Assignment

Q: Is there any review after generating a qualification match schedule to insure that Match Assignment 10.5.2 items 1 through 6 fall within some reasonable parameters? Is so, what are those parameters? For example, team A and team B in a 39 team event meet as opponents three (3) times but never as allies. Would this fall within an acceptable qualification match schedule set of parameters?

A: FMS provides top-level statistics regarding the schedule generated, which FIELD STAFF review for any major abnormalities. For details see [Idle Loop's website](<https://idleloop.com/matchmaker/>). Yes, the example presented falls within acceptable parameters.

(Asked by **5472** answered Mar 11th 24)

Q220 Amplification still active after T=0?

Q: Hi FIRST, we were wondering how Amplification is counted after a Match. If a Speaker is Amplified with 5 seconds left in a Match, does the Speaker still continue to score Amplified Notes during the five seconds after the Match (assuming less than four notes have been scored during that Amplification period)?

A: Yes.

(Asked by **5347** answered Mar 11th 24)

Q221 Question on strategically not clearing the Amp.

Q: We had a question about clearing Notes. We know through Q216, there's no requirement to clear Notes but it's the Alliance's best interest to do so. Does the same apply when it would be strategic to not clear the Amp? Eg: During Amplification 2 Notes were delivered to an Amp blocked by uncleared Notes, and after Amplification ended, they cleared the extra Notes causing the 2 stuck Notes to bank and then they activated Amplification again. We assume this violates G212, is this assumption correct?

A: Yes, any attempt to deliberately manipulate when NOTES pass the sensor array is a violation of G212. This includes intentionally not clearing NOTES in order to artificially stack AMPLIFICATIONS.

(Asked by **5347** answered Mar 12th 24)

Q222 Bumper Zone Definition Question?

Q: Hi FIRST, we had a question about the BUMPER ZONE. We understand that the definition states the BUMPER ZONE being between the floor and 7.5" above the floor in reference to the ROBOT on flat ground. Does the "in reference to the ROBOT on flat ground" apply only to the upper limit (7.5" above the floor), or to both that and the lower limit (the floor)? Eg: if a ROBOT is a foot in the air and parallel to the floor, is the floor still the lower limit of their BUMPER ZONE?

A: No, if the ROBOT were on the ground, the floor would be the lower limit and that plane translates with follows the ROBOT as it reorients/repositions itself.

(Asked by **5347** answered Mar 11th 24)

Q223 Interpretation of "Repeated" in G410.

Q: Hi FIRST, we wanted to confirm our interpretation of rule G410. The rule says that the TECH FOUL applies if the violation is REPEATED in a subsequent MATCH. The manual also says that REPEATED only applies to

actions that happen more than once in a MATCH. Does this mean that if a ROBOT violates G410 in MATCH 1, then they violate it once in MATCH 5, that no TECH FOUL is assessed because the action is not REPEATED in MATCH 5?

A: Yes.

(Asked by **5347** answered Mar 11th 24)

Q224 Podium Protection

Q: Referring to G422. Is it possible for a defensive robot to park in front of their opponent's podium to prevent them from touching it without receiving a foul? In my interpretation, the podium panel is narrower than the leg of the stage that it is mounted on. Therefore, if a defensive bot is parked with their bumpers against the face of the podium panel, it would be impossible for the other alliance members to touch their own podium, and therefore the defensive robot wouldn't receive a foul.

A: Yes, and probably.

(Asked by **5913** answered Mar 11th 24)

Q225 G424 Strategy

Q: A strategy I have noticed is that an alliance will try to trap opponents forcing them near the stage so they can get the ensemble ranking point without having to build a robot that can climb. Is this not in violation of G211?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE.

(Asked by **4152** answered Mar 12th 24)

Q226 Does the front edge of the trap opening count as part of the vertical surface of the core?

Q: 6.5.2 Defines what a robot is able to be contacting in order to qualify as ONSTAGE. This list includes "chain-facing vertical surfaces of their core or the nearest flap." Is the front edge of the trap opening considered to be part of the vertical surface? If a robot were reaching into the trap, contacting this edge, but not on the horizontal top surface of the opening, would it count as ONSTAGE?

A: We don't understand the question. Please rephrase and resubmit.

(Asked by **7457** answered Mar 13th 24)

Q227 Is G421 contingent on robot ability?

Q: Hi FRC, we know you can't comment on hypotheticals, but we had a general question about the interpretation of G421. If 2 robots are on both sides of their STAGE near center-FIELD(in early TELEOP), to slow access to the SOURCE, this would generally would not be considered a violation since the blocked Robot could pass under the STAGE. If the blocked ROBOT was built such that it can't pass under the STAGE, would this scenario now become a violation? Ie: is G421 contingent on ROBOT ability?

A: No.

(Asked by **5347** answered Mar 12th 24)

Q228 A-Stop activation before AUTO?

Q: During our first event, we encountered alliances where the best strategy was for us to use the A-stop to avoid collisions with partners. Can we press the A-stop before the MATCH begins when we know we want to halt our autonomous routine, or does FMS require us to wait for the MATCH to start and our stack light to illuminate before we hit the button? The FMS Whitepaper doesn't describe A-stop functionality in any form to say.

A: No, In order for FMS to start the MATCH all ROBOTS must be considered "ready," or BYPASSED. A ROBOT that is A-stopped prior to MATCH-start is not in either of these states.

(Asked by **1293** answered Mar 13th 24)

Q229 G211 Inferring Intent

Q: In reference to your answer to Q198, Item F in the blue box under G211 now references that the REFEREE can infer the intent of a strategy. We were told very specifically by a head referee in Week 2 that referees were unable to judge intent. Does blue box item F explicitly grant referees the authority to judge the intent of a strategy with violations of G424 and subsequently G211 in mind?

A: We cannot comment on relayed messaging from Head REFEREES, LRIs, or other event staff. !G211 begins "A strategy clearly aimed at..." which requires REFEREES to assess intent.

(Asked by **1610** answered Mar 13th 24)

Q230 Bumper Fastening

Q: R410 requires bumpers to be supported by frame/structure with no gap greater than 8 inches. Does this require the bumpers to be fastened to the frame every 8 in? If not is there a requirement for the distance the bumpers must be fastened to the robot?

A: No, the requirements for BUMPER fastening are contained in !R408-G

(Asked by **4392** answered Mar 13th 24)

Q231 Battery Connection Fastener

Q: R609 requires the use of Anderson connectors on the battery. Is there any rule preventing the use of fasteners (zip ties, Velcro, etc.) to hold the Anderson connectors of the battery and robot together?

A: No, there are no rules prohibiting this.

(Asked by **4392** answered Mar 13th 24)

Q232 Is the edge of the trap opening part of the chain-facing vertical surface of the core?

Q: In Q68 it was ruled that a robot cannot contact the inner surfaces of the trap that are perpendicular to the chain-facing vertical surfaces of their core. My question is can the robot contact the edge where the chain-facing vertical surface (a legal surface) meets the inner surfaces that are perpendicular to them (an illegal surface) and still be considered ONSTAGE

A: Yes, the geometric edge where the vertical chain-facing surface meets the horizontal bottom edge of the opening is considered part of the vertical chain-facing surface. STAGE points are evaluated and scored by human REFEREES, and teams are encouraged to make sure that it is obvious and unambiguous that a ROBOT has met the criteria.

(Asked by **7457** answered Mar 15th 24)

Q233 Capacitors in CUSTOM CIRCUITS

Q: May a CUSTOM CIRCUIT contain capacitors which store electrical energy, which allow the CUSTOM CIRCUIT to continue operating for some time after power to the rest of the ROBOT has been switched off (i.e. via the main 120A breaker)? This seems legal by R601, as the capacitors start discharged before the ROBOT is powered on. We cannot find a rule (equivalent to R813 in pneumatics) which requires the main breaker to shut off all electrical power on the ROBOT, and R602 allows other power sources.

A: There are no rules explicitly prohibiting the use of capacitors in CUSTOM CIRCUITS. Note that large capacitors may invite additional scrutiny under !R203 and, depending on the safety measures employed, overly large capacitors may be deemed unsafe.

(Asked by **766** answered Mar 15th 24)

Q234 Bumper rule R408 section C.

Q: Would Glue be considered a "soft fastener" in attaching pool noodles to the wood backing?

A: Yes, provided the glue penetration into the foam is minimal such that "physical properties of the BUMPER are not significantly altered".

(Asked by **4003** answered Mar 15th 24)

Q236 Control, control! You must learn Control!

Q: Specific for G403, How is "control" of a NOTE defined when that "control" is enforced through transitive or non-direct physical means? (examples of this include blowing the NOTE using wind, or propelling the NOTE by shooting another NOTE at it, causing both to move). If a NOTE is released from control by a robot, but is still in motion due to momentum (thus it could appear to be controlled) and the robot controls a second NOTE, how would this definition apply?

A: We cannot comment absolutely on hypothetical scenarios, and the ultimate decision is determined by the REFEREES at your event, with the final call made by the Head REFEREE. A NOTE being pushed to a desired location but not in contact with the ROBOT is likely to consider being controlled by that ROBOT because "pushing" does not require direct contact with the ROBOT (e.g. a ROBOT uses a NOTE or NOTES to propel another NOTE - this may also be a violation of G406 because using a NOTE in this manner is easing the challenge associated with traversing the FIELD). A ROBOT using air to direct a NOTE to a desired location is also in CONTROL of the NOTE. A NOTE that is released by the ROBOT and no longer meeting criteria listed in A and B of !G403 is no longer CONTROLLED by that ROBOT.

(Asked by **900** answered Mar 22nd 24)

Q237 10.6.5 Pit Crews and Duties

Q: Per 10.6.5 - "Each team is permitted to have up to 3 additional pit crew members to help with needed ROBOT repairs/maintenance." Prior to the start of a match, and assuming they are back near the robot cart when the match begins, are these additional pit crew members allowed to assist with transporting the robot to the field, repairing the robot on the field, transporting and configuring the driver station, and/or ensuring the robot is connected correctly to the field?

A: Yes, as clarified in [Team Update 19]
(<https://firstfrc.blob.core.windows.net/frc2024/Manual/TeamUpdates/TeamUpdate19.pdf>).

(Asked by **900** answered Mar 26th 24)

Q239 "Fan" Motors

Q: Does the definition of Fan in rule R501 apply to COTS fans only? We are considering engineering a our own "fan" to manipulate the trap using a standard motor such as neo.

A: Yes, the fans permitted by the line "Fans, no greater than..." refers to COTS fans, a custom fan developed with another legal actuator does not need to meet these restrictions.

(Asked by **3452** answered Mar 22nd 24)

Q240 Bumper Color

Q: For the fabric on the bumpers, does the whole bumper need to be the same color? We have corners built with our numbers on them that are red and blue. The gap between the corners we would like to have bright yellow (our team color). This seems like it will work fine, the blue and red corners will determine our alliance that we are a part of and the yellow should not distract that.

A: No, the entire set of BUMPERS must be red or blue to comply with !R405.

(Asked by **3122** answered Mar 22nd 24)

Q241 Consistent bumper height

Q: We have 4 separate bumpers, one on each side. Do they all have to be the same height? We are building an inside the bot ground intake and just want to know if our rear bumper can be higher than the other 3?

A: There is no requirement that BUMPER segments be at the same height, provided they're all within the BUMPER ZONE.

(Asked by **9435** answered Mar 23rd 24)

Q242 Determining if ARENA FAULTS are match affecting.

Q: A miscounted note in the AMP has the impact of not just the points awarded by the scored note, but also affects an alliance's ability to access a key part of the game via the amplification period which has a material impact on the outcome of matches. Because of this a miscounted note in the amplifier could be worth anywhere from 1 to 13 points. When determining if a uncounted note in the amplifier was match affecting, what point value will be used for the miscounted note?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. Generally, when determining if miscounted NOTE affected the outcome of the MATCH, the ALLIANCE affected by the fault is given reasonable benefit of the doubt as to its maximum, reasonably possible impact. In the case of a NOTE through the AMP early enough in the MATCH that the ALLIANCE could have scored up to 13 points, that's the value in assessing if the outcome of the MATCH was affected.

(Asked by **2200** answered Mar 28th 24)

Q243 Are judges allowed to take informational materials from teams during the judging process?

Q: This year judges told our students they were not allowed to take handout information about our team, robot, outreach, etc. Is this a new restriction this year? It seems odd that the guidance giving to teams about the judging process states judges "Review team provided materials" but they wouldn't accept them. Are their restriction such as page limits or content restrictions on what materials students can give to the judges to take back as reference material during judge deliberations?

A: Judges are encouraged to take team provided materials and review them as time allows. Materials are then returned to teams through Pit Admin. There are no restrictions on page limits of documents but please be aware that judges will not be able to review every piece of material handed to them during the event and teams should include the most relevant information in their interview with the judges to ensure they are aware.

(Asked by **456** answered Mar 26th 24)

Q244 Blocking the SUBWOOFER

Q: Would two ALLIANCE partner ROBOTS working together to block opponent access to the opponents' SUBWOOFER be a violation of G421?

A: No, the subwoofer is not a major element of match play because there are other positions from which opponents can launch NOTES into their SPEAKER.

(Asked by **99999** answered Mar 26th 24)

Q245 NOTE CONTROL

Q: If a ROBOT drives to the CENTER LINE in AUTO and then through the staged NOTES and is pushing more than 1 NOTE at a time, but not towards the SPEAKER. Is that a violation of G403?

A: Yes. Intentionally pushing more than 1 NOTE at a time on the CENTER LINE from their staged location such that the other ALLIANCE cannot access them is CONTROL.

(Asked by **99999** answered Mar 26th 24)

Q246 Auto note counting after Team Update 19

Q: The FRC blog says that jammed notes in auto will be manually scored. Even when the speaker doesn't jam, some notes launched at the tail end of auto don't pass the sensor array during auto. In the case of a jammed speaker, how will it be determined whether the notes should count for auto? Will all notes count for auto, even if they wouldn't have made it through the sensors in time on a non-jammed speaker? What if the speaker jams a bit, but is somehow unjammed before the end of auto?

A: We believe Example B in the [NOTE Counter Assessment document] (<https://firstfrc.blob.core.windows.net/frc2024/Manual/NOTECounterAssessment.pdf>) addresses this question. If not, please rephrase and resubmit.

(Asked by **6662** answered Mar 27th 24)

Q247 Eligibility for Awards at 3rd District Events

Q: I understand that a Team will only receive the District Points associated with a Judged Award if it is at their first or second district event, but are teams still eligible for consideration for judged awards at a third event? For Example, if a team is playing their third event of the season, are they still eligible to receive First Impact or Engineering Inspiration, just not receive any District Point For the Award?

A: Yes.

(Asked by **1757** answered Mar 29th 24)

Q248 Field Boundaries

Q: Is the field boundary considered human player side of source, or is it field side of source? Can a robot's lexan funnel rest at entrance of source to field side?

A: Per Section 5.1, the FIELD is bounded by inward facing surfaces of the ALLIANCE WALLS, SOURCES, AMPS and AMP pocket walls, and guardrails. Therefore, any surfaces outside the inward (i.e. FIELD) facing surface of the SOURCE are not considered part of the FIELD for the purposes of assessing !G411, part A.

(Asked by **4285** answered Apr 1st 24)

Q249 Clarification of Team Update 17 G211

Q: In Team Update 17, an example was added involving intentionally pushing ROBOTS into the STAGEZONE during the last 20 seconds. Would this example also be applicable when a ROBOT is close to the opponent STAGEZONE, for instance grabbing a note from their SOURCE? Specifically, if a red ROBOT is clearly trying to drive away from the blue STAGE ZONE, but a blue ROBOT intentionally pushes the red ROBOT into the red STAGE ZONE during the last 20 seconds, is this considered a violation of G211?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision for any given situation is determined by the REFEREES at your event, with the final call made by the Head REFEREE. The list of examples in !G211 is not meant to describe *all* scenarios that apply, and instead it offers some situations that are likely to result in a !G211 violation. Any scenario where a REFEREE believes that "a strategy clearly aimed at forcing the opponent ALLIANCE to violate a rule is" ... "not allowed."

(Asked by **5188** answered Apr 4th 24)

Q250 Grace period for note in Autonomous

Q: In a recent NC District Finals match, an alliance successfully shot a note into the speaker just before the end of the AUTONOMOUS period, specifically the note left the robot during auto. Only two points were awarded, I believe because the note did not pass through the sensor quickly enough. The 3-second grace period specified in 6.5 is presumably intended to allow time for notes to be counted by the sensor. Is this intended behavior or could it be brought to a ref's attention after a match?

A: The 3-second grace period is intended to capture the vast majority of NOTES which enter the SPEAKER in AUTO and proceed through the system without jamming. Occasionally NOTES will take slightly longer to process through the SPEAKER and pass through the sensor array. Unless the NOTE becomes jammed, such that interaction with a subsequent NOTE or human interaction is required to free it, this is not an ARENA FAULT.

(Asked by **4561** answered Apr 9th 24)

Q254 Are teams allowed to earn RP by violating G409?

Q: The penalty for G409 violations is fouls and/or a yellow card. This penalty incentivizes teams to respect G409 in matches they can win, but in matches where winning isn't feasible (which could happen in cases where a note has gotten stuck on a bot, for example), teams can be incentivized to violate G409 in order to score additional notes towards melody RP. Will teams be allowed to keep RP earned through G409 violations, or would some RP-nullifying penalty (like a G212 red card) apply?

A: We cannot comment absolutely on hypothetical scenarios. The ultimate decision would be determined by the REFEREES at your event, with the final call made by the Head REFEREE. If a Head REFEREE perceives "multiple instances of any single rule violation," (from the Blue Box in !G212), they may invoke !G212.

(Asked by **1700** answered Apr 10th 24)