

2015 *FIRST*[®] Robotics Competition (FRC[®])

Team Updates

Team Update 2015-04-21

Team Update 2015-04-14

Team Update 2015-04-07

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Team Update 2015-01-20

Team Update 2015-01-16

Team Update 2015-01-13

Team Update 2015-01-09

Team Update 2015-01-06

Team Update 2014-12-19

Team Update 2015-04-21

General Updates

This is the final Team Update for the 2015 FRC season.

Good luck to teams competing at the *FIRST* Championship, and thank you all for a great season!

Admin Manual

No updates.

Game Manual

No updates.

Team Update 2015-04-14

General Updates

The [2015 FRC Game Q&A](#) will be closed to new questions as of noon (Eastern time) on Thursday, April 16, 2015.

Admin Manual

No updates.

Game Manual

No updates.

Team Update 2015-04-07

General Updates

This note is from Frank Merrick, Director of FRC.

Hello Teams. In this update you will see additional detail added to G18, to clarify what we mean by 'contact beyond the step.' This update is in line with Q223, published in the Q&A. We felt clarification in the manual itself was necessary after an incident at an event over the weekend suggested that not all understood this important rule. In some cases, violation can lead to a red card, so both referees and teams need to understand this rule very clearly.

You will also see we've added rules about what it means to decline being an alliance captain or to decline an invitation to join an alliance. We've had a few instances this season in which either a team was not available to participate in the alliance selection process, because they were recalled by their school because of weather, or because their robot was not competition ready, and they did not want to put their alliance at a disadvantage. We found ourselves making up rules on the spot in these cases, and that's not a good thing. So, we're codifying new rules in the manual, should it happen again this year or in future years, which is likely at some point.

Good luck to our District teams participating in their Championships this weekend!

Frank

Admin Manual

7.4.1.3 Playoff Round Performance

This attribute measures Team performance as part of an Alliance.

In Quarterfinals, with 2 matches being played by each alliance in RECYCLE RUSH, each team on an alliance earns 5 points for each match they participated in, and only if the alliance advances. ~~In the unlikely event that more than 2 matches need to be played, each team can still only earn a maximum of 10 points, regardless of the number of matches they participated in.~~

In Semifinals, with 3 matches being played by each alliance in RECYCLE RUSH, each team on an alliance earns 3.3 points for every match they participated in, and only if the alliance advances to the final rounds. All points earned are rounded up to the next highest whole number. ~~In the unlikely event that more than 3 matches need to be played, each team can still only earn a maximum of 10 points, regardless of the number of matches they participated in.~~

7.4.3.1 Michigan District Championship

The first playoff round, with 16 Alliances, is the Octofinals. As in Quarterfinals, two matches will be played by each Alliance in the Octofinals, and each team earns 5 points for each Match in which they participated and only if their Alliance advances.

Eight Alliances advance from the Octofinals to the Quarterfinals using the same advancement rules from Quarterfinals to the Semifinals defined in *FRC Game Manual, Section 5.4.3*, but with 16 Alliances narrowing to eight.

All Timeout and Backup rules per *FRC Game Manual, Section 5.5.6* apply during Octofinals. Octofinals are played on two separate Fields, and as such, reference to the Field Reset Signal preceding an Alliance's Match in T16 and T19 refers to the Field Reset Signal for the last Match played in the tournament, which in most cases will be the Match just played on the opposite Field.

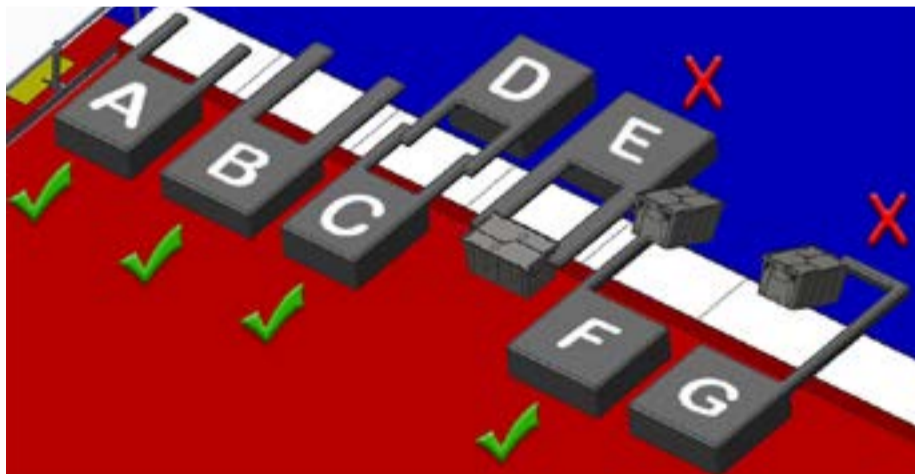
Game Manual

3.2.3 General Rules

G18 ROBOTS may not contact anything any portion of an object where that portion is beyond the STEP. Momentary contact as a result of ROBOT to ROBOT interaction, direct or indirect (e.g. via a RECYCLING CONTAINER), over the STEP is an exception to this rule. If a ROBOT becomes inoperable or "stuck" while some portion of the ROBOT is extending beyond the STEP, the ROBOT will not receive multiple FOULS.

VIOLATION: FOUL. If egregious or strategic, RED CARD.

Figure 3-8: Extension beyond the STEP Examples



In Figure 3-8 ROBOT A is not in violation of G18 because its MECHANISM is entirely within the STEP, which is a shared zone for both ALLIANCES. For ROBOT B, there is also no violation because, even though it has extended onto the Blue ALLIANCE side of the FIELD, the ROBOT is not contacting anything on that side. ROBOT C is in contact with Blue ROBOT D over the STEP which results in no violation as the STEP is a shared zone. ROBOT E has extended from the Blue onto the Red side of the FIELD and contacted a TOTE, which results in a violation of G18. ROBOT F is in contact with a portion of the TOTE that is not beyond the STEP, which results in no violation. ROBOT G is in contact with a portion of a TOTE that is beyond the STEP, which results in a violation of G18.

5.4 Playoff MATCHES

At the end of the Qualification MATCHES, the top eight (8) seeded Teams become the ALLIANCE Leads. The top seeded ALLIANCES are designated, in order, ALLIANCE One, ALLIANCE Two, etc., down to ALLIANCE Eight. Using the ALLIANCE selection process described below, each ALLIANCE Lead chooses two (2) other Teams to join their ALLIANCE. If a team declines the ALLIANCE Lead position or doesn't send a representative for ALLIANCE selection, they are ineligible to participate in the rest of the Tournament. If the declining/absent team would have been an ALLIANCE Lead, all lower ranked ALLIANCE Leads are promoted one spot. The next highest-seeded team moves up to become the ALLIANCE Eight Lead.

5.4.1 ALLIANCE Selection Process

If the Team declines, that Team is not eligible to be picked again or to be a BACKUP TEAM, and the ALLIANCE CAPTAIN extends another invitation to a different Team. If an invitation from a top eight ALLIANCE to another ALLIANCE Lead is declined, the declining Team may still invite Teams to join their ALLIANCE; however, it cannot accept invitations from other ALLIANCES.

Team Update 2015-03-31

General Updates

This note is from Frank Merrick, Director of FRC.

For those of you not following along with every development in the Q&A, the updates to T8 and T10 below may seem to be a bit out of the blue. So, I thought I would explain why we need them.

Following the manual to the letter before these updates, if a team sent a member of their drive team to participate in a match, in the hopes of still earning match points, while their robot was not inspected, this was a rules violation in every situation, with consequences for the entire alliance in some circumstances. We do want this to be the case before a team passes their initial, complete, inspection at their current event, to encourage teams to get through inspection before qualifying matches start and avoid the specter of a team never having passed inspection earning a decent spot in the rankings, as occasionally happened in prior years. However, we don't want this to be the case if, after passing that initial inspection, a team later needs to do some work on, or wants to upgrade, their robot, making the robot temporarily unavailable for a given match, and putting the robot in a state requiring a new inspection. This would be ridiculous. It would lead to us trying to determine if, at the moment the match started, a robot being worked on in the pits would have passed inspection or not. We're also pretty sure this would discourage some design innovation and strategy development during the event.

So, we're making these tweaks to T8 and T10 to fix this, bringing them in line with the way things had been handled as a practical matter at events anyway. Play on.

Frank

Admin Manual

5.8.3 Shipping your Robot using your own Funds

Teams may ship their robot to any event, with the exception of the *FIRST* Championship, at their own cost without receiving an approved Robot Transport Exemption from *FIRST*.

6.2 Complete Awards List

Award	Description	Selected By	Regional	District	District CMP	FIRST CMP Division	FIRST CMP
Engineering Inspiration Award	Celebrates outstanding success in advancing respect and appreciation for engineering within a team's school and community.	Judges	✓	✓	✓	✓*	
Finalist	Celebrates the alliance that makes it to the final match of the competition	Robot Performance	✓	✓	✓	✓**	✓
Winner	Celebrates the alliance that wins the final match of the competition	Robot Performance	✓	✓	✓	✓**	✓

*NASA is generously sponsoring the registration fees to the 2015 *FIRST* Championship for teams earning the Engineering Inspiration Award at District Championships and Regionals that occur within the United States. They are also sponsoring the 2016 *FIRST* Championship registration fees for the four teams that earn the Engineering Inspiration Award at the 2015 *FIRST* Championship.

**These awards are given at the Subdivision level instead of the Division Level. All other awards marked "FIRST CMP Division" are given at the Division level.

Game Manual

5.5.2 Eligibility and Inspection

T8 A Team is only permitted to participate in a Qualification or Playoff MATCH and receive Match Points if their ROBOT has passed an initial, complete Inspection.

VIOLATION: If prior to the start of the MATCH, the Team ROBOT is not eligible to participate in the MATCH. If after the start of the MATCH, the entire ALLIANCE receives a RED CARD for that MATCH.

T10 If a ROBOT is modified after it has passed its most recent Inspection, other than modifications listed in A through F, that ROBOT must be re-Inspected before the ROBOT is eligible to participate in a MATCH. If any of the exceptions listed below result in a significant change to the ROBOT'S size, weight, legality, or safety, the ROBOT must be re-Inspected. When in doubt, the Team should ask to be re-Inspected.

Team Update 2015-03-23

General Updates

We have had a number of reports from events of issues with the Dashboard connecting to the robot. After some investigation we have put together a document to help teams prepare for, understand, and troubleshoot these issues which can be found on the ScreenSteps site [here](#).

We have also had some teams reporting issues uploading LabVIEW code to their robot after installing NI Updates (not the NI FRC Update). There are some Optional Updates in the NI Updater that will conflict with FRC software. Given this, we do not recommend that teams install optional updates using the NI Updater.

Admin Manual

5.6 “Robot Access Period” – For Teams Attending District Events

All District events for the 2015 season are two-day District events for the 2015 season are all District events with the exception of District Championship events for the Michigan, Mid-Atlantic Robotics, New England, and Pacific Northwest Districts (the Indiana District Championship is considered a two-day event). Teams attending these two-day events will not have as much time to work on their robots at events as teams attending traditional Three-day Regional events. Due to this, teams are granted an additional “Robot Access Period” to unbag their robot between “Stop Build Day” and their Two-day District events. Teams attending Traditional Regional Events are NOT granted a “Robot Access Period” after “Stop Build Day”. This section only applies to teams attending District Events.

6.4.2 First-Year (Rookie) and NASA Grant Teams

Because the Chairman's Award recognizes sustained excellence and impact, not just a one (1) year team effort, it is not possible for a first year (rookie) team to receive the Chairman's Award. Rookie teams will not be interviewed at events for the Chairman's Award, and should not request an interview, as Chairman's Award judging resources are limited.

However, all teams that received a NASA Grant, including rookie recipients, must prepare a Chairman's Award submission on line through the *FIRST* Youth Team Member Registration System (formerly known as STIMS) <https://my.usfirst.org/stims/site.lasso> as part of the grant requirement (even though Rookie NASA Grant Teams will not be considered for the award, and are not required to provide a DVD Chairman's Award video, and will not be interviewed).

Game Manual

No updates.

Team Update 2015-03-17

General Updates

This note is from Frank Merrick, Director of FRC.

Hello teams.

Yesterday we answered a question on the Q&A, [Q461](#), related to sharing parts and mechanisms between teams, that has created a great deal of controversy. Seeing your concerns, and after significant additional discussion, we are reversing ourselves on our original answer, and making updates to the manual to support that reversal, bringing greater alignment between the manual and common practices at events. We want teams to provide very strong support to each other at events, and while reasonable, knowledgeable, caring people may disagree with 'how much is too much', and it's hard to define a bright line, we don't want to chill the tremendous spirit of mutual support that is an essential part of *FIRST* culture. We're sorry for the issues our original answer caused, it was a mistake.

Also, last week, an FRC Team Mentor asked me how a team can ask questions about the judging process during an event. She pointed out that the manual provides a method for asking questions of the Head Referee, but that there seemed to be no parallel process for asking questions of the Judge Advisor, who is the lead Judge at the event. I hadn't thought about this before, but she's right. It seems reasonable for teams to have a set way to ask process questions of the Judges. Working with our Chief Judge Advisors and the *FIRST* Volunteer Resources Department, we've come up with the manual change on this topic you see below. One important thing to note, as the manual update says, Judge Advisors will answer questions related to the process, but will not answer questions related to why one team or another did or did not win awards. To make the best decisions on awards, Judges must be able to have free and honest discussions in the Judges' Room, and if Judges believed those discussions were not going to be kept confidential, it could hamper the sharing of opinions and information.

Good luck in Week 4!

Frank

Admin Manual

6.1 *FIRST* Robotics Competition Awards

The *FIRST* Robotics Competition (FRC) is about much more than the mechanics of building a robot or winning a competitive event. It is about the partnership among people who are part of the *FIRST* community and the impact on those who participate in *FIRST* programs with a united goal of achieving the *FIRST* mission. The *FIRST* mission is to change the way young people regard science and technology and to inspire an appreciation for the real-life rewards and career opportunities in these fields.

This chapter contains descriptions of the *FIRST* Robotics Competition Awards. Unless otherwise noted, all awards are earned at Regional events, District events, District Championships and the *FIRST* Championship.

If a team has a question during the event about the awards process, a pre-college student should go to Pit Admin to request a discussion with the Judge Advisor. Pit Admin will then get in touch with the Judge Advisor and a mutually convenient time will be arranged to meet. As with the rule regarding questions for the Head Referee in the Tournament Section of the *Game Manual*, T14, the expectation is the discussion will take place between a pre-college student on the team and the Judge Advisor, though mentors and other adults associated with the team may listen in. Please note that while the Judge Advisor will address questions related to the awards process in general, he or she will not address questions related to why certain teams were or were not selected for specific awards, as that would breach the confidentiality of the selection process.

Game Manual

Section 4.2 - General ROBOT Design

R1 A Team must submit their ROBOT for Inspection. The ROBOT must be built by the FRC Team to perform specific tasks when competing in RECYCLE RUSH. The ROBOT must include all of the basic systems required to be an active participant in the game – power, communications, control, and movement. The ROBOT implementation must obviously follow a design approach intended to play RECYCLE RUSHSM (e.g. a box of unassembled parts placed on the FIELD, or a ROBOT designed to play a different game does not satisfy this definition).

R1 requires that the ROBOT a Team uses in competition was built by that Team, but isn't intended to prohibit assistance from other Teams (e.g. fabricating elements, supporting construction, writing software, developing game strategy, contributing COMPONENTS and/or MECHANISMS, etc.).

Section 4.5 - Fabrication Schedule

R14 All ROBOT elements, with the exception of the WITHHOLDING ALLOWANCE per R17 and COTS items, (including items intended for use during the competition in alternative configurations of the ROBOT) must be bagged and sealed, by 11:59PM local time on Stop Build Day, February 17, 2015 (refer to the 2015 Administrative Manual Section 5: Robot Packaging and Transporting for more details).

Section 4.6 - Material Utilization

R17 At an Event, Teams may have access to a static set of FABRICATED ITEMS, not bagged per R14, known as the WITHHOLDING ALLOWANCE, that shall not exceed 30 lbs. to be used to repair and/or upgrade their ROBOT. With permission from another Team, Teams may also have access to FABRICATED ITEMS that are part of that other Team's WITHHOLDING ALLOWANCE to repair and/or upgrade their ROBOT. The WITHHOLDING ALLOWANCE may only be brought into the Venue when the Team initially loads in at the Event. Items made at an Event do not count towards this weight limit.

Section 4.10 - Pneumatic System

R66-D: Solenoid valves that are rated for a maximum **working rated** pressure that is less than 125 psi rating mandated above are permitted, however if employed, an additional pressure relief valve must be added to the low pressure side of the main regulator.

Section 4.11 - Operator Console

R82 Devices hosting the Driver Station software may only interface with the Field Management System (FMS) via the Ethernet cable provided at the PLAYER STATION (e.g. not through a switch). **Teams may connect the FIELD Ethernet cable to their Driver Station device directly, via an Ethernet pigtail, or with a single-port Ethernet converter (e.g. docking station, USB-Ethernet converter, Thunderbolt-Ethernet converter, etc.).** The Ethernet port on the OPERATOR CONSOLE must be easily and quickly accessible.

Team Update 2015-03-10

General Updates

An updated SmartDashboard has been released which allows teams to connect to Axis Cameras using mDNS. Teams can download this updated version from [here](#) (note: this version is newer than the latest Eclipse plugin update). Teams should make sure they are setting up the network configuration of their devices properly in order to operate both in the pits and on the field at the event, for more detail see [this document](#).

The port for NetConsole has been opened on the field network so teams can receive NetConsole traffic on their DS PC while on the field.

After reviewing feedback from weeks 1 and 2 events and reviewing the firmware changes with NI, we have decided to allow the default roboRIO firmware version, 2.0.0b86, for competition. You will see this reflected in the change to R45.

Admin Manual

No updates.

Game Manual

4.9 Control, Command, & Signal Systems

R45 ROBOTS must be controlled via one (1) programmable National Instruments roboRIO (P/N: am3000), with image version FRC_2015_v23 and firmware 2.1.0f3.

Team Update 2015-03-03

General Updates

No updates.

Admin Manual

No updates.

Game Manual

3.2.2 Pre-MATCH and Post-MATCH

G14 ROBOTS will not be re-enabled after the conclusion of the MATCH, nor will Teams be permitted to tether to the ROBOT **except in exceptional circumstances (e.g. during TIMEOUTS, after Opening Ceremonies, etc.) and with express permission from the FTA or a Referee.**

Team Update 2015-02-24

General Updates

Team Update Schedule

Given that Fridays will be mid-event for most competitions, Team Updates will now only be released on Tuesday of each week (instead of Tuesdays and Fridays). Good luck at the competitions!

C++\Java Library Updates

A recommended, but not required, update has been posted for the C++ and Java versions of WPILib. The primary fix in this update is for C++ only and fixes an issue where it is possible that CAN devices may not properly enable if joystick data is requested from the program while the DS is not connected. Two additional minor fixes, regarding POVs and getting the values of solenoids from non-default PCM IDs, which affect both C++ and Java are also included.

Information about installing updates can be found near the bottom of [this document](#).

A complete changelog can be found [here](#).

Teams that wish to avoid the CAN enable issue, but do not want to update their Eclipse plugins can use a workaround documented in *Section 21.18* of the *Talon SRX Software Reference Manual* and *Section 5.1* of the *PCM User's Guide*, both hosted [here](#).

Admin Manual

Section 4.14 - Site Restrictions

Do not arrange for Internet access or phone lines **from venue service providers on the site or attempt to connect to the Internet. use venue internet connections reserved for event purposes (e.g. FMS or streaming).**

Game Manual

Section 2.1.3 - SCORING PLATFORMS

Figure 2-6 BACKSTOP Geometry has been updated to extend the leader line for the height of the backstop to the carpet (instead of the top of the SCORING PLATFORM), which matches the height of the BACKSTOP stated in the preceding text.

Section 2.2. - ALLIANCE STATIONS

The STARTING LINE is the width of the ALLIANCE STATION and is marked with 2 in. White gaffers tape that is 2 ft. **64** in. from the PLAYER STATIONS.

Section 2.3.1 - TOTES

TOTES will be removed from play **at the end of the MATCH** if, in the judgment of the Head Referee, the TOTE is unsuitable for gameplay. Examples include but are not limited to: lids broken off, large cracks that weaken rigidity, and large holes. Lids that come open but are still attached will be reclosed and secured with cable ties before the start of the next MATCH.

Damaged TOTES count for scoring purposes as long as they remain largely intact and have lids still in place and closed. Examples of damage which do not make the TOTE ineligible for scoring include, but are not limited to, obviously cracked plastic or broken-off handles.

Section 2.3.2 - RECYCLING CONTAINERS

RECYCLING CONTAINERS **are ineligible for scoring and** will be removed from play **at the end of the MATCH** if, in the judgment of the Head Referee, the RECYCLING CONTAINER is unsuitable for gameplay. Examples include but are not limited to: lids **completely** broken off, large cracks that weaken rigidity, and large holes. Lids that come off but are otherwise not damaged will be reclosed and secured with cable ties before the start of the next MATCH.

Team Update 2015-02-20

General Updates

This note is from Frank Merrick, Director of FRC.

Hi Teams. A few noteworthy things in this update. First, you'll see some changes to the way Michigan will be running their District Championship. This only applies to Michigan teams of course, but it may be of interest to others as well. They will be having a 16 Alliance playoff. That's going to be some party!

Also, you'll see clarifying language added to the blue box in G16. G16 itself, letter G, already says damaging field elements, including litter, is not allowed, but gives an exception for *unintentional* damage to litter. The original blue box language said driving over litter leading to damage was not a violation. As with all blue boxes (as explained in Section 1.2, if you are interested), this was intended to provide helpful information about the rule, and not be a rule itself. We were trying to say that if you drive over litter – very likely in this game - with no intention to damage it, and it happens to get damaged, that's OK. Looking back though, we realize this could be confusing to teams. The additional language is an attempt to make clear that for the exception to hold, the damage must be unintentional. Yes, this will be a judgment call. As in all other sports, refs will sometimes need to make those. One approach to look like you're not intending to damage litter is to actually not intend to damage litter.

Can't wait for our first events next week!

Frank

Admin Manual

7.4 Teams Competing at District Events

With the exception of the Michigan District Championship, points earned at District Championships will be multiplied by three and then added to points earned at District events, to determine the final season points total for the Team. Because of the size of the Michigan District Championship in 2015, a modified points system, **not yet finalized as shown in Section 7.4.3.1**, will be used to award points there. However, the points earned there will still be added to the points earned at District events to determine the season total.

7.4.3.1 Michigan District Championship

At the 2015 Michigan District Championship, because of the number of teams in attendance, the event will have a 16 Alliance playoff, rather than a standard 8 Alliance playoff. The first round of this playoff, the Eighth Finals, will be played similarly to a standard Quarter Final playoff, under the same rules, with each Alliance playing two matches and the top 8 Alliances then advancing to the Quarter Finals. The specific order and Alliance pairings for the Eighth Finals is yet to be determined, but this manual will be updated when that information is available. Once the top 8 Alliances have been determined, the process will proceed as described in the *FRC Game Manual, Section 5, The Tournament*.

Alliance selection will follow the same serpentine draft and process as the standard 8 Alliance selection described in the *FRC Game Manual, Section 5, The Tournament*, but with 16 Alliances rather than 8.

With the exception of the 'Alliance Selection Results' category, points at the Michigan District Championship will be awarded as described in *Section 7.4.1*, and will be multiplied by three and summed with district event points, just like all other districts, in determining final season point totals for Teams. As an example, a team winning the Engineering Inspiration Award at the Michigan Championship will earn 24 points, the standard 8 points as shown in *Section 7.4.1*, multiplied by three, as with other Districts.

In place of the 'Alliance Selection Results' category in *Section 7.4.1*, Teams at the Michigan District Championship will be assigned points per the table below. Please note these points will not be multiplied by three as points at District Championships normally would be in determining final season point totals for Teams. Instead, the points are added, just as shown, to Teams' season point totals, in place of the 'Alliance Selection Results' points shown in *Section 7.4.1*.

Alliance	Captain	First Pick	Second Pick
Alliance 1	48	48	1.5
Alliance 2	46.5	46.5	3
Alliance 3	45	45	4.5
Alliance 4	43.5	43.5	6
Alliance 5	42	42	7.5
Alliance 6	40.5	40.5	9
Alliance 7	39	39	10.5
Alliance 8	37.5	37.5	12
Alliance 9	36	36	13.5
Alliance 10	34.5	34.5	15
Alliance 11	33	33	16.5
Alliance 12	31.5	31.5	18
Alliance 13	30	30	19.5
Alliance 14	28.5	28.5	21
Alliance 15	27	27	22.5
Alliance 16	25.5	25.5	24

As an example, the Team picked second for Alliance 11 would earn 16.5 points, and these points would be added, without multiplying, to the Team's season total.

Game Manual

Section 2.3.3 - LITTER

LITTER will be removed from play if, in the judgment of the Head REFEREE, the LITTER is unsuitable for gameplay. Examples include but are not limited to: the length shortened, or a chunk more than approximately 1.5 in. deep and 3 in. long is removed, or tape has been removed. Small cuts or small pieces removed will not cause LITTER to be replaced. **Damaged LITTER counts for scoring purposes as long as the LITTER has at least two of the three 2-inch red or blue tape rings in place.**

Section 3.2.1 - Safety

G5, Blue Box:

The intent of G5 is to ensure that one ALLIANCE member does not work the elements of the HUMAN PLAYER STATION while another ALLIANCE member feeds TOTES or LITTER into their respective CHUTES. TOTES, even if in the HUMAN PLAYER ZONE, are not elements of the HUMAN PLAYER STATION, and therefore not affected by G5 (i.e. two people can be in contact with the same TOTE simultaneously).

Section 3.2.3 - General Rules

G16, Blue Box:

Driving over LITTER leading to LITTER damage is not a violation of this rule, provided that, in the judgement of the Referee, the LITTER damage was not the objective of the action.

Examples of prohibited interaction with FIELD elements include:

- A. use of hook-and-loop fastener to attach a ROBOT to the carpet
- B. humans or ROBOTS tying or weaving LITTER into a knot
- C. a strategy involving the removal of cable ties from TOTES or RECYCLING CONTAINERS

G18 ROBOTS may not contact anything beyond the STEP. Momentary contact as a result of ROBOT to ROBOT interaction, direct or indirect (e.g. via a RECYCLING CONTAINER), over the STEP is an exception to this rule. If a ROBOT becomes inoperable or "stuck" while some portion of the ROBOT is extending beyond the STEP, the ROBOT will not receive multiple FOULS.

Section 3.2.5 - ROBOT Actions

G24 ROBOTS may not cause TOTES, RECYCLING CONTAINERS, and/or LITTER to completely transfer from their side of the FIELD, or from the STEP, onto the opposite side of the FIELD.

VIOLATION: FOUL for each item. If egregious or strategic, RED CARD and offending ROBOT will be DISABLED.

Section 4.7 - Motors and Actuators

R18, Table 4-1

Table 4-1: Legal Motors

Motor Name	Part Numbers Available	Max Qty Allowed
CIM	FR801-001	6
	M4-R0062-12	
	AM802-001A	
	217-2000	
	PM25R-44F-1005	
	PM25R-45F-1004	
	PM25R-45F-1003	
	PMR25R-45F-1003	
BaneBots Motors	M7-RS775-18 / RS775PH-6221WC-8514	unlimited
	M7-RS775-12 / RS775PH-6221	
	M5-RS550-12 / RS550VC-7527	
	M5-RS550-12-B / RS550VC-7527L	
AndyMark 9015	am-0912	unlimited
Denso Throttle Control	AE235100-0160	unlimited
VEX BAG and/or mini-CIM	217-3351	unlimited
	217-3371	
AndyMark PG	am-2161 (alt. PN am-2765) am-2194 (alt. PN am-2766)	unlimited
Automotive Window Motors Automotive Door Motors Automotive Windshield Wiper Motors Automotive Seat Motors	Various	unlimited
Bosch Motor	6004 RA3 353-01	unlimited
Snow Blower Motor	am-2235	unlimited
Electrical solenoid actuators, no greater than 1 in. stroke and rated electrical input power no greater than 10 watts (W) continuous duty at 12 volts (VDC)		unlimited
Hard drive motors or fans that are included in the 2015 Kickoff Kit, 2015 FIRST Choice, are a part of a legal motor controller (including manufacturer provided accessories), or COTS computing device		unlimited
PWM COTS servos with a maximum power rating of 4W each at 6VDC Per the Servo Industry, Servo Max Power Rating = (Stall Torque) X (No Load Speed)		unlimited

Team Update 2015-02-17

General Updates

CONGRATULATIONS! You've made it to Stop Build Day. Good luck wrapping up your build season and your ROBOT, and take a well-deserved break before you start/continue to prep for competition season.

This note is from Frank Merrick, Director of FRC

Hi Teams! In this update, you'll see a few tweaks to the rules. Some of these were a result of observations we made at the Week 0 event we attended. Others are a result of the Q&A, and at least one is a result of a pretty amazing looking reveal video we saw that included a multi-part robot using tethers. None, though, I believe, are significant changes.

You will see rule changes related to playoffs. One deals with how ties are handled. We would expect ties all the way through the 5th order sort on Table 5-2 to be rare, but they certainly are not impossible. Fundamentally, we need tie-breaking rules that cover every situation, including ties through the 5th order sort involving more than just two alliances – even though the chance of this happening is tiny. While we like the idea of having additional playoff matches between closely matched Alliances in the abstract, when we started talking details, including the possibility of three way ties, the situation got very complicated. We considered adding several more sort orders to the list, to further minimize the chance of ties, but the additional sorts we considered were unsatisfactory, especially considering the fact that we eventually wanted to get to a resolution that couldn't result in a tie. In the end, we decided to use Alliance rank as a 6th order sort. Rank is linked to prior Alliance performance, or at least the performance of the Alliance Captain if the tie happened in the Quarter Finals, and seemed a reasonable, if not perfect, solution to the challenge.

You will also see we made a tweak to the order of Alliance play in Semi Finals. This is to address a small inconsistency related to the planned two-field play on Einstein at Championship. In the original ordering, the top ranked Alliance going to Semis would never have to change fields, the 2nd and 4th ranked Alliances would need to change once, and the 3rd ranked alliance would need to change fields twice. While in the grand scheme of things, this probably doesn't matter much, it did seem odd to us that the 4th ranked Alliance had to change fields less than the 3rd ranked Alliance, so we switched things around to fix that.

New Subdivision names have also been incorporated in the rules.

Finally, we have reduced the penalty associated with G6-1. We consider this to be a safety rule, however, we recognize it may be forgotten in the heat of the moment, and didn't want the penalty to be excessive.

Congratulations on making it to Stop Build Day!

Frank

Admin Manual

No changes.

Game Manual

Section 3.1.4 - MATCH Logistics

Section 3.1.4 is not intended to prohibit TEAMS, in coordination with FIELD Staff, from temporarily shifting the position of TOTES and RECYCLING CONTAINERS, if necessary, to get their ROBOTS in position for the start of the MATCH. However, the MATCH will not start until FIELD Staff have verified all TOTES and RECYCLING CONTAINERS are in their designated starting positions. TEAMS should keep in mind the requirements of G10 when getting their ROBOTS in position.

During the FIELD reset period, FIELD staff will return all TOTES, RECYCLING CONTAINERS and LITTER to their designated starting positions, where they must remain (with the exception of Yellow TOTES optionally being relocated to the designated area in the ALLIANCE STATION) until the start of the MATCH.

Section 3.2.1 - Safety

G5 Only one ALLIANCE member may be in each HUMAN PLAYER ZONE (i.e. touching the carpet in a HUMAN PLAYER ZONE), in contact with elements of that HUMAN PLAYER STATION (i.e. elements depicted in Figure 2-12), or in the HUMAN PLAYER ZONE and in contact with the the elements of that HUMAN PLAYER STATION, at a time.

The intent of G5 is to ensure that one ALLIANCE member does not work the elements of the HUMAN PLAYER STATION while another ALLIANCE member feeds TOTES or LITTER into their respective CHUTES.

G6-1 DRIVE TEAMS may not use any object to prop the CHUTE DOOR open.

VIOLATION: **FOUL and YELLOW CARD. If egregious or repeated, RED CARD.**

Section 3.2.3 - General Rules

G16 The following actions are prohibited with regards to interaction with FIELD elements (items A-D exclude TOTES, RECYCLING CONTAINERS, and LITTER):

- A. grabbing
- B. grasping
- C. grappling
- D. attaching to
- E. becoming entangled
- F. hanging **from**
- G. damaging (exception: unintentional damage to LITTER)
- H. tying
- I. removing or repositioning LITTER tape

VIOLATION: *FOUL*. If the Head REFEREE determines that further damage is likely to occur, offending ROBOT will be DISABLED. Corrective action (such as eliminating sharp edges, removing the damaging MECHANISM, and/or re-Inspection) may be required before the ROBOT will be allowed to compete in subsequent MATCHES.

Section 4.2 - General ROBOT Design

R2: Blue Box has been edited.

The intent is that the Team's number is clearly visible and unambiguous so that Judges, Referees, Announcers, and other Teams can easily identify competing ROBOTS. Consider the numbers as the license plates for your ROBOT. **If an observer has to follow a tether to identify the ROBOT's team number, that is considered not clearly visible and does not meet the requirements of R2.**

NOTE: Impact font, size 362pt., shown in Figure 4-1, meets the stroke and height requirements for all digits.

Section 4.8 - Power Distribution

Figure 4-2 in **R25** has been updated to use "Power Distribution Panel" instead of "Power Distribution Board."

R37 Each branch circuit must be protected by one and only one circuit breaker on the PDP per Table 4-2. No other electrical load can be connected to the breaker supplying this circuit.

Table 4-2: Branch Circuit Protection

Branch Circuit	Circuit Breaker Value	Quantity Allowed Per Breaker
Motor Controller	Up to 40A	1
CUSTOM CIRCUIT	Up to 40A	1
Fans permitted per Table 4-1 and not already part of COTS computing devices	Up to 20A	no limit
Relay Module	Up to 20A	1
PCM – with compressor	20A	1
Additional VRM (non-radio)/Additional PCM (non-compressor)	20A	3 total

R41 **With the exception of fans or hard drive motors permitted in R18, each actuator must be controlled by a power regulating device.** The only power regulating devices for actuators permitted on the ROBOT include:

- A. Motor Controllers
 - J. Jaguar Motor Controller (P/N: MDL-BDC, MDL-BDC24, and 217-3367)
 - K. Talon Motor Controller (P/N: CTRE_Talon, CTRE_Talon_SR, and am-2195)
 - L. Talon SRX Motor Controller (P/N: 217-8080), equipped with firmware version 0.28 or newer if using via PWM. See R59 if using via CAN.
 - M. Victor 884 Motor Controller (P/N: VICTOR-884-12/12)
 - N. Victor 888 Motor Controller (P/N: 217-2769)
 - O. Victor SP Motor Controller (P/N: 217-9090)
- B. Relay Modules
 - A. Spike H-Bridge Relay (P/N: 217-0220 and SPIKE-RELAY-H)
- C. Pneumatics controllers
 - A. Pneumatics Control Module (P/N: am-2858, 217-4243)

Section 4.11 - OPERATOR CONSOLE

An explanation for the edit to R81: The version of the Driver Station software release last week (posted on 2/12/15) did not match the version published via Team Update 2015-02-10. This edit corrects that error on our part, and isn't to be interpreted as an even newer version of the software. The version schema is presented in a month, day, year, version number, i.e. MMDDYYNN.

R80 The Driver Station software provided on the [National Instruments website](#) is the only application permitted to specify and communicate the operating mode (i.e. Autonomous/TELEOP) and operating state (Enable/Disable) to the ROBOT. The Driver Station software must be revision ~~06021500~~ 08021500 or newer.

Section 5.4.3 - Playoff Advancement

In the case where the average score of two (2) or more ALLIANCES is equal, the higher position is awarded tie is broken by awarding an additional point to the ALLIANCE's average score using the tiebreaker rules shown in Table 5-2.

Table 5-2: Quarterfinal and Semifinal MATCH Ranking Criteria

1st order sort	Playoff Average
2nd order sort	Cumulative sum of AUTO points
3rd order sort	Cumulative sum of scored RECYCLING CONTAINER points
4th order sort	Cumulative sum of scored TOTE points
5th order sort	Cumulative sum of scored LITTER points (LITTER in a scored RECYCLING CONTAINER + LITTER scored in the ALLIANCE'S LANDFILL ZONE + UNPROCESSED LITTER Bonus)
6th order sort	ALLIANCE Rank upon entering the Playoff Level (e.g. ranks 1-8 entering the Quarterfinals or 1-4 entering the Semifinals)

If ALLIANCES are still tied after applying the rules in Table 5-2, an additional MATCH will be played. In that case, during the Quarterfinals the ALLIANCE with the highest average score after three (3) MATCHES will advance, and during the Semi-Finals the ALLIANCE with the highest average score after four (4) MATCHES will advance.

5.4.4 Playoff MATCH Format

The Playoff MATCHES take place following the completion of the Qualification MATCHES and the ALLIANCE selection process. Playoff MATCHES are played as shown in Figure 5 2, ALLIANCE One, ALLIANCE Two, etc. are abbreviate A1, A2, etc.

The higher seeded ALLIANCE will always be assigned to the Red side of the FIELD. Additionally, ALLIANCE CAPTAINS will always be assigned to the center PLAYER STATION, the first pick will be assigned to the station to their left while they're facing the FIELD, and the second pick will be assigned to their right while they're facing the FIELD. If a BACKUP TEAM is in play, they will be assigned to the PLAYER STATION that was assigned to the DRIVE TEAM they're replacing.

In order to allow time between MATCHES for all ALLIANCES, the order of play is as follows:

- **Round 1:** QF1 (A4 vs. A5), QF2 (A3 vs. A6), QF3 (A2 vs. A7), QF4 (A1 vs. A8)
- **Round 2:** QF5 (A4 vs. A6), QF6 (A3 vs. A5), QF7 (A2 vs. A8), QF8 (A1 vs. A7),

Any additional Quarter-Final MATCHES due to ties*

- **Round 1:** SF1 (Q2 vs. Q3), SF2 (Q1 vs. Q4),
- **Round 2:** SF3 (Q2 vs. Q3), SF4 (Q1 vs. Q4)
- **Round 3:** SF5 (Q3 vs. Q4), SF6 (Q1 vs. Q2)

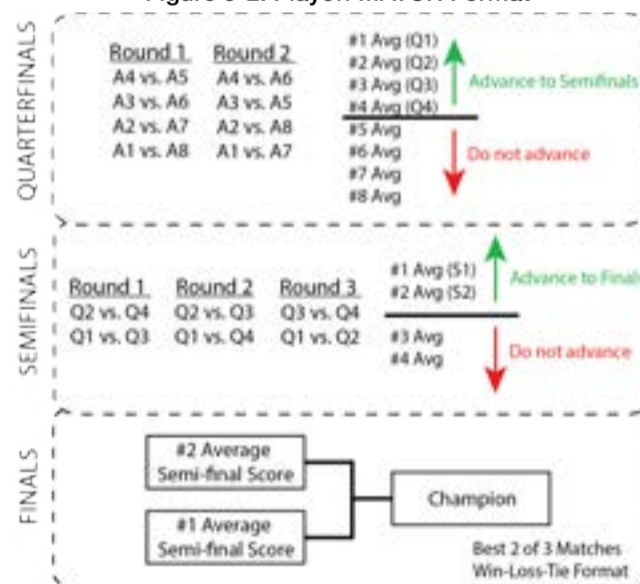
Any additional Semi-Final MATCHES due to ties*

- F1, F2, F3*

Any additional Final MATCHES due to ties*

* IF REQUIRED.

Figure 5-2: Playoff MATCH Format



5.6.3 FRC Championship MATCH Bracket

The figure below details the order in which MATCHES are played during the Championship Playoffs. The winning ALLIANCES from each of the Subdivision Fields are abbreviated F1, F2, etc.

In order to allow time between MATCHES for all ALLIANCES, the order of play is as follows:

- **Round 1:** QF1 (F4Newton vs. F5Hopper), QF2 (F2Curie vs. F7Carver), QF3 (F3Galileo vs. F6Carson), QF4 (F1Archimedes vs. F8Tesla)
- **Round 2:** QF5 (F4Newton vs. F6Carson), QF6 (F2Curie vs. F8Tesla), QF7 (F3Galileo vs. F5Hopper), QF8 (F1Archimedes vs. F7Carver)

~~Any additional Quarter-Final MATCHES due to ties*~~ In the case where (2) or more ALLIANCES are tied through the fifth order sort described in Table 5-2, the higher position is awarded to the ALLIANCE using a method yet to be determined.

- **Round 1:** SF1 (Q2 vs. Q3/Q4), SF2 (Q1 vs. Q4/Q3),
- **Round 2:** SF3 (Q2 vs. Q4/Q3), SF4 (Q1 vs. Q3/Q4)
- **Round 3:** SF5 (Q3 vs. Q4), SF6 (Q1 vs. Q2)

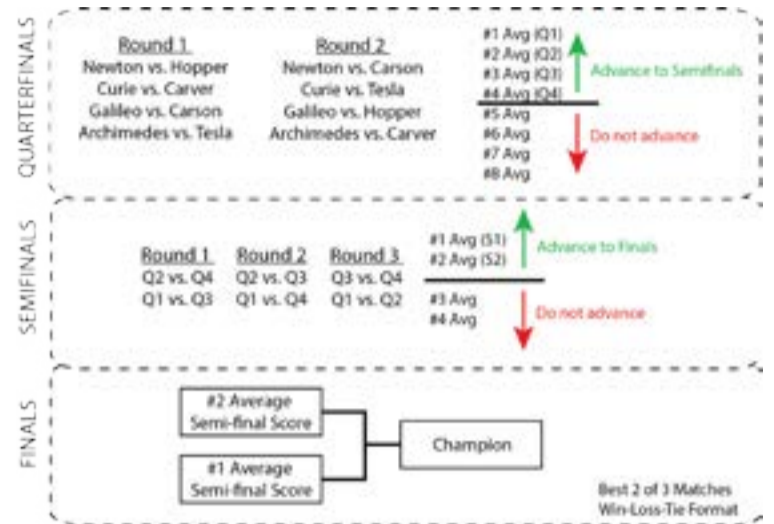
~~Any additional Semi-Final MATCHES due to ties*~~

- F1, F2, F3*

Any additional Final MATCHES due to ties*

* IF REQUIRED.

Figure 5-5: Championship Playoff MATCH Bracket



Team Update 2015-02-13

General Updates

Heads Up on Grounded Encoder

The [AMT103 encoder](#) that CUI donated for distribution in *FIRST* Choice and is used by many FRC teams has a metal case that is electrically connected to the ground pin on its connector. Please be aware of this, as R27 requires you to electrically isolate this (and any other components) from your ROBOT'S frame – including through use of plastic fasteners used to mount the devices. The encoder *is* isolated from the shaft.

While we're on AMT103 encoders, please note that CUI recommends “no more than three cycles of mounting and removal of the AMT top cover base. Multiple cycles of mounting and removing the top cover can cause base fatigue over time and affect encoder performance.”

Admin Manual

No changes.

Game Manual

No changes.

Team Update 2015-02-10

General Updates

Software Update Notice

Driver Station Software Update: A required update will be released for the FRC Driver Station (new version: 06021500) this week. This update must be installed by all teams. This update fixes issues with DS-FMS diagnostics and connectivity. The update installer (FRCUpdate2015.1.0) will be available from NI's site [here](#).

C++ Update: We've identified a bug in the C++ code that causes an issue for teams using the SmartDashboard with C++ which results in their code locking up unexpectedly. The bug has been fixed and included in a new release of the Eclipse Plugins. This update is strongly recommended, but not required.

Information about installing updates can be found near the bottom of this [document](#).

A complete changelog can be found [here](#).

A Request for a Favor?

We've experienced many redundant questions in the Q&A this season, which as resulted in many "We believe Qxyz answers this question..." responses. It will help greatly if, before submitting your question, you peruse the already asked/answered questions to see if the information you need is already posted. Using the Keyword search box may help you find questions related to yours. Thank you for this consideration!

Admin Manual

6.9.1 Business Plan Submission

Submissions will be accepted between the dates listed in *FRC Administrative Manual Section 6.3.1 – Submission Dates*.

A formal business plan must be completed and entered through the *FIRST* Student Team Information Members System (STIMS) <https://my.usfirst.org/stims/site.lasso>.

In addition to submitting their business plans through STIMS, teams may create more comprehensive plans in their own style. They may then provide hard copies of these plans to judges at events to supplement the information they provide in STIMS.

Game Manual

Section 2.3.1 - TOTES

The dimension in Figure 2-16 has been updated to show the correct dimension of 3 ft. 9.5 in. of the center gap between the top edges of the TOTES on the STEP.

Section 4.10 - Pneumatic System

R71 "Working" air pressure on the ROBOT must be no greater than 60 psi and must be provided through one primary adjustable, relieving, pressure regulator, ~~relieving,~~ ~~pressure regulator.~~

Section 4.11 - OPERATOR CONSOLE

The Driver Station software provided on the National Instruments website is the only application permitted to specify and communicate the operating mode (i.e. Autonomous/TELEOP) and operating state (Enable/Disable) to the ROBOT. The Driver Station software must be revision ~~17121400~~ **06021500** or newer.

Team Update 2015-02-06

General Updates

How to Run a Week 0

Week Zero is coming up fast! Unfortunately, running a Week Zero event with the 2015 Control System and a 2014 FMS System (FMS-Lite or 3rd party equivalent) is not 100% straightforward. To help you deal with this year of transition (we anticipate things to go back to being much easier again next year) we put together a document outlining the options we've come up with for how you could configure things to get up and running. It's posted [here](#).

Inspection Checklist

The [2015 Inspection Checklist](#) has been posted on the [Competition Manual website](#).

MXP Boards

We've received reports of confusion over R58 and the legality of certain types of custom MXP designs using the PWM pins. Per R58 and the definitions of PASSIVE CONDUCTORS and ACTIVE DEVICE, any custom MXP board which contains active components is an ACTIVE DEVICE and cannot be used to control motors or servos, except those listed in R58-C. Even though the PWM signals themselves may pass exclusively through passive conductors on the board, the board as a whole is the device and contains active components, making it an ACTIVE DEVICE.

While technically, a device that has the PWM pass-throughs electrically isolated from the active components meets the safety intent of the rules, it's not practical to expect Inspectors to be able to dissect the board to confirm this for themselves. This is the reason we required Active Devices be sent to *FIRST* so that we could confirm the board is safe for use and give Inspectors a clean list of devices that are permitted.

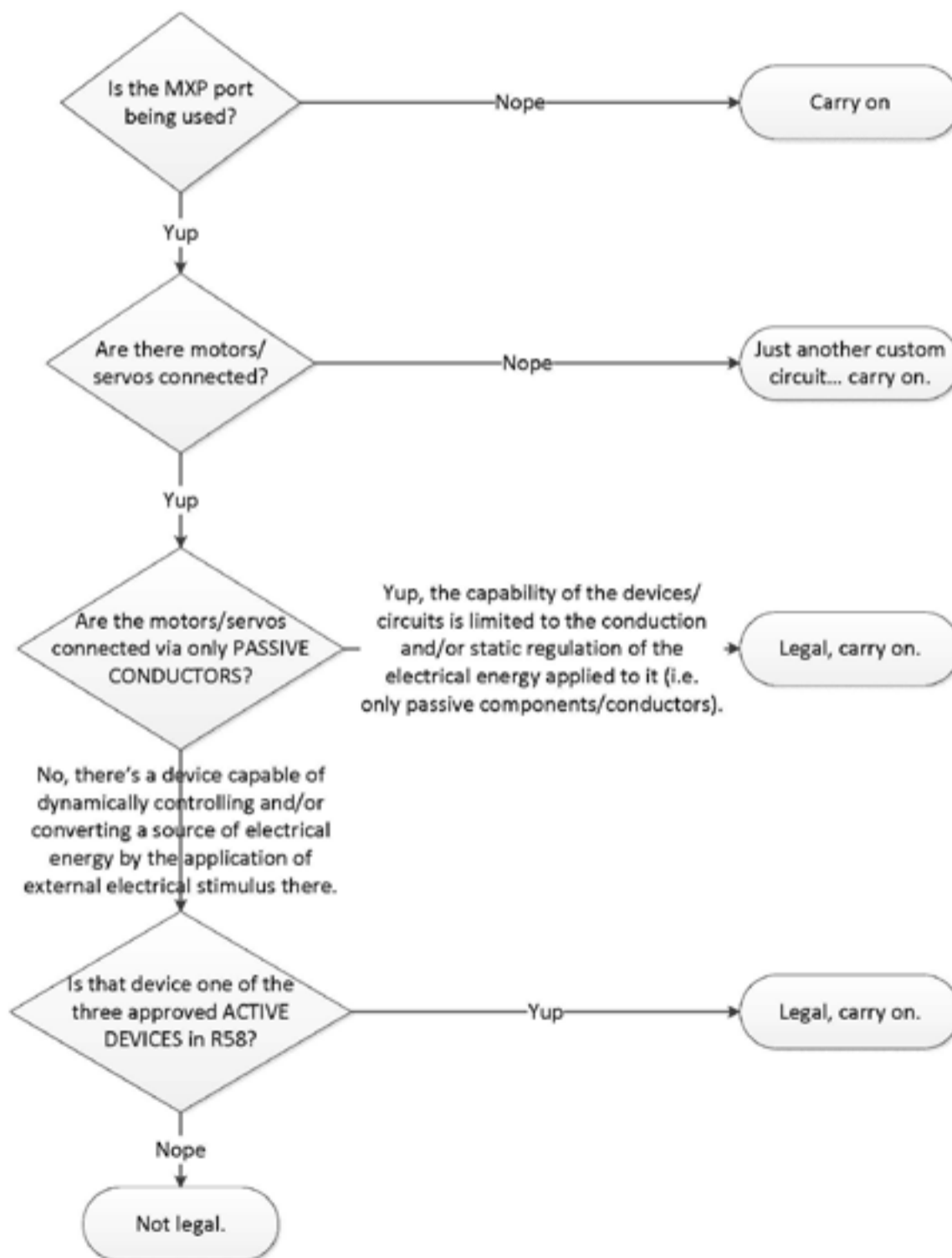
To help clarify, we've drafted this flow chart.

Admin Manual

Section 7 - Team Advancement has been published.

Game Manual

No updates.



Team Update 2015-02-03

General Updates

The [2015 BOM Template](#) has been posted on the [Competition Manual website](#).

Admin Manual

No updates.

Game Manual

Section 2.3.1 - TOTES

The Gray TOTES that AndyMark is selling are hotstamped with a black FIRST logo instead of the white FIRST logo (like the ones teams received as part of their Kickoff Kits). The TOTES that will be used in the competitions will have the white hot stamp, although that may not be the case for unofficial events.

Section 4.2 - General ROBOT Design

There seems to be some misunderstanding about the TRANSPORT CONFIGURATION and how bolt heads or other minor extensions relate. We'd like to explicitly state in this Team Update that there are no exemptions for bolt heads or other minor extensions for the TRANSPORT CONFIGURATION.

Section 4.8 - Power Distribution

R42 Each power regulating device may control electrical loads per Table 4-4. Unless otherwise noted, each power regulating device may control one and only one electrical load.

Table 4-4: Legal Power Regulating Device Use

Electrical Load	Motor Controller	Relay Module	Pneumatics Controller
CIM			
AndyMark 9015	Yes	No	No
Banebots			
VEX BAG/MiniCIM			
Automotive Window/Door/Windshield			
Wiper/Seat Motors			
AndyMark PG	Yes	Yes	No
Bosch Motor	Up to 2 per controller		
Snow-Blower Motor			
Denso Throttle Control			
Compressor	No	Yes	Yes
Pneumatic Solenoid Valves	No	Yes*	Yes (1 per channel)
Electric Solenoids	No	Yes*	Yes (1 per channel)
CUSTOM CIRCUITS	Yes	Yes*	Yes (1 per channel)

*Multiple low-load, pneumatic solenoid valves, electric solenoids or CUSTOM CIRCUITS may be connected to a single relay module. This would allow one (1) relay module to drive multiple pneumatic actions or multiple CUSTOM CIRCUITS. No other electrical load can be connected to a relay module used in this manner.

R44 CUSTOM CIRCUITS shall not directly alter the power pathways between the ROBOT battery, PDP, motor controllers, relays, motors and actuators (per R18), pneumatic solenoid valves, or other elements of the ROBOT control system (items explicitly mentioned in R55). Custom high impedance voltage monitoring or low impedance current monitoring circuitry connected to the ROBOT'S electrical system is acceptable, if the effect on the ROBOT outputs is inconsequential.

Section 5.4.4 - Playoff MATCH Format

The Playoff MATCHES take place following the completion of the Qualification MATCHES and the ALLIANCE selection process. Playoff MATCHES are played as shown in Figure 5 2, ALLIANCE One, ALLIANCE Two, etc. are abbreviate A1, A2, etc.

The higher seeded ALLIANCE will always be assigned to the Red side of the FIELD. Additionally, ALLIANCE CAPTAINS will always be assigned to the center PLAYER STATION, the first pick will be assigned to the station to their left while they're facing the FIELD, and the second pick will be assigned to their right while they're facing the FIELD. If a BACKUP TEAM is in play, they will be assigned to the PLAYER STATION that was assigned to the DRIVE TEAM they're replacing.

Section 5.5.1 - Safety and Security Rules

T6-1 The OPERATOR CONSOLE must be used in the PLAYER STATION to which the Team is assigned, as indicated on the Team sign.

VIOLATION: *The MATCH will not start until the situation is corrected. If during a MATCH and repeated or egregious, YELLOW CARD.*

One intent of T6-1 is to prevent unsafe situations where long tethers to OPERATOR CONSOLE devices increase tripping hazards as the operator moves about the ALLIANCE STATION. In the interest of avoiding nuisance penalties associated with an operator stepping outside of a prescribed area, we prefer to offer a general guideline as to what it means to use the OPERATOR CONSOLE in the PLAYER STATION. Provided the operator is within close proximity of their PLAYER STATION, there will be no repercussions. However, if an operator is located more than approximately 1/2 PLAYER STATION width away from their own PLAYER STATION, that would be considered a violation of T6-1.

Section 5.5.5 - MATCH REPLAYS

The change to T15 allows the Head REFEREE to consider whether or not an affected ALLIANCE wants to replay a MATCH in which an ARENA fault affected the outcome. In other words, if an ARENA fault occurs that affects MATCH outcome, but in the judgment of the Head REFEREE, only one ALLIANCE'S MATCH result is affected, and no team on that ALLIANCE wishes to replay the MATCH, the MATCH will not be replayed. For ARENA faults that affected the MATCH outcome for both ALLIANCES, and no team on either ALLIANCE wishes to replay the MATCH, the MATCH, again, will not be replayed.

T15 If, in the judgment of the Head REFEREE, an "ARENA fault" occurs that affects the outcome of the MATCH and any team on the affected ALLIANCE(S) in that MATCH desires a replay, the MATCH will be replayed.

Section 5.6.1 - Four ROBOT ALLIANCES

The list of Teams participating in the MATCH and their selected PLAYER STATIONS is called the LINEUP.

Section 5.6.2 - Championship Pit Crews

Only Team members wearing proper badges are allowed on the ARENA floor. FIRST will distribute these badges to the ALLIANCE CAPTAINS during the ALLIANCE CAPTAIN meeting, which takes place on the Subdivision FIELDS.

Section 6 - Glossary

LINEUP – the list of three (3) Teams and their selected PLAYER STATIONS submitted by an ALLIANCE CAPTAIN to play in a FIRST Championship Subdivision Playoff MATCH or a MATCH on the Einstein FIELDS.

Team Update 2015-01-30

General Updates

This note is from Frank Merrick, Director of FRC

Hello teams! I wanted to point out to you that we have changed our answer to [Q273](#) in the FRC Q&A.

The original question was:

“Can the robot be in any orientation when being transported as long as it fits and stays within the transport configuration envelope? Can it be carried on and off the field or placed on a cart with the “tall” side laying down if that is a more stable (safer) orientation?”

Our original answer was:

“Yes, there are no rules regulating the orientation of the ROBOT while it's in its TRANSPORT CONFIGURATION.”

Looking at this answer again, we realized it was incomplete and didn't actually address the second part of the question. The corrected answer is:

“Yes, there are no rules regulating the orientation of the ROBOT while it's in a TRANSPORT CONFIGURATION. With that being said the orientation of the TRANSPORT CONFIGURATION itself cannot be changed, (i.e. your robot may be placed on its side for transport, but on its side it must still fit within the dimensions of the TRANSPORT CONFIGURATION as specified in R3 – B 28 in. wide, 42 in. long, and 78 in. tall)”

We're sorry for any trouble our original answer may have caused, and we hope our corrected answer helps clarify the situation

Frank

Admin Manual

No updates.

Game Manual

Section 3 - The Game

G5 Only one ALLIANCE member may be in each HUMAN PLAYER ZONE, in contact with elements of that HUMAN PLAYER STATION, or in the HUMAN PLAYER ZONE and in contact with the the elements of that HUMAN PLAYER STATION, at a time.

G6 A single ALLIANCE member may not be in contact with both a TOTE and the CHUTE DOOR simultaneously, directly or through the use of any object (except for via normal operation of the CHUTE or CHUTE DOOR).

Section 5 - The Tournament

T6-1 The OPERATOR CONSOLE must be used in the PLAYER STATION to which the Team is assigned, as indicated on the Team sign.

VIOLATION: The MATCH will not start until the situation is corrected

Team Update 2015-01-27

General Updates

No Updates

Admin Manual

No Updates

Game Manual

Section 2 - The Arena

Drawing TE-15012, the Team Version drawing of the *Tote Chute Door Wall*, has been revised to change the thickness from 0.63 in. (made of 5/8 in. plywood) to 0.75 in. (made of 3/4 in. plywood). Subsequently, a Revision History block has been added and, as a result, the scale of the isometric image has been reduced from 1:8 to 1:16.

Section 3 - The Game

G6 A single ALLIANCE member may not be in contact with both a TOTE and the CHUTE DOOR simultaneously, **directly or through the use of any object.**

Section 4 - The Robot

R67, part D. **at least one** Pressure vent plug

Section 5 - The Tournament

T11 The ROBOT Bill of Materials (BOM), listing all items on the ROBOT **except those listed in R9-A and -B**, and their relevant costs per *Section 4.4: Budget Constraints* ~~including KOP items~~, must be presented at the time of Inspection.

Team Update 2015-01-23

General Updates

Java Library Update

A recommended, but not required, update has been posted for the Java version of WPILib (note: this is only relevant if you're programming in Java, C++ and LabVIEW teams should ignore this notice). This update allows the Java Installer program for putting Java on the roboRIO to work with Oracle's updated website (as well as some small fixes for encoders).

Information about installing updates can be found near the bottom of this document: <https://wpilib.screenstepslive.com/s/4485/m/13503/l/145002-installing-eclipse-c-java>

A complete changelog can be found here: <https://wpilib.screenstepslive.com/s/4485/m/13810/l/298314-2015-updates-changelog>

Power Distribution Panel Firmware

A recommended, but not required, update (v1.40) has been posted for the Power Distribution Panel firmware. This firmware corrects an issue where the robot motors could be very briefly disabled ("hiccup") if the robot was quickly switched from Enabled to Disabled and back to Enabled. It also corrects the calculations of Power and Energy in the PDP. The update and additional information is posted on Cross the Road Electronics' site here: http://www.crosstheroadelectronics.com/control_system.html.

Talon SRX Firmware

An optional Talon SRX Firmware update (v1.4) has been released. This update includes various improvements for analog encoder support. Teams using analog encoders are encouraged to apply this optional update. See the *Talon SRX Software Reference Manual* for additional details. The update and Software Reference Manual can be found here: http://www.crosstheroadelectronics.com/control_system.html.

Admin Manual

This note is from Frank Merrick, Director of FRC

Hi Teams. We recognize some teams have concerns about the changes to the Chairman's Award feedback process this year. I talk in detail about this [here](#). We will be fundamentally staying with our intended approach for 2015. However, in today's update, we are making a change to allow a mentor to be present during a team's Chairman's Award presentation in addition to, rather than instead of, a third student. We had some internal miscommunication on this specific detail within *FIRST* before the manual was published. This miscommunication was just brought to light. We have made a process change to help reduce the chance of this happening again. I apologize for the stress this added to the situation.

6.4.3.4 Interview Process and VIDEO Requirement

All teams submitting for the Chairman's Award will need to sign up at pit admin in order to be interviewed by the Judges at the event. If a team does not sign up for an interview slot, they will be considered ineligible to earn the award at that event. Chairman's Award interviews are limited to ten (10) minutes total; up to seven (7) minutes for a presentation by the team (which includes set-up) and up to five (5) minutes of question and answer led by the Judges. Not more than three (3) **student** team members, **of which plus** one (1) **may be an** adult mentor, are allowed to attend the interview. Only student (non-mentor) team members are allowed to present information or answer questions from the Judges. The one (1) adult mentor from the team who may attend may observe and later provide feedback to the team, but the mentor is not allowed to provide any assistance during the interview itself. If the mentor provides any assistance during the interview, the team will be downgraded. Exception: If necessary, **an the** adult mentor **/assistant** may provide translation services for students needing foreign language or sign language translation so the students and Judges may communicate. This adult mentor **/assistant may be in addition to the three (3) Team members noted above, but** may provide no assistance to the team other than translation service.

Game Manual

This note is from Frank Merrick, Director of FRC

Hi Teams. In this update, you will see we've added a blue box to G14 to explain what we mean by 'tethering'. I'll tell you how this came about. Someone asked a question (Q216) about using an external control box to drive a motor after a match. It wasn't stated in the question, but we're assuming the intent was to reset a mechanism and possibly get the robot into Transport Configuration. This approach raised safety concerns for us. At the end of a match, teams and volunteers are rushing around trying to clear the field and get it set up for the next match. They may not necessarily be paying attention to robot mechanisms activating near them. If we allowed custom control boxes, without a number of additional rules that would add significant complexity, teams could be creating controls that slam motors on at full speed. They could potentially lose control of the situation, in a crowded, busy environment. Broadening the traditional FRC definition of 'tethering' seemed the best way for us to solve this issue. It's true that teams can still, for example, leave hex shafts on mechanisms accessible to be mechanically driven externally, using hand tools or battery operated drills, so mechanisms could still be activated on the field. However, using hand tools or battery operated drills to drive mechanisms struck us as more controllable situations. Most battery operated drills are variable speed, and – unless locked on – if a team member's finger slips or the tool is dropped, the mechanism in many cases would stop moving. We're trying to balance the need to make sure teams can do what they need to do to play the game with helping to ensure everyone stays safe.

3.2.2 Pre-MATCH and Post-MATCH

G14 ROBOTS will not be re-enabled after the conclusion of the MATCH, nor will Teams be permitted to tether to the ROBOT.

VIOLATION: *RED CARD*

Tethering includes any wired connection used to electrically energize and/or control elements on the ROBOT.

Team Update 2015-01-20

General Updates

No Updates

Admin Manual

No Updates

Game Manual

Section 3 - The Game

Section 3.1.2.1

A STACKED TOTE SET exists if all three (3) Yellow TOTES from an ALLIANCE are arranged such that, at the end of AUTO:

- A. the Yellow TOTES are stacked one on top of another in a single column,
- B. only the bottom-most Yellow TOTE is in contact with **carpet in** the AUTO ZONE,
- C. the entire structure is fully contained by the AUTO ZONE, and
- D. the entire structure is free of contact from ROBOTS

Section 4 - The Robot

4.3 Safety & Damage Prevention

R8 ROBOT parts shall not be made from hazardous materials, be unsafe, cause an unsafe condition, or interfere with the operation of other ROBOTS.

Examples of items that will violate R8 include (but are not limited to):

- A. Shields, curtains, or any other devices or materials designed or used to obstruct or limit the vision of any DRIVERS and/or COACHES and/or interfere with their ability to safely control their ROBOT
- B. Speakers, sirens, air horns, or other audio devices that generate sound at a level sufficient to be a distraction
- C. Any devices or decorations specifically intended to jam or interfere with the remote sensing capabilities of another ROBOT, including vision systems, acoustic range finders, sonars, infrared proximity detectors, etc. (e.g. including imagery on your ROBOT that, to a reasonably astute observer, mimics the Vision Guides)
- D. Exposed lasers other than Class I.
- E. Flammable gasses
- F. Any device intended to produce flames or pyrotechnics
- G. Hydraulic fluids or hydraulic items
- H. Switches or contacts containing liquid mercury
- I. Circuitry used to create voltages in excess of 24V
- J. **Any ballast not secured sufficiently, including loose ballast e.g. sand, ball bearings, etc., such that it may become loose during a MATCH.**

Teams should provide MSD Sheets for any materials they use that might be considered questionable during ROBOT Inspection.

4.8 Power Distribution

R24 Non-electrical sources of energy used by the ROBOT, (i.e., stored at the start of a MATCH), shall come only from the following sources:

- A. compressed air stored in the pneumatic system that has been charged in compliance with R68 and R69,
- B. a change in the altitude of the ROBOT center of gravity, **and**
- C. storage achieved by deformation of ROBOT parts,
- D. **closed-loop COTS pneumatic (gas) shocks, and**
- E. **air-filled (pneumatic) wheels.**

R42 Each power regulating device may control electrical loads per Table 4-4. Unless otherwise noted, each power regulating device may control one and only one electrical load.

Table 4-4: Legal Power Regulating Device Use

Electrical Load	Motor Controller	Relay Module	Pneumatics Controller
CIM			
AndyMark 9015	Yes	No	No
Banebots			
VEX BAG/MiniCIM			
Automotive Window/Door/Windshield			
Wiper/SeatBelt Motors			
AndyMark PG	Yes	Yes	No
Bosch Motor	Up to 2 per controller		
Snow-Blower Motor			
Denso Throttle Control			
Compressor	No	Yes	Yes
Pneumatic Solenoid Valves	No	Yes*	Yes (1 per channel)
Electric Solenoids	No	Yes*	Yes (1 per channel)
CUSTOM CIRCUITS	Yes	Yes*	Yes

4.10 Pneumatic System

R66 The only pneumatic system items permitted on 2015 FRC ROBOTS include the items listed below.

- A. Items available in the KOP (except as noted in I),
- B. Pneumatic pressure vent plug valves functionally equivalent to those provided in the KOP,
- C. Solenoid valves with a maximum 1/8 in. NPT port diameter,
- D. Solenoid valves that are rated for a maximum working pressure that is less than 125 psi rating mandated above are permitted, however if employed, an additional pressure relief valve must be added to the low pressure side of the main regulator. The additional relief valve must be set to a lower pressure than the maximum pressure rating for the solenoid valve,
- E. Additional pneumatic tubing, with a maximum 0.160 in. inside diameter, functionally equivalent to that provided in the KOP,
- F. Pressure transducers, pressure gauges, passive flow control valves (specifically "needle valves"), manifolds, and connecting fittings,
- G. Pressure regulators with a maximum outlet pressure of no more than 60 psi,
- H. Pneumatic cylinders,
- I. Pneumatic storage tanks (with the exception of White Clippard tanks P/N: AVT-PP-41), and
- J. Compressors compliant with R68.

Team Update 2015-01-16

General Updates

C++/Java Library Update

A recommended, but not required, update has been posted for the C++ and Java versions of WPILib (note: this is only relevant if you're programming in Java or C++, LabVIEW teams should ignore this notice). This update contains example programs for locating totes using vision, optimizations and fixes to the camera and vision libraries, and a number of other minor fixes.

Information about installing updates can be found near the bottom of this document:

<https://wpilib.screenstepslive.com/s/4485/m/13503/l/145002-installing-eclipse-c-java>

A complete changelog can be found here:

<https://wpilib.screenstepslive.com/s/4485/m/13810/l/298314-2015-updates-changelog>

Virtual Kit of Parts

Information about the NI development software applications available in the Virtual Kit, Ultiboard and Multisim, has been posted to Virtual Kit section of the [Kit of Parts website](#).

Admin Manual

No Updates

Game Manual

Section 2 – The Arena

The process for preparing game elements for a MATCH, *2015 Game Piece Preparations*, has been documented and posted [here](#).

Section 4 – The Robot

The following rows in Table 4-1 were edited:

Table 4-1: Legal Motors

Motor Name	Part Numbers Available	Max Qty Allowed
AndyMark PG	am-2161 (alt. PN am-2765) am-2194 (alt. PN am-2766)	unlimited
Automotive Window Motors Automotive Door Motors Automotive Windshield Wiper Motors Automotive Seat Motors	Various	unlimited

Team Update 2015-01-13

General Updates

This note is from Frank Merrick, Director of FRC

Hi Teams. In this update, you will see an important change to G27. We originally wrote the rule in an attempt to help ensure the safety of volunteers and others who were field side. However, as several of you made us realize with your questions, the rule was so broad it effectively created a violation for robots grabbing/touching/holding litter and totes that were being introduced by teams through the human player station. This was not our intent. We think team members introducing these game objects are already well protected by other rules and the physical barrier of the human player station itself. So, we're fixing this. We apologize for our mistake, and thank the folks who helped us realize it!

Frank

Admin Manual

5.3 Bag And Tag And Robot Transport

All teams must "Bag and Tag" their robots. Teams are also required to transport their bagged and tagged robot to their competition event(s). For convenience, teams may disassemble their robots and use two bags to "Bag and Tag" them. However, no more than two bags may be used and each bag must have its own numbered tag and entry on the [Robot Lock Up Form](#) described below.

5.8 Crate Shipping Instructions For Robot Transport Exemption Approved Teams And Those Attending FIRST Championship

Important Information:

- All Robot Transport Exemption granted teams and ALL teams attending the FIRST Championship must build a crate to ship their robot in.
 - Robot shipments in crates must abide by standard freight shipping processes. This applies to any team moving their robot within a crate.
 - FedEx will not pick up a robot that is not in a crate.
- See the "[Shipping Crate Construction](#) (*hyperlink added*)" document posted with the FRC Administrative Manual on the [Robot Shipping website](#) for more details. As a reminder these minimum guidelines must be followed:
 - Keep your FILLED crate weight below 400 pounds. Teams are expected to use their crate to ship their robot and to minimize any additional components or tools included, in order to keep the crate weight below 400 pounds.
 - Do not include any tools, luggage or additional materials that will cause your crate to exceed the maximum weight. Any teams exceeding 400 pounds will be charged overage fees accordingly.

6.3 AWARDS SUBMISSION PROCESS

The Main or Alternate contact for your team must assign at least one (1) and up to four (4) student award submitters in FRC TIMS. Those students will be notified of their status via email and may then log into Youth Team Member Registration System (formerly known as STIMS) and be able to view the awards submission section on their main page.

Chairman's Award, Entrepreneurship Award, **Media and Technology Innovation Award**, Safety Animation Award, and Woodie Flowers Award must be submitted through the Youth Team Member Registration System (formerly known as STIMS) <https://my.usFIRST.org/stims/site.lasso>. The FIRST Dean's List Award must be submitted by the team's main or alternate contact through TIMS, <https://my.usFIRST.org/frc/tims/site.lasso>.

6.3.1 Submission Dates

Submission open and close dates will be as follows (All award submissions will open and close at Noon Eastern Time unless otherwise stated):

Award	Open Date	Close Date
Safety Animation	Thursday, October 9, 2014	Thursday, December 11, 2014
Chairman's Award	Thursday, November 13, 2014	Thursday, February 19, 2015
Entrepreneurship Award	Thursday, November 13, 2014	Thursday, February 12, 2015
Media & Technology Innovation Award	To Be Announced Saturday, February 1, 2015 at Midnight EST	Saturday, February 28, 2015 at 11:59 pm EST
Woodie Flowers Award	Thursday, November 13, 2014	Tuesday, February 12, 2015
Dean's List	Thursday, November 13, 2014	Thursday, February 19, 2015
FIRST Future Innovator Award	To Be Announced	

6.7.2 Award Criteria

Teams are asked to develop a marketing strategy complete with rationale for digital channels/devices to disseminate content. Digital media still includes websites, but can and should be augmented with digital media for disseminating content including social, viral* and rich media.

*Viral media defined as low/zero budget and homemade content. Professionally produced content will be disqualified. Viral content is something that premieres and is spread person-to-person on the Internet.

6.7.3 Judging Criteria

Submissions will be reviewed and evaluated by a Comcast executive judging panel. This award is independent of current *FIRST* Program competition season judged awards.

The winner of the Media and Technology Innovation Award will be announced at the 2015 *FIRST* Championship.

Submissions will be judged on the following criteria, with the following weighted scale (out of a possible 100 total points):

- Strategy (15 points)
 - Targeting the right audience with a message that aligns with the *FIRST* mission.
 - Developing a clear strategy and choice of distribution channels and content creation.
 - Teams must use at least two channels. More channels are not necessarily better, but will be considered if appropriate.
 - Setting and meeting clear objectives.
 - Communicating a clear strategy on your website and on your written submission.
- Overall Experience (15 points)
 - Do content and channels fit together in look and feel?
 - Are you promoting a positive impression of *FIRST* and its mission?
 - Do your website and other digital media have a cohesive look? What is the overall digital user experience?
 - How does your overall story come together online? Do you share a unified message and mission?
 - Is the website intuitive and easy to navigate?
- Does the digital experience tell a story about the team and its *FIRST* experience?
 - Visual Design (10 points)
 - How appealing is your design?
 - Is content easy to read?
 - Do you use videos and or graphics in a visually appealing way?
 - Visual fit with *FIRST* – Even though the team has its own identity, is it clear that this team is a part of *FIRST*?
- Navigation (10 points)
 - Content organization and prioritization is being judged in this category
 - Is your website simple to follow?
 - Is it intuitive?
 - Does it have a structure that makes sense?
- Content (20 points)
 - We are looking for whether the information shared is compelling and optimized for consumption.
 - This should be a robust digital experience, so think about including text, sound, video, photos and social media.
 - Good content should be engaging, relevant and appropriate.
 - Was original content created?
 - Is content kept up-to-date and refreshed regularly?
 - Is content action-oriented?
 - Does your site use live links?
 - Do your site or digital media appropriately cite sources and not infringe on others' trademarks or copyrights?
 - Does your website/channel adhere to the [FIRST Branding and Design Standards](#)?
- Functionality (15 points)
 - Does content load quickly?
 - Does your site work with multiple/major browsers and mobile devices?
 - Is the site easy to use?
 - We will also consider the efficiency and utility of the site.
- Engagement (15 points)
 - Did your digital media engage an audience to find out more about your team or about *FIRST* and *FIRST* Progression of Programs?

- How did you track the results?
- Did you leverage your site or digital media for fundraising and/or other purposes outside of the normal scope?

6.7.4 Submission Process

Teams should upload their PDF-formatted submission through the Comcast Media and Technology Award website at <http://FIRSTrobotics.comcast.net>. Submission will be accepted during the dates listed in *Section 6.3.1*.

Submissions are not to exceed two pages including graphics. The maximum allowable size for the PDF document submission is 50MB. Submissions should include and address all judging criteria addressed above. We encourage teams to clearly communicate both strategy and any results that have been tracked (include web site traffic, # of friends and/or followers, likes, etc.). This document must include applicable links, urls and hashtags that provide access to the digital properties you created. This includes, but is not limited to, web and video sites, Facebook pages, Twitter feeds, Pinterest boards, mobile apps, etc.

By making a submission, the Submitter irrevocably grants to *FIRST* and *FIRST* designees the right to use any or all of the submission in any and all media for the purpose of describing the submission, describing the Award, and/or otherwise promoting *FIRST* and *FIRST* programs.

6.7.5 Submission Dates

Submissions will be accepted during the dates listed in *Section 6.3.1*.

You may submit your PDF more than once if you need to make revisions. The last version submitted prior to the deadline will be considered your final submission.

Game Manual

Section 2 – The Arena

The following drawings have been revised.

- FE-00038 – Added Notes and View for Placement of Chute Plastic
- GE-15015 – Added Material Finish Notes
- GE-15016 – Added Material Finish Notes
- GE-15017 – Added Material Finish Notes
- GE-15018 – Added Material Finish Notes
- GE-15025 – Added Tape Notes
- GE-15026 – Added Material Finish Notes
- GE-15027 – Added Material Finish Notes
- GE-15028 – Added Material Finish Notes
- GE-15029 – Added Material Finish Notes
- GE-15030 – Added Material Finish Notes
- GE-15031 – Added Material Finish Notes

Section 2.2.2 – HUMAN PLAYER STATION

The HUMAN PLAYER STATIONS connect the end PLAYER STATIONS to the GUARDRAILS. Each HUMAN PLAYER STATION is constructed of two (2) 6 ft. 6 in. tall by 3 ft. 7 in. wide clear polycarbonate panels, attached to an aluminum frame with cable ties, and the CHUTE DOOR. The panels adjacent to the GUARDRAIL are solid panels adorned with the *FIRST* logo.

...

Teams feed the litter through a \varnothing 2.875 in. diameter hole in the shield.

Section 3 – The Game

G6-2 The CHUTE DOOR may only be operated by a DRIVER or HUMAN PLAYER.

VIOLATION: RED CARD.

G27 ROBOTS and anything they control (except for LITTER in the LITTER CHUTE and TOTES in the TOTE CHUTE), e.g. a TOTE, may not contact anything outside the FIELD.

VIOLATION: Offending ROBOT will be DISABLED.

Section 4 - The Robot

LRI Training

On Saturday, January 10, we hosted more than 50 Lead Robot Inspectors (LRIs) at FIRST HQ as part of LRI Training. Their feedback resulted in some of the changes in this Team Update and are an attempt to clarify the true intent behind each rule. We thank them for their time spent as volunteers and for their feedback as we strive for continuous improvement of the Game Manual.

R25 has been amended to clarify that only a single pair of Andersen Power Products connectors (as depicted in Figure 4-2) are allowed.

R37 has been amended to help clarify that there is no requirement that a PCM be wired to the VRM/PCM connectors indicated in Figure 4-5; teams may choose to wire the PCM through a 20A breaker if desired.

While there is no corresponding change to the Game Manual, the LRI's also wanted to make sure that all teams are aware that ROBOTS must fit in, and be transported in, a single TRANSPORT CONFIGURATION volume at the event. This doesn't mean the exact configuration of the robot within that volume must be the same every time, but that every time a team is moving their robot as required under T6, they must do so using only one contiguous volume of the size and orientation specified.

R25 The one (1) ROBOT battery, **single pair of** Anderson Power Products (or APP) 2-pole SB type connectors, the one (1) main 120-amp (120A) circuit breaker (Cooper Bussman P/N: CB185-120), and the one (1) Cross The Road Electronics Power Distribution Panel (PDP, P/N: am-2856, 217-4244) shall be connected with 6 AWG wire or larger as shown in Figure 4-2.

R37 Each branch circuit must be protected by one and only one circuit breaker on the PDP per Table 4-2. No other electrical load can be connected to the breaker supplying this circuit.

Table 4-2: Branch Circuit Protection

Branch Circuit	Circuit Breaker Value	Quantity Allowed Per Breaker
Motor Controller	Up to 40A	1
CUSTOM CIRCUIT	Up to 40A	1
Relay Module	Up to 20A	1
Additional PCM – with compressor	20A	1
Additional VRM (non-radio)/Additional PCM (non-compressor)	20A	3 total

R41 The only power regulating devices for actuators permitted on the ROBOT include:

A. Motor Controllers

- A. Jaguar Motor Controller (P/N: MDL-BDC, MDL-BDC24, and 217-3367)
- B. Talon Motor Controller (P/N: CTRE_Talon, CTRE_Talon_SR, and am-2195)
- C. Talon SRX Motor Controller (P/N: 217-8080), **equipped with firmware version 0.28 or newer if using via PWM. See R59 if using via CAN.**
- D. Victor 884 Motor Controller (P/N: VICTOR-884-12/12)
- E. Victor 888 Motor Controller (P/N: 217-2769)
- F. Victor SP Motor Controller (P/N: 217-9090)

B. Relay Modules

- A. Spike H-Bridge Relay (P/N: 217-0220 and SPIKE-RELAY-H)

C. Pneumatics controllers

- A. Pneumatics Control Module (P/N: am-2858, 217-4243)

Please see <http://www.crosstheroadelectronics.com/Talon%20SRX%20User's%20Guide.pdf> for more information about the Talon SRX firmware update, determining the firmware on your Talon SRX, and instructions on how install.

R61 The PDP CAN interface must be connected to the CAN-bus on the roboRIO (either directly or daisy-chained via another CAN-bus device). **The firmware on the PDP must be updated to at least version 1.37.**

Section 5 – The Tournament

Section 5.5.2 - Eligibility and Inspection

If a ROBOT will not report for a **QUALIFICATION or PLAYOFF MATCH**, the Lead Queuer should be informed and at least one (1) member of the DRIVE TEAM should report to the FIELD for the MATCH to avoid receiving a RED CARD, with the exception of a Team that has not passed Inspection, per Rule T8.”

Team Update 2015-01-09

Game Manual

General Updates

This note is from Frank Merrick, Director of FRC

Hello Teams! You will see that several of these updates relate to the Noodle Agreement I talked about in the update from January 6th. As I said in that update, game design, like robot design, involves many trade-offs. These changes are not perfect, but I believe they will help ease the controversy over the Noodle Agreement, and encourage more enjoyable game play.

Frank

Section 1 - RECYCLE RUSH Summary

Figure 1-1 was updated to reflect the change to the LITTER description in *Section 2.3.3: LITTER*.

Alliances that ~~unscored~~ leave **unscored** Litter **marked in the other Alliance's color** on their side of the Field at the end of the match add points to the score of the other Alliance, as it is considered unprocessed and not properly disposed of.

Section 2 - The ARENA

Figures 2-1, 2-2, 2-21, and 2-22 were updated to reflect the change to the LITTER description in *Section 2.3.3: LITTER*.

2.1.4 - STEP

The STEP is a wooden platform that bisects the FIELD. It is painted white and is 6.25 in. tall and 2 ft. 1 in. wide. Mounted to the sides of the STEP facing each ALLIANCE WALL is a 0.25 in. thick by ~~6.375~~ **6.625** in. tall HDPE sheet (colored to match the ALLIANCE). This HDPE forms a .375 in. lip along both sides of the STEP. This lip is to help prevent the TOTES from being pushed off the STEP too easily.

2.1.5 - Zone Markings

Each ALLIANCE'S side of the FIELD contains the following zones:

- **AUTO ZONE:** Marked by, but does not include, 2 in. lines of **Red Burgundy** or **Blue Navy** gaffers tape corresponding to the ALLIANCE COLOR, each AUTO ZONE is a 6 ft. ~~62~~ in. wide **area infinitely tall volume** that spans the width of the field and is located between each ALLIANCE'S Platform Ramps (each edge is 3 ft. 1 in. from the Landmark).
- **LANDFILL ZONE:** Bounded by, but does not include, the STEP, GUARDRAILS, and a 2 in. line of White gaffers tape running between the GUARDRAILS on either side of the FIELD. Each LANDFILL ZONE **is an infinitely tall volume that** extends 4 ft. 3 in. from the edge of the STEP towards their ALLIANCE WALL.

2.2.1 - PLAYER STATIONS

The language from the Game Manual is as follows:

Each ALLIANCE WALL includes three (3) PLAYER STATIONS. Each PLAYER STATION is made from a 3 ft. tall diamond plate panel base topped with a 3 ft. 6 in. tall transparent plastic panel. An aluminum shelf is attached to each PLAYER STATION to support the

DRIVE TEAM'S OPERATOR CONSOLE. The shelf is 5 ft. 9 in. wide and 1 ft. deep. There is a 4 ft. 6 in. long by 2 in. wide strip of hook-and-loop tape ("loop" side) along the center of the support shelf that may be used to secure the OPERATOR CONSOLE to the shelf.

[This section of the Field Tour Video](#) says that the "hook" side of hook-and-loop tape is installed on the player station shelf. The video is incorrect, and it is the loop side as stated above. Our apologies for any confusion.

2.2.2 - HUMAN PLAYER STATION

Teams feed the ~~litter~~ LITTER through a 3 in. diameter hole in the shield.

2.3.3 - LITTER

Each ALLIANCE starts the MATCH with ten (10) LITTER, all of which are located in a white Bin. The LITTER is marked 1 in. from each end and in the middle with 2 in. "Red" and "Electric Blue" gaffers tape to match the ALLIANCE STATION in which it starts.

...

LITTER will be removed from play if, in the judgment of the Head REFEREE, the LITTER is unsuitable for gameplay. Examples include but are not limited to: the length shortened, or a chunk more than approximately 1.5 in. deep and 3 in. long is removed, or tape has been removed. Small cuts or small pieces removed will not cause LITTER to be replaced.

(Caption) Figure 2-22: LITTER and Litter Bin Starting Locations

Section 3: The Game

Figures 3-5 and 3-6 were updated to reflect the change to the LITTER description in Section 2.3.3: LITTER.

3.1.2.1: AUTO

During AUTO, each ALLIANCE can earn points ~~are awarded~~ for a ROBOT SETS, TOTE SETS or STACKED TOTE SET, and CONTAINER SETS, and ~~STACKED TOTE SETS~~.

3.1.2.2: Coopertition

"Support" in reference to TOTES, for COOPERTITION, AUTO, and TELEOP, is transitive through other TOTES. For example, a Yellow TOTE is "fully supported by the STEP" if it is resting on top of another Yellow TOTE that is in turn resting directly on the STEP (and thus both Yellow TOTES are "fully supported" by the STEP).

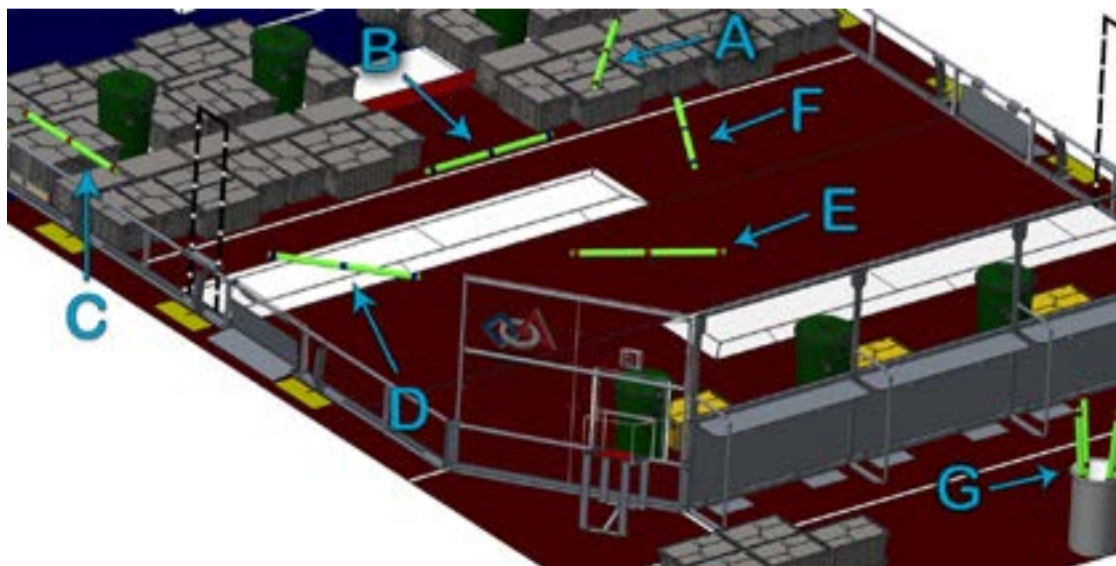
3.1.2.3: TELEOP

When REFEREES are assessing final scores at the end of the MATCH, if it is unclear whether a TOTE, RECYCLING CONTAINER, or LITTER (with the exception of LITTER in the LANDFILL ZONE) is being even partially supported by a ROBOT, the assumption will be that the ROBOT is supporting it (and thus it does not score). As such, it is highly recommend that DRIVE TEAMS make it very clear that their ROBOTS are not supporting any scored TOTES, RECYCLING CONTAINERS, or LITTER at the end of the MATCH.

...

Additionally, LITTER is considered scored in a LANDFILL ZONE when it is fully contained within a LANDFILL ZONE, with each ALLIANCE credited for the LITTER scored in the LANDFILL ZONE on their side of the FIELD. For example, in Figure 3-6 LITTER A and B are fully contained within the Red LANDFILL ZONE, regardless of whether they're marked with Red or Blue and whether or not they are resting on top of TOTES. However, LITTER C is not entirely contained by the Red or Blue LANDFILL ZONE as it is hanging over onto the STEP and does not score. Litter D, E, and F, and G are not fully contained by the Red or Blue LANDFILL ZONE and do not score as LITTER in the LANDFILL.

Figure 3-6: LITTER within the ARENA at the end of a MATCH



Finally, ALLIANCES earn an UNPROCESSED LITTER Bonus for each LITTER that is fully contained by the opposite side of the FIELD, **marked in their ALLIANCE'S color**, and not scored in the LANDFILL ZONE or scored in a RECYCLING CONTAINER.

For example, in Figure 3-6 (above), LITTER C is not fully contained by the Red or Blue side of the FIELD and thus does not score as either LITTER in the LANDFILL or an UNPROCESSED LITTER Bonus for either ALLIANCE. LITTER D scores **as** an UNPROCESSED LITTER Bonus for the Blue ALLIANCE because it is **a Blue marked Litter** fully contained by the Red ALLIANCE side of the FIELD and not scored in the Red LANDFILL ZONE or a scored RECYCLING CONTAINER. **LITTER E does not score an UNPROCESSED LITTER Bonus for the Blue ALLIANCE as it is not Blue marked LITTER.** **Additionally,** LITTER **EF** **also** scores **as** an UNPROCESSED LITTER Bonus for the Blue ALLIANCE for the same reasons as LITTER D, even though it is partially within the Red LANDFILL ZONE. Finally, LITTER **FG** remains in the Bin and does not score as an UNPROCESSED LITTER Bonus as it is not on the FIELD.

3.2.3 General Rules

G16 The following actions are prohibited with regards to interaction with FIELD elements (items A-D exclude TOTES, RECYCLING CONTAINERS, and LITTER):

- A. grabbing
- B. grasping
- C. grappling
- D. attaching to
- E. becoming entangled
- F. hanging
- G. damaging (exception: unintentional damage to LITTER)
- H. tying
- I. removing or repositioning LITTER tape**

VIOLATION: FOUL. If the Head REFEREE determines that further damage is likely to occur, offending ROBOT will be DISABLED. Corrective action (such as eliminating sharp edges, removing the damaging MECHANISM, and/or re-Inspection) may be required before the ROBOT will be allowed to compete in subsequent MATCHES.

Section 5: The Tournament

Table 5-2: Quarterfinal and Semifinal MATCH Ranking Criteria

Table 5-2: Quarterfinal and Semifinal MATCH Ranking Criteria

1st order sort	Playoff Average
2nd order sort	Cumulative sum of AUTO points
3rd order sort	Cumulative sum of scored RECYCLING CONTAINER points
4th order sort	Cumulative sum of scored TOTE points
5th order sort	Cumulative sum of scored LITTER points (LITTER in a scored RECYCLING CONTAINER + LITTER scored in the ALLIANCE'S LANDFILL ZONE + UNPROCESSED LITTER Bonus)

Section 6: Glossary

AUTO ZONE – the **infinitely tall volume area** bound by the GUARDRAILS and carpet between the SCORING PLATFORMS. The AUTO ZONE extends the full width of the FIELD, even though the SCORING PLATFORMS do not.

LANDFILL ZONE – the **infinitely tall volume area** bound by the plastic lip of the STEP on the ALLIANCE'S side of the FIELD, the GUARDRAIL on each side, and the landfill line (**including excluding** the tape).

SCORING PLATFORM – the elevated wood and **polycarbonate HDPE** structures, two (2) per ALLIANCE, on which ROBOTS stack TOTES.

UNPROCESSED LITTER – LITTER which is fully contained by an ALLIANCE'S side of the FIELD, **marked in the opposing ALLIANCE'S color**, but not scored in their LANDFILL ZONE or scored in a RECYCLING CONTAINER. Each ALLIANCE receives an UNPROCESSED LITTER Bonus for the UNPROCESSED LITTER on the opposite ALLIANCE'S side of the FIELD.

Team Update 2015-01-06

Admin Manual

General Updates

You will note this change identifies the eight fields we will have at the FIRST Championship as 'Subdivisions'. At this time, our intent is to keep the current four Division names – Archimedes, Curie, Galileo, and Newton - as Subdivision names, and add four new names to identify the rest of the Subdivisions. Divisions, which will consist of two Subdivisions combined, will be identified by the two Subdivision names joined by a hyphen. As an example, if the Curie and Newton fields, as Subdivisions, are joined to make a Division, the Division names would be Curie-Newton.

Section 6 - Awards

Section 6.1 - FIRST Robotics Competition Awards

The FIRST Robotics Competition (FRC) is about much more than the mechanics of building a robot or winning a competitive event. It is about the partnership among people who are part of the FIRST community and the impact on those who participate in FIRST programs with a united goal of achieving The FIRST mission. The FIRST mission is to change the way young people regard science and technology and to inspire an appreciation for the real-life rewards and career opportunities in these fields.

This chapter contains descriptions of the FIRST Robotics Competition Awards. Unless otherwise noted, all awards are earned at Regional events, District events, District Championships and the FIRST Championship.

For the purpose of awards at the FIRST Championship, all awards are given out at the Division level except the Finalist and Winner, which are given at the Subdivision level. Two Subdivisions are combined to create one Division.

Section 6.2 - Complete Awards List

Award	Description	Selected By	Regional	District	District CMP	FIRST CMP Division	FIRST CMP
Finalist	Celebrates the alliance that makes it to the final match of the competition	Robot Performance	✓	✓	✓	✓*	✓
Winner	Celebrates the alliance that wins the final match of the competition	Robot Performance	✓	✓	✓	✓*	✓

*These awards are given at the Subdivision level instead of the Division Level. All other awards marked "FIRST CMP Division" are given at the Division level.

Game Manual

General Updates

This note is from Frank Merrick, Director of FRC

Hello teams! For this part of today's update I wanted to include a note directly from me, rather than generically from the Game Design Committee. I lead the GDC, so all information released by the GDC ultimately has my OK, but I thought it might help to let you know I'm writing this particular note myself.

There has been significant discussion and some anxiety on the Chief Delphi forums over what some are calling 'The Noodle Agreement', in which the two alliances in a Recycle Rush match could agree to collude, legally under the current rules, to simply drop their own litter on their side of the field, then not touch it, effectively giving both alliances easy bonuses to their score. The GDC talked about this specific possibility before the game was released. We actually talked about two different ways alliances could collude regarding noodles.

We had briefly considered, then quickly rejected, having the opposing alliance receive a bonus for ALL litter not in scoring position in the possession of an alliance. In other words, an alliance would have received a bonus for litter still sitting in the other alliance's bin. This was rejected right away, as we realized passive collusion would be easy – both alliances simply needed to agree to not touch the litter in their own bins, and it would be immediately obvious if one alliance was not holding up their side of the bargain. This led to the current rules, in which any litter remaining in the bin has no effect on the score.

The second form of collusion we had discussed was what is being talked about on the forums – both alliances dumping all their own litter on their side of the field and leaving it. This form of collusion is more difficult to pull off, as both alliances need to take some physical action to bring it about, and there would be some natural concern over whether or not the other alliance was going to follow through with their commitment. A game of chicken could ensue. Also, it seems that getting all six teams on both alliances to agree to take a physical action like this, that many would perceive as being contrary to the spirit of the game – if not the rules – would be trickier than taking no physical action, as in the option above, and simply letting the points accumulate passively.

This year we worked hard to keep the rules simple, and to keep both penalties and rules to a minimum number. I'll give you a specific example of an approach we occasionally used. You will note there are no rules in the manual giving penalties for teams building stacks of totes more than six high. Very high stacks are still somewhat of a concern, however, as they are harder for field reset to deal with and potentially could lead to game pieces exiting the field if the stacks are tipped over. Rather than telling teams they can't build over six totes high, and assigning a penalty to that, we simply said, per Section 3.1.2.3, that if any portion of the tote extends over the backstops on the scoring platforms, they won't be counted as scored. In this way, teams have no incentive to build high, as it's a waste of resources they otherwise could have turned into points. Will we still occasionally see high stacks? I think so. Some teams will have not picked up on this element in the manual, as it's not a 'G' numbered rule and has no penalty assigned to it. For those teams, we think they'll quickly get up to speed at events. The cost, though, of more aggressively working to prevent these outlying actions within the rules is a more complex manual, more nuisance penalties, and something else the refs have to watch for. We essentially were willing to keep the manual simpler in exchange for likely more often seeing stacks higher than we would like to.

We took a similar approach with the second form of collusion with the litter. We don't know how often this would happen at actual events, and actively preventing it likely means more complicated rules. However, looking at the forums, the possibility of this noodle agreement happening at events looks as if it's creating some concern in the community, and distracting from other strategic elements of the game. This still may not be likely to happen often at events under the current rules, but if it does, I think they will be less enjoyable.

So, in this case, we will be making some changes to the rules to discourage this activity. They won't be perfect, but they should be an improvement. Game Design, like robot design, means working through many trade-offs. The changes are not ready for today's update, but will follow shortly.

Frank

National Instruments has alerted us that they have received reports of the power terminals on some roboRIO's not being completely screwed in. Teams are encouraged to check the power connector's connection to the roboRIO.

The [Kickoff Kit Checklist](#) for the Separate Items has been updated with a new "Where to get more" for the Recycling Containers and Pool Noodles.

Section 2 - The ARENA

Section 2.1.3 - SCORING PLATFORMS

Each SCORING PLATFORM is adjacent to a BACKSTOP and positioned such that the bottom edge of the Platform Ramp is 3 ft. 3 in. from the center of the Landmark. Please see [Figure 2-5](#) for more details.

Section 2.1.5 - Zone Markings

■ ~~Taped Boxes~~ STAGING ZONES: Each ALLIANCE has three (3) STAGING ZONES...

Section 2.1.6 - The Landmark

Each AUTO ZONE contains one (1) Landmark, which is centered across the width of the zone and located ~~±5~~ 13 ft. 7 in. from the ALLIANCE WALL.

Section 2.3.2 - RECYCLING CONTAINERS

The lids are secured to the RECYCLING CONTAINERS ~~garbage cans~~ using cable ties, and each lid has a 4.75 in. diameter hole in the center.

Section 2.3.3 - LITTER

Each LITTER is a solid core, green Pool Noodle, manufactured by Tundra (Part Number: SR20C). They are between 4 ft. 7 in. long and 4 ft. ~~±0~~ 11 in. in length and have an outside diameter of approximately 2.6 in. Given that the manufacturing process for Pool Noodles is not tightly controlled and the Pool Noodles used and distributed for the 2015 season were made in different production runs, teams should expect some variation in rigidity, length, diameter, and surface characteristics.

Section 3 - The Game

When REFEREES are assessing final scores at the end of the MATCH, if it is unclear whether a TOTE, RECYCLING CONTAINER, or LITTER (with the exception of LITTER in the LANDFILL ZONE) is being even partially supported by a ROBOT, the assumption will be that the ROBOT is supporting it (and thus it does not score). As such, it is highly recommend that DRIVE TEAMS make it very clear that their ROBOTS are not supporting any scored TOTES, RECYCLING CONTAINERS, or LITTER at the end of the MATCH.

Section 3.2.1 - Safety

G6-1 DRIVE TEAMS may not use any object to prop the CHUTE DOOR open.

VIOLATION: RED CARD

Section 4 - The ROBOT

Section 4.2 - General ROBOT Design

R3

Size constraints specified in part B may be met with additional aids such as bungee cords, minor disassembly, etc., provided transition from/to the TRANSPORT CONFIGURATION does not risk violation of other rules, particularly G5 and G6 G10 and G11.

Section 5 - The Tournament

Playoff Tournament MATCH nomenclature in Sections 5.4.4 and 5.6.3 was corrected to be consistent with nomenclature used in Figures 5-2 and 5-5.

Section 6 - Glossary

BACKSTOP – an aluminum structure positioned between each SCORING PLATFORM and the GUARDRAILS, primarily used to determine the LEVEL of a scored RECYCLING CONTAINER.

Team Update 2014-12-19

Admin Manual

General Updates

The Tables of Contents for Sections 2 and 4 have been updated to reflect the content of those sections.

Section 4 - At the Events

Section 4.9.1 - All Teams Should Attend

Should a team need to remain in their pit to continue to work on their robot during the Opening or Closing Ceremonies, they are allowed to. However, the team should **must** follow the rules below.

Section 5 - Robot Packaging and Transporting

Section 5.5.3 - Robot Displays

To assist teams with their promotional and community relations activities, robots may be unbagged and operated briefly after “Stop Build Day” for display purposes only.

- The intent of this option is to allow teams to briefly show their robot to their community, sponsors, or potential sponsors after “Stop Build Day”.
 - Unbagging a robot and putting it on display for many hours (i.e. more than four (4)) at a time would not be considered a “brief” display.
- The Robot Lock-Up Form must be used to track the unbagging and rebagging of the robot during this period. In the “Explanation” column of the form, enter “Robot Display”.
- No activity that could be considered “work on” or “practice with” the robot is allowed.
- Brief displays of robot functions - driving for example - are allowed, but not to the extent that they could be considered practice.
 - A good way to avoid turning a robot display period in to a practice session is to have non-drive team members operate the robot, and only for as short a time as necessary to show the robot’s capabilities.
- If you have any questions about this new Robot Display option, please email frcteams@usfirst.org.

Section 6 - Awards

Section 6.4.3.3 - Submission Process

- Enter in a link through YouTube for your official Chairman’s Video. This link does not need to be entered by the February 19th submission deadline. **FIRST** requests that the Team submit their video before the Team attends the first event at which it is eligible to compete for the Chairman’s Award. Failure to submit this link will not preclude a Team from earning the Chairman’s Award. (You will still be required to bring a copy to each event you are eligible at.)

Section 6.4.3.4 - Interview Process and VIDEO Requirements

Tips, Timelines & Tools

- [Guidelines and Tips](#) video by Paul Lazarus of White Dwarf Productions
- [Chairman's Award Video Helpful Tips and Guidelines](#)
- [Chairman's Award Video Suggested Shot List](#)
- [Chairman's Award Video Tape Log \(example\)](#)
- [Chairman's Award Video Tape Log \(blank\)](#)
- [Chairman's Award Video Consent and Release Form](#)