VIQC Pitching In - Game Overview

Grant Cox
Chairman of the VEX Game Design Committee
2021-22: VIQC
Pitching In
Scoring

Figure 12: The ball would not be considered scored because it is not fully or partially within the vertical projection of the Low Goal.

Figure 13: The ball would be considered scored in the Low Goal because it is partially within the vertical projection of the Low Goal.

Figure 14: The ball would be considered scored in the Low Goal because it is fully within the vertical projection of the Low Goal.
Scoring - **Starting Corral / Cleared**

**Starting Corral** - One of two areas of the *Floor* on either end of the *Field*, each of which are bound by the *Field* perimeter and the outside of the solid black line closest to the 6’ edge of the *Field*. The *Starting Corral* is defined as this portion of the *Floor*, not the three-dimensional volume above it.

**Cleared** - A *Starting Corral* status. A *Starting Corral* is considered *Cleared* at the end of a *Match* if no *Balls* are contacting the *Floor* inside of the *Starting Corral*. Referees can check any *Balls* in question by sliding a piece of paper between the *Ball* and the *Floor*.
Scoring - **Low Goal**

**Low Goal** - The area in the center of the *Field* surrounding the *High Goal* structure. On two sides, the *Low Goal* is bound by clear plastic sheets. On the other two sides, the *Low Goal* is bounded by the outer edge of the teal PVC pipes, and the VEX IQ parts attached to the *Floor*. The plastic sheets, PVC pipes, and VEX IQ parts are considered part of the *Low Goal*.

*Figure 11: The Low Goal.*
Scoring - **Low Goal**

**Scored** - A *Ball* status. A *Ball* is considered **Scored** at the end of a *Match* if it is not touching a *Robot*, and if it is "in" one of the Goals:

1. The *Ball* is partially or fully within the three-dimensional area defined by the infinite vertical projection of the **Low Goal**, or
**Scoring - High Goal**

**High Goal** - The cube-shaped structure built out of VEX IQ parts and clear plastic sheets that is elevated in the center of the *Field*. The support structure underneath the clear cube, with green and pink VEX IQ parts on each side, is not considered part of the *High Goal*.

*Figure 10: The High Goal.*
**Scoring - High Goal**

**Scored** - A *Ball* status. A *Ball* is considered *Scored* at the end of a *Match* if it is not touching a *Robot*, and if it is "in" one of the Goals:

1. **2. The Ball** is above the bottom surface of the *High Goal*, and partially or fully within the three-dimensional area defined by the infinite vertical projection of the *High Goal*.

**Note:** Once a *Ball* is considered *Scored* in the *High Goal*, it is no longer considered *Scored* in the *Low Goal*.

![Diagram](image.png)

*Figure 15: All Balls would be considered Scored in the High Goal, because they are full or partially within the vertical projection of the High Goal.*
Scoring - Hanging

**Hanging** - A *Robot* status at the end of a *Match*.

- **Low Hanging** – A *Robot* is *Low Hanging* if it is contacting one of the *Hanging Bars*, is not contacting the *Floor*, and is not supported by any *Balls*. Referees can check to see if a *Robot* is *Low Hanging* by sliding a piece of paper between the *Robot* and the *Floor*.

- **High Hanging** – A *Robot* is *High Hanging* if it is contacting one of the *Hanging Bars*, is not supported by any *Balls*, and is completely above a horizontal plane that is in line with the bottom edge of the lower *Hanging Bar*. Referees can check to see if a *Robot* is *High Hanging* by sliding a VEX IQ part which is 15 holes long (e.g. a 1x15 beam) underneath it.

**Note 1:** A *High Hanging Robot* does not also count as a *Low Hanging Robot*.

**Note 2:** Referees can check to see if a *Robot* is supported by any *Balls* by gently removing the *Ball* in question.
Scoring - Hanging

Figure 6: This Robot would be considered High Hanging, because it is completely above the bottom edge of the lower Hanging Bar.

Figure 7: This Robot would be considered Low Hanging, because it is not completely above the bottom edge of the lower Hanging Bar.

Figure 8: This Robot would be considered Low Hanging, because it is contacting a Hanging Bar, is not contacting the Floor, and is not supported by any Balls.
Teams may encounter other Ball / Goal states than the examples depicted in the figures above. In these edge cases, Teams will be given the “benefit of the doubt”, and the Ball should generally be considered Scored. Head Referees will not be expected or required to define a perfectly rigid imaginary vertical projection or check imperceptibly small measurements.
Field Setup - Ball Starting Locations
High Goal - **Remove for Field Reset**
Build Tips - High Goal Height
Driver Station & Starting Position Options

Note: Either Driver Station option, as shown in Figure 2, may be used.
### <G19> - Game Manual Updates

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<G5> & <R6> - Expansion Limits

<G5> Expansion is limited during a Match. During the Match, Robots may not expand beyond the following restrictions:

a. Horizontally, beyond an 11” x 19” (279.4mm x 482.6mm) area.

b. Vertically, beyond 19” (482.6mm) high. This is the same height as the top of the teal T-shaped VEX IQ parts in the center of the Field. See Figure 19.

This expansion limit does not require that the Robot stay in the same configuration as it was when it began the Match. It simply means that, at any given moment during the Match, it should be able to fit within an 11” x 19” x 19” (279.4mm x 482.6mm x 482.6mm) rectangular prism. Robots will be tested for compliance with this rule, alongside rule <R6>, during inspection.

<R6> The Match configuration will be inspected. The starting configuration of the Robot at the beginning of a Match must be the same as a Robot configuration inspected for compliance.

c. Once the Match begins, Robots must not be capable of violating the 19” height limit set forth by <G5>. Teams may be requested to demonstrate any extendable Robot mechanisms during inspection, to ensure compliance with this limit. Software limitations are acceptable, for the purposes of this rule.
The intent of testing compliance with this rule during inspection is to reduce the need for judgment calls during a Match. The 19” height restriction is not a “virtual ceiling”; for example, it is legal for a portion of the Robot to extend beyond the T-shaped VEX IQ markers while Hanging, so long as it never momentarily extends beyond 19” along the way. If a Head Referee is unsure of a Robot’s compliance with this rule, they may request a field-side height check for the configuration that was seen momentarily during the Match.

Figure 19: Robots may not vertically expand beyond 19”.

Figure 20: The same Robot from Figure 19 in a Hanging position.
<RSC1> Standard rules apply in most cases. All rules and scoring from previous sections apply to Skills Matches, unless otherwise specified.

<RSC2> Skills Field Layout. For each Skills Match, the Field will be set up exactly the same as a standard VIQC Pitching In Match.
In a *Live Remote Match*, each field is set up with twenty-two (22) *Balls*, as shown below in figure 22.

*Figure 22: A Field in its starting configuration for a Live Remote Match. Ball positions have been highlighted.*
At the beginning of a Live Remote Match, the setup criteria listed in rule <G4> still applies. However, only one Robot from the Alliance may start in each pair of the Starting Position options depicted in Figure 22: one Robot must start on the “audience side”, and one Robot must start on the “Driver Station side”. See Figure 23.

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**Legal**

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**Illegal**

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Figure 23: Examples of legal and illegal Robot Starting Positions in a Live Remote Match.
VRC Tipping Point - Game Overview

Grant Cox
Chairman of the VEX Game Design Committee
2021-22: VRC Tipping Point
Scoring / Definitions
Scoring - Rings

Each Ring which is Scored on a Neutral Mobile Goal High Branch is worth ten (10) points.

Each Ring which is Scored on any other Mobile Goal Branch is worth three (3) points.

Each Ring which is Scored in a Mobile Goal Base is worth one (1) point.

1. A Ring is considered Scored in a Mobile Goal Base if it is not contacting a Robot and is at least partially within the 3-dimensional vertical projection formed by the "bowl" of the Mobile Goal Base.

2. A Ring is considered Scored on a Mobile Goal Branch if it is not contacting a Robot, and any part of the Branch is within the volume defined by the outer edges of the Ring (i.e., part of the Ring is encircling or surrounding the Branch). A Ring supported by the Mobile Goal Branch, but not encircling it would still be considered Scored in the Mobile Goal Base, as it is within the 3D vertical projection.

a. Rings which are Scored on I in an Alliance Mobile Goal are worth points for that color Alliance, regardless of where the Alliance Mobile Goal ends the Match.
Scoring - Mobile Goals in Zones

A Mobile Goal is considered Scored in an Alliance Home Zone if, at the end of the Match, any part of the Mobile Goal Base is contacting the Alliance Home Zone.

Each Mobile Goal that is Scored in an Alliance Home Zone is worth twenty (20) points for that Alliance.

That Alliance also receives the points for any Rings which are Scored on or in that Mobile Goal.

*Note - July 27th update to definition of “Alliance Home Zone”

Alliance Mobile Goals only count for points when Scored in the same color Alliance Home Zone. Alliance Mobile Goals which end the Match anywhere other than their corresponding Alliance Home Zone or Platform are not worth any points for either Alliance.
**Scoring - Platforms**

**Balanced** - A Platform state. A Platform is considered Balanced if all of the following criteria are met at the end of a Match:

1. The Platform is roughly parallel to the field.
2. Both flat surfaces of the Platform hinges are contacting the Platform base, as shown in Figure 7.
3. Robots and/or Scoring Objects contacting the Platform in their Alliance Home Zone are not also contacting any other Field Elements, such as foam field tiles or the field perimeter.
   a. For the purposes of this definition, contact is considered “transitive” through other Robots and Scoring Objects. For example, as shown in Figure 9, contact with a Mobile Goal that is resting on top of the field perimeter would not satisfy the definition of Balanced.

*Figure 7: A Balanced Platform.*
Scoring - Platforms

Each Robot which is Elevated on an Alliance’s Balanced Platform is worth thirty (30) points for that Alliance.

Each Mobile Goal which is Elevated on an Alliance’s Balanced Platform is worth forty (40) points for that Alliance.

4. Rings which are Scored on or in an Elevated Mobile Goal count for points for the Alliance who is Elevating the Mobile Goal.
   a. An Elevated Mobile Goal does not also receive points for being Scored in an Alliance Home Zone.

The example shown here would be worth 51 points for the Red Alliance.
- Forty (40) points for the Elevated Mobile Goal
- Two (2) points for the two (2) Scored Rings in the Mobile Goal Base
- Nine (9) points for the three (3) Scored Rings on the Mobile Goal Branches
An **Autonomous Win Point** is awarded to any **Alliance** that has **Cleared** their **AWP Line**, and **Scored** at least one **Ring** on each **Alliance Mobile Goal**, at the end of the **Autonomous Period**.

The winner of the **Autonomous Bonus** receives a twenty (20) point bonus. In the case of a tie, both **Alliances** receive a ten (10) point bonus.

*Figure 5: Top view of the field with an AWP Line highlighted.*
a. Scoring Object placement at the beginning of Matches may vary.
b. The rotation of Scoring Objects may vary from nominal to ±20° such that the “raised” portions are parallel to the Platforms.

Figure
Field Setup - **Alliance Stations**

*Figure 4:* The two permissible *Alliance Station* configurations for VRC Tipping Point.
Field Setup - **Scoring Object Orientation**

<619> Be prepared for minor field variance. Field Element tolerances may vary from nominal by ±1.0", unless otherwise specified. Ring weights may vary from nominal to ±5 grams. Mobile Goal weights may vary from nominal to ±65 grams respectively. Teams are encouraged to design their Robots accordingly. Please make sure to check Appendix A for more specific nominal dimensions and tolerances.

a. Scoring Object placement at the beginning of Matches may vary from nominal to ±1.5".
b. The rotation of Scoring Objects may vary from nominal to ±20°. Rings should always be oriented such that the “raised” portions are parallel to the Platforms. See Figure 22.
Field Setup - Platform Stability

Note: In some specific cases, like older field tiles, it is permissible to replace the 0.75" (275-1015) standoff with a 0.5" (275-1014) standoff. Please note a 0.25" screw (276-4990) must be used in place of the 0.375" screw (276-4991) that attaches the standoff to the under-tile plate.
Programming Skills - **Code Strip & VEX GPS**

In *Programming Skills Matches*, the VEX GPS code strip must be installed on the field. This field modification will be recommended for all events beginning August 1, and required for all events beginning October 1.

![Image of code strip](image_url)

*Figure 2. GPS Field Code strips must be installed on the field for Programming Skills Matches.*
Notable Gameplay & Robot Rules

a. Scoring Object placement at the beginning of Matches may vary.
b. The rotation of Scoring Objects may vary from nominal to ±20° such that the "raised" portions are parallel to the Platforms.
<SG2> Robot expansion is limited once the Match begins. Per <G3>, at the beginning of a Match, each Robot must be smaller than a volume of 18” (457.2 mm) long by 18” (457.2 mm) wide by 18” (457.2 mm) tall. Once the Match begins, Robots may expand, but no horizontal dimension can exceed 36” (914.4 mm) at any point during the Match. See Figure 24.
<SG3> Platforms are “safe” during the endgame. During the last thirty (30) seconds, Robots may not contact the opposing Alliance’s Platform.

a. For the purposes of this rule, contact is considered “transitive” through other Robots and Scoring Objects. For example, contacting an opposing Robot who is contacting their own Platform would be considered a violation of this rule.

b. For the purposes of this rule, <G13> supersedes rule <G14>. Any Robot which is contacting its own Platform during the last thirty (30) seconds, provided that no other rules are being violated, will automatically receive the “benefit of the doubt”. Therefore, any contact with this Robot will be considered a violation, regardless of intent.

c. Per <SG10>, using a Scoring Object to cause interference with the opposing Alliance’s Platform during the last thirty (30) seconds would be considered a violation of this rule.

A Robot which interferes with gameplay as a result of violating this rule, such as preventing a Platform from becoming Balanced, will result in a Disqualification, whether the interference was Match Affecting or not.

*Note - “Interference” Q&A’s & July 27th update
Neutral Zone Interactions

Cycle 5: Neutral Zone Interactions

Enter the Neutral Zone during Autonomous at your own risk. Any Robot who engages with the Neutral Zone during the Autonomous Period should be aware that opponent Robots may also choose to do the same. Per Cycle 1 and Cycle 2, Teams are responsible for the actions of their Robots at all times.

a. For the purposes of this rule, "engages with" means any combination of:
   i. Contracting foam tiles within the Neutral Zone
   ii. Contracting Neutral Mobile Goals
   iii. Contracting Rings that begin the Match on the double white tape line in the center of the Neutral Zone
b. If opposing Robots contact one another while both engaging with the Neutral Zone, and a possible Cycle 2 violation results (i.e. damage, Entanglement, or tipping over), then a judgment call will be made by the Head Referee within the context of Cycle 2 just as it would if the interaction had occurred during the Driver Controlled Period.
c. If opposing Robots contact one another while both engaging with the Neutral Zone, and an Incidental violation of Cycle 4 occurs, no penalty will be assessed on either Alliance.

The overarching intent of Cycle 5 is for the vast majority of these interactions to result in no rule violations and/or penalties for either Alliance, just as no rules violations occur in 99% of Driver Controlled Interactions.

With that being said, this is a Neutral Zone, not a "free-for-all" zone. The intent of point "a" is to provide Head Referees with the leeway to still make a judgment call, if needed, when a Team has chosen to exploit this rule beyond its intent. Reckless or unsafe strategies aimed solely at the destruction, damage, tipping over, Entanglement, Trapping, or forcing of an opponent into a penalty are still prohibited in the VEX Robotics Competition.
<SG8> - Match Load Rings

Each Alliance may introduce their Match Load Rings at any point during the Match. This action must follow the following criteria:

a. Match Load Rings must be gently placed onto one of the gray foam tiles directly in front of the Alliance Station, i.e. the tiles coincident with the field perimeter wall. See Figure 24.
b. Match Load Rings may not be placed into a Scored position on a Mobile Goal.
c. Match Load Rings may not be placed such that they are contacting a Robot (from either Alliance) while still in contact with a Drive Team Member.
d. Match Load Rings must remain on a foam in the Match Period, i.e. they may not be introduced during the pause between the two periods, or prior to the Match.
e. It is expected that Drive Team Members may momentarily break the plane of the field perimeter while legally introducing Match Load Rings. This action should be kept as brief as possible, and Teams from both Alliances should be very mindful of <S1> when Match Load Rings are being entered into the field.

The intent of this rule is to keep Drive Team Member hands away from any Robots during this interaction. There is no explicit requirement for an amount of time before a Robot may contact the Ring, or minimum distance away from other Robots. Teams are advised to bear <SG8> in mind when introducing.

Note: There is no requirement for Alliances to Introduce their Match Load Rings, if they do not wish to do so.

Minor violations of this rule that do not affect the Match will result in a warning. Match Affecting offenses, or violations of <S1>, will result in a Disqualification as applicable. Teams that receive multiple warnings may also receive a Disqualification at the Head Referee’s discretion.
<G12> & <G13> - Intended to be a (Heavily) Interactive Game

**Note:** Incidental damage that occurs due to interaction with a Robot in Possession of a Neutral Mobile Goal will, in most cases, not be considered a violation of <G12>. Intentional damage, tipping, or dangerous mechanisms may still be considered a violation of <R3>, <S1>, or <G1> at the Head Referee's discretion.

VRC Tipping Point is intended to be an offensive, interactive game. Robots interacting with Neutral Mobile Goals should expect vigorous interactions from opponent Robots, especially if attempting to interact with multiple Mobile Goals at once.

The following “rules of thumb” apply when determining offensive / defensive roles in the context of rule <G13>:

- A Robot in Possession of its own Alliance Mobile Goal is generally playing an offensive role.
- A Robot in Possession of an opponent’s Alliance Mobile Goal is generally playing a defensive role.
- A Robot in Possession of a Neutral Mobile Goal is generally neither playing a defensive or offensive role. In the case of a destructive interaction between two Robots competing for the same Neutral Mobile Goal, the Note from <G12> will apply.
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