The World Championship Programming Skills Challenge

Overview
This section describes the Programming Skills Challenge of VEX Gateway to take place at the VEX Robotics World Championship. Further denoted as the WC Programming Skills Challenge.

WC Programming Skills Challenge Description
In this challenge teams will compete in 1:00 long matches in an effort to score as many points as possible. These matches will be autonomous with exceptions for minor human interaction. The playing field will be set up identically to that of a normal VEX Gateway tournament match, with the following exceptions.

- There are no Gates on the field
- There are no Alliance Starting Tiles in the Isolation Zone
- There are only nine (9) Balls and nine (9) Barrels on the field as shown below
- Two (2) Doubler Barrels begin the match on the field
Please note that all definitions from “The Game” section of the manual apply to the Programming Skills Challenge, unless otherwise specified.

*Programming Skills Match* – A Programming Skills Match consists of a 1:00 *Autonomous Period*. There is no *Driver Controlled Period*.

*Programming Skills Match Loads* – The three (3) *Barrels* and three (3) *Balls* available to be loaded at any time during the Programming Skills Match. Of these Programming Skills Match Loads, only one (1) *Barrel* and one (1) *Ball* may be used as Programming Skills Preloads.

*Programming Skills Preloads* – The one (1) *Barrel* and one (1) *Ball* each team may load into their *Robot* prior to each Programming Skills Match. Unused Programming Skills Preloads become Programming Skills Match Loads.

*Programming Skills Alliance Starting Tile* – Either of the Alliance Starting Tiles in the Interaction Zone.
WC Programming Skills Challenge Rules

Please note that all rules from “The Game” section of the manual apply to the Programming Skills Challenge, unless otherwise specified.

<PSC1> At the beginning of each Programming Skills Match, the Robot must be placed such that it is touching either one of the colored Programming Skills Alliance Starting Tiles and not touching any Scoring Objects other than those permitted by <PSC2>.

<PSC2> Prior to the start of each Programming Skills Match, each team will have one (1) Barrel and one (1) Ball available as Programming Skills Preloads. A Scoring Object is considered to be legally preloaded if it is touching the Robot or a legal Programming Skills Preload.

<PSC3> Robots can Score any Scoring Object, regardless of color.

<PSC4> Programming Skills Match Loads may only be introduced in the Programming Skills Alliance Starting Tiles.

<PSC5> Drivers and Coaches may interact with their robots as specified in <SG5> of Section 2 – The Game, with the following additional restrictions:

i. Drivers and Coaches may only interact with a Robot if it is touching an Alliance Starting Tile and no part of the Robot is touching a gray foam tile, except the interaction allowed in <PSC5ii>.

ii. If any part of a Robot is touching a grey foam tile, the only interaction that will be allowed is to bring the Robot fully into the Alliance Starting Tile, into a legal position as per <PSC5i>.

iii. After any legal interaction with the robot by Drivers and Coaches, and prior to the robot attempting to score or interact with Game Objects, the robot must be in a position such that it is touching an Alliance Starting Tile and no part of the Robot is touching a gray foam tile; a legal position as per <PSC5i>. i.e. Before the Robot leaves the Alliance Starting Tile, Drivers and Coaches may not be touching the robot. If Drivers and Coaches touch the Robot again, it must be touching the Alliance Starting Tile and it must immediately be brought fully back onto the tile.

Note: Robots that hang over the edge of the Alliance Starting Tile, but do not touch any gray foam tiles, are considered to be in legal positions for interaction as per <PSC5>.

Figure 1 – Example of a robot not touching an Alliance Starting Tile. This Robot may not be interacted with under any circumstances.
Figure 2 – Example of a robot touching an Alliance Starting Tile, with no part of the Robot touching a gray foam tile. This Robot may only be interacted with as per PSC5i.

Figure 3 – Example of a robot touching an Alliance Starting Tile, but also touching a gray foam tile. This Robot may only be interacted with as per PSC5ii. i.e. It must brought entirely into the Alliance Starting Tile before any further interaction may occur.

<PSC6> In a Programming Skills Match all Robots, Balls and Barrels are considered to be the same color for purposes of any rules or definitions.

**WC Programming Skills Challenge Scoring**

All scoring is the same as in a regular VEX Gateway match.
- A Barrel that is Scored in a Goal is worth one (1) point.
- A Ball that is Scored in a Goal is worth one (1) point.
- A Bonus Point earned is worth one (1) point.
- A Doubler Barrel that is Scored in a Circular Goal doubles the value of all points in the Goal including the Bonus Point.
**WC Programming Skills Challenge Format**

- The *Programming Skills Challenge* is an optional event. Teams who do not compete will not be penalized in either the main tournament, or the Robot Skills Challenge.
- Teams will play *Programming Skills Matches* on a “first come, first serve” basis.
- Teams will be guaranteed a maximum of three *Programming Skills Matches*, with a limit of one or two per day. Please refer to the World Championship Agenda for full details.

**WC Programming Skills Challenge Rankings**

- For each *Programming Skills Match* teams are awarded a score based on the above scoring rules.
- Teams will be ranked based on their highest *Programming Skills Match* score, with the team with the highest score being declared the Programming Skills Challenge Winner.
- In the case where two teams are tied for the highest score, the tie will be broken by looking at both teams’ second highest *Programming Skills Match* score. If the two teams are still tied, the tie will be broken by looking at both teams’ third highest *Programming Skills Match* score.
- If the tie cannot be broken (i.e. both teams have the exact same scores for each *Programming Skills Match*), the next tie-breakers will be based on the following criteria in each team’s highest scoring *Programming Skills Match*. The tie-breakers are as follows (in order):
  - Number of *Bonus Points* earned
  - Number of *Doubler Barrels Scored*
- If the tie still isn’t broken, then one more deciding match will be played.

**WC Programming Skills Challenge Heads-Up**

- The top two teams from the Programming Skills Challenge Rankings will advance to a final heads-up match.
- Each team will perform one (1) *Programming Skills Match* with both teams performing simultaneously on separate fields.
- This *Programming Skills Match*, will be a final opportunity for both teams to beat the high score posted in earlier rounds, if neither team beats or matches the previous high score, the holder of the previous high score will be declared the Programming Skills Challenge Winner.
- If one or both teams beat the previous high score, the team with the highest score in the “Heads-Up Match” will be declared the Programming Skills Challenge Winner.
- In the case of a tie for highest overall score, the tie will be broken by looking at the second highest score for both teams. (This process of looking at the next highest score will continue until the tie is broken, or all matches have been exhausted)
- If the tie cannot be broken, two winners may be declared, or a new match may be played.