

Section  
**2**



# AIM High The Challenge

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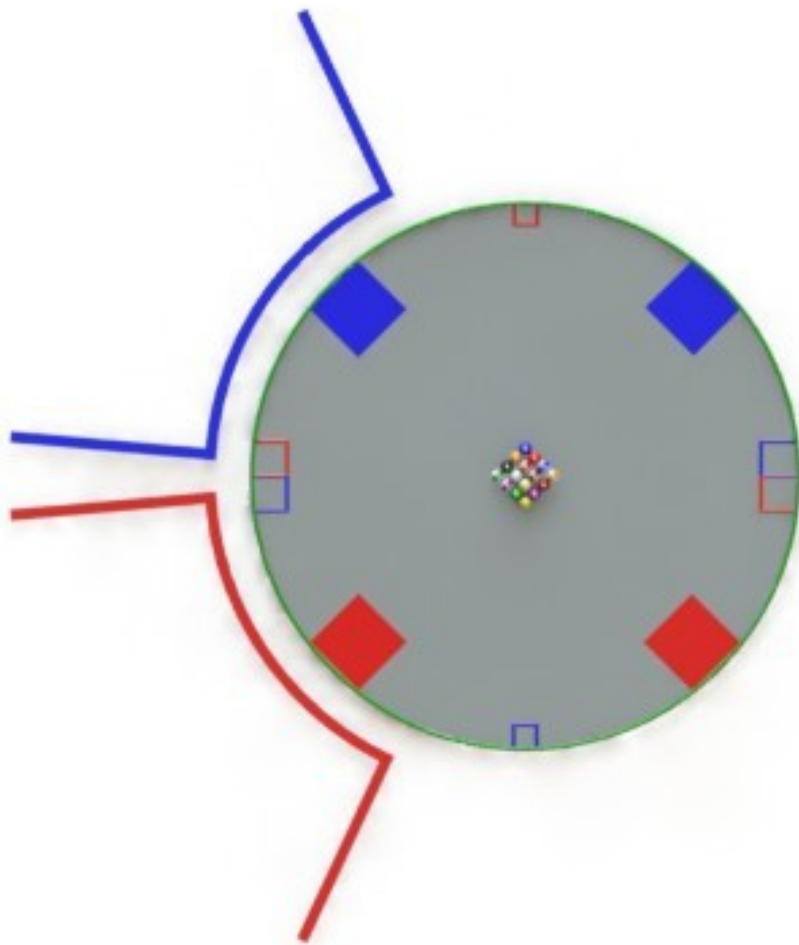
# Section 2 – The Game

## 2.1 – Overview

This section describes the CREATE / AIM game called Freeze-Pool. It also lists the game definitions and game rules.

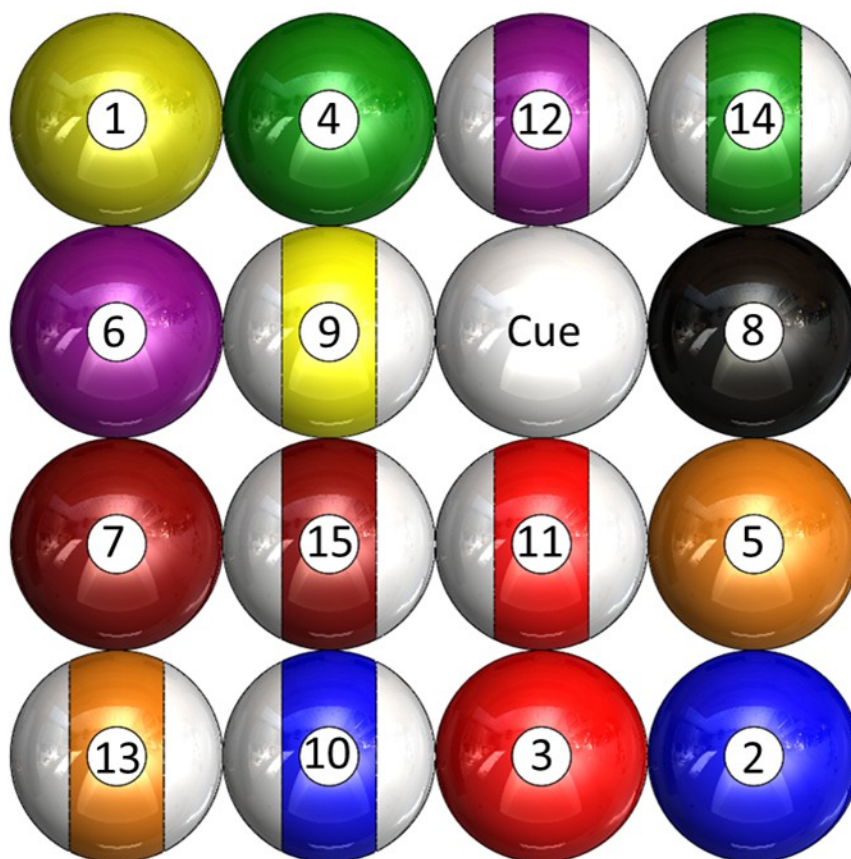
## 2.2 – Game Description and Field Drawings

*Matches* are played on a field initially set up as illustrated in the figure below. Two teams, making up an *alliance*, collaborate in each *match* vs another *alliance*. The object of the game is to attain a higher score than the opposing *alliance* by scoring as many billiard ball points or reducing the opposing alliance's score with the negator cue-ball.



There are a total of sixteen (16) scoring objects on the field. These are billiard balls marked 1-15 and a cue-ball. Each billiard ball scored in the colored goal of that alliance will score it's face value. The cue-ball is a negator and will cancel ALL scores in the goal into which it is placed.

The billiard balls will be arranged in the following pattern:



## 2.3 – Game Definitions

*Alliance* – Two randomly paired teams that work together for a *match*.

*Coach* - A student or adult designated as the team adviser during the *match*.

*Driver* - A team member responsible for operating and controlling the *Robot*.

*False Start* - A *robot* leaving the *starting platform* before the *match* begins will be considered to have *false started*. A five (5) point penalty will be assessed for each *robot* that *false starts*. If the *false start* is severe, at the discretion of the referee, the *robot* may be disqualified.

*Goal* – Any one of the six, 3 red and 3 blue, scoring zones.

*Negator* – The white cue-ball.

*Match* - A *match* consists of a one minute and thirty second *driver* controlled period. A *match* starts when the referee says “Go”.

*Starting Platform* – The 12"x12" 1/4" inch high square located on the playing field.

*Robot* – Anything (which has passed inspection) a team places on the field prior to the start of a *match*.

*Scored* –

- ✦ A billiard ball or cue-ball is *scored* if more than 50% of the perimeter of the ball is inside any of the 6 *goals* and is NOT touching a robot of that goal's color.

*Team Station* – The designated region where the *drivers* stand during any *match*.

## 2.4 – Game Rules

### 2.4.1 – Scoring

- Balls cannot be intentionally descored.
- If descoring of an opponent alliance happens and the referee determines it is inadvertent the offending team will be given a warning and the descored object will be returned to its goal. If the descoring is judged to be intentional the offending team will be disqualified and is to drive their robot to the center of the field and then put down their remote and remain there for the remainder of the match. Disqualified teams will receive zero ranking points and zero strength of schedule points. Teams that push opposing robots resulting in the opposing alliance's objects to be descored will be treated as though they were pushed out by the robot themselves.
- Descored objects from an alliance's own goal will result in those objects remaining descored.
- Pinning is not allowed. Any team judged to be pinning another robot will be warned and must disengage immediately. Failure to disengage or repeated pinning will result in disqualification.
- Pushing a robot out of the field is not allowed. Any team deemed to be intentionally pushing another robot out of the field will be disqualified.
- If a robot, either through normal game play, or by their own driving gets high centered on the field perimeter or get out side the field may either try to get back into the field by themselves by driving the robot or may put down their remote and ask for assistance from a referee. Once the request for assistance has been acknowledged by the referee he will start a 10 second countdown. When complete the referee will place the offending robot back into the playing field closest to where it went out or got high centered without touching any game objects.
- Each billiard ball will count its face value. (i.e. the one ball will count 1 point when scored the two ball 2, and so on.)
- The cue-ball is the negator and cancels all scores in the goal into which it is scored.
- All scoring objects may be pushed out of the field.
- Any object pushed out of the field, intentional or accidentally, will remain out of the field with the exception of descored balls.
- Once a match has started a team may not touch its robot again during the match under any circumstances. Any violation of this rule will result in disqualification.
- Once a match has ended teams should not enter the field and remove their robots until told to do so by the referee.
- The final score will be tallied once all game objects have come to the complete stop.
- If a *robot false starts*, a five (5) point penalty will be assessed. The *match* continues and is NOT restarted. If the *false start* is severe, by the judgment of the referee, a *robot* may be disqualified.
- As time expires any robot not touching a starting platform of its own color will be assessed a 10 point penalty.

### 2.4.2 – Safety Rules

<S1> If at any time the *robot* operation is deemed unsafe or has damaged the playing field, surface, barriers or wall, by the determination of the referees, the offending team may be disqualified. The *robot* will

require re-inspection before it may take the field again.

<S2> If a *robot* goes completely out-of-bounds (outside the playing field), the *match* will be over and the

### 2.4.3 – General Game Rules

<G1> At the beginning of a *match*, each *robot* must be within 1/2" of build specifications. An offending *robot* will be removed from the *match* at the Head Referee's discretion.

- a. Alignment devices (templates, tape measures, lasers, etc.) that are not part of the *robot* may NOT be used to assist with the positioning of the *robot*.

<G2> Each team shall include at least one driver, one programmer and one *coach*.

<G3> During a *match*, the *drivers* and *coach* must remain in their *team station*.

<G4> Scoring objects that leave the playing field are considered out of play. They will not be returned to the field for that *match*.

<G5> *Drivers* and *coaches* are prohibited from making intentional contact with any game or field object. The first instance of intentional contact will result in a warning, with any following instances resulting in disqualification.

<G6> During a *match*, *robots* may be remotely operated only by the *drivers*. If a *coach* touches his/her team's controls anytime during a *match*, the *team* will be disqualified for that *match*.

<G8> *Robots* may not intentionally detach parts during any *match*, or leave mechanisms on the field. Multiple infractions may result in disqualification for the entire competition.

<G10> Field tolerances may vary by as much as +/-1". Teams must design their *robots* accordingly.

<G11> At the beginning of each *match*, the *robot* must be placed such that they are completely within the *starting platform* and not part of the *robot* is in contact with the foam tiles.

## 2.5 – Programming Rules

The programming portion of the challenge has two components. The base programming of the bot required to participate in the Freeze-Pool tournament and the team component that will take on the day of Youth at InfoTech on April 17<sup>th</sup>, 2013.

## 2.5.1 – Base Programming

The robot must be programmed to behave in the following fashion:

- a) It must be able to remotely drive forward, backward and turn.
- b) While the robot is active and not in the safety zone the green led must be steady on.
- c) If either of the bumper/proximity switches are tripped while the robot is active (green led on) the robot must put to sleep for 5 seconds and the green led turned off and the red led turned on steady.
- d) After 5 seconds have elapsed the red led is turned off and the yellow led is turned on blinking for 5 seconds. At this time the robot is in the safety zone and cannot be frozen until the 5 second safety zone has expired.
- e) Once the safety zone period has expired the yellow led is turned off and the green led is turned on steady. The robot is now back in active mode.

## 2.5.2 – Team Programming

The morning of Youth at InfoTech each team will be given the same programming challenge. No details will be release prior to this day. We recommend that all teams be prepared in the following way:

- a) Understand how to program all components of your robot. For detailed robot specifications see chapter four of the challenge manual “The Robot”.
- b) Develop a “shell” program that allows for quick development of a new program.

Your program will be judged based upon the following criteria:

- a) How quickly and accurately your robot can perform the task required.
- b) How well structured your program is. Well structured programs are easy for other programmers to read, understand and debug if necessary. Documenting your program is an important aspect of readability.
- c) How elegant your program is. An elegant solution often solves a problem in the least number of steps.
- d) How deep your understanding of your program and programming in general.