

FTC Block Party – CS2N Mode – Fall 2013

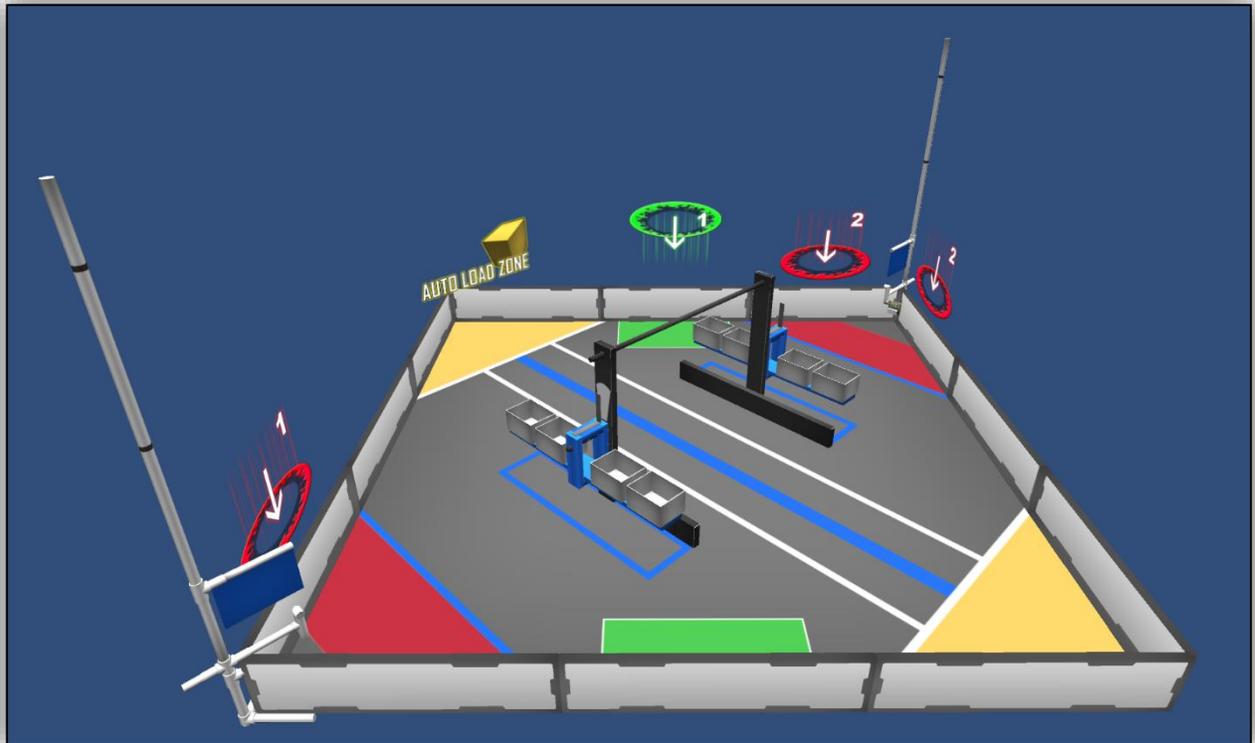


Figure 1: FTC Block Party! Virtual World (CS2N Mode).

Overview:

The FTC Block Party – CS2N Mode Fall 2013 Challenge is a two-minute long competition utilizing the Robot Virtual Worlds environment. *Robots* are programmed with *Autonomous* programs in order to score as many points as possible within the *Match*. Multiple elements have been added to the field that allow this game to be played using autonomous-only programming, such as colored lines and tiles, *IR Beacons*, walls, and *Auto Load Zones*. The game's time is tracked using the RVW game's *Internal Timer*, which will be used in the final scoring metric to determine high scores.

A *Player* can earn points during a *Match* by placing *Blocks* into any of the *Goals* on the *Pendulum(s)*, by placing *Blocks* onto the *Floor Scoring Area(s)*, by raising a *Flag* during the *End Game* period, or by having a *Robot Hang* using the *Pull-Up Bar* during the *End Game* period. *Blocks* scored in *Outer Pendulum Goals* are worth 3 points each, *Blocks* scored in the *Inner Pendulum Goals* are worth 2 points each, and *Blocks* scored in the *Floor Scoring Areas* are worth 1 point each. If the *Pendulum* is *Balanced* at the end of the *Match*, a multiplier will be applied to a *Player's* total score.

The robot can begin the *Match* in either of the two *Start Positions*. The *Match* begins when the *Player* presses the *Game Start Button*.

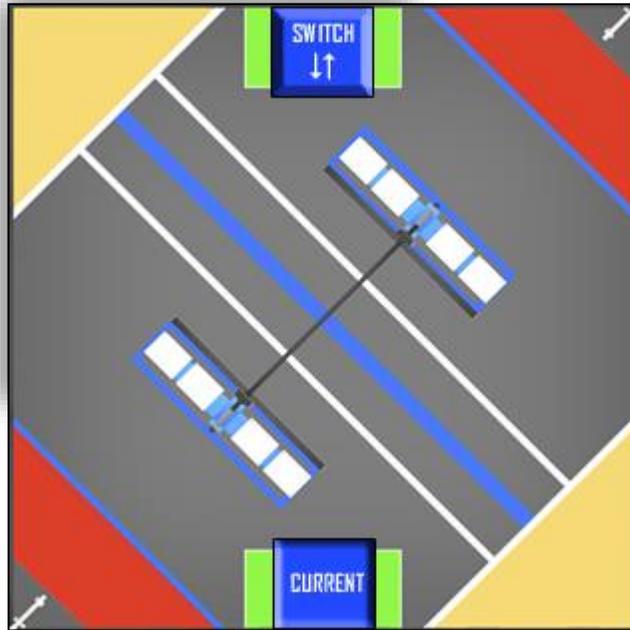


Figure 2: There are 2 different *Base Tiles* for a *Robot* at the beginning of a *Match*.

Definitions:

Autonomous Mode – The *Robot* operates and reacts only to sensor inputs and to commands pre-programmed by the player into the onboard *Robot* control system.

Auto Load Zone - The areas of the *Playing Field* where the *Blocks* are automatically loaded onto a *Robot* during a *Match*. There are two *Auto Load Zones* on the *Playing Field*, located in opposite corners of the field. The *Auto Load Zones* will automatically load *Blocks* onto the *Robot* when it enters the *Zone* and activates its end effector, but only if the *Robot* is not already carrying *Blocks*.

Balanced Pendulum – A *Pendulum* is considered *Balanced* if the black ‘needle’ attached to the fulcrum point of the *Pendulum* is within the white zone of the balance indicator (also attached to the *Pendulum*).

Base Tile – One of two available areas that the *Robot* can start a *Match* in. A *Robot* can be move to a *Base Tile* during a *Match* by using the *Robot Reset Button*.

Block – The game object in the FTC Block Party competition that can be *Scored* in the *Inner Pendulum Goals*, *Outer Pendulum Goals*, or *Floor Scoring Area* for points. A *Match* is played with 100 *Blocks*. Each *Block Zone* contains 50 *Blocks* at the start of a *Match*.

Bridge – The raised structure in the middle of the *Playing Field*. Two *Pendulums* are attached to its sides and the *Pull-Up Bar* resides above it.

Code – A program that is loaded into the *Robot* which enables it to play the *Match*.

End Game – The final 30 seconds of a *Match*.

Flag – Either of the two *Flags* (two blue) located in the corner of the *Playing Field*. These *Flags* can be raised by spinning the mechanism at the bottom of the *Flag's* pole clockwise during the *End Game*. The *Flag* can be raised to a *Low Mark* or a *High Mark*.

Floor Scoring Area – The areas (outlined by tape) directly below the *Pendulums*, extending in a plane upwards to the top of the *Pendulum*. This plane is shown in Figure 3, below.

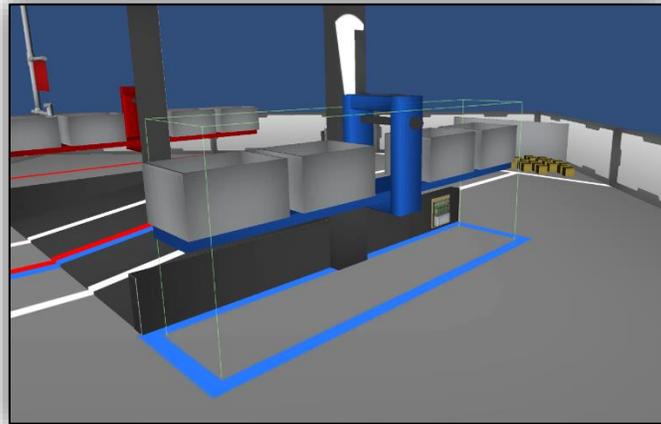


Figure 3: The scoring plane for the Floor Scoring Area.

Game Start Button – This is the button on the user interface that the *Player* presses to start the *Match*.

Game Time – The combination of the amount of time that the *Match* has been running which is measured by the *Internal Timer* in milliseconds.

Game Time Remaining – The amount of time left in the *Match*. Each *Match* is 120 seconds long. Once a player presses the *Game Start Button* the *Game Timer* begins to count down from 120 to 0 seconds. When the *Game Time Remaining* reaches 0, the *Match* ends.

Hanging – A *Robot* is considered *Hanging* if it is supported solely by the *Pull-Up Bar* and is not in contact with the *Playing Field* or *Bridge*. *Hanging* will only be scored if the *Hang* is initiated during the *End Game*. If the *Hang* is initiated before the *End Game*, the *Robot* must completely detach itself from the *Pull-Up Bar* and reinitiate the *Hang* during the *End Game* in order to score points with the *Hang*.

High Mark – A *Flag* that is raised above the third black mark (from the bottom) on the *Flag's* pole during the *End Game* is considered to have reached the *High Mark*. If a *Flag* is raised before the *End Game*, the *Flag* must be fully lowered and re-raised during the *End Game* in order for it to be worth points.

Inner Pendulum Goal – A rectangular box nearest to the center of a *Pendulum*. Each *Pendulum* contains two *Inner Pendulum Goals*. *Blocks* can be *Scored* in an *Inner Pendulum Goal* for two (2) points each.

Internal Timer – The internal timer is a clock built into the RVW software that tracks the time in milliseconds that the *Player* has been playing the *Match*.

IR Beacons – Two *IR* (Infrared) *Beacons* are located underneath the *Flag* poles' handles to assist with navigation to the *Flag* poles (one per flag).

Low Mark – A *Flag* that is raised above the second black mark (from the bottom) on the *Flag's* pole during the *End Game* is considered to have reached the *Low Mark*. If a *Flag* is raised before the *End Game*, the *Flag* must be fully lowered and re-raised during the *End Game* in order for it to be worth points.

Match – A *Match* consists of a two minute (120 second) *Autonomous Mode* programming challenge.

Outer Pendulum Goal – A rectangular box furthest from the center of a *Pendulum*. Each *Pendulum* contains two *Outer Pendulum Goals*. *Blocks* can be *Scored* in an *Outer Pendulum Goal* for three (3) points each.

Pendulum – Either of the blue structures attached to the sides of the *Bridge* in the center of the *Playing Field*. Each *Pendulum* contains two *Inner Pendulum Goals* and two *Outer Pendulum Goals*.

Player – The person that wrote the code and is playing the *Match*. The *Player* must meet all eligibility requirements for the RVW Challenge in order to compete.

Playing Field – The 12'x12' surface that the *Match* is played on, designated by the solid walls enclosing it.

Pull-Up Bar – The bar residing above the *Bridge* that a *Robot* can *Hang* from during the *End Game* for points.

Robot – A programmable object that a *Player* can load into the virtual world.

Robot Reset Button - A button on the RVW Game interface that allows the *Player* to pause the *Match* and reset the *Robot*. The button allows the *Player* to select another *Robot* to load code onto and run.

RVW – Robot Virtual World

Scored – A *Block* is considered '*Scored*' if it resides in an *Inner Pendulum Goal*, *Outer Pendulum Goal*, or *Floor Scoring Area*, including the vertical plane above the *Pendulum Goals* and *Floor Scoring Area*. Any *Block* can only be *Scored* in one of these areas at a time.

Student – Anyone enrolled in a pre-college school or home-schooled as part of a pre-college educational curriculum.

Warp Zone – One of two designated areas on the *Playing Field* that can be used with the *Robot Reset Button* to move the *Robot* to its corresponding *Base Tile* (*Warp Zone 1* to *Base Tile 1*, for example) with no time penalty.

Loading Programs:

A *Player* may reset the *Robot* and load a new program/change the robot being used by utilizing the *Robot Reset Button*. The following rules apply when using the *Robot Reset Button*:

- If the *Robot* is in a *Warp Zone*, it can be sent to the corresponding *Base Tile* with no penalty.
- A *Player* may only load a new program onto the *Robot* while it is on a *Base Tile*.
- While on a *Base Tile* (and before the *Match* has been started or unpaused), *Players* may switch their *Robot* model, load a program to the *Robot*, or switch which *Base Tile* the *Robot* starts the program from.
- *Players* may also use the *Robot Reset Button* while the *Robot* is not on a *Warp Zone* or *Base Tile* to move the *Robot* to a *Base Tile*; however, doing so will subtract ten (10) seconds from the *Game Time Remaining*.

Scoring Points:

Points can be scored during a *Match* by programming the *Robot* to perform the following actions. The *Player's* final score is the highest score achieved during the *Match*. Alliance color has no bearing on how an object is scored; this means that both *Flags* can be raised, the *Blocks* can be scored in any *Pendulum Goal* or *Floor Scoring Area*, and the *Robot* can *Hang* from any location on the *Pull-Up Bar*.

- Each *Block* placed on a *Floor Scoring Area* is worth one (1) point.
- Each *Block* placed in an *Inner Pendulum Goal* is worth two (2) points.
- Each *Block* placed in an *Outer Pendulum Goal* is worth three (3) points.
- A *Balanced Pendulum* at the end of a *Match* applies a 1.5x multiplier to all *Blocks* scored in that *Pendulum's* *Inner* and *Outer Goals*.
- A *Flag* that is raised to the *Low Mark* during the *End Game* is worth twenty (20) points.
- A *Flag* that is raised to the *High Mark* during the *End Game* is worth thirty-five (35) points.
 - A *Flag* will only be scored for the highest level *Mark* it has reached at the end of the *Match*, and will only be scored if the *Flag* was raised during the *End Game*.
- A *Robot* that is *Hanging* from the *Pull-Up Bar* at the end of a *Match* is worth fifty (50) points.
 - A *Robot* will only be credited for a *Hang* if the *Hang* occurs during the *End Game*.

Tiebreaker:

If two *Players* achieve the same score, the tiebreaker will be determined by which *Player* was able to achieve the high score in the shortest amount of *Game Time* (tracked by the *Internal Timer* and displayed as the fractional part of the score).

Divisions:

There will be 3 Divisions for the CS2N FTC Driver Skills Challenge:

- **Middle School:** For students entering 8th grade or lower at the start of the 2013-2014 school year
- **High School:** For students entering grades 9th-12th at the start of the 2013-2014 school year
- **Open:** This division is open to all participants.

Prizes:

A listing of the prizes for the FTC Block Party – CS2N Mode Fall 2013 competition can be found on the CS2N website, cs2n.org.

Other Rules

- Any Player intentionally using glitches or hacks in the RVW environment to obtain a higher score than would normally be possible may be subject to disqualification from the Competition.

- Each *Player* is eligible for only one prize per *Competition*. In the case of multiple high scores that are eligible for prizes that are submitted by the same *Player*, only the highest score will be used in determining prizes for that *Player*.

- All *Players* must adhere to the Robot Virtual World Competition Rules as they are written, and must abide by the listed intent of the rules. Every *Player* has the opportunity to ask for official rule interpretations in the RVW Robotics Competition Question & Answer Forum at www.robotc.net/forums. Any responses in this Q&A forum should be treated as official rulings from the RVW Robotics Competition Game Design Committee, and represent the correct and official interpretation of the RVW Robotics Competition Rules.

All submissions must include the program(s) used to achieve the high score, any include or header files needed to run the program, the comments at the top of the program filled out fully, and a fully filled out Programming Order file. Any submission that lacks these documents will be ineligible for prizes.

- Blank RBC templates can be found in the FTC Block Party! Virtual World, as well as the FTC Block Party Sample Programs folder. These files contain the comments at the top of the program that must be filled out and included with every program.
- A blank Programming Order text file can also be found in the FTC Block Party Sample Programs folder. This file must also be completed and included with your file submission.
- Multiple programs should be zipped (with a completed Programming Notebook) for submission. The zipped folder should follow a Lastname_Firstname_Competition.zip naming convention. Example: Smith_John_FTC.zip or Doe_Jane_FTC.zip.

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