

Section
2



Magbot Mayhem - Avalanche The Game

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Section 2 – The Game

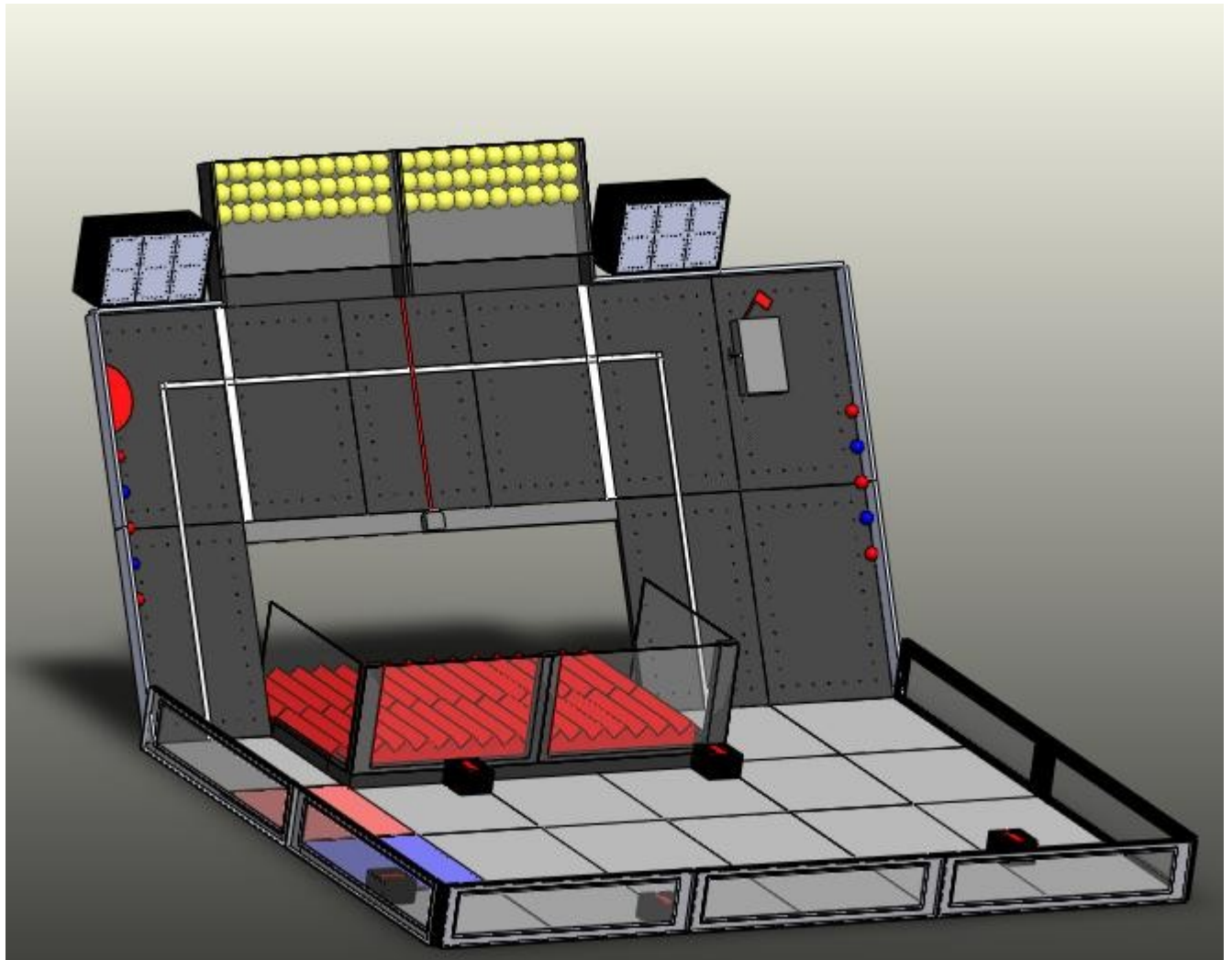
2.1 – Overview

This section describes the CREATE Open game, called *Magbot Mayhem- Avalanche*. 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 figures below. Teams take turns navigating the field in each *match*. The object of the game is to attain a higher score than your opponent by gaining as much *bonus time* and completing the course as quickly as possible. Bonus points are gained by knocking *bonus balls* off their light sensor ledges, using the *gear grinder* to raise a weight tripping a limit switch and by pressing the *bonus bumper* switches located on the road to the finish line.

There are a total of twelve (12) time bonus mechanisms in the game. Six (6) are bonus balls, five (5) are *bonus bumpers* and there is one (1) *gear grinder*. In addition to these mechanisms there is one other bumper switch on the field, the *finish line switch*.



2.3 – Game Definitions

Autonomous Period – A twenty (20) second time period in which the *robots* operate and react only to sensor inputs and to commands pre-programmed by the team into the on board *robot* control system. Human control of the *robot* is not permitted at this time. The object during the optional autonomous mode is to earn as much bonus time as possible. Bonus time can be earned on any of the field's twelve (12) time bonus mechanisms.

Avalanche Zone – The area directly below the softball holding area.

Avalanche Zone Center Laser Line – The laser line sensor located directly in the middle of the *Avalanche Zone*. This sensor is used to make sure the *Avalanche Zone Start Switch* has been started and the robot does not attempt to reach the finish line by backtracking.

Avalanche Zone Finish Laser Line – The laser line sensor located at the end (right side) of the *Avalanche Zone*. This sensor is used to stop the *Avalanche Zone Timer*. NOTE: The avalanche timer is not stopped until this laser line is interrupted AND re-established.

Avalanche Zone Timer – The blue LED timer used count down the time during the autonomous mode and to count down time to avalanche during the driver control period.

Bonus Ball – Any of the six (6) red or blue racquetballs. located on the left and right side wall sitting on light sensor ledges.

Bonus Bumpers – One of five (5) bumper switches located on the floor of the field.

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

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

Driver Controlled Period – The time period in which the *robots* are operated by the *drivers*. The amount of time of this period decreases with each subsequent match. (i.e. The first match for a team is 70 seconds, the second match is 60 seconds and the third and final match is 50 seconds.)

Driver Station – The designated region where the *drivers* and *coach* stand during any match.

Finish Bumper Switch – A bumper switch located on the side wall mid way down the blue floor tile. Pressing this switch signifies completion of the course and stops the timer.

Gear Grinder – The mechanism on the right side of the wall. It has a bar on the left side that can be turned raising the weight located on the bottom of the mechanism.

Match - A *match* consists of a twenty (20) second *autonomous period* followed by a *driver controlled period* of seventy (70), sixty (60) or fifty (50) seconds.

Match Timer – The red LED timer used to count down time in the autonomous period and the driver control period. .

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

Starting Laser Line – A laser line located directly in the middle of the red starting tile. The robot is placed in the path of this laser line. Once this robot clears the laser liine the match timer begins to count down..

2.4 – Game Rules

2.4.1 – Scoring

- The final reading on the clock when the *finish line bumper* is pressed is the team's score for that round.
- Each team will be given three rounds. The cumulative score of all three rounds is a team's score for the qualification portion of the competition.
- The driver portion time for the first match will be 70 seconds. The second round will be 60 seconds. The third round will be 50 seconds.
- Time for the finals will be set to 40 seconds.
- If the *match timer* reaches zero at any point in the *match* then that *match* is over and the team will receive a score of zero for that *match*.
- Bonus time applies ONLY to the match time, not the avalanche time. Bonus time can be earned as follows:
 - *Bonus Ball* – For each bonus ball dislodged from its light sensor ledge four (4) seconds will be added to the *match timer*.
 - *Gear Grinder* – Sixteen (16) seconds will be added to the *match timer* for any team which is successful in using the *gear grinder* to raise a 2 pound weight 12" into a limit switch.
 - *Bonus Bumper* – For each bonus bumper pressed four (4) seconds will be added to the *match timer*.
- Bonus time can be earned only once per bonus mechanism. (i.e. Pressing a *bonus bumper* more than once will not result in more than the four (4) seconds of bonus time.)
- The amount of time given to pass through the *avalanche zone* will decrease with each round. Thirty (30) seconds will be given for round one, twenty-five (25) for round 2 and twenty (20) for round three.

2.4.2 – Scoring in Autonomous Mode

- A team may opt for a 20 second *autonomous period*. The object of the 20 second *autonomous period* will be to earn bonus time and/or advance as far through the course as possible. In the *autonomous period* the robot may earn bonus time from any of the twelve (12) time bonus mechanisms.

2.4.3 – Safety Rules

- <S1> If at any time the *robot* operation is deemed unsafe or has damaged the playing field, game components, 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), it will end the match and zero will be the score for that *match*.
- <S3> If a *robot* falls from the wall and is no longer able to move the *match* will be over and zero will be the score for that match.

2.4.4 – General Game Rules

- <G1> At the beginning of a *match*, each *robot* must not exceed a volume of 18 inches wide by 18 inches long by 18 inches tall. An offending *robot* will be removed from the match at the 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 up to two (2) *drivers* and one(1) *coach*.

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

<G4> Balls that leave the playing field are considered out of play. These balls 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 a disqualification.

<G6> During a *match*, *robots* may be remotely operated only by the *drivers* and/or by software running in the on board control system. If a *coach* touches his/her team's controls anytime during a *match*, the team disqualified for that match and receive a score of zero.

<G8> *Robots* may not intentionally detach parts during any *match*, or leave mechanisms on the field. If a detached component or mechanism is deemed by the referee to be intentional the team will be disqualified and a score of zero will be recorded. Multiple infractions may result in disqualification from the entire competition.

<G9> Strategies aimed solely at the destruction, damage, of the field or game components are not in the spirit of the CREATE Open and are not allowed. However, *Magbot Mayhem – Avalanche* is a highly interactive contract game. The avalanche may pose a danger to the robots and damage may occur. Teams are aware of this potential danger and assume all risks associated with this game.

<G10> *Robots* must be designed to permit easy removal of *balls* from any grasping mechanism without requiring that the *robot* have power after the *match*.

<G11> Horizontal field tolerances may vary by as much as +/-1". Vertical field tolerances may vary as much as +/-1" in all areas except the following: a) The metal wall panels may not have more than a 1/4" gap between panels, b) The metal panels may not have more than 1/8" rise/dip where the panels adjoin, c) No portion of the wall may bow out from the regular plane of the wall, over any 18" square section, by more than 1/8". Teams must design their *robots* accordingly.

2.4.5 – Magbot Mayhem - Avalanche Specific Game Rules

<SG1> At the beginning of each *match*, each *robots* must be placed such that they are in the path of the *laser starting line* and are entirely within the red starting tile..

<SG2> Prior to the start of each *match*, the team will specify whether they are participating in the optional autonomous mode or are going straight to the driver control portion of the match.

<SG3> A *bonus ball* time bonus is awarded when the bonus ball is sufficiently dislodged from it's light sensor ledge to trip the light sensor. It is not required to completely remove the bonus ball from the light sensor ledge to get the bonus time. However you may only get one four (4) second bonus per *bonus ball*.

<SG4> A *robot* must make a complete circle starting at the red starting tile, moving up the wall, through the *avalanche zone*, down the other side of the wall and through the finish line road before pressing the finish line bumper. If the finish line bumper is pressed out of sequence the team will receive a time of zero for that round.

<SG5> Before the *finish line bumper* is pressed the *robot* is required to do the following:.

- Drive completely through the *avalanche zone*.
- Drive down the wall on the gear grinder side.

<SG6> To ensure the robot follows the proper path as quickly as possible the field has been programmed

in the following fashion:

- If at any time the match clock goes to zero the *match* is over and zero is the score for that round. Even though a *robot* may still be able to move all of the scoring mechanisms will be shut down ending the match.
- Once a robot passes into or through the avalanche zone finish laser line the avalanche center laser line is programmed to set the timer to zero and end the match should it be interrupted after the avalanche zone finish laser line has been tripped. This is to prevent a robot from trying to backtrack to the finish line.