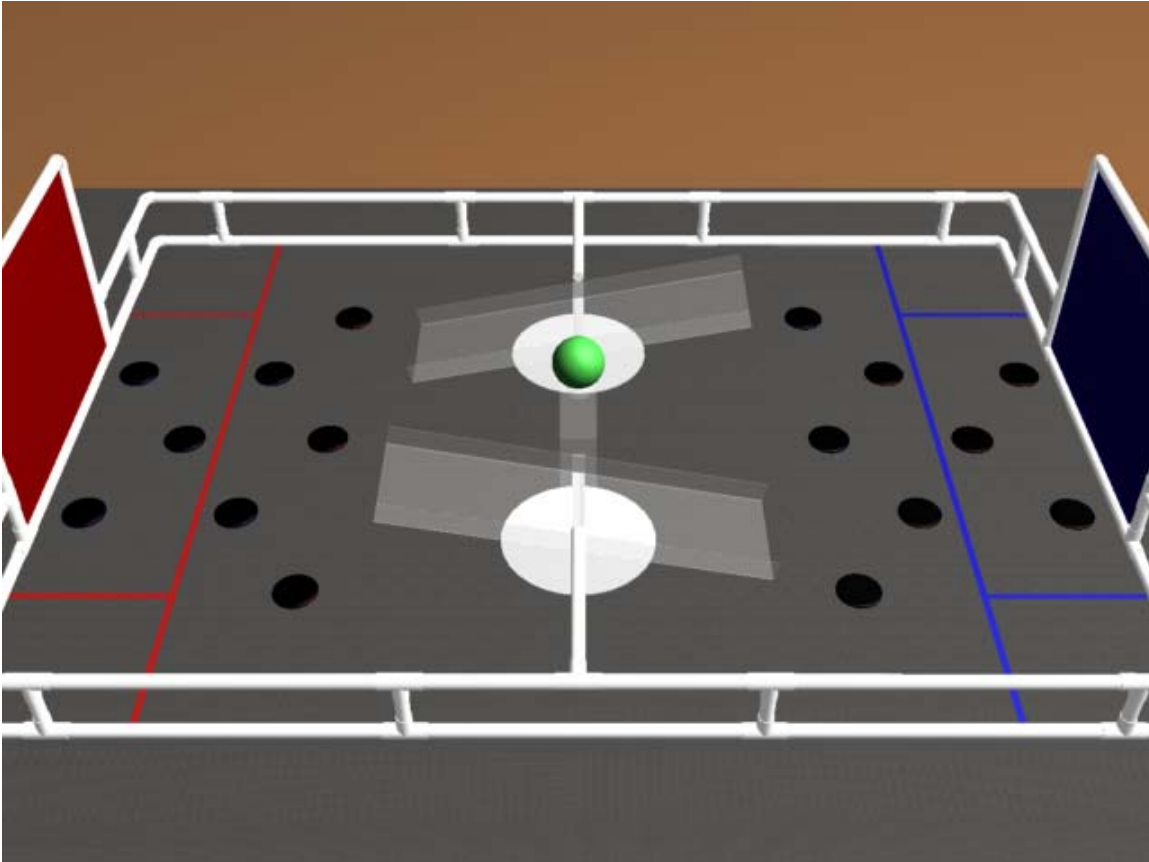


## 1. Objective

The objective of “Frisbee Flip Fest” is to design and build a radio-controlled robot that will allow you and your partnered team to earn a higher Match Score than the opposing alliance.

## 2. The Field



Visit [www.midwestvex.org](http://www.midwestvex.org) to download files containing larger, dimensioned field diagrams and descriptions of each of the elements on the field above.

2.1 The Official Midwest Vex Programs Field measures 10 feet by 14 feet and is viewable on [www.midwestvex.org](http://www.midwestvex.org). The surface of the playing area consists of 2' x 2' interlocking foam floor tiles, rough side up, available from [www.softtiles.com](http://www.softtiles.com).

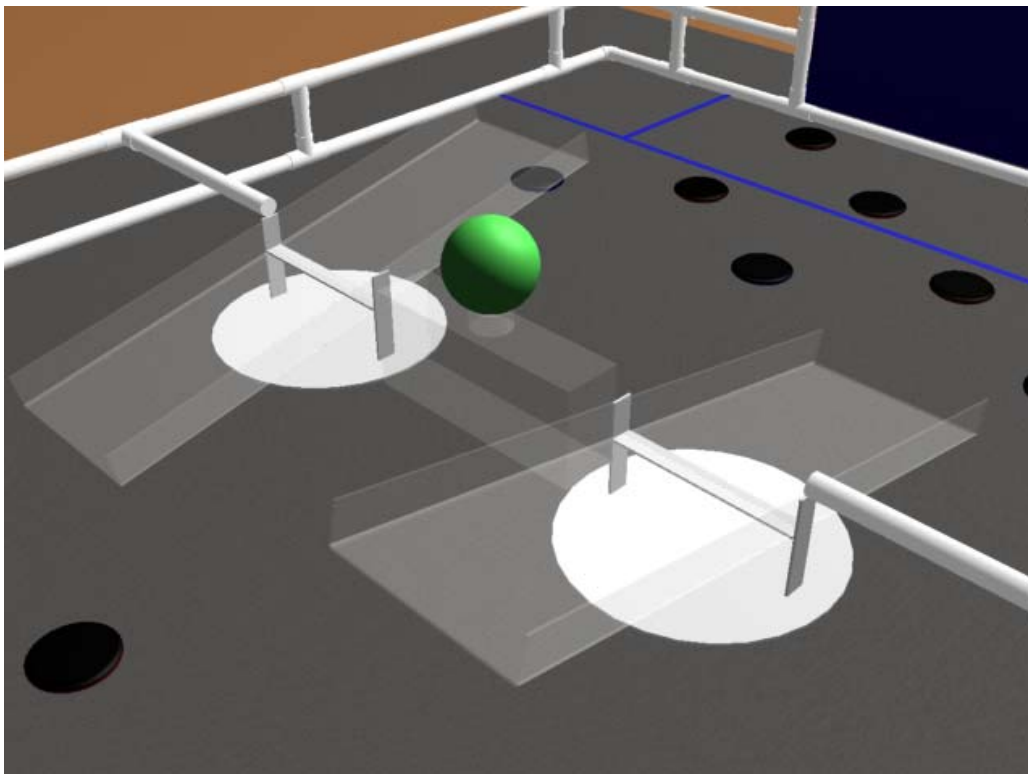
2.2 All official field dimensions will be within +/- 1/2" tolerance. Robots must be built accordingly.

2.3 Starting Zones: Robots must start the match in their alliance's Starting Zone at the corners of the field. These zones are marked by colored tape. The dimensions of a single Starting Zone are 2' x 2'.

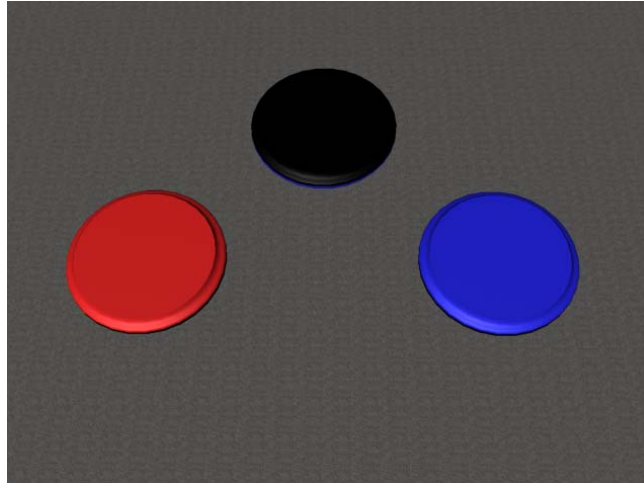
2.4 Scoring Zones: Scoring Zones are the portions of the field where points are received for scoring pieces contained within them. These zones are marked with colored tape

corresponding to each alliance and extend infinitely upward perpendicular to the field. The Starting Zones are part of the alliance's Scoring Zone. These will be located in each end of the field – one for each alliance. The rest of the field does not belong to any alliance. The dimensions of a single Scoring Zone are 10' x 2', including the Starting Zones.

2.5 Ramps: In the center of the field are two ramps, divided by the Center Wall . Each ramp is 5' long by 17" wide and has sides of 3.5" high. The Ramps float on a 24" diameter base, and are spaced 2' apart from each other and the sides of the field. The two ramps will be arranged with the long sides matching up with the length of field. The ramps will pose as obstacles for the robots throughout the match. At the start of the match, the ramp on the right, when viewed from the driver station, will be tilted such that the end of the ramp touches your side of the playing field.



2.6 Flops: Located throughout the field are "Flops." Flops are made up of two 8" Frisbees placed rim to rim and fastened together with 1.75" lengths of wood and screws (instructions on how to construct a Flop can be found at [midwestvex.org](http://midwestvex.org)). Each Flop has one side colored black, with the other side colored either red or blue, corresponding to each alliance. There are 8 red and 8 blue Flops available on the field.



2.7 Bonus Ball: At the start of each match, a green playground ball will be balanced on the center wall in the middle of the field, between the two ramps. The Bonus Ball is 8" in diameter, and can be found at most K-Mart stores (an 8" kickball replicates the Bonus Ball).

2.8 Center Wall: Between the two ramps will be a Center Wall, 2' long, 1' high, and 4" thick.

2.9 Limbo Bar: Between each Ramp and the edge of the field is a six inch high Limbo Bar. Robots may run under, or over, the Limbo Bar.

### 3. Scoring

3.1 All scoring will occur at the end of each two minute and thirty second match, after all robots and scoring objects have come to rest.

3.2 The primary scoring method will be to flip Flops with the alliance color side facing up in the alliance's respective Scoring Zone

3.2.1 Each flipped Flop in the corresponding Alliance's Scoring Zone is worth FIVE points.

3.2.2 Each flipped Flop outside of its corresponding Scoring Zone is worth TWO points.

3.2.3 For each Flop that is black side up, neither alliance will be given points.

3.2.4 The alliance that possesses the Bonus Ball within their Scoring Zone at the end of the match will receive TEN points.

3.2.5 Ramp Bonus: The alliance who "possess" both ramps will be awarded a TWENTY point bonus. A ramp is considered "possessed" if the lip of the ramp is completely touching your alliance's side of the playing field.

3.3 Tie Breakers: In the event of a tie, the winner of the match will be determined by a coin FLIP (pun intended).

## 4. Matches

4.1 The competition will consist of Qualifying Matches followed by Elimination Matches. Each match is two minutes and thirty seconds long. There is no autonomous period.

4.2 Field Crew: Each team is allowed to bring one driver and one coach to the field. The coach and driver may switch positions at any time during the match.

4.2.1 Both members must remain in the Player Station for the entire duration of the two minute and thirty second match. Failure to do so will result in a 10 point penalty.

4.2.2 Teams are expected to be present for each of their scheduled matches; however, if a robot is unable to compete for a scheduled match, the team is required to send one representative to stand in the driver's area for the duration of the match.

4.3 Match Safety: Safety glasses are required at all times in the pit area and on the competition field. Teams will not be permitted to compete unless all team members on the competition field are wearing safety glasses. Teams must provide their own safety glasses for the event; no safety glasses will be supplied by the event coordinators. It is recommended that teams bring extra safety glasses to events for any team visitors.

### 4.4 Qualifying Matches

4.4.1 All teams will play in the same number of Qualifying Matches. The number of qualifying matches at each event will be determined by the length of the event and the number of teams competing. Teams may be asked to play in surrogate matches that do not count towards their Ranking Points in order to ensure all robots have played an equal number of matches.

4.4.2 Teams will be given their schedule of qualification matches before the start of the first match. The qualification match schedule will show the match number, the alliances competing in each match, and the color that each team is assigned for that match.

4.4.3 At the end of each qualifying match, the Ranking Score for each alliance will be modified based on the Match Score. The team with the highest Match Score receives two (2) points and the other alliance receives one (1) point.

### 4.5 Ranking

At the end of the qualifying matches, teams will be ranked from 1 to N (N being the total number of teams present) based on the following:

- Highest Ranking Score
- Highest Match Score
- Most times a Bonus Ball was possessed
- Coin FLIP

### 4.6 Elimination Matches

4.6.1 The number of teams participating in Elimination Matches will be no less than 4 but may be increased prior to the start of the event based on the number of teams participating.

4.6.2 Alliance selection procedure for the Elimination Matches will be run like the FRC elimination alliance selections. The top ranked teams become “Selecting Teams” and are able to select their own alliance partners. In the first round of selections, the highest seeded team will pick first and the lowest seeded team will pick last. If a team is picked that is ranked as a “Selecting Team”, then the next seeded team is bumped up to pick. A “Selecting Team” may refuse an invitation from a higher seeded team, but may not then accept an invitation from a different “Selecting Team”. A team outside of the top seeded teams may not accept an invitation from any team if a previous invitation is refused. To allow more teams to participate in the Elimination Matches, it may be determined prior to the start of the tournament to use three team alliances. In this case, the second round of selections will be conducted in reverse, with the lowest seeded team making the first selection and the highest seeded team making the last pick. Each team of the three team alliance must play in at least one Elimination Match.

4.6.3 The number of top seeded teams that earn the right to select their alliances partners will be determined prior to the start of the tournament based on the number of attending teams.

4.6.4 The elimination tournament requires two victories in a round to advance to the next round. Therefore each round will consist of a minimum of two matches and may require up to three matches to determine a winner.

## **5. General Rules**

5.1 Disqualification: Robots may be disqualified based on their actions which violate the rules of the game. If a referee calls for a disqualification during a match, the robot will be disabled and they will receive a Ranking Score of zero for the match. If disqualification is not determined until the completion of the match, the offending robot will receive a Ranking Score of zero for the match. The alliance partner of a disqualified robot will still receive the score earned by all robots during the match, provided that they are also not disqualified. In both situations, the opposing alliance will receive a score based on the points that they earned. The disqualification of one robot during the Elimination Matches will disqualify the entire alliance.

### **5.2 Safety Hazards:**

5.2.1 Referees may request that teams alter any portion of their robot that is considered a safety hazard. It is the right of the referees to prevent teams from playing in matches until such changes are made to the robot.

5.2.2 Referees will disqualify any robot that they deem to be a repeat safety hazard. A safety hazard is any direct action of, or mechanical failure on said robot which may increase the possibility of immediate damage to other robots, field objects, or personnel.

5.3 Loss of Parts: All parts of the robot must remain attached to the robot for the duration of the match and must not cause any hazard of entanglement to any other robot, or else that robot's team may run the risk of disqualification. Minor pieces which become detached from the robot and do not affect the outcome of the match will not result in a disqualification.

5.4 Out of Bounds: If a robot leaves the playing field for any reason so that it must exert

force on the ground outside of the field border, the robot will be immediately disabled. If a robot is forced out of bounds by an opposing robot, both robots will be disabled and the aggressor will be given a 10 point penalty.

5.5 Pinning: Pinning occurs when an opposing robot is held against an obstacle and cannot move, in any direction, because of your robot's presence. Pinning will be visibly counted out by the closest referee for a duration of 5 seconds. If a robot is being pinned for five seconds, the team doing the pinning must back off for at least five seconds before they can resume pinning. Failure to do so will result in a 10 point penalty of the aggressor. If a robot continues to engage in this behavior, they may be disqualified.

5.6 Flipping: Robots may not flip an opposing team's robot. The flipping robot will be disqualified from the match if in the referee's decision they initiated an action which results in flipping. In incidents where the flipped robot initiates action or both robots are in motion, disqualification may not occur and will be at the discretion of the referees.

5.7 Intent to Destroy: Strategies resulting in the destruction of or damage to an opponent's robot or the field and field element is not in the spirit of the competition and will not be allowed.

5.8 Starting Zone: At the start of the match, teams may place their robot anywhere inside either of their Starting Zones. Only one robot may start in each Starting Zone. The tape which defines the Starting Zone is considered part of the zone and robots may be in contact with it. The exterior edge of the tape forms an infinite vertical plane which robots must begin entirely within. Teams must make a joint decision as to which Starting Zone their robots will be placed in before each match.

5.9 Ramps Touching the Floor: A ramp is considered "possessed," or touching the floor, when the lip of the ramp is in complete contact with the floor. Robots may be in contact with a "possessed" ramp at the end of a match, robot contact will not disqualify a "possession."

5.10 Flipped Flops: Any flipped Flops will count for points. This includes Flops on robots, ramps, the center wall, and the floor.

5.11 Scoring Objects: Any scoring object which leaves the playing area during a match will be returned to the field near the point at which it exited at the referee or volunteer's earliest convenience.

5.12 Robot Control: Team members may interact with their robot during a match only through the normal operation of the VEX control system. Only designated drivers may be in contact with the controls during the match.

5.14 Robot Modification: Teams are allowed to modify their robots in between matches as long as the robot remains compliant with all specifications and rules after the modification. Any modification should be brought to the attention of the referees or head inspector prior to the start of the team's next match. Teams may be subject to re-inspection at the discretion of the referees/head inspector.

5.15 Robot Identification: Teams must have their team number clearly marked on four sides of their robot, such that it is visible from 15 ft. away. Teams must also have the

ability to designate Red or Blue alliances with a color insert or flag. These inserts must be provided by the team and must not be a functional part of the robot.

5.16 Rule Clarification: All questions or requests for rule clarifications should be submitted to [mentor.vex.qa@gmail.com](mailto:mentor.vex.qa@gmail.com). Questions and answers will be publicly posted on the event website.

5.17 Referee Rulings: All referee decisions regarding rules of play and scoring are final. If there is a question regarding a referee decision the driver may approach the head referee for clarification immediately following that match.

## **6. The Robot**

6.1 Size Restriction: At the start of each match, every part of the robot must fit, unconstrained, in a stable position, within a cube with 15 inch sides. The robot may only contact the surface of the field in starting position. Robots will be measured before the beginning of Qualification Matches.

6.2 Controls: Teams will be required to use one (1) competition remote control as well as one (1) other controller that does not interfere with the field's control. Frequency modules will be provided by the competition coordinators and are not allowed to be brought to the competition site. Each team's remote is required to be tethered to a field disable tether during matches.

6.3 Pit Operation: Teams must use their own tether for robot control in the pit area. Robots may not be operated outside of the competition field or pit area. Failure to follow this rule may result in forfeiture of the next round of competition.

### **6.5 Construction Restrictions:**

6.5.1 A robot must be designed to operate by reacting only against features within the confines of the playing field boundaries and may not interact with anything outside the boundaries of the playing field.

6.5.2 Gaining traction by use of adhesives or by abrading or breaking the surface of the playing field is not allowed and will be considered to be damaging the playing field and is subject to disqualification.

6.5.3 A robot may not contaminate the playing field or an opponent's robot with lubricants or other debris.

6.5.4 Teams may use 7.2V NiCd batteries of any manufacture, but only one battery (six cells) may be used on the robot at a time. The battery cost does not count towards the cost limit listed below.

6.5.5 Only parts from the VEX Robotics Design System Starter Kit are permitted unless specified on the additional materials list below.

6.5.6 Modifications are permitted to the mechanical parts of the kit. Teams may opt to buy their own replacement or spare parts from [www.vexrobotics.com](http://www.vexrobotics.com) but these may not

be used as part of the robot until the part fails. Teams may NOT intentionally modify any of the kit electronics. Modification of items on the additional materials list is permitted.

6.5.7 A parts outline form the VEX Robotics Design System Starter Kit can be found at <http://www.vexrobotics.com/vex-robotics-design-system.shtml>.

6.6 Materials: Teams are restricted to the contents of 2 VEX Robotics Design System Starter Kits. Additional materials may be used as outlined below. Each team must submit a Bill of Materials outlining their parts and expenses before their first match. We ask that the Bill of Materials distinguish between starter kit materials and additional materials.

6.7 Additional Materials List:

- String of no more than ¼" in diameter.
- Rubber bands of no more than 1" in width.
- Non-functional decorations
- A maximum of \$200 in additional VEX accessories, VEX Expansion kits, or VEXplorer kits available from [www.vexrobotics.com](http://www.vexrobotics.com). Anything that comes with the kit, including the VEX packaging, may be used.
- This competition does not use autonomous mode. However, you may choose to program certain functions in your robot. The programming kit may be used to program custom functions to your robot but does not count against the \$200 maximum listed above.

6.8 Energy Sources: The energy used by the devices in the competition must come solely from:

- A change in altitude of the center of gravity of the device
- Electrical energy delivered by the battery to the electronics and motors provided with the kit.
- Stored energy by deformation of parts allowed above (rubber bands) provided the stored energy does not pose a safety hazard at release.