

BOTBASH ROBO-BALL RULES, 2007

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1 INTRODUCTION

Robo-ball is an exciting, entertaining robotic sport in which two teams of remotely-operated robots vie for points by scoring goals, ejecting opponents from the arena, disabling opponents, or all three in any combination. Robo-ball is played in an enclosed arena with transparent walls featuring pneumatically operated pits, flame jets, and “land mine” pistons that pop up from the floor. Scoring goals in this environment is not easy, and every match is sure to feature plenty of exciting action!

2 THE ARENA

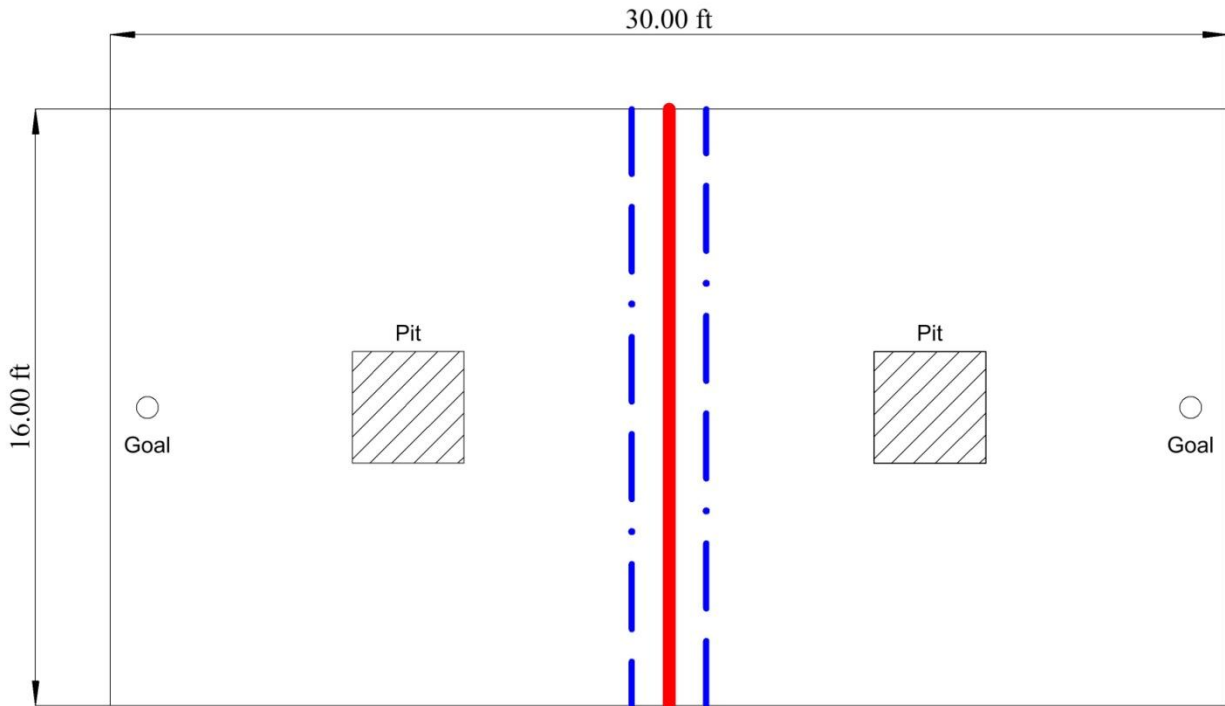
The arena consists of a 16'x30' flat playing surface with a goal opening at each end. The arena is surrounded by rails, above which are angled sections of metal mesh which allow the ball to roll back onto the playing surface.

The arena is equipped with several obstacles:

- Open rail section: there are 14 rail sections that surround the arena. One section is removed leaving a gap through which robots may push other competitors. The open section will be located approximately on the center line one side of the arena.
- Pits: there are two pneumatically operated pits, each approximately 36" square and 8" deep when lowered. The pits floors are lowered and raised automatically at intervals. The interval, up, and down times can all be varied.
- “Whunkle Sweeper” – this is a pendulum that sweeps across the midpoint of the arena (see diagram). The pendulum weight is equipped with flame ports and spews burning propane as it swings.
- “Daisy Death Petals” – pneumatic rams that pop up from the floor.
- “Flame Pits” – propane powered flame jets that fire up through the floor.

2.1 SCOREBOARD

The arena is equipped with a “basketball” style lighted scoreboard displaying the score, period of play, time remaining, and possession timer (“shot clock”).



3 OVERVIEW OF THE GAME

3.1 OBJECT OF THE GAME

The object of the game is to accumulate the highest possible score during regulation play. In the case of a tie a “sudden death” overtime period will be played with the first team to score winning the match.

3.2 GAME PLAY

The game is played in 4 quarters of 5 minutes each, with a 10 break between quarters. The sudden death overtime, if required, is 5 minutes.

The game begins with each teams’ robots positioned midway between the goal and the pit at their respective end of the arena. Play is started with the release of the ball onto the Tee by the Arena Control System.

The ball remains in play until:

- It is placed in a goal
- It is ejected from the arena
- It becomes stuck in a non-playable position

When the ball goes into a goal it is automatically shot back into the arena after a 5 second delay. The ball must be brought back past the mid-court foul line before it can score in that goal again.

When the ball goes out of play by leaving the arena or becoming stuck a time-out will occur and the ball will be returned to the arena playing surface at the point closest to where it left or became stuck.

Possession of the ball is limited by a 20-second “shot clock”. A team may not control the ball for more than 20 seconds without scoring a goal. If the shot clock expires, play is stopped and the ball is surrendered. Both teams must back their robots 5 feet away from the ball, and play is restarted.

In the event that a robot is ejected from the arena while carrying the ball, a timeout will occur and the ball will be placed on the arena playing surface nearest the point of ejection. Should a robot become stranded or disabled while carrying the ball and be unable to release it, a timeout will occur and the ball will be placed on the floor adjacent to the stranded or disabled robot.

Any robot ejected from the arena during game play will be “out” for the remainder of the quarter. Should all of a team’s robots be ejected or disabled before time expires, the quarter will be declared over.

3.3 SCORING

There are 4 ways to score points:

- 5 points) – ball score with ball on the “serve”, originating from ball tee
- (3 points) – ball score from play as long as passes the mid-court foul line first
- (3 points) – throw opponent out of arena
- (1 point) – disable opponent

In addition a team can win the match during Sudden Death Overtime by scoring with the ball.

3.4 TEAMS

A team will consist of from 3 to 5 people and from 3 to 5 robots.

3.5 ROBOTS

Robots must weigh at least 30 lbs but no more than 60 lbs. A team may bring up to 5 robots total and select 3 or more to play in each quarter. The total weight of the robots selected must not exceed 150 lbs.

4 ROBOT TECHNICAL CONSTRUCTION RULES

Robots shall be constructed in accordance with the **Robot Fighting League Standard Extensible Technical Regulations for Botbash Robo-Ball 2007** (provided under separate cover) as defined for the **30 Lb Sportsman Class**, with the added proviso that a robot must weigh *not less than 30 lbs* and *not more than 60*. All other RFL rules apply.

5 GENERAL RULES AND PROCEDURES

5.1 OFFICIALS

The power of all officials is absolute, and all decisions are final. This includes the Event Organizer, arena staff, referees, safety inspectors, and any other event staff. The job of the officials is to provide a safe environment for competitors and spectators and to ensure a “level playing field” for all competitors.

5.2 TECHNICAL INSPECTION

All robots will be inspected by the safety inspection staff to ensure compliance with the robot construction rules prior to being allowed to compete.

5.2.1 STATIC INSPECTION

1. A Competitor's robot will not be inspected if it does not have adequate protective covers and weapon locks. Competitors shall be required to personally demonstrate that the safety covers and locks are adequate.
2. Weight check - No tolerance for overweight robots.
3. Appearance suitable for competition. No profane, racially insulting, sexually explicit graphics, etc. will be allowed. The event reserves the right to have removed from Competitor's robot any graphics deemed not suitable for general public viewing.
4. Internal inspection -- covers/armor must be removed to allow for an internal inspection.
5. Approved batteries.
6. Battery terminals not exposed.
7. Clearly visible power status LED
8. Pneumatic and hydraulic components (pressure vessels, valves, line, etc.) are compliant with RFL rules.
9. Leakage -- There shall be no visible or audible fluid/gas leaks.
10. No other hazards.

5.2.2 ACTIVE INSPECTION

- Transmitter/receiver check --Ensure that the robot is receiving adequate signal without interference.
- Verify master switch and fail safe.
- Verify mobility and control
- Verify weapon(s) operation and safety.

5.2.3 TECHNICAL / SAFETY DISPUTES

Tournament Safety / Technical Officials are held to the highest standards of fairness and interpretation of the rules as set forth in the tournament documents. If a Competitor's robot should fail based on the strict interpretation of the rules every means possible will be explored to remedy the situation and allow the Competitor to compete. However, should a dispute arise between the Competitor and the Senior Safety Official, the Event Organizer shall rule on the acceptance or disqualification of the Competitor's robot and this ruling will be final.

5.2.4 FAILURE TO PASS

Any Competitor failing safety / technical inspection will forfeit Competitor status and may be required to remove their robot from the premises for the duration of the tournament.

5.3 RADIO FREQUENCY MANAGEMENT

5.3.1 USE OF FREQUENCY CLIPS

To prevent interference between robots, one antenna clip is provided for each of the frequencies used by Competitors. Before their transmitter is turned on, the Competitor must obtain the appropriate clip for his or her frequency and attach it to the transmitter antenna. Clips are obtained from the Tournament Frequency Coordinator. This clip must remain attached at all times while the transmitter is on. After the transmitter has been turned off, the clip is returned to the Frequency Coordinator. Unless otherwise authorized by a Tournament Official, use of a transmitter without a frequency clip can result in disqualification and expulsion from the tournament forfeiting all passes and entry fees.

5.3.2 SPREAD-SPECTRUM RADIOS

There are several commercially available hobby radios using 900 MHz or 2.4 GHz spread-spectrum technology. These include the “Nomadio” and “Spektrum” products among others. These radios use techniques such as dynamic channel allocation and/or frequency hopping to avoid interference and numerically keyed transmitters and receivers to “bind” a specific transmitter and receiver together. These and similar radios do not require frequency clips. Their use is allowed, and in fact highly recommended.

5.3.3 CUSTOM RADIO SYSTEMS

Custom radio control systems based on spread-spectrum technologies may also be exempted from radio frequency management. Contact the event if you are using a custom radio control system that may qualify.

5.4 PITS

5.4.1 PIT ACCESS

All Team members have access to the pit area. Additional personnel (above the 5 team members permitted) is not allowed.

5.4.2 PIT BEHAVIOR

While it is impossible to list all the safety / behavior requirements of the Pit area, competitors should practice common sense and good sportsmanship at all times. Any competitor violating any of the safety rules is subject to immediate disqualification and removal from the event forfeiting all passes and entry fees as well as being banned from future events.

5.4.2.1 SPECIFIC REQUIREMENTS WHILE IN THE PITS:

1. All robots' wheels shall be lifted off of the ground so that they are suspended in air. This is to prevent runaway bots.
2. Under no circumstances shall a robot that employs pneumatic/hydraulic systems be pressurized in the pit area. A robot may only be pressurized in the Arena or in a designated area just prior to their match.
3. Gas supply cylinders in robots must be emptied before the robot is moved to the pit. . An exception may be made when the next match for a given robot will occur within an hour of the match just ended. Competitors may fill their supply tanks one hour prior to the scheduled time of their next match.
4. Keep all sharp objects and edges covered at all times in the pit.
5. Welding and grinding is not allowed in the pit area. A designated welding / grinding area will be made available.
6. Make sure the tournament Frequency Coordinator is aware of your radio frequency(ies) and channel(s). Do not use your radio at any time without first obtaining and attaching a frequency clip (See 1.7).
UNAUTHORIZED USE OF TRANSMITTERS IS GROUNDS FOR IMMEDIATE DISQUALIFICATION AND REMOVAL FROM THE PREMISES FORFEITING ANY AND ALL PASSES AND ENTRY FEES. Any violators are subject to disqualification from future events.
7. As safety issues arise during a tournament, the tournament staff can and will modify the rules regarding safety as set forth in this document and make them effective immediately. A flyer will be placed at each pit table indicating the rule change and the effective time of the change. Anyone found in violation shall be subject to disqualification.
8. Be safe. Keep your fellow Competitors safe. Have a good time.

5.4.3 COMPRESSED GAS STORAGE AND TANK FILLING

Compressed or liquefied gases for use in pneumatic systems will be stored in approved cylinders at a designated location in the tournament venue. All compressed gas cylinders will be stored upright and secured to a rigid support with a safety chain.

A tournament safety official will supervise the filling of all compressed or liquefied gas supply tanks.

5.4.4 TESTING

An area for testing purposes may be provided for all Competitors. If such an area is provided a Tournament Staff Member will supervise the testing area. This Official will control entry and exit from the testing area, the testing area schedule, and what type of testing may be safely executed.

5.4.4.1 DRIVING ROBOTS ("TEST DRIVES")

The testing area is not intended for use in testing robot mobility or providing driving practice. Competitors that can show a legitimate need to operate their robot with the wheels on the ground may be allowed limited test driving at the discretion of the event Safety Director. This will normally take place in the arena, but may be allowed elsewhere if a sufficiently protected space is available at the venue.

Absolutely **no** driving of robots outside of the main arena will be allowed at any event without the prior consent of the Safety Director and direct supervision by the event staff. Any violators are subject to immediate disqualification and removal from the event.

5.4.4.2 DRIVE TRAIN TESTING

Competitors may perform drive train tests with the robot's driving mechanism (wheels, legs, treads etc.) clear of the ground such that no movement of the robot is possible. Wheels-up drive train testing will normally be performed in the testing area. Trivial tests (e.g. briefly running the drive train to verify control) will usually be allowed at the competitor's pit table, at the discretion of the Safety Director.

5.5 PRE-MATCH PROCEDURE

Teams are called to the pre-match staging area at least 10 minutes before the start of their match. At 1 minute before the start of a match, the Arena staff will call the teams to load their robots. Any robot not present in the pre-match staging area when called will be "out" for the first quarter.

When the robots are loaded the arena staff will signal the teams to turn their robots on. The team farthest from the door will be called first, and will exit the arena after powering on. The team nearest to the door will be called last and will exit the arena after powering on. No robot shall be turned on before the arena staff signals the team to do so by calling "<x> TEAM, POWER ON, where "<x>" is FAR or NEAR. If a robot is powered on before the arena staff calls for it is OUT and will be removed from the arena for that quarter.

When all robots are powered and all personnel have exited the arena, the door will be closed and locked and the arena systems enabled. The match is then turned over to the referee who will verify that the teams are ready, and start the match.

5.6 POST-MATCH / QUARTER PROCEDURE

At the end of a quarter the arena staff will disable the arena systems and unlock the door. Each team will enter when called and, power off, and remove their robots. Robots will be powered off and removed based on their position relative to the arena doors, with the closest robot first, then the next closest, and so on.

No team member shall enter the arena until called by the arena staff.

Robots unloaded at an intra-quarter break will be moved to the post-match staging area. When all robots have been moved to the post-match staging area the 10 minute break timer will start and the teams may service their robots.

5.7 INTRA-QUARTER BREAK PROCEDURE

Teams have 10 minutes between quarters to remove their robots from the post-match staging area, service them, and return them to the pre-match staging area. Any robots NOT in the pre-match staging area when the 10 minute time expires will cost that team **2 points** for each minute or part thereof until all of the teams robots are present.

When all robots are present in the pre-match staging area arena loading will proceed as for the beginning of a match.

6 DETAILED GAME RULES

6.1 THE BALL

The ball is a 6" diameter black polyethylene sphere with an offset weight inside. The ball is made from a tank float, McMaster-Carr Part #8154K11. The threaded nipple is removed, ¼ lb of sand is added and the float is filled with expanding rigid foam ("Great Stuff" or the equivalent).

6.2 THE GOAL

Each goal is a 6.25" diameter hole in a flat steel plate angled at approximately 30 degrees with respect to the arena floor. The goals are on the center line of the arena approximately 1 foot from each end wall.

6.3 ROBOT STARTING POSITIONS

At the beginning of a new quarter all robots must be positioned behind an imaginary line passing through the rear edge of the pit at their end of the arena. The robots can be placed ANYWHERE behind this line.

6.4 PLACING A BALL IN PLAY

When play commences at the beginning of a quarter a new ball is released onto the "Ball Tee" located in the center of the ½ court line in the arena.

When a goal is scored the ball is returned to play automatically 5 seconds later by pneumatic cannons located in each goal. When the ball returns to play the Half-court Rule applies (see below).

When the ball goes out of play for any reason a timeout is called, the ball is repositioned on the playing service adjacent to where it went out, and play resumes using that ball. Prior to the resumption of play all robots must move at least 5 feet away from the ball. The Half-Court Rule **does not apply** in these situations.

6.5 SCORING

6.5.1 SCORING ON THE SERVE

A goal shall count for **5 points** if it scored directly from the Ball Tee without intervening possession by the defending team.

6.5.2 SCORING FROM PLAY

All other goals shall count for **3 points**.

6.5.3 EJECTING AN OPPONENT

When a robot from one team forces a robot from another team out of the arena through the rail opening, the aggressor team shall score **3 points**. In the event that both robots leave the arena the robot that hits the ground first shall be considered the defender and the robot that hits the ground second shall be the aggressor. The referee shall make the call.

6.5.4 DISABLING AN OPPONENT

When a robot from one team directly disables an opponent (e.g. renders the opponent inoperable) the aggressor team shall score **1 point**. A robot is deemed inoperable if the driver cannot drive the robot in a direction indicated by the referee when asked to do so. The referee shall determine whether the bot is stranded or disabled if necessary by observing the robot to see if the drive train moves on command.

6.5.4.1 STRANDING

Stranding an opponent shall not be considered disabling. A robot is *stranded* when it is placed or lands in such a way that it cannot move even though the drive train moves on command.

6.6 POSSESSION TIMER

A team may control the ball for a maximum of 20 seconds without scoring. "Possession" is defined as clear control of the ball. The possession timer starts when a team takes control of the ball and is reset each time control of the ball changes hands.

If the possession timer expires a time-out shall be called. The ball will be placed on the arena floor where it stands and all robots will back away at least 5 feet, after which play will resume. When resuming play the Half-Court Rule applies.

6.7 HALF-COURT RULE

Before the ball can score it must cross the half-court line.

6.8 TIME OUTS

Other than time-outs called by the referee, play will be continuous.

The referee will call a time-out when:

- The ball leaves the arena
- The ball becomes stuck in an inaccessible or unplayable position
- Play needs to be stopped for any other reason

6.9 OFFICIALS

Play shall be monitored by one or more referees. In the event that there is more than one referee, one referee shall be designated as the primary referee and will make the final call in the event of any disputes. Referees' decisions are final.