Overview

This document outlines the requirements for any Team that intends to build a bot and compete in the 2015 BattleBots Tournament (the "**Tournament**"). The following rules have been constructed to be as unrestrictive to the bot-building process as possible while balancing fairness to all competitors, arena damage, event-scheduling issues, and the safety of all competitors, crew, and audience members. Changes from Rev 1.0 are indicated with blue text.

Nothing contained herein shall be construed as an official invitation to join and/or compete in the Tournament. BattleBots Inc. ("**BattleBots**") must approve your bot's design prior to the commencement of any building activities. If your bot has been approved by BattleBots for use in a prior tournament, that does not guarantee that that same bot will be approved for use in this Tournament. Once the design of your bot has been approved, you will receive further instructions and documentation.

Section 1. BattleBot Basics

a. Mobility

A BattleBot can be a walker, roller, hopper, flier, slitherer, or whatever, as long as it moves around in a controlled manner without causing damage to the arena.

At a minimum, we would like your bot to be able to move around at a fast walking pace (~4 mph), but preferably MUCH faster. If your bot is slower, we expect it to have a really awesome weapon (or two).

b. Bot Control

You must have reliable remote control over all of your bot's functions and positions. Autonomous functions in the bot are acceptable, provided you are able to remotely disable or override those functions at any time.

c. Weapons

Whether it's a flipper, pounder, whacker, grabber or whatever, your bot must have at least one powered weapon that can seriously affect the operation of another BattleBot. Bring spares and/or alternate (modular) weapons. If your bot does not enter the arena with a functional weapon, you will forfeit your match.

d. Configuration

A BattleBot can actually be a group of two or more bots. Each bot must meet the requirements described in this document, but only one of the bots must have a weapon. And of course, the total weight of all the bots cannot exceed the limit set forth herein.

There is no maximum size limit; however, your bot must be able to fit through the 8' x 8' arena door.

e. Component Protection

Batteries, high-pressure tanks, fuel tanks and fuel lines must be sufficiently protected. If you (or we) can jam the blade of a long screwdriver through the outer shell/frame of the bot and hit a battery, pressure tank, fuel tank or fuel line, it is not sufficiently protected.

f. Floor Clearance

There is no specific requirement for the clearance underneath a bot; however, the arena floor may not be flat and the floor panels may not all be the same height. In addition, there may be "pop-up" obstacles at least 1 inch tall.

Section 2. Weight Limit

a. Maximum Weight

The maximum allowed weight is **250.0** pounds. There is no minimum weight.

Your bot's final official weight will be measured on our certified scales at the Tournament. Any weight measurements you have taken at home, or otherwise, will not be applicable. Note that scales can vary by 5% or more -- if your bot is overweight, you will have very little time at the Tournament to correct it. It is strongly recommended that you design your bot underweight and bring ballast.

b. Weight Exclusions

- Safety covers and restraints do not count towards the weight of your bot.
- If you (or we) install one or two *small* cameras on your bot, the weight of such cameras shall not count towards the weight limit of your bot.
- If we install a telemetry package into your bot, the weight of such telemetry package shall not count towards the weight limit of your bot.

Section 3. Activation/Deactivation

If your bot is not easy and safe to activate and deactivate, it will not be approved. We are VERY strict about this.

Activation and deactivation must be done by one person and within the maximum amount of time permitted herein.

a. Master Switch

The Master Switch location and its access should be one of the first things you think about when designing your bot.

The Master Switch requirements are:

- It must cut off all electrical power to the bot (excluding only cameras and telemetry).
- Switch operation must be simple enough to allow any event crewperson to use it.
- Switch operation cannot require any lifting or tilting of the bot.
- Switch operation cannot require that a person get in the path of any weapon.
- The master switch cannot be located inside any spinning enclosing shell.
- A special tool may be used to operate a Master Switch. If your bot requires a special tool to operate a Master Switch, you must bring a spare tool.

Two (or more) master switches are allowed, so long as all can be operated within the Activation/Deactivation time limit.

Insertable/removable jumper plugs are an approved (and preferred) alternative to Master Switches.

b. Activation

It cannot require more than thirty (30) seconds to activate the bot (including removal of safety covers and restraints and operation of the Master Switch).

When the Master Switch is turned on, there must be no motion at all by the bot or its weapons.

c. Deactivation

When your bot is deactivated, it must be incapable of moving or operating any of its weapons. Deactivation cannot require more than thirty (30) seconds.

If the bot has just been seriously damaged in combat, the deactivation time requirement may be waived for that match, but the bot must be otherwise rendered safe before removing it from the arena.

Section 4. Electrical System

a. Maximum Voltage

The maximum allowed voltage anywhere in the bot is 220 volts. However, if your bot uses voltages higher than 48 volts nominal, you will have to convince us that you know what you are doing, and we reserve the right to reject your bot's design for failure to meet our safety requirements.

b. Batteries

Any type of commercially available battery may be used. If your bot uses lead-acid batteries, they must be factory-marked as AGM-type.

Protect your batteries well. If your batteries catch fire during a match, the arena may (at the sole discretion of the BattleBots crewmembers) be sealed off until the fire has burned itself out and the fumes have cleared.

Section 5. Remote Control

All bots must use a commercially available remote control ("**RC**") system that uses a form of Digital Spread Spectrum ("**DSS**") communication with automatic pairing between the transmitter and receiver.

There are many systems and conversions available. A good commercial DSS system is virtually immune to interference. It is your responsibility to confirm that your RC equipment cannot interfere with any other RC system operating on the same frequency.

Your control systems have to be designed such that if your transmitter(s) lose power or are turned off, your bot and its weapon(s) will stop moving.

We will verify your system at the Tournament. If your RC system interferes with other systems at the Tournament, you may be disqualified.

If you have elaborate RC transmitting station equipment, you will have sixty (60) seconds to set it up and sixty (60) seconds to remove it.

Section 6. Construction Materials

Basically, we do not want your bot to upset the EPA or the CDC. We also do not want to have to clean up a big (or toxic) mess after a match.

a. Prohibited Materials

This is not a comprehensive list. Be sensible. Check with BattleBots if you are unsure whether or not materials used on your bot may be prohibited.

- Radioactive materials.
- Hazardous loose fibers (asbestos, etc.). Carbon or fiberglass composites are OK.
- Toxic or reactive metals (e.g., Cadmium, Mercury, Lithium), except in batteries.
- Organic anything (except in batteries).

b. On the Bot Exterior

Stuff on the outside of your bot should not foul up the arena when it's fighting another bot. This list is also not comprehensive, so be sensible here too. Not allowed are:

- Lead metal (Pb).
- Rigid plastic foams (PVC, Polystyrene, Polyurethane, etc.)
- Glass or brittle ceramics

Section 7. Active Weapons

Every bot must have a real weapon (or multiple weapons). If the weapon does not look like it can damage or incapacitate another bot, your bot may not be accepted.

a. Weapon Definition

A weapon is a powered part of your bot that is remotely operated, independent of its mobility method (wheels or otherwise). The weapon can be used in conjunction with moving the bot, but the basic effectiveness of the weapon cannot depend on moving the bot. Wedges, Thwackbots and such are allowed, but are not weapons by themselves.

b. Projectile Weapons

Projectile weapons are allowed, as long as they do not create an arena-fouling problem. Projectile weapons must not use explosives. Springs, catapults and gas-pressure powered guns are acceptable.

c. Multiple Weapons

A bot can have more than one weapon, but at least one of the installed weapons must display the ability to damage or incapacitate.

The use of interchangeable (modular) weapons is encouraged. However, the bot cannot weigh more than the maximum limit regardless of weapon configuration.

d. Flaming Weapons

Flaming weapons are allowed, but the basic limits are:

- Only two fuel types are allowed: **propane** or **butane** gas.
- The flame effect may be started and stopped at will using the remote control.
- The pressure tank must be protected.
- The length and upward angle limits of the flame must be adjustable in order for BattleBots to minimize the risk of damage to the clear plastic arena walls.

e. Spinning Weapons

Spinning weapons must have a fail-safe that causes power to be removed from the spinning part(s) if the RC signal is lost.

Spinning weapons must spin down from full speed to a full stop within sixty (60) seconds on command from the remote controller, or if the RC signal is lost.

f. Prohibited Weapons

The following weapons are not allowed under any circumstances:

- Squirting glue, throwing out fishing line, ball bearings and such.
- EMP generators or other means intended to damage or jam the opponent bot's electronics.
- Deliberate smoke generators.
- Bright lights, lasers, etc., that are distracting or dangerous to vision.
- Weapons that damage the other bot by destroying themselves.

Section 8. Internal Combustion Engines

Internal combustion engines are allowed, but with the following requirements:

- The engine must use a self-starter that is activated by remote control.
- Any electric fuel pumps must be able to be shut off by remote control.
- If the engine uses a separate fuel tank, the tank and fuel line must be well protected.
- The fuel tank must be vented (no pressurized tanks) with a vent system that will not continuously leak fuel if the bot is upside-down.

Section 9. Pneumatics

Pneumatics can be dangerous. If you are not familiar with pneumatic systems, use another energy source for your weapons. Requirements for any pneumatic system are:

- Systems can use Nitrogen (N_2) gas or compressed air. CO_2 cannot be used.
- The maximum allowed stored pressure is 3000 psi.
- The maximum allowed regulated system pressure is 400 psi.
- There are no specific restrictions on the system design; however, the pneumatic system must use best practices and commercially available components that are rated for the operating pressures used.
- On-board air compressors that fill a buffer tank are allowed and preferred over stored N_2. In a match, you may start pressurizing after the arena has been closed, but prior to the start of combat.
- You must have a way to shut off or purge the pneumatic system as part of the deactivation procedure.
- Nitrogen pneumatic systems have to be designed to be filled using a Foster FST-series 12MPS straight-through stainless steel quick-disconnect male plug fitting. An exact equivalent fitting from other manufacturers is also acceptable.

Pressures above the stated limits may be approved if you can convince us that you have the necessary knowledge and experience to safely engineer such a system.

Section 10. Hydraulics

Requirements for any hydraulic system are:

- The maximum allowed system pressure is 3000 psi. A higher limit may be approved if you can convince us that you have the necessary expertise to engineer a reliable and safe system.
- The hydraulic fluid must be non-flammable, non-corrosive, have moderate-to-low toxicity, and be rated for the maximum pressure used in the hydraulic system.
- There are no specific restrictions on the system design; however, the hydraulic system must use best practices and commercially available components that are rated for the operating pressures used.
- Hydraulic reservoir tanks must be protected within the bot.
- You must have a way to de-pressurize the system as part of the deactivation procedure.

Section 10. Handling Safety

Any sharp edges or corners that could injure someone must have a removable protective cover that cannot be accidentally knocked off (e.g., fastened covers).

If a weapon or other part of a deactivated bot can move such that it could injure a person, it must have some built-in or external method of preventing such movement.

If we decide that your covers or restraints are not adequate, you will not be allowed to move your bot from your pit area to the arena.

Also, you'll not be allowed to hand-carry your bot anywhere during the Tournament. BattleBots Inc. may supply a limited number of pallet-style dollies, but it would be wise to bring your own hand-truck or custom dolly.

Section 11. Telemetry Package

BattleBots Inc. may choose to install a self-powered telemetry package into your bot. As such, you need to leave room in the bot for a module approximately the size of an iPhone 4.

Section 12. Appearance

Your bot may be seen on national TV and they have broadcast standards. BattleBots and its affiliates reserve the right, in its sole and absolute discretion, to require changes to, or elimination of, any design elements, graphics, or wording on your bot.

These rules may change at any time with or without specific notice to you. Any changes made to these rules will be noted in a revised Design Rules document. You acknowledge and agree that it is your responsibility to read, understand, and comply with any and all rules provided herein or otherwise by BattleBots. It is strongly encouraged that you check the Design Rules often for any changes that may affect your design, build, and/or ability to compete in the Tournament. BattleBots reserves the right disqualify any team from the Tournament for any reason (including, without limitation, failure to meet safety and/or technical requirements) in its sole and absolute discretion.