General NERC Rules*

Wheels

- A robot is considered to be wheeled if those parts of the robot which touch the ground and either cause it to move or support some or all of its weight undergo unrestrained rotation around a horizontal axis during the normal operation of the robot's drivetrain. This includes all forms of wheels (including noncircular, spoked, or offset-axis wheels) as well as continuous track or belt drive systems.
- Robots that rely on a thrust method other than mechanical friction with the floor (such as thrust-generating fans, electromagnetic interaction with the surroundings, or reaction forces from gas jets or hurled projectiles), will not be considered walkers or shufflers. This is true even if the robot rests on an air cushion or skids rather than wheels.
- Robots that float or fly are not allowed. Hovercraft robots are allowed, but are subject to wheeled weight limits. A jumping bot that has no wheel driven locomotion and otherwise conforms to the walker definitions may receive the walker weight bonus. Keep in mind, the controlled movement and minimum speed requirements must be met.

Shufflers

- If a robot is supported and/or propelled by parts that do not normally undergo continuous unrestrained rotation around a horizontal axis, but uses a system of mechanical devices such as cams or crankshafts to generate reciprocating motion of those parts from one or more continuously rotating drive shafts, it will be considered a shuffler. The defining feature of a shuffler (versus a walker) will be the ability to generate continual forward motion of the robot from continual rotation of its drive motors. Shufflers typically have electrical control systems indistinguishable from those on wheeled robots.
- Shufflers may weigh up to 50% more than their standard class weight limit.

Walkers

- Walkers are those robots in which multiple linear or limited-travel rotary actuators are intermittently driven to produce linear travel of the robot. Actuation may be through electric, pneumatic, or hydraulic means. Walkers must have no parts normally in contact with the ground undergoing continuous rotation, and must

require some change in timing or sequencing of the driving mechanisms in order to reverse direction. Walkers will typically have control systems significantly more complex than those found on shufflers or rollers, involving multiple actuators, servos, or valves running through a specific sequence to produce motion.
- Walkers may weigh up to 100% more than their standard class weight limit.

Minimum Speed
- All bots less than 12 lbs have no minimum speed requirement.
- All 12 lb bots must be capable of a linear speed of 16 feet per minute. This requirement must only be met during initial inspection. This rule is not a means to disqualify any competing bot or to determine the winner of a bout.

Multibot
- Multi-bots are legal. They do not need to 'snap' together in any way, but they do need to conform to all rules and regulations. If all members of the multi-bot team are walkers, they follow the walker weight limit. Multi's that are a mixture of walking/rolling robots follow rolling weight guidelines.
- The entire multibot will be considered KO'd if 50% or more of the bot by weight is KO'd. Each section of a multi-bot will be weighed separately and the judges and opponent will be informed of the weights. A portion of the multi-bot may not compete in another weightclass during the same competition.

Radio Control
- Robots must be radio controlled and use ground frequencies (27/49/50/75/900). These are the ground frequency bands and is a matter of federal law. Tethered control is not allowed.
- All bots must have a failsafe for weapon and drive. When the drivetrain and weapon are powered and the radio transmitter is then turned off, the drive and weapon must come to a stop and remain motionless.
- Having two or more frequencies available is STRONGLY recommended. If alternate frequencies are not available and a conflict arises, one robot may forfeit voluntarily or a coin toss may be used to determine the winner.
- Radios may not be turned on for any purpose without obtaining the appropriate frequency clip from the frequency board.

Master Kill Switch

- **All bots** must have a manually operated master kill switch or removable link. This switch or link will shut off main weapon and drive power. Simply turning off the receiver is not sufficient. A remotely operated relay or contactor to break main power does NOT fulfill the killswitch requirement. The switch or link must be quickly and easily accessible. Having to remove armor panels etc. to access the switch is not acceptable.
- A single switch or removable link is preferred, but two switches/links will be allowed if they are easily accessible.

Safety/ Inspection

- All entries will be required to pass a safety inspection before competing. All operating principles must be clearly explained and demonstrated during this inspection. All robots must be on some type of 'stand' to keep drive wheels off the ground while in the pit area.
- The judges reserve the right to disqualify, at any time, any robot that poses a threat to anything other than the arena surface or its opponent(s). If you have a questionable design, please consult with NERC before constructing your robot.
- Weapons must have a safety cover on any sharp edges.
- Weapons that could harm a person outside the arena must have some kind of mechanical locking device in case of accidental activation.
- There will be absolutely NO testing of robots outside the enclosed arena. Robot weapon testing MUST be carried out under the supervision of a NERC official with the appropriate frequency clip.
- Robots running pneumatics or hydraulics must stay within the specified ratings of the system parts. Documentation and proof of operation will be required. A gauge to display operating pressure is required. **All pneumatic and hydraulic systems must be approved by a NERC official**. **Contact NERC PRIOR to the event with your system's specifications.**

Batteries

- Batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCads, NiMH, or dry cells). Internal combustion engines are NOT allowed.

Banned Weapons

- - Liquid projectiles
- - Any kind of flammable liquid.
- - Flame-based weapons.
- - Any kind of explosive or intentionally ignited solid.
- - Nets, tape, glue, or any other entanglement device.
- - Radio jamming, tazers, tesla coils, or any other high-voltage device.
- - Un-tethered projectiles

*The wording of some rules has been modified to be relevant to this competition, namely, weight class specific rules. For the official NERC rules please visit http://www.nerc.us/rules.html.

Competition Specific Rules

All bots must have an active working weapon at inspection.

One bot per weight class per team will be allowed.

Revision History

Version	Date	Change Summary
1.0	2018/12/29	Initial Release