

# CRBL RULESET

## Design Constraints: updated May 2024

- The weight limit is 2 pounds (907 grams). All robots will be weighed in prior to competing.
- The size limit is 45x45x45 studs.
  - Robots are allowed to be larger than the size limit only if the builder can explain why this is necessary for the function of the primary weapon, and gain approval from officials prior to the event.
  - Robots are allowed to extend out of the 45x45x45 stud limit during a match, as long as they fit at the start of the match.
- There is no limit to the number of electronic components used.
- Robots using non-wheeled drive (crawlers, shufflers, tank treads, etc.) gain a 250-gram weight bonus. This bonus also applies to robots using mecanum or omnidirectional wheels.
- Unless stated as an exception, all entrants must be made entirely from unmodified LEGO brand parts.
- Lego brand parts must be parts. Cardboard boxes, instructions, and other separate items made by LEGO should not be used.
- Because parts often break in combat, damaged parts are not considered modified. Damaged parts are only allowed to be used if they are not used in a way that would not be possible with a brand-new copy.
- In an attempt to reduce friction wear on parts caused by movement within the mechanism of a design, a small amount of plastic-safe lubricant is allowed.
- Third-party power sources are allowed, assuming they leave no LiPos or other batteries exposed. For safety measures, all third-party batteries must have a built-in current sensor that will prevent overcurrenting (overcurrent protection).
  - Approved third-party batteries include the BuWizz 2.0 and the BuWizz 3.0. All other batteries must be approved prior to the registration deadline.
- All LEGO brand battery packs must have the battery covers inserted.
- Robots using only unmodified LEGO brand batteries gain a 250-gram weight bonus.
- Due to the discontinuation of previous LEGO motors, third-party clones are allowed.
  - Third-party motors must match the dimensions of LEGO motors.
  - Approved third-party brands for motors are BuWizz and Green Gecko. All other motors must be approved prior to the registration deadline.
  - The torque of a third-party motor must not exceed 150% of the torque of a Lego brand equivalent. Likewise, the RPM of a third-party motor must not exceed 150% of the RPM of a Lego brand equivalent.

- BuWizz motors are the only allowed clone motor for powering high-speed kinetic weapons. This rule is a safety measure to prevent overheating other alternate motors designed to run at voltages provided by standard Lego batteries.
- Each third-party electrical component will face a minor weight penalty.
  - Third-party clone motors receive a 10-gram penalty per motor
  - BuWizz motors receive a 30-gram penalty per motor
  - Each third-party battery after the first will receive a 50-gram penalty.
- The maximum weight penalty for a design is 100 grams.
- The maximum weight bonus for a design is 300 grams.
- Third-party Power Functions to Powered Up adaptors are allowed
- Due to the discontinuation of the part “metal train axle x1687” in 2019, third-party alternatives are allowed. Third-party alternatives to the metal train axle must be indistinguishable from the LEGO equivalent.
- Robots are allowed up to 50 grams for aesthetics. These features must be used for the purpose of decorating the robot and cannot be used to benefit the design in any other way. For example, brick-built walls that add an additional layer of armor do not factor into this bonus, aesthetically pleasing or not.
  - Any opponent may request the removal of any decorations from another design prior to a match if they can explain why the aesthetics will change the outcome of the match.
  - Stickers are allowed only for the purpose of decorating the robot. Stickers may not be used in any other way, and they may not hold several parts together.
  - Decorations added onto a design that would not fit under the weight limit without this bonus must be approved by the organizer before fights begin.
  - To encourage artistic designs, entrants that use 40 or more grams of the aesthetics bonus gain an additional 15-gram weight bonus that can be used in any way.
- The following systems and items are not allowed:
  - Magnets.
  - Anything purposely designed to damage the arena.
  - Anything designed to interfere with radio signals from an opponent’s controller.
  - Anything intentionally designed to cause the need for unsticks.
  - Glue. Absolutely no glue allowed!
- Any design that is permitted through a “loophole” in the rules and is classified by CRBL staff as unsafe, unsportsmanlike, or destructive to the competition in any way will not be allowed to compete.

### **Weapon Rules:**

- All robots must have at least one active weapon. Active weapons are classified as any motorized system designed to win the fight.

- The following weapon types are not allowed:
  - Fire.
  - Liquids.
  - Heat weapons.
  - Weapons designed to jam or entangle an opponent's weapon.
- Metal parts are allowed in weapons, but they may not be used as a contact point.
- Third-party string and rubber bands are allowed for use in the weapon mechanism. String and rubber bands (LEGO brand or third party) may not be used for other purposes such as holding parts together, creating protective layers outside of the frame, etc.
- Battery packs filled with any batteries are not allowed in the weapon itself.
- Third-party pneumatics are allowed only if the dimensions match those of their LEGO counterparts.
  - Air ports are allowed to be drilled to custom sizes.
- Robots using pneumatics to power their primary weapon gain a 100-gram weight bonus
- Robots designed with only unmodified LEGO brand pneumatics will instead gain a 150-gram weight bonus.

### **Multibot rules:**

- Multibots are classified as two independent robots registered under the same name.
- Only one robot in a multibot entry needs an active weapon.
- Multibot entrants gain a 225-gram weight bonus.
- There is no limit to the number of robots in a multibot entry, as long as the team has enough drivers.
- The difference in weight between robots in a multibot pair must not exceed 250 grams.
- In order for a multibot to be applicable for a weight bonus, both robots must be eligible. For example, creating a multibot pair that includes one wheeled and one non-wheeled design does not gain the non-wheeled bonus. Both robots would need to be non-wheeled to be eligible for this weight bonus.

### **Safety:**

- If a battery becomes exposed, the match is over. The robot that loses its battery loses the match by knockout.
- In the event of any emergency situation, the fight will immediately be stopped and resumed when conditions are made safe. If the fight cannot be resumed for any reason, it will be brought to a judges' decision.
- High-speed weapons are not to be tested outside of the arena. Doing so will result in a warning, and then a ban from the competition if repeated.
  - Robots are allowed to test high speed weapons inside of the smaller test box.
- Any competitor that aims for and hits a dislodged battery lying on the floor will lose the match and be removed from the competition. This does not include accidental hits.

- All robots must pass safety before being allowed to compete. This process includes the following:
  - A weight and size check
  - A drive and weapon test done inside the arena
  - Inspection of the electronics; all of the electronics inside the design must be made visible and approved
- Safety will close at 9:00 am on the Saturday of the event.

### **Match rules:**

- The match length is two minutes.
- After two minutes, the winner will be announced based off of a judges' decision.
- A match will end early in the event of a knockout if a robot cannot show forward directional movement.
  - "Crab walking" with only one side of working drive counts as directional movement if the robot can make its way to the opposing robot.
- If both robots become incapacitated at the same time, a double knockout will occur and the winner will be declared by the judges.
- If a robot is hit out of the inner playing area, a knockout countdown will take place.
- During a rumble, all but one of the robots must be incapacitated for a knockout victory to occur.
- If two robots become stuck in a way in which they cannot separate for 10 seconds, the match will be paused for a manual unstick. This differs from pins and grapples where one robot holds another intentionally for a limited time.
  - During an unstick, all weapons must be stopped and controllers must be placed on top of the arena.
  - Officials may request the removal of certain parts after an unstick to prevent the robots from getting stuck later in the match.
  - If a competitor moves during an unstick or uses their weapon, they will forfeit the match
- There will be only one manual unstick per match. If another unstick is required, the match will go to a judges' decision.
- A competitor is allowed to hold a pin for 10 seconds. A pin occurs when a robot holds an opponent against the wall or in any other stationary position. After 10 seconds, the opponent must be released.
- A competitor is allowed to grapple for 20 seconds. A grapple occurs when one robot maintains complete control over another while driving around. After 20 seconds, the opponent must be released.
- A robot must not leave its starting square or power its weapon during the countdown to begin the match.

- A false start may occur if a robot does not function properly at the beginning of a match. In this case, the match will be restarted.
- Competitors are allowed to tap out/forfeit a match in order to save time on repairs.
- Attacking an opponent after the end of a match will result in a forfeit loss.

## **Judging**

- When a fight goes to a judges' decision, judges will declare a winner using an 11-point system. This is composed of 5 points for damage, 3 points for aggression, and 3 points for control.
  - Damage: The amount of damage a robot has taken. This includes self-inflicted damage and any success in immobilizing another design. In a fight with little or no damage, judges may consider the effectiveness of weapons throughout the match.
  - Aggression: How often a robot intentionally makes use of its primary weapon.
  - Control: How well a robot controls the pace and tempo of the match.
- In a close match, judges may request to inspect the damage on each robot before they are picked up by the driver.
- During a rumble (classified as a match with three or more entrants), a winner will be determined by a crowd vote based on cheering.
- All judges' decisions are final.
- Judges are not required to share their scorecards with the audience or competitors.

## **Liability:**

- By entering the competition, the builder acknowledges that:
  - Opponents and event staff are not responsible for damage caused to their design. There is yet to be a CRBL event where parts have not broken.
  - The safe handling of a design outside of the arena is the responsibility of the builder.
  - All robots must pass safety before being allowed to compete.
  - Event organizers may remove any competitor for unsafe conduct or any behavior that is destructive to the convention.
  - Fights will be filmed and uploaded onto YouTube. Robot drivers will very likely be seen on camera.
  - All robots must be approved no later than 2 weeks prior to the event to ensure that they meet the design criteria and to provide enough time for a tournament bracket to be made. Robots submitted later may be left as reserves.

For questions regarding the CRBL ruleset, please contact us at [crbl.arena@gmail.com](mailto:crbl.arena@gmail.com)