



Rocky Mountain Robotic League 2020 COMPETITION March 17, 2020

RULES & REGULATIONS

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1.0 Introduction

1.1 RMRL

The Rocky Mountain Robotics League (RMRL) is a manufacturing workforce development program of the Northern Utah National Tooling & Machining Association (NUNTMA) and the National Tooling & Machining Foundation (NTMF). The RMRL is a job-driven, project-based STEM learning program that energizes students to learn about the manufacturing process and the technical skills needed for the design and fabrication of a 15lb Bot to battle in a gladiator-style competition.

The student teams are encouraged to build partnerships with local manufacturing companies and post-secondary institutions during the Bot building process. This provides the students with direct application of classroom concepts to real world manufacturing situations. The RMRL endows students with the 21st century skills needed by industry including project and time management, teamwork, problem solving and critical thinking. As a result of participation in the NRL program and interactions with industry mentors, students discover the excitement and rewards of a career in manufacturing,



1.2 RMRL Vision & Mission

The vision is for every student in Utah to consider manufacturing as a viable career option.

The mission is to provide an exciting, hands-on experience through business/education partnerships to build the current and future workforce needed by the manufacturing industry.

1.3 Yearly RMRL Competitions

Regional Competitions are managed by local NTMA chapters and affiliated organizations. The dates, times and locations of the Regional Competitions are decided by the individual local organizing entities and are posted on the NRL website.

The National Competition will be held annually during the 3rd weekend of May. The NRL Organizing Committee and NTMA Staff will determine competition dates and location.

1.4 Contacting RMRL

For questions, comments, requests, and clarifications regarding the competition rules, technical regulations, contact Contest Manager.

Bret Holmes
Contest Manager, (RMRL)
Rocky Mountain Robotics League
200N Washington Blvd Ogden, Utah
84404
Direct Tel: 801-395-3795 / Email: bret.holmes@otech.edu

2.0 General Information

2.1 Competition

- 15 lb. Bots compete against each other in a head-to-head match.
- The match will last 3 minutes or until one Bot is knocked out or taps out.
- The National Competition will be a double elimination tournament.
- Regional Competitions may be formatted as modified double elimination or Round-Robin depending on the number of Bots competing.

2.2 Classes

RMBL's goal is to have separate classes for middle school, high school, and postsecondary. We will be combining all three classes for competitions until there are a sufficient number of Bots in each class to separate the classes.

2.3 Teams

A team is defined by its name and its affiliated school or youth organization. A team includes at least three students and at least one adult Coach and an Industry Advisor. There is no limit to the number of students allowed on a team. If the number exceeds 5, please contact the Event Organizer prior to the Competition to ensure adequate space in the pit area. Definitions and responsibilities are as follows:

The Coach or Teacher is responsible for the students and must be at least 21 years old and affiliated with the school or organization.

An Industry Advisor is a professional that assists the team and offers them advice. They may be from a local company, post-secondary institution or parent. There is no limit to the number of teams an Industry Advisor helps or how many Industry Advisors a team has.

Students on the team must be currently enrolled at a middle school, high school, or a post-secondary educational institution. Each Student must have contributed to the design and construction of the Bot, and may be asked questions about the Bot by an RMBL representative during a competition. A Student may only be a member of one team. To form a team based in a qualified youth organization, contact the RMBL for eligibility requirements. Note: the RMBL reserves the right to request verification of current student enrollment.

It is assumed that the students do the majority of the work on the Bot with adult supervision when necessary. Non-students, including advisors, coaches, and parents, may not work on the Bot unless they get approval from the Event Organizer, or if intervening to prevent an imminent safety violation. Inadvertently touching the Bot while giving instruction, or holding the Bot while a student works does not count as working on the Bot. All teams are expected to be responsible, safe, follow NRL rules, and be respectful. Fighting, unruly behavior, and disrespectful behaviors will result in immediate expulsion from the competition.

2.4 Bot Eligibility

Bots may be used in multiple years until the team decides to retire it, or the Bot wins the National Competition twice. We highly encourage changes and improvements to the Bot if it is used in multiple years.

2.5 Resolving Problems

If there are any issues that need to be resolved, they should be brought to the attention of the RMBL

Information



Program Manager at the Regional Competition. The Program Manager will decide the outcome. The decision will be final.

2.6 Insurance

All events will have basic accident insurance coverage. Teams are advised to have their own coverage when not at an event.

2.7 Photographs and Videotaping

RMBL allows individuals to photograph and videotape the competitions. Individuals are encouraged to display the NRL logo in said photos and videos. Teams will sign a waiver stating their consent to videotaping and photography while at the competition.

2.8 Competition Awards

The following winners will be recognized at the Competition: First Place (overall), Second Place, Third Place.



3.0 Registration Requirements

3.1 Registration Agreement

The RMRL Registration Agreement is used to document the organization, team name, Bot name, and the names of the participants. This document and the registration fee must be turned into the RMRL before competing.

3.2 Registration Fee

The official registration fee for the Competition is \$0 for this years Bot event.

3.3 Bot Transport

Once a team has checked in, and their Bot has passed safety inspection, the Bot must remain in the competition/pit area until they have checked out at the end of the competition.

3.4 Documentation

Engineering Documentation is used to explain the process that a team has used to build their Bot, this documentation process also serves as a learning exercise. The documentation includes: schematics, drawings, photos, timelines, journals, etc. that show the process of building your Bot. Documentation must be submitted at safety inspection the day of the event, and will be returned to you prior to the end of the competition. A team that fails to provide engineering documentation for its Bot will not be eligible to place higher than 2nd.

Registration



4.0 Safety Rules

4.1 SafetyGlasses

Safety glasses must be worn at all times when in the pit area as well as in the arena area when your bot is competing. Standard prescription glasses do not count as safety glasses. Prescription safety glasses or safety glasses designed to fit over prescription lenses are acceptable. Standard safety glasses should not be worn over prescription lenses. This rule also applies to coaches and technical advisors. Safety is the responsibility of everyone. Non-compliance will result in a match penalty.

4.2 Bots on Blocks

Bots must always be on an approved block platform, so that the wheels cannot touch the ground/table when they are in the pit area.

4.3 PitAreaRestrictions

Only team members are allowed in the pit area. There may be restrictions on the number of people allowed in the pit area, depending on the venue. Teams with over 10 students should check with the Event Organizer before a competition to find out the pit restrictions. Aisles must be kept clear of stationary objects. If needed, teams may use the area under the table for storage.

4.4 Clothing

Everyone in the pit area is required to wear appropriate clothing and this includes closed-toed shoes and long pants. Students, teachers or advisors without appropriate clothing will be escorted from the pit area.

4.5 Adult Supervision

When any team member is working on a Bot, a supervising adult needs to be present. An adult can supervise no more than 2 teams at a time. If every team member is over 18, additional adult supervision is not required. High School students, even those over 18 years of age, are not eligible to provide adult supervision. The coach is responsible for their team members at all times.

4.6 Bot Testing

All Bot drive and weapon tests need to be performed in a test box, or arena, and NOT the pit area. Bots and controllers must not be turned on in the pit area.

4.7 Bot Transportation to the Arena

Any Bot being transported outside the pit area must have safety covers and restraints in place, and they must be completely deactivated until the Bot is placed into the arena.



Safety

4.8 Weapons

Under no circumstance may any body part be placed in the path of a weapon or other moveable Bot part, including during installation, activation or deactivation, or removal of any safety device. A Bot may never be picked up or carried by its weapon.

4.9 Weapon Restraints

Weapons must be restrained at all times, unless the Bot is in the test box or in the arena. The restraints will only be removed once the Bot has powered on successfully. Weapon restraints must be able to prevent the motion of the weapon.

4.10 Welding/Grinding

Welding and grinding are not allowed in the pit area.



Safety

5.0 Matches

5.1 Match Length

Each match will be three minutes long, unless a Bot is knocked out or taps out before time expires. In the case of Multi-Bot, this is true only when it is the “primary” Bot that is knocked out or taps out.

5.2 Tournament Placement

The placement of your Bot in the tournament brackets will be random. Minor adjustments may be made to ensure teams from the same school do not compete against each other in the first round.

5.3 Judging

Matches are judged on three criteria: aggression, control and damage. If the match lasts for the entire three minutes, the judges will decide the winner. The winner will be the Bot or Multi-Bots with the judges’ majority votes. There are three judges, each judge entitled to one vote. Judges will be using a scoring card to track the match.

5.4 Bot Unstuck Rule

Each Bot is allowed one release during the match; this means if your Bot is stuck on the floor or under an arena rail, the referee will stop the match, release the Bot without changing its position, and then restart the match. Being tossed out of the arena (i.e., over the rail, up on the rail or wall, between the rail and wall) or knocked upside down does not constitute being stuck. Multi-Bots are allowed one release total, not one release for each bot.

If both competing teams’ Bots are stuck on each other, they will be released as often as needed without changing the Bot’s position.

5.5 Bot Pinning

If a Bot pins or traps the other Bot, they must release it after the referee counts 10 seconds.

5.6 Bot Unable to Move

If a Bot is unable to move during the match, the referee will start a 10 second countdown. If that Bot cannot move by the end of the countdown, it will be considered a loss, and the other Bot will be the winner of the match. The referee will decide whether the Bot shows sufficient movement. In the case of Multi-Bots, this is true if it is the “primary” Bot. If it is not the “primary” Bot, the match continues, and there is not a countdown. If both Bots are unable to move after the 10 second countdown, the judges will determine the winner of the match.

5.7 Tap Out

If a team wishes to stop the match at any time, they may loudly declare “Tap Out.” This will be an automatic loss for that team. The other team will not be allowed to attack them after they have declared a “Tap Out.”

5.8 Postponements

Postponements will not be allowed at the Competition. At the referee’s discretion, some leeway will be given at the beginning of the match to troubleshoot transmitter/receiver linking issues.

Matches



There is not an established set time between matches; however, each team will be allowed at least 10 minutes between matches if needed. An RMBL official will inform you about your scheduled matches. Failure to be available could cause your team to forfeit.

Matches

5.10 Double Elimination

The National Competition will be a double elimination tournament. Each team is guaranteed two matches.

5.11 Rumble

If the Event Organizer feels there is time, they may announce the opportunity for a “Rumble.” Teams will then be offered the opportunity to sign up and fight against an unspecified amount of opponents. All the teams entering their Bots must have already been eliminated from the competition. The “Rumble” will last for three minutes, and the Bot with the most functionality at the end of the “Rumble” event will be declared the winner. Tap-outs will not be permitted. This is purely for fun, and this event will not affect any tournament results.

6.0 Radio Control

6.1 Spektrum DSM Controllers

NRL permits the use of Spektrum Dx6 or Dx7 controller with the BR6000 receiver. The DX6 or DX7 transmitter can be used only with the BR6000 receiver; a Bot is specifically not allowed to use the AR7000 receiver.

A blue rectangular box containing the text "Radio Control" in white, sans-serif font.

Radio Control

7.0 Inspection Procedure

7.1 Safety Inspector

Each Competition will have a Safety Inspector. This person will be responsible for the scheduling of the inspections and keeping the inspection sheets for each Bot. This person will be the main contact for any Safety Inspection related questions or comments.

7.2 Internal/Functional Inspection

Each Bot must pass both an “Internal and Functional Inspection” before competing. An “Internal Inspection” involves inspection of all of the components in a Bot. A “Functional Inspection” involves a demonstration that the Bot can safely be controlled and meets the fail-safe requirement listed in the Technical Regulations.

7.3 Official Scale

The RMRL will have a specific scale designated as the official scale for that event. Your Bot must make weight using that scale.

7.4 Inspection Time Schedule

Safety Inspection will take place only during a specified time period prior to the start of the competition.

7.5 RMRL Right to Inspect/Disqualify

The RMRL reserves the right to inspect or re-inspect your Bot at any time during the competition. Any additions or changes to the Bot must be re-inspected before competing, as well as after any significant damage during a match. If an official feels a Bot is unsafe for any reason and it cannot be made safe, it will be disqualified and not allowed to compete.

7.6 Building Cautions

Combat Bot systems can be dangerous if not designed, constructed, and tested properly. Damage during matches can render the Bot unsafe. It is ultimately the responsibility of RMRL Bot teams to ensure the safety of their system design

Inspection



8.0 Rules Enforcement

8.1 Rules Compliance

In all matters of compliance with the Rules, and any applicable civil or criminal laws, the RMRL and its officials reserve the right to penalize, or disqualify a Bot, or to warn or, expel any team or individual from the competition.

8.2 Expelled Team

If an entire team is expelled, they will be asked to leave the premise. They will also need to clear their pit table. They will not be allowed to compete in any RMRL or NRL event for the remainder of the year.

Enforcement



9.0 Rules Enforcement

9.1 Allowable Protests

The following items may be protested:

- The Safety Inspector's decision to fail a Bot during inspection
- A match forfeit due to non-availability
- Disqualification due to an inadvertent rules violation

9.2 Unallowable Protests

The following items may not be protested:

- The Judge's decision on a match
- Disqualification due to an intentional safety violation
- Disqualification due to failure to obey an RMRL official's instruction

9.3 Protest Procedure

The procedure for protesting is as follows:

- The protest must be lodged within 15 minutes of the time the event occurred.
- The protest should be brought to the Program Manager.
- All parties involved will be given a maximum of 5 minutes to present their side of the case.
- After all parties have presented their side of the case, the Program Manager will make the final decision within one hour after the presentations.
- The decision made by the Program Manager will be final.

Protests



Glossary of Terms

Aggression – The frequency, severity, boldness, and effectiveness of attacks deliberately initiated by one Bot against an opponent. If a Bot appears to have accidentally contacted an opponent, that act will not be considered aggression.

Arena – The enclosed area in which the Bots fight.

Bye – A Bot does not have to compete in a round and is automatically advanced to the next round. Byes occur in an Elimination Tournament, when it is not possible to schedule a competitor in the current round.

Competition – This is the overall process of using a group of matches to identify the winner of the tournament.

Control – The ability of the Bot to move in a specific and deliberate manner. Control means a Bot is able to attack an opponent at its weakest point, use its weapons in the most effective way, and avoid being struck by the opponent or its weapons.

Damage – Reduce the functionality, effectiveness, or defensibility of an opponent through deliberate action. Damage is not considered relevant if a Bot inadvertently harms itself. Also, if a Bot fragment strikes the opposing Bot, it will not be considered “deliberate.”

Disqualification – A Bot that is no longer permitted to compete in the tournament.

Eliminations – The standard tournament format composed of successive “Rounds of Competition.” The league format is Double Elimination through the final round.

Event Organizer – The main contact person for a particular competition.

Forfeit – A Bot loses a match because it was not ready to compete at the scheduled time.

Grudge Match – A one-on-one, non-competition match between Bots in the arena. This is reserved for two Bots that have each had two losses. It will follow the standard three-minute match rules. Grudge Matches will be allowed when and if there is time.

Incapacitated – A Bot is not responsive. The Referee is the final authority on this call.

Judging – Matches are judged on three criteria: aggression, control and damage. If a match goes the full three minutes, the judges will decide the winner. The winner will be the Bot with the most judges’ votes. There are three judges and each has one vote. Judges will be using a scoring card to track the match. All judges must attend training before participating at a competition.

Knock-Out – Occurs when the attack or deliberate actions of one Bot cause the opponent to become incapacitated.

Match – Any competition between Bots in the arena. This includes the standard three minute match, a Grudge Match, and a Rumble.

Multi-bot – Two or more Bots that together meet the weight requirements. They compete as a team against their opponent. One of the bots must be designated as the “primary” bot. This bot must be functional for a match to continue.

Pinning – A Bot pins or traps the other Bot.

Glossary



Pit Crew – The students, coaches, and advisors allowed in the pit area.

Postponement – Occurs when a specific match is delayed from the originally scheduled time due to a request by one of the teams. A 20 minute time period will be given for a postponement. A Bot may only use one postponement per event.

Round Robin – A tournament style that allows each Bot to fight all of its opponents once. The winner is decided by the total number of wins.

Rounds – One set of matches where all remaining competitors are paired off and compete (or receive Byes) in order to advance in the eliminations.

Rumble – Any competition between multiple Bots in the arena. This is reserved for multiple Bots that have all had two losses. It will follow different rules. There are NO Tap Outs, NO unstuck opportunities, and the match is 5 minutes long. There is also no judging. The winner is determined as the Bot that has the most functionality remaining. Rumbles will be allowed when there is time in between the regular competition.

Scoring – Three criteria are used to determine the winner of a match that completes the 3 minute time limit (aggression, control, & damage). Judges will be using a scoring card to track the match.

Spread Spectrum –We strongly recommend using the Spektrum DX6 or DX7 controller with the BR6000 receiver. Newer receivers with a built-in failsafe are also allowed.

Tap Out – Occurs in a match when a driver of a Bot decides that they no longer want to continue the match and concede the win to the opponent. At the time of the tap out, all contact must stop.

Glossary

