



ROBONEXUS
Design. Build. Compete.

VERSION 1.0

SEPTEMBER 15

OFFICIAL COMPETITION RULEBOOK

Combat Robotics

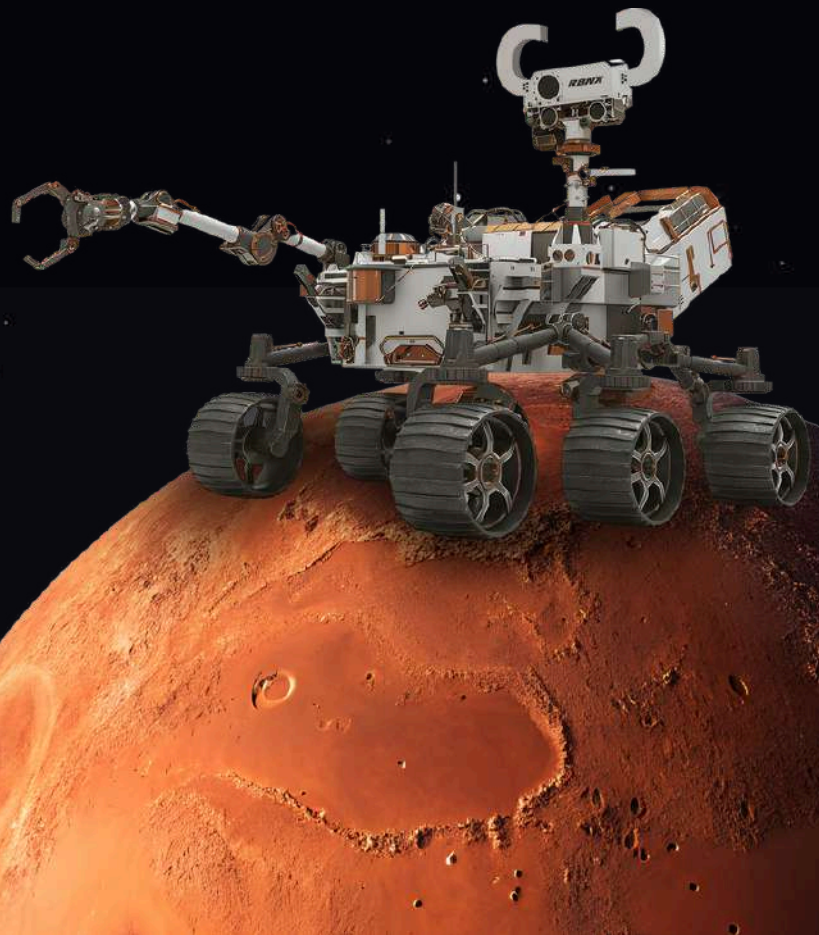


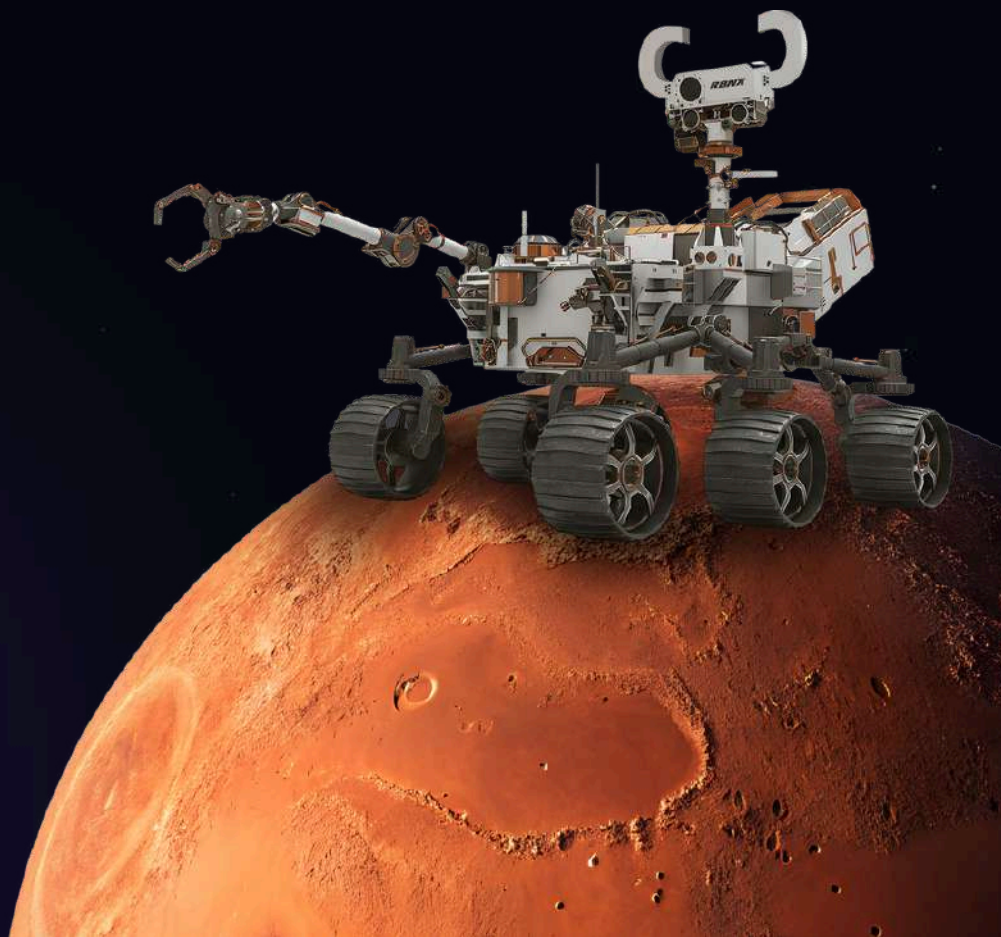
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CHAPTER 01

WELCOME MESSAGE



Welcome to RoboNexus

RoboNexus World Championship brings together future engineers to design, build, and compete through hands-on robotics challenges. It is a journey of engineering, teamwork, problem-solving, and turning ideas into systems that perform in the arena.

Welcome to the RoboNexus competition family! This Rulebook is the official reference for the **Combat Robotics** track, guiding teams through the rules, technical requirements, arena specifications, gameplay, scoring, inspection, and everything needed to prepare for competition.

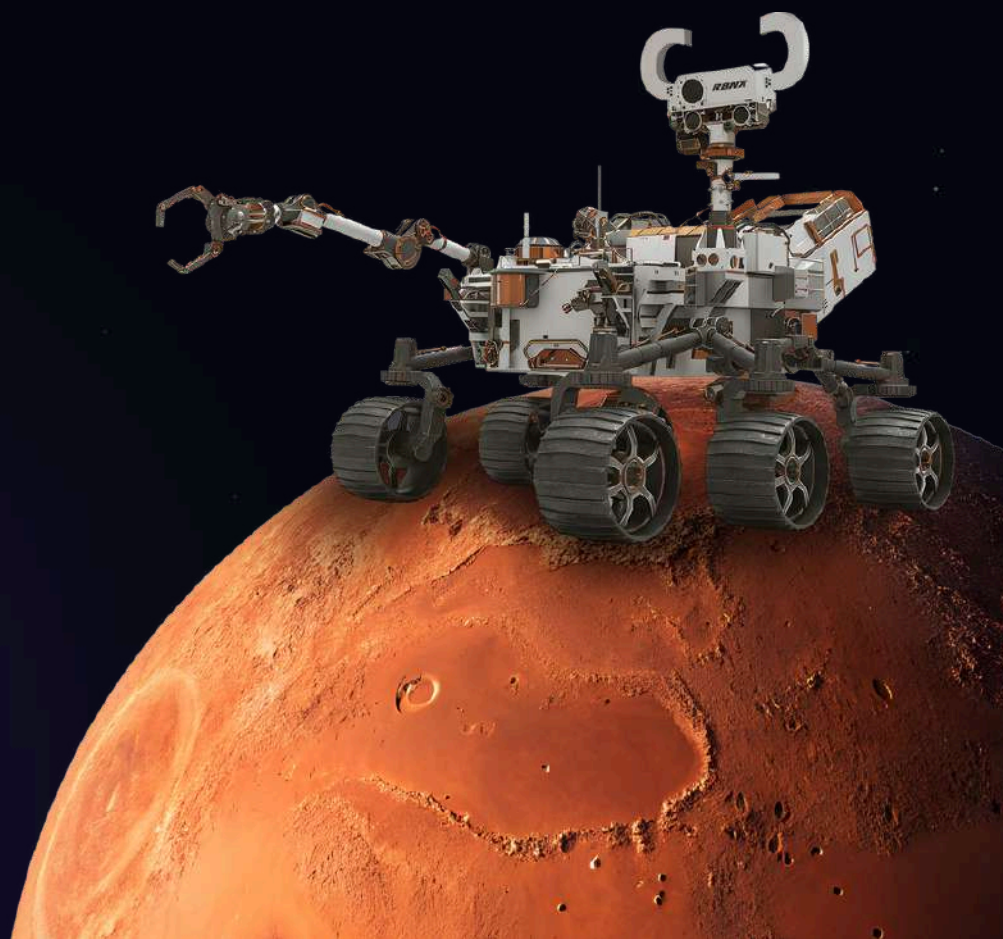
The Rulebook is organized to take you from the competition overview into the technical and gameplay details. Use the Table of Contents to quickly find any section you need throughout the season.

RoboNexus may modify, clarify, or update these Rules when necessary to address safety, technical, or competition requirements. RoboNexus Officials have the final authority in interpreting and enforcing the Rules, and their decisions are final.

But the challenge is about more than meeting specifications. Build thoughtfully, test constantly, learn from every attempt, and enjoy the process. Your challenge starts here.

CHAPTER 02

COMPETITION OVERVIEW



Competition Overview



RoboNexus Combat Robotics is a head-to-head robotic combat competition in which teams design, build, and control robots to demonstrate creativity, engineering skills, and driving ability. Teams compete in the arena with the **objective** of eliminating, incapacitating their opponent or, if the match reaches the time limit, winning through the Judges' determination.

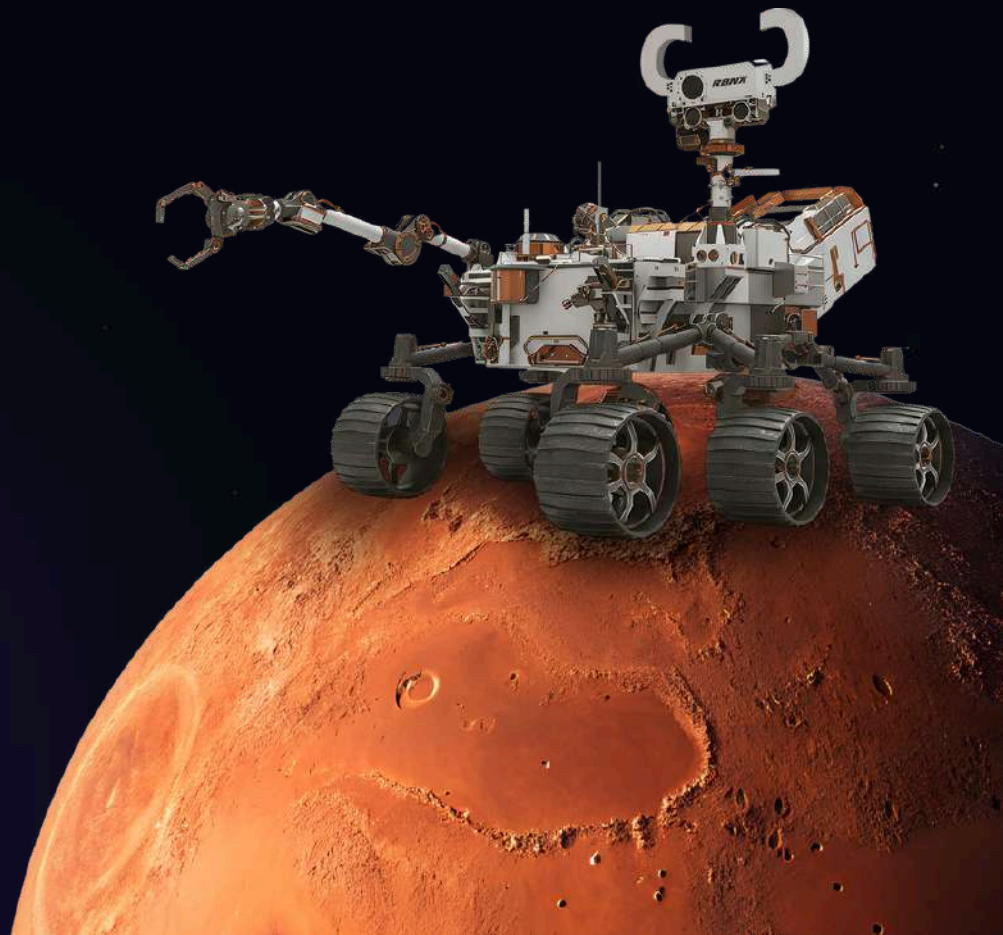


Format Summary

RoboNexus Combat Robotics is a **27 kg**, one-on-one tournament with 3-minute matches. Matches are held in a fully enclosed Arena and **end** by KO, TKO, Forfeit, Disqualification, or Judges' Decision. Winners advance through the tournament bracket until a champion is determined. All Robots must pass Safety and Technical Inspection before competing.

CHAPTER 03

TERMINOLOGIES



Terminologies

1. **RoboNexus:** The corporate entity RoboNexus.
2. **Officials:** Executives or designees performing duties at the Tournament.
3. **Robot:** An individual combat machine designed, built, and controlled by a Team to compete in a Match.
4. **Multibot:** A competition configuration consisting of two or more individual Robots operated by the same Team as a combined entry in a Match.
5. **Judges:** A group of at least three people who determine the winner if a match goes the distance.
6. **Team/Entrant:** A group of 2+ people associated with a Robot. If a Robot is disqualified, the Team is also disqualified.
7. **Match Steward:** The official intermediary between Judges and Teams.
8. **Primary Applicant:** The person managing the Team's entry. RoboNexus must approve any changes to this role.
9. **Alternate:** A backup Team selected to replace an Entrant unable to compete.
10. **Tournament/Program:** Includes all on-location activities, production, and exhibition of the event.
11. **Arena:** The enclosed area where combat takes place between Robots. The Arena may also be made available for supervised testing purposes.
12. **Driving Platform:** The area adjacent to the Arena where Team members operate their Robots. RoboNexus may limit the number of Team members allowed on the platform during a contest.
13. **Activation/Deactivation:** "Activation" is the process of applying power to the Robot's weapons and mobility systems. "Deactivation" is the removal of all power from these systems.
14. **Disqualification:** The Robot is no longer allowed to compete in the Tournament.
15. **Expulsion:** One or more Team members must leave the Tournament premises for the duration of the event.
16. **MiniBot:** A Multi-Bot segment with no active weapon (as defined in the Design Rules) weighing no more than 9 kilograms.

Terminologies

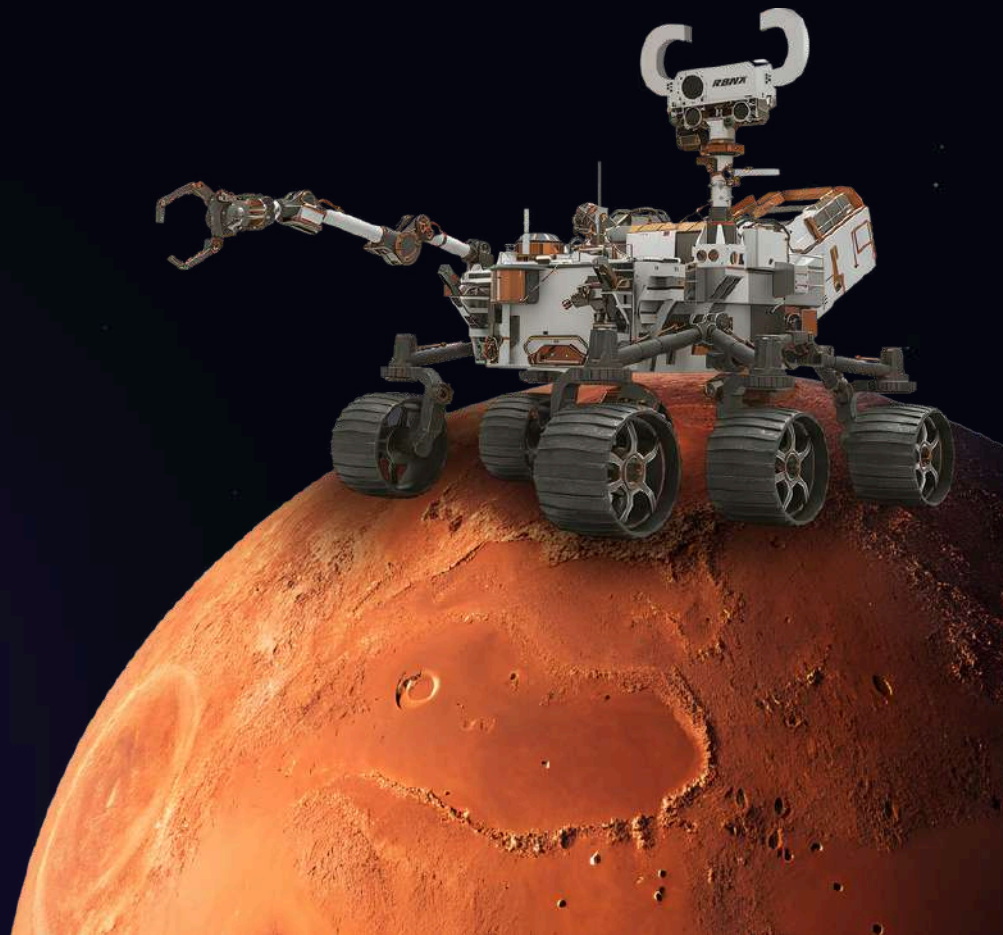
- 17. **Pit Area:** The designated area where Robots and support equipment are prepared, maintained, stored, and tested.
- 18. **Match:** A one-on-one combat competition used for eliminations.
- 19. **Rematch:** A repeat Match occurring when a previous Match was stopped or declared incomplete.
- 20. **Round:** One set of Matches where all remaining Competitors compete to advance.
- 21. **Eliminations:** The standard Tournament format of successive Rounds leading to one winner.
- 22. **Fault:** Moving or activating weapons before the official Match start.
- 23. **Forfeit:** Losing a Match due to not being ready or specific illegal actions.
- 24. **Hazards:** Powered obstacles in the Arena controlled by persons outside the arena.
- 25. **Disabled:** A Robot is malfunctioning due to internal failure or combat damage.
- 26. **Engagement Avoidance:** Deliberately avoiding contact with an actively pursuing opponent.
- 27. **Incapacitated:** A Robot is deemed non-Responsive by a Referee for a specified time.
- 28. **KnockOut (KO):** Winning because the opponent Robot is Incapacitated by an attack.
- 29. **Lifting/Grappling:** Controlling an opponent's motion by raising them or grabbing/holding them.
- 30. **Pinning:** Holding an opponent stationary against the Arena edge through sheer force.
- 31. **Postponement:** Delaying a Match from its scheduled time.
- 32. **Radio Interference:** Loss of control due to the opponent's signal or any external signal.
- 33. **Responsive:** The ability to display controlled, directed translational movement.

Terminologies

- 34. **Restart:** Resuming a Match after a Fault or Timeout.
- 35. **Stuck:** A Robot is hung up on the Arena or opponent and is effectively non-Responsive.
- 36. **Tap-Out:** Not Allowed. Teams cannot concede a Match voluntarily.
- 37. **Technical KnockOut (TKO):** Winning due to opponent Incapacitation that was not caused by the winner's direct action.
- 38. **Timeout:** A temporary halt to the Match called by Referees or Officials.
- 39. **Weapon:** An active weapon is any powered device designed to damage, control, or disable another robot. Every robot must have at least one active weapon.

CHAPTER 04

COMPETITION SNAPSHOT



Competition Snapshot

The Competition Snapshot gives a fast, at-a-glance summary of the **numbers** that matter most. Full detail for each value appears in later chapters.

Quick Reference

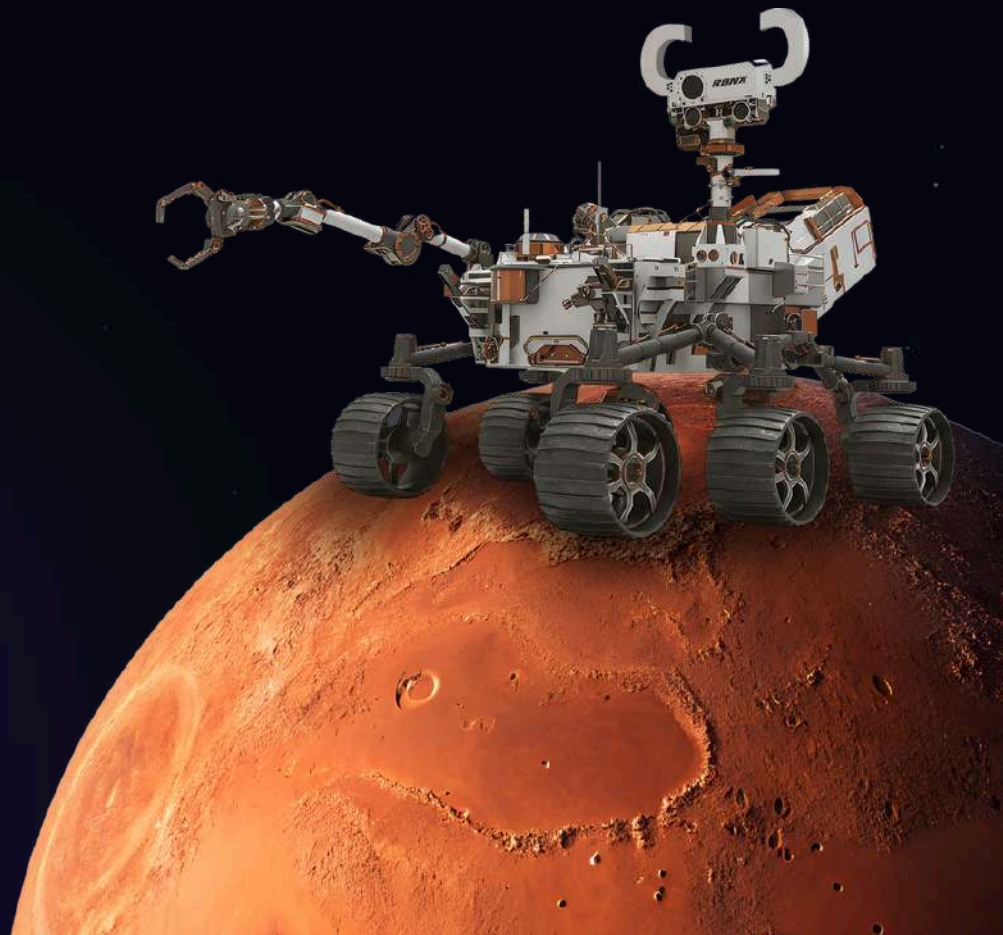
MATCH DURATION 3 MIN	ROBOT COUNT 1v1 Note: there is no limit on the number of robots as long as they have a combined weight of 27 kg or less and fit in a 50x50x70 cm box	MAX ROBOT WEIGHT 27 KG
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Extended Reference

COMPETITION FORMAT Team-Based	WEIGHT CLASS Lightweight	MAX VOLTAGE 60V
PRIMARY OBJECTIVE Disable	CORE COMPETENCIES Combat Strategy	FIELD SIZE (combat floor only) [6 × 6 m]

CHAPTER 05

ROBOT SPECIFICATIONS



Robot Specifications

All robots competing in the Combat Robotics track must meet the technical requirements defined in this chapter. Robots that do not comply will not pass Robot Inspection (Chapter 9).

General Requirements

Table 1: Robot Specifications

Parameter	Specification Limit	Compliance Verification
Maximum Weight (does not include safety covers, team identification flags or panels, required labelling, safety tethers, protective weapon guards used during transport only)	27 kg	Official Scale Inspection
Starting Volume (for multibots, all robots must fit inside the same box)	500mm x 500mm x 700mm	Sizing Box Test
Maximum System Voltage (unsafe electrical configurations, even if within the voltage limit, are not permitted and may result in Disqualification.)	60.0V DC Nominal Only approved battery chemistries may be used (e.g. LiPo, LiFePO ₄ , NiMH). All batteries must be securely mounted, impact-protected, and enclosed to prevent puncture. Swappable battery packs must have protective casings.	Multimeter / PDM Log
Flame Systems	Secondary/show effect only (does not qualify as an active weapon); propane or butane fuel; maximum 0.5 L capacity and 30 cm (1 ft) flame length. Tanks must be pressure-rated, leak-free, and impact-protected, with secure high-pressure hoses and connections. Tanks must be located far from heat sources and impact zones. Flame systems must not use oxidizers, accelerants, or pressurized liquids and may only operate within the designated flame-approved zone.	Design inspection, documentation, leak test, and controlled ignition/shutdown test.

Robot Specifications

General Requirements

Table 1: Robot Specifications

Parameter	Specification Limit	Compliance Verification
Weapon Locks	Each Active Weapon must have a secure mechanical Weapon Lock that prevents unintended movement. Locks must remain installed outside the Arena.	Physical inspection and lock test
Master Switch	Clearly visible and safely accessible; must disconnect power to all Drive and Weapon systems.	Visual inspection and activation test
Indicator Light	Must be clearly visible from outside the Robot and illuminated whenever the Robot is active.	Visual inspection and power-on test
Wiring	Wiring must be properly insulated, secured, and protected from movement, abrasion, and damage.	Visual and physical inspection
Failsafe	Drive systems, weapon systems, and autonomous functions must immediately stop when radio connection is lost and must not automatically resume when connection is restored.	Loss-of-signal functional test
Remote Control	Robot must be remotely operated. Permitted autonomous functions must be immediately overridable by the Driver.	Functional test and demonstration
Pneumatic System	Tanks, regulators, valves, fittings, and hoses must be properly rated and free of damage or leaks. System must safely pressurize and vent.	Documentation review, leak test, pressurization, and vent test
Fire Safety	Flammable materials must be appropriately separated and protected from heat, sparks, electronics, and Flame Systems.	Visual inspection

Robot Specifications

General Requirements

Table 1: Robot Specifications

Parameter	Specification Limit	Compliance Verification
Exterior Materials	Exterior must use durable, non-flammable Armor such as aluminum, steel, titanium, UHMW, or polycarbonate. Armor and panels must be securely attached with no loose or flexible external parts. Sharp protrusions or unprotected spikes are not permitted when handling the Robot outside the Arena. Paint, decals, and cosmetic materials must not obscure Team Numbers or safety indicators.	Visual and physical inspection
Interior Materials	Internal components must be securely mounted and protected. Wiring must be insulated, secured, and protected from abrasion and impact. Batteries must be enclosed in a rigid, fire-resistant compartment. Open containers and liquid cooling systems are not permitted.	Visual and physical inspection
Magnets	Magnets may be used for traction or stabilization provided they do not damage the Arena floor or interfere with another Robot's electronics. Permanent magnets require Inspector approval. Electromagnets may be restricted or require additional safety measures.	Design review and physical inspection; functional test if required

Robot Specifications

General Requirements

Table 1: Robot Specifications

Parameter	Specification Limit	Compliance Verification
Active Weapon	At least one Active Weapon is required. The weapon must be capable of directly damaging, disabling, or otherwise impeding an opponent and must be intentionally activated by the Driver. Passive Armor, wedges, and fixed plows do not qualify as Active Weapons. At least one Robot in a Multibot must have an Active Weapon; Minibots are not required to have an Active Weapon.	Design review and functional test
Multibots	Multibots are permitted. The combined weight must not exceed the applicable class limit. All Robots must meet applicable activation, safety, and control requirements, and each Robot must have its own Master Switch.	Design review, weight inspection, safety inspection, and functional test

Robot Specifications



Warning

Robots that do not meet the stated specifications will fail inspection and may not compete until the non-compliance is corrected.

Prohibited Components/Features

- Explosives, pyrotechnics, firearms, or reactive chemicals.
- Corrosive, acidic, toxic, or otherwise hazardous substances.
- Flammable liquids or gels, except for specifically approved Flame System fuels.
- Lead, mercury, radioactive materials, or other hazardous materials.
- Glass, brittle ceramics, or materials that can shatter and create airborne hazards.
- Unsealed carbon fiber dust, fiberglass dust, or similar hazardous particulate materials.
- Polyurethane foams or other materials that may produce toxic smoke when ignited.
- Lasers capable of causing injury or interfering with vision.
- Entangling devices designed to interfere with an opponent's mobility or systems.
- Radio jammers or other devices intended to interfere with communications.
- Hazardous debris, gases, or substances that may escape the Robot or create a safety hazard.
- Any other material or system that RoboNexus Officials determine presents an unacceptable safety risk.
- Fully autonomous Robots are prohibited.

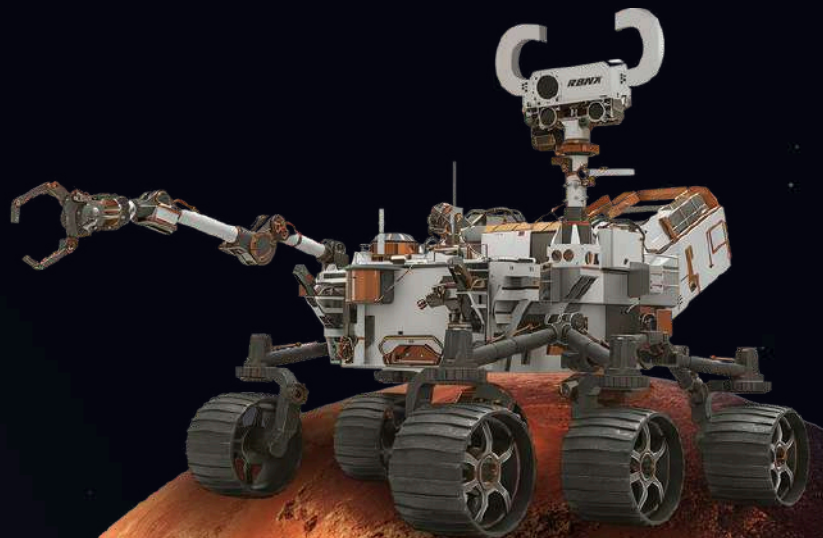
Permitted autonomous functions include:

- Self-righting
- Weapon spin-up automation
- Hazard avoidance
- Proximity slowing
- Driver-assisting sensors

All functions must be overridable at any time. Weapons may not activate autonomously.

CHAPTER 06

ARENA



Arena

This chapter describes the physical playing field for the Combat Robotics track, including dimensions, zones, and field elements.

Field Layout

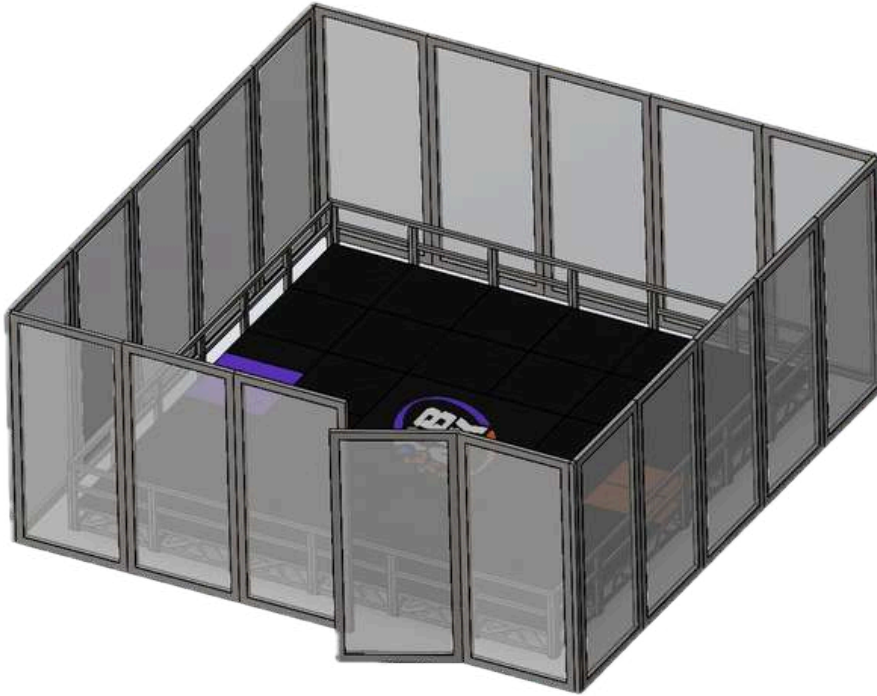


Figure 1 — Combat Robotics Arena Layout (isometric view)

Field Parameters

Table 2: Arena Elements		
Parameter	Specification	Purpose/Requirement
Arena Configuration	Dual-layer containment system	Consists of an Outer Safety Enclosure and Inner Combat Arena
Outer Enclosure Footprint	7 m × 7 m	Provides the required containment structure and safety buffer
Outer Enclosure Height	2.5–3.0 m	Provides overhead containment

Arena

Field Parameters

Table 2: Arena Element		
Parameter	Specification	Purpose/Requirement
Safety Buffer	Minimum 50 cm on all sides	Continuous clearance between the Inner Combat Arena and Outer Enclosure
Outer Enclosure Frame	Steel bar sections	Provides structural rigidity and impact resistance
Outer Wall Panels	Double-layer polycarbonate	Provides impact resistance, debris containment, and visibility
Outer Enclosure	Fully enclosed on all sides	Prevents debris and fragments from escaping the arena
Access Door	Hinged, outward-opening door with reinforced locking mechanism	Provides controlled access and emergency egress
Visibility	360° visibility through transparent polycarbonate	Allows spectators and officials to observe matches while maintaining containment
Inner Arena Footprint	6 m × 6 m	Primary combat area
Inner Arena Position	Centrally positioned within Outer Enclosure	Maintains the required 50 cm safety buffer
Floor Construction	36 modular steel blocks arranged in a 6 × 6 grid	Provides a rigid and modular foundation
Floor Module Size	1 m × 1 m per module	Forms the 6 m × 6 m combat area
Floor Surface	Continuous steel sheet over modular base (teams should account for possible unevenness or minor variations in the floor surface)	Provides durable fighting surface
Floor Elevation	Modular blocks: 40–50 cm; additional reinforcement: 40–50 cm	Provides structural support and load distribution

Arena

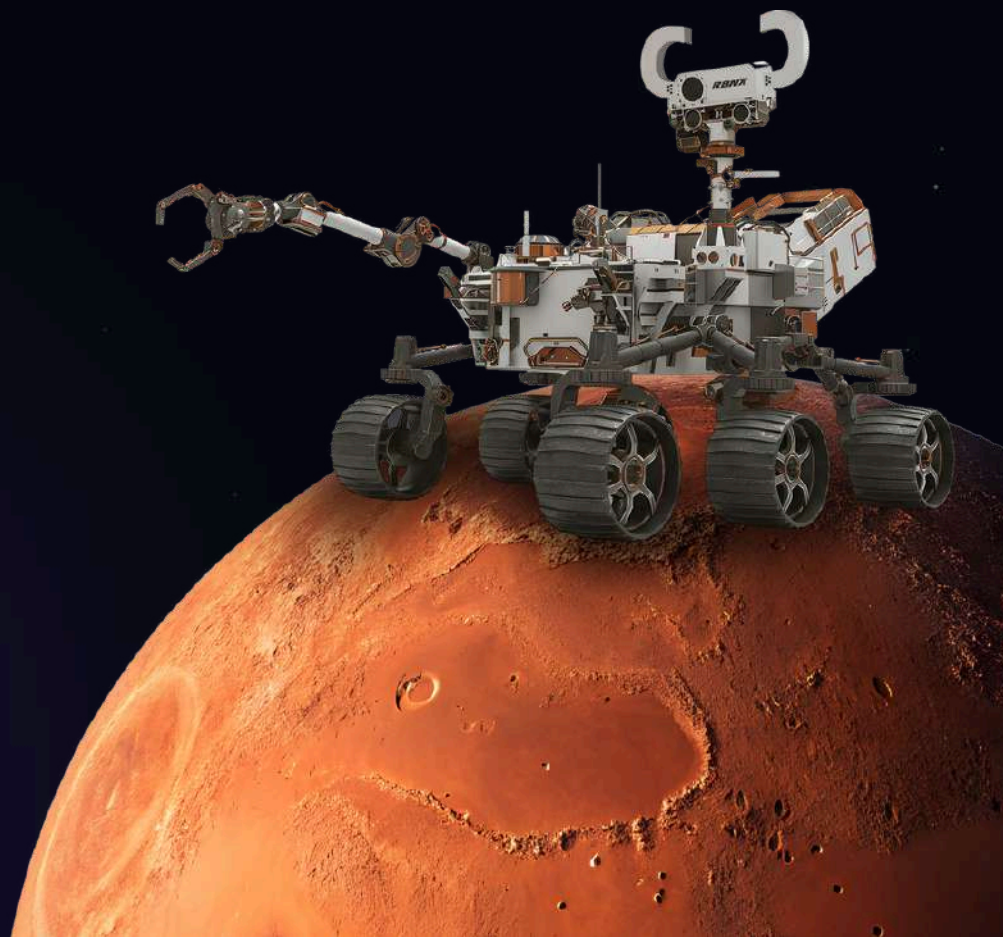
Field Parameters

Table 2: Arena Element

Parameter	Specification	Purpose/Requirement
Arena Hazards	1 Hammer Mechanism and 1 Rotating Blade Mechanism; locations to be determined; all hazards have an emergency stop capability	Provides controlled interactive elements during matches
Modular Assembly	Rapid installation, disassembly, and component replacement	Allows damaged sections to be replaced without dismantling the entire enclosure

CHAPTER 07

SCORING



Scoring

Points are awarded for the actions listed below. **Judges** are the final authority on scoring during a live match.

Judges' Scoring

If a Match goes the full 3 minutes without a KO, TKO, Forfeit, or Disqualification, Judges assign points based on four criteria. The winner is determined by majority vote.

If the match stops before 3 minutes due to an unresolved technical issue, radio interference, simultaneous TKO, or other circumstances that prevent the Match from continuing, Judges will determine the outcome if at least 60 seconds of the Match have elapsed. If less than 60 seconds have elapsed, or if the Judges cannot reasonably determine an outcome, the Match will be rescheduled.

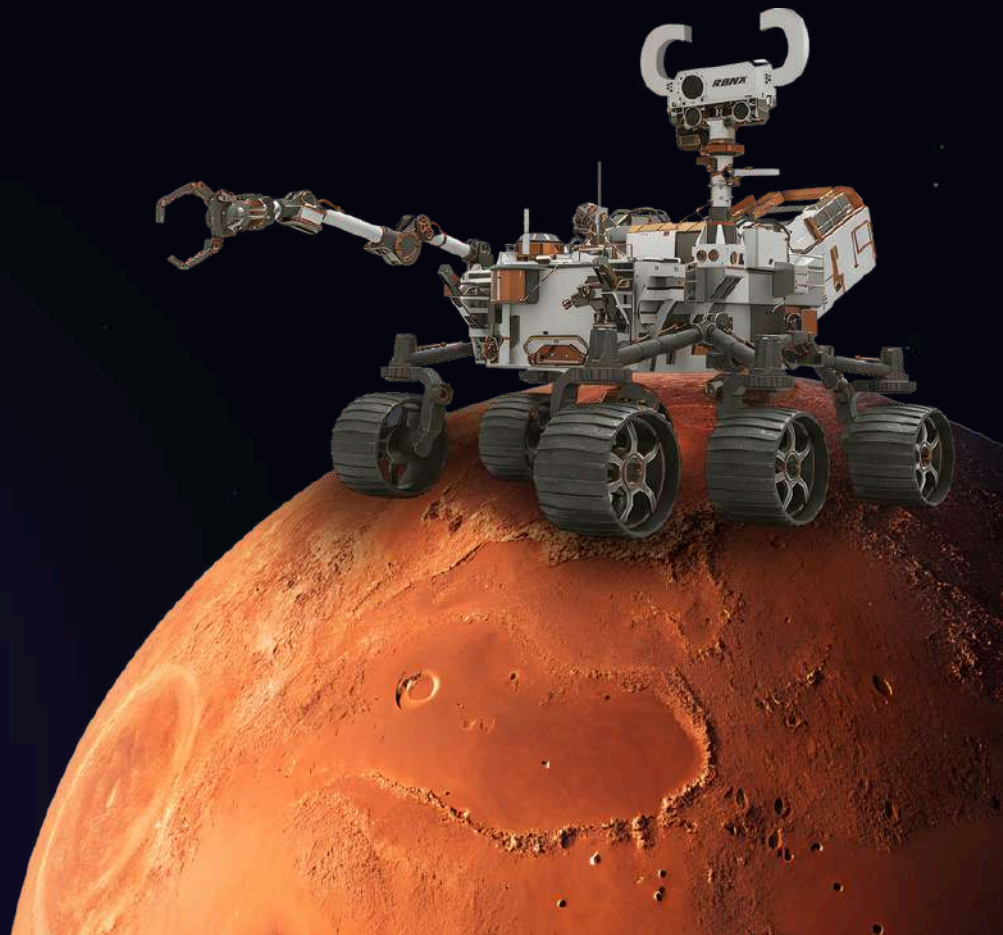
Scoring Table

Table 3: Match Scoring Matrix

Action / Milestone	Point Value	Evaluation Method
Aggression: Frequency, severity, and boldness of primary weapon attacks. Ramming with a wedge (without a weapon) does not count as Aggression.	+ 2 Points	Judges assess frequency, effectiveness, and impact of attacks
Control: Ability to dictate the fight, avoid hazards, and minimize damage received.	+ 1 Point	Judges assess positioning, movement, and ability to control the fight
Damage: Reducing the opponent's functionality or effectiveness (directly or via Hazards). Self-inflicted damage is not counted.	+ 1 Point	Judges assess the extent and impact of damage inflicted
Strategy: Exploiting opponent weaknesses, protecting own weaknesses, and using Hazards effectively.	+ 1 Point	Judges assess tactical decisions and adaptation during the match

CHAPTER 08

PENALTIES & VIOLATIONS



Penalties & Violations

Violations of these rules result in the **penalties** described below. Repeated violations may result in escalated consequences, including match **disqualification**.

RoboNexus Officials retain final authority to Disqualify any Team for safety or technical violations at any time. All decisions are final.

Table 4: Match Infraction Penalties

Infraction Code	Violation Description	Penalty Consequence
M-01	Accidental non-compliance that does not affect the match outcome or create a safety concern.	The robot must be modified to comply with the applicable specifications before competing.
M-02	Accidental non-compliance that may affect the match outcome, or deliberate non-compliance that does not create a serious safety risk.	The robot may be disqualified from the match or competition, depending on severity.
M-03	Deliberate non-compliance that creates a significant safety risk to participants, officials, spectators, robots, or the arena.	The team may be expelled from the competition.
M-04	Failure to request re-inspection after a modification that affects the robot's safety, operation, or appearance.	The robot may be disqualified from the match or competition, depending on severity.
M-05	Pinning, grappling, or lifting an opponent is limited to 10 seconds, or 30 seconds when actively moving the opponent.	Failure to release upon instruction may result in Disqualification or Forfeit.
C-01	Failure to Cooperate: Failure to comply with inspection, re-inspection, safety procedures, or reasonable instructions from competition officials.	The robot or team may be Disqualified.
M-06	Unauthorized or improper use of any radio control transmitter.	Warning or Match Penalty; Disqualification for repeated or intentional violations.
C-02	Fighting, belligerence, threats of violence, or abusive physical contact toward any RoboNexus Official.	Immediate Expulsion of the individual involved. Team expulsion if involved. Potential Ban for serious or repeated violations.

Safety (S), Rules (R), Conduct (C), and Match Operations (M)

Penalties & Violations

Table 4: Match Infraction Penalties

Infraction Code	Violation Description	Penalty Consequence
C-03	Deliberate failure to follow Official instructions, inappropriate or disruptive behavior, deliberate attacks on Arena Hazards, or attacks against an opponent after the Match has ended.	Penalties may include Forfeit, Disqualification, or Expulsion, depending on the severity of the violation.
S-01	Deliberate activation of a damaged or non-compliant Robot.	The robot may be disqualified from the match or competition, depending on severity.
S-02	Failure to comply with safety modifications required by a RoboNexus Official when a Robot is determined to pose a safety threat.	The Robot may be Disqualified if the required modifications cannot be completed or the safety concern cannot otherwise be resolved.
S-03	Failure to safely activate the Robot within 60 seconds, including removal of weapon locks and safety blocks, or activation that causes unintended movement of the drive system or weapon.	The Robot must be corrected before competing. If the issue cannot be safely corrected within the allotted time, the Robot may be Disqualified.
S-04	Activating a flame weapon outside the designated flame-approved zone or near restricted areas, including arena walls and polycarbonate panels.	The Robot will be required to disable the flame weapon. Failure to comply may result in Forfeit. Repeated or serious violations may result in Disqualification.
R-01	Deliberate misrepresentation or concealment of robot features especially during the safety inspection.	The robot may be disqualified from the match or competition, depending on severity.

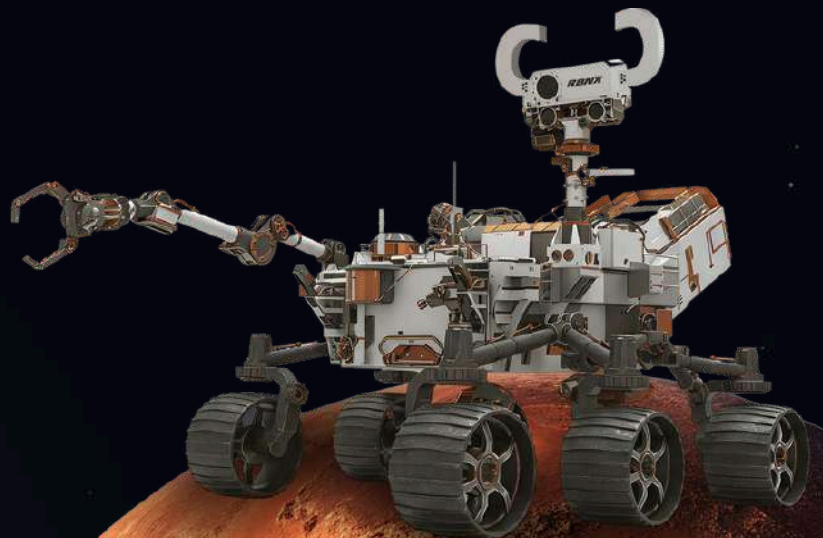
Safety (S), Rules (R), Conduct (C), and Match Operations (M)

⚠ Warning

Severe violations, including unsafe robot behavior, may be escalated beyond a single match. See Chapter 9 Safety Requirements.

CHAPTER 09

ROBOT INSPECTION



Robot Inspection

Every robot must pass inspection **before** competing in any match. Inspection confirms compliance with Chapter 5 Robot Specifications and Chapter 10 Safety Requirements.

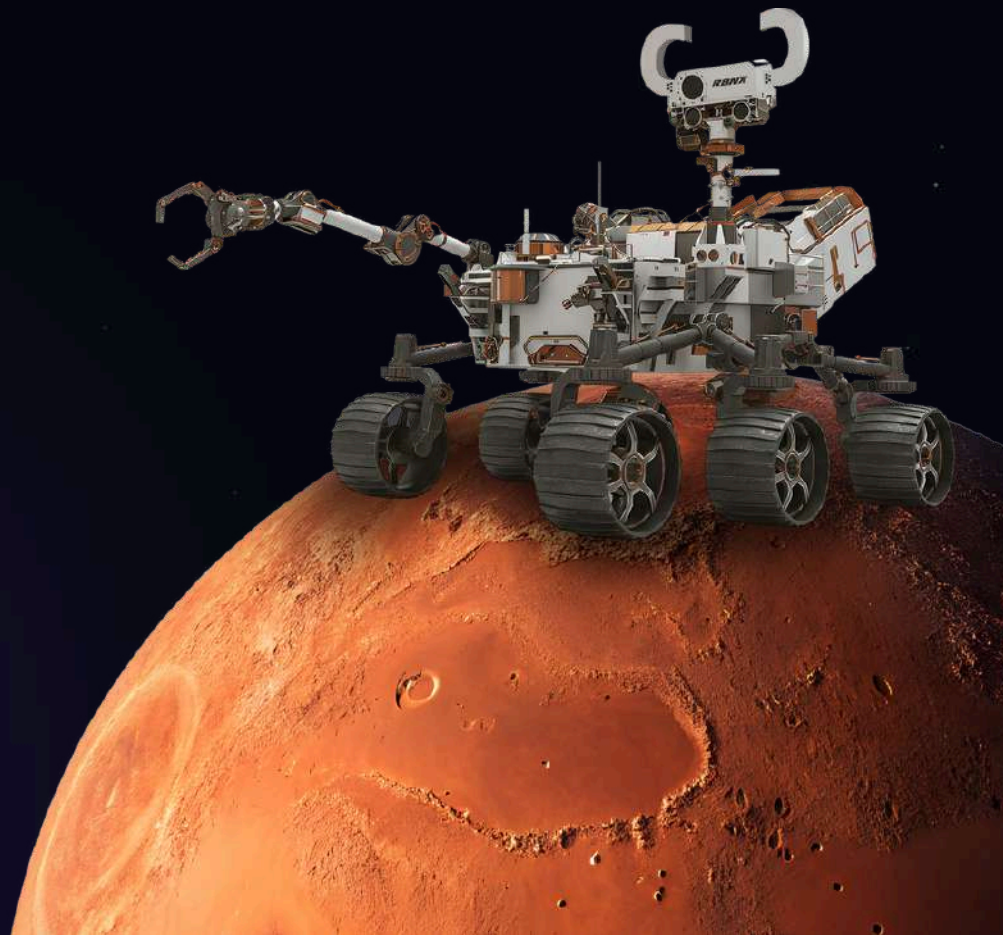
Inspection Checklist

1. Confirm robot weight is within the published limit.
2. Confirm starting footprint fits the sizing box.
3. Confirm battery voltage and wiring meet safety requirements.
4. Confirm no prohibited components are present.
5. Record inspection result and issue an inspection sticker/tag.

Bring spare fasteners, a multimeter, and your robot's spec sheet to inspection to resolve minor issues on the spot.

CHAPTER 10

SAFETY REQUIREMENTS



Safety Requirements

Safety requirements apply to every team, robot, and individual present at a RoboNexus event. Safety rules take precedence over competitive advantage.

General Safety Rules

- All instructions from RoboNexus Officials and safety personnel must be followed.
- Robots must remain deactivated except in designated activation areas or the Arena.
- Robots must be transported on a rolling dolly or cart with required Safety Covers and Restraints installed.
- Driving or hand-carrying Robots during transport is prohibited.
- Required Weapon Locks and Safety Locks must be installed when the Robot is outside the Arena.
- The Master Switch and Indicator Light must be functional.
- Robots must be fully deactivated before handling, repair, or modification.
- Batteries must be handled and charged only in designated areas.
- No person may enter the Arena while a Robot or Arena Hazard is active.
- Any fire, smoke, leak, unexpected activation, or significant Robot damage must be reported immediately.
- Teams must immediately comply with emergency shutdown instructions.
- Re-inspection is required after any repair, modification, or damage that may affect the Robot's safety, operation, or compliance with the Rules.
- RoboNexus Officials may require additional inspection whenever a Robot is considered unsafe or non-compliant.

Warning

Any robot behavior judged unsafe by a referee or inspector may be stopped immediately, regardless of match state.