The 23rd China University Robot Competition

ROBOMASTER 2024

University League

Rules Manual

Intellectual Property Statement

The RoboMaster Organizing Committee (RMOC) encourages and promotes technical innovation and open-source technology and respects the intellectual property rights of participating teams. All rights related to the intellectual property developed during the competition are owned by individual teams. The RMOC will not participate in the handling of intellectual property disputes within the team. The participating teams must properly handle all aspects of intellectual property rights among internal school members, company members and other members of the team.

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Any behavior that may infringe upon the intellectual property rights of the RMOC or other organizers in relation to the provided educational materials for the competition will be investigated and affixed legal liability in strict accordance with the law.
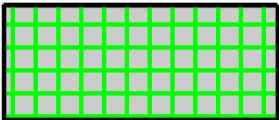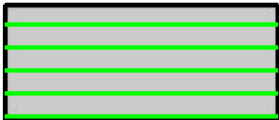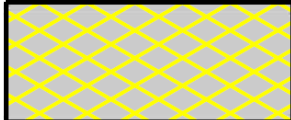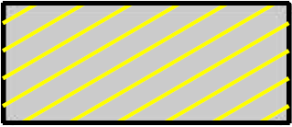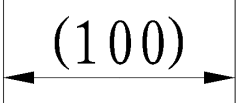
For suggestions on open-source materials, please refer to: https://bbs.robomaster.com/thread-7026-1-1.html.

Using this Manual

Legend

☀ Hints and tips	"√" Applicable	"-" Not applicable

Legend for Battlefield Drawings

Buff point for both sides	Buff point for one side	Both sides penalty zone
One side penalty zone	The plane on which the battlefield is located is its lowest plane	Dimensions are for reference only

Release Notes

Date	Version	Release Notes
2023.10.31	V1.0	First Release

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1. Foreword

1.1 About the Competition

The RoboMaster University League (RMUL), organized by local academic institutions and universities, engaging in nearby universities, is dedicated to promote technology exchanges among regional universities, cultivate a strong academic atmosphere, and assist the development of regional technology innovation.

The RMUL 2024 comprises two battle formats: 3V3 Match and Standard Match

During the 3V3 Match, both teams need to independently develop their own Standard, Hero, and Sentry Robots, and conduct tactical combat on the designated competition area by controlling the robots to launch projectiles against opponent robots and bases. At the end of the match, the winner shall be the team with the higher remaining Base HP. The participating teams in the 3V3 Match can advance to the RoboMaster University Championship (RMUC) through the Scoring and Ranking System.

During the Standard Match, both teams need to independently develop their own Standard Robots, and engage in 1V1 battles on the designated competition area by controlling their robots to launch projectiles. The winner at the end of the Match shall be the team with the higher remaining Standard Robot HP.

1.2 About the Rules Manual

This Rules Manual and its additions are applicable to all participating teams, referees, competition staff, and other partners.

Outside the competition period, the RMOC may update this Rules Manual as required by circumstances.

During the competition, the Chief Referee reserves the right of final interpretation regarding competition rules. Only the Chief Referee can be consulted on any questions related to the competition rules.

1.3 Q&A

Any participating team or other relevant personnel who have questions about the specifications manuals (including the Rules Manual, Participant Manual, and Robot Building Specifications Manual) may direct them through our official channel, and the RMOC will reply to them periodically. The Q&A process is as follows:

1. To submit questions about the specifications manuals, the inquirer should complete a questionnaire available at this link:

   https://qingflow.com/f/8ac4033d

2. The RMOC will respond within 5 business days at this link:

   https://qingflow.com/appView/8ac4033d/shareView/f5f09581

The Rules Q&A is considered an authoritative source with the same effect as the Specifications Manuals. In the case of any discrepancy between the Q&A and Specifications Manuals, the latest document shall prevail. The Q&A for each season applies only to the current season.

1.4 Main Rule Changes for the New Season

Compared with RMUL 2023, RMUL 2024 has been updated with the following changes:

Battlefield:

- Adjusted the size of the Supplier Zone.

- Adjusted the frame of the Visual Marker.

Competition Mechanism:

- Adjusted the HP Recovery Mechanism.

- Adjusted the Experience and Performance systems.

- Adjusted the mechanism related to the Central Buff Point.

2. Key Terms

In this chapter, we will provide an overview of commonly used terms in the competition rules. For details on each term, please refer to the relevant chapter using associated keywords.

Table 2-1 Overview of Key Terms

Term	Definition
Robots	
Standard Robots	Includes Regular Standard and Balancing Standard Robots. For a detailed definition of the Balancing Standard Robot, please refer to the "Standard Robots" chapter of the RoboMaster 2024 University Series Robot Building Specifications Manual. All Standard robots other than Balancing Standard robots are Regular Standard robots.
Referee System	The Referee System is an electronic penalty system used for robotic competitions. It integrates computation, communication, and control features and It includes the Robot Side installed on the robot, as well as the server and player's client installed on the PC; and has functions such as monitoring robot power, projectile launches and damage, and automatic ruling based on competition rules.
Robot chassis	A mechanism that carries a robot's drivetrain and its accessories.
Chassis Power	For the power of the propulsion system that enables horizontal movement and rotation of the robot, please refer to the definition of chassis power in the "Referee System Mounting Specifications" chapter of the RoboMaster 2024 University Series Robot Building Specifications Manual.
Launching Mechanism	A mechanism capable of launching a projectile from a robot on a fixed trajectory and at a certain initial speed.
Initial Launching Speed	The velocity detected by the relevant modules of the Referee System after a projectile has completed its acceleration.
Barrel Heat	The barrel heat generated by a robot after launching a projectile. A robot's ability to continuously launch projectiles is restricted by its Barrel Heat Limit.
Projectile Allowance	The quantity of projectiles each robot is allowed to launch currently.
Initial HP	The HP value set by the Referee System for a robot at the start of the competition.
Current HP	A robot's Real-time HP.
Maximum HP	The maximum value to which a robot's HP can be restored.

Term	Definition
Experience Point	The accumulated points needed for a robot to upgrade itself, which can be obtained through natural growth, destroying or assisting in the attack of other robots, or other methods.
Experience Value	The experience points provided by a robot to an opponent robot when the former changes from alive to non-alive state.
Destruction	Where a robot attacks the Armor Module of an opponent Base or robot until the latter's HP drops to zero. If a robot is not alive or the Referee System is unable to detect a destroyer for reasons other than suffering a hit on its Armor Module, it will be deemed that no destroyer has been found.
Invincible	When a robot receives a 100% Defense Buff, the Defense Buff will not be affected by any other mechanisms. Note: Defense buffs can reduce the damage suffered from a projectile attack or impact.
Alive	The Referee System Main Controller Module normally connects to the Referee System Server and the robot's HP is not zero.
Defeated	Where a robot's HP drops to zero after its Armor Module has been attacked or hit; it has exceeded its Chassis Power Consumption limit, Initial Launching Speed limit or Barrel Heat limit; its Referee System module has gone offline, etc. Note: After a robot is defeated or ejected, the Referee System will cut off power supply to the robot (except for the Mini PC).
Ejected	The robot is directly ejected by the Referee System due to a Red Card Warning. Note: After a robot is defeated or ejected, the Referee System will cut off power supply to the robot (except for the Mini PC).
Irregular Offline	The Referee System Main Controller Module is unable to connect to the Referee System Server during the competition, due to a power outage on the robot or other reasons.
Temporarily Activated	A status where a robot's chassis and gimbal is powered on temporarily after it has been defeated or ejected. The Launching Mechanism for the robot will be powered off.
Occupy	When an alive robot has reached a Buff Point and its RFID Interaction Module has detected the RFID Interaction Module Card in the area.
Entanglement	Mechanisms of robots are entangled with one another during the competition, i.e. one robot remains connected to the other robot and is pulled with said robot whichever direction it moves.

Term	Definition
Collision	An active act of collision by a robot during the competition.

Battlefield

Term	Definition
Buff Point	A zone that, once occupied by a robot during the competition, will generate a special effect.
Penalty Zone	An area into which a robot's entry is forbidden.
Battlefield Components	Composite elements of the Battlefield, including but not limited to: Base.

Staff

Term	Definition
Arbitration Commission	A body consisting of the Chief Referee and other members of the RMOC, responsible for handling appeals.
Chief Referee	The person with the final right of interpretation over the competition rules during the competition.
Head Referee	The lead referee responsible for maintaining the order of the competition and enforcing its rules.
Referee	Personnel responsible for maintaining the order of the competition and enforcing its rules.
Head Inspector	The referee responsible for leading and assigning pre-match inspection tasks, with the final right of interpretation over the inspection standards.
Participants	Individuals that have registered and been recorded in the registration system for the current competition season.
Participating Teams	The teams that have registered and been recorded in the registration system for the current competition season.
Pit Crew Members	Regular Member and Supervisor who have registered for this Season and have been entered into the registration system, can walk into the Staging Area and Competition Area.
Operator	The Pit Crew members responsible for controlling robots during the competition.
Offending Team	A participating team that violates the competition rules.
Offender	Participants that violate the competition rules.
Offending Robot	A robot that violates the competition rules.

Competition Process

Term	Definition
Round	A complete competition that includes the setup period, a 15-second referee system initialization period, a 5-second countdown period, and the competition round.
Match	Depending on the Competition System, a match may contain several rounds.
Official Technical Timeout	A Technical Timeout initiated by the Head Referee during the Setup Period or Referee System Initialization Period.
Team Technical Timeout	A Technical Timeout requested by a Participating Team during the Setup Period.

<div align="center">Factors Determining the Competition Outcome</div>

Term	Definition
Attack Damage	The HP deducted from a robot or Battlefield Component caused by a projectile launch from an opponent robot. Exceptions are shown below: ● HP deduction caused by the imposition of penalty from the violation of one side's robot is included in the opponent's Attack Damage. ● HP deducted as a result of exceeding the Initial Launching Speed limit, Barrel Heat limit and Chassis Power Consumption limit, a collision on an armor module, the Referee System going offline, or an irregular offline status is not added to the other team's Attack Damage.
Non-attack Damage	HP deducted as a result of exceeding the Initial Launching Speed limit, Barrel Heat limit and Chassis Power Consumption limit, a collision on an armor module, the Referee System going offline, or an irregular offline status.
Net Base HP	At the end of each round, the remaining HP of one's Base is subtracted from the remaining HP of the other Base.
Net Sentry HP	The remaining HP of a team's Sentry subtracted from the remaining HP of the opponent's Sentry at the end of a round.
Total Remaining HP	The total value of remaining HP of one's alive robots at the end of each round.

3. Robot and Operator

RoboMaster requires robots to fight together as a team with good coordination and teamwork. For the robot building specifications, please refer to RoboMaster 2024 University Series Robot Building Specifications Manual.

The required robot and operator line-up is as follows:

Table 3-1 Robots and Operator Line-up

Type	No.	Quantity (set)	Operator Line-up	Event
Hero Robots	1	0-1	1 Operator/Robot	3V3 Match
Standard Robots	3/4	0-2	1 Operator/Robot	
Sentry Robot	7	0-1	0 Operator/Robot	
Standard Robots	5	1	1 Operator/Robot	Standard Match

- In 3V3 Match and Standard Match, each team is only allowed to deploy no more than one Balancing Standard Robot.

- In 3V3 Match, the total number of Hero and Standard Robots shall not be greater than 2. In the first round of each match, the number of line-up robots shall not be less than 2.

- In a Standard Match, the armor sticker of a Standard can be 3/4/5.

- An operator must be a Regular Member of a team in the current season.

- After the end of each round, the Operator can be replaced by a Regular Member among the Pit Crew Members for the current match.

The basic robot information is as follows:

Table 3-2 Basic Robot Information

Robot Type	3V3 Match			Standard Match	
	Hero Robots	Standard Robots	Sentry Robot	Regular Standard Robot	Balancing Standard Robot
Maximum Chassis Power Consumption (W)	For details on robot levels, please refer to "5.2.6 Level-Up Mechanism".		100	120	150
Initial HP			600	200	200
Maximum HP			600	200	200
Barrel Heat Limit			400	280	280
Barrel Cooling Value per Second			80	25	50
Experience Value			500	-	-
Initial Launching Speed Limit (m/s)	16	30	30	30	30
Launching Mechanism	One 42 mm Launching Mechanism	One 17 mm Launching Mechanism	Two 17 mm Launching Mechanisms	One 17 mm Launching Mechanism	One 17 mm Launching Mechanism
Initial Zone	Starting Zone	Starting Zone	Sentry Starting Zone	Starting Zone	Starting Zone

4. General Competition Mechanism

4.1 HP Deduction Mechanism

The HP of robots may be deducted in any of the following situations. The Referee System server will round down the HP deduction and keep the integer when calculating the HP.

Table 4-1 Overview of the HP Deduction Mechanism

Robots / HP Deduction Reason	Standard Robots	Hero Robots	Sentry Robots
Exceeding the Barrel Heat Limit	√	√	√
Exceeding the Initial Launching Speed Limit	√	√	√
Exceeding Chassis Power Consumption Limit	√	√	√
Armor Module attacked by projectiles	√	√	√
Armor module collided	√	√	√
Critical Referee System Modules gone offline	√	√	√
Yellow Card	√	√	√
Red Card	√	√	√

4.1.1 Exceeding the Initial Launching Speed Limit

Set the Initial Launching Speed limit as V_0 (m/s), the actual initial speed detected by the Referee System as V_1 (m/s).

When $V_1 > V_0$, if it's 17 mm projectile, the deducted HP = Maximum HP * L%. If it's 42 mm projectile, the deducted HP = Maximum HP * M%. The values of L% and M% are correlated to the margin of excess. The larger the margin of excess, the greater the values of L% and M%.

Table 4-2 Penalty Mechanism for Exceeding the Initial Launching Speed Limit

17 mm projectile	L%	42 mm projectile	M%
$0 < V_1 - V_0 < 5$	10%	$V_0 < V_1 \leq 1.1 * V_0$	10%

17 mm projectile	L%	42 mm projectile	M%
$5 \leq V_1 - V_0 < 10$	50%	$1.1 * V_0 < V_1 \leq 1.2 * V_0$	20%
$10 \leq V_1 - V_0$	100%	$1.2 * V_0 < V1$	50%

4.1.2   Barrel Overheating and Cooling

Let the Barrel Heat limit as Q_0, the current barrel heat as Q_1. For each 17 mm projectile detected by the Referee System, the current barrel heat Q_1 is increased by 10 (regardless of its initial speed). For each 42 mm projectile detected, the current barrel heat Q_1 is increased by 100 (regardless of the 42 mm projectile's initial speed). The barrel cools at a frequency of 10 Hz. The cooling value per detection cycle = cooling value per second / 10.

A.   When $Q_1 > Q_0$, the First Person View (FPV) visibility of the robot operator's computer will be reduced. When $Q_1 \leq Q_0$, the FPV will return to normal. The FPV of the player's client is as follows:
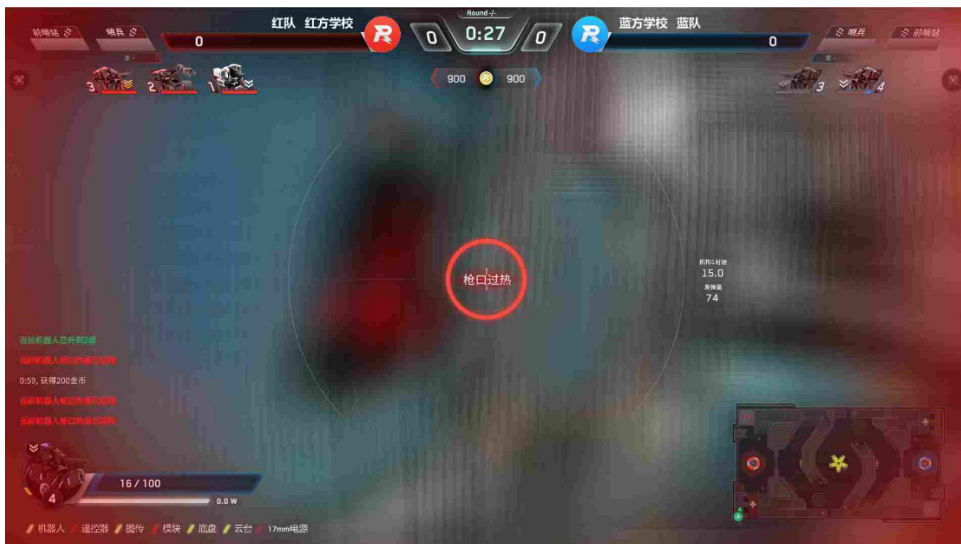
Figure 4-1 FPV of the Player's Client

B.   When $2Q0 > Q1 > Q0$, the deducted HP for every 100 ms = ((Q1 - Q0) / 250) / 10 * Maximum HP. After the HP deduction, the barrel cooling will be calculated.

C.   When $Q1 \geq 2Q0$, the immediate deducted HP = (Q1 - 2Q0) / 250 * Maximum HP. After HP deduction, set Q1 = 2Q0.

The below shows the calculation and cooling logic when the Barrel Heat limit is exceeded:
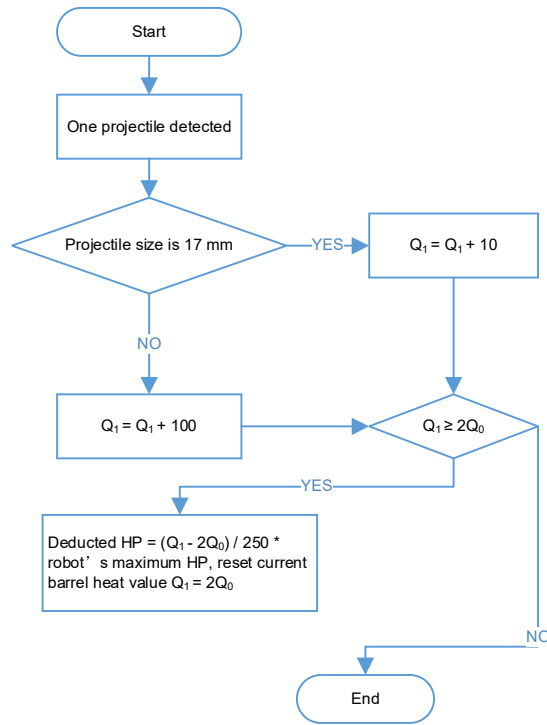
Figure 4-2 Calculation Logic when Exceeding Barrel Heat Limit
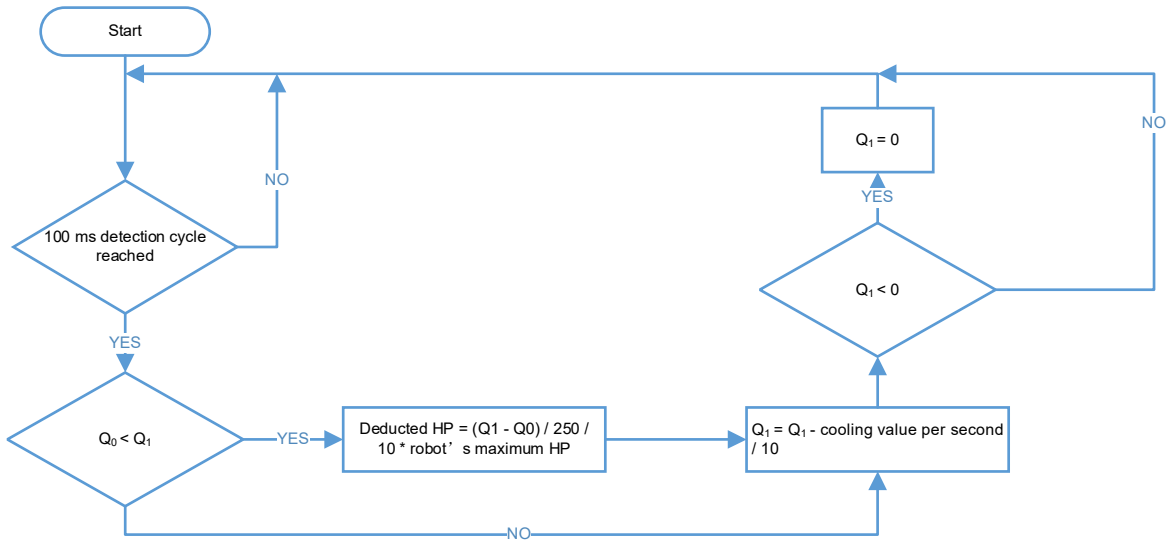
Figure 4-3 Barrel Heat Cooling Logic

4.1.3   Exceeding Chassis Power Consumption Limit

The chassis power consumption of robots will be continuously monitored by the Referee System, and the robot chassis needs to run within the chassis power consumption limit. Considering it is difficult for a robot to control instantaneous power consumption output when in motion, a buffer energy (Z) has been defined to avoid the consequent penalty.

Table 4-3 Penalty Mechanism for Exceeding Chassis Power Consumption Limit

K	N%
K ≤ 10%	10%
10% < K ≤ 20%	20%
K > 20%	40%

After buffer energy has been exhausted, when the chassis power consumption of Hero, Standard, and Sentry exceeds the limit, the deducted HP for each detection cycle = Maximum HP * N% * 0.1.

The buffer energy value of Hero, Standard and Sentry Robots is 60 J.

The Referee System calculates chassis power consumption at a frequency of 10 Hz.

Excess Percentage: $K = (P_r - P_l) / P_l * 100\%$, where P_r is the instantaneous Chassis Power Consumption output and P_l is the power consumption limit.

The logic graph for Chassis Power Consumption detection and Deducted HP for Hero, Standard, and Sentry is shown below:
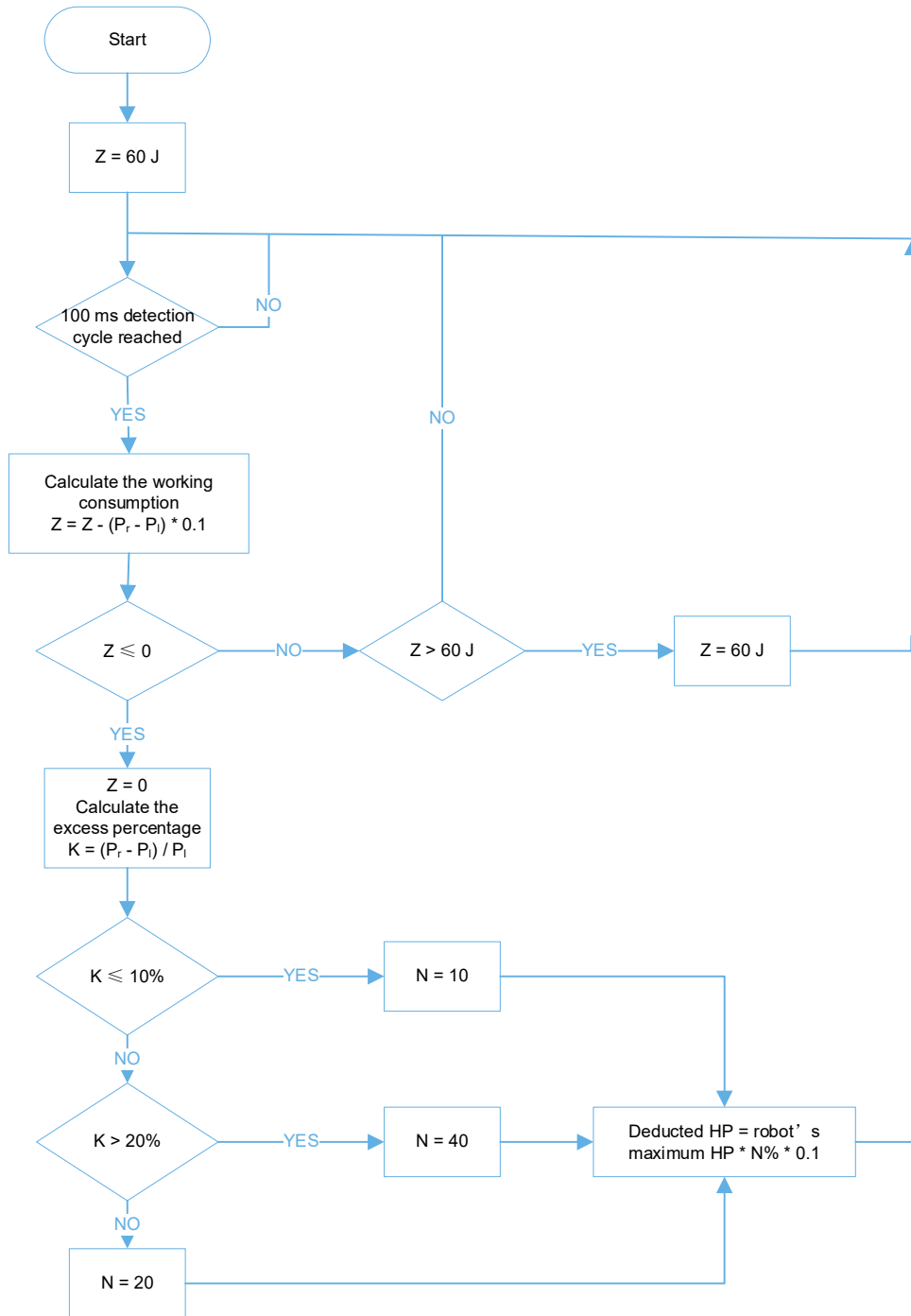
Figure 4-4 Chassis Power Consumption Detection and HP Deduction Logic of Hero, Standard, and Sentry

4.1.4 Attack Damage

An Armor Module detects projectile attacks using the pressure sensor and the vibration frequency of the Armor.

The shortest detection interval for an Armor Module is 50 ms (when hitting an Armor Module using a 42 mm projectile, the detection interval can be extended to a maximum of 200 ms).

The projectile needs to come into contact with the impact surface of the armor module at a certain speed in order to be successfully detected. The velocity range for the detection of different projectile types by an armor module is as follows:

Table 4-4 Effective Detection Speeds of Armor Modules for Different Types of Projectiles

Armor Module	17 mm projectile	42 mm projectile
Large Armor Module, Small Armor Module	Higher than 12 m/s	Higher than 8 m/s

> In an actual match, the normal speed of a projectile that touches the Armor Module attack surface is different from its Initial Projectile Speed due to the projectile's speed decay and its incident angle not being normal to the Armor Module attack surface. Damage detection is based on the normal component of the projectile's speed upon contact with the Armor Module attack surface.

A robot experiences damage when its Armor Module is struck. However, a robot is not allowed to cause damage to the other side's robots through striking (including collision with the robots or launching objects).

The table below shows damages where no buff is gained:

Table 4-5 HP Deduction Mechanism for Attack Damage

Target \ Damage type	42 mm projectile	17 mm projectile	Collision
Robot Armor Module	100	10	2
Base Large Armor Module	200	5	2

4.1.5   Referee System Going Offline

Participating teams must mount the corresponding referee system modules on their robots in accordance with the requirements of RoboMaster 2024 University Series Robot Building Specifications Manual, and ensure the stability of the connection between each module of the referee system and the server throughout the competition. The Referee System server detects the connectivity of each module at a frequency of 2 Hz. If Critical Referee System Modules go offline due to design or structural problems, it will result in the deduction of the HP of the corresponding Ground Robots. If a Speed Monitor Module (17 mm Projectile) or (42 mm Projectile) mounted on a robot goes offline, the robot's 17 mm or 42 mm Launching Mechanism will be powered off immediately.

Critical Referee System Modules: Armor Module and Supercapacitor Management Module.
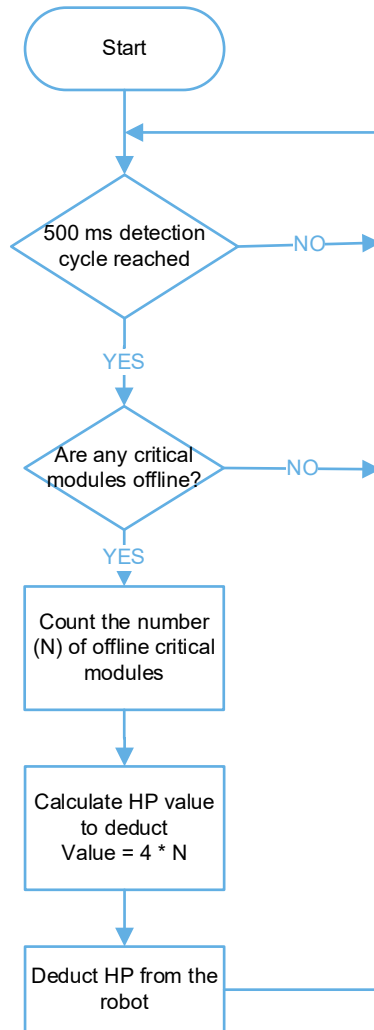
Figure 4-5 HP Deduction Mechanism for Critical Referee System Going Offline
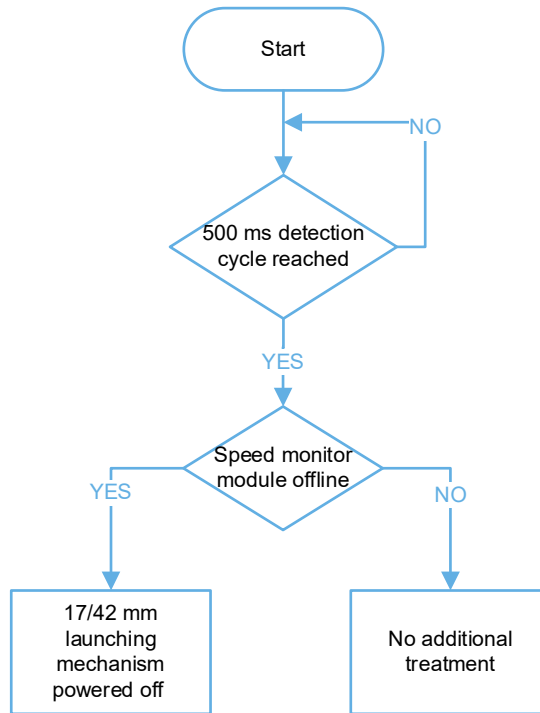
Figure 4-6 Offline and Power-off Mechanism for Speed Monitor Module

4.1.6   Irregular Offline Status

During the competition, if a robot enters the Irregular Offline state, it can reconnect to the competition while its experience and levels will continue to be calculated during the offline period.

Table 4-6 Consequences of Irregular Offline Status

Robot Type	Consequences of irregular offline status
Hero, Standard	● When the power supply to the Launching Mechanism, Gimbal and Chassis is powered off, 5% of the Maximum HP is deducted for each second elapsed until it drops to zero. ● The RFID Interaction Module is expired. ● The robot no longer detects any damage caused by collision or projectile attacks. ● The respawn process drops to zero.
Sentry	● When the power supply to the Launching Mechanism, Gimbal and Chassis is powered off, 5% of the Maximum HP is deducted for each second elapsed until it drops to zero. ● The RFID Interaction Module is expired. ● The robot no longer detects any damage caused by collision or projectile attacks.

5.   3V3 Match

During a five-minute round, both teams control their robots to engage in tactical combat on the core competition area - the Battlefield. The team that destroys the opponent's Base shall be the winner.

5.1   Competition Area

5.1.1   Overview

- The dimension error margin of all battlefield components described here is within ±10%. The unit for the size parameters on the site drawings is mm.
- The Battlefield has a symmetrical layout with a central line. All descriptions and illustrations of Battlefield modules in this text will be based on the Red Team as an example but will apply equally to the Blue Team.

The core competition area of the 3V3 Match is called the Battlefield. The Battlefield is 12 m x 8 m in size. Each team has a Starting Zone, Supplier Zone and Battlefield Buff Point.
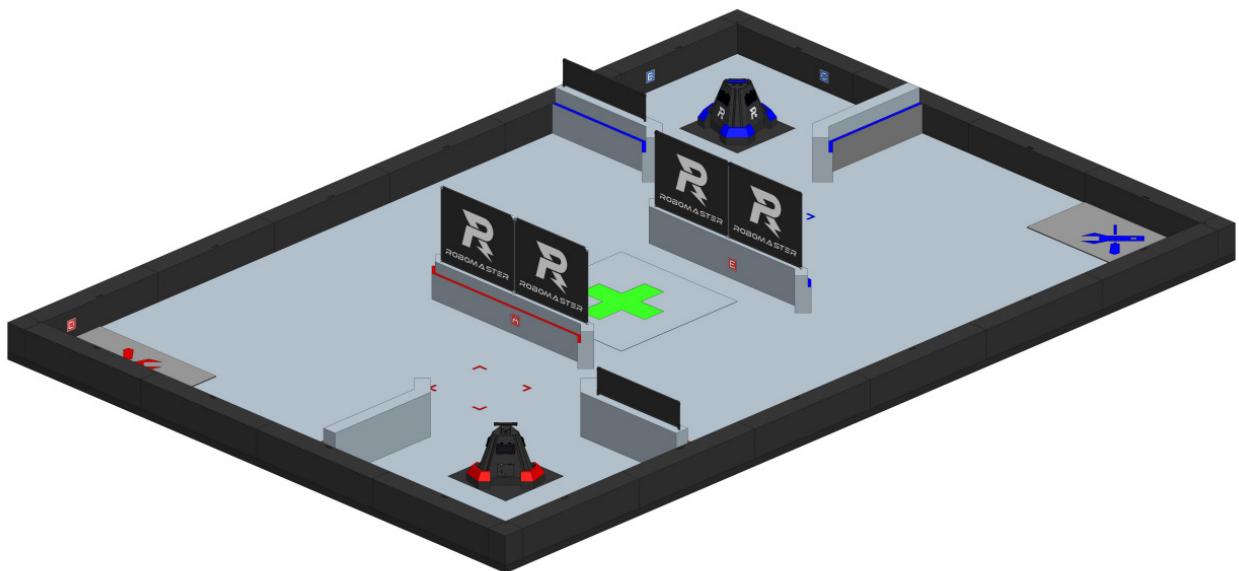
Figure 5-1 Axonometric View of 3V3 Match Wooden Battlefield
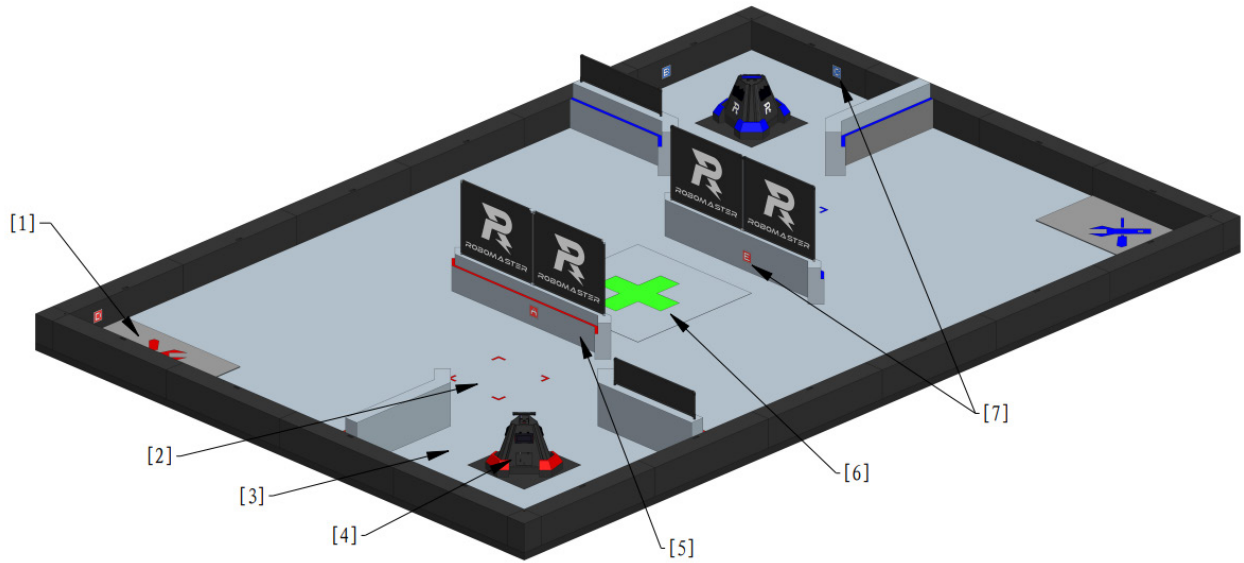
[1]	Supplier Zone	[2]	Sentry Starting Zone	[3]	Starting Zone	[4]	Base	[5]	Bunker
[6]	Central Buff Point	[7]	Visual Marker						

Figure 5-2 Modules of 3V3 Match Wooden Battlefield
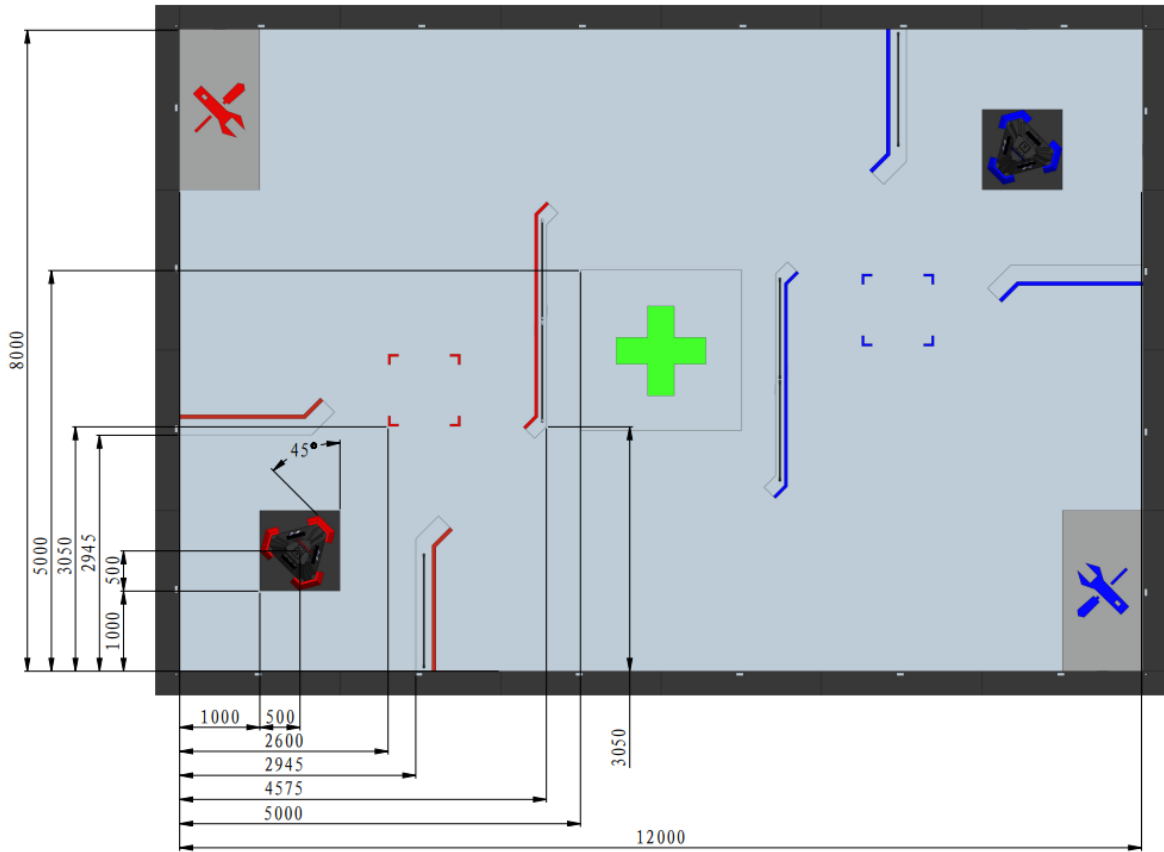
Figure 5-3 Dimensions of 3V3 Match Wooden Battlefield

5.1.2 Starting Zone

The Starting Zone is the robots placement area before a match, mainly including the Base.
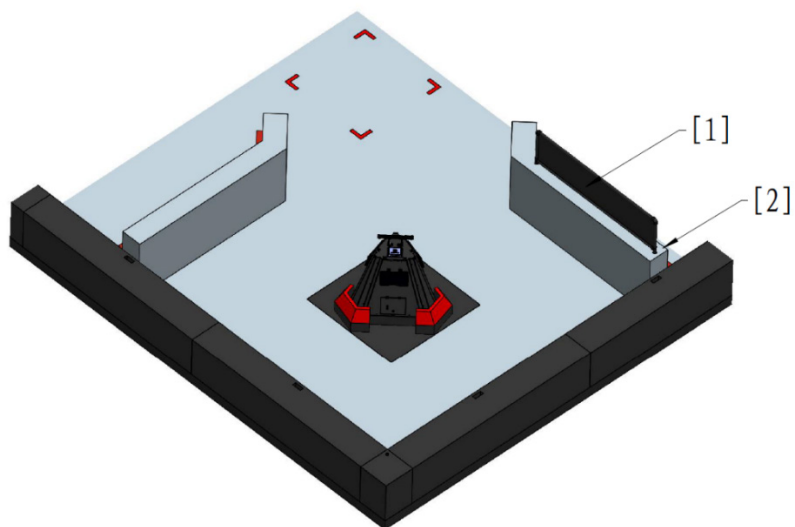
| [1] | Cloth perimeter wall of the Starting Zone | [2] | Wooden perimeter wall of the Starting Zone |
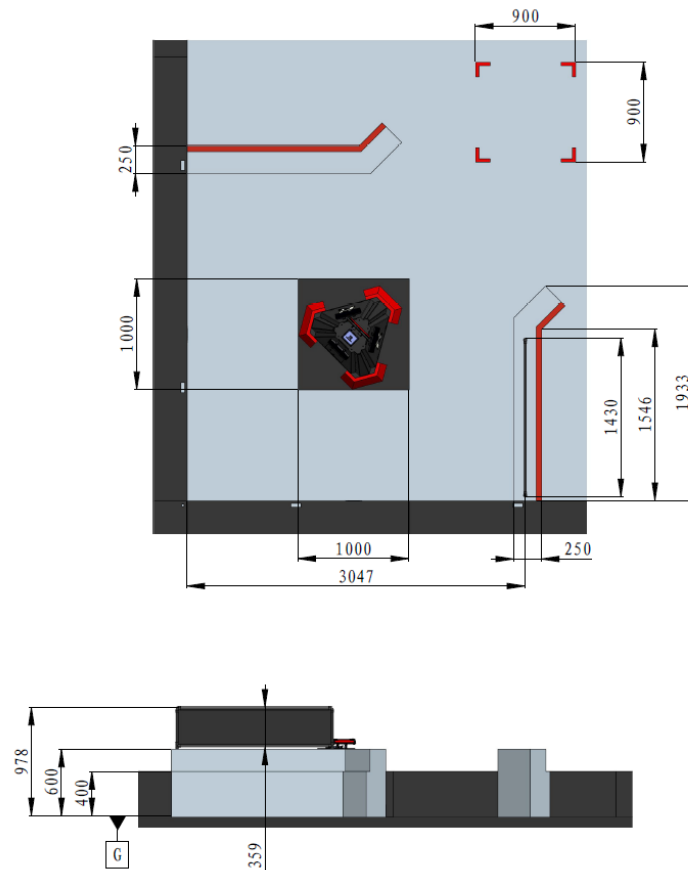
Figure 5-4 Starting Zone of the Wooden Battlefield

5.1.2.1   Base

The Red Team and Blue Team each have a Base. The Base is equipped with several Armor Modules with stickers attached.

[1]   Light Indicator Module   [2]   Armor Module
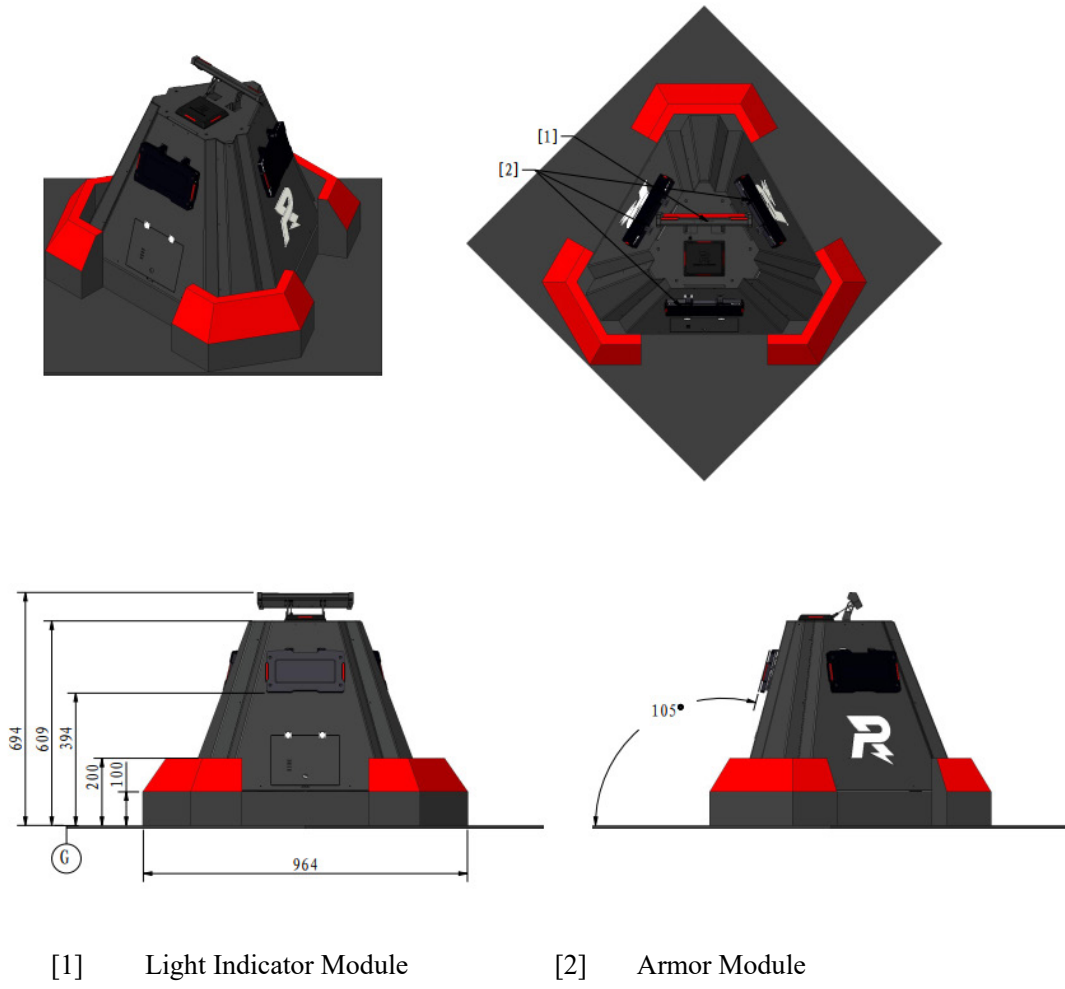
Figure 5-5 Base

5.1.3 Bunker
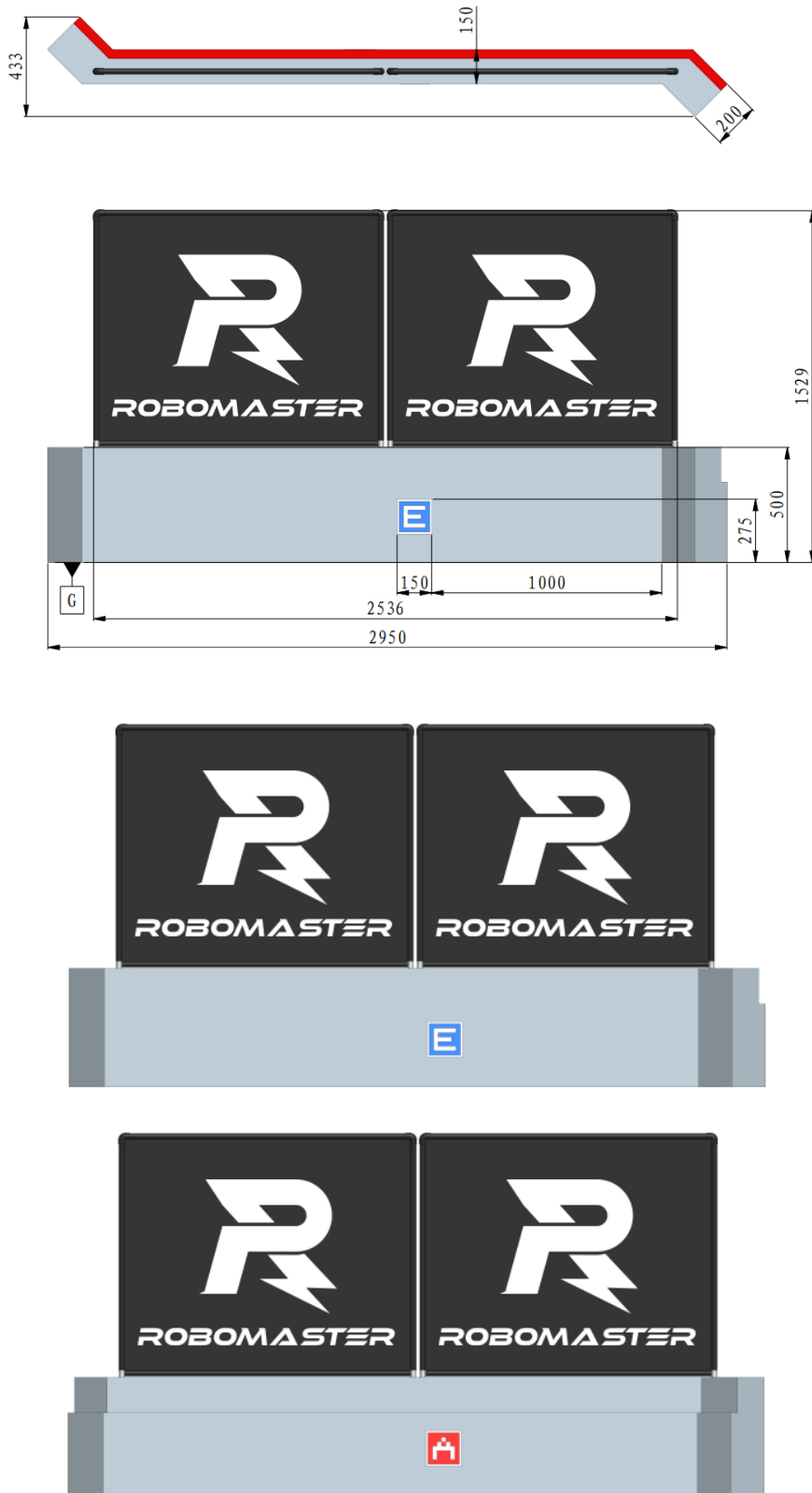
Figure 5-6 Bunker on the Wooden Battlefield

5.1.4   Supplier Zone

A Supplier Zone is an important area for the reloading of projectiles and the recovery of robot HP.
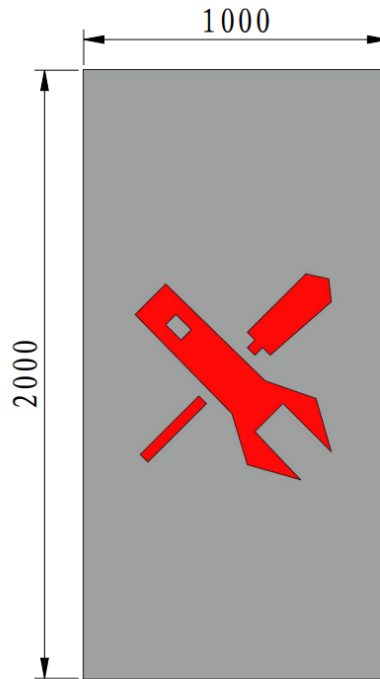
Figure 5-7 Supplier Zone

5.1.4.1   Supplier Penalty Zone

The Supplier Zone of one team is the Supplier Penalty Zone for the opponent's robots.
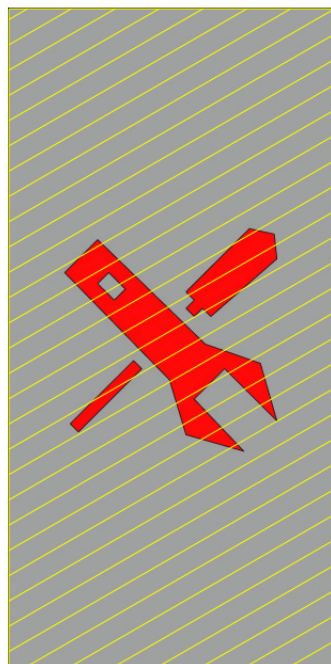
Figure 5-8 Supplier Penalty Zone

5.1.5   Central Buff Point

Central Buff Point is located at the center of the battlefield.
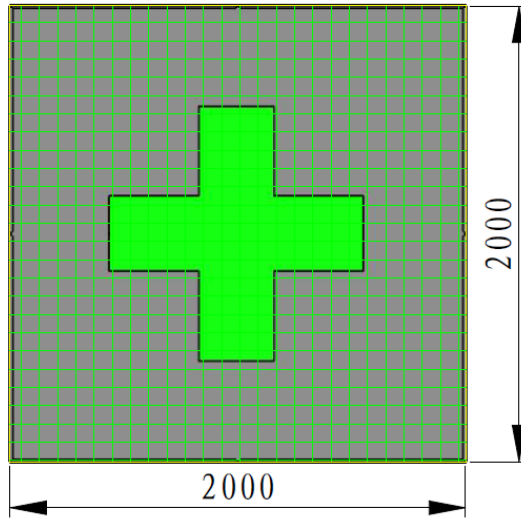
Figure 5-9 Central Buff Point
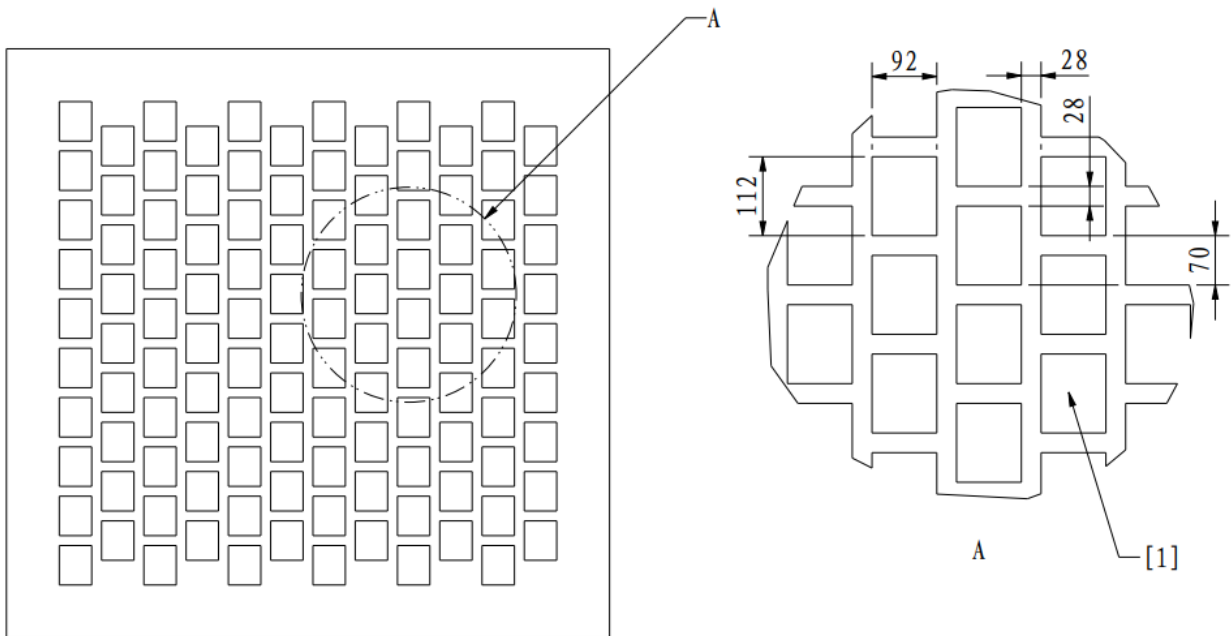
[1]   Locations where RFID Interaction Module Cards are lodged

Figure 5-10 Layout of the RFID Interaction Module Cards

Deadbands may exist for the RFID Interaction Module Cards at the Buff Points in the Battlefield. The teams have to adjust on their own.

5.1.6   Miscellaneous

5.1.6.1   Projectiles

Robots attack the Armor Modules of opponent robots by launching projectiles, causing damage to their HP so as to ultimately defeat them. The parameters and scenarios of use for projectiles in the competition are as follows:

Table 5-1 Projectile Parameters and Scenarios of Use

Type	Appearance	Color	Dimensions	Weight	Shore Hardness	Material	Scenarios of Use
42 mm projectile	Similar to a golf ball	White	42.5 mm ± 0.5 mm	41 g ± 1 g	90 A	Plastic (TPE)	3V3 Match
17 mm projectile	Sphere	Yellow-green	16.8 mm ± 0.2 mm	3.2 g ± 0.1 g	90 A	Plastic (TPU)	All RMUL Events

5.1.6.2   Projectile Reloader

An off-field reloading operator may refill projectiles for a robot using an official Projectile Reloader. The Projectile Reloader is shown below:
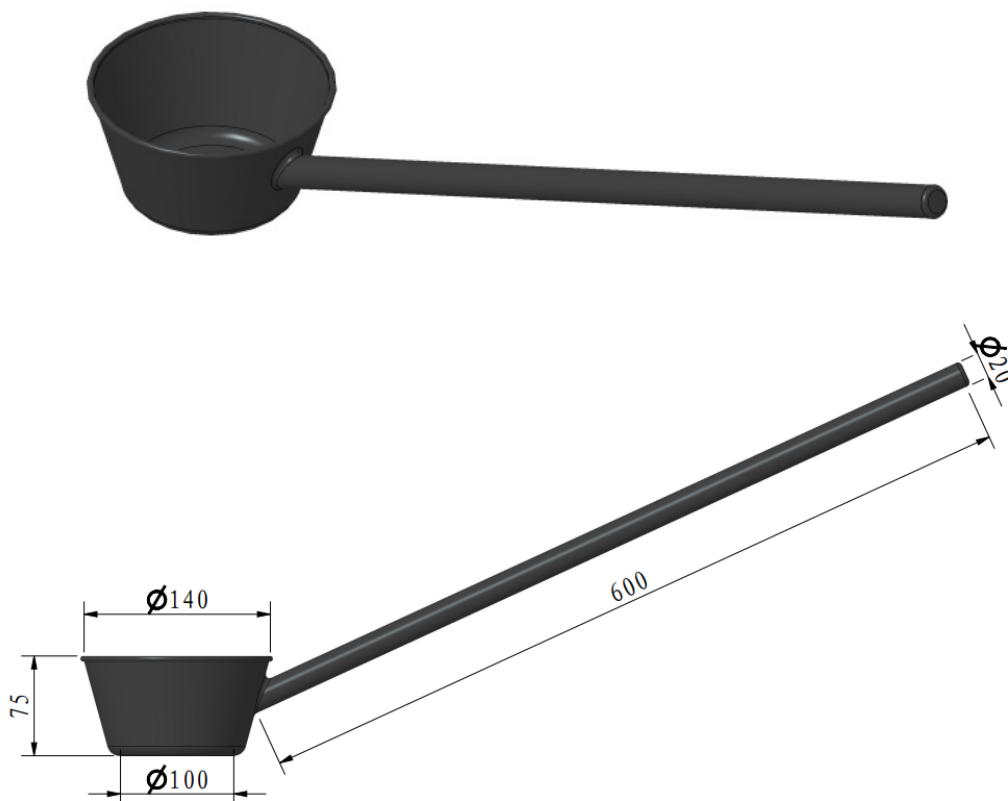
Figure 5-11 Projectile Reloader

5.1.6.3   Visual Marker

A Visual Marker is a white-bordered square label with a side length of 150 mm and white words on a red or blue

background. Each Marker is different. For their codes, please refer to RoboMaster Visual Marker Library.

The color codes for Visual Markers are:

Red RGB: R255 G51 B51; CMYK: C0 M89 Y75 K0; HEX: ff3333

Blue RGB: R51 G153 B204; CMYK: C74 M30 Y13 K0; HEX: 3399cc
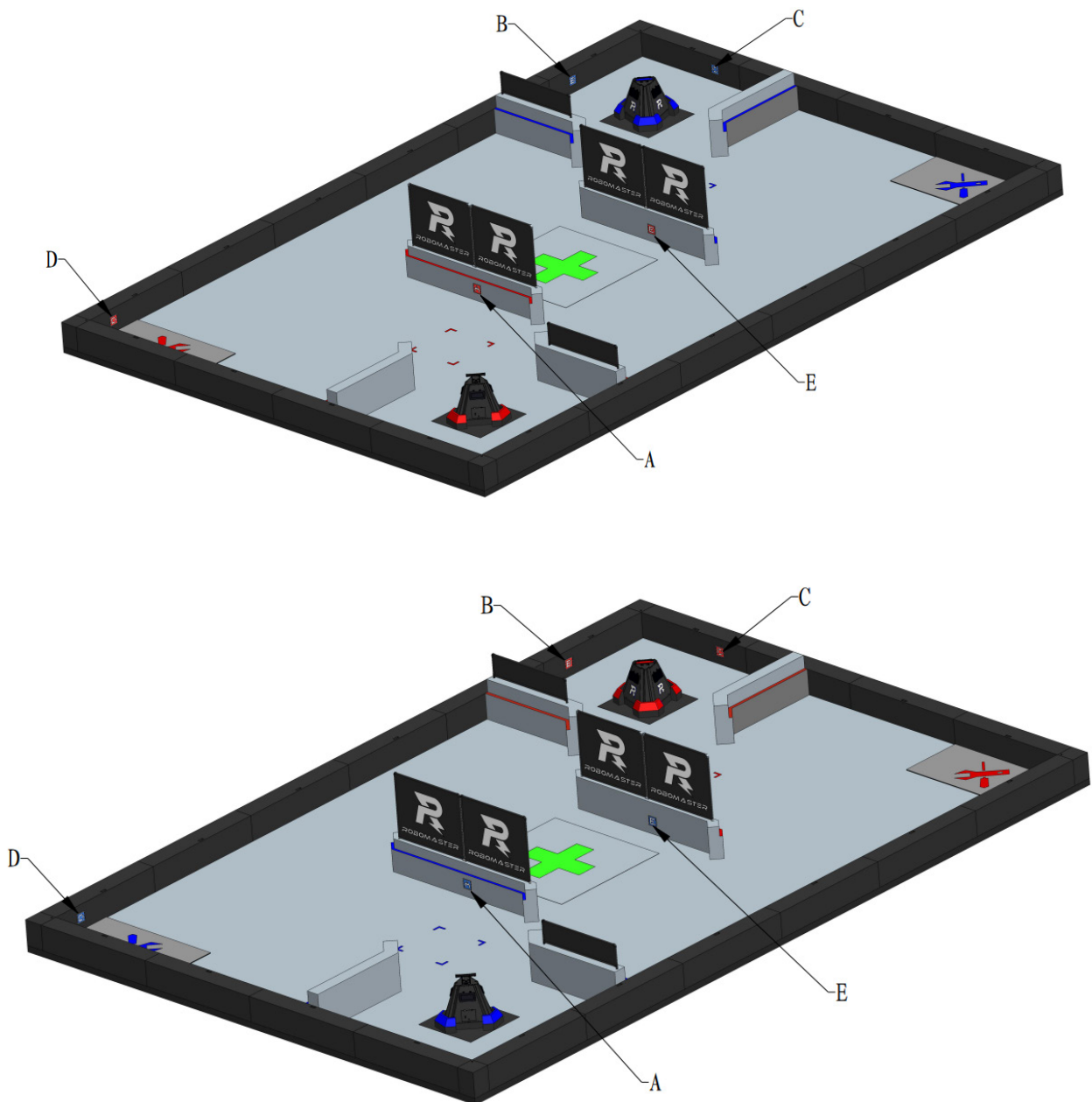
Figure 5-12 Diagram of Visual Markers

5.1.6.4 Operator Room

Operator Room lies outside the Battlefield and is an area for Operators during the competition. Each Operator Room

must be equipped with a corresponding number of computers with official equipment such as monitor, mouse, keyboard and USB hub.

5.2 Competition Mechanism

5.2.1 HP Recovery and Revival Mechanism

All robots (except for ejected robots) may recover their HP; only Sentries cannot be respawned.

5.2.1.1 HP Recovery Mechanism

Hero and Standard Robots: When occupying own side's Supplier Zone, they may restore up to 10% of HP per second. If a robot fails to launch a projectile nor suffer any damage for 6 consecutive seconds, this value will increase to 25%.

Sentry: From the start to the 4th minute of the competition (countdown from 4:59 - 1:00), an alive Sentry Robot that occupies its Supplier Zone will restore 100 HP per second. The total maximum HP that can be recovered in this manner is 600.

5.2.1.2 Respawn Mechanism

● A defeated Standard or Hero Robot can be respawned automatically, by completing the respawn process.

● When a Standard or Hero robot is auto-respawning, it gains 2 respawn points each second.

● After a Standard or Hero is respawned, all launching mechanisms remain powered off. A robot must return to its team s Supplier Zone to enable the launching mechanism again.

The respawn process length for different robots on their first defeat are shown as follows:

Table 5-2 The Respawn Process Length for different Robots on their First Defeat

Type	Respawn process length
Standard Robots	10
Hero Robots	20

The respawn process length for the same robot increases by 10 after each defeat.

A respawned robot will maintain its level, performance points and experience points from before its defeat, and its HP will be restored to 20% of the Maximum HP. The robot is invincible for 10 seconds after respawn.

5.2.2 Projectile Supply

In each round, a robot can enter its team's Supplier Zone at any time, where the off-field reloading operator can refill projectiles for the robot using the official Projectile Reloader. For details of a projectile reloader, please refer

to "Figure 5-16 Projectile Reloader".

Reloading operators can only refill projectiles using the official projectile reloader, and cannot touch the robots in any other manner.

5.2.3   Battlefield-related Mechanism

5.2.3.1   Base HP

The Base HP is 1500 and it is in the Invincible state at the start of a round.

During the competition, when one team experiences its first robot defeat or ejection, its Base's Invincible status will be removed while its Virtual Shield will be activated and have 1,500 HP points. When a robot attacks the opponent's Base, the HP of its Virtual Shield will be deducted first. If the Virtual Shield's HP is reduced to zero, the Base's HP will begin to be deducted.

The "invincible" status of the team's base and its Virtual Shield will expire when its Sentry is destroyed or ejected.

If a team's Sentry Robots have not showed up on the Battlefield after one minute has elapsed in the round, the "invincible" status of the team's base and its Virtual Shield will be expired.

- The HP of Virtual Shields cannot be restored. The HP deducted due to the opponent's attack on a Virtual Shield counts as their Attack Damage.

- When a Base is in the Invincible status or its Virtual Shield is enabled, its armor lights will become purple

5.2.3.2 Central Buff Points Mechanism

The location of the Central Buff Point is shown below (with a wooden battlefield as an example):
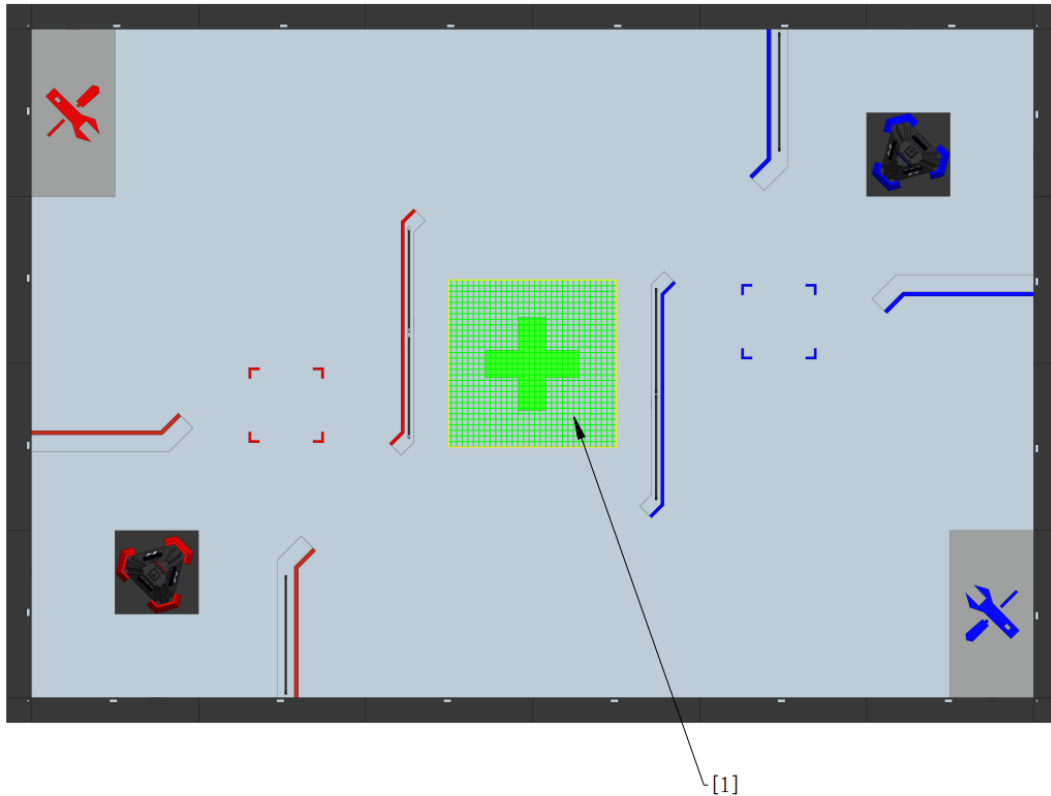
[1]   Central Buff Point

Figure 5-13 Central Buff Point

Within the first minute of the match, Central Buff Point is not activated, and no robot can occupy the Zone.

One minute into the round (when the countdown is at 3:59), the Central Buff Point activates. Any Hero or Standard Robot that occupies the Central Buff Point will gain 10 energy points for its team per second. Any Sentry Robot that occupies a Central Buff Point will gain an additional 10 energy points for its team per second. Both teams can occupy Central Buff Point simultaneously, and the deactivation of Occupied Status is delayed by 2 seconds.

If a robot is attacked while occupying a Central Buff Point, the energy received by its team will be deducted: For every 17 mm projectile detected, 2 energy points will be deducted, and for every 42 mm projectile detected, 20 energy points will be deducted, until the team's energy is reduced to zero.

When a team gains 100 energy points by occupying the Central Buff Point, the Central Buff Point immediately expires. The alive Hero and Standard Robots of that team share the 500 experience points equally. Both teams' occupation energy becomes zero. The Central Buff Point cannot be reactivated for 90 seconds. Central Buff Point

becomes activated again after 90 seconds.

5.2.4   Sentry-Related Mechanism

The barrel heat of Sentry's two Launching Mechanism Barrels shall be calculated separately. When the total number of projectiles launched by two Launching Mechanisms has reached 750, all Launching Mechanisms will be powered off.

5.2.5   Economic System

Both teams will receive gold coins regularly during the competition. Gold coins can only be exchanged for Projectile Allowance.

Each team has 200 gold coins at the start of the match. For every minute afterwards, 200 gold coins will be given to each team until the second minute (when countdown is at 2:59). In the third minute and fourth minute of the game, both sides can get 300 gold coins again.

Table 5-3 Rules for Exchange

Exchange item	Exchange ratio
17 mm projectile	50 gold coins/50 rounds
42 mm projectile	75 gold coins/5 rounds

After the start of the competition, for each round of projectiles fired by a robot, the Projectile Allowance corresponding to the type of projectiles fired is reduced by 1. When the corresponding Projectile Allowance is not zero, the launching Mechanism will remain powered on; otherwise it will be powered off. If a Hero Robot launches more projectiles than its allowance (the Speed Monitor Module detects a 42 mm projectile has been fired when the Projectile Allowance is 0), the Referee System will shield all the Armor Modules of the other team's robots and Base from 42 mm projectile damage.

Standard and Hero Robots can exchange 17 mm or 42 mm projectiles with gold coins at any time in the Supplier Zone. The operator reloads projectiles through the Player's Client using a keyboard and mouse. Projectiles can be reloaded on robots after the match has started. If projectile reloading is confirmed to take place and there are gold coins remaining, a team can select the number of projectiles on the exchange panel and complete the exchange by having its Standard operator press the corresponding key and Hero operator press the corresponding key.

Hero Robots can be pre-loaded with 42 mm projectiles, and Standard and Sentry Robots can be pre-loaded with 17 mm projectiles. All robots can have their 17 mm projectiles reloaded by the off-field reloading operator of the Supplier Zone during the competition. They may not have their 42 mm projectiles reloaded.

5.2.6 Experience and Performance Systems

5.2.6.1 Experience System

After the match starts, Standard and Hero Robots are both at Level 1. They can go up to Level 10 (the highest level possible) by gaining experience points. Sentry Robots cannot gain experience points or level up, and will always be considered Level 10.

During the competition, a robot earns experience points in various ways, as shown below:

Behavior Type	Experience Points Gained
Launching projectiles	• Standard robot: For every 1 projectile launched, the robot gains 1 experience point. • Hero robot: For every 1 projectile launched, the robot gains 10 experience points.
Dealing damage	• Dealing damage to a robot: For every 1 point of damage dealt, the attacking team gains 4 experience points • Dealing damage to the Base: For every 1 point of damage dealt, the attacking team gains 1 experience point When a team's Hero Robots deal damage to the opponent with 42 mm projectiles, they will get experience points listed above. When a team's Standard or Sentry Robots deal damage to the opponent with 17 mm projectiles, the experience points will be divided equally among all the alive Standard Robots of that team. The average is rounded up and shall be accurate to one decimal place. **Example: A Standard Robot of the blue team received 10 points of damage from a 17 mm projectile, but the system is unable to identify the damage's origin. At this moment, Red Team has 1 alive Standard Robot and 1 alive Hero Robot. As a result, the experience points gained by the alive Standard Robot is 4*10=40. The alive Hero Robot gains no experience point.**
Defeated robots	• If the destroyer is a Hero Robot that defeats other robots with 42 mm projectiles:

Behavior Type	Experience Points Gained
	➢ When the destroyed robot's level is not lower than that of the destroyer, the experience points are calculated as follows: The experience points gained by destroyer = 50 * the level of the destroyed robot * (1 + 0.2 * the difference between the level of the destroyed robot and that of the destroyer) ➢ When the destroyed robot's level is lower than that of the destroyer, the level difference is considered to be 0. The experience points are calculated as follows: The experience points gained by destroyer = 50 * the level of the destroyed robot ● If the defeat of the opponent's robots is not achieved through the use of 42 mm projectiles: The level of the destroyer is considered to be the level corresponding to the average experience points of the opponent's alive Standard Robots. The average value of experience points is rounded off. **Example 1: When a Level 2 Hero Robot destroys a Level 6 Standard Robot of the opponent with 42 mm projectiles, the experience gained by the Hero Robot is 50 * 6 * (1 + (6 - 2) * 0.2) = 540** **Example 2: One Level 8 Standard Robot of the Blue Team is defeated by 17 mm projectiles, and the Red Team has 2 alive Standard Robots with experience of 600 and 1800. Their average experience points should be 1200, corresponding to Level 5. Thus the experience gained by each alive Standard Robot of the Red Team is 50 * 8 * (1 + (8 - 5) * 0.2) / 2 = 320.**
Occupying the Central Buff Point	Each time a team successfully occupy the Central Buff Point, it gains 500 experience points.

Table 5-4 Levels and Experience Points of Hero and Standard Robots

Level	Experience Points Required for Leveling Up
1	0
2	250
3	500
4	750
5	1,000

Level	Experience Points Required for Leveling Up
6	1250
7	1500
8	1750
9	2000
10	2500

When a Balancing Standard Robot gains experience, it receives an additional 50% experience increase.

5.2.6.2 Performance System

After the start of the Three-Minute Setup Period, the operators of the Standard and Hero Robots may select the types of chassis and Launching Mechanism for the robots. Once the Five-Minute Competition Round has begun, the robots' chassis and launching mechanism types, once selected, cannot be changed during the entire round.

If the chassis or launching mechanism types are not selected, after the start of the Five-Minute Competition Round, the unselected chassis performance type will be automatically set to "HP-Focused", and the unselected barrel type will be automatically set to "Cooling-Focused".

Table 5-5 Attributes of Hero Robot Chassis

Chassis Type	Level	Maximum HP	Chassis Power Consumption Limit (W)
Power-Focused	1	200	70
	2	225	75
	3	250	80
	4	275	85

Chassis Type	Level	Maximum HP	Chassis Power Consumption Limit (W)
	5	300	90
	6	325	95
	7	350	100
	8	375	105
	9	400	110
	10	500	120
HP-focused	1	250	55
	2	275	60
	3	300	65
	4	325	70
	5	350	75
	6	375	80
	7	400	85
	8	425	90
	9	450	100
	10	500	120

Table 5-6 Attributes of Standard Robot Chassis

Chassis Type	Level	Maximum HP	Chassis Power Consumption Limit (W)
Power-focused	1	150	60
	2	175	65
	3	200	70
	4	225	75
	5	250	80
	6	275	85
	7	300	90
	8	325	95
	9	350	100
	10	400	100
HP-focused	1	200	45
	2	225	50
	3	250	55
	4	275	60
	5	300	65
	6	325	70
	7	350	75
	8	375	80
	9	400	90
	10	400	100

Table 5-7 Attributes of 17 mm Launching Mechanisms

Launching Mechanism Type	Level	Barrel Heat Limit	Barrel Cooling Value per Second
Burst-focused	1	200	10
	2	250	15
	3	300	20
	4	350	25
	5	400	30
	6	450	35
	7	500	40
	8	550	45
	9	600	50
	10	650	60
Cooling-focused	1	50	40
	2	85	45
	3	120	50
	4	155	55
	5	190	60
	6	225	65
	7	260	70
	8	295	75
	9	330	80
	10	400	80

Table 5-8 Attributes of 42 mm Launching Mechanisms

Launching Mechanism Type	Level	Barrel Heat Limit	Barrel Cooling Value per Second
Default	1	200	40
	2	230	48
	3	260	56
	4	290	64
	5	320	72
	6	350	80
	7	380	88
	8	420	96
	9	450	104
	10	500	120

5.2.7   Competition System and Winning Criteria

The 3V3 Match consists of the Group Stage and the Knockout Stage. The Group Stage follows the BO2 competition system, while for Knockout Stage it is BO3 or BO5.

Winning criteria for a Single Round as shown below:

1.   When the Base of one team is destroyed, the round ends immediately and the alive team wins.

2.   When the entire seven minutes of a round elapses, if the Bases of both teams have survived, the team with the higher remaining Base HP is the winner.

3.   If a round has ended, and the remaining Base HP of both teams are the same, the team with the higher remaining Sentry HP is the winner.

4.   If a round ends, and the remaining Base HP and Sentry HP of both teams are the same, the team that dealt more attack damage is the winner.

5. If a round ends, and the remaining base HP and Sentry HP of both teams are the same, and the total attack damage dealt by the two teams are the same, the team with higher total robot remaining HP is the winner.

6. If neither fulfills these criteria, the round is considered a draw. A draw in the Knockout Stage leads to an immediate tie-breaker round until a team wins.

6. Standard Match

During a two-minute round, the robots from both teams engage in a shootout on the Battlefield. The team that destroys the other's robots shall be the winner.

During a Standard Match, a Standard Robot:

- Will maintain the same experience and robot level.

- May launch up to 200 rounds of 17 mm projectiles.

6.1 Competition Area

The core competition area of the Standard Match is called the "Battlefield". The Battlefield is a 5 m x 5 m area that contains the Starting Zones of the blue and red teams.
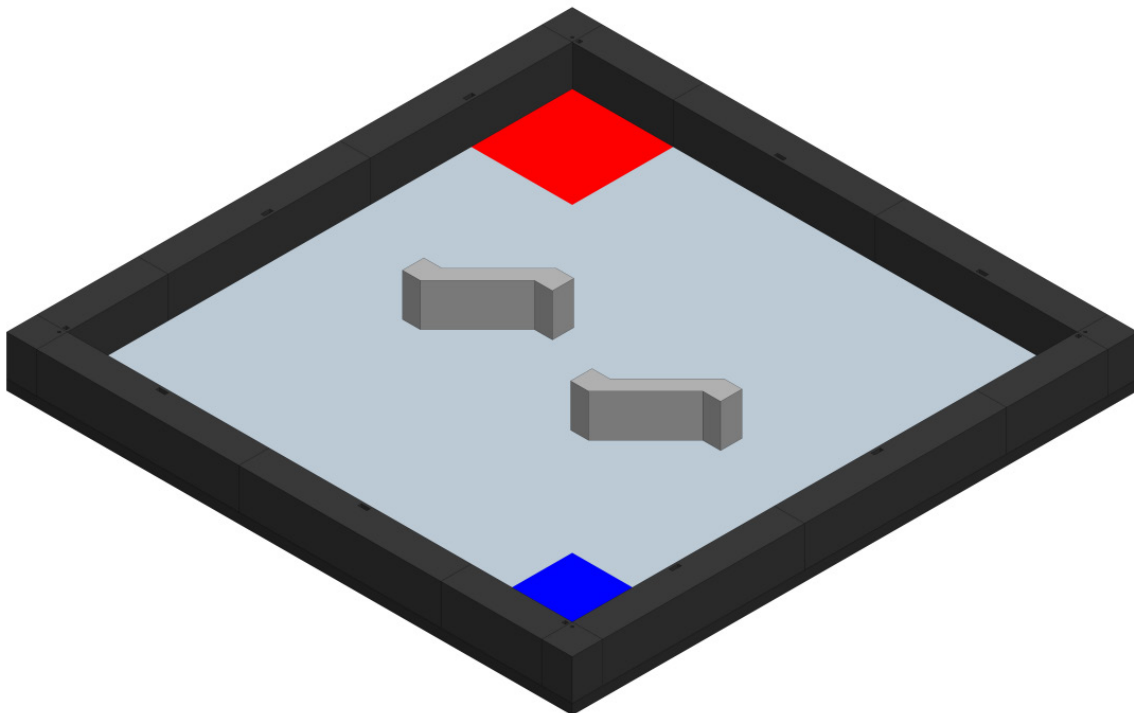
Figure 5-14 Axonometric View of Standard Match Wooden Battlefield

| [1] | Red Team's Starting Zone | [2] | Bunker | [3] | Blue Team's Starting Zone |
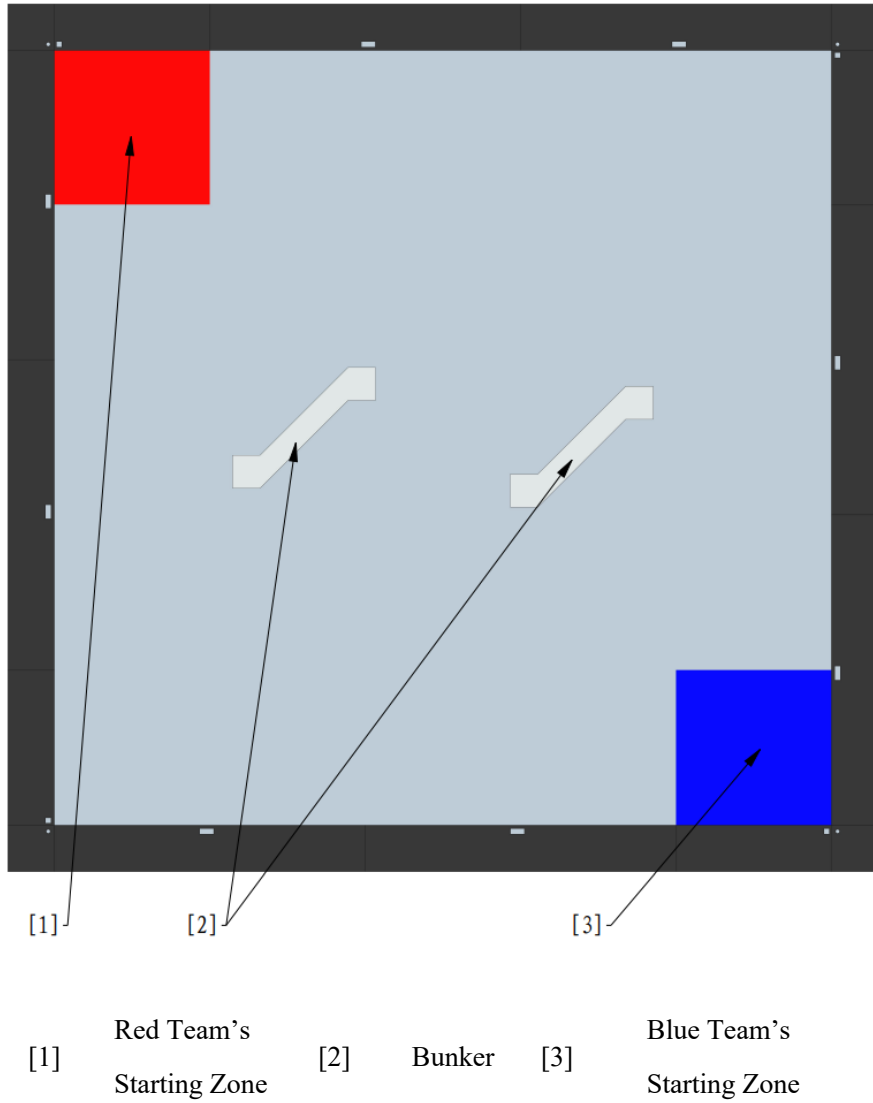
Figure 5-15 Top View of Standard Match Wooden Battlefield
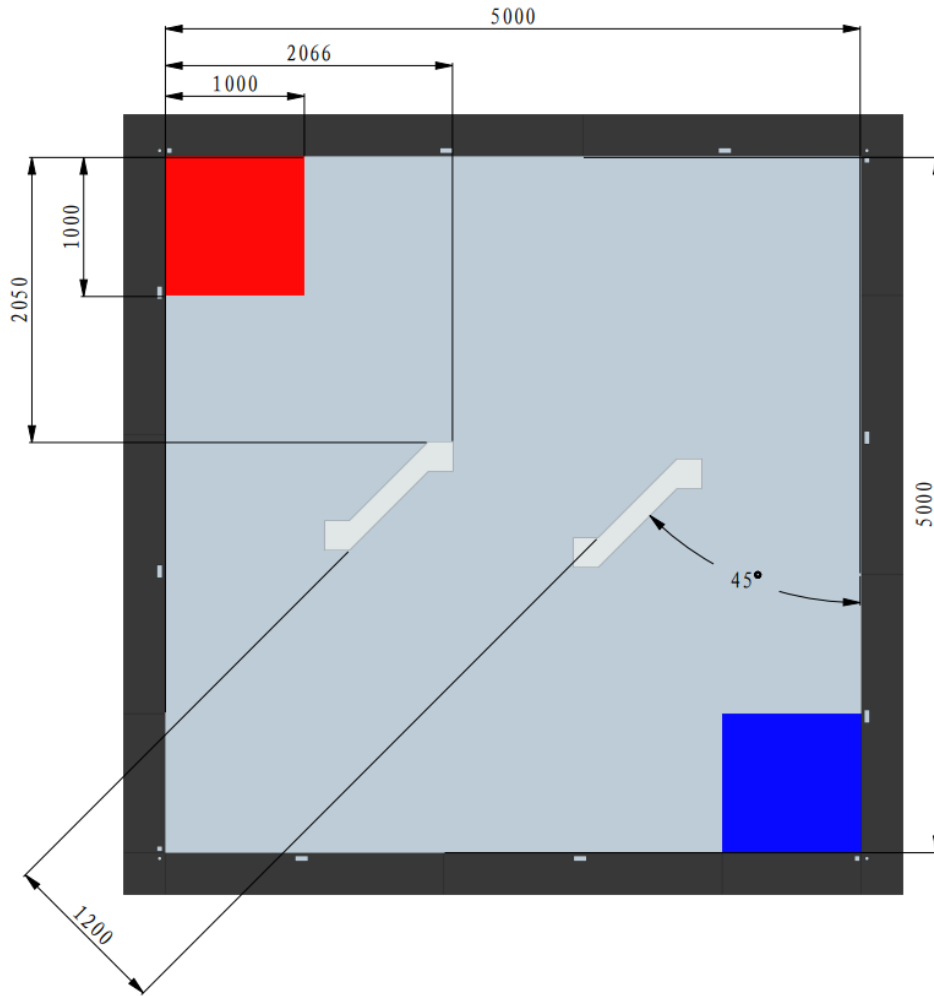
Figure 5-16 Dimensions of Standard Match Wooden Battlefield
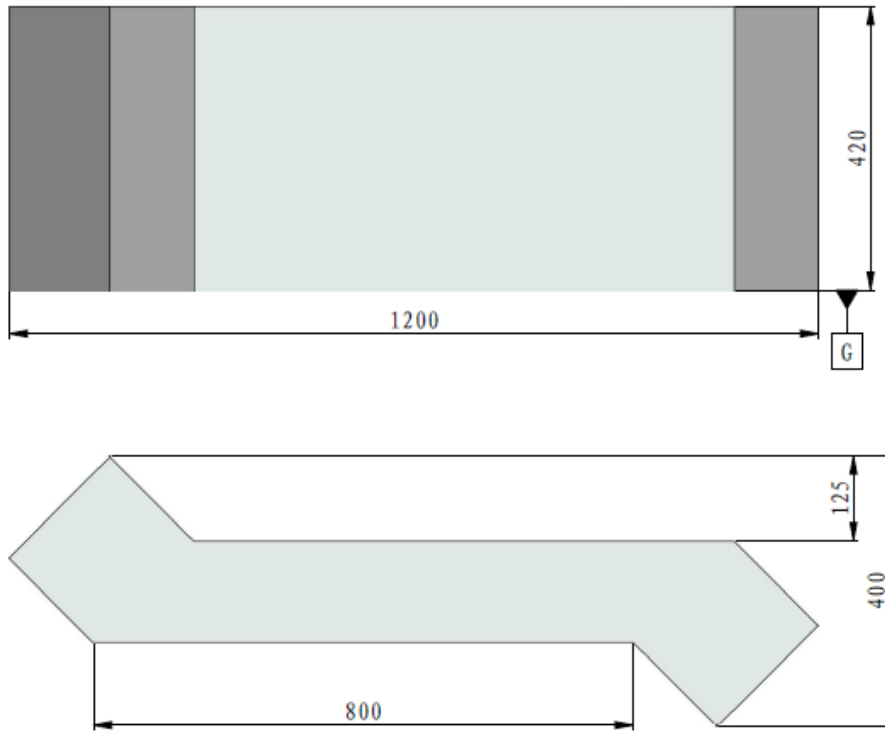
Figure 5-17 Bunker

6.2 Competition System and Winning Criteria

Standard Match consists of two parts: the Group Stage and the Knockout Stage. The competition system of Group Stage is BO2; the system of Knockout Stage is all BO3.

1. When a robot defeats the opponent through attacking the armor module.

2. If neither robot is defeated within the time limit, the team with more remaining HP wins.

3. If neither robot is defeated and both robots have the same HP after the time limit, then the robot with less weight wins.

4. If neither fulfills these criteria, the round is considered a draw. A draw in the Knockout Stage leads to an immediate tie-breaker round until a team wins.

7. Competition Process

Flowchart Step	Details
Wait for inspection in the Preparation Area	① The team has properly installed the referee system. ② Check if the robots meet the requirements of the specifications documents.
Does the team pass Pre-Match Inspection?	① The team arrives at the Inspection Area at the specified time before the match for the inspection. ② The Captain signs and confirms the inspection results.
Arrive at the Staging Area	① The team arrives at the Staging Area at the specified time before the match. ② The team abides by the rules of the Staging Area. ③ The team waits to enter the Battlefield.
Arrive at the Waiting Area	
Setup Period begins	① Power on robots and check whether they work properly. ② Connect to the referee system server. ③ Acquire the initial projectiles. ④ The Operators enter the Operator Room. ⑤ In the last 30 seconds, all robots are required to power on and team members must leave the Battlefield. ⑥ Technical Timeout in case of exceptional situations.
Fifteen-second referee system initialization + five-second countdown	① The referee system initialization period begins. ② The match enters the countdown.
Match start -‑- end	① Both teams' robots engage in a shooting battle on the Battlefield. ② The winning team is decided based on competition rules.
Any next round in the match?	
One match ends	① Robots are powered off and leave the Battlefield. ② The Captain signs and confirms the results or initiates an appeal within 5 minutes.
The team leaves the Competition Area and arrives at the Projectile Unloading Area	Recover projectiles, armbands, and pass cards.
Return to the Preparation Area	Return to the Preparation Area.

Figure 7-1 Process for A Single Match

7.1 Pre-Match Inspection

- The inspection results of the Mock Inspection and Practice Match are for reference only and are not taken into account for the inspection in the actual competition.

- The inspection results during the competition are only valid for the current match.

In order to make sure that the robots manufactured by participating teams conform to the requirements in RoboMaster 2024 University Series Robot Building Specifications Manual, 3V3 Match and Standard Match teams must arrive at the inspection area 60 and 40 minutes in advance, respectively, for pre-match inspection. The inspection process is as follows:

```
Team members bring their robots into          Each Standard or Sentry is brought into the Inspection Area by one
         the Inspection Area                   team member. Each of the other robots must be brought into the
                                               Inspection Area by no more than two team members, and another
                                               team member will be responsible for coordinating during the Pre-Match
                                               Inspection. Without the permission of the Head Inspector, other team
                                               members are not allowed to enter the Inspection Area. Team members
                                               are prohibited from entering the Inspection Area before their robots
                                               have entered the Inspection Area.

         Inspection of robots                  The staff will stick a pass card on robots that have passed the
                                               inspection, and fill in the pass card based on the inspection results.
                                               Only those robots that have received pass cards with complete
                                               markings are allowed to enter the Staging and Competition Areas.
                                               Teams must modify their non-qualifying robots until the robots meet the
                                               inspection requirements, before they can pass the inspection.

   Team Captains sign and confirm              After the Captain has signed and confirmed, no objections may be
         inspection results                    raised to the inspection results.
```

Figure 7-2 Pre-match Inspection Process

The rules regarding backup robots are as follows:

- During each round, each team can carry no more than one backup robot.

- Team members are required to declare the types of backup robots they are carrying during Pre-match Inspection. Backup Hero and Sentry must be attached with armor stickers in the Pre-match Inspection Area. If a backup Standard Robot is needed on the field, a Pit Crew Member must obtain the corresponding armor sticker promptly from the referee. The attachment of armor stickers must follow the requirements stated in the RoboMaster 2024 University Series Robot Building Specifications Manual.

During Mock Inspection, the RMOC will issue Referee Systems to backup robots that have passed Mock Inspection. For all RMUL events, each team can borrow at most one backup robot's Referee Systems.

7.2 Staging Area

After the pre-match inspection, the teams should arrive at the Staging Area at least 10 minutes before the start of each round. In a 3V3 Match, each team is allowed to have a maximum of seven pit crew, which must include one supervisor and up to six regular members (including reloading operators). In a Standard Match, each team is allowed to have a maximum of three pit crew, which must include one supervisors and up to two regular members. One Pit Crew Member should wear the "Captain" armband and undertake the Captain's role. If any team needs to repair their robots after entering the staging area, they must obtain the permission from the referee at the staging area. A robot may leave the Staging Area for repair only after the staff at the Staging Area have removed the Pass Card on the robot. When repair is finished, the robot needs to be brought back to the Inspection Area for another Pre-Match Inspection before re-entering the Staging Area. If the team is unable to arrive at the Staging Area in time as a result of this delay, the robot will not be able to enter the match, and the team will bear the consequences.

> Captain Armband: Any Regular Member that wears the "Captain" armband performs the Captain role during the match. The Captain is responsible for managing and controlling the team's participation in the competition process, confirming results, and requesting for Technical Timeouts, appeals, etc.

After leaving the staging area, the participating teams will enter the waiting area of the competition area to place their robots. With the permission of the referee, the next pair of participating teams will wait at the entrance of the Battlefield with their robots for further instructions. The referee will follow the competition process and open the door and lead the team members into the competition area. The countdown for the setup period will begin when the doors are opened.

7.3 Setup Period

> After the end of the second and fourth round of a BO5 match, both teams have five minutes to debug their robots. When five minutes run out, the three-minute setup period of the next round begins.

The Setup Period for a 3V3 Match is three minutes, and two minutes for a Standard Match. During the Setup Period, Pit Crew Members shall place their robots on their respective Initialization Areas, check whether their Referee Systems are operating normally, and load their Standard Robots with initial projectiles. Pit Crew Members may repair robots or replace equivalent parts, provided the requirements of the specifications documents are met.

> Equivalent parts: Standard modules or components having the same material, form and functions, for example motors of the same model and self-built friction wheel modules.

One minute before the Setup Period ends, the Operator is advised to enter the Operator Room to complete debugging

for the keyboard and mouse (which can be brought on your own), and double-check whether the robot controls and official equipment are operating properly. If any official equipment does not operate normally, the Pit Crew members must raise the issue before entering the final 15 seconds of the Setup Period. Otherwise, no technical timeout will be allowed by the referee. Except for the Operators of the robots on the Battlefield, the Pit Crew are not allowed in the Operator Room.

When the Setup Period is down to 30 seconds, all robots in the Battlefield must be powered up, robots that are not powered up must be removed from the Battlefield, and the staff in the Battlefield should leave the Competition Area in an orderly manner. After the end of the Setup Period, Pit Crew must place the Sentry's remote controller in the designated area at the Battlefield entrance.

7.3.1   Official Technical Timeout

During the setup period, if the referee system or equipment inside the operator room malfunctions (for details see the table below), or the robot needs temporary pre-match inspection, the head referee can announce an official technical timeout and pause the setup countdown. The starting time of the Timeout shall be decided by the Head Referee based on the situation.

During an Official Technical Timeout, pit crews can only eliminate the relevant faults of the Referee System or other official equipment according to the requirements of the referee, and are not allowed to repair other faults. When the relevant fault of the Referee System or official equipment has been eliminated and the Head Referee has resumed the countdown, Pit Crew Members are required to follow the set procedures for the Setup Period and leave the Battlefield within the specified time.

Table 7-1 Failures

Rules	Description
1	A fault occurs with the official equipment in the operator room, and any key competition component in the Battlefield experiences structural damage or functional irregularity.
2	During the Setup Period of the first round, the modules of the robot client on the Referee System experience faults, such as: damage of the Armor Module, Speed Monitor Module going offline, etc.
3	During the Setup Period, the main controller of the Referee System is unable to connect to the server or a robot cannot transmit images to the Operator Room.
4	Other situations where the head referee deems it necessary to call an Official Technical Timeout.

If the malfunction referred to in Rule 2 occurs during a setup period between rounds or during a round, it will be categorized as "regular battle damage", as it cannot be determined whether the malfunction was caused by the referee system module, a flaw in the robot's electrical or structural designs, or the robot combat from previous

matches. Regular battle damage will not trigger an Official Technical Timeout. Referees will provide backup Referee System modules. Participating teams may request for a "Team Technical Timeout" to repair their robots.

If the referee determines that the malfunction referred to in Rule 2 and 3 above is caused by the team, the referee will explain the situation and end the Official Technical Timeout.

7.3.2 Team Technical Timeout

If the mechanical structure of a robot, a software system, the keyboard or mouse in the operator room or other equipment experiences any faults, the team captain may make a request to the referee on the battlefield or in the operator room for "Team Technical Timeout" only during the setup period and before its 15-second countdown, and indicate the requested timeout length and reasons for the request. Team Technical Timeout once requested and conveyed to the Head Referee, this Timeout cannot be cancelled or revised.

After the Team Technical Timeout is confirmed by the Head Referee, the Referee will notify both teams at the same time regardless of which team initiated the timeout. Pit Crew Members may enter the Battlefield to repair robots, while the members of both teams can only inspect, repair and commission their own robots in the initialization zones for the robots.

The Head Referee may end the Technical Timeout once they determine that the teams are ready. Even if the participating team does not enter the battlefield or ends the Technical Timeout early, the opportunity consumed is still the opportunity corresponding to the time declared by the participating team when applying.

To ensure that subsequent matches begin on time, only one Team Technical Timeout is allowed in each Setup Period on a first-come-first-served basis. The Technical Timeout usage is recorded in the Match Results Confirmation Form.

During each event, each team has two technical timeout opportunities. A team cannot request for more Team Technical Timeout opportunities once they have been used up.

7.4 15-Second Referee System Initialization Period

After the setup period, the match enters a 15-second referee system initialization period. During the Initialization Period, the competition server will automatically detect the connection status of the player's client, the Referee System module status of the robot, the status of Battlefield Components and restore the HP of all robots, ensuring their HP are full when the match officially begins.

If the Head Referee initiates an Official Technical Timeout during the Referee System Initialization Period and requires the team to troubleshoot and fix a problem, such team will be allowed to send a maximum of two Pit Crew Members into the Battlefield to do so.

7.5　Five-Second Countdown

After the 15-Second Referee System Initialization Period, the match enters a Five-Second Countdown. A clear countdown sound effect and live animation will be played. At this time, the player's client will not respond to control commands from robots (including Custom Controllers). Once the countdown finishes, the keyboard is unlocked and the competition starts.

7.6　Competition Round

During the matches, the robots from both teams in 3V3 Match and Standard Matches engage in a shooting battle on the core Competition Area (the Battlefield).

7.7　End of Round

A round ends either when the full time has elapsed or one team has triggered the conditions for winning. For the winning criteria, please refer to "5.2.7 Competition System and Winning Criteria" and "6.2 Winning Criteria". The match is over when a winner has emerged or all rounds have ended.

7.8　Results Confirmation

During a match, the referee will record on the Match Results Confirmation Form the penalties issued for each round, the key competition data at the end of the match, the winning teams, the use of Technical Timeout opportunities by the teams, and other relevant details.

Within 5 minutes after the end of a match, the Captains of both teams must sign and confirm the match results. If a team Captain does not sign and confirm the results within 5 minutes or has not requested an appeal, it is deemed that the team agrees with the match results.

7.9　Projectile Unloading

After a match is over, members from both teams must power off all their robots, remove them from the Battlefield, and proceed to the Projectile Unloading Area to unload their projectiles. At the Projectile Unloading Area, teams must follow the instructions of the staff and return all armbands and pass cards, empty the projectiles in their robots, and return all projectiles used in the competition.

8. Violations and Penalties

In order to ensure the fairness of the competition and maintain competition discipline, the participating teams, participants, and participating robots must strictly follow the competition rules. If there is a violation, the referee will give a corresponding penalty for the violation. Some violation penalties issued before the official start of the competition will be enforced after the official start of the competition. Serious violations and all appeals in the competition will be publicized.

Penalty of violation stated in this chapter will be determined by the head referee according to the actual situation. If there is a situation during the competition that affects the fairness of the competition but is not involved in the penalty rules or serious violations, the head referee will make a judgment based on the actual situation.

> If a team's actions have directly caused the other team to commit a violation, the other team shall not be deemed in violation but it must cease its violating behavior immediately.

8.1 Penalty System

8.1.1 Forms of Penalties

During a match, the referee may issue penalties against participants and robots that have failed to comply with competition rules. The forms of penalties are as follows.

Table 8-1 Forms of Penalties

Forms of Penalties	Descriptions
Automatic penalties by the Referee System	HP deductions as a result of a robot exceeding its parameter limits or a referee system going offline. The HP deductions mentioned in "4.1 HP Deduction Mechanism", except those caused by attacks, are all automatic penalties by the referee system.
Manual penalties through the Referee System	Penalties issued by the referee through the server against robots for violation of rules.
Manual referee penalties	Used in situations where penalties cannot be issued through the Referee System, for example issuing a verbal warning or disqualifying a team.

8.1.2 Types of penalties

There are five types of penalties that can be issued during the competition, as shown below.

Table 8-2 Types of Penalties

Types of penalties	Descriptions
Verbal Warning	Verbal alert
Yellow Card	● One team receives a Yellow Card: ➢ The operating interface of the offending robot is blocked for 5 seconds (the chassis of a Sentry Robot powers off for 2 seconds) and the operating interfaces of other robots are blocked for 2 seconds. ➢ The Referee System will automatically deduct the offending robot's HP by 15% of its current Maximum HP, while the remaining alive robots will have their HP deducted by 5% of their current Maximum HP. If the robot receives a Yellow Card again within 30 seconds after it receives a Yellow Card, the deducted percentage of their current Maximum HP will be twice that of the previous deduction for that robot, and 5% for the other team's alive robots. **Example 1: An Standard Robot has a Maximum HP of 200 while the other robots in the team have a Maximum HP of 100.** **If the offending robot receives a Yellow Card at the 15th, 25th, and 58th second of the competition respectively,** **the HP deduction caused by each of the Yellow Cards shall be as follows: The offending robot's HP is deducted by** **30, 60, and 30 respectively. The deducted HP for the other robots are 5, 5, and 5.** **Example 2: An Standard Robot has a Maximum HP of 200 while the other robots in the team have a Maximum HP of 100.** **If the offending robot receives a Yellow Card at the 15th, 25th, and 50th second of the competition respectively,** **the HP deduction caused by each of the Yellow Cards shall be as follows: The offending robot's HP is deducted by 30, 60, and 120 respectively. The deducted HP for the other robots are 5, 5 and 5.** ➢ In each round, a robot that has been issued a cumulative four Yellow Card Warnings will receive a Red Card Warning. ● Both teams receive a Yellow Card: The interface of all operators is blocked for 2 seconds and the HP of all robots is deducted by 5% of their maximum HP, without taking into account the cumulative number of yellow cards received by one robot.

Types of penalties	Descriptions
	💡 - If multiple Yellow Cards are received successively, the blockage time for the operation interface will add up accordingly. - If a robot's remaining HP is less than or equal to that needs to be deducted from penalty, this robot's HP reduces to 1.
Red Card (Ejection)	- Ejecting a robot - If a robot is ejected before entering the 15-second referee system initialization period, the offending robot will not be allowed to enter the stage and must be removed from the battlefield, nor can they be replaced by other robots for all rounds in the current match. - If a robot is ejected during the 15-Second Referee System Initialization Period, the Red Card Warning shall be issued after the competition starts. - If a robot is ejected during the competition, the robot's HP will turn zero and the transmitted images will become monochrome. - Ejection of Pit Crew Members: Pit Crew members ejected by a referee must leave the Competition Area immediately and cannot be replaced by other Pit Crew Members for all rounds in the current match. All robots controlled by an ejected Operator shall also be ejected for the current round, and will not be allowed to join the Battlefield nor can they be replaced by other robots for all rounds in the current match.
Forfeiture	- If a Forfeiture is issued for a round (hereinafter referred to as "Round Forfeiture"), the following rules shall apply. - If a forfeiture is issued before the five-minute round (including the setup period and referee system initialization period), the offending team's base and Sentry HP will become zero, and the HP of its other robots will be full. The opposing team's base HP and robots' HP will be full. - If a forfeiture is issued during the five-minute round, the round will end immediately. The offending team's base and Sentry's HP will become zero, and the team's other robots maintain their HP level at the end of the round. The HP of the opposing team's base and robots will remain at the level when the round ended. - If a forfeiture is issued after the five-minute round, the offending team's base and Sentry's HP will become zero, and the team's other robots maintain their HP

Types of penalties	Descriptions
	level at the end of the round. The HP of the opposing team's base and robots will remain at the level when the round ended. ● If a Forfeiture is issued in a match (hereinafter referred to as "Match Forfeiture"), it applies to all rounds in the match, and the HP for each round shall be calculated according to the above descriptions.
Exclusion from Awards	● Participants are excluded from awards. ● Participating teams are excluded from awards.
Disqualification	● The team member is disqualified from the current competition season. ● The team is disqualified from the current season, but its results in the season will be maintained as a basis for other teams' advancement.

8.2 Penalty Rules

This chapter specifies the penalty rules. The R# rules clearly indicate the rules that participating teams, participants and robots must follow.

8.2.1 Staff

8.2.1.1 General Rules

R1 Participating teams are required to meet the requirements listed in RoboMaster 2024 University League Participant Manual.

Penalties: The highest penalty that can be imposed on the offending team is disqualification.

R2 Participants and their actions must not interfere with the normal operation of the Official Equipment, competition processes, and the normal work of the RMOC personnel.

Penalties: The highest penalty that can be imposed on the offending team is disqualification.

R3 Teams must not set up their own wireless networks or communicate with team members using walkie-talkies in the relevant competition areas (including but not limited the Preparation Area, Inspection Area, Staging Area and Competition Area).

Penalties: The highest penalty that can be imposed on the offending team is disqualification.

R4 Teams must not damage any official equipment (including but not limited to equipment in the Competition Area, Staging Area, Preparation Area and Inspection Area).

Penalties: The highest penalty that can be imposed on the offending team is disqualification and compensation as per the price.

R5 Apart from Pit Crew Members who have entered the Staging Area and Competition Area due to match-related reasons, no participants are allowed inside either area without special reasons.

Penalties: The offending team member may be disqualified as the maximum penalty.

R6 Any Pit Crew member who has entered the Staging Area and Competition Area for competition needs may not leave either area or be replaced by another Pit Crew member without the permission of the referee.

Penalties: Offender are not allowed to enter the staging area and competition area. The highest penalty that can be imposed is disqualification from the competition.

R7 Except for the projectiles preloaded in the Inspection Area, participating teams are not allowed to bring the projectiles to be used in the competition into the Staging Area or Competition Area.

Penalties: Confiscation of projectiles and Verbal Warning. If the Verbal Warning is ineffective, the offender may be disqualified as the maximum penalty.

R8 After a match is over, the pit crew must power off all their robots, remove them from the competition area and empty all projectiles inside the robots at the projectile unloading area.

Penalties: The offending robot will be detained in the Projectile Unloading Area, until its projectiles are cleared.

R9 After a match ends, Pit Crew must return all projectiles used in the competition to the Projectile Unloading Area.

Penalties: Confiscation of projectiles and disqualification of the offender from subsequent matches in the current division. The highest penalty that can be imposed on the offender is disqualification.

R10 Except for emergency situations, teams must be present at the Inspection Area before the start of each match for Pre-match Inspection. The team must stand by at the Staging Area 10 minutes before each match.

Penalties: The maximum penalty is a Match Forfeiture.

R11 Team members must not turn on the power and commission or repair their robots in the Staging Area.

Penalties: Verbal Warning. If violations persist despite the warning, the team will be issued a Match Forfeiture.

R12 The identities and number of personnel of each team entering designated areas such as the Preparation, Inspection, Staging, and Competition Areas must meet the relevant requirements.

Penalties: The highest penalty that can be imposed on the offending team is disqualification.

R13 One member of a Pit Crew must wear the "Captain" armband which must not be covered.

Penalties: The highest penalty that can be imposed on the offender is disqualification.

R14 Without the permission of the referee, Pit Crew Members entering the Battlefield must not communicate with anyone from the outside.

Penalties: Verbal Warning. If the verbal warning is ineffective, the offender may be disqualified as the maximum penalty.

R15 Pit Crew Members are not allowed to power their equipment using the power supply for official equipment in the Competition Area. However, they may bring their own power supply.

Penalties: Verbal warning will be given; and if it does not work, the offender will be issued a Red Card. The highest penalty that can be imposed on the offending team is disqualification.

R16 Except for special circumstances, Pit Crews are prohibited from wearing slippers into the Competition Area.

Penalties: The highest penalty that can be imposed on the offender is a Red Card.

8.2.1.2 Battlefield Specifications

R17 Participants must wear protective goggles when inside the Battlefield.

Penalties: The offender is barred from the battlefield.

R18 During an Official Technical Timeout, Pit Crew Members are not allowed to fix faults other than those in modules related to the Referee System.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Red Card.

R19 After the end of the Setup Period, Pit Crew Members must return to the designated area outside the Battlefield. During the competition, Pit Crew Members are not allowed to leave the area without the permission of the referee.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Red Card.

R20 After the end of the Setup Period, the Pit Crew must place the Commissioning Remote Controller for the Sentry Robot at the entrance of the Battlefield. The Remote Controller cannot be used to commission the Sentry Robot once the five-second countdown has started.

Penalties: If it is before the five-minute round, a verbal warning shall be issued. If the verbal warning is ineffective, a red card shall be issued against the offending robot; if it is during the seven-minute round, a red card shall be issued against the offending robot.

R21 After the Five-Second Countdown, the pit crew must not operate remote controllers located outside the Operator Room that correspond to deployed robots.

Penalties: A Red Card shall be issued against the offending robot, with the highest penalty being a Round Forfeiture.

R22 Pit crew members must ensure their robots are operating safely and will not cause harm to any person or equipment in the Competition Area.

Penalties: The offending team must bear the relevant responsibility.

R23 During the competition, a reloading operator can only refill projectiles using the official Projectile Reloader and is not permitted to touch a robot by any other means.

Penalties: Verbal Warning. If the warning is ineffective, the offender shall be issued a Red Card.

R24 During the competition, a projectile reloader must wear a long-sleeved top and goggles when reloading projectiles for a robot, and can only do so by standing outside the perimeter wall of the Battlefield.

Penalties: Forbidden from reloading projectiles for robots. Any violation will result in the offender being issued a red card warning.

8.2.1.3 Operator Room Requirements

R25 Except for the Operators of the robots on the Battlefield, the Pit Crew are not allowed in the Operator Room.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Red Card.

R26 Operators must remain in the relevant operator room during the 15-second referee system initialization period and the five-minute round to operate the control equipment for the corresponding robots, and must remain in position after a match has started, unless otherwise permitted by the referee.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Red Card.

R27 During the competition, each operator is equipped with at most one remote controller and one custom controller.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Red Card.

R28 Operators are not allowed to use their own headphones or computers in the Operator Room.

Penalties: Verbal Warning. If the verbal warning is ineffective, the team shall be issued a Round Forfeiture.

8.2.2 Robots

R29 Robots and Custom Controllers to be deployed in a match must pass a Pre-Match Inspection.

Penalties: Round Forfeiture.

R30 In the first round of a match, the robots must meet the minimum battle team lineup.

Penalties: Match Forfeiture.

R31 Robots must meet the requirements in RoboMaster 2024 University Series Robot Building Specifications Manual.

Penalties: The highest penalty that can be imposed on the offending team is disqualification.

- The RMOC will conduct random checks on robots.
- Any report made against a robot for not complying with the robot building specifications manual must be supported by the relevant evidence.

R32 Before the 15-second referee system initialization period, robots must be attached with armor stickers that meet the specifications documents.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offending robot will be issued a Red Card.

R33 When waiting in the Staging Area, team members are not allowed to bring robots out of the Staging Area without permission.

Penalties: Verbal Warning. If the warning is ineffective, the offenders and robots will be issued a red card, with the highest penalty being disqualification from the competition.

R34 Robots must not carry or present safety issues including but not limited to short circuits, crashing, creating fumes or lighting flames, and falling to the ground. If a safety issue is present or has arisen, team members must execute the relevant operations in accordance with the referee's instructions.

Penalties: If it happens before the start of a match, the Pit Crew need to resolve the safety issue as required by the referee, otherwise the offending robot will not be allowed to appear on the Battlefield. If it is during the competition, a Verbal Warning shall be issued. If the Verbal Warning is ineffective, a Red Card shall be issued against the offender or the offending robot. Any incident involving serious safety hazards shall be handled by the head referee in accordance with "9 Irregularities".

R35 Robots are not allowed to launch projectiles off the battlefield.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offending robot will be issued a Red Card.

R36 During the setup period and the 15-second referee system initialization period, robots in the battlefield are not allowed to leave their corresponding initialization zones.

Penalties: The offending robot can be issued a Red Card as the maximum penalty.

R37 If any projectile needs to be launched during the setup period, it must be launched into the projectile clearance bag offered by the referee.

Penalties: The offender and the offending robot can be issued a red card as the maximum penalty.

R38 During the competition, the robot is not allowed to disintegrate into sub-robots or sub-systems connected by multiple flexible cables, and must not cast or launch their own parts.

Penalties: The offending robot will be issued a Red Card.

R39 During the competition, robots are not allowed to block any of its armor modules with its body or transform beyond its maximum expansion size.

Penalties: Warnings shall be issued against the offending team as judged based on their subjective intention. If the blocking was intentional, a Yellow Card will be issued along with a Verbal Warning. If the Verbal Warning is ineffective, a Red Card shall be issued. If the blocking was passive in nature, the offender will be issued a Yellow Card.

R40 During the setup period, the replacement modules and parts used on robots must meet the requirements for "equivalent parts" as stated in "7.3 Setup Period".

Penalties: The offending robot can be issued a Red Card as the maximum penalty.

R41 Standard Robots to be fitted with a balancing chassis must meet the definition of a Balancing Standard Robot while they are alive. This does not apply to Standard Robot when not alive.

> In the Supplier Zone, a Balancing Standard Robot is not required to meet the definition of a Balancing Standard Robot.

Penalties: Warnings shall be issued against the offending robot based on the length of the violation. If it exceeds 3 seconds, a first Yellow Card is issued. Thereafter, each 10 seconds will incur a further Yellow Card. This carries on until the robot is not alive.

8.2.3   Interactions

8.2.3.1   Interaction between Robots

R42 A robot may not use any of its body structures to strike an opponent robot in collision. If a defeated robot is blocking a key path, the robot can be slowly pushed away.

> In any collision between robots, the offending robot will be deemed by the referee as the initiator.

Penalties: Warnings shall be issued against the offending robot judged based on their subjective intention and the degree of collision.

Table 8-3 Collision Penalties Standard

Violation level	Descriptions
Yellow Card	● Actively causing frontal and high-speed collision ● Active pushing that causes the other team's robot to move noticeably ● Active pushing that impedes the normal movement of the other team's robot

Violation level	Descriptions
Red Card	• Actively causing high-speed, repeated and intense frontal collision • Active pushing that causes the other team's robot to move for a longer distance • Active pushing that seriously impedes the normal movement of the other team's robot

R43 A robot must not get stuck together with any other robot due to active interference, blocking or collision.

Penalties: Counting from when an entanglement is determined, warnings shall be issued against the offending robot based on the length of the violation. If it exceeds 10 seconds, a first Yellow Card will be issued. Thereafter, each 20 seconds will incur a further Yellow Card. This shall carry on until the offending robot is ejected. Regardless of whether the offending robot is alive, if the violation goes on for longer than 90 seconds, the offending team may be issued a Round Forfeiture, as judged based on their subjective intention.

R44 A robot must not use any means other than firing projectiles to interfere with an opponent robot's projectile reload, HP recovery, or respawn in any area.

Penalties: The offending robot will be issued a Yellow Card.

8.2.3.2 Interaction between Robots and Battlefield Components

To ensure the fairness of the competition and that robots in the Battlefield are able to receive buffs and reloads effectively, Supplier Penalty Zones have been set up in the Battlefield which the robots of one or both teams are forbidden from entering, as shown below (with a wooden battlefield as an example). The Supplier Zone of one team is the Supplier Penalty Zone for the other.
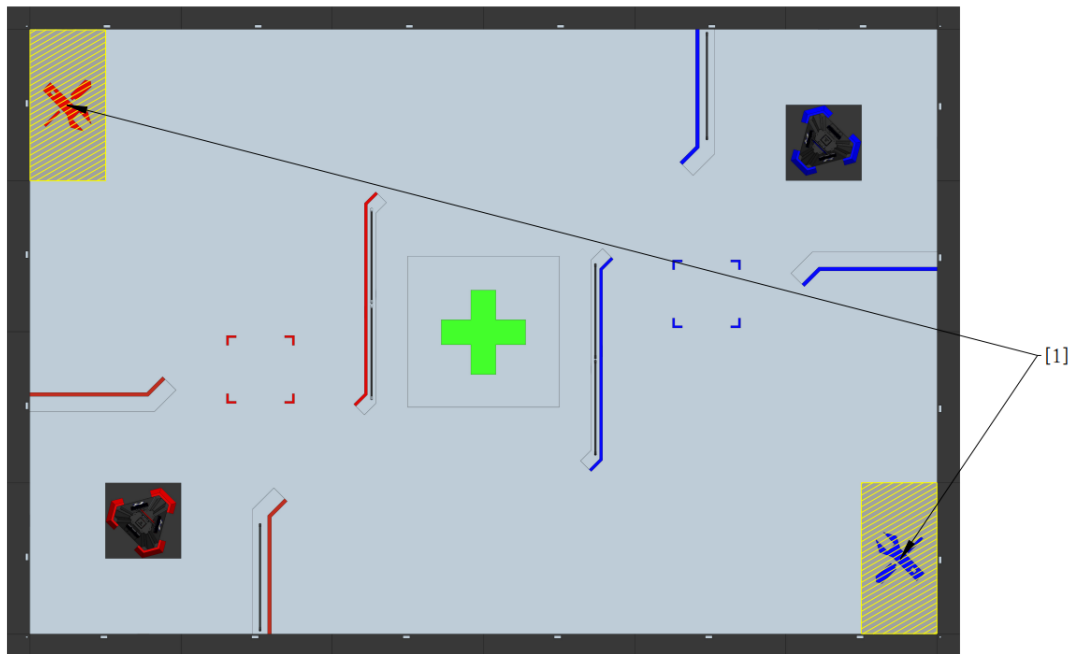
[1]   Supplier Penalty Zone

Figure 8-1 Battlefield Penalty Zone

R45 The robots of one team are forbidden from the Supplier Penalty Zone, and must not cause any interference with or block to the entry of the other team's robots into the Supplier Penalty Zone.

Penalties: Warnings shall be issued against the offending team based on how long the robot remained in the Penalty Zone and the impact of the violation. If it exceeds 3 seconds, a first Yellow Card is issued. Thereafter, each 10 seconds will incur a further Yellow Card. This carries on until the robot is not alive. An offending robot that causes serious damage to an opponent robot by remaining in a Penalty Zone will be issued a Red Card.

R46 During the competition, robots may only use projectiles supplied by the RMOC.

Penalties: The highest penalty that can be imposed on the offending team is disqualification.

R47 During the competition, robots are not allowed to destroy nor affect the normal function of the Battlefield Components.

Penalties: The maximum penalty is a Match Forfeiture.

8.3 Serious Violations

The following actions are considered serious violations of rules. The highest penalty the RMOC may impose on an offending team for serious violations is disqualification. In the event of any violation against local laws and

regulations, the RMOC will fully cooperate with the relevant authorities in pursuing appropriate legal action against the offender.

Table 8-4 Categories of Serious Violations

Rules	Type
1.	Malicious destruction of the Battlefield, Battlefield Components, other Official Equipment, or the robots or equipment of other teams
2.	Falsification, assumption of a false identity, or any other behavior determined as cheating.
3.	Tampering with or damaging the Referee System, or interfering with any detecting function of the Referee System through technical means.
4.	Circumstances that violate the specifications documents and determined by the Chief Referee as a serious violation.
5.	Disobedience over penalties, refusal to cooperate, deliberate delay, disrupting the competition, forfeiting without valid reasons, boycotting, or other behavior that hinders the competition.
6.	Match throwing or manipulation
7.	Providing property to others or illegally soliciting or accepting property from others for the purpose of obtaining an unjust competition outcome or improper benefits.
8.	Uncivilized and immoral conduct involving defamation, verbal abuse, rude gestures, malicious heckling, or malicious throwing of objects.
9.	Publishing, spreading or disseminating to the media false or irresponsible remarks.
10.	Deliberately attacking or colliding with others in a manner that endangers themselves or others.
11.	Carrying hazardous items or contrabands.
12.	Other behavior that violates the spirit of the competition and deemed a serious violation.
13.	Other conduct that violates core socialist values, sports ethics, public order and norms, the culture and discipline of the competition, laws and regulations, or that causes an adverse impact on society.

9. Irregularities

There will be a certain delay in the referee's manual penalties and handling of abnormal situations. If it has a major impact on the result of the competition, the Chief Referee will determine the final processing result according to the actual situation.

If any of the following anomalies occur during the competition, it shall be handled according to the corresponding process, to which both teams cannot object. The handling process is as follows:

- When a serious safety hazard or irregularity has occurred, such as: a battery explosion, Aerial breaking an Aerial Safety Rope, stadium power outage, explosion of a compressed gas cylinder, or interpersonal conflict, the Head Referee will notify both teams' operators after discovering and confirming the emergency, and eject all robots through the Referee System. The result of the round will be invalidated. The round will restart after the safety hazard or exception has been eliminated. While handling an irregular situation, the RMOC will prioritize safety issues and any consequences arising from the handling process shall be borne by the participating teams.

- If non-key Battlefield Components are damaged during a match (damage to the PVC Flooring, the light effects on the site or the base), which do not affect the fairness of the match, the match will proceed as usual.

- The competition will carry on despite any anomaly with a robot's armor light effects or light indicator effects or any damage to an Armor Module Sticker.

- If key Battlefield Components experience logical or structural faults, for example, where the network connections are disrupted causing a robot to go offline or a Battlefield Component does not operate normally, the referee will solve the problem manually through the Referee System. If the failure cannot be dealt with manually, the referee will notify the operators of both sides and eject all robots at the same time. The competition will end immediately, and the result of the competition will be invalid. When problems are solved, there will be a replay.

- During a match, if there is structural damage or malfunction of the key Battlefield Components that affects the fairness of the match and the Head Referee does not confirm and end the game in time, leading to a situation where a game that should have ended continues and has a winner, the results for the round shall be invalidated once the Head Referee has made a determination to that effect within 5 minutes after the end of the round, and a rematch shall be held.

- In the case of a serious violation that would clearly have triggered a penalty of forfeiture, and the Head Referee did not confirm and execute it in time, the results for the round shall be invalidated once the Head Referee has made a determination to that effect within five minutes after the end of the round, and the offending team will be issued a forfeiture.

- During the competition, if any situation has occurred that may affect the fairness of the competition, the Chief Referee shall notify the Captains of both teams of the situation and suspend the results confirmation process within five minutes after the end of the match, and shall make a determination within 60 minutes and notify both Captains of the final course of action. The handling outcome is final and cannot be challenged by both teams.

10. Appeal

Each team has one opportunity to appeal in each event of each division during the RMUL 2024. Such opportunities cannot be accumulated. If an appeal is successful, the team involved retains its right to appeal again in future matches. If it is unsuccessful, the team will have exhausted its one opportunity to appeal. When a team has exhausted its opportunity to appeal, the Arbitration Commission will no longer accept any appeal from the team. After the appeal is accepted, the Arbitration Commission will deliberate on the appeal materials and relevant evidence. On behalf of the Arbitration Commission, the Chief Referee will then communicate and confirm the appeal decision. The Arbitration Commission reserves the final right of interpretation with regard to its appeal decisions.

The following situations do not constitute a basis for appeal:

- Verbal Warnings and Yellow and Red Cards issued as penalties for violations.

- The types and processes of Technical Timeouts initiated.

- "Regular battle damage" occurred at the Referee System Robot Side.

No appeal is allowed five minutes after a Match Results Confirmation Form has been signed or a match has ended.

10.1 Appeal Process

Teams filing an appeal need to follow the procedures as shown below:

| Lodging of an appeal | A team may lodge an appeal within 5 minutes after the end of a match (based on the time recorded on the Match Results Confirmation Form). Teams during the Group Stage may appeal on all rounds of a match, while in the Knockout Stage the losing team is only allowed to appeal on the rounds in which it has lost. Team Captains can lodge an appeal at the Result Confirmation site. After a Captain lodges an appeal, an appeal process is initiated. The team consumes an opportunity to lodge an appeal. Any appeal made five minutes after a Match Results Confirmation Form has been signed or a match has ended will be deemed invalid. No appeals are allowed before and during the competition.

Note:
If robots of both teams are involved in the appeal, the Arbitration Commission has the authority to isolate any relevant robot from both teams after an appeal has been lodged. These robots will be returned to the teams at the latest when the appeal decision is announced. |

| Filling in and signing the Appeal Form | After an Appeal From is provided, the Captain of the appealing team must fill in and sign the Appeal Form within 10 minutes at the Result Confirmation site. When the Captain of the appealing team fills in the Appeal Form, a maximum of two pit crew other than the Captain of the appealing team are allowed to provide assistance. The Arbitration Commission shall conduct arbitration based on the reason for appeal that is filled in the Appeal Form. The appealing team is not allowed to modify or supplement the reason for appeal. If the Captain of the appealing team does not sign and submit the Appeal Form within 10 monites after the Appeal Form is provided, the Arbitration Commission shall consider that the appealing team has no reason for appeal. The following steps shall be skipped and the original match results are maintained. |

| Gathering of evidence or defense materials | If either team needs to collect appeal materials, they have to be submitted to the Chief Referee within 60 minutes after the appeal request has been accepted. The time and location of the submission must be agreed beforehand, and the team is required to explain the appeal materials during the submission. The Arbitration Commission will not accept any new appeal material furnished beyond the submission period. If both teams do not need collect appeal materials, or the Arbitration Commission has determined that there is sufficient evidence or the grounds provided by the appealing team cannot be used as a basis for appeal, the parties shall proceed directly to the next step. |

| Arbitration communication | The Arbitration Commission calls the Captains of both teams to the Arbitration Room for the arbitration. Both teams must be at the Arbitration Room within 10 minutes after being notified by the Arbitration Commission. Participation in the arbitration communication section is only allowed offline. No more than three members from each team may be present, and they must only consist of Regular Members or the Supervisor. The absence of any team shall be deemed as a forfeiture of its rights to the arbitration communication. If the grounds of appeal relied on by the appealing team are clearly inconsistent with facts or cannot be used as a basis for appeal, the Arbitration Commission may maintain the original match results after only explaining its decision to the appealing team. If the representatives of both teams agree with the appeal decision or the Arbitration Commission considers that the necessary communication has been completed, the arbitration communication shall be terminated and the appeal shall proceed to the next step. |

| Confirmation of appeal decisions | The Arbitration Commission will indicate its final decision on the Appeal Form. One member in the Arbitration Room from each team must sign the Appeal Form on behalf of the team. The signing of the Form means that the appeal decision is confirmed and no longer disputable. If the Appeal Form is not signed within 5 minutes after the decision has been announced, the decision is deemed to be accepted. If the grounds of appeal relied on by the appealing team are clearly inconsistent with facts or cannot be used as a basis for appeal, the Arbitration Commission shall maintain the original match results after explaining its decision to the appealing team. The appealing team is not required to sign the Appeal Form and shall be deemed to have accepted the appeal decision by default. |

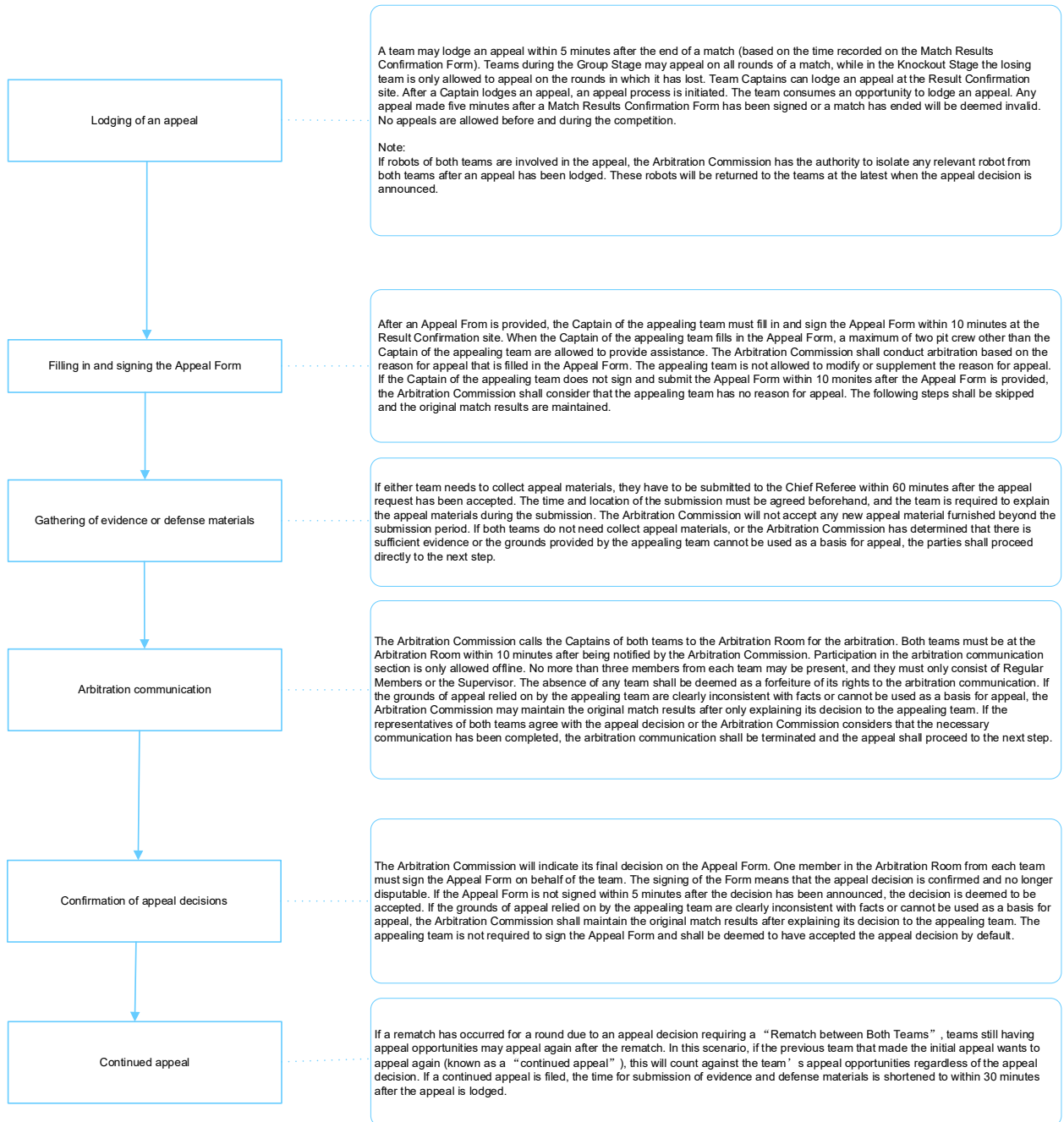| Continued appeal | If a rematch has occurred for a round due to an appeal decision requiring a "Rematch between Both Teams", teams still having appeal opportunities may appeal again after the rematch. In this scenario, if the previous team that made the initial appeal wants to appeal again (known as a "continued appeal"), this will count against the team's appeal opportunities regardless of the appeal decision. If a continued appeal is filed, the time for submission of evidence and defense materials is shortened to within 30 minutes after the appeal is lodged. |

Figure 10-1 Appeal Process

10.2 Appeal Materials

The appeal materials submitted by the participating teams cannot exceed 500 MB in size for each file. The number of files cannot exceed 10.

10.3 Appeal Decision

Appeal decisions include: maintaining the original match results, a forfeiture against the respondent, and rematch between both teams. Teams may not appeal against the decision made by the Arbitration Commission.

- Appeal successful: forfeiture against the respondent or rematch between both teams

- Appeal failed: maintaining the original match results

If the communicated appeal decision is a rematch between both teams, but neither team is willing to accept a rematch, the appeal shall be deemed as failed and the original match results will be maintained.
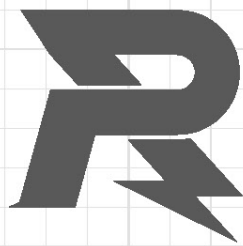
- Provided it does not affect the schedule of the entire competition, the rematch will in principle be held on the same day after all the other matches, depending on the actual situation.

- The flow of the rematch shall be the same as the regular matches. Both teams are required to compete according to the time stipulated by the RMOC and the relevant rules.

Appendix References

This chapter contains relevant reference materials for RMUL.

Appendix Table 1 Overview of Reference Materials

Category	Download Links and Documents List
Specifications Manuals	Download address: https://www.robomaster.com/en-US/resource/pages/announcement/1658 ● Rules Manual ● Participant Manual ● Robot Building Specifications Manual
Referee System related	Download address: https://www.robomaster.com/en-US/products/components/referee ● RoboMaster Referee System User Manual ● Referee System Serial Port Protocol Appendix ● User Manuals of Referee System Modules ● FAQ
RoboMaster Champion related	Download address: To be pdated ● Player's Client Interface Instructions ● Referee's Client Interface Instructions