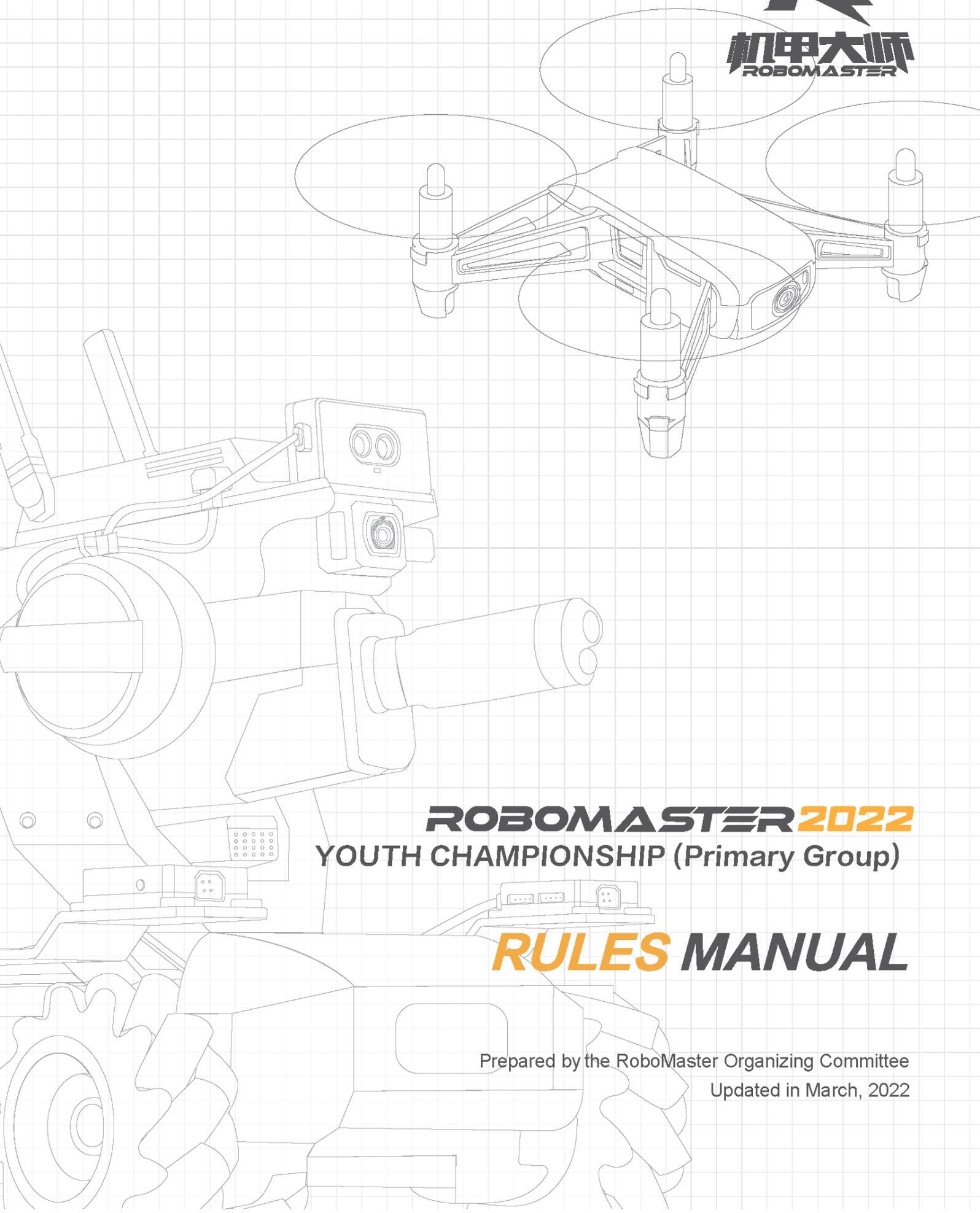


V1.1



**ROBOMASTER 2022**  
YOUTH CHAMPIONSHIP (Primary Group)

**RULES MANUAL**

Prepared by the RoboMaster Organizing Committee  
Updated in March, 2022

## Intellectual Property Statement

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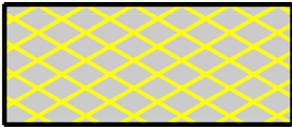
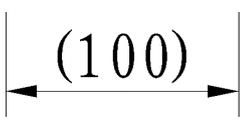
Relevant suggestions for open source materials can be found in this link: <https://bbs.robomaster.com/thread-7026-1-1.html>.

## Using this Manual

### Legend

 Prohibitions	 Important notes	 Hints and tips	 Definitions and references
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### Legend for Battlefield Drawings

		
Penalty zone for one side	Penalty zone for both sides	Dimensions are for reference only

## Release Notes

Date	Version	Changes
2022.03.03	V1.1	<ol style="list-style-type: none"> <li>Added a new robot status – “Offline” and its related mechanism</li> <li>Modified the benefits for recognizing the Defense Visual Marker</li> </ol>

		<ol style="list-style-type: none"><li>3. Modified the refresh duration when the Aerial hits the Base again</li><li>4. Added descriptions on the Base light effects</li><li>5. Added penalties for a defeated robot moving autonomously</li><li>6. Modified the process and penalty related to armbands</li></ol>
<b>2021.12.20</b>	V1.0	First release

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# 1. Introduction

The core format of the RoboMaster 2022 Youth Championship (“RMYC 2022”) is a shootout battle between robots that are either remotely operated or fully-automated, where projectiles are launched to attack the opponent’s robots or Base to win the competition. See “3.12 Winning Criteria”.

Compared with RMYC 2021, the RMYC 2022 has been updated with the following changes:

- Adjusted activation logic for Power Rune
- Added projectile casting mission for Aerial Robots
- Added Bumpy Roads on the Battlefield
- Adjusted some penalty rules
- Adjusted the projectile container reloading mechanism
- Added a new projectile type

## 1.1 Robot Line-up

The robot lineup for the RMYC 2022 is as follows:

Table 1-1 Robot Line-up

Type	Numbering	Full Team Size (Units)
Standard Robot	1/2	2
Engineer Robot	3	1
Aerial Robot	4	1



Minimum lineup for the first round of each match: All Ground Robots



Ground Robots: The collective term for Engineer and Standard Robots

## 1.2 Basic Robot Information

The basic robot information for the RMYC 2022 is as follows:

Table 1-2 Basic Robot Information

Type	Initial Projectile Allowance	Initial HP	Barrel Heat Limit	Barrel Cooling Value per Second	Initial Position
Standard	50	200	40	40	Starting Zone
Engineer	0	300	-	-	Starting Zone
Aerial	9	-	-	-	Landing Pad

## 1.3 Operator Line-up

The operator line-up is as follows:

Table 1-3 Operator Line-up

Type	Operating Robot	Full Team Lineup Size
Ground Robot Operator	Standard Robot	2
	Engineer	1
Pilot	Aerial	1

## 2. Competition Area

### 2.1 Overview



The error margin for the dimensions of all Battlefield Components described in the document is  $\pm 5\%$ . The dimension parameter unit is mm.

The core Competition Area of RMYC 2022 is called the “Battlefield”. The Battlefield is 7 meters long and 5 meters wide, and consists mainly of the Base Zone, Supplier Zone, Central Combat Zone, and Flight Zone.

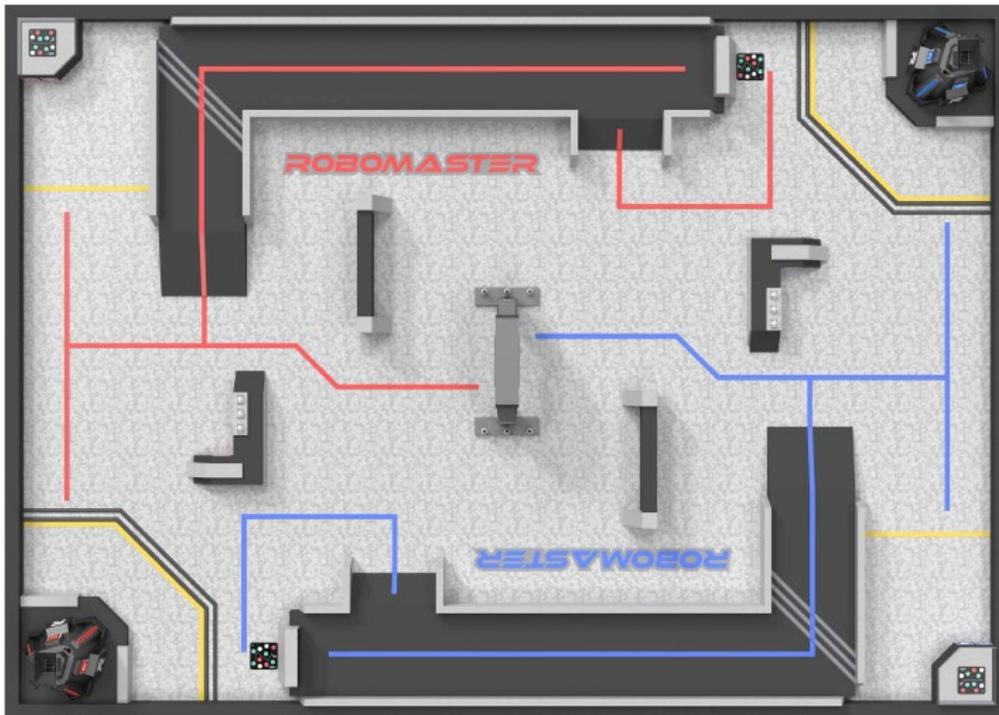


Figure 2-1 Top-view rendering of the Battlefield

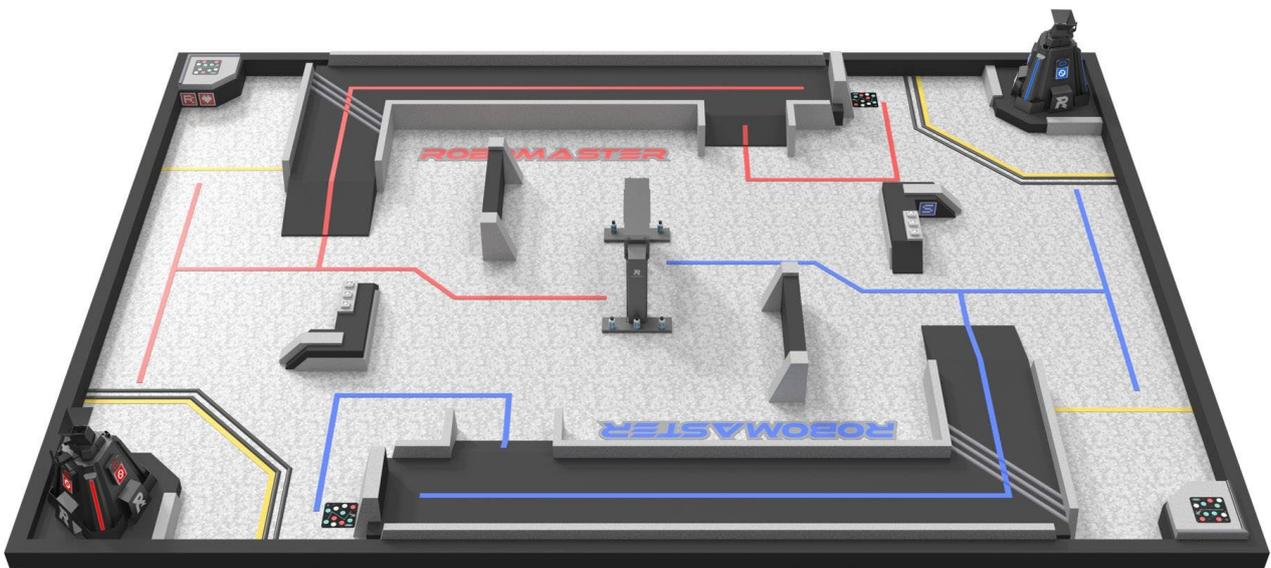
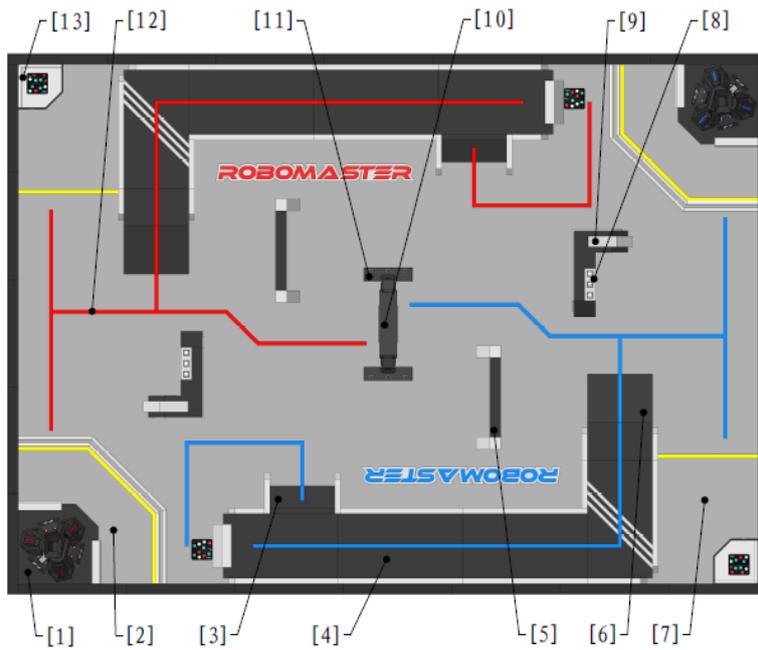


Figure 2-2 Side-view rendering of the Battlefield



Figure 2-3 Axonometric rendering of the Battlefield



- |                      |                   |                      |                           |
|----------------------|-------------------|----------------------|---------------------------|
| [1] Base Zone        | [2] Starting Zone | [3] 30° Slope        | [4] Road                  |
| [5] High wall        | [6] 15° Slope     | [7] Supplier Zone    | [8] Large Projectile Zone |
| [9] L-shaped Terrain | [10] Power Rune   | [11] Resource Island | [12] Guiding line         |
| [13] Landing Pad     |                   |                      |                           |

Figure 2-4 Battlefield modules

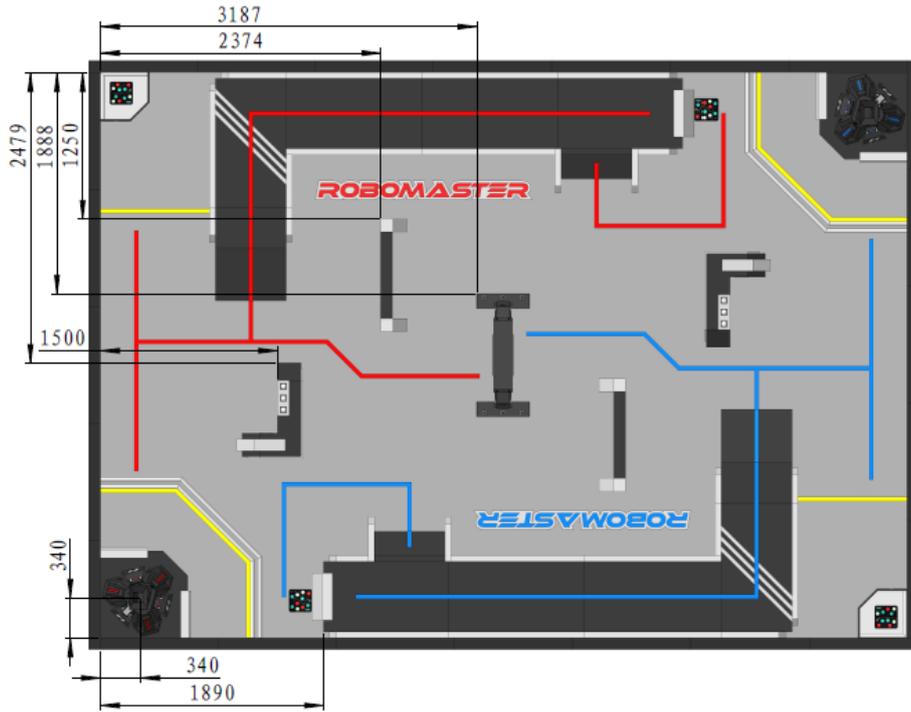


Figure 2-5 Localization dimensions for battlefield modules

The ground of the Battlefield is laid with 20mm-thick EVA ground padding. The Battlefield Components such as the roads are all made of EVA, while the Resource Island is mainly made of metal.

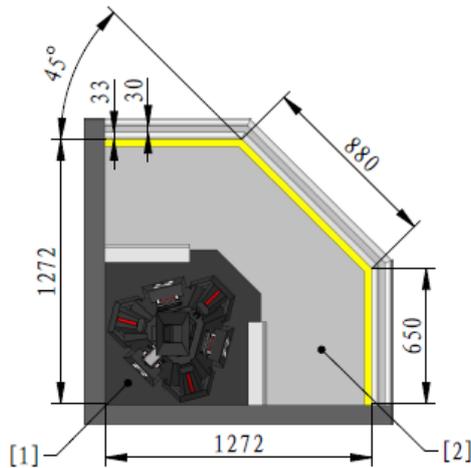


Figure 2-6 Ground Padding Reference Diagram

## 2.2 Robot Initialization Area

### 2.2.1 Starting Zone

The Starting Zone is where robots are placed before a match starts. The area of the Starting Zone is shown below:

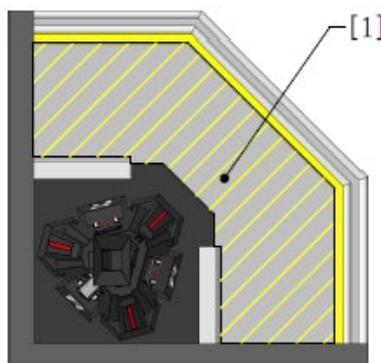


[1] Base Zone [2] Starting Zone

Figure 2-7 Diagram of Starting Zone

### 2.2.2 Engineering Robot Penalty Zone

After the competition begins, once the Engineering Robot leaves the Starting Zone, this area will be its team's Engineering Robot Penalty Zone.

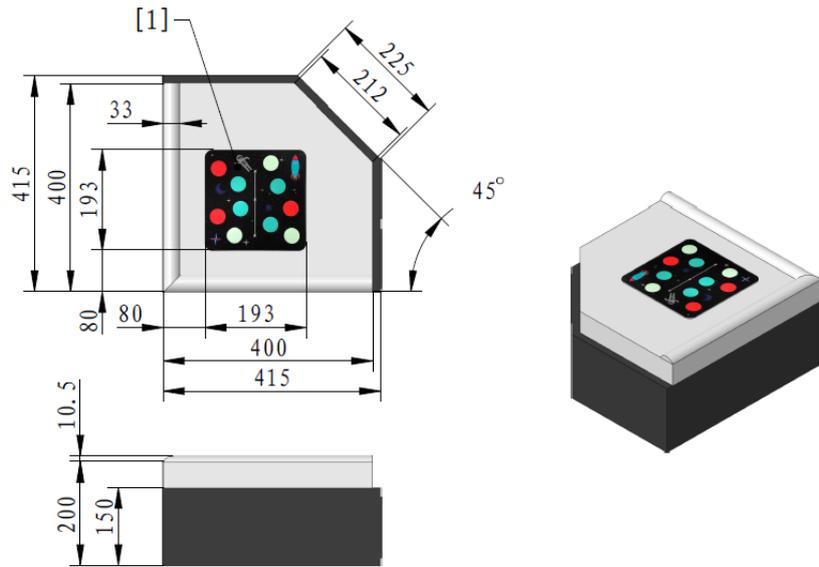


[1] Engineering Robot Penalty Zone

Figure 2-8 Engineering Robot Penalty Zone

### 2.2.3 Landing Pad

The Landing Pad is the take-off zone for Aerial Robots. An Aerial Robot Recognition Card is attached to the Landing Pad to provide Aerial Robots with a visual positioning mark. The image pattern of the Aerial Robot Recognition Card is as shown below.

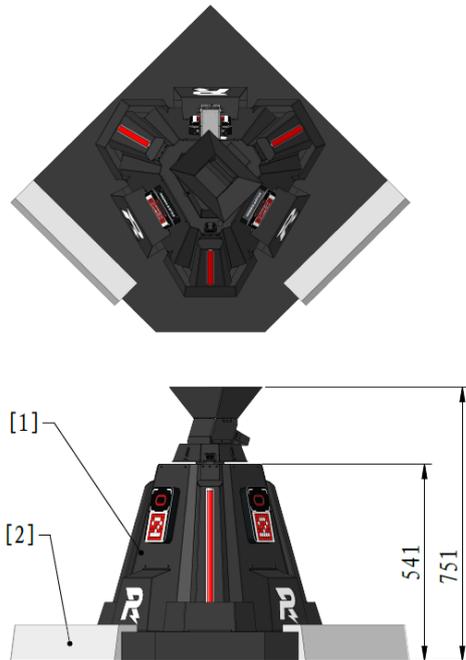


[1] Aerial Robot Recognition Card

Figure 2-9 Landing Pad

## 2.3 Base Zone

The Base Zone is located in the Starting Zone. The Base is in the center of the Base Zone. The Base Zone and its space above are penalty zones for robots of both sides.



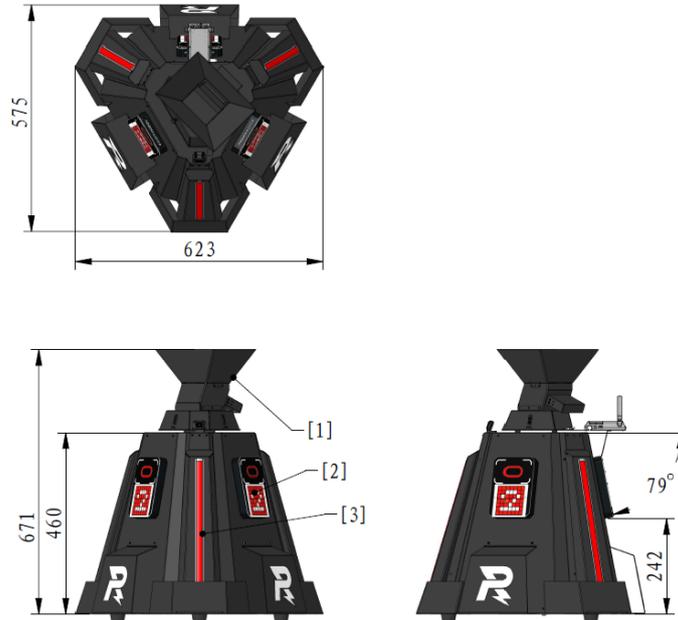
[1] Base [2] Base Foundation

Figure 2-10 Base Zone

### 2.3.1 Base

The maximum HP of the Base is 3000. The Red and Blue Teams each have their own Base.

The Base is equipped with three Armor Modules distributed evenly on its sides. A Camera Module is mounted at the top for interacting with Aerial Robots.

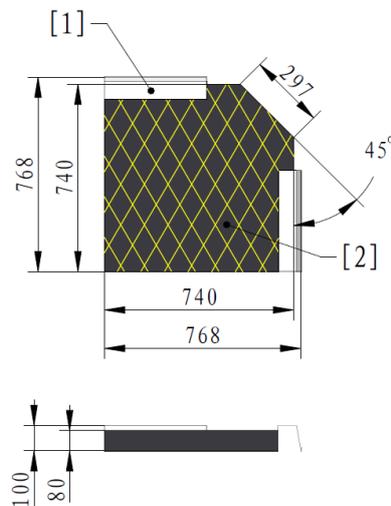


[1] Base Receiving Area [2] Armor Module [3] Base HP Light Indicator

Figure 2-11 Base

### 2.3.2 Base Foundation

The Base Foundation is where the base is placed, and is located in the Base Zone. The area above the Base Foundation is a Base Penalty Zone.

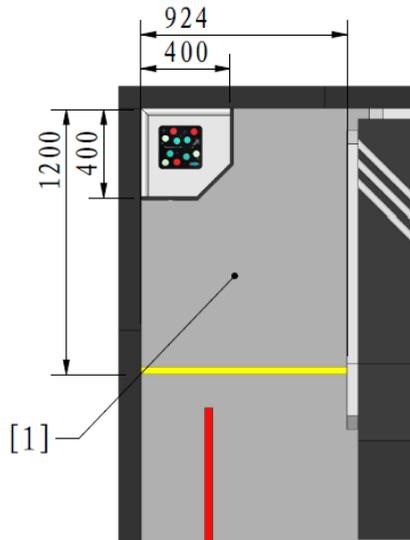


[1] Base Foundation [2] Base Penalty Zone

Figure 2-12 Base Foundation

## 2.4 Supplier Zone

The Supplier Zone is an important area that allows robots to recover HP, be revived, and reload projectiles. Both Red and Blue Teams each have a Supplier Zone.

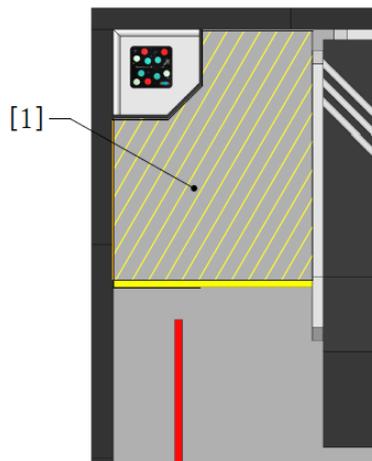


[1] Supplier Zone

Figure 2-13 Supplier Zone

### 2.4.1 Supplier Penalty Zone

One team's Supplier Zone is the Supplier Penalty Zone for the other team's robots.



[1] Supplier Penalty Zone

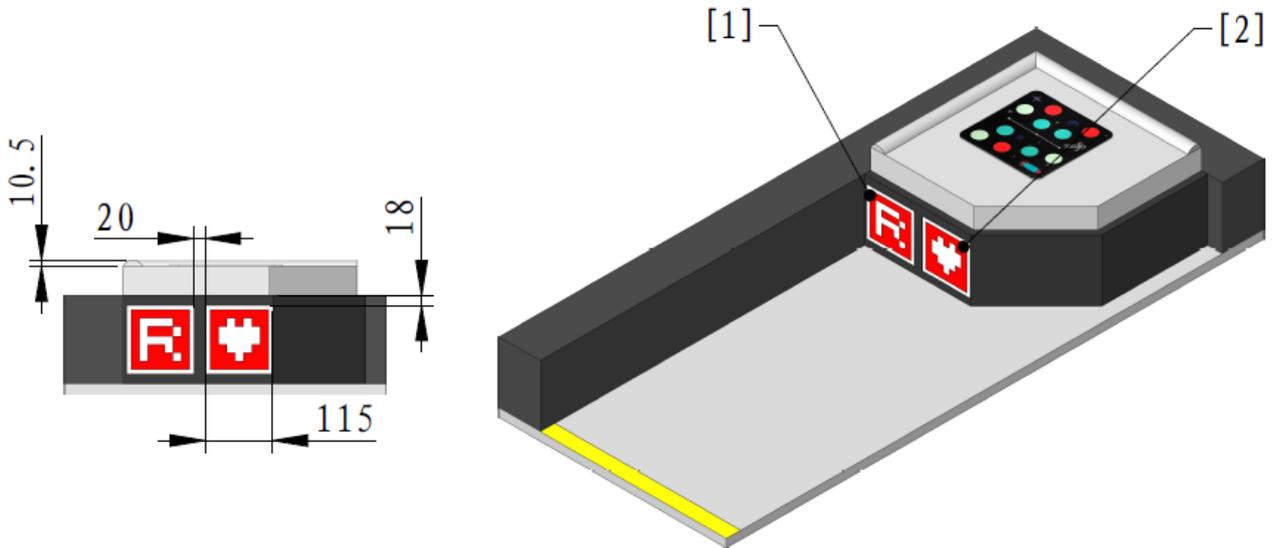
Figure 2-14 Supplier Penalty Zone

### 2.4.2 Revival Marker and Recovery Marker

The Revival Marker and Recovery Marker are located on the side of the Landing Pad facing the Supplier Zone. The

Revival Marker is in the form of the letter “R”, while the Recovery Marker is in the heart shape.

The Revival Marker and Recovery Marker are in red or blue, with an effective size of 100\*100 mm.



[1] Revival Marker [2] Recovery Marker

Figure 2-15 Revival Marker and Recovery Marker

- Visual Marker: A special pattern that is recognizable by the Video Transmitter Module on a Referee System, used for interactions between robots and the Battlefield, Battlefield Components or between one robot and another. Visual Markers are in red or blue, each used by the Red and Blue Teams respectively. The examples in this document are based on the red Visual Marker.
- The effective size of a Visual Marker: The size of the colored pattern on a Visual Marker, not including the white frame outside the pattern.

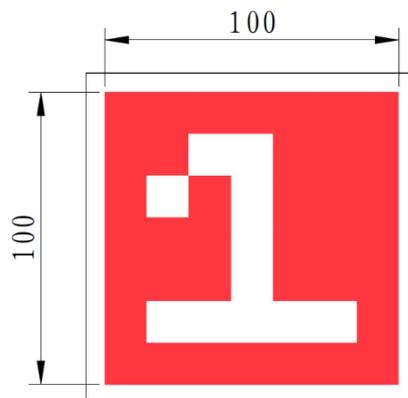


Figure 2-16 Effective Size of Visual Marker

## 2.5 Road

The Road is a fast channel for Ground Robots to move to the opponent's Base from their own Base. There is a 15° slope and a 30° slope on both ends of the road.

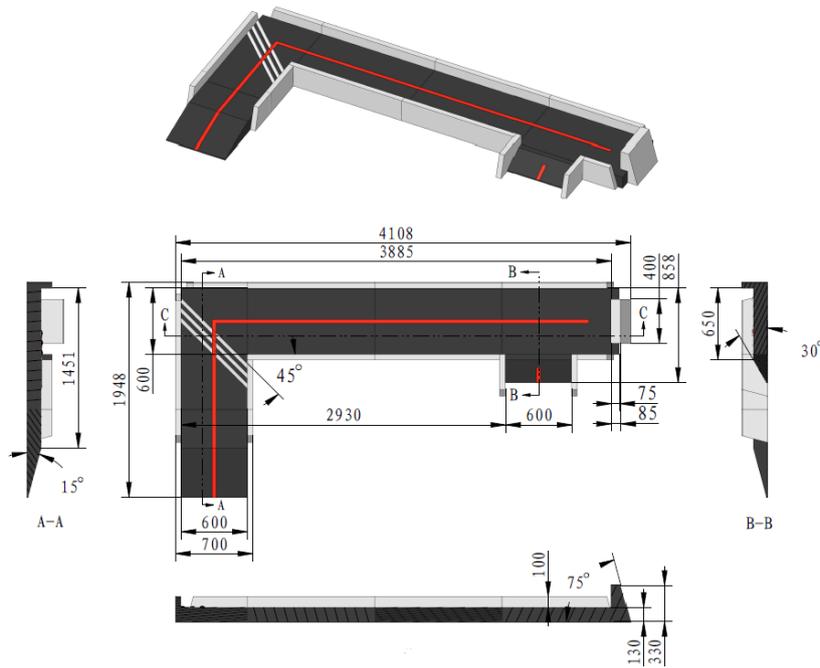
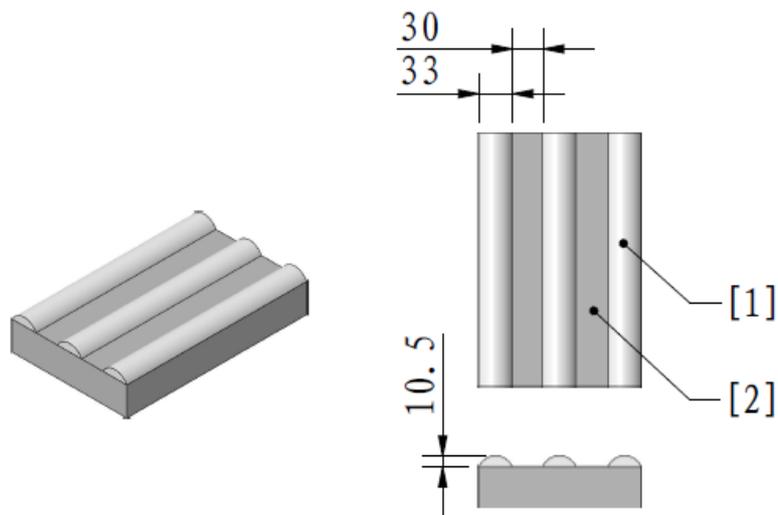


Figure 2-17 Road

## 2.6 Bumpy Roads

The Bumpy Roads are located in some parts of the Battlefield, having evenly spaced bumps on their surface.



[1] Bump [2] Ground

Figure 2-18 Bumpy road

## 2.7 Central Combat Zone

The Central Combat Zone is located in the center of the Battlefield, and forms the core area for the shootout battles of robots. The Central Combat Zone includes two terrain barriers (L-shaped Terrain and High Wall) and the Resource Island.

### 2.7.1 L-shaped Terrain

The L-shaped Terrain is located at the entrance of the Central Combat Zone. Its dimensions are as shown below:

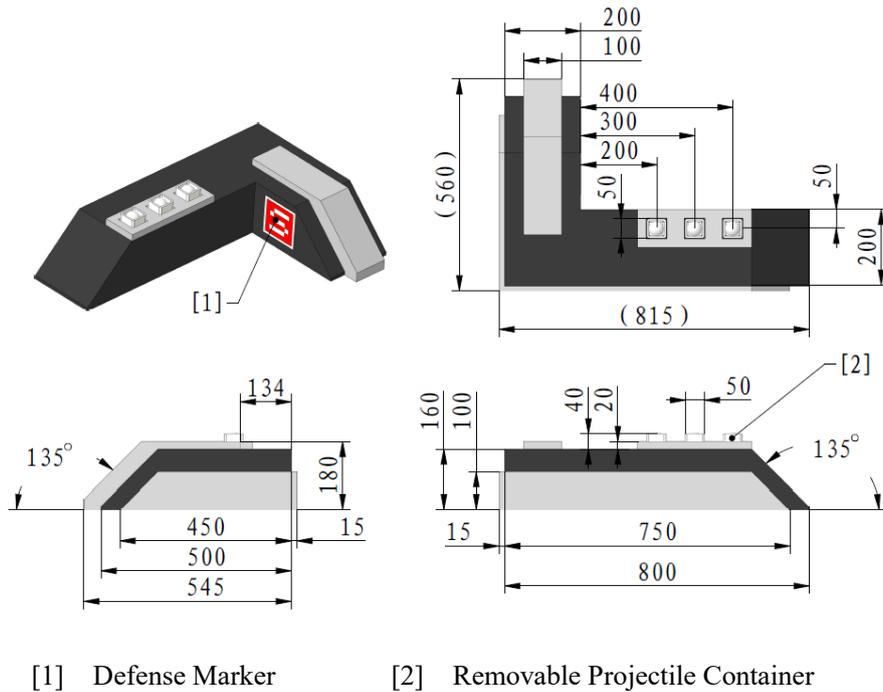


Figure 2-19 L-shaped Terrain

#### 2.7.1.1 Aerial Robot Recognition Card

The Aerial Robot can use the Aerial Robot recognition card to calibrate its position and attitude.

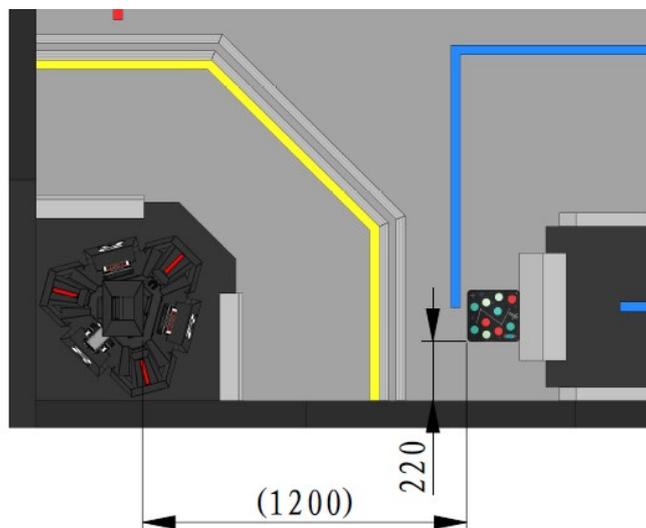
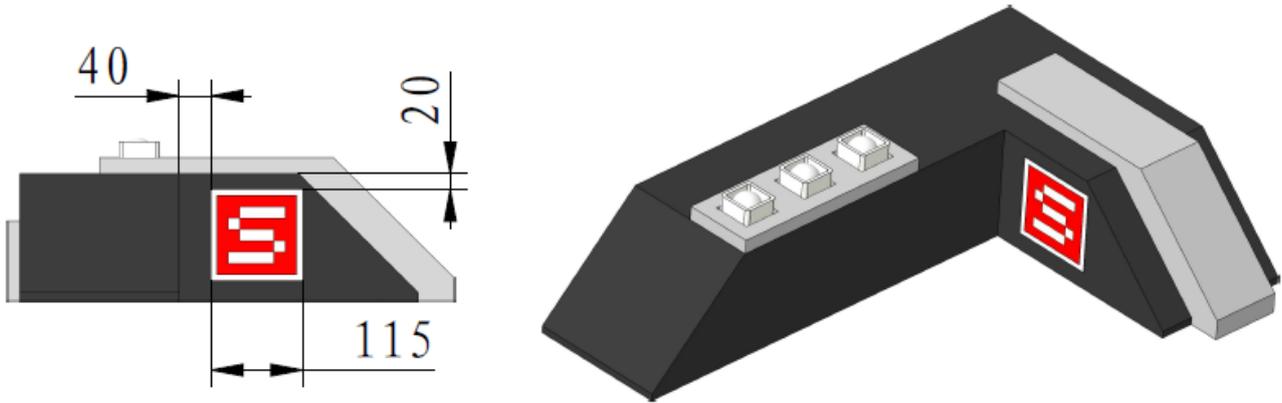


Figure 2-20 Aerial Robot Recognition Card

### 2.7.1.2 Defense Marker

The Defense Marker is located on the short side of the L-shaped Terrain facing the Supplier Zone. It is a Visual Marker in the form of the letter “S”, in red or blue. Its effective size is 100\*100 mm.



[1] Defense Marker

Figure 2-21 Visual Markers

### 2.7.2 High Wall

The High Wall is located near the Resource Island. Its dimensions are shown as follows:

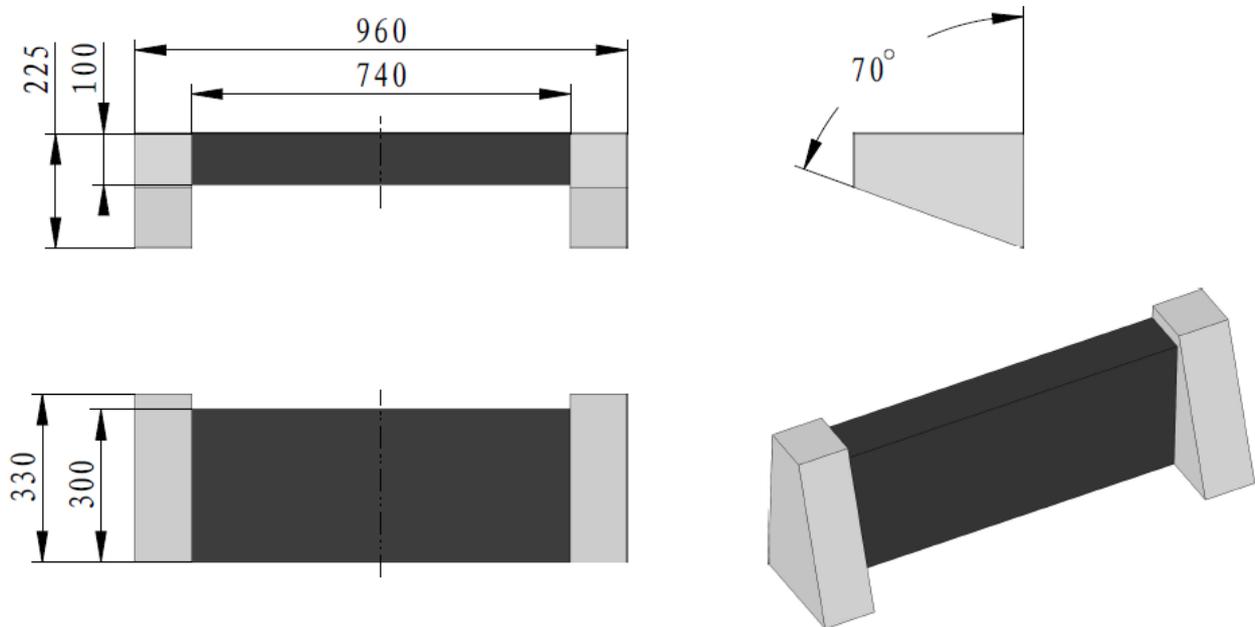
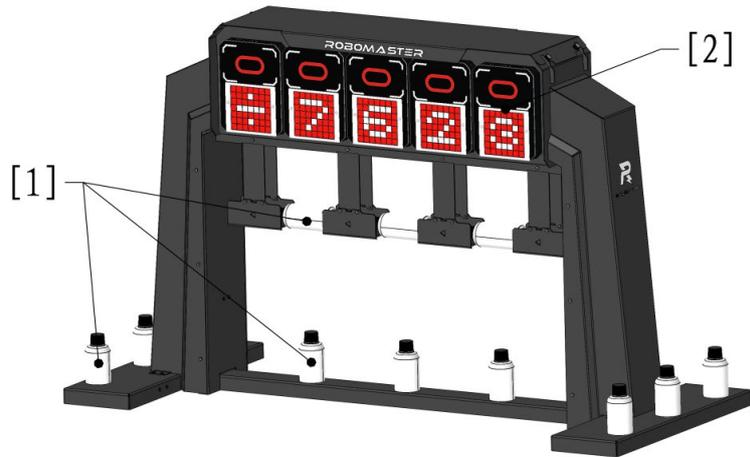


Figure 2-22 High Wall

### 2.7.3 Resource Island

The Resource Island is a resource area in the center of the Battlefield consisting of a Projectile Depot and a Power Rune.

There are no separate Resource Islands for each of the Red and Blue Teams. The Engineer Robots of both teams are allowed to procure projectile containers from the Resource Island.



[1] Projectile container [2] Electronic Visual Marker

Figure 2-23 Axonometric View of Resource Island

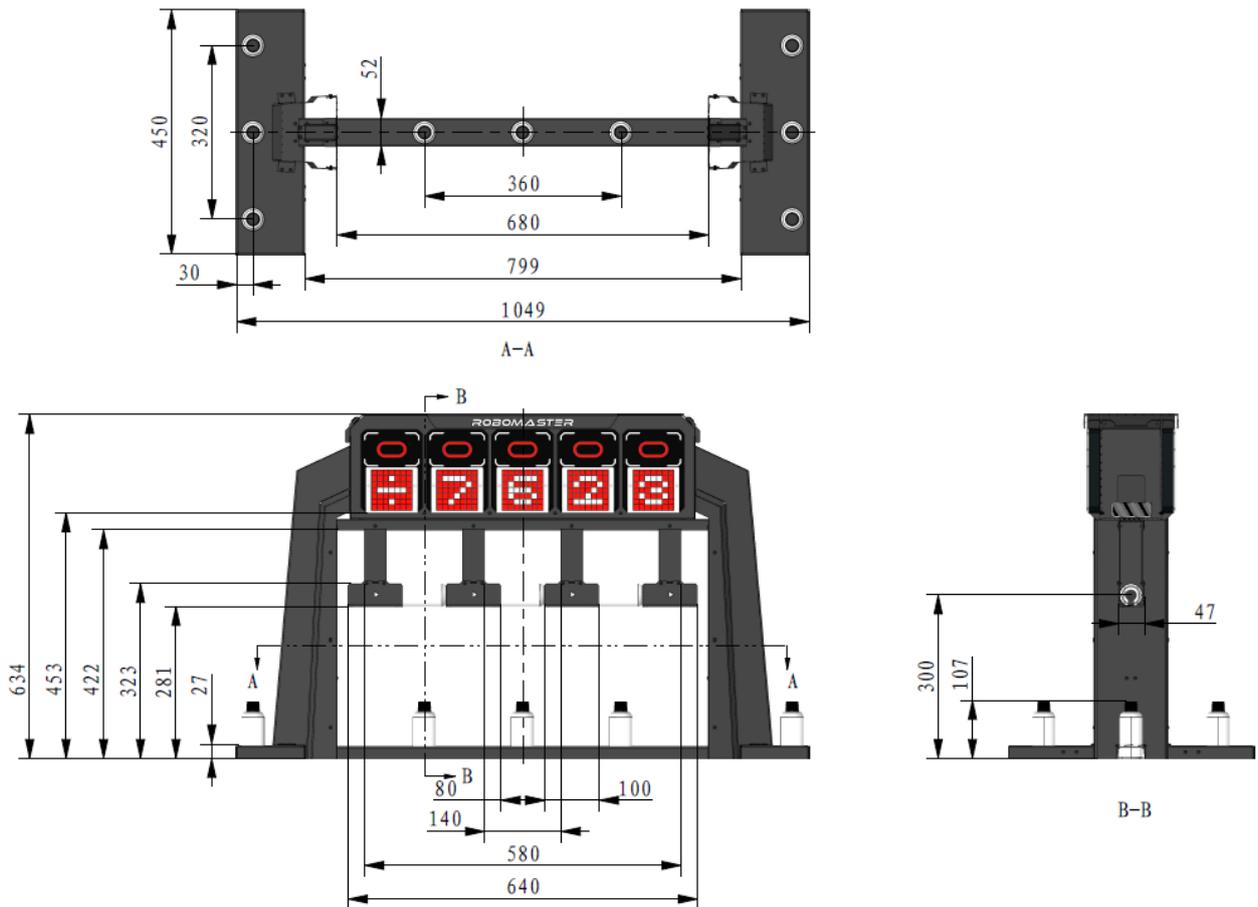


Figure 2-24 Dimensions of the Resource Island

### 2.7.3.1 Projectile Depot

The Projectile Depot has three sections where projectile containers are placed. Different quantities of projectile

containers are supplied at each different section.

### 2.7.3.2 Projectile Container

A projectile container is cylindrical in shape and is made of polypropylene. A red and blue set of Visual Markers can be found on a projectile container, with each set containing two Visual Markers; At the top is the group letter Marker and at the bottom is the serial number Marker. The red and blue sets of Visual Markers are attached around the body of the container at 180° apart. The effective size is 30mm\*30mm, as shown below. The serial number Marker and group letter Marker are used for interacting with the Standard Robot. See 3.9.3 Projectile Container Reloading Mechanism ”.



Figure 2-25 Projectile Container

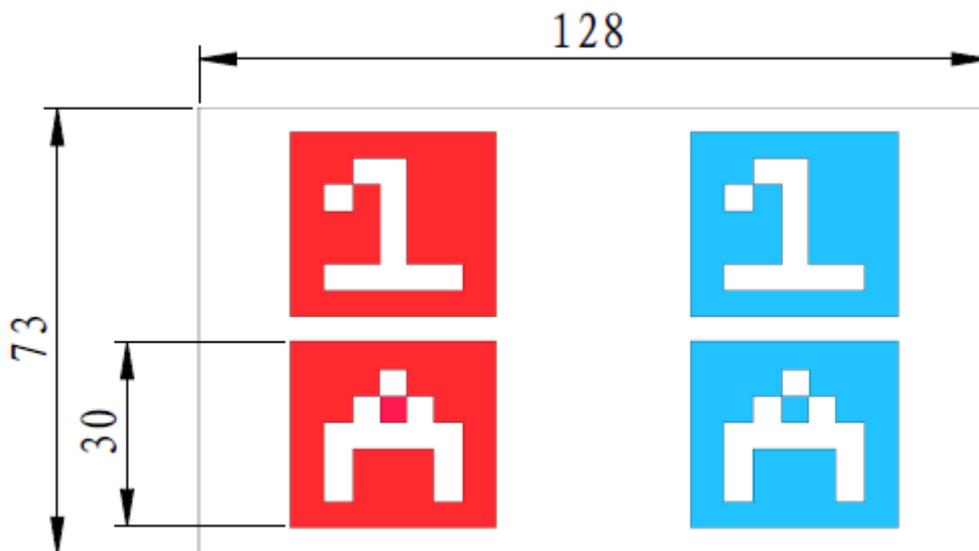


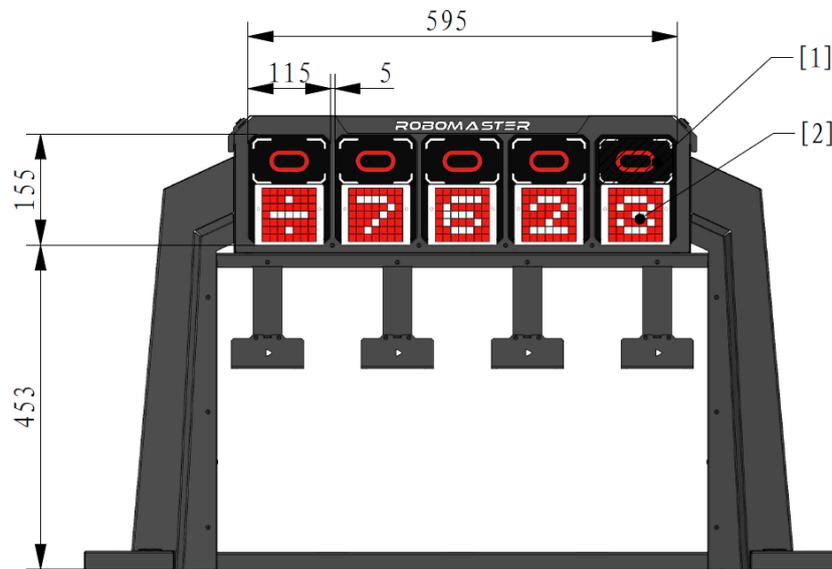
Figure 2-26 Container Body Visual Marker

### 2.7.3.3 Power Rune

Located above the Projectile Depot of the Resource Island, the Power Rune consists of 5 Electronic Visual Markers, where the characters are updated randomly. Hitting the 5 Visual Markers in sequence will activate the Power Rune and the team will receive HP buff. For detailed descriptions, see “3.6Power Rune Mechanism”.



Electronic Visual Marker: It consists of an LED dot matrix screen and a Hit Detector, and is able to display various Visual Markers and detect projectile hits.



[1] Hit detection effective area [2] LED dot matrix screen

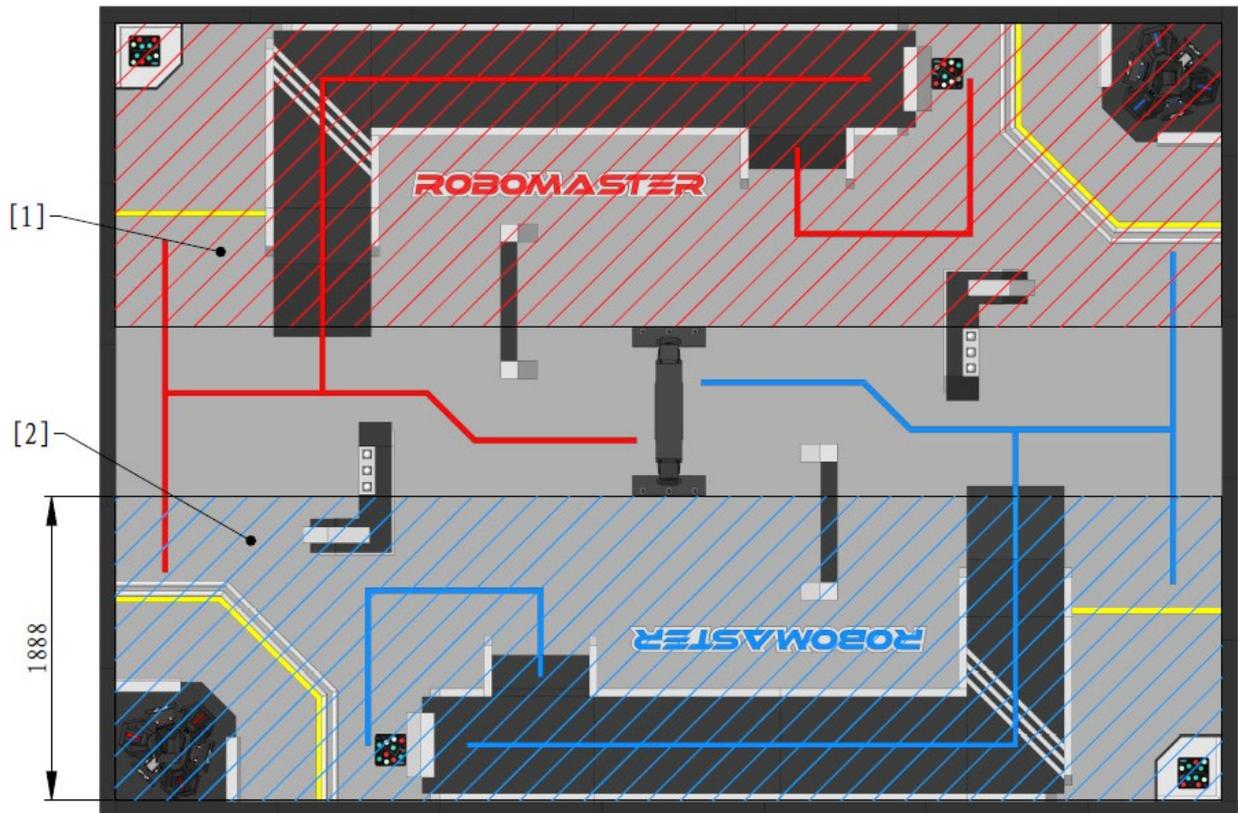
Figure 2-27 Power Rune

## 2.8 Flight Zone

The Flight Zone is the activity area for Aerial Robots. The whole Battlefield is the Flight Zone for Aerial Robots.

### 2.8.1 Safe Flight Zone

The Aerial Robots of both sides have their own Safe Flight Zone, as shown below. The Aerial Robot of one side must fly within its own Safe Flight Zone. If it is necessary to enter the Safe Flight Zone of the other team, avoid interference or collision with the opponent's Aerial Robot.



[1] Red Team’s Safe Flight Zone [2] Blue Team’s Safe Flight Zone

Figure 2-28 Safe Flight Zones

## 2.9 Operator Room

Each Operator Room shall be equipped with a corresponding number of computers, each connected to its corresponding official equipment such as a mouse, a keyboard and a wired headset.

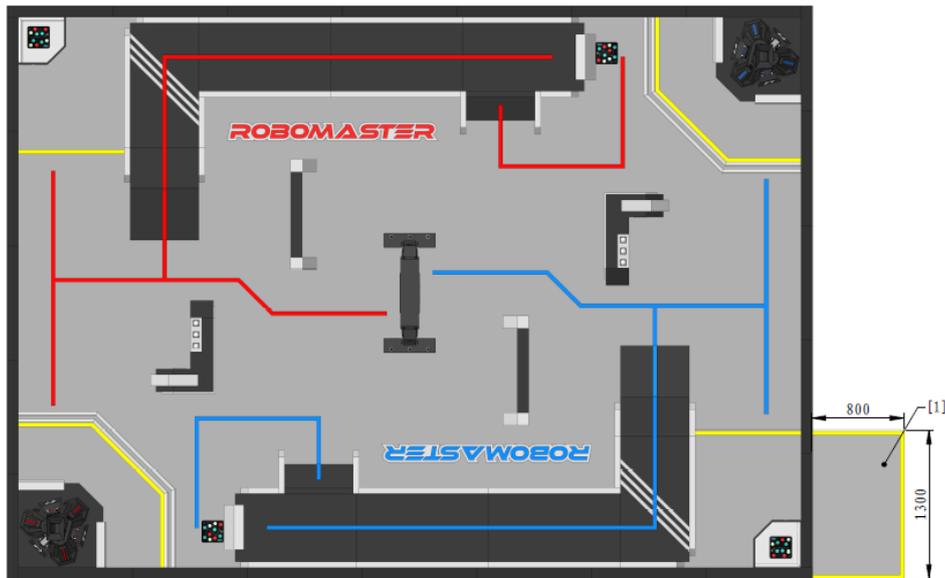
The Pilot and the Ground Robot Operator can conduct two-way communication through official communication devices.

An Operator Room is not provided with additional power supply.

## 2.10 Pilot Operation Zone

The Pilot Operation Zone is equipped with communication devices for the pilot to communicate by voice with his teammates in the Operator Room. Participants must bring their own devices for controlling their Aerial Robots.

The Pilot must stand in his team’s operation zone in order to control the Aerial Robot, and can also receive Projectile Containers to reload his team’s robots.



[1] Pilot Operation Zone

Figure 2-29 Pilot Operation Zone

## 2.11 Projectiles

Robots can attack Armor Modules or hit the Power Rune by launching projectiles, and decrease the enemy’s Base Armor Value temporarily by casting large projectiles. The specifications and requirements for the two types of projectiles are as follows:

Projectile type	Size (diameter)	Weight	Applicable robots
Crystal Projectile	6.3±0.5 mm	/	Standard Robot
Large Projectile	40mm	2.6 g ± 0.1 g	Aerial



The material and size of large projectiles are the same as the national standards for table tennis balls.

### 3. Competition Mechanism

#### 3.1 Robot Status and Buff Types

Robots will display the following statuses during the competition as shown below:

Table 3-1 Robot Status

Status	Description
<b>Survive</b>	Robot’s HP is not zero.
<b>Invincible</b>	When the Armor Module is attacked by projectiles, the HP is not deducted.
	 The “invincible” status is not applicable to HP deduction penalties for rule violations, modules going offline, etc.
<b>Defeated</b>	Where the HP of a robot is reduced to zero as a result of its Armor Module being attacked, its Referee System going offline, etc.
	 If a robot is defeated as a result of its Armor Module being attacked, it is deemed “destroyed”.
<b>Ejected</b>	Where a robot is ejected from the competition by the Referee System on a Level 2 warning.
<b>Offline</b>	The Referee System is unable to connect to the Referee System Server due to power outage on the robot or other reasons.



A robot cannot move or launch projectiles when it is ejected or defeated.

Robots can earn buffs by completing specific missions. The types of buffs are as follows:

Table 3-2 Robot buffs

Type	Description
<b>Defense buff</b>	Increases the Armor Value of the robot
<b>Attack buff</b>	Increases the damage caused by a projectile attack.
<b>HP recovery buff</b>	The robot restores its HP by a certain amount each second, until it reaches its Maximum HP.

Type	Description
Maximum HP buff	Increases the Maximum HP of the robot

## 3.2 Armor Value Mechanism

The Armor Value Mechanism affects actual HP deductions when the Base or robot is attacked.

- When the Armor Value is positive or zero and the Base or robot is attacked: Actual Deducted HP = Deducted HP \*  $\frac{10}{10 + \text{Armor Value}}$ .
- When the Armor Value is negative and the Base or robot is attacked: Actual Deducted HP = Deducted HP \*  $\frac{10 - \text{Armor Value}}{10}$ .



The Armor Value does not affect actual HP deductions caused by rule violations, Referee System going offline, etc.

For example:

- Assuming no HP buff is received, and the Armor Value of the Base is 30, the HP deduction suffered after one projectile attack is:  $10 * 10 / (10 + 30) = 2.5$ , rounded off to 3.
- Assuming no HP buff is received, and the Armor Value of the Base is -10, the HP deduction suffered after one projectile attack is:  $10 * [10 - (-10)] / 10 = 20$ .

The change in the Armor Value is as shown below:

Table 3-3 Armor Value Change

Reason	Target	Change Value	Detailed Description
The first defeat of the Ground Robot during the manual operation phase	Base	Reduced by 30 points permanently	“3.2.1 Base Armor Value”
Non-first Defeat of Ground Robots during the Manual Control Phase	Base	Reduced by 10 points permanently	“3.2.1 Base Armor Value”
Recognition of the Defense Marker during the automatic movement phase	Standard	Increased by 5 points temporarily	“3.5 Automatic Movement Mechanism”
Aerial casts a large projectile successfully	Base	Reduced by 20 points permanently	“3.7.2 Projectile Casting by Aerial Robots”

For the HP deductions suffered by a Base or robot under attack, refer to “3.3 HP Deduction Mechanism”.

### 3.2.1 Base Armor Value

At the start of the competition, the Base Armor Value is zero; upon entering the manual operation phase, the Base gets 50 points in Armor Value.

During the manual operation phase, the team’s Base Armor Value will be reduced by 30 points permanently on the defeat of its first robot. With every subsequent defeat of a robot, the Base Armor Value will be reduced by 10 points permanently. The maximum reduction in Base Armor Value caused by a robot defeat on either side is 50 points.

### 3.2.2 Ground Robot Armor Value

For the Armor Value buff of Ground Robots, please refer to “3.5 Automatic Movement Mechanism”.

## 3.3 HP Deduction Mechanism

The HP of robots will be deducted in any of the following situations: The Armor Module is attacked by a projectile, an important module in the Referee System has gone offline, penalty for violation, etc.

When calculating the HP, the Referee System will round off the HP deduction amount to an integer.

### 3.3.1 Attack Damage

A robot is only allowed to inflict damage on the enemy unit using projectiles. The Armor Module detects projectile attacks through the sensor.

A robot may also suffer damage when its Armor Module is struck. However, a robot cannot cause HP damage to the other side’s robots through striking (including collision or launching objects).

The minimum detection gap for an Armor Module is 100 ms. To make sure an attack can be steadily detected, the robot must use a Launching Mechanism that complies with the technical safety standards of the RMOC and hit an Armor Module from within a distance of 3 m.

The table below shows HP deductions where no buff is gained and the Armor Value is zero:

Table 3-4 HP Deduction Mechanism for Attack Damage

Projectile Type	HP Deduction
Crystal Projectiles	10

### 3.3.2 Referee System Going Offline

According to the latest version of the [RoboMaster 2022 Youth Championship Robot Building Specifications Manual](#), robots must be mounted with their corresponding Referee System Modules, and each Referee System Module must have a stable connection to its server throughout the competition. The Referee System server detects the connectivity of each module at a frequency of 2 Hz. If important Referee System Modules go offline due to design or structural issues, the HP of the corresponding Ground Robots will be deducted.

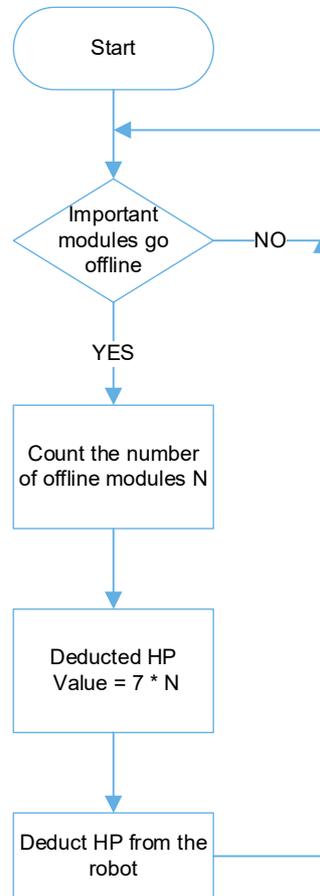


Figure 3-1 HP Deduction Mechanism for Important Referee System Modules Going Offline

### 3.3.3 Irregular Offline Status

During the competition, if a robot enters an “irregular offline” status:

- 5% of its Maximum HP is deducted for each second elapsed until it drops to zero.
- The robot no longer detects any damage caused by collision or projectile attacks.

## 3.4 HP Recovery and Revival Mechanism

Only Standard and Engineer Robots are allowed to recover and be revived, excluding any robot ejected from the competition.

### 3.4.1 HP Recovery Mechanism

- Engineer Robots: If an Engineer Robot has not suffered any damage for 30 seconds or after being revived from a defeat during a single round, it will receive a recovery buff of Maximum HP at 2% per second.

- Engineer or Standard Robots:: If the Video Transmitter Module of a Referee System detects a Recovery Marker at its team's HP Recovery Point, it will receive a recovery buff of Maximum HP at 20% per second.

## 3.4.2 Revival Mechanism

After the defeat, a robot will be revived automatically after a certain period of time has lapsed. After a robot is defeated, if the Video Transmitter Module of a Referee System recognizes the Revival Marker, its waiting time will be reduced by 20 seconds before it can be revived (it is only effective once after each defeat) .

After a robot is revived, its HP will be restored to 20% of its Maximum HP. After a robot is revived, it will be in the unbeatable status for 10 seconds.

### 3.4.2.1 Waiting time for revival

- Engineer Robots: 25 seconds
- Standard: After the first defeat, a robot needs to wait for 20 seconds to be revived; For every subsequent defeat, the robot's waiting time will increase by 5 seconds, with the maximum waiting time being 40 seconds.

### 3.4.2.2 Revival Marker

A Revival Marker is a Visual Marker in the form of the letter "R" and is located in the team's own Supplier Zone. It can also be carried by an Engineer or Aerial Robot. The robots of each team can only recognize Revival Markers in their own team's color.

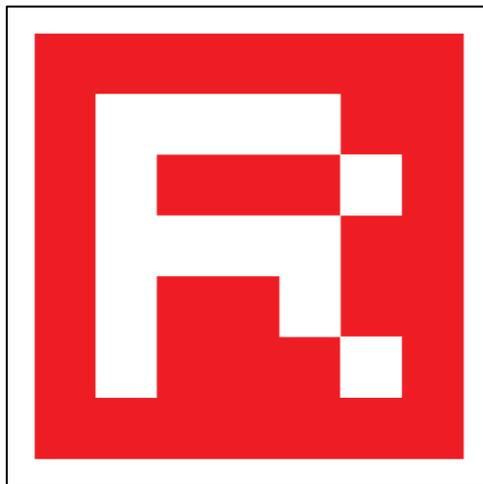


Figure 3-2 Revival Marker



Revival Markers must be produced by the teams themselves. The specifications can be found in the [RoboMaster 2022 Youth Championship Robot Building Specifications Manual](#).

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## 3.5 Automatic Movement Mechanism

In the first minute of the match (countdown from 5:00-4:00), the robot can move automatically. It cannot be controlled through the direction control key and the mouse of the Operator Client. But the Operator can launch the

custom skill loaded into the robot in advance through the custom skill function provided by the Operator Client. The unleashing of each skill is followed by a cooling time of 10 seconds. After the cooling time, the skill can be unleashed again. For steps on installing custom skills, please visit the [DJI Education Help Center](#).

During the automatic movement phase, all Ground Robots must move along their own team’s guiding lines as much as possible. If the normal projection of any part of a robot is in contact with the guiding lines of its own team in the Battlefield, it is deemed that the robot is moving along the guiding lines.

The Red Team and Blue Team have their own guiding lines which are all 35mm wide, as shown below.

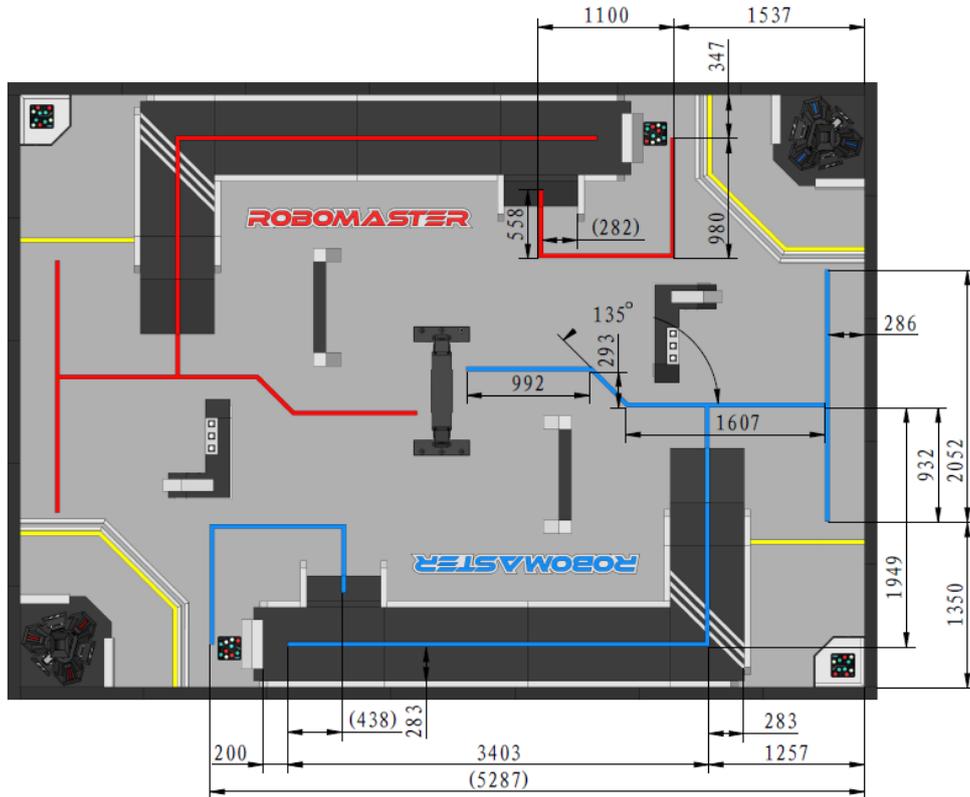


Figure 3-3 Battlefield Guiding Lines

During this period, the Ground Robot can finish the missions set out in the table below and get the corresponding benefits.

Table 3-5 Mission Benefits in Automatic Movement Phase

Mission	Mission Benefits
<b>The Referee System recognizes a Defense Visual Marker on its own team’s L-shaped Terrain</b>	The robot will receive 5 points of Armor Value and the effect will persist for 1 minute after the automatic movement phase.
<b>Activate the Power Rune</b>	Refer to “3.6Power Rune Mechanism”
<b>Attack the other team’s Base</b>	Damage the Base (The Base Armor Value in the automatic movement phase is zero; refer to “3.2.1Base Armor Value”)

Mission	Mission Benefits
<b>Destroy any robot of the other team</b>	All the team’s robots receive 50% of the current HP and Maximum HP buff (triggered once only) until the end of the round.

After the automatic movement phase, the Standard Robot’s projectile allowance returns to the initial quantity, and the skill cooling time is reduced to 2 seconds.

### 3.6 Power Rune Mechanism

The Power Rune is located on both sides of the Resource Island. It can be activated by being hit with a projectile. The whole team will receive a certain amount of buff points once it is activated.

The Red Team can only activate the Red Team’s Power Rune while the Blue Team can only activate the Blue Team’s Power Rune. Both teams can hit and activate their Power Runes simultaneously.

The Power Rune consists of two phases: Power Rune in automatic movement phase and manual control phase.

- Power Rune in automatic movement phase: During the automatic movement phase, if a robot of one team activates the Power Rune, all robots of this team will receive a 1.5-time attack power buff until the end of the competition.
- Power Rune in manual control phase: One minute after the manual control phase begins, if a robot of one team activates the Power Rune, all robots of this team will receive a double attack power buff for 40 minutes.

A team’s Power Rune cannot be activated again within one minute of its activation.

The Power Rune consists of five Electronic Visual Markers. The electronic visual Markers on the left of the Power Rune are symbols, while the four on the right are digits. The symbols are:  $\times$ ,  $\div$ . The digits are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. A symbol can be triggered multiple times, while each digit can only be triggered once.



“ $\div$ ” is equal to “/”.

At the start of a match, the electronic visual Markers will randomly generate one symbol and four digits. The robots will launch projectiles to hit the effective detection area corresponding to the visual Markers (indicated in white frames in “Figure 2-27 Power Rune) to generate a mathematical formula with a result of 24, which will activate the Power Rune successfully. You can form a double figure by hitting two digits consecutively, and a triple figure by hitting three digits.

**Example 1: For  $\div 2269$ , hit 9, 6,  $\div$ , 2,  $\div$ , 2 in sequence**

**Example 2: For  $\times 2269$ , hit 2,  $\times$ , 2,  $\times$ , 6 in sequence**



A mathematical formula refers to any formula of calculation involving numbers (or algebras), including digits and arithmetic symbols. In the case of x4293, for example, hitting 2 and 4 will not trigger the Power Rune.

### 3.6.1 Power Rune States

Power Runes can display five states: Activable, Activating, Activation Successful, Activation Failed and Cooling.

Table 3-6 Power Rune State Parameters

Parameter name	Parameter value	Parameter description
Refresh cycle of the activable state	5 seconds	Refresh rate when the Power Rune is activable
The longest hitting interval in the activating state	1 second	When the Power Rune is activable, the next correct Electronic Visual Marker must be hit during this period.
Duration of successful activation	10 seconds	The display duration for the letters “ATK” on the Power Rune.
Duration of the cooling state	50 seconds	The duration of the cooling state of the Power Rune, which will display the cooling countdown in this state.

#### 3.6.1.1 Activable

After the competition begins, the Power Rune is activable before it suffers any hit. When the Power Rune is activable, it displays a random string of numbers, and refreshes them every 5 seconds.

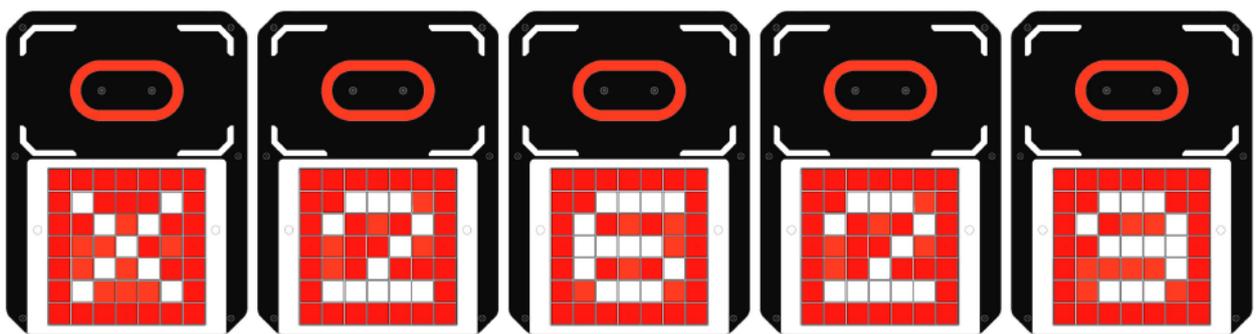


Figure 3-4 Power Rune When Activable

#### 3.6.1.2 Activating

After it is hit, a symbol visual Marker will change to “↑”: if a digital visual Marker is hit within one second, the symbol visual Marker will revert to the symbol before it was hit.

A digital visual Marker will change to “↑” after it is hit.

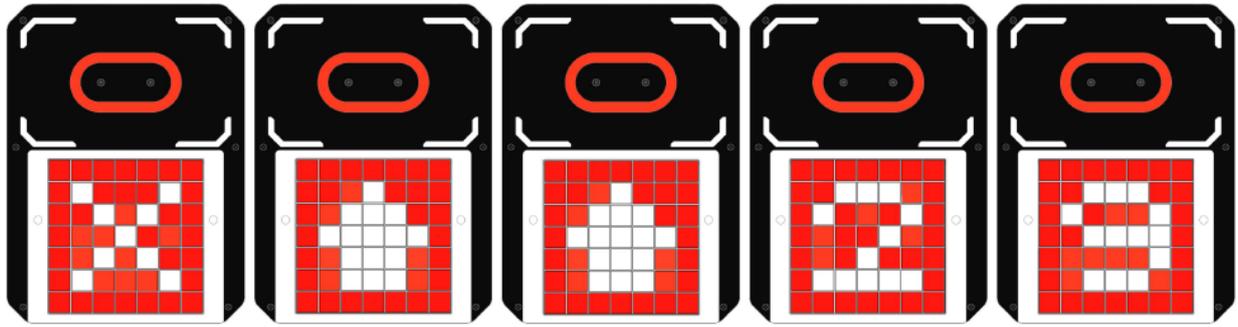


Figure 3-5 Power Rune Activating

### 3.6.1.3 Activation Successful

Two minutes into the match (countdown at 2:59), if the robot hits the corresponding Electronic Visual Markers in the required manner and generates a calculated result of 24, it shall be deemed that the Power Rune is activated, and the Electronic Visual Markers of the Power Rune will display the following characters. The successful activation state will last for 10 seconds, and then the Power Rune will enter the cooling state

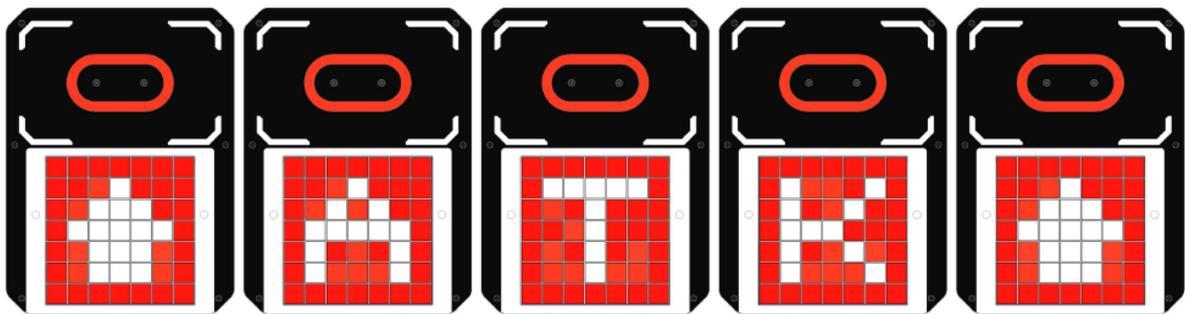


Figure 3-6 Successful Power Rune Activation



In the successful activation state, a team will receive the Power Rune buff only if any of its Ground Robots recognize the three letters “ATK” through the Video Transmitter Module.

### 3.6.1.4 Activation Failed

If the robot fails to hit the Electronic Visual Markers with the correct serial numbers within one second, the activation will be deemed failed. The Power Rune will return to the activable state, and the robot will have to reactivate the Power Rune. If a robot has hit all the electronic visual Markers but the calculation is incorrect, the Power Rune will revert to “Activable” status and the robot will have to reactivate the Power Rune.

### 3.6.1.5 Cooling State

The cooling state of the Power Rune is as shown below. The cooling state of the Power Rune lasts for 50 seconds. In this state, the Power Rune displays the cooling countdown, and the time is accurate to 0.1 seconds. For example: The figure below indicates 10.9 seconds are left in the cooling state.

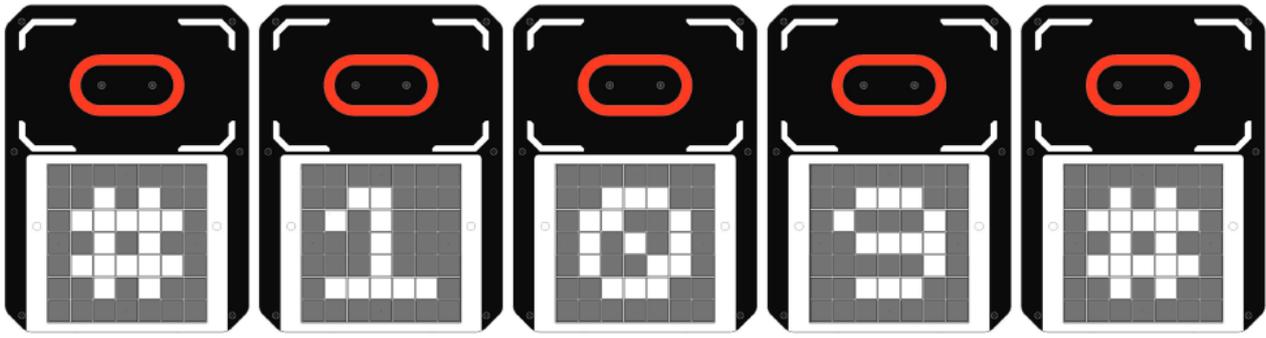


Figure 3-7 Cooling State of the Power Rune

## 3.7 Aerial Robot-Related Mechanisms

### 3.7.1 Take-off Mechanism

An Aerial Robot can only take off after the automatic period for Ground Robots has ended.

### 3.7.2 Projectile Casting by Aerial Robots

Before the start of a match, the pilots of both teams will receive 3 large projectiles which can be reloaded directly onto an Aerial. An Aerial is allowed to carry no more than 3 large projectiles in flight and cast them onto the specific area of the other team's base. Once hit by a large projectile, the other team's Base Armor Value will be reduced by 30 points temporarily for 30 seconds. If the Base is hit by a projectile again within 30 seconds, the Base Armor Value will not decrease any further but the duration will be refreshed with a 30-second countdown.

### 3.7.3 Base Receiving Area

The Base Receiving Area is where the base is able to receive large projectiles cast by robots. The receiver is in funnel shape, with a maximum cross section of 150mm\*200mm. The Base Receiving Area is shown as follows:

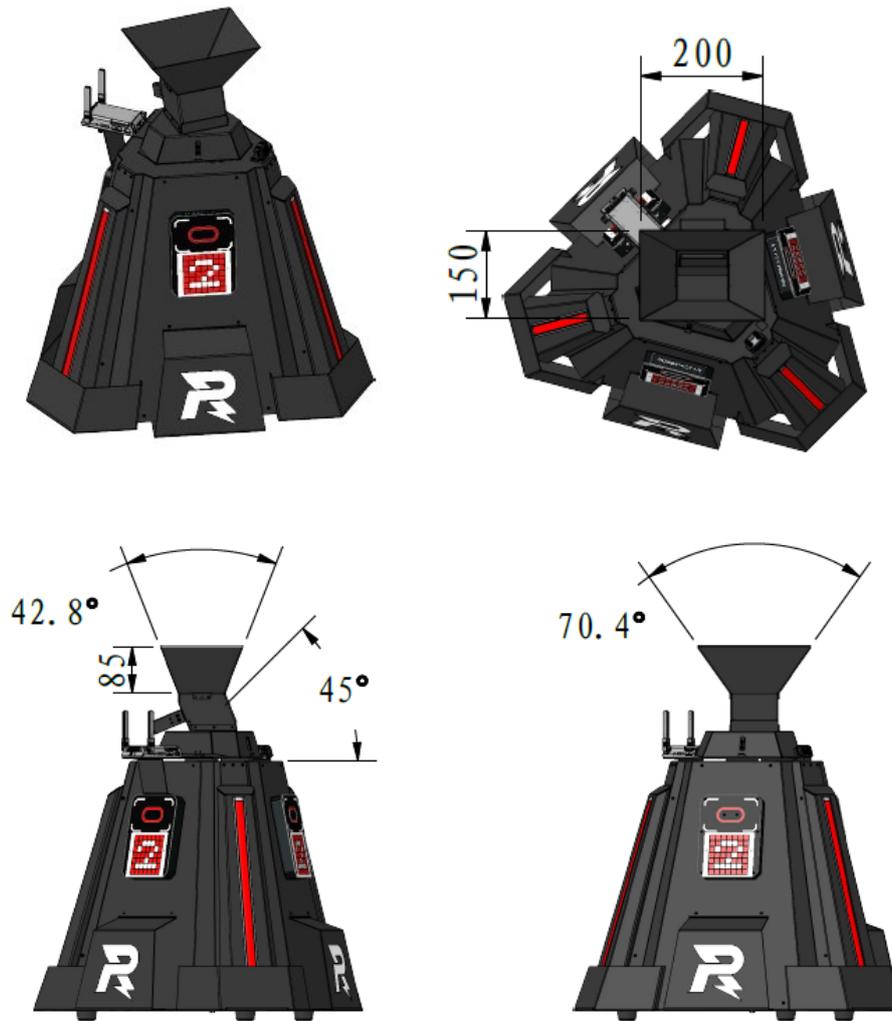


Figure 3-8 Base Receiving Area

### 3.8 Barrel Heat Mechanism

Set the barrel heat limit as  $Q_0$ , the current barrel heat as  $Q_1$ . For each projectile detected by the Referee System, the current barrel heat  $Q_1$  is increased by 10 (regardless of its initial speed). The barrel cools at a frequency of 10 Hz. The cooling value per detection cycle = cooling value per second / 10. If  $Q_1 \geq Q_0$ , the Launching Mechanism will be barred from use (unable to launch projectiles) until the barrel heat is lower than  $1/2 Q_0$  where it will be reactivated.

The barrel heat cooling logic is as shown below:

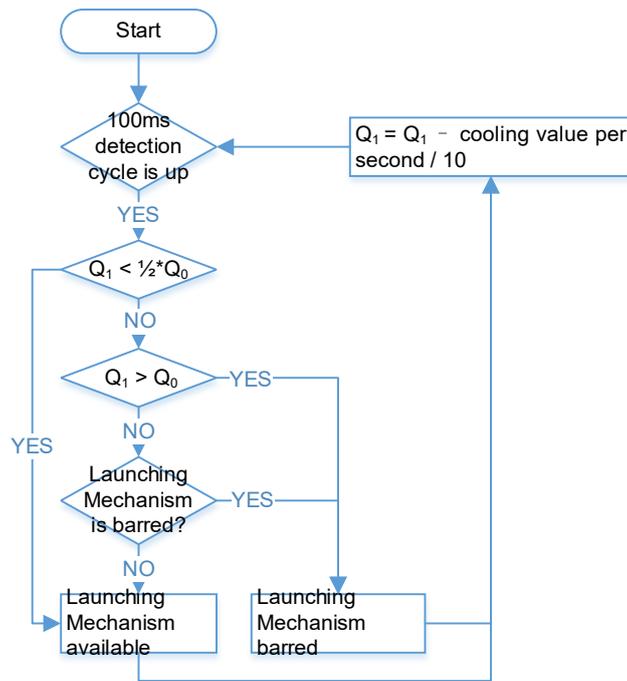


Figure 3-9 Barrel Heat Cooling Logic

## 3.9 Projectile-Supplying Mechanism

### 3.9.1 Projectile Allowance

The projectile allowance indicates the quantity of projectiles allowed to be launched by a robot. With each projectile launched by the robot, the projectile allowance reduces by one point. When the projectile allowance hits zero, the robot will no longer be able to launch any projectile.

The projectile allowance can be increased by reloading projectile containers or returning to the Supplier Zone to recognize the Recovery Marker.

Two, three and four minutes into the competition (i.e. 2:59, 1:59 and 0:59 in the countdown), each robot can earn 25 points in projectile allowance ONLY by recognizing the Recovery Marker. Any projectile allowance that has not been procured can be accumulated.

### 3.9.2 Launching Mechanism's Durability Value

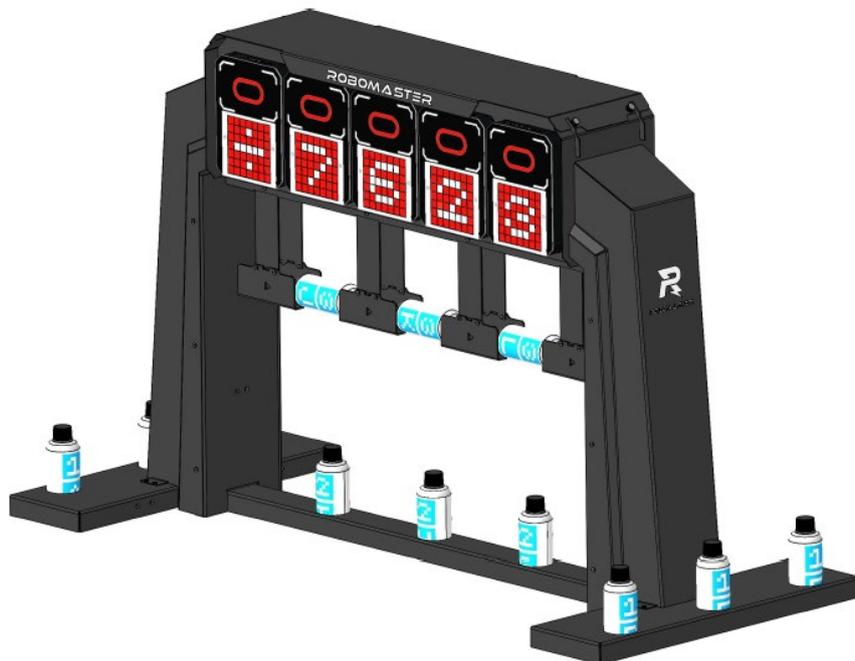
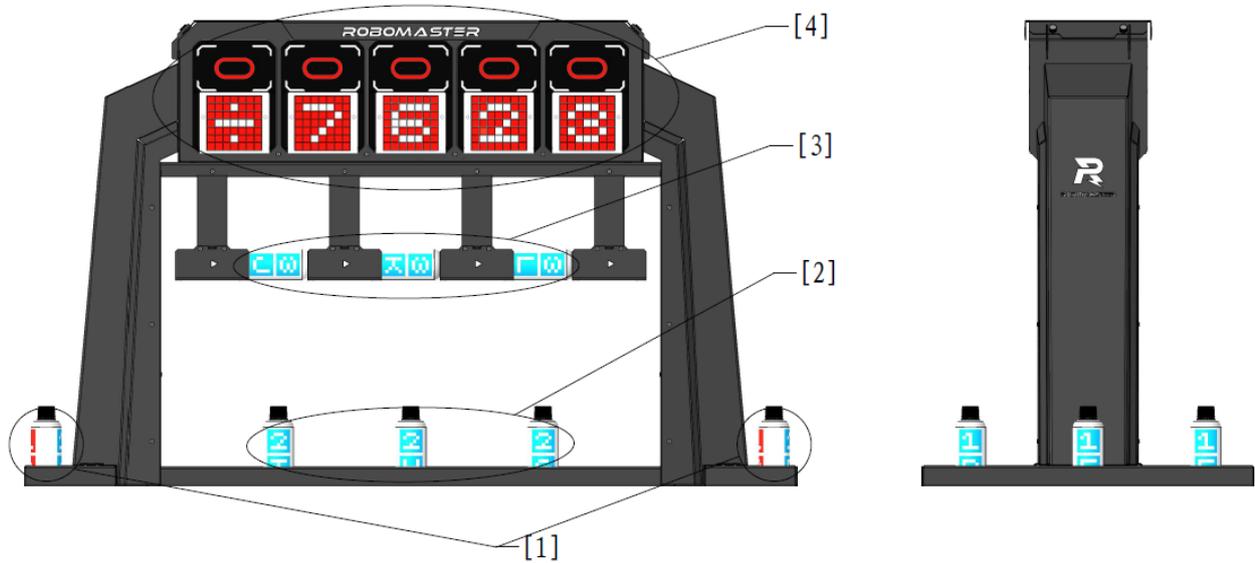
The Launching Mechanism's Durability Value is 400. Every projectile launched by the robot lowers the Durability Value by one point. When the Durability Value hits zero, the robot will no longer launch any projectile, and no projectiles can be reloaded through projectile containers. The Launching Mechanism's Durability Value will be reset at the start of each round, but cannot be restored by any means during a round.



Team members should ensure that the clips are fully loaded before a match, to avoid projectiles running out and resulting in robots not being able to launch projectiles.

### 3.9.3 Projectile Container Reloading Mechanism

The projectile containers on the Resource Island are divided into three groups indicated by the numbers 1, 2 and 3. Their layout is shown as follows:



[1] Group 1 [2] Group 2 [3] Group 3 [4] Power Rune

Figure 3-10 Projectile Container Layout

Group 1 has 6 projectile containers indicated by the letters A, B, C, D, E and F.

Group 2 has 3 projectile containers indicated by the letters G, H and I.

Group 3 has 3 projectile containers indicated by the letters J, K and L.



The projectile containers in the same group are placed randomly. The directions of the projectile containers during the competition are as shown in the figure, however their angles may not be exactly the same as in the figure.

Each group is allowed to supply a different quantity of projectile containers. The projectile container groups and their corresponding reloading quantities are shown as follows:

Table 3-7 Projectile Container Groups and their Corresponding Reloading Quantities

group letter	Reloading Quantity
1	50
2	75
3	125

When a Standard Robot recognizes the serial number and group letter Visual Markers of its own team’s color on projectile containers simultaneously through the Video Transmitter Module, the reloading is deemed successful, and the robot’s current projectile allowance will increase. Once the reloading is completed, the projectile containers used in this reloading will become ineffective during this round.

When a Standard Robot recognizes the Visual Markers on a projectile container, the projectile container must be upright, and the team number and serial number Markers must not be blocked and must face the reloaded robot directly. After the Engineering Robot receives the projectile container, it can adjust the attitude of the projectile containers with its mechanical structure to meet the recognition requirements. If its mechanical structure does not meet the requirements, the projectile containers can be transported back to the Supplier Zone for the Pilot to reload the robot manually. The Pilot is only allowed to touch the projectile containers placed in the Supplier Zone. At no time can the Pilot touch the projectile containers placed outside the Supplier Zone.



Upright: When the angle between the central axis of a projectile container and the horizontal plane is  $90\pm 10^\circ$ , the projectile container is deemed upright.

### 3.10 Logic of Mechanism Overlap

When a robot gains more than one buff of the same type, the maximum buff effect will be recorded. Buffs include attack power, recovery and Maximum HP.

**For example, if an Engineer Robot has not suffered any damage for 30 seconds, it will recover its HP at 2% of its Maximum HP per second. If the Engineer Robot recognizes its own team’s HP Recovery Marker, its HP will recover at 20% of its Maximum HP per second.**

### 3.11 Base Light Effects

Below are the descriptions of base HP light effects:

Light status	Description
Constant green	Base is in “invincible” status
Constant red or blue	Base “invincible status” is lifted
White flashes followed by red or blue	Aerial casts a large projectile successfully

Electronic visual markers on Base Armor Modules will change with time. The number and color are associated with the current Base Armor Value by the following rules:

- The number displayed represents the tens digit of the current Base Armor Value
- When the Base Armor Value is greater than zero, the electronic visual marker displays green, and when it is less than or equal to zero, the electronic visual marker displays its team color

Below are descriptions of Base Armor Module effects:

Armor Module status	Description
	Base Armor Value is 20
	Base Armor Value is -20
	Base is invincible

### 3.12 Winning Criteria

The official matches of RMYC 2022 consist of the Group Stage and the Knockout Stage. The competition format for the Group Stage is B01, while the competition format for the Knockout Stages for the other matches is B03.

The following are the criteria for winning in a single round:

1. When the Base of one team is destroyed, the round ends immediately and the team with the surviving Base wins.
2. When the duration of a round has elapsed and if the Bases of both teams have survived, the team with the higher Remaining HP is the winner.
3. If a round has ended and the Bases of both teams have not been destroyed and the remaining Base HP of both teams are the same, the team with the higher HP deduction is the winner.

4. If a round has ended and the Bases of both teams have not been destroyed, the remaining Base HP of both teams are the same, and the total HP deductions of both teams are the same, the team with the higher total Robot Remaining HP is the winner.

If neither team 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.

### 3.12.1 Group Stage

The below shows the points for Group Stage:

Table 3-8 Points for Group Stage

Competition Format	Competition Result	Points	Remarks
B01	1:0	3:0	Winner of one round gains three points
	0:0	1:1	(Draw) Each team gains one point

The ranking for the Group Stage is determined by the total points for each match. Teams are ranked based on the following order, in descending order of priority:

1. The team with the higher total match points ranks higher.
2. If the total match points of teams are the same, the team with the higher total Net Base HP from all rounds ranks higher.
3. If the total Net Base HP are the same, the team with the higher total HP deduction ranks higher.
4. If two or more teams are still tied for the same place according to these criteria, the RMOC will arrange a playoff match on the basis of two extra rounds.



- HP Deduction: The HP deduction (consumption) of the robot and props caused by attacking another team.
  - HP Deduction as a result of the penalty issued by the Referee is added to the other team’s Damage HP.
  - HP Deduction caused by the Referee System going offline is not added to the other team’s Damage HP.
  - HP Deduction caused by the robot entering “offline status” is not added to the other team’s Damage HP.
- Net Base HP: The remaining HP of a team’s Base subtracted by the remaining HP of the enemy’s Base at the end of a round.
- Total Remaining HP: The total value of the remaining HP of a team’s surviving robots at the end of a round.

### 3.12.2 Knockout Stage

Knockout Stage winner determined by number of rounds won: BO3 requires the winning of two rounds.

## 4. Competition Process



The actual competition process might differ on the site and shall be based on the details communicated in the Captains' Meeting before the competition.

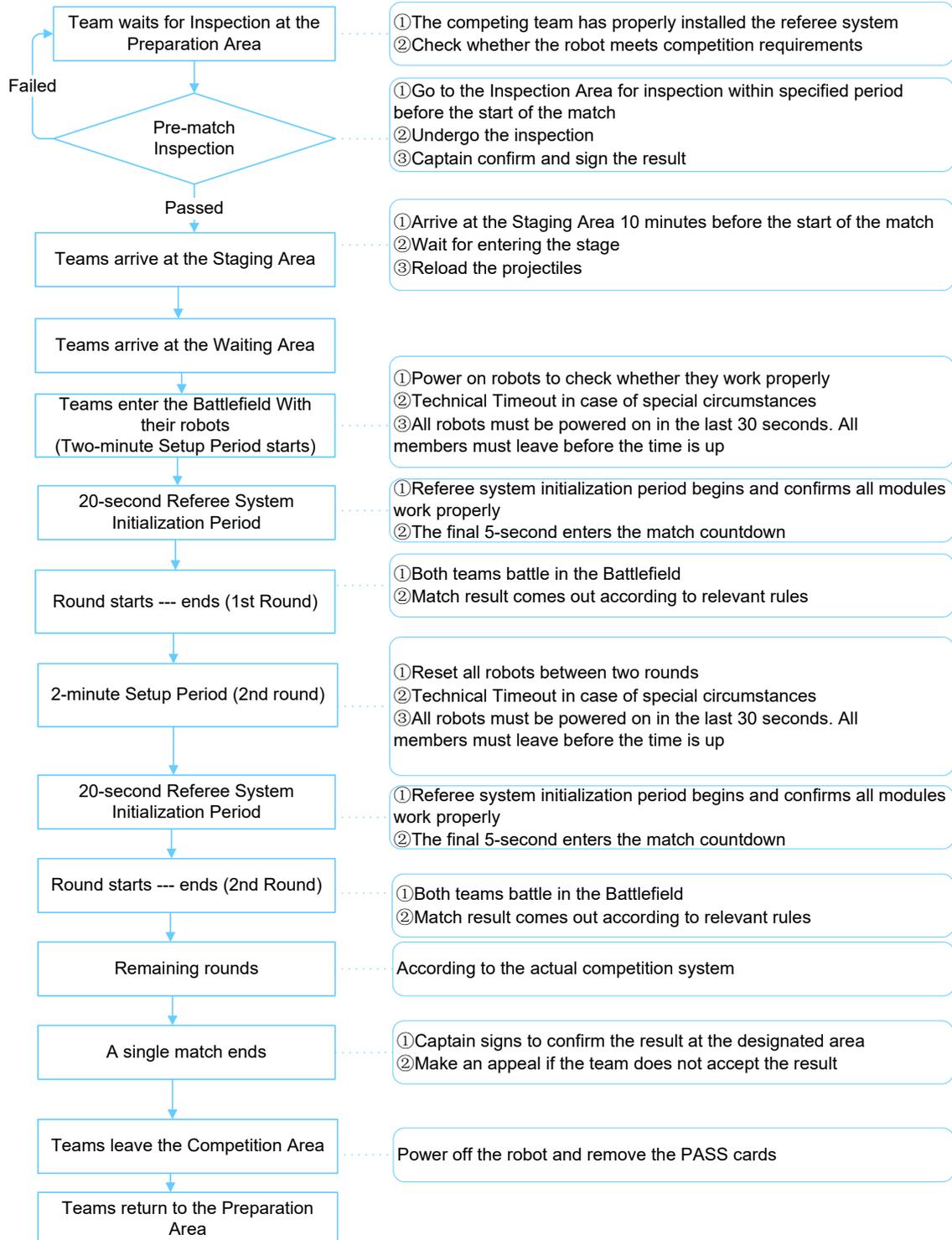


Figure 4-1 Process of a single match

## 4.1 Pre-Match Inspection

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**Pit Crew Members:** Formal staff who have registered for this Season, have been entered into the registration system and allowed to enter the Staging Area and Competition Area.

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To ensure the robots built by all teams meet the required standard specifications, each team must undergo Pre-match Inspection in the Inspection Area 30 minutes before the start of each match.

Up to 5 members of each team can enter the Inspection Area, of which one member is responsible for coordinating and cooperating in the Pre-match Inspection, and each of the remaining four members should carry a robot into the Inspection Area. 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.

During the Pre-Match Inspection, the inspection referee will stick a Pass Card on the robots that have passed the inspection. Only the robots having a Pass Card with a complete mark will be eligible to enter the Staging and Competition Areas. Teams must modify their non-qualifying robots in the designated area or the Preparation Area until they meet the inspection requirements, before they can enter the match.

When the Pre-Match Inspection is completed, the Captain shall sign and confirm that he/she agrees with the inspection results. After the Captain has signed and confirmed, no objections may be raised to the inspection results.

During each round, each team can carry no more than one backup robot. Team members are required to declare the types of standby robots they are carrying during Pre-match Inspection. Apart from backup Standard Robots, other types of backup robots must be attached with number stickers in the Inspection Area. If backup Standard Robots are needed on the field, a Pit Crew Member must obtain the relevant number sticker from the official technicians.

After passing the inspection, teams are not allowed to replace spare robots or activate robots without the permission of the referee.

### 4.1.1 Borrowing the Referee System

Before the inspection, teams must ensure that their robots are correctly installed with the Referee System and that it works normally. If a team's robots are not installed with the Referee System or the Referee System fails, the team can borrow it from the organizer.

To borrow the Referee System, a team needs to make the request 40 minutes before the start of the Pre-match Inspection, and arrive at the Inspection Area 30 minutes before the normal inspection time to collect the Referee System and install it. After completing the installation, the team will be inspected as usual.

After the end of a day's matches, the teams must return their borrowed Referee Systems to the Inspection Area.

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## 4.2 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. The staff at the Staging Area will check the status of the participating robots and the team members' information. There is a supply point for crystal projectiles in the Staging Area, where participants can load robots and spare clips with projectiles.

If any team needs to repair its robots after entering the Staging Area, it must obtain the permission of the staff at the Staging Area. A robot of the applicant can only return to the Repair Area if a staff member at the Staging Area has removed the Pass Card on the robot. When repair is finished, the team must bring their robots back to the Inspection Area for another Pre-match Inspection before reentering the Staging Area.

After leaving the Staging Area, teams will enter the Preparation Area and set up their robots. When the previous match has ended and with the permission of the referee, the next pair of teams will wait at the entrance of the Competition Area with their robots. After the referee confirms that both teams are ready, the Side Referee will guide the players into the Competition Area and start the countdown of the Two-Minute Setup Period.

## 4.3 Two-Minute Setup Period

During the Two-Minute Setup Period, Pit Crew Members should first enter the Operator Room and connect the robots to the event engine system with the assistance of the staff to check whether the official equipment and robots work well. If any equipment in the Operator Room does not operate normally, the Operator must raise the issue before the Two-Minute Setup Period is down to the last 15 seconds. Otherwise, any request will not be entertained by the Technical Referee.

When the Two-minute Setup Period is in its last minute, it is recommended that the operator place the robot in its initial area and load it with projectiles or replace the clip.

When the Two-Minute Setup Period is in its last 30 seconds, the personnel must leave the Battlefield in an orderly manner.



There is a supply point for crystal projectiles in the Competition Area. It is recommended that participants carry spare clips and load the projectiles in advance in the Staging Area, so as to facilitate the replacement of clips in the two minutes between rounds.

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### 4.3.1 Official Technical Timeout

During the Two-Minute Setup Period, if the official equipment, such as the Referee System and the equipment inside the Operator Room experience any faults (see “Table 4-1 Descriptions of Technical Faults”), the Head

Referee can announce an Official Technical Timeout and pause the setup countdown.

During an Official Technical Timeout, participants can only cooperate with the referee in eliminating the faults of the official equipment and cannot repair other breakdowns. After the faults of the official equipment have been eliminated and the Head Referee has resumed countdown, the team must comply with the rules for the Two-Minute Setup Period and leave the Battlefield at the required time.

Table 4-1 Descriptions of Technical Faults

Rule	Description
1	The official equipment inside the Operator Room malfunctions.
2	During the Two-Minute Setup Period of the first round, the Referee System module on a robot fails, for example where the robot is unable to transmit images back to the Operator Room normally or connect to the server.
3	Structural damage or malfunctions of key Battlefield Components, for example: where a Base Armor Module shifts, drops off or cannot detect hit damage; a Power Rune cannot be hit and triggered normally.
4	Other situations determined by the Chief Referee as requiring an Official Technical Timeout.

If the malfunction referred to in Rule 2 occurs during a Two-Minute Setup Period between rounds or during a Five-Minute Match Period, 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 mechanical or electrical system designs, or robot combat from previous matches. Regular battle damage will not trigger an Official Technical Timeout. The referee will provide a spare Referee System Module, which should be returned to the exit area after the competition. Teams may request for a “Team Technical Timeout” to repair their robots.

### 4.3.2 Team Technical Timeout

If the mechanical structure and a software system of a robot experiences any faults, the team Captain may make a request to the referee for a “Team Technical Timeout” before the 15-second countdown in the Two-minute Setup Period, and indicate the requested timeout length and reasons for the request. Once a Team Technical Timeout request has been made and conveyed to the Chief Referee, the Technical Timeout cannot be revoked or revised.

After a team’s Technical Timeout has been allowed by the Head Referee, the Head Referee will inform both teams of the timeout regardless of which team requested the Team Technical Timeout. Pit Crew Members may enter the Battlefield to repair robots, while the members of both teams can only inspect, repair and commission their robots in their own robot initialization zones.

Even if the team did not enter the Battlefield or ended the Technical Timeout early, the opportunity used will still be the opportunity corresponding to the timeout length indicated by the team during its request. At this time, the

Head Referee will continue the countdown of the Technical Timeout or end the Technical Timeout early after confirming that both teams are ready.

To ensure that subsequent matches begin on time, only one Team Technical Timeout is allowed for both teams for each Two-Minute Setup Period, on a first-come-first-served basis. After the match, the Match Results Confirmation Form will state whether Technical Timeout opportunities have been used during the match. The type of Technical Timeout allowed is determined by the Chief Referee based on the request of the team. The team cannot dispute the type of Technical Timeout allowed, and the Technical Timeout process cannot be the basis for any appeal after the match.

The Team Technical Timeout arrangements for different competitions are as follows:

Table 4-2 Team Technical Timeout Arrangement

Competition	Arrangement
<b>Regional &amp; League Competitions</b>	<ul style="list-style-type: none"> <li>● Group Stage: Two Technical Timeouts for 2 minutes each</li> <li>● Knockout Stage: One Technical Timeout for 3 minutes Technical Timeout opportunities not used in the Group Stage can be carried over to the Knockout Stage</li> </ul>

## 4.4 Referee System Initialization Period

After the Two-Minute Setup Period, the match enters a 20-second Referee System Initialization Period. During the Initialization Period, the competition server will automatically detect the connection status of the 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 in the first round of the match a robot experiences a technical fault with the Referee System, which causes the initialization countdown to stop, a maximum of two Pit Crew Members for the team are allowed to enter the Battlefield to inspect and solve the issue.

When 5 seconds are left in the Referee System Initialization Period, a clear countdown sound and live animation will be played. At this time, the keyboard and the mouse connected to the computer in the Operator Room are locked. When the countdown finishes, the keyboard and the mouse are unlocked and the match starts immediately.

## 4.5 Five-Minute Match Period

The Five-Minute Match Period consists of a one-minute automatic movement period (see “3.5 Automatic Movement Mechanism”) and a four-minute manual operation period. During the match, the robots from both teams will engage in tactical battles in the core competition zone – the Battlefield.

## 4.6 End of Competition

A round ends either when time has elapsed for the round or one team has fulfilled the conditions for winning (see “3.12 Winning Criteria”). When a round ends, the match immediately enters the Two-minute Setup Period for the next round. The match is over when the winner has been determined.

## 4.7 Match Results Confirmation

During a match, the referee will record on the Match Results Confirmation Form, the penalties issued for each round and the HP deductions of both sides at the end of the rounds, the Remaining HP of each Base, the winning teams, the use of Technical Timeout opportunities by teams, and other relevant details. After the end of each match, team Captains need to be at the Referee Area to confirm the results.

Within five minutes after a match ends, Captains of both teams must confirm the match results by signing at the Referee Area. If a team Captain is not at the Referee Area within five minutes to sign and confirm the results and has not requested an appeal, it is deemed that the team agrees with the match results.

The referee will not entertain any request for appeals on match results between rounds of an individual match.

Once a Team Captain has signed and confirmed the results, no further appeals can be made.

## 5. Violations and Penalties



Any penalty issued before the start of a competition will be executed after the competition officially starts.

To ensure the fairness and uphold discipline in the competition, teams and robots should strictly adhere to the competition rules. Referee will issue the appropriate penalty against any violation of rules. Any penalty issued before the start of a competition will be executed after the competition officially starts.

Penalty of violation stated in this chapter will be determined by the Chief Referee according to the actual situation. If any incident has occurred during the competition that affects the fairness of the competition but does not trigger any penalty or amount to a serious violation, the Head Referee shall decide on the issue of penalty based on the circumstances.

During the competition, the Chief Referee has the final right of interpretation on the Competition Rules. Any questions related to the Competition Rules must be referred to the Chief Referee only.

### 5.1 Penalty System

The Penalty System of RMYC 2022 is as shown below:

Table 5-1 Penalty System

Violation Level	Description
<b>Level 1 Warning</b>	<ul style="list-style-type: none"> <li>The operation interface of all Operators from the offending team will be blurred for 3 seconds</li> <li>The Referee System will automatically deduct 5% of the current maximum HP from all surviving robots of the offending team</li> </ul>
<b>Level 2 Warning (Ejection)</b>	<ul style="list-style-type: none"> <li>The offending robot is ejected: All the HP of the Ground Robots in the round is deducted; the Aerial Robot must immediately return to the Landing Pad. Ejected robots cannot be revived.</li> <li>The Operator or other team members are ejected: Participants ejected by the referee must immediately leave the Competition Area, and no substitute Operators or Pit Crew Members will be allowed in the remaining rounds of the match. The robot operated by the ejected Operator will be ejected from this round and barred from all rounds of the current match, with no substitute robots allowed.</li> </ul>
<b>Level 3 Warning (Forfeiture)</b>	<ul style="list-style-type: none"> <li>The Level 3 Warning is only effective for one round.</li> </ul>

Violation Level	Description
	<ul style="list-style-type: none"> <li>● If a Forfeiture is issued before the match (not including the Two-minute Setup Period), the Pit Crew of the offending team must all leave the Competition Area. The offending team’s Base HP is deducted to zero, and the HP of all the offending team’s robots is full. The opposing team’s Base HP and robots’ HP remain full.</li> <li>● If a Forfeiture is issued during a match (including the Two-minute Setup Period), the round is immediately over. The offending team’s Base HP is deducted to zero, and the HP of all the offending team’s robot shall be based on the HP at the end of the match. The opposing team’s Base HP and robots’ HP remain at the amount when the round ends.</li> <li>● If a Forfeiture is issued after the round (due to an appeal), the offending team’s Base HP is deducted to zero, and the HP of all the offending team’s robots shall be based on the HP at the end of the match. The opposing team’s Base HP and robots’ HP remain at the amount when the round ends.</li> </ul>

Some violations will directly trigger a Level 4 or Level 5 Warning, while the penalties for some violations will escalate gradually from a Verbal Warning. A Verbal Warning, Level 1 Warning and Level 2 Warning cannot be used by any team as the basis for an appeal. The Chief Referee will reject an appeal immediately if it is made by any team on this basis.

If a robot’s remaining HP is less than that needs to be deducted from penalty, this robot’s HP reduces to 1.

During the competition, the Chief Referee has the final right of interpretation on the Competition Rules. Any questions related to the Competition Rules must be referred to the Chief Referee only.

## 5.2 Penalty Rules

This chapter sets out the competition rules and defines the relevant penalties to be taken by the referee after a violation. Rules with a serial number R# are rules that must be adhered to by participating teams, team members and robots.

### 5.2.1 Staff

#### 5.2.1.1 Participating Teams/Personnel

R1 Teams are required to meet the requirements in the [RoboMaster 2022 Youth Championship Participant Manual](#).

Penalty: Depending on the seriousness of the situation, the highest penalty that can be given to an offending

team is disqualification.

- R2 Teams must not set up their own wireless networks or use walkie-talkies in the relevant competition zones (including but not limited the Preparation Area, Inspection Area, Staging Area and Competition Area).

Penalty: Depending on the seriousness of the situation, the highest penalty that can be given to an offending team is disqualification.

- R3 Except for emergencies, teams must be at the Inspection Area at least 30 minutes before the start of a match to carry out the Pre-Match Inspection.

Penalty: The highest penalty that can be given to the offending team is a Level 3 Warning.

- R4 Team members must wear protective goggles when entering official designated areas such as the Preparation Area, Staging Area and Competition Area.

Penalty: The offending member will be ejected from the area.

- R5 Team members must not turn on the power and commission or repair their robots in the Staging Area.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 3 Warning.

- R6 Apart from Pit Crew Members who have entered the Staging Area and Competition Area beforehand due to match-related reasons, no participants are allowed inside either area without special reasons.

Penalty: Verbal Warning If the warning is ineffective, depending on the seriousness of the case, the highest penalty that can be given is the disqualification of the offending member.

- R7 Teams must not damage any official equipment (including but not limited to equipment in the Competition Area, Staging Area, Repair Area and Inspection Area).

Penalty: Verbal Warning, and the offending party is required to pay compensation as per the price. The team may be issued a maximum penalty of disqualification, as judged by the team's subjective intention and the impact of its violation on the competition process.

- R8 Any participant who has entered the Staging Area and Competition Area for match-related reasons may not leave either area without permission.

Penalty: The offending team shall be issued a Level 2 Warning.

- R9 Participants are not allowed to bring wireless headsets into the Operator Room.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 3 Warning.

- R10 During any competition Stage, participants must ensure their robots are operating safely and will not cause harm to any person or equipment in the Competition Area.

Penalty: The offending party must bear the relevant responsibility.

R11 After the end of a match, participants must remove their robots from the Competition Area.

Penalty: Verbal Warning If the warning is ineffective, depending on the seriousness of the situation, the highest penalty that can be given to the offending team is disqualification.

### **5.2.1.2 Pit Crew Members**

R12 Only 6 participants of each team are allowed to enter the Competition Area.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 3 Warning.

R13 Pit Crew Members must meet identity requirements.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 3 Warning.

R14 The Captain must wear an armband which must not be covered.

Penalty: Verbal Warning.

R15 Without the permission of the referee, Pit Crew Members in the Competition Area are not allowed to communicate in any way or exchange items with anyone outside the Competition Area.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 3 Warning.

R16 During the final 30 seconds of the Two-Minute Setup Period or the final 20 seconds of a Team Technical Timeout, the Pit Crew Members must leave the Battlefield as quickly as possible and return to the designated area outside the Battlefield.

Penalty: Verbal Warning If the warning is ineffective, the offender shall be issued a Level 2 Warning. If the offending team disobeys the penalty, it will be given a Level 3 Warning.

R17 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.

Penalty: Verbal Warning If the warning is ineffective, the offending Pit Crew shall be issued a Level 2 Warning.

### **5.2.1.3 Operator**

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An operator can be substituted after each round.

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R18 The requirements in “Table 1-3 Operator Line-up” must be satisfied.

Penalty: The offending team shall be issued a Level 3 Warning.

R19 The use of one’s own computers is prohibited in the Operator’s Room.

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Penalty: The offending team shall be issued a Level 3 Warning.

R20 Operators must remain in the relevant Operator's Room during the Referee System Initialization Period and the Match, to operate the relevant computers, and must remain in position after a match has started, unless otherwise permitted by the referee.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 2 Warning. If the offending team disobeys the penalty, it will be given a Level 3 Warning.

R21 During the competition, the Operator must wear the official headphones (except in the case of a failure of the official equipment).

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 2 Warning. If the offending team disobeys the penalty, it will be given a Level 3 Warning.

R22 During the competition and except with the permission of the referee, the Pilot can only move in the Pilot Operation Zone and other Pit Crew Members apart from the Operator must stay in the spectators' zone in the Competition Area.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 2 Warning. If the offending team disobeys the penalty, it will be given a Level 3 Warning.

R23 The Pilots are not allowed to touch any Ground Robot or projectile container outside their own Supplier Zones at any time after the competition begins.

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Except for the following situations:



1. The Ground Robot's Armor Module bounces off
2. The Ground Robot's clip falls off

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Penalty: Verbal Warning If the warning is ineffective, the highest penalty that can be given to the offending participant is a Level 2 Warning.

## 5.2.2 Robots

### 5.2.2.1 General

R24 Teams must design, assemble and commission their robots by themselves, and may not borrow the robots of other teams for the competition, or copy the program codes of other teams.

Penalty: The violation once verified will be regarded as cheating and both teams will be disqualified.



The organizing committee will conduct spot checks on the program codes of participating teams to look for duplicates.

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R25 Robots entering a match must pass Pre-match Inspection.

Penalty: The offending team shall be issued a Level 3 Warning.

R26 Participating robots must satisfy the requirements in the [RoboMaster 2022 Youth Championship Robot Building Specifications Manual](#).

Penalty: If the robot is found to have violated the robot building specifications before or during the competition, the referee will issue the offending robot with a maximum Level 2 Warning depending on the seriousness of the violation. If the robot buildings specifications are found to be violated after the competition, the referee will order a rematch after confirming the violation. During the rematch, offending robots are not allowed to compete, and no substitute robots may be used.

R27 In the first round of the match, each participating team must meet the minimum lineup requirement.

Penalty: The offending team shall be issued a Level 3 Warning.

R28 Robots must be attached with their corresponding number stickers that meet the specifications.

Penalty: Before the start of the competition, the offending robot is not allowed to enter the Stage. During the competition, the highest penalty that can be given to the offending robot is a Level 2 Warning, depending on the seriousness of the situation.

R29 Robots are not allowed to leave when waiting in the Staging Area.

Penalty: Verbal Warning If the warning is ineffective, the highest penalty that can be given to the offending robot is a Level 2 Warning.

R30 Robots must not exhibit any safety issues including but not limited to short circuits and crashing. If safety issues are present or have arisen, the relevant personnel must operate the robot in accordance with the referee's instructions.

Penalty: The Pit Crew need to resolve the safety issue as required by the referee before the start of a match, otherwise the offending robot will not be allowed onto the Battlefield. Verbal Warning given during the competition. If the warning is ineffective, the offending member will be given a Level 2 warning. If the potential safety hazard is serious, the Head Referee will handle it according to "6Irregularities".

R31 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.

Penalty: The offending robot shall be issued a Level 2 Warning.

R32 No part of any robot may extend beyond the initial area during the Initialization Period.

Penalty: As judged by the team’s subjective intention, the offending robot shall be given a Level 1 or 2 Warning after the competition starts.

R33 During the competition, apart from projectile supply reloads and rescues, robots are not allowed to cover their Armor Modules through transformation or sticking to one another to avoid attacks by other robots.

Penalty: The offending team is issued a Level X Warning based on the blocking duration of T second(s).

Table 5-2 Penalties for Blocking

T Second(s)	Level X Warning
$T \leq 10$	1
$T > 10$	2

R34 After a robot is defeated, none of its propulsion systems is allowed to run autonomously.



If a robot uses an unofficial propulsion system, the robot should have the function of judging whether it is defeated because the Referee System cannot control the unofficial power system. This is to ensure that no propulsion system of the robot can run autonomously after the robot’s defeat.

Penalty: The offending team is issued a Level X Warning depending on the defeated robot’s movement duration of T second(s). If the defeated robot’s movement duration exceeds 30 seconds, the highest penalty the Head Referee can issue is Level 3 Warning.

Table 5-3 Penalties for Propulsion System

T Second(s)	Level X Warning
$T \leq 10$	1
$T > 10$	2

### 5.2.2.2 Ground Robots

R35 During the Two-Minute Setup Period, Ground Robots in the Battlefield are not allowed to leave their team’s Starting Zone.

Penalty: Verbal Warning If the warning is ineffective, the offending robot shall be issued a Level 2 Warning.

R36 During the competition, no robot of the offending team is allowed to attack its enemy’s Aerial.

Penalty: The offending robot shall be issued a Level 2 Warning.

R37 During a match, Standards are not allowed to launch projectiles out of the Battlefield deliberately.

Penalty: Verbal Warning If the warning is ineffective, the offending robot shall be issued a Level 2 Warning.

R38 No Engineer Robots may enter the Engineer Robot Penalty Zone.

Penalty: If an Engineer Robot enters the Engineer Robot Penalty Zone, it shall be issued a Level X Warning depending on the robot’s stay time of T second(s).

Table 5-4 Penalties for Staying

T Second(s)	Level X Warning
$T \leq 10$	1
$T > 10$	2

### 5.2.2.3 Aerial Robot

R39 During the match, an Aerial Robot’s flying altitude must not exceed 1500 mm, and its flight range must not extend beyond the Flight Zone.

Penalty: Verbal Warning If the warning is ineffective, the offending team shall be issued a Level 2 Warning.

R40 The Aerial Robots of both teams shall not actively collide with those of the other team during the competition, otherwise the offending Aerial Robots will deemed as having violated the rules. If such a collision has occurred and the offending party cannot be determined, the Aerial Robot of one team will be deemed the violating party if the collision occurred in the Safe Flight Zone of the other team, or no penalty will be imposed if the collision occurred outside a Safe Flight Zone.

Table 5-5 Penalties for Collision

Violation Level	Description
Level 1	The other team’s robot shakes lightly but does not fall or suffer any damage
Level 2	The other team’s robot falls or suffers damage

## 5.2.3 Interaction

### 5.2.3.1 Between Robots

R41 Aerial Robots must not interfere with the normal operation of Ground Robots during flight.

Penalty: The offending team shall be issued a Level 1 Warning.

R42 The Engineer Robot of one team is not allowed to interfere with the other team’s Engineer Robot when it is procuring projectile containers.

Penalty: Depending on the degree of interference, the violator shall be given a Level 1 or 2 Warning. The Engineer Robots of two teams competing to possess a projectile container is not considered an interference.

Table 5-6 Penalties for Interference

Violation Level	Description
Level 1	Minor interference, including but not limited to minor collision and short-duration blocking.
Level 2	Severe interference, including but not limited to repeated collisions and long-duration blocking.

R43 A robot may not use any of its structures to strike an enemy robot in collision, regardless of whether the enemy robots are alive or destroyed.

A collision is not considered a violation in the following situations:



- Unintentional minor collision during confrontation
- Slowly pushing away a defeated or ejected robot that is in the way
- Minor collision when trying to bypass an enemy robot that is blocking your robot against the rules

Penalty: The offending team or robot is issued a Level 1 or 2 Warning, depending on the subjective intention and the degree of collision.

Table 5-7 Penalties for Collision

Violation Level	Description
Level 1	Actively causing frontal high-speed collision, active pushing causing the other team’s robot to move, or impeding the normal movement of the other team’s robot
Level 2	Actively causing high-speed and repeated frontal collision, active pushing causing the other team’s robot to move across a longer distance, or impeding the normal movement of the other team’s robot for a long period of time

R44 In the automatic movement Stage, no robot may interfere with an enemy robot that is moving along the guiding lines.

Penalty: The offending robot is issued a Level 1 or 2 Warning, depending on the degree of interference.

Table 5-8 Penalties for Interference

<b>Violation Level</b>	<b>Description</b>
<b>Level 1</b>	Actively causing light collision, without affecting the normal movement of the other team's robot
<b>Level 2</b>	Actively pushing the other team's robot causing it to deviate from the guiding lines, obstructing the other team's robot and affecting its movement, or blocking the guiding lines by any means which prevents the other team's robot's automatic movement based on its preset programs.

R45 A robot must not stick itself to any enemy robot through active interference, blocking or collision.



It is not a violation of the rules if the robots of two teams become stuck to one another unintentionally.

Penalty: From the moment the robots become stuck together, a warning shall be issued at regular intervals until the robots are separated or the warning is upgraded to Level 3.

Table 5-9 Penalties for Sticking Together

<b>The Tth second</b>	<b>Level X Warning</b>
<b>T = 20</b>	1
<b>T = 40</b>	1
<b>T = 60</b>	2
<b>T = 90</b>	3

### 5.2.3.2 Robots and Battlefield Components

R46 Robots are not allowed to enter the Supplier Penalty Zone.

Penalty: Depending on the stay duration of T second(s) and the degree of blocking, the offending team is issued a Level X Warning.

Table 5-10 Penalties for Stay, Contact and Blocking

<b>T Second(s)</b>	<b>Level X Warning</b>
<b>T ≤ 10</b>	1
<b>10 &lt; T ≤ 30</b>	2
<b>T &gt; 30</b>	3

R47 No robot may block an enemy robot from entering or leaving the Supplier Zone outside the Supplier Penalty

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Zone.

Penalty: Verbal Warning If the warning is ineffective, the highest penalty that can be given is a Level 2 Warning depending on the degree of impact.

R48 During any match, participating robots may only use projectiles supplied by the RMOC.

Penalty: A Verbal Warning. If the warning is ineffective, the highest penalty that can be given is a Level 3 Warning.

R49 No robot may touch and leave viscous substances on any field component.

Penalty: The offending robot shall be issued a Level 2 Warning.

R50 During the competition, no robot may cause any active damage to the core components of the Competition Area with any of its mechanisms.

Penalty: After the failure is confirmed, the match will end and the offending team shall be issued a Level 3 Warning.

R51 During the competition, robots must not actively collide with the Resource Island.

Penalty: The offending robot shall be issued a Level 1 Warning.

R52 Standard Robots can only obtain projectiles from the official projectile containers, and are prohibited from acquiring projectiles through forgery, modifying projectile container stickers or other irregular means.

Penalty: Once verified, it will be deemed as cheating and the offending team will be disqualified.

R53 An Engineer only has one grabbing mechanism.

Penalty: The offending robot shall be issued a Level 2 Warning.

R54 The Projectile-Grabbing Mechanism of an Engineer Robot is not allowed to hold multiple projectile containers of the same group simultaneously, but the Engineer Robot can store multiple projectile containers. The Storage Mechanism and the Projectile-Grabbing Mechanism must not be of the same structure.



Projectile-Grabbing Mechanism: A device for taking projectile containers directly out of the projectile container grooves of the Resource Island.

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Penalty: The offending robot shall be issued a Level 2 Warning.

## 5.3 Serious Violations

The following actions are considered serious violations of rules. For a serious violation, whether it is the individual behavior of a participant or the collective behavior of a team, the highest penalty that can be given is the disqualification of the offending member or team.



- Disqualify the participant from the competition Disqualify the participant from the current and subsequent matches in this season, but the qualification of his team is not affected. The offending participant must leave the Competition Area immediately and is disqualified from any awards for this season.
- Disqualify the participating team from the competition The offending team is disqualified from the current competition season and awards, but its results so far in this season will be maintained as a basis for other teams to be selected for the next round.

Table 5-11 Categories of Serious Violations

Rule	Type
1.	Violating rules mentioned in this chapter and refusing to accept penalties, for example a Pit Crew Member interfering with the regular work process of a referee.
2.	Tampering with or damaging the Referee System, or interfering with any detecting function of the Referee System through technical means.
3.	Installing explosives or other prohibited materials on robots
4.	A situation has occurred in the Competition Area that violates Pre-Match Inspection requirements
5.	A team member deliberately damaging the opponent’s robots, Battlefield Components and related equipment.
6.	Causing delays deliberately or refusing to immediately leave the Competition Area after a match has ended, thereby disrupting the schedule of the competition
7.	A team member using robots to collide into or attack other people deliberately, putting themselves and other people at risk of injury
8.	Serious verbal or physical conflicts between team members and the staff of the RMOC, other participating teams, audience, etc.
9.	A team member’s refusal to cooperate, deliberate delay or provision of false materials and information during the RMCO’s handling of an appeal request.

Rule	Type
10.	In respect of any violation of local laws and regulations occurring inside the Competition Area, Audience Area, dormitories or other relevant competition zones during the competition, the RMOC, apart from issuing the most severe penalty of “disqualification”, will fully cooperate with the relevant authorities to pursue appropriate legal actions against the offenders.
11.	Any other violation that seriously affects the progress of the matches, goes against the spirit of fair competition, or is deemed as serious in nature by the Chief Referee.

## 6. Irregularities



There may be some degree of delay in the referee's issuance of a manual penalty and handling of an irregularity. If the competition's outcome has been seriously affected, the Chief Referee will determine the final penalty based on the actual circumstances.

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:

- In the event of a robot safety hazard or an anomaly on the Battlefield, such as battery deflagration, power outage in the stadium, or field personnel conflicts, the Head Referee will notify the Operators of both teams after discovering and confirming the emergency, and eject all robots through the Referee System. The result of this round will be invalidated. The match will restart after the safety hazard or anomaly has been eliminated.
- If non-key Battlefield Components, such as ground lighting and Base lighting, are damaged during a match, which do not affect the fairness of the match, the match will proceed as usual.
- If key Battlefield Components have logical or structural faults, for example the network anomaly causes robots to go offline and no buff is gained after a Power Rune is hit, the referee will solve the problem manually through the Referee System. If the problem cannot be solved manually, the referee will notify the operators of both teams and eject all robots. The round of the match is ended immediately and its results are invalidated. The round will restart after the issue has been solved.
- During a match, if the fairness of a match has been affected by the malfunction or structural damage of a key Battlefield Component, and the Chief Referee did not confirm the situation and end the competition in time, causing a round that should have been ended to continue and thereby producing a winner, a rematch will be required and the results of the round will be invalidated, after an appeal has been made or the Chief Referee has made a determination to that effect after the end of the round.
- During the competition, if the key functions of the robot are working abnormally, and the anomaly is caused by the mechanical structure and electrical system of the robot or programs developed by the participants themselves, no rematch will be held. If the anomaly is caused by the logic of the official system software, a rematch may be held after the anomaly is confirmed by the referee. Key functional anomalies include but are not limited to: The robot cannot move or launch projectiles, and the Armor Module cannot respond to projectile strikes.
- During the competition, if the Aerial Robot can take off again after an accidental fall, the Pilot is allowed to fly the Aerial Robot again. If it cannot take off normally, the Aerial Robot can be transported back to the Landing Pad by the Ground Robot of its own team and can take off again on the Landing Pad after the referee confirms that the Aerial Robot has no potential safety hazards. If the Ground Robot of its team cannot transport the Aerial Robot back to the Landing Pad, the damage to the Aerial Robot during the competition shall be

borne by its own team.

- During the match, if the video transmitter lags for more than 20 seconds, and no obvious damage has been inflicted on the exterior of the Referee System, the referee will rule the situation as an official equipment failure and may order a rematch, provided the installation of the Referee System does not violate the specifications.
- If a serious violation has taken place that clearly warrants a Level 3 Warning but the Head Referee has not confirmed the situation and has not issued a Level 3 Warning in a timely manner, the original match result will be invalidated once confirmed by the Head Referee or an appeal has been allowed after the match, and the offending team will be issued a Level 3 Warning.
- If an issue has occurred during the competition that affects the fairness of the competition, the Chief Referee will make a determination according to the actual situation.

## 7. Appeals



- Penalty for violations, except for a Level-3 Warning, cannot be used as grounds of appeal.
- The failure of a non-referee system of a participating robot cannot be used as grounds for appeal.

Every team has one appeal opportunity during the Regional Competition and one during the Grand Final. Appeal opportunities cannot be used cumulatively across competitions. 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 RMOC will no longer accept any appeal from the team. When processing an appeal, an Arbitration Commission will be formed by the Chief Referee and heads of the RMOC. The Arbitration Commission has the final right of interpretation on all appeal decisions.

If a rematch has occurred for a round due to an arbitration decision requiring a “Rematch between Both Teams”, both teams can appeal again after the rematch. In this scenario, if the original appealing team appeals again (known as a “continued appeal”), the team’s opportunity to appeal will be exhausted regardless of whether the appeal is successful. As a continued appeal will cause serious delays to the competition schedule, the continued appeal must be initiated together by both the team Captain and the Supervisor within five minutes after the match ends (both signing the Appeal Form). The process for a continued appeal will also be reduced. The time for submission of evidence and materials is shortened to within 20 minutes of making the appeal. The RMOC will announce the outcome of the appeal on the Appeal Form within 60 minutes of the continued appeal being made.

### 7.1 Appeal Process

Teams lodging an appeal must follow the procedure below:

1. Within five minutes after the end of each match, a Captain who wishes to file an appeal should submit a request for appeal to the Referee Area, fill out the Appeal Form and sign for confirmation. If the reason for the appeal is related to the robots of any team in the competition, the appealing party needs to propose that the relevant robots be isolated and tested, which will be implemented after being confirmed by the Arbitration Commission. By signing, the appealing party confirms that it is initiating the appeal process, and the Appeal Form cannot be modified after it has been signed. Any appeal made 5 minutes after a match has ended will be deemed invalid. No appeals are allowed before and during the competition.
2. The Captains of both teams will be brought by the staff to the Arbitration Room. The Arbitration Commission will determine whether the appeal request can be accepted.
3. If either team needs to collect evidence or defense materials, the period of time granted is 30 minutes. The materials collected should be submitted to the Arbitration Commission, which will further communicate with

the members of both team involved in the appeal. If neither side needs to collect evidence or defense materials, proceed to the next step.

4. After the Chief Referee has accepted the appeal request, the staff will invite the Captains of both teams to meet in the Arbitration Room. Only a maximum of two members of either team are allowed in the Arbitration Room, who can include only the team's Captain or supervisor. A supervisor must be present.
5. The Arbitration Commission will make a final decision, and the Captain of both teams will sign the Appeal Form to confirm the decision. Once signed, both teams cannot question the appeal decision any further.

## 7.2 Appeal Validity

Teams must file their appeal within the validity period. Below are the appeal validity periods for different phases:

- Validity period for appeal requests: Appeals must be made within five minutes after the end of a match, and the time recorded on the Appeal Form shall prevail. The Arbitration Commission will not accept any appeal request that has exceeded the validity period.
- Validity period for both teams to meet at the Arbitration Room: Within 10 minutes of being notified by the Arbitration Commission. If a team is absent during the validity period when both teams meet in the Arbitration Room, the absent team is deemed to have given up its right to the arbitration. If more than three members of a team are present in the Arbitration Room or the attendees do not meet the specified identity requirements, the team is also deemed to have given up its right to the arbitration.
- Validity period for submission of evidence or defense materials: Within 30 minutes after an appeal is made. The Arbitration Commission will not accept any new materials beyond this time limit.

## 7.3 Appeal Materials

Appeal materials submitted by teams must follow the below specifications:

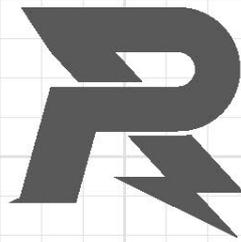
- Material type: Only materials stored on a USB flash drive and the robots themselves will be accepted as appeal materials. Materials submitted in other forms will not be accepted by the Arbitration Commission.
- USB flash drives: The edited video (the video materials should be prepared by the team itself - the organizing committee will not provide any videos in order to stay impartial) and the text files for the appeal should be placed according to the directory.
- Material format: No video can exceed one minute in length or 500MB in size. The name of the video must indicate the specific Round of the match and the time it was taken. Videos should be compatible with the latest version of Windows Media Player, photos must be in JPG format, and text documents must be in MS Word format and not exceed 1,000 words in length.

- Material naming: The file name of each video and photo must be within 30 Chinese characters.
- Text requirements: One text file can only correspond to one video or a photo, which must be indicated in the text. Text files only need to explain the violations reflected in the corresponding materials.
- Robot evidence: The Arbitration Committee has the authority to isolate the relevant robots of both teams after an appeal has been made. These robots will be isolated for no more than two hours and will be returned to the teams at the latest when the arbitration decision is announced.

## 7.4 Appeal Decision

The Arbitration Committee will provide its final arbitration decision on the Appeal Form, which the Captains of both team must sign within 30 minutes after the decision has been announced. If a team does not sign the Appeal Form, it is deemed to have accepted the appeal decision. The arbitration decisions that can be made include: Maintaining the original match results; a forfeiture issued against the respondent; a rematch between both teams. Neither team may appeal against the final decision of the Arbitration Committee.

If the Arbitration Committee requires both teams to hold a rematch, the Organizing Committee will inform both teams of the rematch time when the arbitration decision is announced. If both teams refuse to hold a rematch, the appeal is deemed invalidated and the original match results are maintained, with both teams retaining their rights to appeal. If only one team refuses the rematch, the refusing team is deemed to have forfeited and lost the round.



**E-mail:** [robomasteryouth@dji.com](mailto:robomasteryouth@dji.com)

**Forum:** [bbs.robomaster.com](http://bbs.robomaster.com)

**Website:** [www.robomaster.com](http://www.robomaster.com)

**Tel:** +86 (0)755 36383255 (GTC+8, 10:30AM-7:30PM, Monday to Friday)

**Address:** Room 202, Floor 2, Integrated Circuit Design & Application Industrial Park, No. 1089, Chaguang Road,  
Xili County, Nanshan District, Shenzhen City, Guangdong Province, China