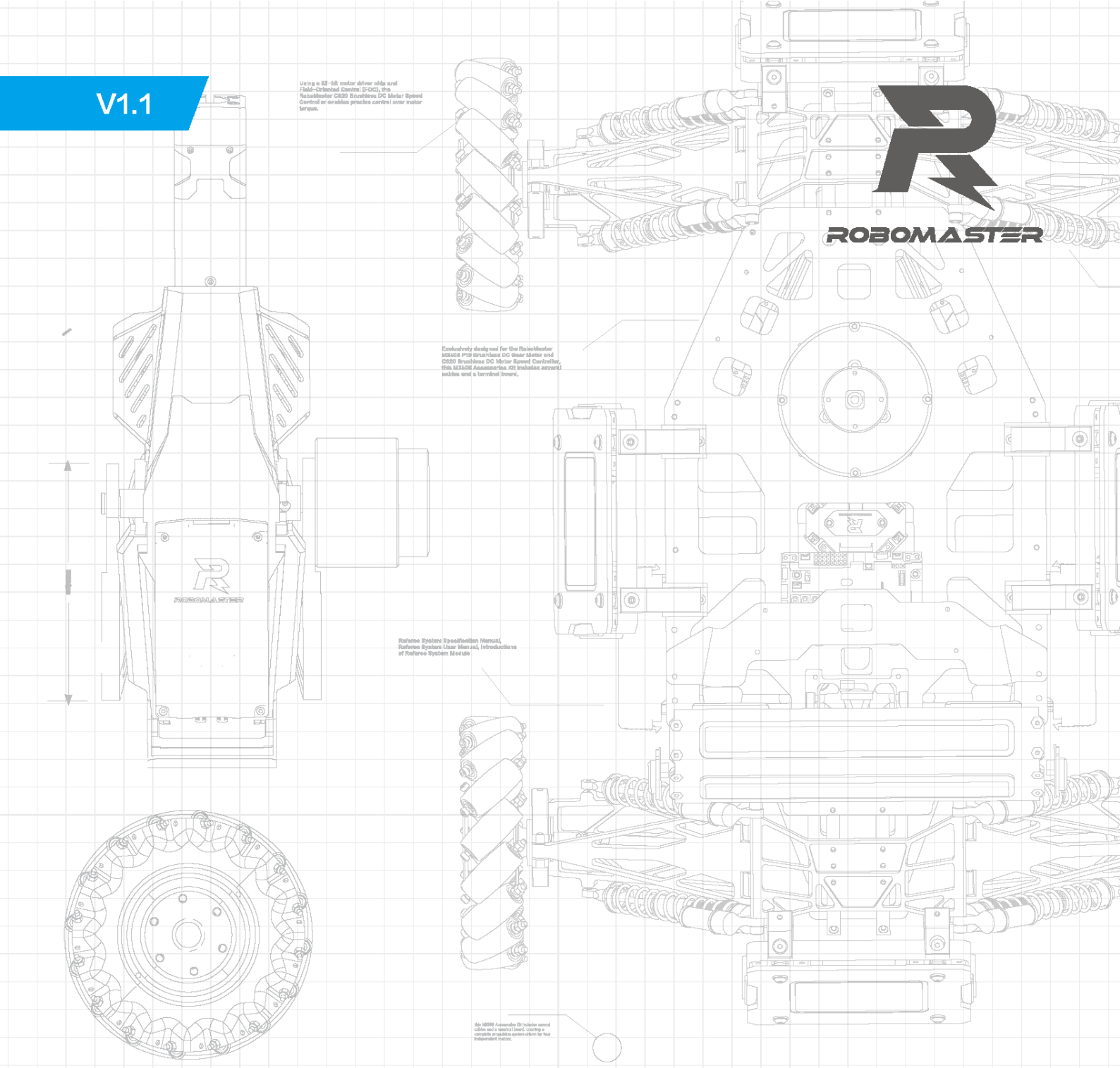
V1.1

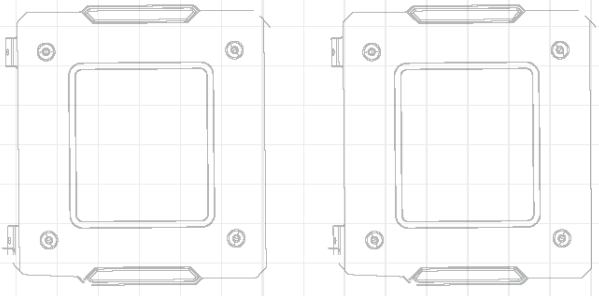


ROBOMASTER 2020
TECHNICAL CHALLENGE

RULES MANUAL

Prepared by the *RoboMaster* Organizing Committee

Updated on **January,** 2020



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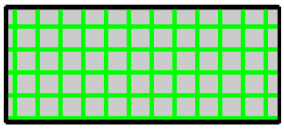
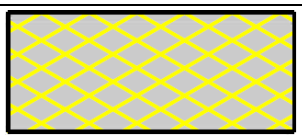
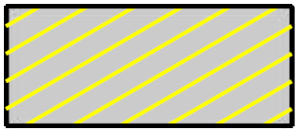
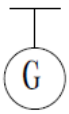
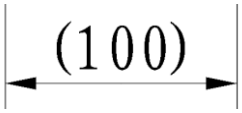
Relevant suggestions for open source materials can be found in this link: https://bbs.robomaster.com/thread-7026-1-1.html.

Using this Manual

Legend

Prohibition	Important note	Hints and tips	Definition and reference

Legend for Battlefield Drawings

		
Buff Point for both sides	Buff Point for one side	Penalty Zone for both sides
		
Penalty Zone for one side	The plane on which the Battlefield is located is its lowest plane	Dimensions are for reference only

Release Notes

Date	Version	Changes
2020.1.7	V1.1	1. Update Dart Targeting challenge. 2. Update robot parameters. 3. Add legend for Battlefield drawings and update Battlefield drawings. 4. Update competition mechanisms. 5. Update Penalty System and competition rules.
2019.10.31	V1.0	First Release

Contents

Table Directory

Diagram Directory

1. Introduction

RoboMaster 2020 Technical Challenge (hereinafter referred to as "RM2020 Technical Challenge") has four challenges: Engineer Projectile Obtaining, Standard Racing and Smart Firing, 2V2 Confrontation and Dart Targeting.

1.1 Main Changes to New Competition Season

The following are the new changes made to the RM2020 Technical Challenge compared to RM2019:

Robot

- Cancel Hero
- Add Sentry

Competition Area

- Adjust Battlefield size parameters
- Add new Battlefield Component, Spinning Top

Challenge

- Change Standard Confrontation to 2V2 Confrontation
- Cancel Hero Remote Firing
- Add Dart Targeting

1.2 Robot and Operator

Building specifications for robots can be found in the RoboMaster 2020 Robot Building Specification Manual.

1.2.1 Robot Lineup

The robot lineup for the RM2020 Technical Challenge is as follows:

Table 1-1 Robot Lineup

Challenge	Qty. of Robot to Play	Standby Robot (optional)	Robot Numbering
Engineer Projectile Obtaining	1	Except for Dart Targeting, the total number of standby robots in other challenges should not exceed one As for Dart Targeting, each team can carry four standby darts at most.	Blue 2
Standard Racing and Smart Firing	1		Blue 3
2V2 Confrontation	1-2		• Standard: 3 • Sentry: 7

Challenge	Qty. of Robot to Play	Standby Robot (optional)	Robot Numbering
Dart Targeting	1 (one Dart System consists of four darts)		Red 8

1.2.2 Basic Robot Information

The basic robot information for the RM2020 Technical Challenge is as follows:

Table 1-2 Basic Robot Information

Type	Initial Projectile (round)	Maximum Chassis Power Consumption (W)	Initial HP	Initial Firing Speed Limit (m/s)	Barrel Heat Limit	Barrel Cooling Value per Second	Projectile Launch Speed (round/s)	Initial Position
Engineer	-	No limits	500	-	-	-	-	Starting Zone
Standard	2V2 Confrontation: 100 Standard Racing and Smart Firing: 150	80	200	30	240	40	Negatively correlated to initial velocity – refer to 3.1.2 Barrel Heat Exceeds the Limit and Cooling	Starting Zone
Sentry	2V2 Confrontation: 300	30	600	30	300	50	Negatively correlated to initial velocity – refer to 3.1.2 Barrel Heat Exceeds the Limit and Cooling	Sentry Rail
Dart System	-	-	-	18	-	-	-	Dart Launching Station

- During a match, when Standard's HP is less than 20% of Maximum HP, it gains a double barrel heat cooling buff.
- Standard in the Technical Challenge is allowed to be equipped with only one Launching Mechanism.
- Sentry in the Technical Challenge is recommended to have a magazine capacity of 500 rounds of projectiles, so as to be compatible with the Sentry's initial projectile requirement stated in the Robotics Competition.

- Robot chassis: A mechanism that carries and has mounted a robot propulsion system and its accessories.
- Chassis power consumption: The power propulsion system that enables a robot to move horizontally, excluding the power used for special tasks (e.g., power consumption for functional movements such as moving the upper mechanical structure).
- Initial Firing Speed: The speed detected by relevant modules of Referee System after a projectile or dart has completed its acceleration.

1.2.3 Operator Lineup

The Operator lineup is as follows:

Table 1-3 Operator Lineup

Type	Robot Operated	Full Team Lineup Size
Ground Robot Operator	Standard	1
	Engineer	1
Aerial Gimbal Operator	Dart System	1

Ground Robots: Engineer and Standard, collectively.

2. Operator Room and Projectile

2.1 Operator Room

⚠ Deterioration in performance is unavoidable from prolonged use of equipment.

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

Operator Room is not provided with additional power supply.

2.2 Projectile

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

Table 2-1 Projectile Parameters and Scenarios of Use

Type	Appearance	Color	Size	Weight	Shore Hardness	Material	Scenarios of Use
42mm projectile	Similar to a golf ball	White	42.5 mm ±0.5 mm	41 g ±1 g	90 A	Plastic (TPE)	Engineer Projectile Obtaining
17mm projectile	Spherical	Yellow-green	16.8 mm ±0.2 mm	3.2 g ±0.1 g	90 A	Plastic (TPU)	2V2 Confrontation, Standard Racing and Smart Firing

3. Competition Mechanism

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

Table 3-1 Robot Status

States	Definition
Survive	Robot's HP is not zero.
Defeated	Where a robot's HP drops to zero after its Armor Module has been attacked or hit, it has exceeded its chassis power consumption limit, initial firing speed limit or barrel heat limit, its Referee System module has gone offline, etc.
Ejected	Where a robot is ejected directly by the Referee System due to penalty of Level 4 Warning or the violation score has reached 9 points.
Destroyed	Where a robot attacks the Armor Module of an enemy robot until the latter's HP drops to zero. The destroy of a robot is determined in one of the following two ways: ● Where a robot defeats an enemy robot with a critical hit, it is considered destroyed ● If a robot is attacked by multiple enemy robots within 10 seconds before its destroy or ejection, then the last of the enemy robots to attack the defeated robot will be deemed the destroying robot

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

Table 3-2 Robot Buffs

Type	Definition
Defense Buff	Reduces the damage suffered from a projectile attack or impact. Defense buffs are not applicable to HP deductions caused by penalties, the Referee System going offline, exceeding limits, etc.
Barrel Heat Cooling Buff	Increases the barrel heat cooling rate per second.
HP Recovery Buff	The robot restores its HP by a certain amount each second, until it reaches its Maximum HP.

3.1 HP Deduction Mechanism

The HP of ground robots and Sentry will be deducted in any of the following situations: the Barrel Heat limit, Initial Firing Speed limit or Maximum Chassis Power Consumption of a Launching Mechanism is exceeded; an Armor Module is attacked by a projectile or strike; an important module of the Referee System goes offline; penalty for violation of rules; etc.

The Referee System will round down the HP deduction and keep the integer when calculating the HP.

3.1.1 Initial Firing Speed Exceeds the Limit

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

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

Table 3-3 Penalty Mechanism for Exceeding the Initial Firing Speed Limit

17mm projectile	L%	42mm projectile	M%
$0 < V_1 - V_0 < 5$	10%	**$V_0 < V_1 \leq 1.1 * V_0$**	10%
$5 \leq V_1 - V_0 < 10$	50%	**$1.1 * V_0 < V_1 \leq 1.2 * V_0$**	20%
$10 \leq V_1 - V_0$	100%	**$1.2 * V_0 < V_1$**	50%

3.1.2 Barrel Heat Exceeds the Limit and Cooling

Set the Barrel Heat limit as Q_0, the current barrel heat as Q_1, for each 17mm projectile detected by the Referee System, the current barrel heat Q_1 is increased by 10 (regardless of its initial speed) For each 42mm projectile detected, the current barrel heat Q_1 is increased by 100 (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.

A. and when $Q_1 > Q_0$, the first-person-view (FPV) visibility on the robot Operator's screen is reduced. The FPV will only return to normal when $Q_1 < Q_0$. The FPV for the client is as follows:

Figure 3-1 FPV of Client

B. When $2Q_0 > Q_1 > Q_0$, the deducted HP for every 100 ms = $((Q_1 - Q_0) / 250) / 10$ * Maximum HP. After the HP deduction, the barrel cooling will be calculated.

C. When $Q_1 \geq 2Q_0$, the immediate deducted HP = $(Q_1 - 2Q_0) / 250$ * maximum HP. After deducting HP, set $Q_1 = 2Q_0$.

The below shows the HP deduction and cooling logic when the Barrel Heat limit is exceeded:

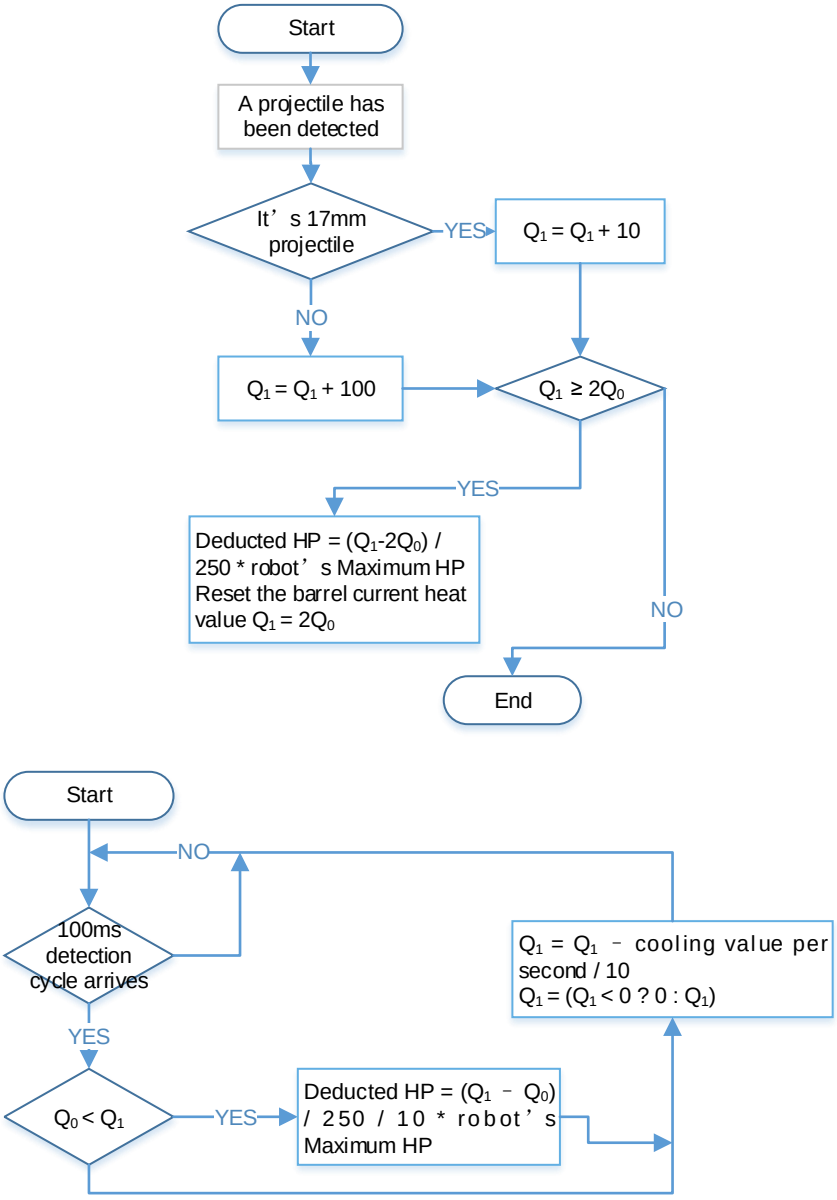


Figure 3-2 (Above) HP Deduction logic and (Below) cooling logic when Barrel Heat limit is exceeded

3.1.3 Chassis Power Consumption Exceeds the Limit

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

The buffer energy (Z) of Standard is 60J, the buffer energy (Z) of Sentry is 200J.

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

Excess Percentage: K = (Pr - Pl) / Pl * 100%, where Pr is the instantaneous chassis power consumption output and Pl is the power consumption limit.

Table 3-4 Penalty Mechanism for Chassis Power Consumption Exceeds the Limit

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

Standard:

After the exhaustion of buffer energy, when the Chassis Power Consumption of Standard exceeds the limit, in each detection cycle the deducted HP = Maximum HP * N% * 0.1.

The logic graph for chassis power consumption detection and HP deductions for Standard is shown below:

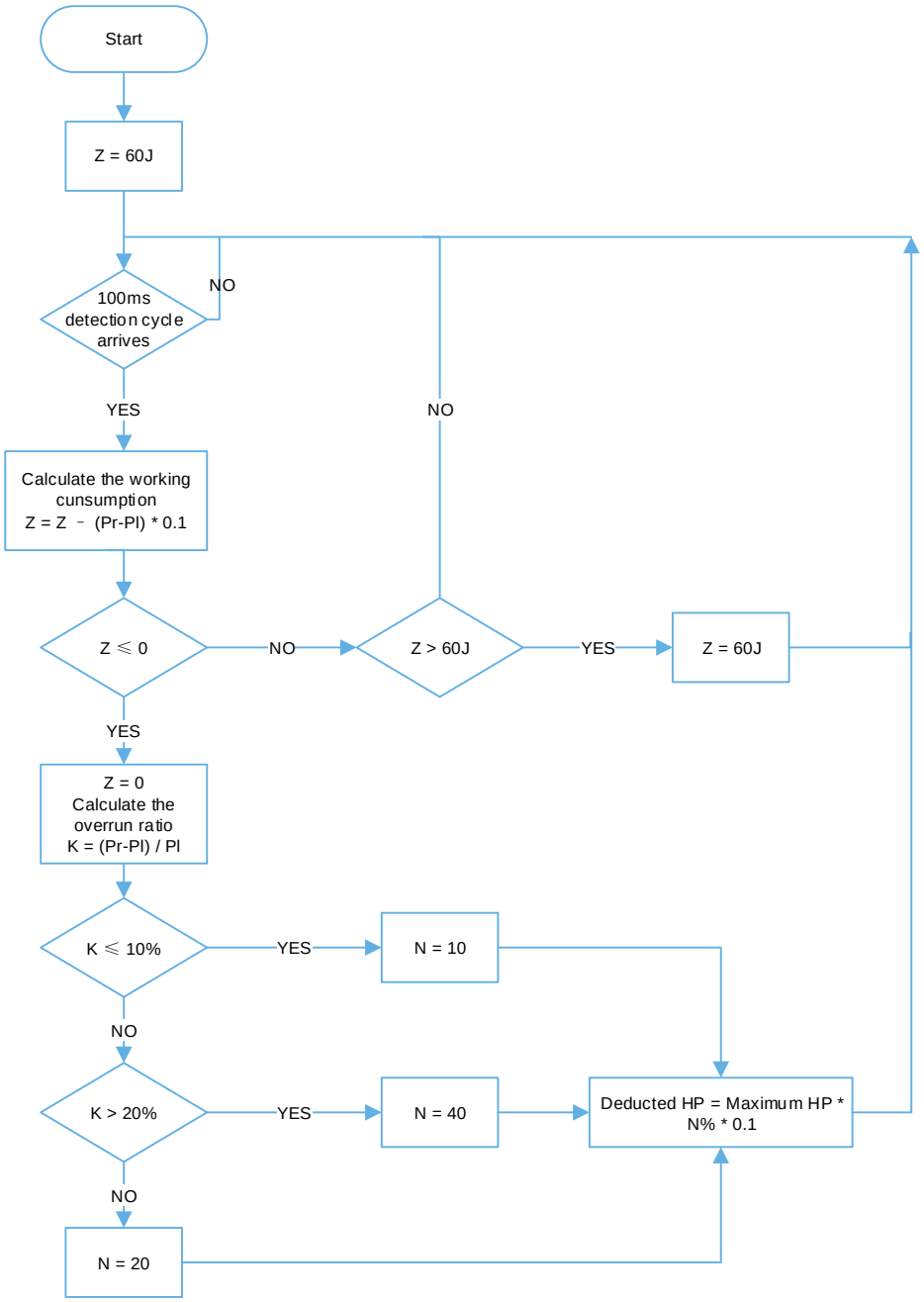


Figure 3-3 Chassis Power Consumption Detection and HP Deduction Logic of Standard

Sentry:

After the exhaustion of buffer energy, when the Chassis Power Consumption of Sentry exceeds the limit, its chassis will be powered off.

The logic graph for chassis power consumption detection of Sentry and chassis power-off is shown below:

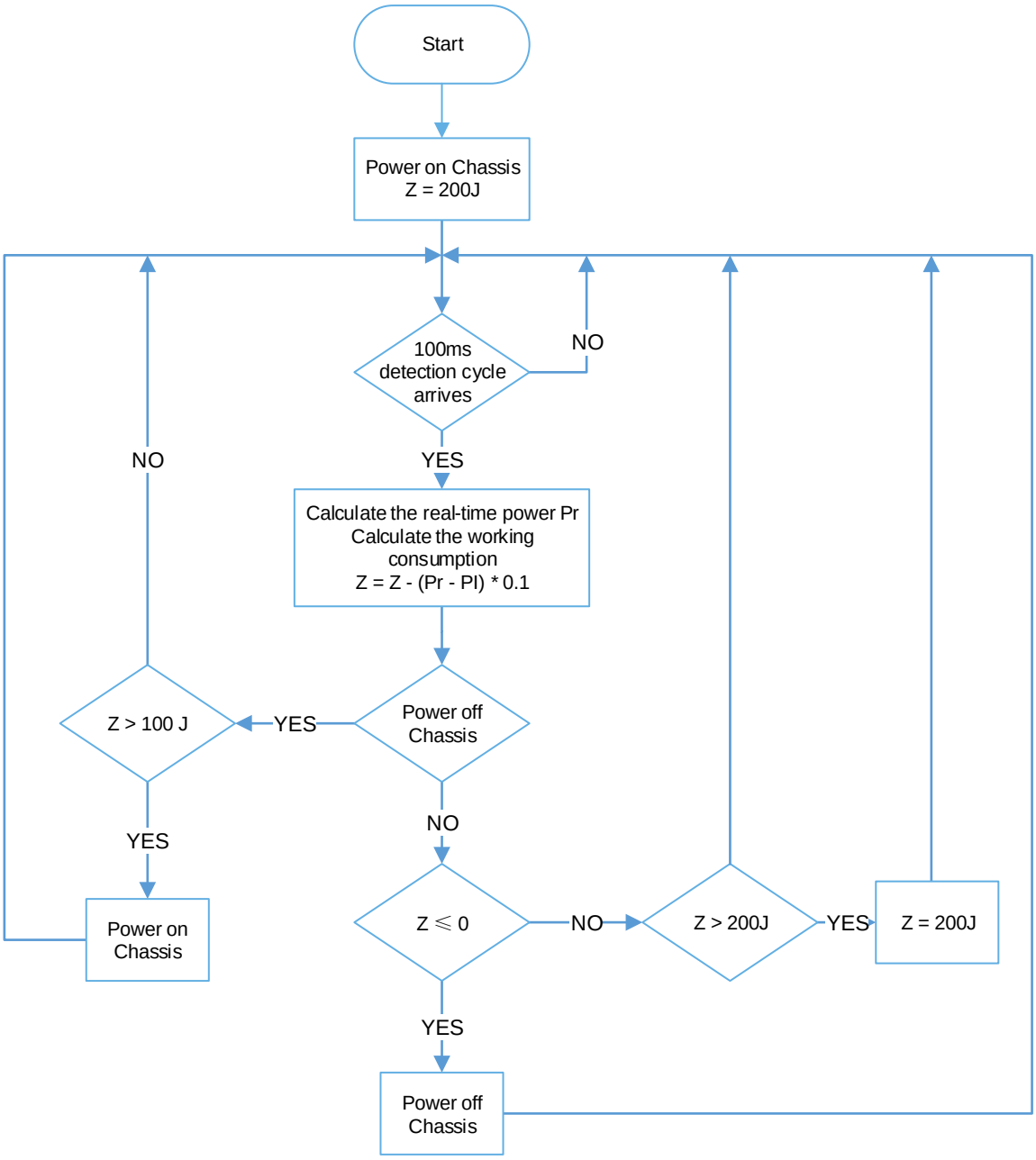


Figure 3-4 Chassis Power Consumption Detection and Chassis Power-off Logic of Sentry

3.1.4 Attack Damage

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

A robot is only allowed to inflict damage on the enemy unit using projectiles and Darts.

An Armor Module detects projectile attacks using the pressure sensor combined with the Armor's vibration frequency. A Dart Target detects dart attacks using the Armor Module combined with the phototube.

The smallest detection interval for an Armor Module is 50 ms.

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

Table 3-5 An Armor Module's detection speed for projectile

Armor Module	17mm projectile
Large Armor Module, Small Armor Module	Not less than 12 m/s
Triangular Armor Module	Not detected

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

Below are HP deductions in situations of no buff:

Table 3-6 HP deduction Mechanism for Attack Damage

Damage Type	HP Damage Value
17mm projectile	Armor Module: 10
Collision	2
Dart	1/2 of the Maximum HP of Base or Outpost

3.1.5 Referee System Going Offline

According to the latest version of the RoboMaster 2020 Robot Building Specification 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 2Hz. If important Referee System modules such as a Speed Monitor Module, Positioning System Module or Armor Module goes offline due to design or structural problems, then the HP of the corresponding ground robots and Sentry will be deducted.

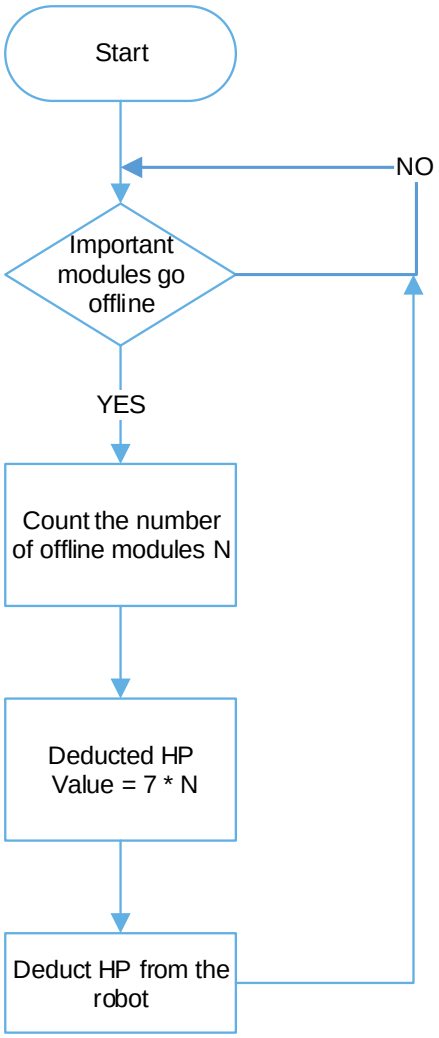


Figure 3-5 HP Deduction Mechanism for Important Referee System Modules Going Offline

3.2 HP Recovery and Revive Mechanism

HP Recovery Mechanism: If an RFID Interaction Module has been detected in one's own Restoration Zone, the robot will recover 5% of its Maximum HP per second until the Maximum HP is reached.

Revive Mechanism: Standard can be revived on any location in the Battlefield. After it is revived, it will maintain its Level before it was defeated, and it will recover its HP to 50% of the Maximum HP. A revived robot will gain a 100% defense buff lasting for 5 seconds.

Time Required for Revive: If defeated for the first time, Standard needs to wait for 10 seconds before it can be revived. For every subsequent revival, the waiting time for Standard will increase by 5 seconds each time.

3.3 Relationships between Sentry and Base

Below shows the relationship between Sentry and Base in the 2V2 Confrontation challenge:

- **If Sentry is playing:** When Sentry is destroyed, the team's Base 60% defense will be eliminated.
- **If Sentry is not playing:** Two minutes into the match, the Base 60% defense will be eliminated.

3.4 HP Gain Mechanism for Sentry

Sentry will receive HP Gain, which is calculated in real-time, from attacking ground robots of the enemy side. HP Gain for Sentry = HP Deduction by Sentry * 0.2.

3.5 Logic of Mechanism Overlap

When a robot gains more than one buffs of the same type, the maximum buff effect will be recorded. Buffs include attack, defense, HP recovery, and barrel heat cooling.

4. Challenge

The error margin for the dimensions of all battlefield components described in the document is ±5%. The dimension parameter unit is mm.

Below shows the pre-match preparation period and competition time of a single round:

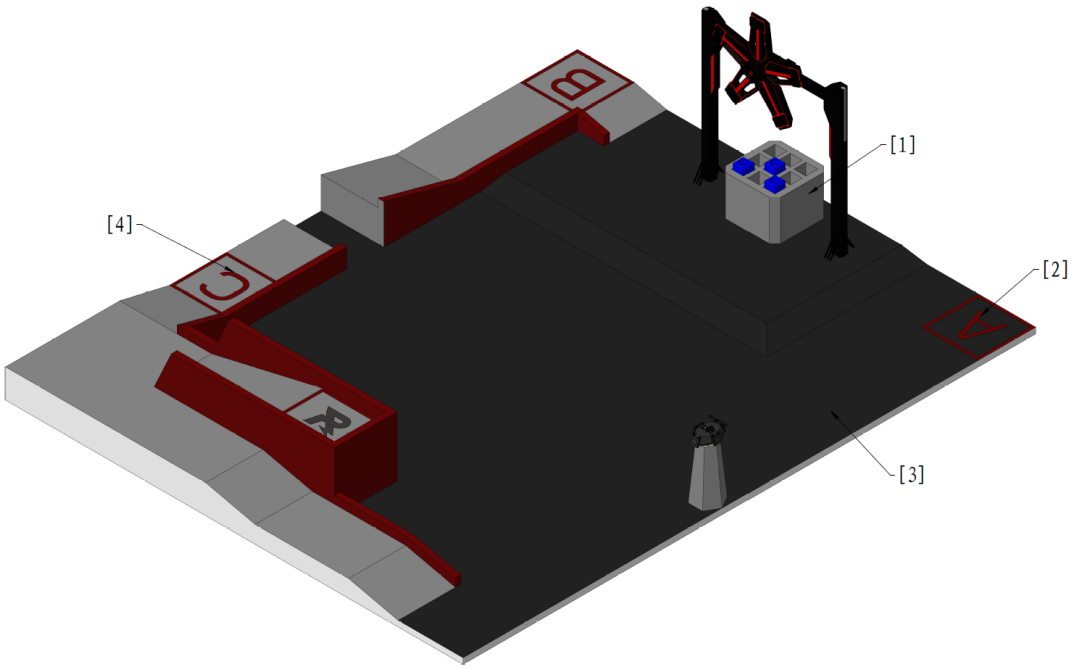
Table 4-1 Challenge Specification

Challenge	Pre-Match Preparation (min)	Time for a Round (min)
Engineer Projectile Obtaining	1	2
Standard Racing and Smart Firing	2	3
2V2 Confrontation	2	5
Dart Targeting	2	1

4.1 Engineer Projectile Obtaining

The Engineer Projectile Obtaining challenge and the Standard Racing and Smart Firing challenge share the same Battlefield.

4.1.1 Battlefield



[1] Resource Island [2] Starting Zone (Zone A) [3] Litchi texture rubber [4] Zone C

Figure 4-1 Engineer Projectile Obtaining Battlefield

4.1.1.1 Resource Island

The Resource Island includes Projectile Depot and Power Rune. In the “Engineer Projectile Obtaining” challenge, the Engineer needs to obtain Projectile Containers at the Resource Island.

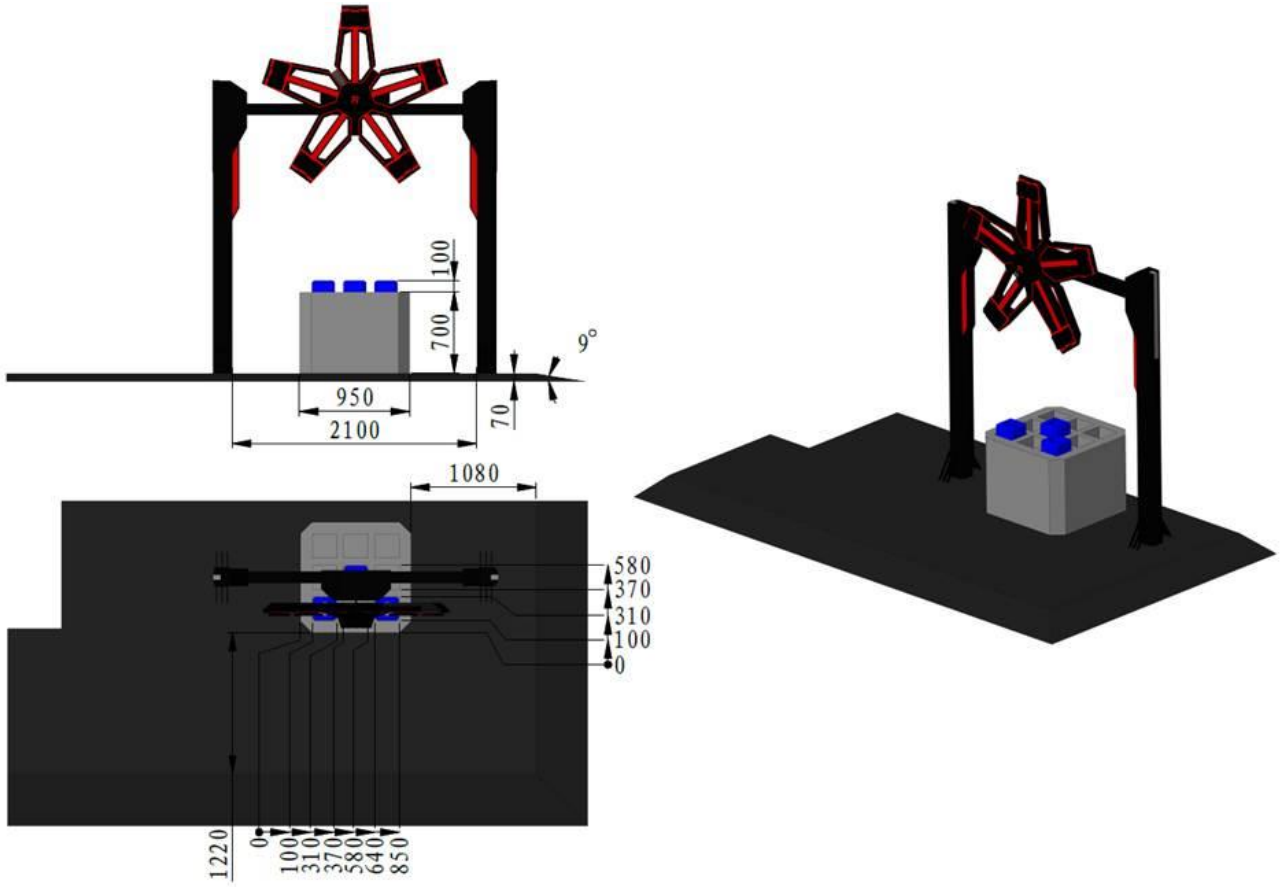


Figure 4-2 Resource Island

4.1.1.2 Projectile Depot

The Resource Island is provided with nine fixed-position Projectile Container grooves, which holds full Projectile Containers.

In the Engineer Projectile Obtaining challenge, three Projectile Containers are placed on the Resource Island. For the position of Projectile Containers, refer to Figure 4-2. In each of Projectile Container, there are twenty rounds of 42mm projectiles. Engineer can move or take away them to obtain projectiles.

Projectile Container

The graphics on the outside of Projectile Containers will be changed and updated subsequently.

Projectile containers are 200 x 200 x 200 mm in size. Their six faces are chamfered, and they are made out of EVA

materials. The top surface has a hole with a diameter of 115 mm. The hole depths of the Projectile Containers on the Resource Island is 150 mm.

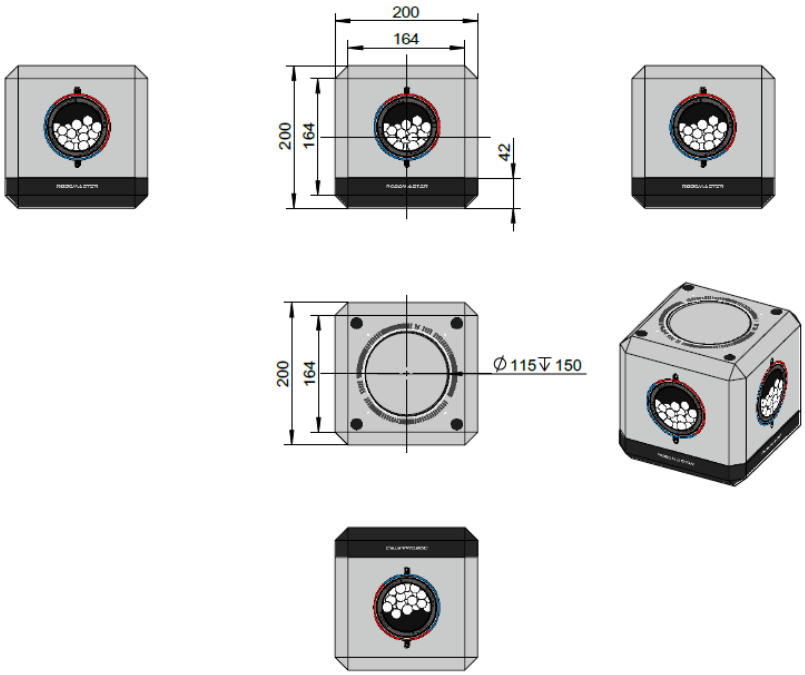


Figure 4-3 Projectile Containers of the Resource Island

4.1.2 Rules

4.1.2.1 Competition Rule

At the beginning of the competition, Engineer leaves the Zone A to retrieve projectiles in the Projectile Containers. After retrieving projectiles, Engineer needs to move to the Zone C to complete the challenge.

4.1.2.2 Scoring Rule

Engineer moves to Zone C to count the quantity of projectiles. It needs to put the obtained projectiles into a storage box held by the staff. Projectile needs to be obtained naturally from the projectile interacting mechanism of Engineer. One projectile gains five points.

If projectiles in the Projectile Containers on the Resource Island are all taken, and the game time is not over when Engineer moves to Zone C, one point will be added for each remaining second. The final score will be zero if Engineer fails to move to Zone C.

4.1.2.3 Ranking Rule

Below is the team ranking rule in Engineer Projectile Obtaining:

1. Each team can initiate two challenges and take the highest total score of the two challenges as the final score. All teams will be ranked from high to low based on their total scores.
2. If the total scores of several teams are the same, the teams will be ranked based on the weight oftheir robots, with the lightest ranking higher.

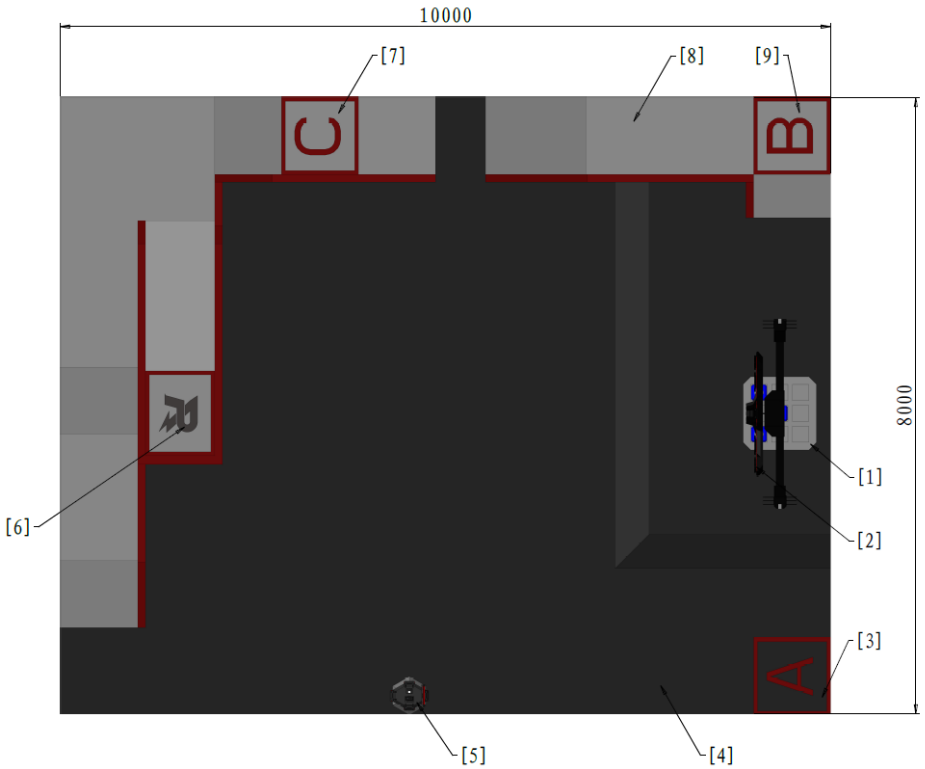
4.1.2.4 Eligibility

Engineer must successfully retrieve at least one round of projectile and move to Zone C in the schedule time.

4.2 Standard Racing and Smart Firing

The Standard Racing and Smart Firing challenge and the Engineer Projectile Obtaining challenge share the same Battlefield.

4.2.1 Battlefield



[1]	Resource Island	[2]	Power Rune	[3]	Zone A	[4]	Litchi texture rubber
[5]	Spinning Top	[6]	Power Rune Activation Point (Zone D)	[7]	Zone C	[8]	Road
[9]	Zone B						

Figure 4-4 Top View of Standard Racing and Smart Firing Battlefield

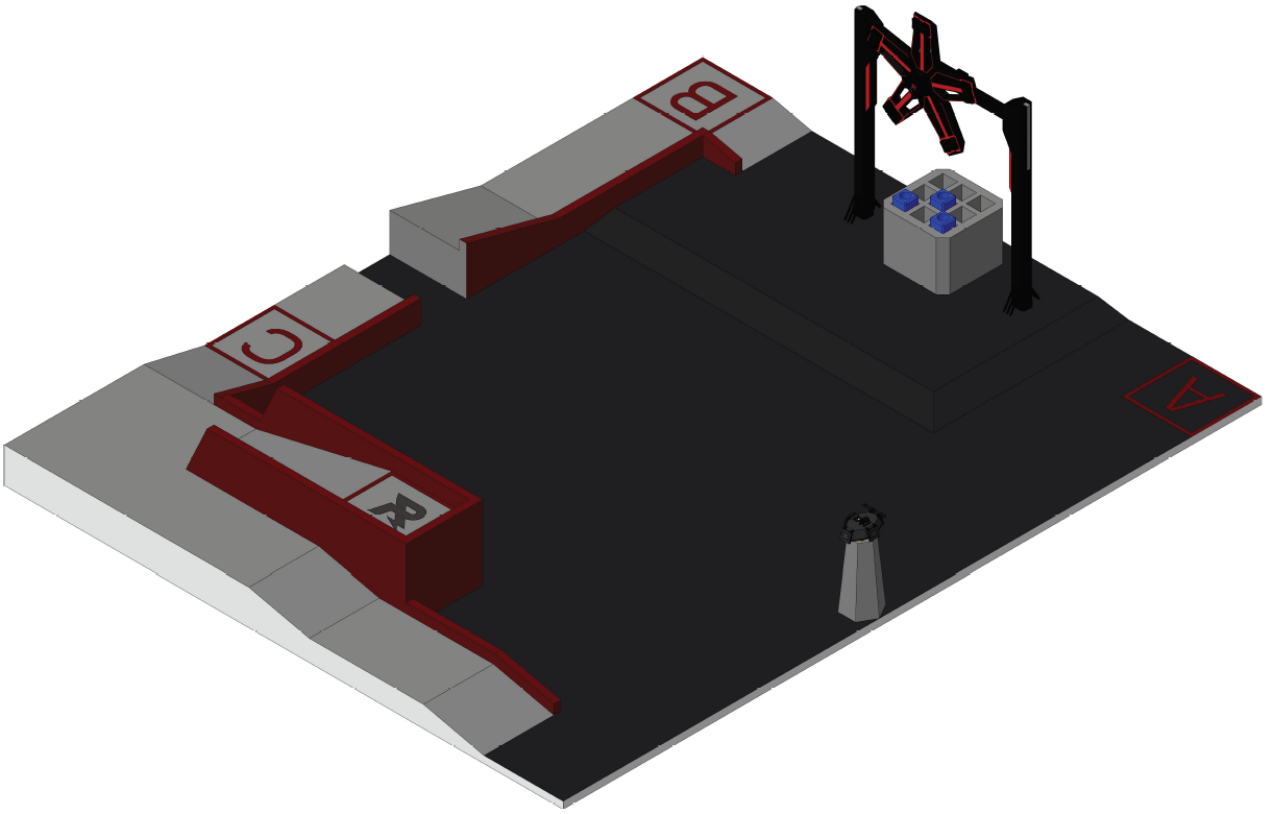
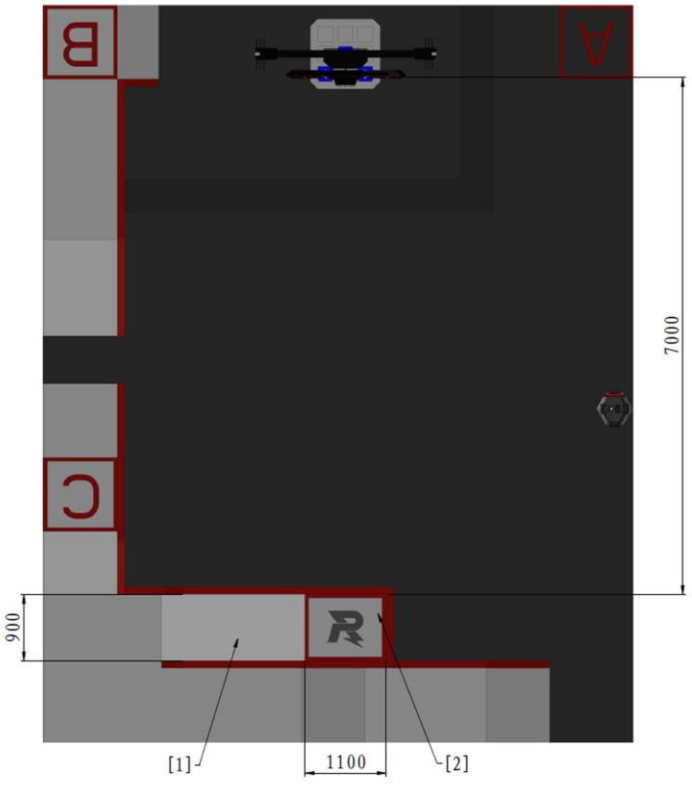
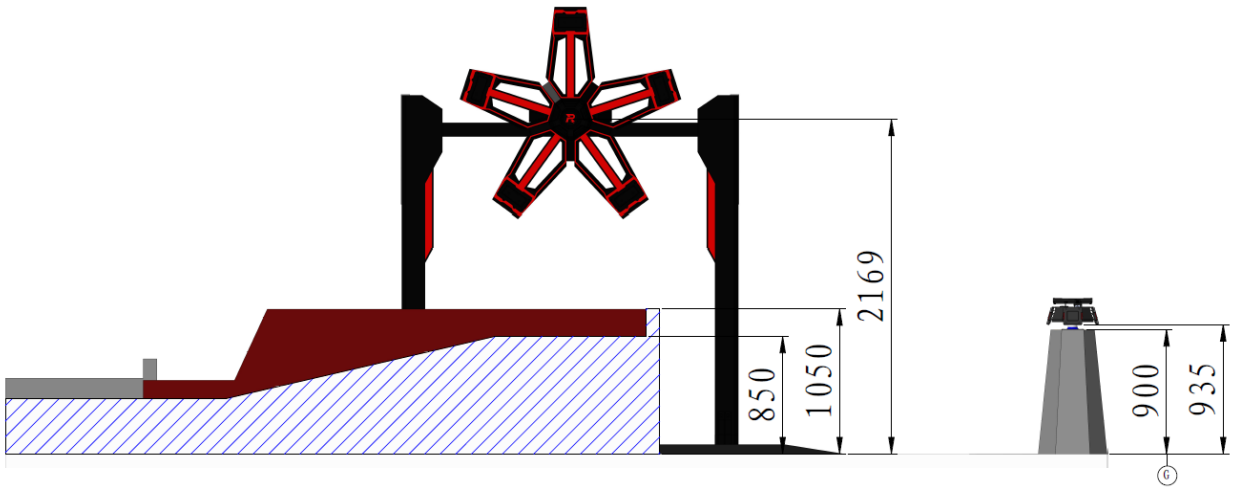


Figure 4-5 Axonometric View of Standard Racing and Smart Firing Battlefield

4.2.1.1 Power Rune Activation Point

Standard needs to strike Power Rune at the Power Rune Activation Point.





[1] 13 °slope [2] Power Rune Activation Point (Zone D)

Figure 4-6 Power Rune Activation Point (Zone D)

4.2.1.2 Road

When Standard reaches Zone B, it can choose to get access to Zone C quickly through the Launch Ramp.

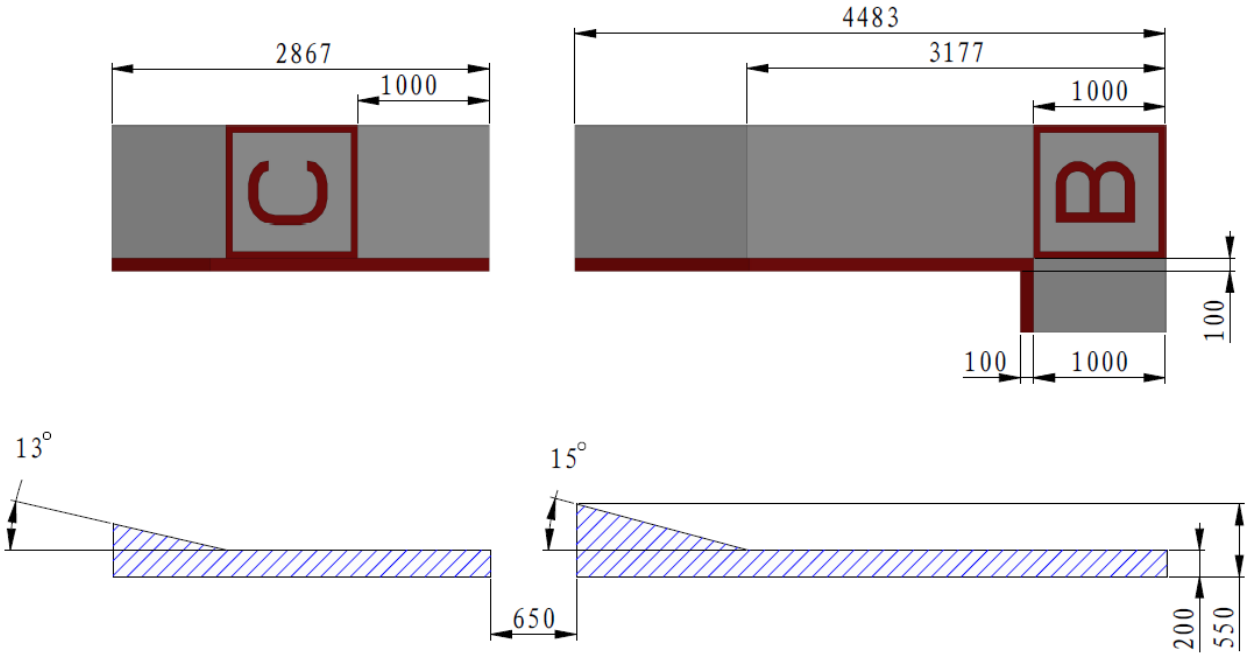


Figure 4-7 Road

4.2.1.3 Spinning Top

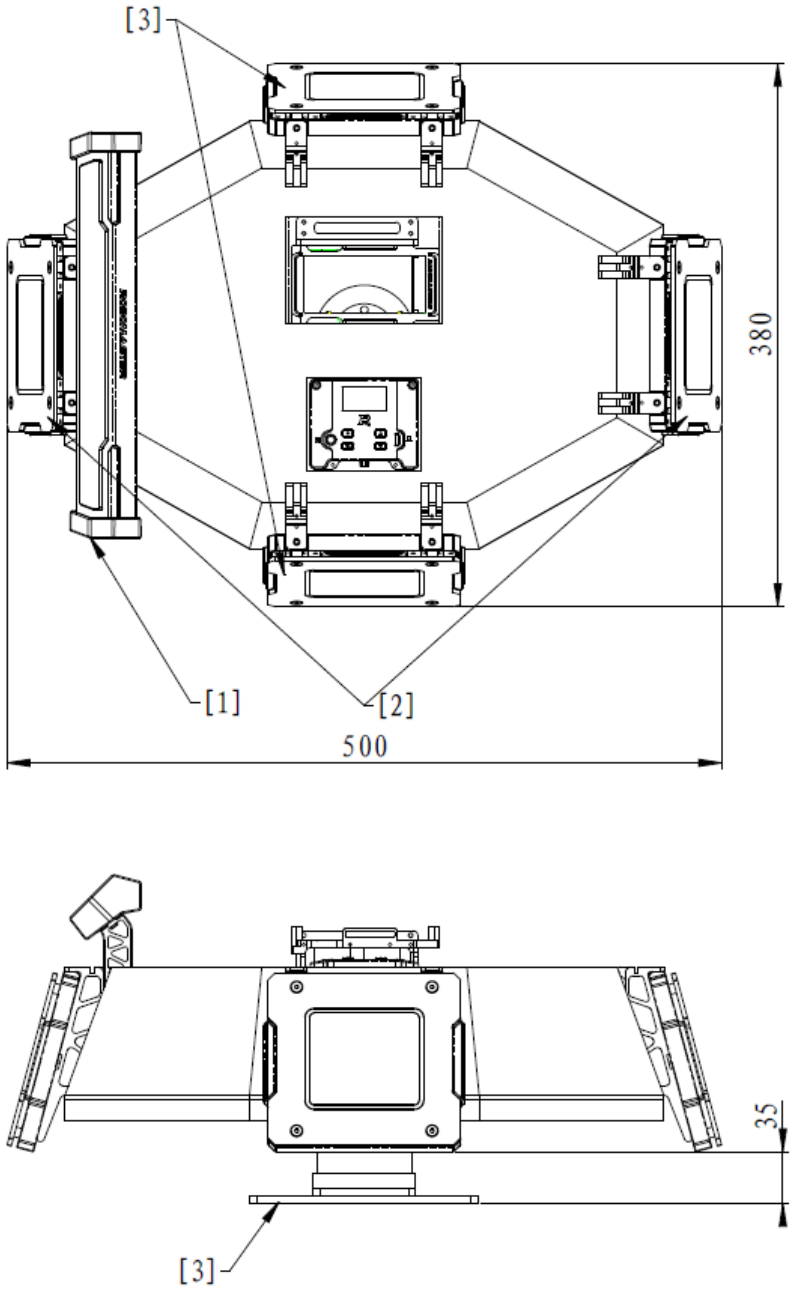
The Spinning Top is mounted on a platform at an altitude of 900 mm, at a distance of 4000 mm from Zone D. Four small Armor Modules and a Light Indicator Module are mounted on the Spinning Top. The lowest altitude of the Armor Modules from their bottom to the site is 935 mm, and the Light Indicator Module is fixed on one of the

Armor Modules. For the position of Armor Module, refer to Figure 4-8.

On the Spinning Top, there are two valid Armor Modules with No.4 sticker attached, and two invalid Armor Modules without stickers. During the match, the indicator of valid Armor Modules displays red while that of invalid Modules is off.

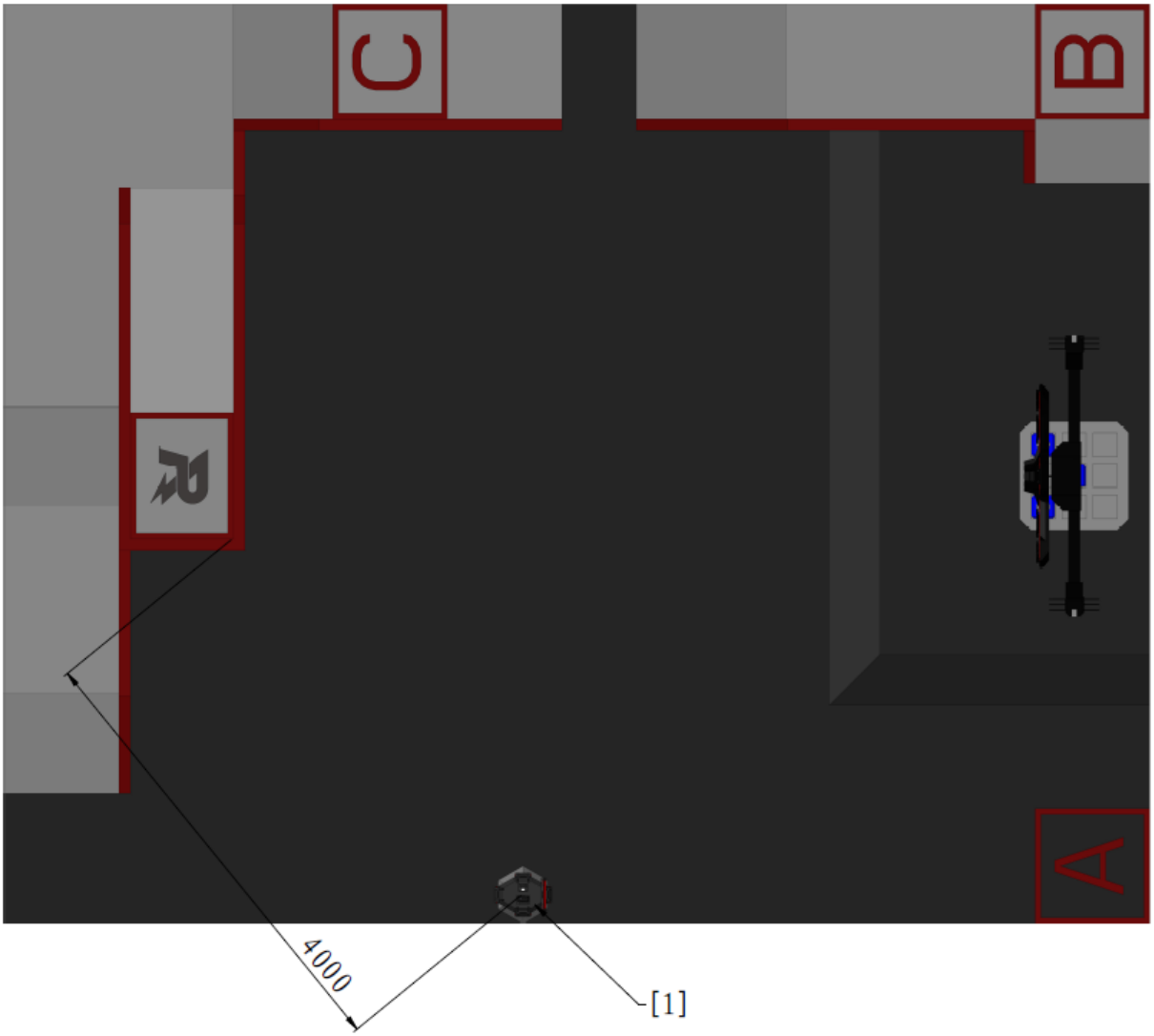
The rotation axis of Top is fixed on the base. Spinning Top only performs rotation motion.

The Spinning Top has a HP of 300.



[1] Light Indicator Module [2] Valid Armor Module [3] Invalid Armor Module

Figure 4-8 Spinning Top



[1] Spinning Top

Figure 4-9 Relative Positional Relationship between Spinning Top Platform and Strike Point Zone D

Status

The Spinning Top will be in one of two states: active and inactive.

1. Active

At the start of the match, the Top performs a variable motion at the pace of $\omega = \mathrm{A} * \sin\left(\frac{2\pi}{T} * t + \varphi\right) + \mathrm{B}$.

Specifically speaking, Spinning Top performs a variable motion at the pace of sine wave. The variant period T is a random number ranging from 3 seconds to 7 seconds. This random number is generated randomly at the start of each round and T will remain unchanged before the end of the round. Variant buff is A 1.5. The largest rotational speed is 6.5rad/s (about 1.034r/s) and the smallest is 3.5 rad/s (about 0.557r/s).

ω: Angular velocity (unit: rad/s)

T: Variant period (unit: s)

A: Variant buff

2. Inactive

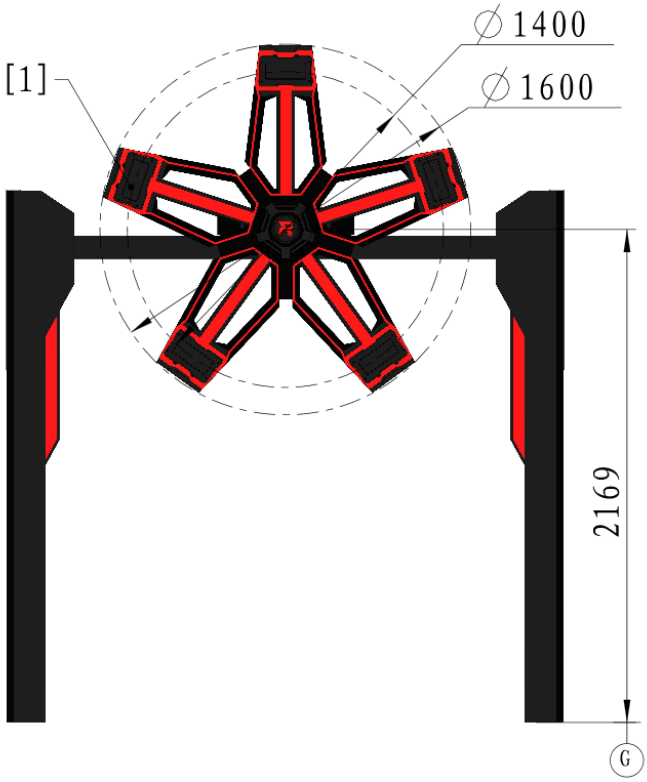
HP of the Spinning Top becomes zero and the Top stops spinning.

4.2.1.4 Power Rune

- The Power Rune will have a slight dip in the middle due to its weight. The dip is around 0~50 mm.
- In the China Regional Competition phase, there is no lighting effect on the supporting pillar of both sides.

The Power Rune is located directly above the Resource Island. The Power Rune is powered by the motor and rotates at a regular rhythm. A robot needs to occupy the Power Rune Activation Point to activate the Power Rune. The Power Rune of the red team is used in the Technical Challenge.

A Power Rune has five mounting brackets that are distributed evenly. The end of each mounting bracket is installed with a Large Armor Module. The specific location and dimensions of the Large Armor Module are as follows:



[1] Large Armor Module

Figure 4-10 Power Rune

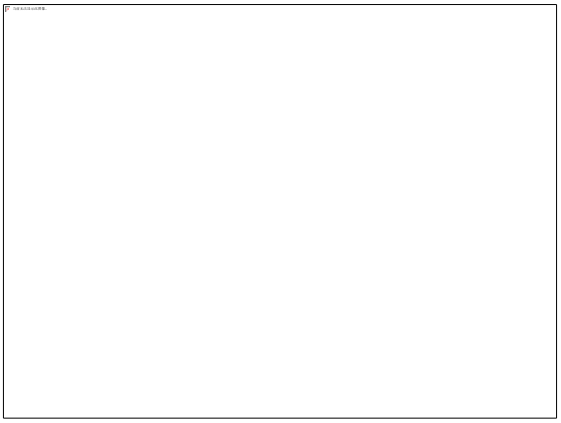


Figure 4-11 Central logo of the Power Rune

4.2.1.4.1 Rotation Strategy

Before the start of a match, the Power Rune rotates in a random direction. During the match, the Power Rune rotates in a consistent direction.

The rotating speed of Power Rune is based on the cyclical change of a trigonometric function. The target function for speed is: $spd = 0.785 * \sin(1.884 * t) + 1.305$, the unit for spd is rad/s, and the unit for t is s. The speed tracking for the Power Rune will be updated.

4.2.1.4.2 States

Power Runes can display five states: Unavailable, Available, Activating, Activated and Activation Failed.

1. Unavailable

After the start of the match, when Spinning Top is in the active state, Power Rune is unavailable as shown below:

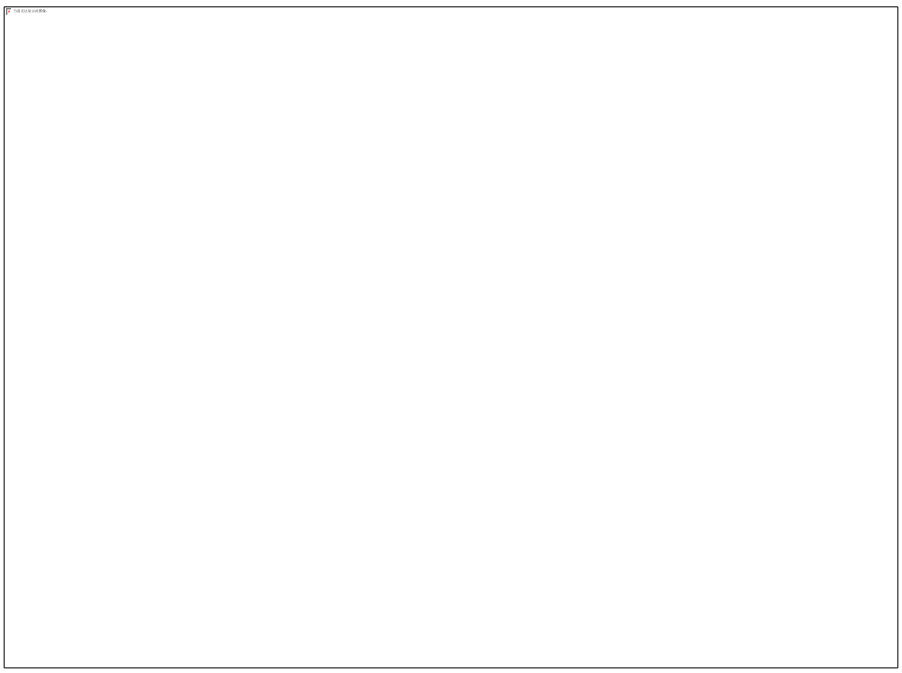


Figure 4-12 Power Rune When Unavailable

2. Available

When Spinning Top is in the inactive state, the Power Rune enters the available state as shown below:

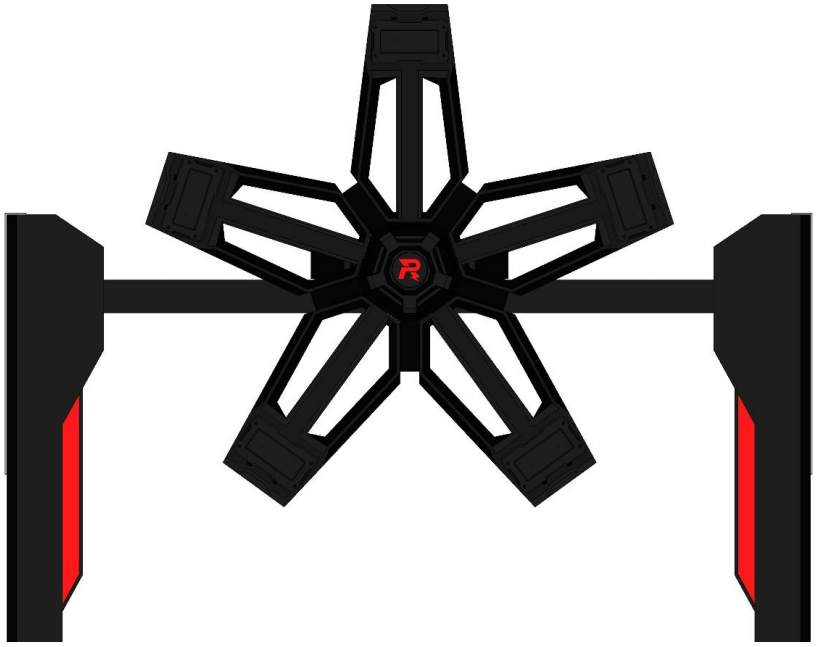


Figure 4-13 Power Rune When Available

3. Activating

When the Power Rune is activating, if a projectile hits the Armor Module with flowing arrow lights on the central axis of the mounting bracket within 2.5 seconds, the bracket will be fully illuminated. At the same time, the Power Rune will randomly illuminate one of the remaining four Armor Modules, and so on and so forth, as shown below:

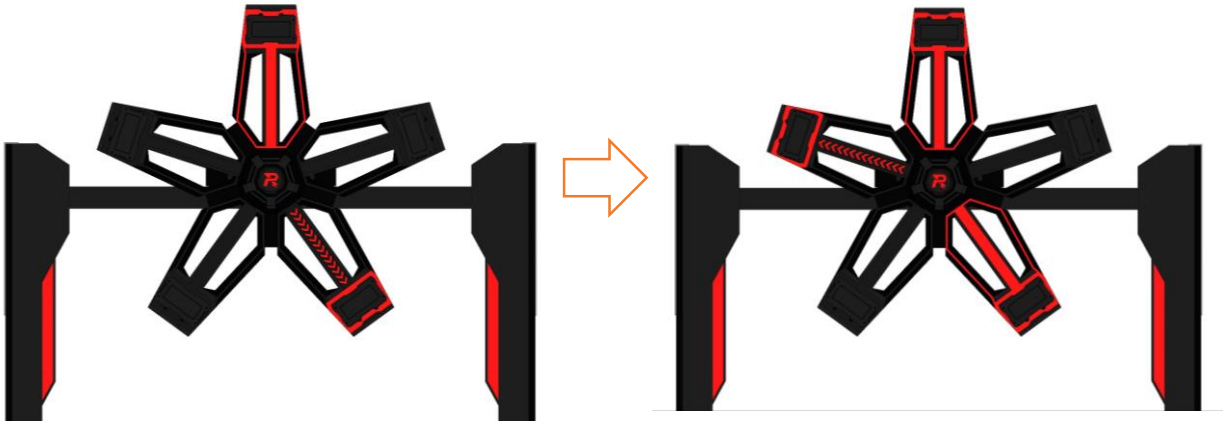


Figure 4-14 Power Rune When Activating

4. Activated

If all five mounting brackets are illuminated, the Power Rune is then activated as shown below:

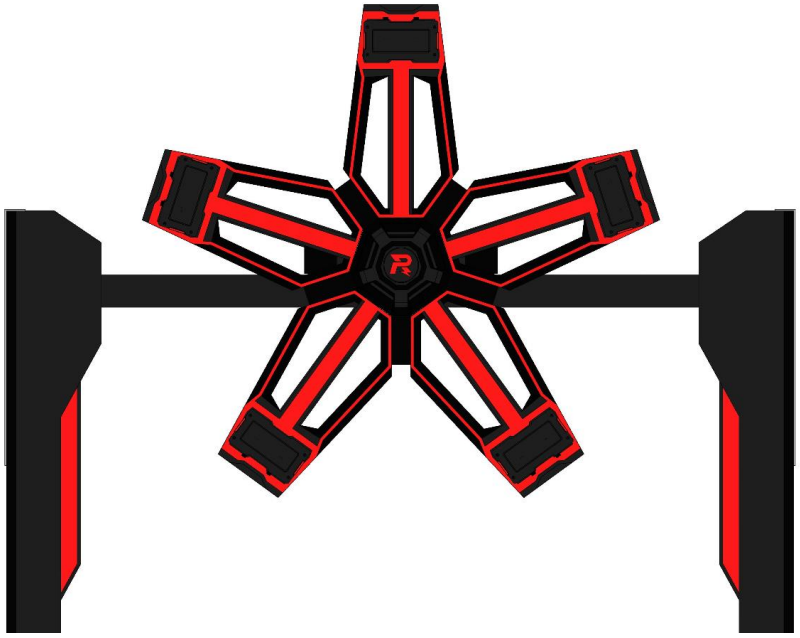


Figure 4-15 Power Rune When Activated

5. Activation Failed

If any of the following conditions occur during a shooting, the activation fails and the Power Rune becomes available for activation again. Situations causing activation to fail:

- Failure to hit a randomly lit Armor Module within 2.5 seconds
- A non-randomly lit Armor Module is hit

4.2.2 Rules

4.2.2.1 Competition Rule

Standard is pre-loaded with 150 rounds of 17mm projectiles. During the competition round, Standard must complete the following missions:

1. Depart from Zone A, occupy Zone A, B and C on the site in turn, eventually reaching Zone D. The robot gains a 5-time barrel heat cooling buff.
2. Standard strikes the Spinning Top at Zone D to make it inactive. Striking the Top in other places will be invalid.
3. After the Spinning Top is inactive, Standard needs to continue occupying Zone D for the Power Rune to enter into the state of activating. If the robot leaves Zone D or has been defeated for longer than 2 seconds, any gains will be lost, and it will not be able to strike the Spinning Top or activate the Power Rune.
4. Standard can try to activate the Power Rune at Zone D multiple times. The round ends once the Power Rune is activated completely.

The specific movement track of Standard is decided by the participant.

4.2.2.2 Scoring Rule

Record the time when each challenge is completed. If Standard is still unable to make the Spinning Top inactive after the round's countdown has ended, the challenge will be deemed as failed.

4.2.2.3 Ranking Rule

Each team can initiate two challenges and take the shortest time used as the final score.

Activated Power Rune:

1. The team that spends the least amount of time to finish the challenge ranks the highest.
2. If the time to finish the challenge is the same, the teams will be ranked based on the remaining HP values of their robots.
3. If the time and the remaining HP values are the same, the teams will be ranked based on the weight of their robots, with the lighter ranking higher.

Failed to activate Power Rune:

1. Take the highest strike rings of Power Rune as the final score, with the higher ranking higher.
2. If the number of highest strike rings are the same, the team whose strike was achieved in the shortest time (time is accurate to seconds) will be given the higher ranking. In the case of two or more teams having zero strike rings, the team that makes Spinning Top enter in the inactive state in the shortest time (time is accurate to seconds) will be given the higher ranking.
3. If the time of achieving the highest strike rings of Power Rune is the same, robot with the higher remaining HP values ranks higher.
4. If the time and the remaining HP values are the same, the teams will be ranked based on the weight of their robots, with the lighter ranking higher.

4.2.2.4 Eligibility

Standard must make the Spinning Top inactive for the team to be shortlisted.

4.3 2V2 Confrontation

4.3.1 Participant

Participants qualify for 2V2 Confrontation are: teams that have never obtained or for the first time have obtained the entry qualification in the RoboMaster 2018 Robotics Competition or RoboMaster 2019 Robotics Competition

The RMOC will determine whether participants of this challenge meet relevant requirements for team and conduct an on-site verification of participants' identity. If any team does not meet the requirements, the highest penalty that can be given to the offending personnel and offending team is a Forfeiture of the match.

4.3.2 Battlefield

The core Competition Area of 2V2 Confrontation is called the "Battlefield". The Battlefield is an area with the size of 8m x 6m. Within the area are the Base, Starting Zone, Sentry Rail, Supplier Zone and Bonus Zone.

The material of Battlefield ground is common litchi texture rubber.

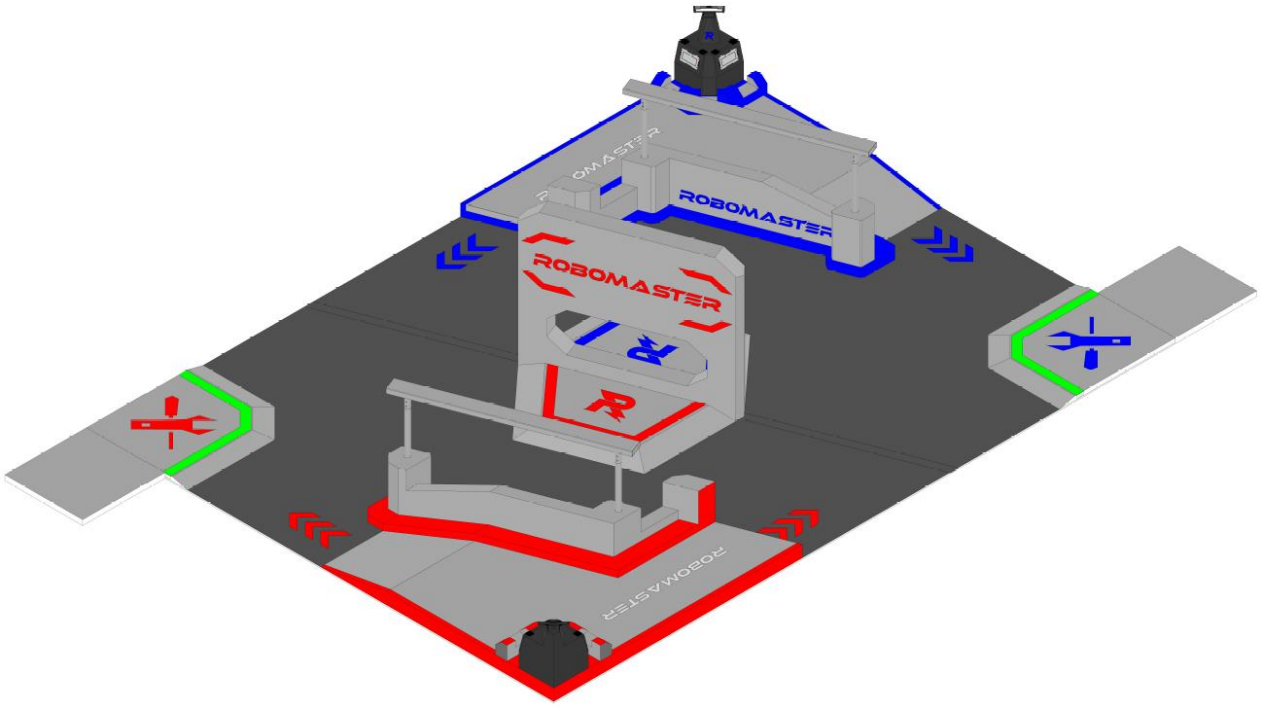
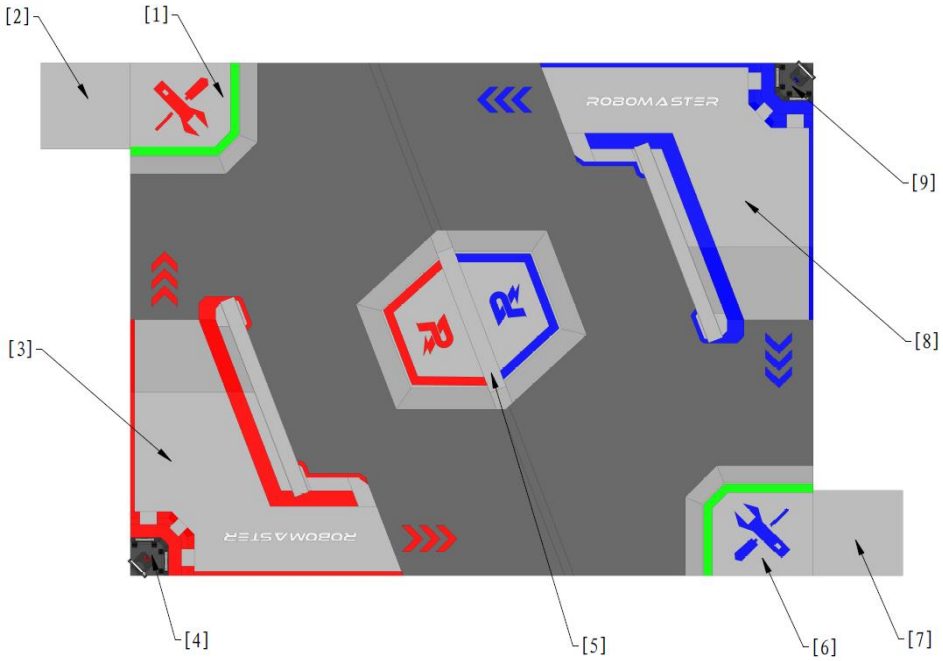


Figure 4-16 Axonometric View of 2V2 Confrontation Battlefield



[1]	Red Team Restoration Zone	[2]	Red Team Supplier Zone	[3]	Red Team Starting Zone
[4]	Red Team Base	[5]	Red Team and Blue Team Bonus Zone	[6]	Blue Team Restoration Zone
[7]	Blue Team Supplier Zone	[8]	Blue Team Starting Zone	[9]	Blue Team Base

Figure 4-17 Top View of 2V2 Confrontation Battlefield

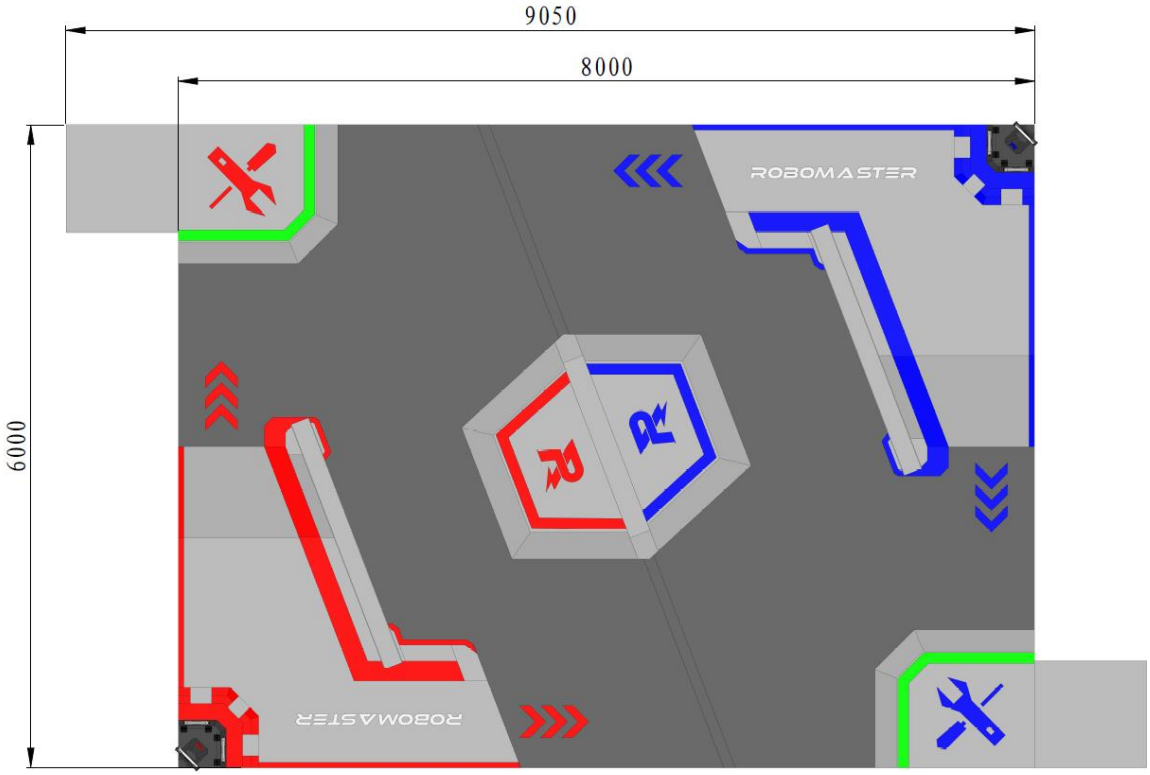


Figure 4-18 2V2 Confrontation Battlefield Size

4.3.2.1 Starting Zone

The Starting Zone is the area where Standard is placed before a competition begins, which includes the Base, Base Zone and Sentry Rail.

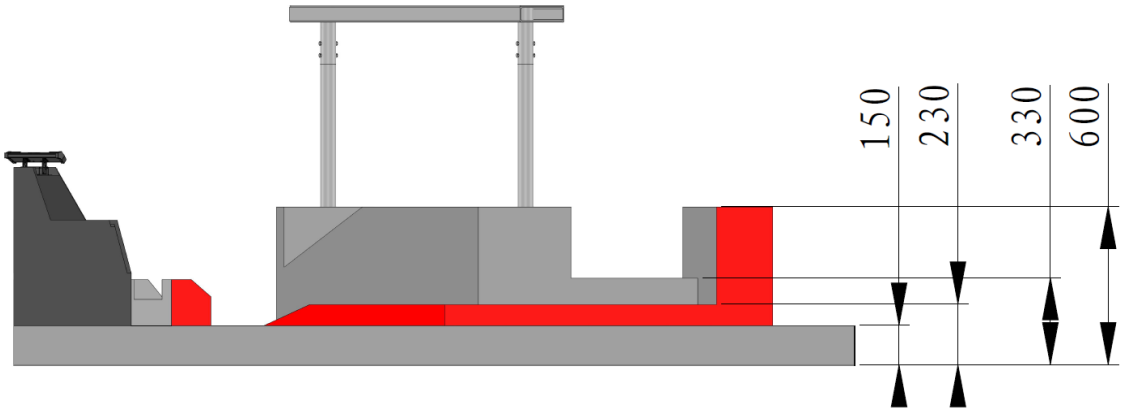
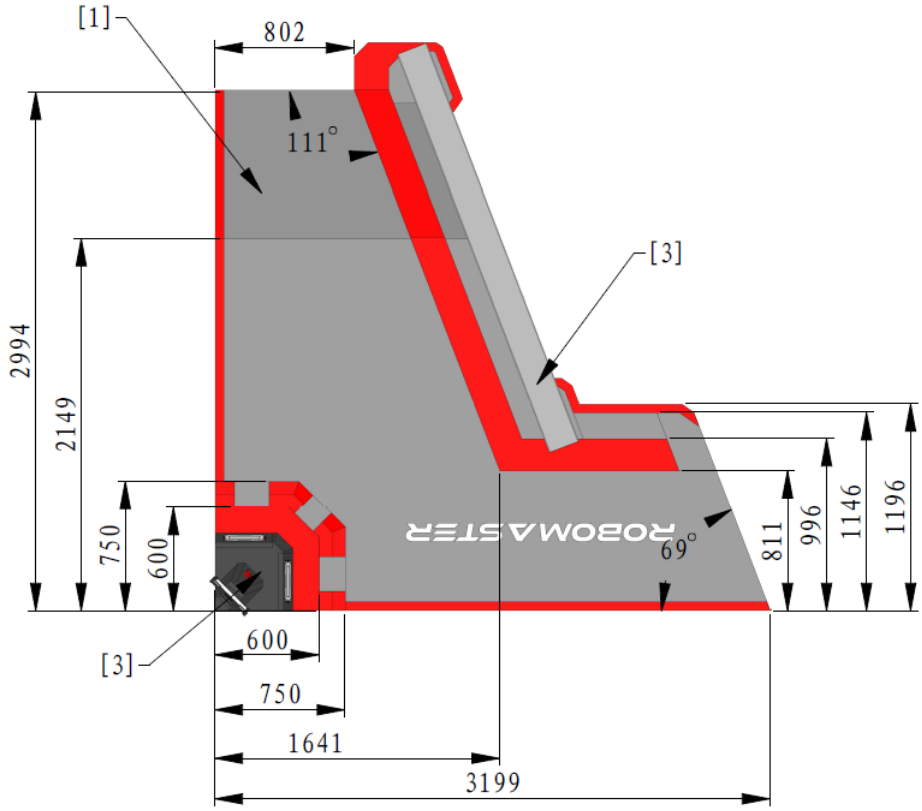


Figure 4-19 Front View of Starting Zone



[1] 10 °slope [2] Base [3] Sentry Rail

Figure 4-20 Top View of Starting Zone

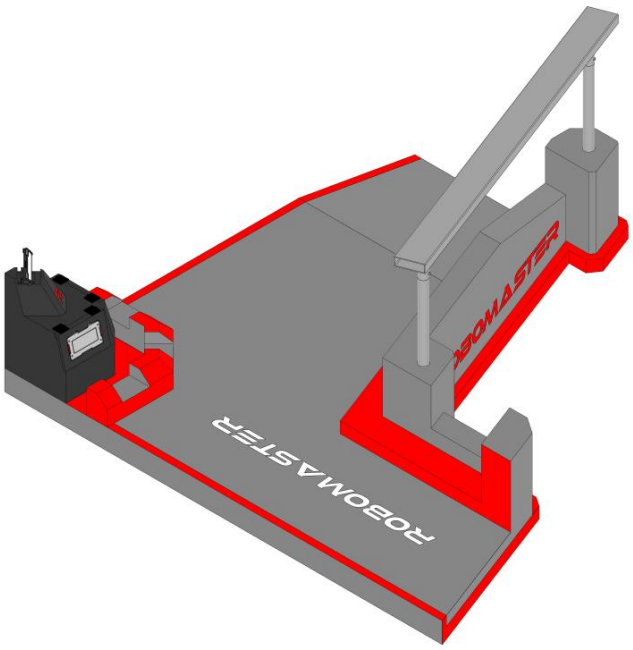
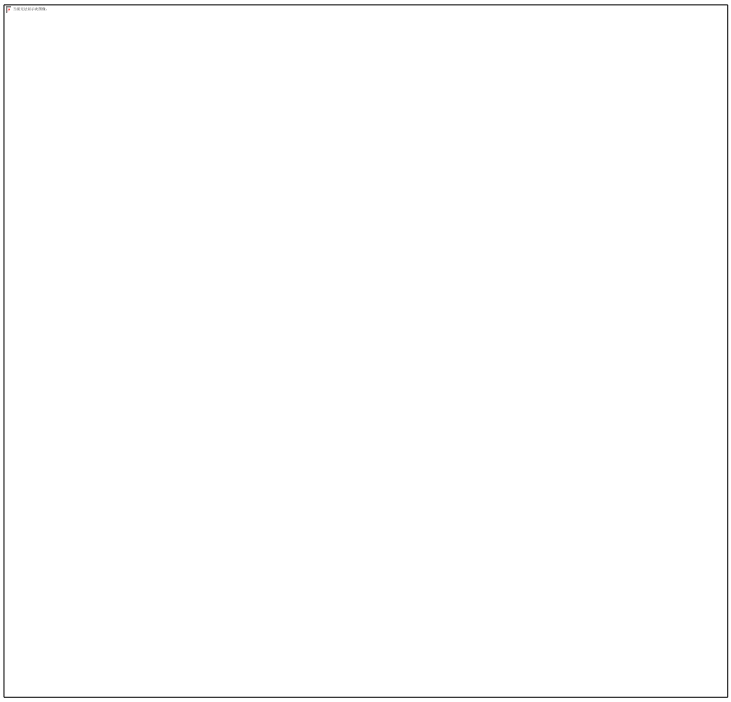


Figure 4-21 Axonometric View of Starting Zone

4.3.2.1.1 Base

The total HP of a Base is 1500. The Red Team and Blue Team each have a Base. Each Base is installed with two large armors. A corresponding sticker is attached on the armor plate. Intersection angle between the large armor panel inside the Base with the ground is 75 °.



[1] Light Indicator Module [2] Large Armor Module [3] Large Armor Module

Figure 4-22 Top View of Base

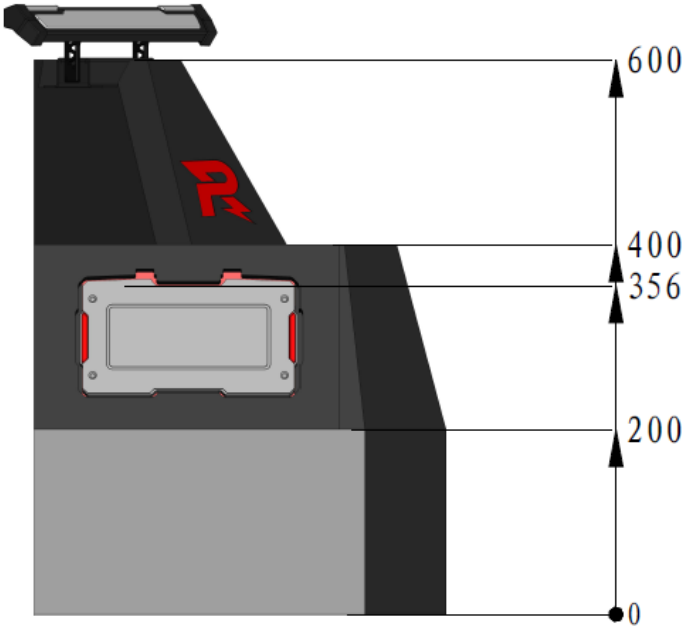


Figure 4-23 Side View of Base

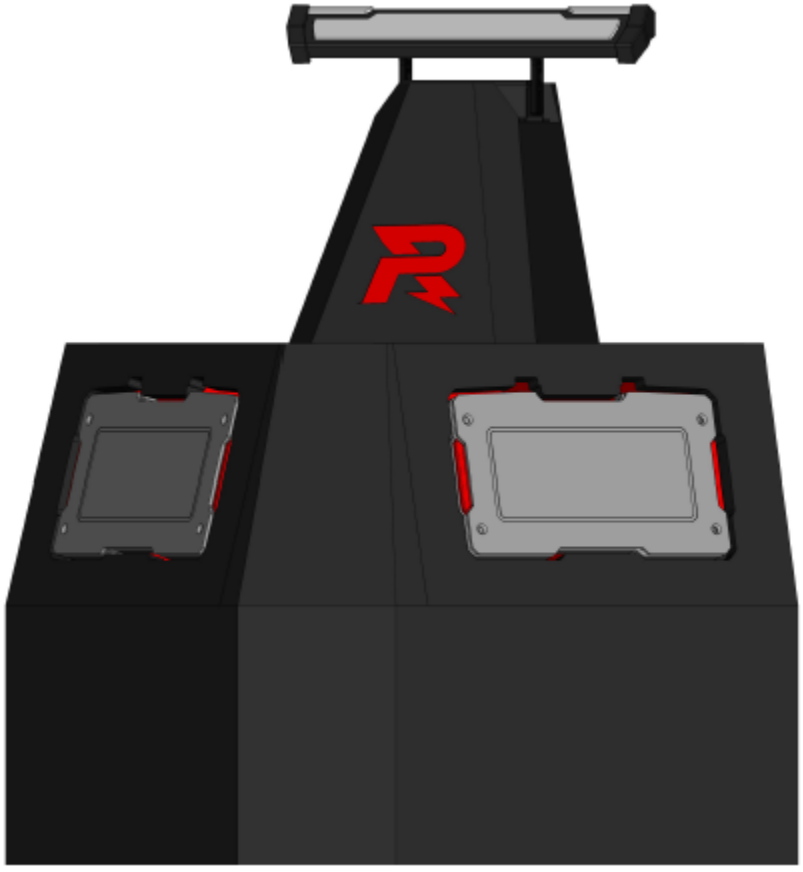


Figure 4-24 Axonometric View of Base

4.3.2.1.2 Sentry Rail

Sentry Rail consists of the main rail and its supporting frame. The main rail is the only area on which Sentry moves.

The surface of the Sentry Rail is matte paint.

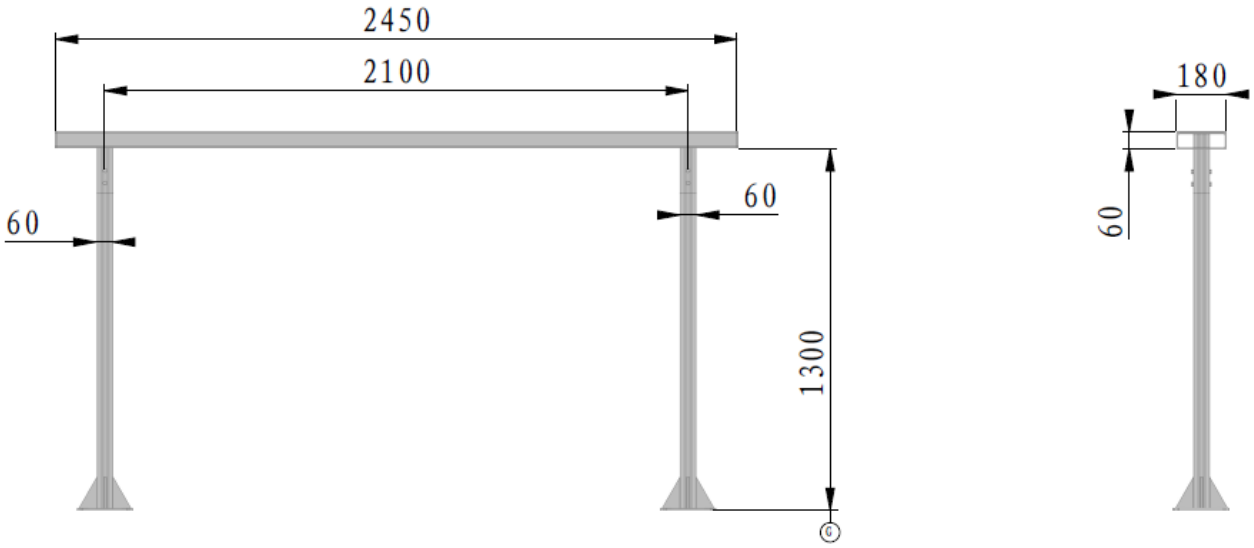


Figure 4-25 Sentry Rail

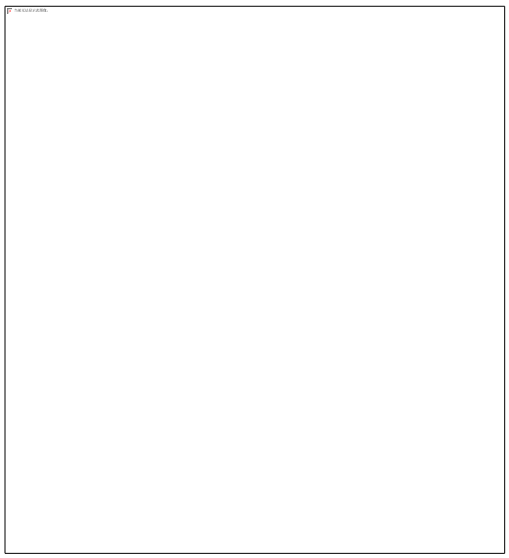


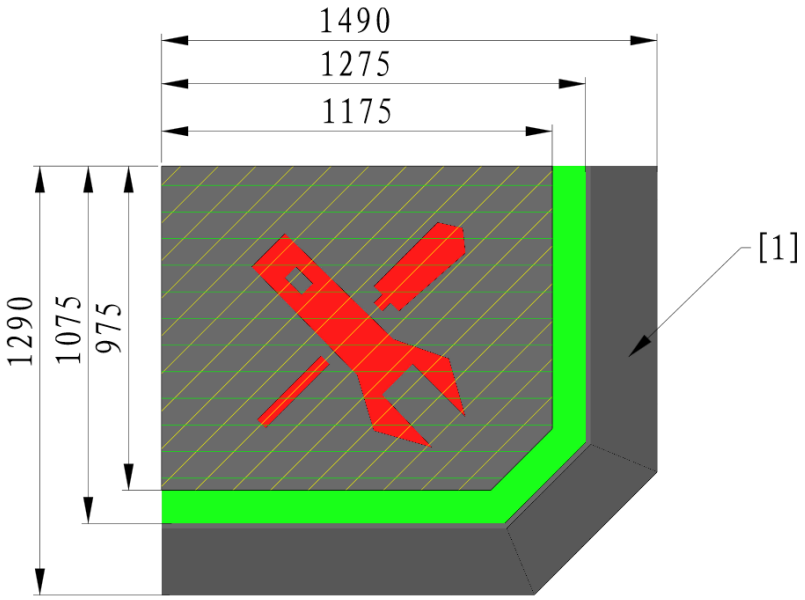
Figure 4-26 Sentry Rail

4.3.2.2 Supplier Zone

The Supplier Zone is an important area for reloading the projectiles and restoring the HP of a robot. Each Supplier Zone consists of a Restoration Zone and Projectile Supplier Zone. Both Red and Blue Teams each have a Supplier Zone.

4.3.2.2.1 Restoration Zone

Each Supplier Zone has a Restoration Zone and the slope is 14 °.



[1] 14 °slope

Figure 4-27 Top View of Restoration Zone

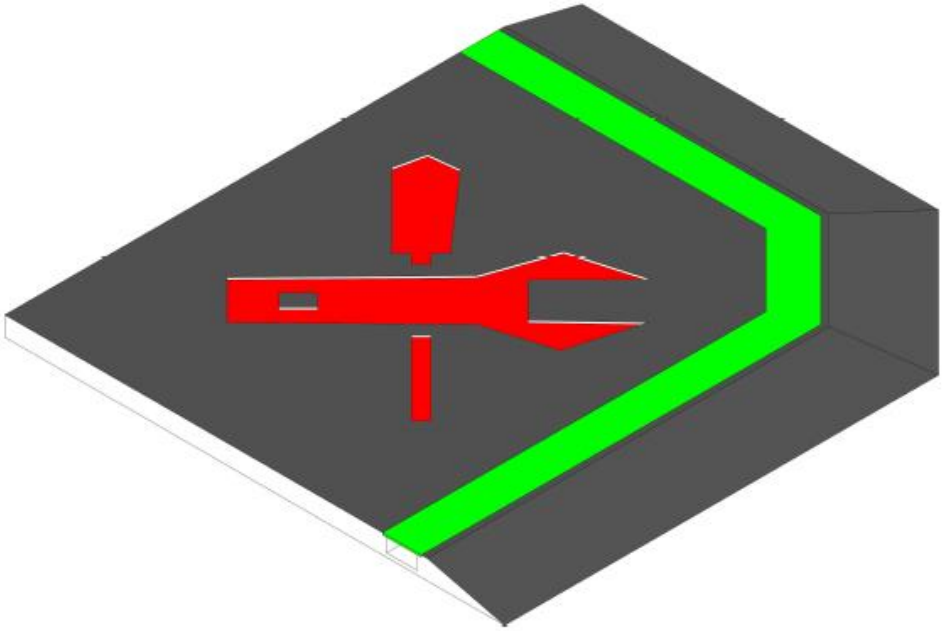


Figure 4-28 Axonometric View of Restoration Zone

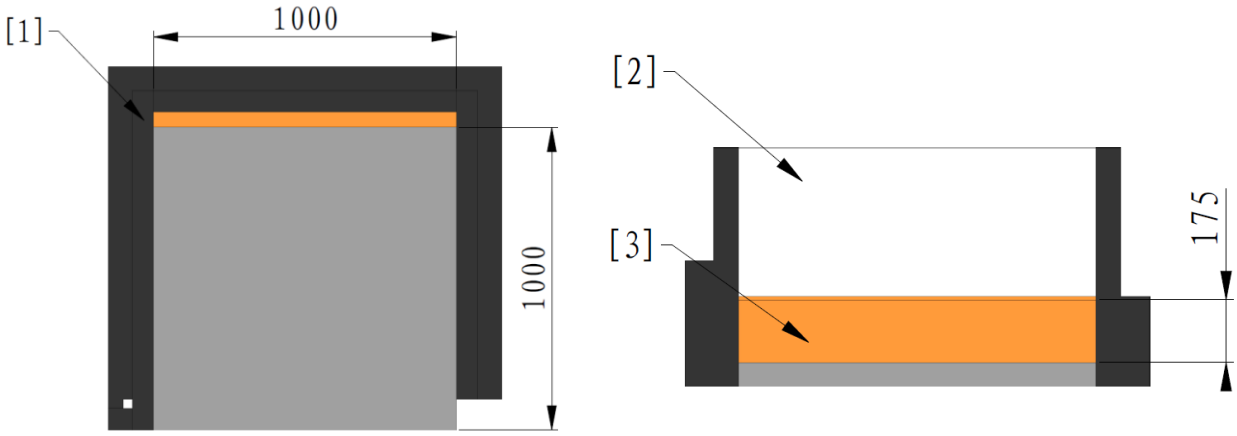
When a surviving robot is at its own Restoration Zone and detects the RFID Interaction IC Card of the Zone (the valid detection area of IC Card please refer to Figure 4-27), it will recover its HP at an amount equal to 5% of its maximum HP per second until its HP is fully restored.

4.3.2.2.2 Projectile Supplier Zone

One of the sides of the Perimeter Wall of the Projectile Supplier Zone is mirror stainless steel.

In each round, a Supplier outside the Battlefield will supply 200 rounds 17mm projectiles for robots for twice. Operator needs to control the robot to the Projectile Supplier Zone, where he can observe the whole process of projectile supplying from the mirror reflection.

The projectile supply time is at the start of the first minute (countdown at 3:59) and at the start of the third minute (countdown at 1:59).



[1] Perimeter Wall [2] Mirror Material [3] EVA

Figure 4-29 Top View of Projectile Supplier Zone

Figure 4-30 Axonometric View of Projectile Supplier Zone

4.3.2.2.3 Supplier Penalty Zone

The Supplier Zone of one team is the Supplier Penalty Zone for the other.

4.3.2.3 Bonus Zone

The Bonus Zone is a hexagonal island zone located at the center of the Battlefield. The Bonus Zone is divided into two sides by a Perimeter Wall, in the middle of which there is a feature area for observation (the actual effects will be based on conditions at the competition site). Both Red Team and Blue Team has its own Bonus Zone. The slope for the Bonus Zone is 22 °.

Robot that occupies the Bonus Zone of any side, in other words detects the RFID Interaction IC Card of the Zone (the valid detection area of IC Card please refer to Figure 4-32), will gain a 50% defense buff and 5-time barrel heat cooling buff. Only robots of the first occupied team can gain this buff. If the robot leaves this area for more than two seconds, the buff will be invalid.

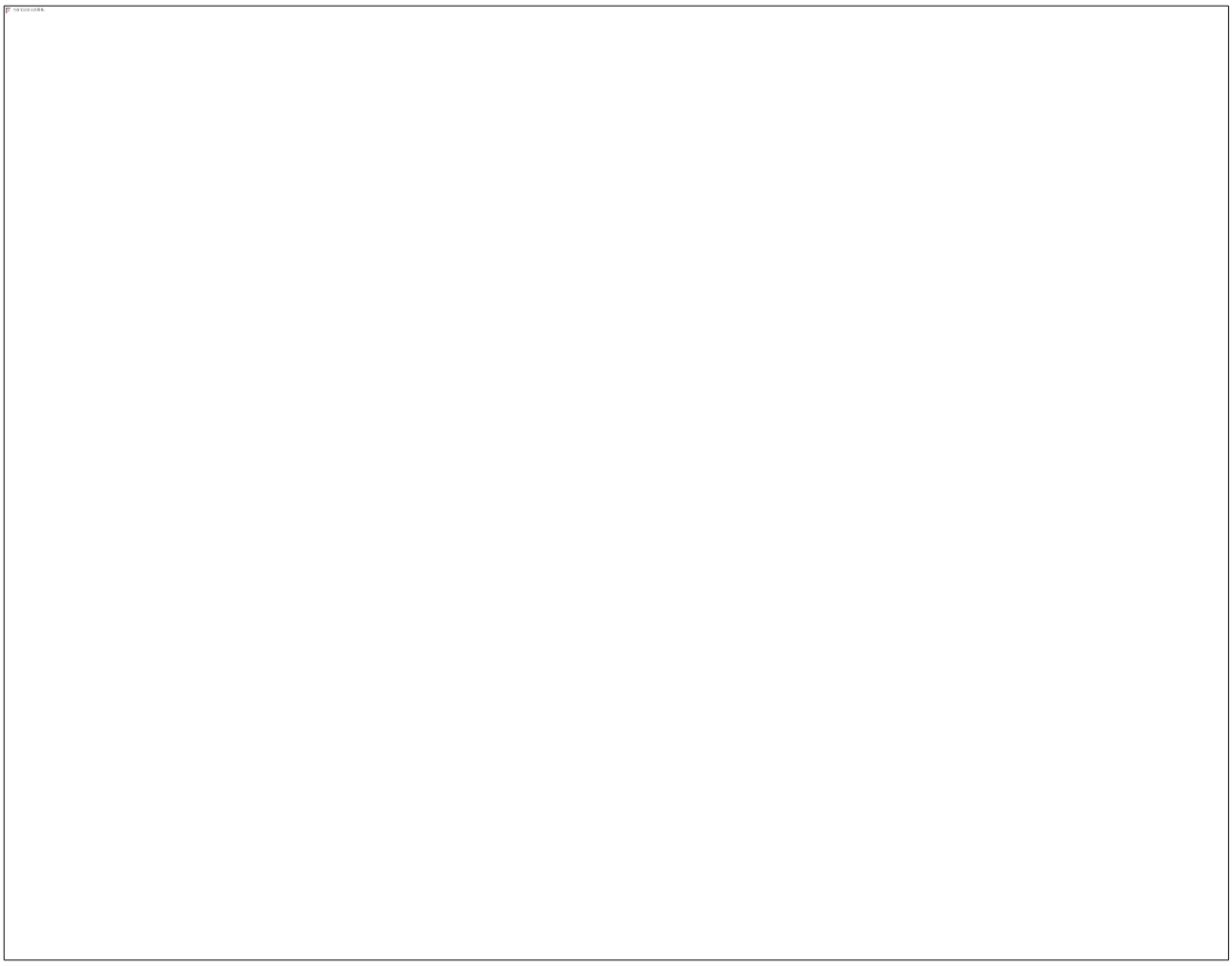


Figure 4-31 Front View of Bonus Zone

Figure 4-32 Bonus Zone Size

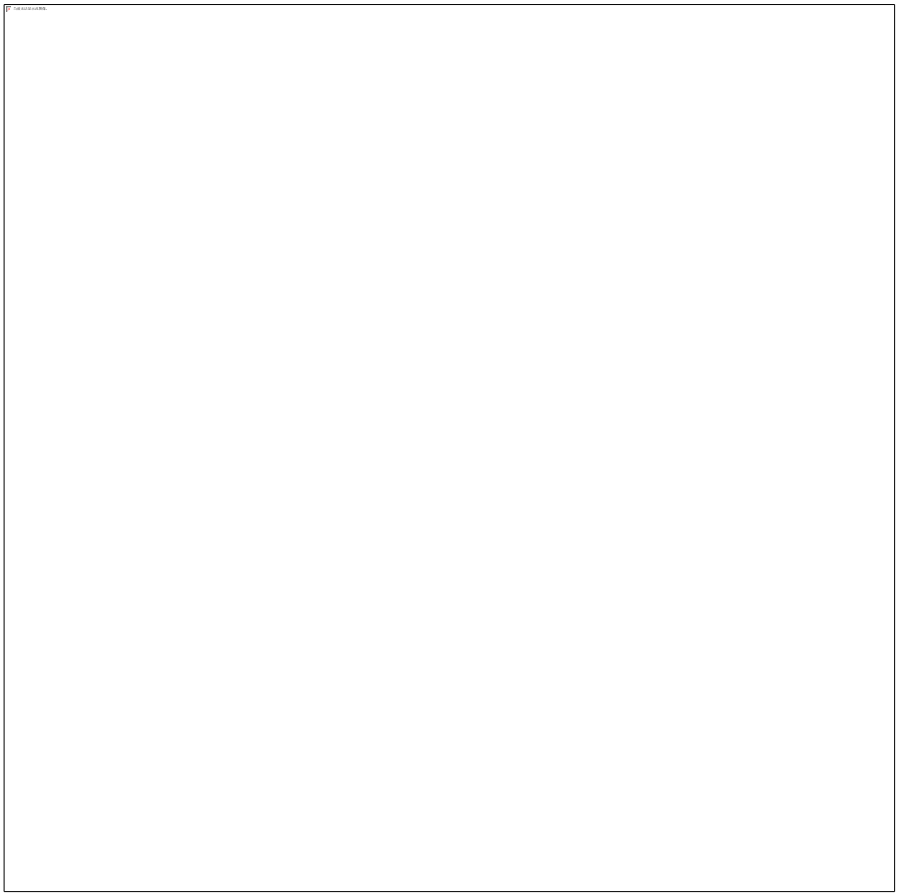


Figure 4-33 Axonometric View of Bonus Zone

4.3.3 Rules

4.3.3.1 Competition Rule

During the competition round, Standard and Sentry of both sides engage in a 2V2 Confrontation in the Battlefield and attempt to shoot the Armor Modules in the opponent's Base.

4.3.3.2 Winning Criteria

The official matches of RM2020 consist of the Group Stage and the Knockout Stage. The competition system for the Group Stage is BO2, and that for Knockout Stage is BO3.

1. When the Base of one team is destroyed, the round ends immediately and the surviving team wins.
2. If a round has ended and the Bases of both teams have not been destroyed, the team with the higher remaining Base 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 Deduction of both teams is the same, the team with the higher total Robot Remaining HP is the winner.

If the winning team is unable to be determined based on these criteria, the round is considered a draw. A draw in the Knockout Stage will lead to an immediate tie-breaker round until a team wins.

4.3.3.3 Group Stage

Below shows the points for Group Stage:

Table 4-2 Points for Group Stage

Competition System	Competition Result	Points	Notes
BO2	2:0	3:0	Winner of two rounds gains 3 points
	1:1	1:1	One point for each team
	1:0	1:0	(draw for one round): The team winning one round gains 1 point
	0:0	0:0	(draw for two rounds): Each team gains 0 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 the total HP Deduction of a team are the same, the team with the higher total Robot Remaining HP ranks higher.

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 total damage accrued by a team at the end of each round from successfully hitting the Armor Modules of enemy robots leading to HP deductions in the enemy robots or Base.
  - HP deducted as a result of exceeding the Initial Firing Speed limit, Barrel Heat limit and Maximum Chassis Power Consumption and of the Referee System going offline are not counted as HP Deduction.
  - HP deducted as a result of penalties executed by a referee for a Level 2 to 5 Warning will be counted as the enemy's HP Deduction.
- 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.

4.3.3.4 Knockout Stage

A team wins the Knockout Stage if it has won the most number of rounds: B03 requires the winning of two rounds.

4.3.3.5 Eligibility

Awards are set in a certain proportion based on the scores.

4.4 Dart Targeting

Battlefield of the Dart Targeting challenge is the same with that of RoboMaster 2020 Robotics Competition. Object of dart is Outpost and Base of the enemy team.

For details of Battlefield and Dart Launching Mechanism, please refer to the latest version of RoboMaster 2020 Robotics Competition Rules Manual.

4.4.1 Rules

4.4.1.1 Qualification

Each team must produce at least four darts in order to participate.

4.4.1.2 Competition Rule

After the competition has begun, the team has a setup period of two minutes to adjust darts. Thereafter, the team must launch all darts within one minute. If Outpost has not been destroyed, dart's attack on Base will be invalid. For attack damage of dart, please refer to 3.1.4 Attack Damage.

4.4.1.3 Ranking Rule

Below is the team ranking rule in Dart Targeting:

1. Each team can initiate two challenges and take the highest total HP Deduction of the two challenges as the final score. All teams will be ranked from high to low based on their total scores.
2. If the total HP Deduction of teams are the same, the team whose last subject hit was achieved in the shortest time will be given the higher ranking (time is accurate to milliseconds and subject to server record time).

4.4.1.4 Eligibility

A team must have dart at least one valid Outpost hit to be shortlisted.

5. Competition Process

5.1 Pre-Match Inspection

To ensure that robots meet the required unified specifications, each team must undergo Pre-Match Inspection in the Inspection Area before each match. For requirements of Pre-Match Inspection, please refer to RoboMaster 2020 Robot Building Specification Manual.

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

During Pre-Match Inspection, inspectors will stick a Pass Card on robots that have passed the inspection. Only robots with a Pass Card that is fully marked can enter the Staging Area and Competition Area. Teams must modify their non-qualifying robots in the Preparation Area until they meet the inspection requirements, before they can enter the stage.

When Pre-Match Inspection is complete, the team Captain must sign the inspection form to confirm the inspection results. After the team Captain has signed and confirmed, no objections may be raised to the inspection results.

Team members are required to declare the types of backup robots they are carrying during Pre-Match Inspection. Backup robots must be attached with armor stickers in the Inspection Area. The attachment of armor stickers must follow the requirements stated in the RoboMaster 2020 Robot Building Specification Manual.

After passing Pre-Match Inspection, backup robots cannot be replaced without permission. In the Mock Inspection stage, the RMOC will issue Referee Systems to backup robots that have passed the Pre-Match Inspection. Teams need to immediately return the Referee Systems of backup robots after finishing the competition in the division.

5.2 Staging Area

After completing the Pre-Match Inspection, each team must be at the Staging Area at least 15 minutes before the start of the match. Staff at the Staging Area will check the status of the participating robots and the information of Pit Crew and Supervisor. The team needs to sign the Staging Area Statement after confirmation.

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. Only when staff at the Staging Area has removed the Pass Card on the robot and the Staging Area Statement originally signed become invalidated can a robot leave the Staging Area for repair. When repair is finished, the robot needs to be brought back to the Inspection Area for another Pre-Match Inspection before re-entering the

Staging Area, and the team Captain must sign a new Staging Area Statement. If a Staging Area Statement cannot be signed in time as a result of this delay, the robot will not be able to enter the match, and the team will bear its own consequences.

After leaving the Staging Area, the participating teams will enter the waiting area of the Competition Area to place their robots. When the previous match has ended and with the permission of the referee, the next pair of participating teams will wait at the entrance of the Battlefield with their robots for further instructions. After the referee has confirmed that both teams are ready, he or she will open the door and lead the team members into the Competition Area. The countdown for the Setup Period will begin when the door opens.

5.3 Setup Period

During the Setup Period, Pit Crew Members will place robots on their respective initial positions, check whether Referee Systems are operating normally, load Standard and Sentry with initial projectiles and mount darts on Dart Launcher.

When the Setup Period is left with 30 seconds, the Operator should preferably enter the Operator Room to complete the debugging for the keyboard and mouse (can be brought his own), and double-check that the robot controls and official equipment are operating normally. If equipment in the Operator's Room cannot operate normally, the Operator must raise the issue before the Setup Period is left with 15 seconds. Otherwise, referee will not announce technical timeout.

When the Setup Period is left with 30 seconds, all robots in the Battlefield must be powered up, and the staff in the Battlefield should leave the Competition Area in an orderly manner. Pit Crew must place the Sentry's remote controller in the designated area at the Battlefield entrance.

5.3.1 Official Technical Timeout

During the Setup Period, if a Referee System, equipment inside the Operator Room or other modules related to a Referee System experience any faults (for details see Table 7-1), the Head Referee can announce an Official Technical Timeout and pause the countdown.

During an Official Technical Timeout, team members can only cooperate with the referee in eliminating the faults of the relevant Referee System modules and cannot repair other breakdowns. After the faults in the relevant Referee System modules have been eliminated and the Head Referee has resumed countdown, the team must comply with the specifications for the Setup Period and leave the Battlefield at the designated time.

5.3.2 Team Technical Timeout

If the mechanical structure of a robot, a software system, the keyboard or mouse in the Operator's Room or other equipment experiences any faults, the team Captain may make a request to the referee in the Battlefield or Operator's Room for "Team Technical Timeout" before the 15-second countdown in the 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 Head 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 can enter the Battlefield to inspect and repair robots, while members of both teams can only inspect, repair and debug their own robots in their Starting Zone and Dart Launching Station, respectively.

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 the Head Referee may 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 per the 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 Head 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.

A team cannot request for more Technical Timeout opportunities once they have been used up. The Team Technical Timeout arrangements for different challenges are as follows:

Table 5-1 Team Technical Timeout Arrangement

Competition	Challenge	Arrangement
China Regional Competition, Final Tournament	2V2 Confrontation	One Technical Timeout for 3 minutes and one Technical Timeout for 2 minutes
	Engineer Projectile Obtaining, Standard Racing and Smart Firing, Dart Targeting	One Technical Timeout for 2 minutes

5.4 Referee System Initialization Period

After the 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 Referee System technical fault, which causes the initialization countdown to stop, a maximum of two Pit Crew Members for the team are allowed to enter the Battlefield to check on the fault.

When the Referee System Initialization Period is left with 15 seconds, a clear countdown sound effect and live animation will be played. At this time, the keyboard connected to the computer in the Operator Room will be locked. When the countdown finishes and the keyboard unlocks, the match starts immediately.

5.5 Competition Round

During the competition round, robots will engage in tactical combat or complete the challenge on the Battlefield – the core Competition Area.

5.6 End of Competition

A round ends either when time has elapsed or one team has fulfilled the conditions for winning. When a round ends, the match immediately enters the Setup Period for the next round. The match is over when the winner has been determined or all rounds are ended.

5.7 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 Deduction of both sides at the end of the rounds, the Remaining HP of each Base, Outpost and Sentry, 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, Captain 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.

6. Competition 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 Head Referee according to the actual situation.

To ensure the fairness of the competition and uphold discipline in the competition, participating teams and robots are required to adhere strictly to the Competition Rules. Referee will issue the appropriate penalty against any violation of rules.

Serious violations and appeals in the competition will be publicized.

6.1 Penalty System

Before the start of each round of match, the violation score of each robot will be clear to zero. During the match, robot will be recorded 2 scores when receives a Level 2 Warning and 4 scores for Level 3 Warning.

- When a robot has 4 violation scores, a yellow exclamation point will be displayed on the robot's avatar on the robot server client interface
- When a robot has 7 violation scores, a red exclamation point will be displayed on the robot's avatar on the robot server client interface
- When a robot has 9 violation scores, the robot is ejected for this round of match

The details of penalty system for the RM2020 Robotics Competition are as follows:

Table 6-1 Penalty System

Penalty	Description
Verbal Warning	The referee will give an indication and warning on the violation of a team member or robot.
Level 1 Warning	When a warning is issued, the operation interface of all Operators from the offending team will be blocked for one second
Level 2 Warning	● The operation interface of all Operators from the offending team will be blocked for five seconds ● The Referee System will automatically deduct 5% of the current maximum HP from all surviving robots of the offending team ● The offending robot will be recorded with 2 violation scores
Level 3 Warning	● The operation interface of the offending Operator will be blocked for ten seconds, and that of other Operators in the offending team will be blocked for five seconds

Penalty	Description
	● The current maximum HP of the offending robot will be deducted by 50%, and those of other surviving robots will be deducted by 5% ● The offending robot will be recorded with 4 violation scores
Level 4 Warning (Ejection)	● The offending robot is ejected: In the round of the match, ground robots and Sentry are immediately ejected by the Referee System (deduct all HP). Aerial will have its Launching Mechanism (including the loading mechanism and friction wheel) powered off and its VTM disconnected and must immediately land on the Landing Pad. ● The Operator or other team members are ejected: Members ejected by the referee must immediately leave the Competition Area and no substitute Operators or Pit Crew are allowed in the remaining rounds of the match. The robot operated by the ejected Operator will be ejected for this round and at the start of all rounds of the current match.
Level 5 Warning (Forfeiture)	● If a Forfeiture is issued before the start of the match (not including the Setup Period), the Pit Crew of the offending party must all leave the Competition Area. The offending party's Base, Outpost and Sentry HP are deducted to zero, and other robots' HP of the offending party is full. The opposing team's Base and Outpost HP and their robots' HP remain full ● If a Forfeiture is issued during a match (including the Setup Period), the round ends immediately. The offending team's Base, Outpost and Sentry HP are deducted to zero, and other robots maintain their HP level at the end of the round. The opposing team's Base and Outpost HP and their robots' HP remain at the level when the round ended ● If a Forfeiture is issued after a match (due to an appeal for arbitration), the offending team's Base, Outpost and Sentry HP are deducted to zero, and other robots maintain their HP level from the end of the round. The opposing team's Base and Outpost HP and their robots' HP remain at the level when the round ended

Some violations will directly trigger a Level 4 or Level 5 Warning, while the penalties for some violations will increase gradually from a Verbal Warning. A Verbal Warning, Level 1 Warning, Level 2 Warning, Level 3 Warning or Level 4 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.

6.2 Rules

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

6.2.1 Personnel Rules

6.2.1.1 Participating Teams/Personnel

R1 Participating teams must adhere to the following rules when forming their teams:

R1.1 A participating team must be attached to a university or college, and must meet the role, number and identity requirements for personnel stated in the Chapter 3 of the RoboMaster 2020 Technical Challenge Participant Manual.

R1.2 For each institution of higher learning participating in the competition, only one team representing the institution is allowed to register for each challenge. In other words, multiple teams from one institution can register for four challenges, but they must follow the "Five Different Principles", which are different team name, different team members, different supervisors, different affiliated organizations(e.g. school of the college) and different participating robots.

R1.3 The team name must be in the format of "XXX-Team" ("-" is only a separator and should not appear in the actual team name), in which “XXX” is the personalized name of the team. The total length of the team name should not exceed 16 character units (each Chinese character is considered 2 character units, while each English letter is 1 character unit). The team name must not include the university/college name or its abbreviation in Chinese/English, or such Chinese characters as “队”, “团队” and “战队” (which mean "team" in English) or other special symbols such as "*/-+”. The team name must reflect the proactive spirit and motivation of the team and comply with relevant national laws and regulations.

R1.4 Two to five universities or colleges that do not have their own individual teams can form an Intercollegiate Team.

A. Before establishing an Intercollegiate Team, members must consider all their respective circumstances and communicate with each other thoroughly about team planning. Any operating and R&D costs, personnel arrangements or disputes arising therefrom must be handled by the Intercollegiate Team itself, for which the RMOC bears no responsibility.

B. After an Intercollegiate Team has been established, it can only participate in the RoboMaster 2020 Technical Challenge in the name of the Intercollegiate Team. If an Intercollegiate Team is disbanded, the team will be deemed to have voluntarily dropped out of the competition.

C. The registered team name shall be "Intercollegiate Team" instead of "Team". An Intercollegiate Team Statement must be issued by the universities or colleges represented by the Intercollegiate Team, and must be submitted to the registration system. Refer to the registration system for the template of the Intercollegiate Team Statement.

D. For an Intercollegiate Team consisting of Hong Kong, Macau, Taiwan and overseas team members, if more than 50% of the total number of regular team members are formal team members from Hong Kong, Macau, Taiwan and overseas, the Intercollegiate Team shall be categorized as a Hong Kong, Macau, Taiwan and Overseas team and directly participate in the Final Tournament. Otherwise, the Intercollegiate Team shall be categorized as a Mainland China team and must participate in the China Regional Competition.

R1.5 Any participant can only belong to one participating team during the RM2020 Technical Challenge.

Penalties:

- The RMOC will reject the registration of any team that does not meet any of R1.1-R1.4. The registration can be resubmitted after the team has amended it to meet the requirements.
- If any member of a team does not meet the identity requirements stated in R1.1, a Verbal Warning will be given to the team. If the Verbal Warning is ineffective, according to the seriousness of the situation, the highest penalty that can be given to the offending party is disqualification.
- If R1.5 is not met, the highest penalty that can be given to the offending team member and offending team is disqualification.

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

Penalties: The highest penalty that can be given to the offending party is disqualification.

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

Penalties: Forfeiture of the current match.

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

Penalties: The offender will be prevented from accessing the area.

R5 Except for emergencies, team Captains must sign the Staging Area Statement 10 minutes before the start of each match.

Penalties: Forfeiture of the current match.

R6 Team members must not turn on the power and debug or repair their robots in the Staging Area.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the team shall be issued a Forfeiture of the match.

R7 Except Pit Crew that are about to start the next match, other team members are not allowed to enter competition zones such as the Staging Area and Competition Area.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offending team member shall be disqualified.

R8 Except projectiles preset in the Inspection Area, teams must not bring their own projectiles into the Inspection Area, Staging Area or Competition Area, and also must not take official projectiles away from the Competition Area.

Penalties: The staff confiscate the projectiles.

R9 Teams must not damage any official equipment (including but not limited to equipment in the Competition Area, Staging Area, Preparation Area and Inspection Area).

Penalties: Verbal Warning, and the offending party is required to pay compensation as per the price.

R10 Team members are not allowed to leave the Staging Area or Competition Area without permission.

Penalties: Offender is forbidden from entering the Competition Area.

R11 Team members are not allowed bring wireless headsets into the Operator Room.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the team shall be issued a Forfeiture of the match.

R12 During the Setup Period, team members must ensure their robots are operating safely and will not cause harm to any person or equipment in the Competition Area.

Penalties: The offending party must bear the relevant responsibility.

R13 After a match is over, members from both teams must power off all their robots, remove them from the Competition Area and empty all projectiles inside the robots at the Projectile Unloading Area.

Penalties: The offending robot is detained at the Projectile Unloading Area.

R14 If the lighting on a Dart Trigger Device malfunctions, such as when a light bead is damaged and unable to light up normally, team members will need to replace the Dart Trigger Device.

Penalties: Base and Outpost will not be able to detect the damage inflicted by the dart.

6.2.1.2 Pit Crew

- Pit Crew: Participating team member and Supervisor who have registered for this Season and have been entered into the registration system, can walk into the Preparation Area and Competition Area.
- Captain Armband: Any participating team member that wears the 'Captain' armband performs the Captain role during the match. Captain needs to control the team's competition schedule, confirms result, raises Team Technical Timeout and appeal.

R15 Pit Crew must meet the identity and quantity requirements of the corresponding challenge. For details, refer to RoboMaster 2020 Technical Challenge Participant Manual. There should be one Pit Crew Member wearing Captain armband to perform the Captain role.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the team shall be issued a Forfeiture of the match.

R16 Pit Crews must wear armbands which must not be covered. The "Captain" sign of the Captain's armband must face the front.

Penalties: Verbal Warning.

R17 Team members are not allowed to power their equipment using the power supply for official equipment in the Competition Area. However, they may bring their own power supply.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, offender shall be ejected from the Competition Area.

R18 Pit Crew entering the Competition Area must not communicate with the outside world.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the team shall be issued a Forfeiture of the match.

R19 During the final 30 seconds of the Setup Period or the final 20 seconds of a Team Technical Timeout, Pit Crew must leave the Battlefield as quickly as possible.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Level 4 Warning. If the team does not obey the penalty order, it shall be issued a Forfeiture of the match.

R20 After the end of the Setup Period, Pit Crew must return to the designated area outside the Battlefield.

Penalties: The offender is issued a Level 4 Warning. If the offender does not obey the penalty order, the team shall be issued a Forfeiture of the match.

R21 Pit Crew may debug the fully automated Sentry using a remote controller before entering the Referee System Initialization Period.

Penalties: Forfeiture of the round.

R22 During the match, other Pit crew apart from the Operators must remain in the Pit Area of the Competition Area unless otherwise permitted by the referee.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Level 4 Warning. If the offender does not obey the penalty order, the team shall be issued a Forfeiture of the match.

6.2.1.3 Operator

An Operator can be substituted after each round.

R23 The number requirements for Operators stated in Table 1-3 must be met.

Penalties: Forfeiture of the round.

R24 The use of one's own computers is prohibited in the Operator's Room.

Penalties: Forfeiture of the round.

R25 During the Referee System Initialization Period and the 7-minute Match, Operators must remain in the relevant Operator's Room to operate the relevant computers, and remain in position after a match has started, unless otherwise permitted by the referee.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender shall be issued a Level 4 Warning. If the offender does not obey the penalty order, the offending party shall be issued a Forfeiture of the match.

R26 During the competition, Operators must wear headsets, equipped with at most one remote controller.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offender and the robots operated by the offender shall be issued a Level 4 Warning. If the offender does not obey the penalty order, the offending party shall be issued a Forfeiture of the round.

6.2.2 Robot Rules

6.2.2.1 General

R27 Robots entering a match must pass Pre-Match Inspection.

Penalties: Forfeiture of the round.

R28 In any challenge, the number of robot to play must meet the requirement stated in Table 1-1.

Penalties: Forfeiture of the current match.

R29 Robots must be attached with their corresponding armor stickers that meet the specifications.

Penalties: Before the start of the competition, offending robot is not allowed to enter the stage. During the competition, the highest penalty that can be given to the offending party, according to the seriousness of the situation, is a Level 4 Warning.

R30 Robot is not allowed to leave the Staging Area without permission.

Penalties: Verbal Warning. If a Verbal Warning is ineffective, the highest penalty that can be given to an offending robot is ejection.

R31 Robot must not carry or present safety issues including but not limited to short circuits, crashing and falling to the ground. If safety issues are present or have arisen, the relevant personnel must execute the relevant operations in accordance with the referee's instructions.

Penalties: Before the start of the competition, Pit Crew must resolve the safety issue as required by the referee. Otherwise the offending robot will not be allowed to enter the stage, and the relevant Operator will not be allowed to enter the Operator's Room, and must return to the Pit Area. Verbal Warning given during the competition. If the Verbal Warning is ineffective, a Level 4 Warning shall be issued to the offender and the robot operated by him/her or the offending robot.

R32 During the 5-second countdown in the Referee System Initialization Period, robot is not allowed to transform beyond their Maximum Initial Size.

Penalties: After the start of the competition, the offending party is issued a Level 2 Warning.

R33 During the competition, robot is not allowed to disintegrate into sub-robots or sub-systems connected by multiple flexible cables, and must not cast or launch their own parts.

Penalties: The offending robot is issued a Level 4 Warning.

R34 Except for reloading projectiles, a robot is not allowed to cover its Armor Module during a match by transforming to deflect the attacks from other robots. Robot is also not allowed to transform beyond the Maximum Expansion Size during a match.

Penalties: An X-level warning will be issued against the offending party according to the length of time (T seconds) of its robot's blockage or transformation beyond the Maximum Expansion Size.

Table 6-2 Penalties for Blockage or Transformation

T Second(s)	Level X Warning
3 < T ≤ 10	2
10 < T ≤ 30	3
T > 30	4

R35 During the competition, if the gas cylinders are found to have safety hazards (such as damage to the external

protection device, hidden dangers arising from aging, etc.), the participating members must follow the instructions of the referee to deal with the safety hazards.

Penalties: Robot with safety hazards will not be allowed to enter the stage.

6.2.2.2 Ground Robots

R36 During the Setup Period, ground robots in the Battlefield are not allowed to leave their team's Starting Zone.

Penalties: Based on their subjective intention and the influence caused to the match, the offending party or robot is issued a Level 2 or Level 4 Warning.

R37 During the Setup Period for each round, ground robots must empty their projectiles until they are no longer able to launch any projectiles. Among them, Engineer needs to empty 42mm projectiles.

Penalties: If the competition has yet to start, Pit Crew must empty the projectiles in compliance with the referee's instructions. Otherwise the offending robot will not be allowed to compete in the round. If it occurs during competition, the offending robot shall be issued a Level 4 Warning.

R38 During the competition, Engineer is not allowed to use supplement lights except for procuring Projectile Containers.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, the offending party shall be issued a Level 2 Warning.

6.2.3 Interaction Rules

6.2.3.1 Interaction between Robots

R39 Except for slowly pushing away a destroyed robot that is obstructing the path, a robot must not use any of its structures to collide with the enemy's robots.

Penalties: Based on their subjective intention and the degree of collision, the offending party or robot is issued a warning from Level 1 to 4.

Table 6-3 Penalties for Collision

Degree of collision	Description
Level 1	Actively causing front collision
Level 2	Actively causing high-speed front collision, active pushing causing the other team's robot to move, or impeding the normal movement of the other team's robot

Degree of collision	Description
Level 3	Actively causing high-speed and repeated front 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
Level 4	Actively causing high-speed, repeated and intense front collision, or engaging in active high-speed collision for a long period of time causing the robot to move across a longer distance

R40 To ensure that Sentry is fully capable of moving along its Rail, any part of a robot that attacks the opposing team's Sentry, either intentionally or unintentionally, will be deemed as violation.

Penalties: Refer to penalties for collision, see Table 6-3.

R41 A robot must not stick itself to any enemy robot through active interference, blocking or collision.

Penalties: An X-level warning will be issued against the offending party according to the length of time of sticking together T second(s) and the impact on the competition.

Table 6-4 Penalties for Sticking Together

T Second(s)	Level X Warning
T ≤ 10	1
10 < T ≤ 30	2
30 < T ≤ 60	3
60 < T ≤ 90	4
T > 90	5

R42 A team's robots must not interfere with an enemy robot during a regular projectile supply reload, HP recovery or revival.

Penalties: The offending party is issued a Level 3 Warning.

6.2.3.2 Interaction between Robots and Battlefield Components

R43 Robot of one side is not allowed to enter the Supplier Penalty Zone or Power Rune Activation Point Penalty Zone, or any part to gain contact with the opposing side's Projectile Supplier Zone, and also not allowed to block an enemy robot from entering into the Projectile Supplier Zone or Power Rune Activation Point Zone.

Penalties: Based on the length of time the robot was in the Penalty Zone, the situation of gaining contact with the Projectile Supplier Zone and the degree of blocking, the offending party is issued a warning from Level 2

to 5.

Table 6-5 Penalties for Stay, Contact and Blocking

T Second(s)	Level X Warning
T ≤ 3	2
3 < T ≤ 10	3
10 < T ≤ 30	4
T > 30	5
Block near the Penalty Zone, so that the enemy robot cannot receive regular projectile supply or strike the Power Rune	5

R44 During any match in RM2020, participating robots can only use projectiles supplied by the RMOC.

Penalties: Verbal Warning. If the Verbal Warning is ineffective, according to the seriousness of the situation, the highest penalty that can be given to the offending party is disqualification.

R45 Robots are not allowed to procure directly projectiles that have fallen to the ground.

Penalties: The offending robot is issued a Level 4 Warning.

R46 Standard is not allowed to directly procure projectiles from Projectile Containers on the Resource Island.

Penalties: The offending robot is issued a Level 4 Warning.

R47 Engineer is not allowed to grab more than one Projectile Container once or procure projectiles from more than one Projectile Container. Only when one Projectile Container has completely left the groove of the Resource Island can the next Projectile Container be taken.

Penalties: The offending robot is issued a Level 4 Warning.

R48 Engineer must not use adhesive materials to collect or place any projectile or Projectile Container.

Penalties: The offending robot is issued a Level 4 Warning.

R49 During the competition, the movements of robots must not cause any damage to the core components of the Competition Area.

Penalties: If the fault has been confirmed, the round ends and the offending party is issued a Forfeiture for the round.

6.3 Serious Violations

The following actions are considered serious violations of rules. Any serious violation by an individual or a team

will lead to a maximum penalty of disqualification from the competition. The team will be prohibited from participating in the current competition season and receiving any awards. The match results of this team will still be documented as reference for the other teams' advancement in the competition.

Table 6-6 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.	Situations have occurred in the Competition Area that violate Pre-Match Inspection requirements
3.	Causing delays deliberately or refusing to immediately leave the Competition Area after a match has ended, thereby disrupting the schedule of the competition
4.	Installing explosives or other prohibited materials on robots
5.	Team members using robots to collide with or attack other people deliberately, putting themselves and other people at risk of injury
6.	Team members deliberately damaging the opponent's robots, Battlefield Components and related equipment.
7.	Serious verbal or physical conflicts between team members and the staff of the RMOC, opponent, audience, etc.
8.	Team members do not cooperate in inspections or cause delays deliberately when the RMOC is handling an appeal
9.	Other serious actions that disrupt the competition's schedule and violate the spirit of fair competition will be penalized accordingly by the Head Referee and Chief Referee based on to the actual acts of violation
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.	Tampering with or damaging the Referee System, or interfering with any detecting function of the Referee System through technical means.
12.	Any other behavior that seriously violates the spirit of competition or has been determined by the Chief Referee as a serious violation

7. Technical Fault or Exception

7.1 Technical Fault

The faults that will trigger an Official Technical Timeout during the Setup Period are set out as follows:

Table 7-1 Descriptions of Technical Fault

Rule	Description
1	The official equipment inside the Operator's Room malfunctions.
2	During the 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's Room normally or connect to the Referee System server.
3	Structural damage or malfunctions of key Battlefield Components, for example: where a Base cannot open its shield normally; 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 Head Referee as requiring an Official Technical Timeout.

If the malfunction referred to in Rule 2 occurs during a Setup Period between rounds or during a Round, it will be categorized as "regular battle damage", as it cannot be determined whether the malfunction was caused by the Referee System module, a flaw in the robot's mechanical or electrical system designs, or robot combat from previous matches. Regular battle damage will not trigger an Official Technical Timeout. Technical Referees will provide backup Referee System modules. Teams can request for a Team Technical Timeout to repair their robots.

7.2 Exception

Any exception that occurs during the competition should be handled as follows:

- When a robot safety hazard or exception in a robot has occurred on the Battlefield, such as battery explosion, stadium power outage, explosion of a compressed gas cylinder, or interpersonal conflict), the Head Referee will notify both teams through the Operator's Room Referees after discovering and confirming the emergency, and eject all robots through the Referee System. The result of the round will be invalidated. The round will restart after the safety hazard or exception has been eliminated.
- If the general Battlefield Components are damaged during a match (damage to the ground rubber surface, ground lighting, or Base lighting), the match will proceed as usual. If there is structural damage or malfunction of key Battlefield Components (Base armor module shifts, drops or cannot detect hit damage, Power Rune cannot be triggered by normal hit), the Head Referee will notify both teams through the Operator Room

Referees after discovering and confirming the emergency, and eject all robots through the Referee System. The result of the round will be invalid. The Technical Referees will enter the Battlefield to perform repairs. The round will restart once the Battlefield Component resumes its normal function.

- If certain Battlefield Components experience logical or structural faults that are not caused by participants in the process of the match, for example where no buff is gained after a Power Rune is hit or a Base cannot open its shield normally, the Referee will solve the problem manually through the Referee System. If the problem cannot be solved manually through the Referee System and after determining that the issue cannot be eliminated, the Referee will notify both teams through the Operator Room Referee and eject all robots through the Referee System. The round ends immediately and its result is invalidated. The round will restart after the issue has been solved.

  ⚠ Resolving issues manually will cause delays, and the RMOC will not be responsible for any resulting consequences.

- 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 Head Referee did not confirm the situation and end the game in time, causing a Round that should have been ended to continue and thereby produce a winner, the result of the Round will be deemed invalid once confirmed by the Chief Referee, and one rematch will be given.

- If a serious violation has taken place that clearly warrants a Level 5 Warning but the Head Referee did not confirm the situation and did not issue a Level 5 Warning in a timely manner, the original match result will be deemed invalid once confirmed by the Head Referee or an appeal has been allowed after the match, and the offending team will be given a Level 5 Warning and penalty.

- 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.

8. Appeal

Each team has the right to one appeal during the China Regional Competition, Wild Card Competition, International Regional Competition, and Final Tournament. However, opportunities to appeal cannot be accumulated 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 Head Referee and heads of the RMOC. The Arbitration Commission has the final right of interpretation on all appeal decisions.

8.1 Appeal Process

Teams filing an appeal must follow the procedure below:

1. Within five minutes after a match ends, the appealing team's Captain submits an appeal request and signs an Appeal Form at the Referee Area. 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 five 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 one hour. The materials collected will need to be submitted to the Arbitration Commission, which will further communicate with the team members involved in the appeal. If neither side needs to collect evidence or defense materials, proceed to the next step.
4. After the Head Referee has accepted the appeal request, the staff will invite the Captain of both teams to meet in the Arbitration Room. Each team can only send three members to the Arbitration Room, and they must be regular members or the Supervisor. The presence of either the Captain or the Project Manager is mandatory.
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.
6. 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 Supervisor within five minutes after the match ends (both signing on the Appeal Form at the same time).

The time for submission of evidence and materials is shortened to within 30 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.

8.2 Appeal Validity

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

- Validity period for appeal requests: Appeals must be made within five minutes after the end of a match and recorded on the Appeal Form. 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 30 minutes of being notified by the Arbitration Commission. If a team is absent during the validity period for both teams to meet at the Arbitration, the absent team is deemed to have given up its right to the arbitration. If more than three members of a team are present at 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 60 minutes of making an appeal. The Arbitration Commission will not accept any new materials beyond this 60-minute limit.

8.3 Appeal Material

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: Each video cannot 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 Commission has the authority to isolate any relevant robot from both teams after an appeal has been made. These robots will not be isolated for more than three hours and will be returned to the teams latest when the arbitration decision is announced.

8.4 Appeal Decision

The Arbitration Commission will provide its final arbitration decision on the Appeal Form, which both team Captains must sign within an hour of 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 Commission.

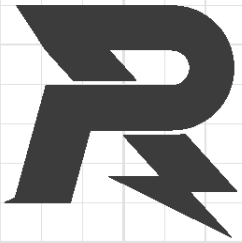
If the Arbitration Commission requires both teams to hold a rematch, the Organizing Committee will inform both teams of the rematch time when the arbitration decision is announced. If both teams refuse to hold a rematch, the appeal is deemed failed and the original match results are maintained. If only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

Appendix 1 Safety Instruction

Every team member participating in the RoboMaster 2020 must fully understand and accept that safety is the most important issue for the sustainable development of the RoboMaster Competition. In order to protect the rights and interests of all team members and the event organizers, and according to relevant laws and regulations, all team members who have registered for RM2020 will be deemed to have acknowledged and agreed to abide by the following safety terms:

1. All team members who have registered to take part in the RoboMaster 2020 Competition confirm that they possess the full capacity for civil conduct and can independently create and operate robots. All team members further confirm that, before using any products of the competition organizer SZ DJI Technology Co., Ltd., to create any robots, they will read in detail the RoboMaster 2020 Competition registration guide, competition regulations, and other important documents containing rules and regulations related to the competition.
2. During the competition, all team members should make sure that their actions including the creation, testing, and use of robots will not cause any injury or damage to his or her teammates, members of the opposing teams, staff, audience, equipment, or the Competition Area.
3. All teams must ensure that the structural design of their robots will not hinder safety inspection during Pre-Match Inspection, and agree to fully cooperate in the Pre-Match Inspection carried out by RoboMaster's organizers.
4. All teams guarantee that they will not use any internal combustion engines, explosives, or high-pressure gas as working gas, or any dangerous materials.
5. During any stage of the R&D, preparation or competition period, all team members must be fully aware of any potential safety issues, and the team's Supervisor is responsible for instructing and supervising the team on safety issues.
6. All teams must guarantee the safety of all robots. This includes ensuring the projectile launchers installed on robots are safe, and that they will not cause any harm either directly or indirectly to any Operator, referee, staff member or audience member.
7. All teams will take sufficient and necessary safety measures during the R&D, training and competition periods regarding any hazardous situations that may occur. These include but are not limited to: preventing the control system from becoming unstable; anticipating every operation step prior to execution to avoid errors or collisions between team members or between robots and team members; prohibiting team members from engaging in solo training and making sure personnel are available as emergency responders to any situation; wearing goggles and helmets; applying the spotlight lock function and adding an emergency stop function other measures in a robot during debugging.

8. Teams will be held responsible for all accidents and losses resulting from the technical faults of robots, loss of control of UAVs or any other unexpected circumstances.
9. The materials bought from or provided by the organizer SZ DJI Technology Co., Ltd., such as batteries and the Referee System, must be used in accordance with their instructions. SZ DJI Technology Co., Ltd. will not be held responsible for any injuries that arise from improper use of these materials. Teams will be held responsible for any injuries caused to their own members or any third party and for any property loss arising from creating and operating any robots.
10. All team members must remain in strict compliance with the laws and regulations of the country or region. All team members pledge that their robots will only be used for the RoboMaster competitions and that their robots will not be illegally modified or used for any illicit purpose.



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