

V1.0

Using a 1248 motor allows using an
high-rated 12V 20A DC power supply.
RoboMaster uses brushless DC motor speed
control to enable precise control of motor
speed.

Designed for the RoboMaster
chassis and designed to use Motor and
Gear Interface Kit Motor Gear Interface
Kit (MIGIK) accessories (includes sensor
cable and a limited board).

RoboMaster System Specification Manual
RoboMaster System Specification Manual
of RoboMaster System Manual

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ROBOMASTER

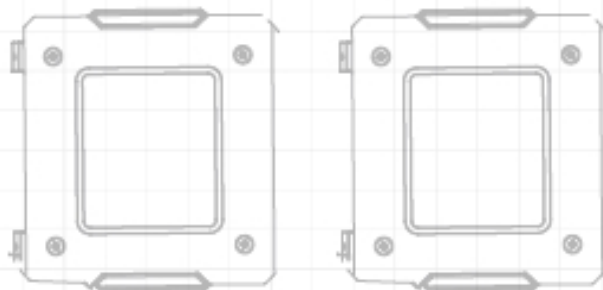
ROBOMASTER 2019

ROBOTICS COMPETITION

TECHNICAL CHALLENGE

PARTICIPANT'S MANUAL

Prepared by the RoboMaster Organizing Committee
Updated on July, 2019





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1. Competition summary

1) List of organizing committees (in no particular order)

Honorary Chairman: Cai Hejun Academician
Executive Chairman: Li Zexiang Professor (Hong Kong University of Science and Technology)
Vice Chairman: Xu Chen Vice President (Shenzhen University)
Han Shangfeng Deputy Secretary of the Party Committee and Vice President (China University of Petroleum (Beijing))
Zheng Qinghua Vice President and Professor (Xi'an Jiaotong University)
Competition Advisors: Gao Deli Academician (China University of Petroleum (Beijing))
Feng Zuren Professor (Xi'an Jiaotong University)
Shang Xuebing (Foshan Education Bureau)
Shen Shaojie Professor (Hong Kong University of Science and Technology)
Pan Jia Professor (University of Hong Kong)
Quan Long Professor (Hong Kong University of Science and Technology)
Qiu Li Professor (Hong Kong University of Science and Technology)
Zhang Lei Professor (Hong Kong Polytechnic University)
Shi Ling Professor (Hong Kong University of Science and Technology)
Zong Guanghua Professor (Beijing Aerospace University)
Lu Jilian Professor (Beijing Institute of Technology)
Harald Löwe Dr. (Brunei University of Technology, Germany)
Frank C.Park Professor (Seoul University)
G. Chirikjian Professor (Johns Hopkins University)

2) Organizational structure

Sponsors: The Communist Youth League of China

The All-China Students' Federation

Shenzhen Municipal People's Government

Undertakers: SZ DJI Technology Co., Ltd.

Organizers: Shenzhen Municipal Science and Technology Innovation Committee

Shenzhen Municipal Committee of the Communist Youth League

Nanshan District Government, Shenzhen Municipality

Supporters: The China Youth Development Foundation

The CCYL National Research Center of Colleges and Middle Schools

Shenzhen University

Shenzhen Second Senior High School

Shenzhen Bao'an District Youth Service Center (The Youth Palace)



Co-organizers: Applied Technology University (College) Ministry of Education Alliance
MLT Advisory Board under the Ministry of Education
CLT Advisory Board under the Ministry of Education

2. List of Competing Teams

Engineer island climbing & projectile pick-up		
No.	School	Team name
1	Anhui Institute of Information Engineering	Artisans
2	Dalian Jiaotong University	TOE
3	University of Electronic Science and Technology	One Point Five
4	Northeastern University	TDT
5	Dongguan Institute of Technology Guangdong University of Science and Technology & Taiwan Chung Cheng University	Kinetic Robotics
6	Foshan University of Science and Technology	Lions
7	Virginia Polytechnic Institute and State University	Yipin Zhou
8	Fukuoka Union University	Fukuoka Niwaka
9	Fujian Institute of Technology	Zhongwei Power
10	Guilin University of Electronic Technology	Evolution
11	Harbin Institute of Technology	I Hiter
12	South China University of Technology, Guangzhou College	Wild Wolves
13	Nanjing University of Aeronautics and Astronautics	Sky&Wind ENG2
14	Sino-British International College, University of Shanghai for Science and Technology	RoboVigor
15	Shenzhen University	RobotPilots
16	Taiyuan Institute of Technology	FireWire
17	Xi'an Jiaotong University	SpeedNet
18	Xi'an Jiaotong-Liverpool University & University of Liverpool	GMaster
19	The University of Hong Kong	HerKules
20	The Hong Kong University of Science and Technology	ENTERPRIZE



21	Yanshan University	YanYing
22	Zhejiang Fashion Institute of Technology	Gourd Doll
23	China University of Mining and Technology	CUBOT
24	China University of Petroleum (Beijing)	SPR
25	Sun Yat-sen University	Yat-sen Lions
Infantry Racing & Smart Shooting		
No.	School	Team name
1	University of Macau	π
2	Macau University of Science and Technology	MRobotic
3	Beijing University of Science and Technology	Reborn S
4	Zhuhai College, Beijing Institute of Technology	HengYi Giant
5	Pennsylvania State University	RoboX
6	University of British Columbia	BearBots
7	Dalian Jiaotong University	TOE
8	Northeastern University	TDT
9	Dongguan Institute of Technology Guangdong University of Science and Technology & Taiwan Chung Cheng University	Kinetic Robotics
10	Virginia Polytechnic Institute and State University	RoboGrinder
11	Fukuoka Union University	Fukuoka Niwaka
12	Harbin Institute of Technology	I Hiter
13	Leuven University	LAB Robotix
14	McMaster University	MacFalcons
15	University of Nottingham Ningbo	NingboWorkshop
16	Queen's University	Queen' s knights
17	Shandong University of Science and Technology	SmartRobot
18	Shanghai Jiao Tong University	Jiao Dragons
19	Sino-British International College, University of Shanghai for Science and Technology	RoboVigor
20	Shenzhen University	RobotPilots
21	Xi'an Jiaotong University	SpeedNet
22	Northwestern Polytechnical University	WMJ
23	Xi'an Jiaotong-Liverpool University & University of Liverpool	GMaster
24	The University of Hong Kong	HerKules



25	The Hong Kong University of Science and Technology	ENTERPRIZE
26	China University of Mining and Technology	CUBOT
Hero far shot		
No.	School	Team name
1	Beijing University of Science and Technology	Reborn X
2	Northeastern University	TDT
3	Northeast Forestry University	Ares
4	Dongguan Institute of Technology Guangdong University of Science and Technology & Taiwan Chung Cheng University	Kinetic Robotics
5	Virginia Polytechnic Institute and State University	RoboGrinder
6	Fukuoka Union University	FUKUOKA NIWAKA
7	Fujian Institute of Technology	ZhongWei Power
8	Harbin Engineering University	DreamWings
9	Harbin Institute of Technology	I Hiter
10	South China University of Technology, Guangzhou College	Wild Wolves
11	South China Normal University	Pioneer
12	University of Washington	AdvancedRobotics
13	Nanjing University of Aeronautics and Astronautics	SkyWing_Hero
14	Nanjing University of Science and Technology	Alliance
15	University of Nottingham Ningbo	NingboWorkshop
16	Xiamen University Jiageng College	TCR
17	Shandong University of Science and Technology	SmartRobot
18	Sino-British International College, University of Shanghai for Science and Technology	RoboVigor
19	Shenzhen University	RobotPilots
20	Taiyuan University of Technology	TRoMac
21	Xi'an Jiaotong University	SpeedNet
22	The University of Hong Kong	HerKules
23	The Hong Kong University of Science and Technology	ENTERPRIZE
24	China University of Mining and Technology	CUBOT



Infantry Battle

No.	School	Team name
1	University of Macau	π
2	Beijing University of Technology	Light of Hope
3	Beijing Institute of Technology	Nuclear
4	Pennsylvania State University	RoboX
5	University of British Columbia	BearBots
6	Dongguan Institute of Technology Guangdong University of Science and Technology & Taiwan Chung Cheng University	Kinetic Robotics
7	Harbin Institute of Technology (Weihai)	HERO
8	South China Normal University	Pioneer
9	McMaster University	MacFalcons
10	Nanchang University	Passion
11	University of Nottingham Ningbo	NingboWorkshop
12	Queen's University	Queen's Knights
13	Xiamen University	RCS
14	Xiamen University Jiageng College	TCR
15	Shanghai University	SRM
16	Shanghai University of Science and Technology	Pigeons
17	Sino-British International College, University of Shanghai for Science and Technology	RoboVigor
18	Shenzhen Vocational and Technical College	RCIA
19	Xi'an Jiaotong-Liverpool University & University of Liverpool	GMaster
20	Southwest Minzu University	AmbitiousYounger
21	Yunnan University & Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences	Future
22	ZJU-UIUC Institute	Meta

* This list is in no particular order.



3. Competition System and Prizes

1) Competition System

For the RoboMaster Technical Challenge Finals (hereafter referred as "Technical Challenge Finals") of the RoboMaster 2019 Robotics Competition, the number of teams participating in the Engineer Island Climbing & Projectile Pick-up Program is 25; The number of teams participating in the Infantry Racing & Smart Shooting Program is 26; The number of teams participating in the Hero Far Shot Program is 24. In all three programs all the teams will enter the stage. The order will be announced after the results of the RM2019 RoboMaster Final Tournament draw on August 5, 2019, and will be adjusted in real time according to the RM2019 Masters Final Tournament schedule.

The number of teams participating in the Infantry Battle of RoboMaster 2019 Technical Challenge Finals is 22 and all groupings will be decided by the draw. The 22 teams will be divided into 6 groups (A, B, C, D, E, F). The A, B, C, and D groups each have 4 teams, and the E and F groups each have 3 teams. At the draw, there will be one drawing box. The box has 22 balls corresponding to each team. Chief Referee will draw teams for A1, B1, C1, D1, E1, F1, A2, B2, C2, D2, E2, F2, A3, B3, C3, D3, E3, F3, A4, B4, C4, D4.

1. Competition System

(1) Engineer Island Climbing & Projectile Pick-up, Infantry Racing & Smart Shooting

It consists of a practice match and an official match for Engineer island climbing & Projectile Pick-up, the Infantry Racing & the Smart Shooting of the Technical Challenge Finals.

Practice Match: Each team gets a chance for Practice Match. Teams participating in only one of the programs will have 20 minutes of Practice Match time, while teams participating in both programs will have a total of 40 minutes of Practice Match time.

Official Match: All teams will enter the stage one by one to complete the match. The team participating in only one program will have 15 minutes for the whole match (including 1 minute to enter stage, 1 minute for preparation, 9 minutes for three rounds, 2 minutes of adjustments in total between matches and 2 minutes to leave the stage). The total match time for teams participating in both programs is 30 minutes. After the end of all matches, all teams will be ranked according to the ranking rules.

(2) Hero far shot



It consists of practice match and formal match for Hero Far Shot of the Technical Challenge Finals.

Practice Match: Each team gets a chance for Practice Match, time is 15 minutes. **Teams participating at the same time in the RM2019 RoboMaster Finals will not be arranged otherwise for a practice match.**

Official match: A team will enter the stage and complete the match one after another in 15 minutes (including 1.5 minutes to enter the stage, 1.5 minutes for preparation, 9 minutes for three rounds, 2 minutes between matches and 1 minute for leaving the stage). After the end of all matches, all teams will be ranked according to the ranking rules.

(3) Infantry Battle

It consists of Practice Match , Group Round Robin, 6/12 double-loss knockout, 4/6 Tournament, 4/6 Knock-out Stage, Semifinals, Second Runner-up Contest and Champion Contest for Infantry Battle of the Technical Challenge Finals.

Practice Match: Each team has a chance for a practice match, which lasts for 20 minutes and includes a BO2 match and time for orientation.

Group Round Robin (BO2): The team will be divided into 6 groups for Group Round Robin, with each team having equal chance to enter the stage. The Group Round Robin shall use the BO2 system, which is 2 rounds per game, with a duration of 10 minutes (including 2 minutes to enter the stage, 1 minute for preparation, 4 minutes for two rounds, 1 minute between matches and 2 minutes to leave the stage). The groups are ranked according to the Group Round Robin ranking principle. Each group' s first and second teams advance to 6/12 Double Elimination Knockout stage.

6/12 Double Elimination Knockout Stage (BO3): 6/12 Double Elimination Knockout stage (BO3) competition system: 3 rounds per match, winner of two rounds wins, 12 minutes in total (including 2 minutes to enter the stage, 1 minute for preparation, 6 minutes for three rounds, 2 minute between matches and 1 minutes to leave the stage). Six teams will be selected from the top 12 teams through double elimination to advance to the 4/6 Tournament.

4/6 Tournament (BO2): 3 teams from the winner group will enter into the 4/6 Tournament, with a duration of 10 minutes (including 2 minutes to enter the stage, 1 minute for preparation, 4 minutes for two rounds, 1 minute between matches and 1 minute to leave the stage). Based on the tournament ranking, the top 2 teams will directly advance to the Semifinals, and the third team goes to the 4/6 Knockout Stage.

4/6 Knockout Stage (BO3): 3 teams of the loser group, and the third team in the 4/6 Tournament enter into 4/6 Knockout Stage using BO3 competition system, i.e. three rounds are played in each match, and the winner of two rounds wins the match. Time duration is 12 minutes (including 2 minutes to enter the stage, 1 minute for preparation, 6 minutes for three rounds, 2 minute between matches and 1 minutes to leave the stage). Two teams will be selected by single



elimination to advance to the Semifinals.

Semifinals (BO3): The Semifinals uses BO3 competition system, which means every match has 3 rounds, winner of 2 rounds wins the match. Time duration is 12 minutes (including 2 minutes to enter the stage, 1 minute for preparation, 6 minutes for three rounds, 2 minute between matches and 1 minutes to leave the stage). Teams will be selected using single elimination to compete for Infantry Battle Champion Contest and Second Runner-up Contest of Technical Challenge Finals.

Champion Contest and Second Runner-up Contest (BO5): Champion Contest and Second Runner-up Contest use the BO5 competition system, that is, 5 rounds per match, the winner of 3 rounds wins the match. Time duration is 20 minutes (including 2 minutes to enter the stage, 1 minute for preparation, 10 minutes for five rounds, 4 minutes in total between matches and 3 minutes to leave the stage). The first, second and third places in the infantry battle program of Technical Challenge Finals will be decided using single elimination.

2. Ranking rules and conditions for winning

Engineer Island Climbing & Projectile Pick-up Ranking Rules

1. Each team can initiate three challenges and take the highest total score of the three 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 of their robots, with the lightest ranking higher.

Infantry Racing & Smart Shooting Ranking Rules

1. Each team can initiate three challenges and take the shortest time used of the three challenges as the final score. The team that spends the least amount of time to finish the challenge ranks the highest.
2. If the time it takes for two or more teams to finish the challenge is the same, the teams will be ranked based on the remaining HP' s of their robots.
3. If the time it takes for two or more teams to finish the challenge and the remaining HP values of the robots are the same, whichever team has the lightest robot will be ranked the highest.

Hero Far Shot Program Ranking Rules

1. Each team can initiate three challenges and take the highest total score of the three 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 remaining HP values of their Heroes.
3. If the total scores and the remaining HP values of the Heroes of several teams are the same, the teams will be ranked based on the weight of their robots, with the lighter ranking higher.

Infantry Battle Program conditions for winning



1. If a team's robot attacks the armor modules of the enemy robot until the enemy's HP drops to zero, then the team wins.

2. When the round is over, if the HP of both teams is not zero, the one with the higher remaining HP wins.

3. When the round is over, if the remaining HP of both teams is the same, the one with less weight wins.

Competition System	Competition result	Points
BO2	2:0	Winner of two rounds gets three points
	1:1	One point for each team
	0:2	Loser of two rounds gets zero points
Competition System	Conditions for winning	
BO3	Two-round winner	
BO5	Three-round winner	

Infantry Battle Group Round Robin Ranking Rules

The following criteria are used to determine rankings in descending order of priority:

1. The team with the higher number of total match points ranks higher.
2. If teams have the same total match points, the team with higher infantry Remaining HP accumulated from Group Stage ranks higher.
3. If the infantry accumulative remaining HPs are the same, then compare parallel teams' infantry weight. The lighter ranks higher.
4. If two or more teams still share the same ranking, the RoboMaster Organizing Committee will arrange playoff matches on a round-robin basis.

2) Award System

1. Finals Awards

Engineer Island Climbing & Projectile Pick-up		
Awards	Quantity	Reward
National Grand Prize	1	Grand prize trophy Honor certificate for the grand prize Bonus RMB 5,000 (pre-tax)
National First Prize	Multiple	Honor certificate for the first prize Bonus RMB 4,000 (pre-tax)
National Second Prize	Multiple	Honor certificate for the second prize



National Third Prize	Multiple	Honor certificate for the third prize
Infantry Racing & Smart Shooting		
Award	Quantity	Reward
National Grand Prize	1	Grand prize trophy Honor certificate for the grand prize Bonus RMB 5,000 (pre-tax)
National First Prize	Multiple	Honor certificate for the first prize Bonus RMB 4,000 (pre-tax)
National Second Prize	Multiple	Honor certificate for the second prize
National Third Prize	Multiple	Honor certificate for the third prize
Hero far shot		
Award	Quantity	Reward
National Grand Prize	1	Grand prize trophy Honor certificate for the grand prize Bonus RMB 5,000 (pre-tax)
National First Prize	Multiple	Honor certificate for the first prize Bonus RMB 4,000 (pre-tax)
National Second Prize	Multiple	Honor certificate for the second prize
National Third Prize	Multiple	Honor certificate for the third prize
Infantry Battle		
Award	Quantity	Reward
National Grand Prize	1	Grand prize trophy Honor certificate for the grand prize Bonus RMB 5,000 (pre-tax)
National First Prize	Multiple	Honor certificate for the first prize Bonus RMB 4,000 (pre-tax)
National Second Prize	Multiple	Honor certificate for the second prize
National Third Prize	Multiple	Honor certificate for the third prize

The number of winners will be determined according to the number of participating teams.

2. Open source award

Award	Quantity	Reward	Notes
Open Source Grand Prize	Multiple	Honor certificate RMB 100,000 (pre-tax)	In the RM2019 season (September 20, 2018 to August 31, 2019), the core technologies
Open Source First Prize	Multiple	Honor certificate RMB 50,000 (pre-tax)	
Open Source	Multiple	Honor certificate	

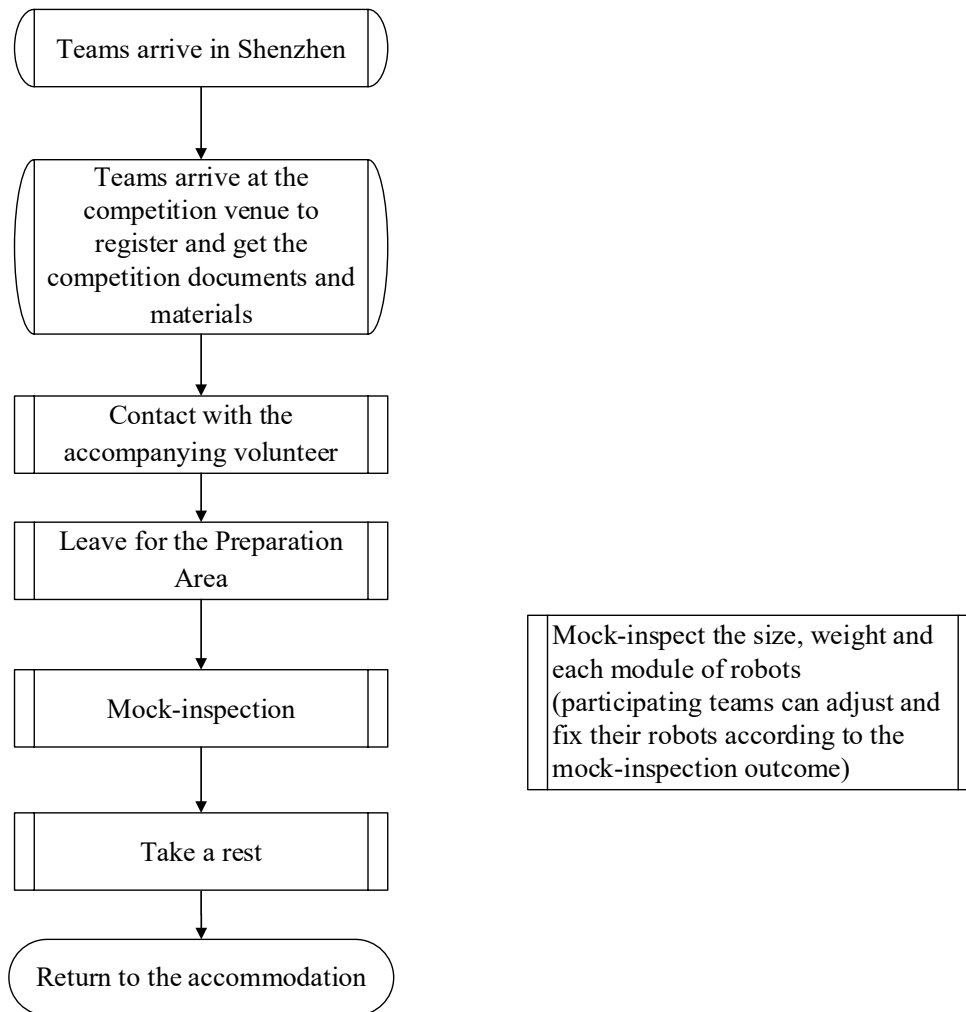


Second Prize		RMB 30,000 (pre-tax)	operation management approaches were publicly shared in the RoboMaster BBS and on the official website to promote the development of the RoboMaster Robotics Competition and the culture and spirit of engineers
Open Source Third Prize	Multiple	Honor certificate RMB 100,000 (pre-tax)	
Open Source Outstanding Award	Multiple	Honor certificate A level: RMB 5,000 (pre-tax) B level: RMB 3,000 (pre-tax) C level: RMB 2,000 (pre-tax)	



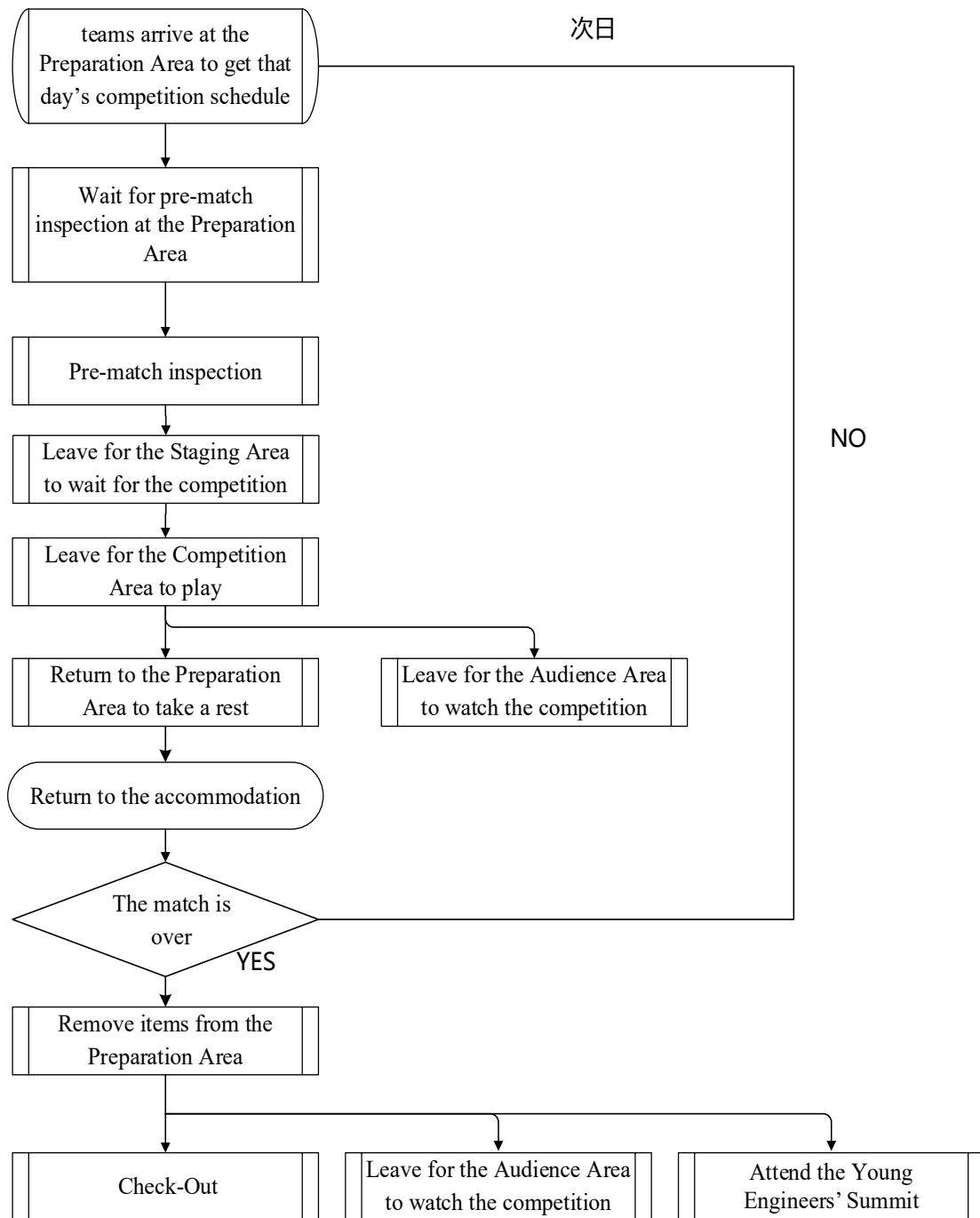
4. Competition organization

1) Check-in Day Flow Chart



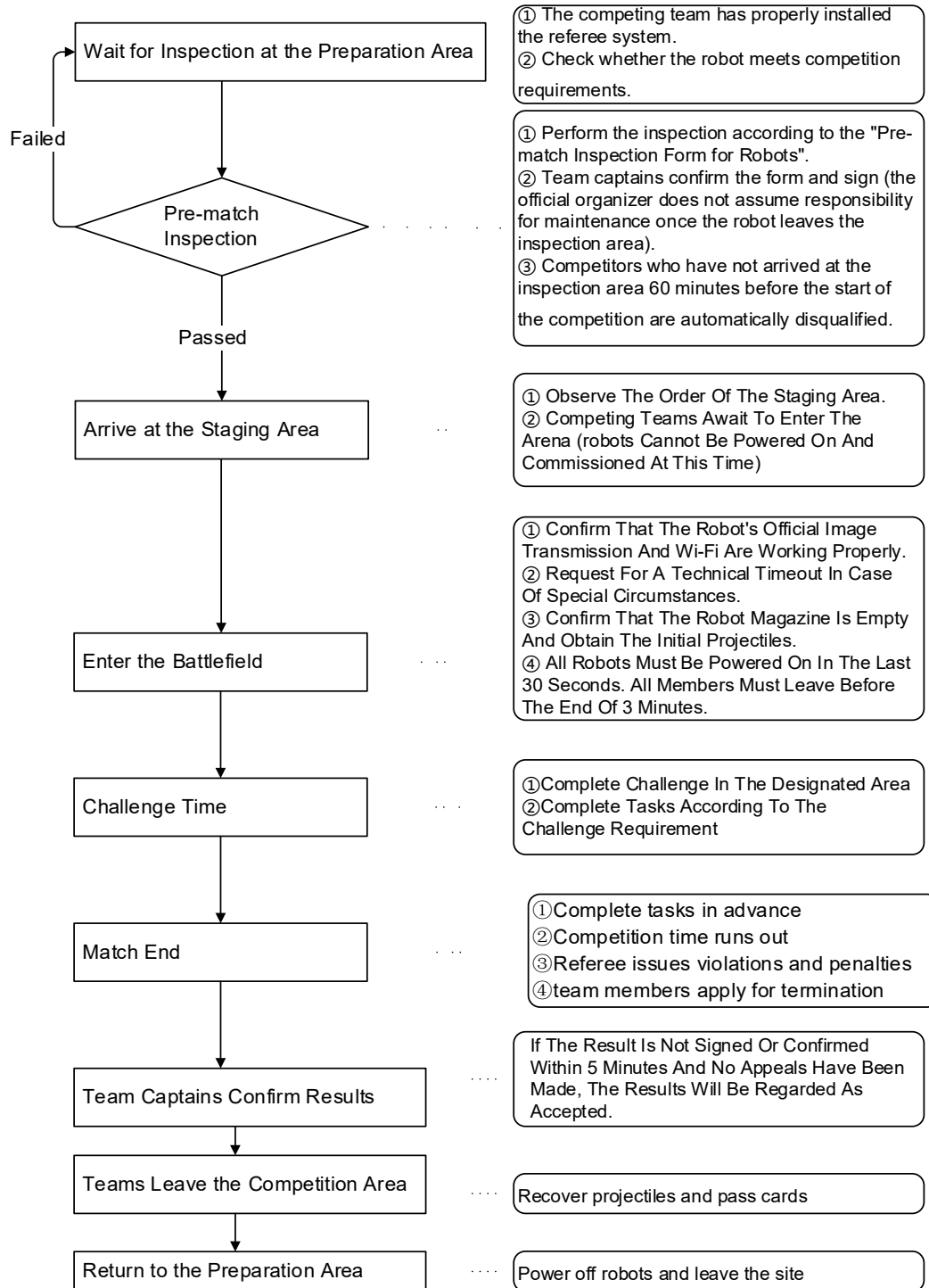


2) Competition Day Flow Chart





3) Single Match Flow Chart





4) Competition order and schedule

1. Registration, Mock Inspection, Captains Meeting, Draw

August 5, 2019

Time	Item	Instructions
9:30-18:00	Team Check-in	The teams check in and receive competition information.
		The order for practice match is according to the team' s check-in order.
9:30-18:00	Mock Inspection	Mock inspection of robot size, weight, referee system, etc.

August 6, 2019

Time	Item	Instructions
17:00-17:30	Captains Meeting	Each team must have 1~2 representatives participating
17:30-18:00	Draw	Only for Infantry Battle Program

2. Infantry Racing & Smart Shooting

1) August 6, 2019

Match No.	Team	Time
Practice Match		
Morning inspection		Begins 9:30
1	Team 1 check-in	10:30-11:10
2	Team 2 check-in	11:10-11:50
3	Team 3 check-in	11:50-12:30
Break		12:30-13:30
Afternoon Inspection		Begins 12:30
4	Team 4 check-in	13:30-14:10



5	Team 5 check-in	14:10-14:50
6	Team 6 check-in	14:50-15:30
7	Team 7 check-in	15:30-16:10
8	Team 8 check-in	16:10-16:50
Break		16:50-17:50
Evening Inspection		Begins 16:50
9	Team 9 check-in	17:50-18:30
10	Team 10 check-in	18:30-19:10
11	Team 11 check-in	19:10-19:50
12	Team 12 check-in	19:50-20:30
13	Team 13 check-in	20:30-21:10

***Actual time may differ. Teams participating in only one of the programs will have 20-minute practice match time and teams participating in both programs will have 40 minutes for practice match.**

2) August 7, 2019

Match No.	Team	Time
Practice Matches		
Morning inspection		Begins 9:30
14	Team 14 check-in	10:30-10:50
15	Team 15 check-in	10:50-11:10
16	Team 16 check-in	11:10-11:30
17	Team 17 check-in	11:30-11:50
18	Team 18 check-in	11:50-12:10
19	Team 19 check-in	12:10-12:30
Break		12:30-13:30
Afternoon Inspection		Begins 12:30
20	Team 20 check-in	13:30-13:50
21	Team 21 check-in	13:50-14:10
22	Team 22 check-in	14:10-14:30
23	Team 23 check-in	14:30-14:50
24	Team 24 check-in	14:50-15:10
25	Team 25 check-in	15:10-15:30
26	Team 26 check-in	15:30-15:50
27	Team 27 check-in	15:50-16:10



28	Team 28 check-in	16:10-16:30
29	Team 29 check-in	16:30-16:50
30	Team 30 check-in	16:50-17:10
Break		17:10-18:10
Evening Inspection		Begins 17:10
31	Team 31 check-in	18:10-18:30
32	Team 32 check-in	18:30-18:50
33	Team 33 check-in	18:50-19:10
34	Team 34 check-in	19:10-19:30
35	Team 35 check-in	19:30-19:50
36	Team 36 check-in	19:50-20:10
37	Team 37 check-in	20:10-20:30
38	Team 38 check-in	20:30-20:50

***Actual time may differ. Teams participating in only one of the programs will have 20-minute practice match time and teams participating in both programs will have 40 minutes for practice match.**

3) August 8, 2019

Match No.	Team	Time
Official Competition		
Morning inspection		Begins 9:30
1	Team 1	10:30-11:00
2	Team 2	11:00-11:30
3	Team 3	11:30-12:00
4	Team 4	12:00-12:30
Break		12:30-14:00
Noon Inspection		Begins 13:00
5	Team 5	14:00-14:30
6	Team 6	14:30-15:00
7	Team 7	15:00-15:30
8	Team 8	15:30-16:00
9	Team 9	16:00-16:30
10	Team 10	16:30-17:00
11	Team 11	17:00-17:30
Break		17:30-19:00
Evening Inspection		Begins 18:00



12	Team 12	19:00-19:30
13	Team 13	19:30-20:00

***Actual time may differ. Teams participating in only one of the programs will have 15-minute practice match time and teams participating in both programs will have 30 minutes for practice match. Teams must use up three challenge opportunities in one match.**

4) August 9, 2019

Match No.	Team	Time
Official Competition		
Morning inspection		Begins 09:30
14	Team 14	10:30-10:45
15	Team 15	10:45-11:00
16	Team 16	11:00-11:15
17	Team 17	11:15-11:30
18	Team 18	11:30-11:45
19	Team 19	11:45-12:00
20	Team 20	12:00-12:15
21	Team 21	12:15-12:30
Break		12:30-14:00
Afternoon Inspection		Begins 12:30
22	Team 22	14:00-14:15
23	Team 23	14:15-14:30
24	Team 24	14:30-14:45
25	Team 25	14:45-15:00
26	Team 26	15:00-15:15
27	Team 27	15:15-15:30
28	Team 28	15:30-15:45
29	Team 29	15:45-16:00
30	Team 30	16:00-16:15
31	Team 31	16:15-16:30
32	Team 32	16:30-16:45
33	Team 33	16:45-17:00
34	Team 34	17:00-17:15
35	Team 35	17:15-17:30
36	Team 36	17:30-17:45
37	Team 37	17:45-18:00



38	Team 38	18:00-18:15
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***Actual time may differ. Teams participating in one of the programs will have a 15-minute practice match time and teams participating in both programs will have 30 minutes for practice match. Teams must use up three challenge opportunities in one match.**

3. Hero far shot

(1) August 9, 2019

Match No.	Team	Time
Practice Match		
Noon Inspection		Begins 15:20
1	Technical Challenge team 1, Technical Challenge team 2	16:30-16:45
2	Technical Challenge team 3, Technical Challenge team 4	16:45-17:00
3	Technical Challenge Team 5	17:00-17:15

***Only 5 teams participating in the Technical Challenge have the opportunity for practice match of the Hero Far Shot**

Match No.	Team	Time
Official Competition		
1	Team 1, 2	17:15-17:30
2	Team 3, 4	17:30-17:45
3	Team 5, 6	17:45-18:00

***Actual time may differ. Teams must use up three challenge opportunities in one match.**

(2) August 10, 2019

Match No.	Team	Time
Noon Inspection		Begins 12:00
4	Team 7, 8	13:00-13:15
5	Team 9, 10	13:15-13:30
6	Team 11, 12	13:30-13:45
7	Team 13, 14	13:45-14:00
Battle Program Break		17:20-20:00



Afternoon Inspection		Begins 16:50
8	Team 15, 16	17:30-17:45
9	Team 17, 18	17:45-18:00
10	Team 19, 20	18:00-18:15
11	Team 21, 22	18:15-18:30
12	Team 23, 24	18:30-18:45

*Actual time may differ. Teams must use up three challenge opportunities in one match.

4. Infantry Battle

(1) August 6, 2019

Match No.	Red Team	Blue team	Winner	Loser	Time
Practice Match					
Morning Inspection					Begins 09:30
1	Team 1	Team 2			10:30-10:50
2	Team 3	Team 4			10:50-11:10
3	Team 5	Team 6			11:10-11:30
4	Team 7	Team 8			11:30-11:50
5	Team 9	Team 10			11:50-12:10
6	Team 11	Team 12			12:10-12:30
Break					12:30-14:00
Afternoon Inspection					Begins 13:00
7	Team 13	Team 14			13:30-13:50
8	Team 15	Team 16			13:50-14:10
9	Team 17	Team 18			14:10-14:30
10	Team 19	Team 20			14:30-14:50
11	Team 21	Team 22			14:50-15:10

*Actual time may differ.

(2) August 7, 2019

Matc	Red team	Blue team	Winner	Loser	Time
Group Round Robin (BO2)					
Morning Inspection					Begins 9:30



1	A1	A4			10:30-10:40
2	B1	B4			10:40-10:50
3	C4	C1			10:50-11:00
4	D4	D1			11:00-11:10
5	E1	E3			11:10-11:20
6	F1	F3			11:20-11:30
Break					11:30-12:30
Afternoon Inspection					Begins 11:30
7	A2	A3			12:30-12:40
8	B2	B3			12:40-12:50
9	C3	C2			12:50-13:00
10	D3	D2			13:00-13:10
11	E2	E3			13:10-13:20
12	F2	F3			13:20-13:30
Interval Break					13:30-14:30
13	A3	A1			14:30-14:40
14	B3	B1			14:40-14:50
15	C1	C3			14:50-15:00
16	D1	D3			15:00-15:10
17	E2	E1			15:10-15:20
18	F2	F1			15:20-15:30
Interval Break					15:30-16:30
19	A2	A4			16:30-16:40
20	B2	B4			16:40-16:50
21	C4	C2			16:50-17:00
22	D4	D2			17:00-17:10
Break					17:10-18:10
Afternoon Inspection					Begins 17:10
23	A1	A2			18:10-18:20
24	B1	B2			18:20-18:30
25	C2	C1			18:30-18:40
26	D2	D1			18:40-18:50
Break					18:50-19:50
27	A4	A3			19:50-20:00
28	B4	B3			20:00-20:10
29	C3	C4			20:10-20:20
30	D3	D4			20:20-20:30

*Actual time may differ.



(3) August 8, 2019

Match No.	Red team	Blue team	Winner	Loser	Time
Morning Inspection					Begins 09:30
Infantry Battle Knockout Stage (BO3)					
31	A-1	B-2	Winner ①	Loser ①	10:30-10:42
32	B-1	C-2	Winner ②	Loser ②	10:42-10:54
33	C-1	D-2	Winner ③	Loser ③	10:54-11:06
34	E-2	D-1	Winner ④	Loser ④	11:06-11:18
35	F-2	E-1	Winner ⑤	Loser ⑤	11:18-11:30
36	A-2	F-1	Winner ⑥	Loser ⑥	11:30-11:42
Interval Break					11:42-13:30
Noon Inspection					Begins 12:30
6/12 Stage Winner Group (BO3)					
37	Winner ①	Winner ④	Winner a (Top 6)	Loser a	13:30-13:42
38	Winner ②	Winner ⑤	Winner b (Top 6)	Loser b	13:42-13:54
39	Winner ③	Winner ⑥	Winner c (Top 6)	Loser c	13:54-14:06
6/12 Loser group (BO3)					
40	Loser ①	Loser ④	Winner 1	Loser 1	14:06-14:18
41	Loser ②	Loser ⑤	Winner 2	Loser 2	14:18-14:30
42	Loser ③	Loser ⑥	Winner 3	Loser 3	14:30-14:42
Interval Break					14:42-16:30
Afternoon Inspection					Begins 15:30
The loser in 6/12 Stage Winner group Vs. The winner in 6/12 Loser group (BO3)					
43	Loser a	Winner 2	Winner I (Top 6)	Loser I	16:30-16:42
44	Winner 3	Loser b	Winner II (Top 6)	Loser II	16:42-16:54
45	Loser c	Winner 1	Winner III (Top 6)	Loser III	16:54-17:06

***Actual time may differ.**



(4) August 8, 2019

Match No.	Red team	Blue team	Winner	Loser	Time
Morning Inspection					Begins 09:30
Points Race (BO2)					
46	Winner a	Winner b			10:30-10:40
Interval Break					10:40-11:40
47	Winner b	Winner c			11:40-11:50
Interval Break					11:50-12:50
48	Winner c	Winner a			12:50-13:00
Interval Break					13:00-15:30
Afternoon Inspection					Begins 14:30
4/6 Knockout Stage (BO3)					
49	Third Team	Winner I	Winner	Loser one	15:30-15:42
50	Winner II	Winner III	Winner two	Loser two	15:42-15:54
Interval Break					15:54-17:30
Afternoon Inspection					Begins 16:20
Semifinals (BO3)					
51	First Team	Winner one	Finals1	Semifinals 1	17:30-17:42
52	Winner two	Second Team	Finals2	Semifinals 2	17:42-17:54

***Actual time may differ. The winner in the Tournament is team No.1, the second place in the Tournament is team No.2, and the third place in the Tournament is team No.3.**

(5) August 10, 2019

Match No.	Red team	Blue team	Winner	Loser	Time
Morning Inspection					Begins 09:30
Second Runner-up Contest (BO5)					
53	Semifinals 1	Semifinals 2	Second Runner-up	Third Runner-up	10:30-10:50
Champion Contest (BO5)					
54	Finals 1	Finals 2	Champion	First Runner-up	10:50-11:10



5. Match Location

1) Competition Location

Location		Address
Competition Area	Hero far shot	Bao'an District, Shenzhen Bao'an Sports Center Gymnasium
	Engineer Island Climbing & Projectile Pick-up Infantry Racing & Smart Shooting Infantry Battle	Bao'an District, Shenzhen Bao'an Center, The Youth Palace
Preparation Area		Bao'an District, Shenzhen Bao'an Center The Youth Palace
Accommodation Area		Shenzhen Nanshan District, Shenzhen Second High School

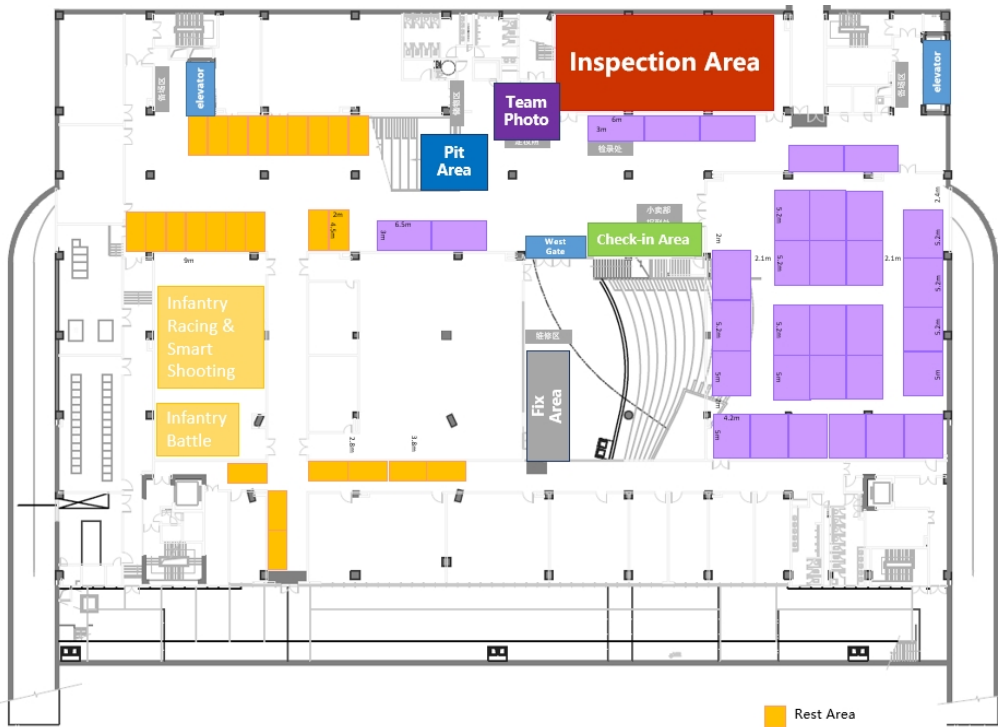
***For detailed dormitory arrangements, please pay attention to the follow-up notice of organizing committee and the "RM2019 Team Accommodation Instructions".**

***The organizing committee will arrange the shuttle bus from the dormitory to the preparation area and from the preparation area to the competition area. The shuttle bus schedule will be updated later.**

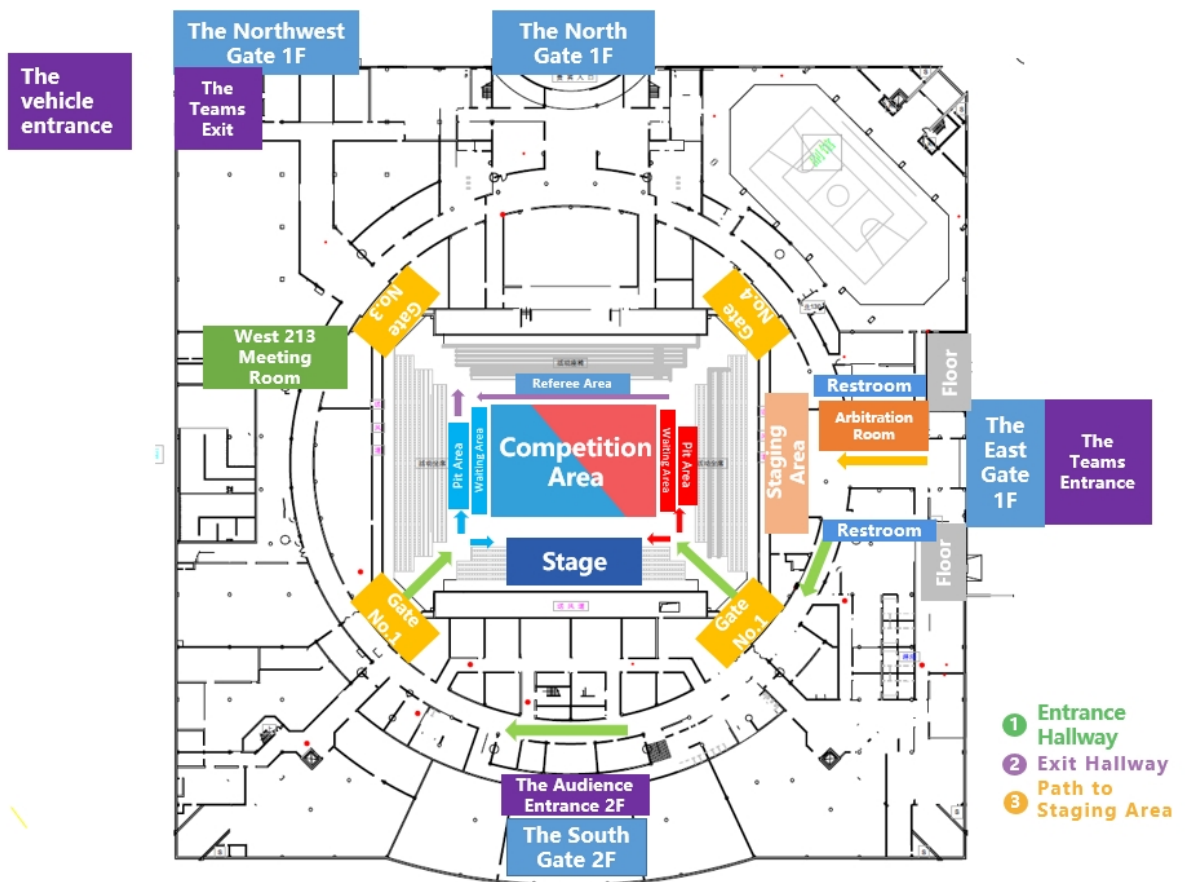
2) Match Site Map

1. Sketch Map of the preparation area and competition area

Take the north elevator to the first floor from the Youth Palace' s first floor north entrance



2. Sketch Map of the Competition Area for Hero far shot





3) Main traffic routes

1. Main Transportation Routes to Accommodations

(1) From Shenzhen Bao' an International Airport to Shenzhen Second High School

- Taxi: Around 45min, RMB70.
- Public transportation: Around 1h30min.

Route 1: Walk 1.4km - Airport New Terminal Bus Station - take line M528 (Shenzhen Bay Port direction) - Heliport bus station - take bus No. 74 / 122 (Minzhi Direction) - Second High School bus station;

Route 2: Airport subway station - take line 11 (Futian direction) - Nanshan subway station exit E2 - walk 431m - China Southern Airlines bus stop - take line 74 (Minzhi direction) - Second High School bus station;

Route 3: Airport subway station - take line 11 (Futian direction) - Qianhai Bay subway station - take line 5 (direction of Huangbeiling) - Liuxiandong subway station exit C - walk 204m - Shenzhen Vocational College West Dormitory bus stop - take line 37 (Sea world direction) - Second High School bus station;

(2) From Shenzhen Station (Luohu Railway Station) to Shenzhen Second High School

- Taxi: Around 50min, RMB90.
- Public transportation: Around 1h30min.

Route 1: Luohu Subway Station - take Line 1 (East airport direction) - Shenda Subway Station Exit C - take line M539 (TCL International E City direction) - Second High School bus station;

Route 2: Walk 257m - Railway Station 337 Terminus Bus Station - Take line 337 (Haishang Tianyuan direction) - China Southern Airlines Bus Station - take line 74 (Minzhi direction) - Second High School bus station;

(3) From Shenzhen West Railway Station to Shenzhen Second High School

- Taxi: Around 20min, RMB40.
- Public transportation: Around 1 hour.

Route 1: Walk 668m - Qianhai Garden Bus Station - take line M176 (Shenda Xili Hostel Direction) - Second High School bus station;

Route 2: Nantou West Railway Station Bus Station - take line 36 (zoo terminal direction) - Nanshan District Committee Bus Station - take line 74 (Minzhi direction) - Second High School bus station.

(4) From Shenzhen North Railway Station to Shenzhen Second High School



- Taxi: Around 25min, RMB50.
- Public transportation: Around 45min.
Route 1: Walk 795m - Caiyue Building Bus Station - take line 74 (Yanguang Science and Technology Direction) - Second High School bus station;
Route 2: Shenzhen North Railway Station Subway Station - Take line 5 (Qian Haiwan direction) - Liuxiandong Subway Station Exit C - Walk 204m - Shenzhen Vocational College West Dormitory Bus Station - Take Bus 37 (Sea World direction) - Second High School bus station.

(5) From Shenzhen East Railway Station to Shenzhen Second High School

- Taxi: Around 45min, RMB95.
- Public transportation: Around 57min.
Route 1: Buji subway station - take Line 5 (Qian Haiwan direction) - Liuxiandong Subway Station Exit C - walk 204m - Shenzhen Vocational College West Dormitory Bus Station - take line 37 (Sea World Direction) - Second High School bus station;
Route 2: Buji subway station - take line 5 (Qian Haiwan direction) - Xili subway station exit B - walk 205m - 2 bus stops to Xili court - take line 74/M492 (Yanguang Science and Technology Direction) - Second High School bus station.

(6) From Futian Station to Shenzhen Second Senior High School

- Taxi: Around 40min, RMB60.
- Public transportation: Around 1 hour.
Route: Futian subway station - take line 11 (Bitou direction) - Nanshan subway station exit E2 - walk 431m - China Southern Airlines bus station - take line 74 (Minzhi direction) - Second High School bus station;

2. Main routes to the preparation area

(1) From Shenzhen Baoan International Airport to Bao' an Cennter Youth Palace

- Taxi: Around 36min, RMB48.
- Public transportation: Around 1 hour.
Route 1: Airport subway station - take line 11 (Futian direction) - Baoan subway station B exit - walk 1km;
Route 2: Airport subway station - take line 11 (Futian direction) - Qianhai Bay subway station - take line 5 (Huang Beiling direction) - Baohua subway station exit D - walk 697m.

(2) From Shenzhen Station (Luohu Railway Station) to Bao' an Center Youth Palace

- Taxi: Around 1 hour, RMB120.



- Public transportation: Around 1 hour.
Route 1: Luohu Subway Station - take Line 1 (East airport direction) - Chegongmiao Subway Station - take line 11 (Bitou direction) - Baoan Subway Station Exit B - walk 1km;
Route 2: Luohu Subway Station - Take Line 1 (East airport direction) - Qianhaiwan Subway Station - take Line 5 (Huangbeiling direction) - Baohua Subway Station Exit D - walk 697m.

(3) From Shenzhen West Railway Station to Bao' an Center Youth Palace

- Taxi: Around 13min, RMB20.
- Public transportation: Around 40min.
Route 1: Walk 1.2KM - Leiyumen Subway Station Exit A - Take Line 1 (East airport direction) - Qianhai Bay Subway Station - take Line 5 (Huangbeiling direction) - Baohua Subway Station Exit D - walk 697m;
Route 2: Walk 910M - Daxincun Bus Station - take line M507 (Da Shui Wan direction) - Baoan Administration Center Bus Station - walk 995m.

(4) From Shenzhen North Railway Station to Bao' an Center Youth Palace

- Taxi: Around 43min, RMB80.
- Public transportation: Around 45min.
Route: Shenzhen North Railway Station Subway Station - Take Line 5 (Qianhai Bay direction) - Baohua Subway Station exit D - walk 697m.

(5) From Shenzhen East Railway Station to Bao' an Center Youth Palace

- Taxi: Around 50min, RMB120.
Public transportation: Around 1 hour.
Route: Buji Subway Station - Take Line 5 (Qian Haiwan direction) - Baohua Subway Station exit D - walk 697m.

(6) From Futian Station to Bao' an Center Youth Palace

- Taxi: Around 50min, RMB90.
- Public transportation: Around 40min.
Route 1: Futian subway station - take line 11 (Bitou direction) - Qianhai Bay subway station - take line 5 (Huang Beiling direction) - Baohua subway station exit D - walk 697m;
Route 2: Futian subway station - take line 11 (Bitou direction) - Baoan subway station exit B - walk 1km.



4) Restaurants around Preparation area

Restaurant	Address	Contact	Price per person	Distance
Fuxiangyuan Restaurant	Shop 111, Building 4, Xilong Bay 1, Haixiu Road, Baoan District	25339166	13	598 m
Chang Ledao Fast Food	17-47 Haixiu Road, Baoan District	27809955	13	565 m
Chao Zhiwei	Building 2, Longguang Century Building, Xinghua Road South Side, Baoan District	15017948030	15	489 m
Tang' s Fried Dumplings	No.009, Block A, Longguang Century Building, Haizhu Road, Bao'an District	13859108126	14	522 m
Haojia yellow chicken rice	23-28 Haixiu Road, Baoan District	13428712875	20	488 m
Xin Wanfu Old North Dumplings	106, Building 4, Xilongwan Garden (N23 District), Baoan District	23018566	40%	566 m
Italian Restaurant Salia	2F, Hongfa Building, 1004, Chuanye Yi Road, Baoan District	29083112	37	1.1 km
Shihao Stake	4-102-103, Xilongwan Garden, Jia'an Road, Bao'an District	23289898	215	945 m
Jinhui Steak House	No. 254-1 Jian'an Yi Road, Baoan District	27751297	63	2.9 km
Supreme Pizza	Shop 1136, 18 Haixiu Road, Baoan District	29367032	19	798 m

*You need to add the area code 0755 before the landline number.



5) Restaurants around dormitory

Restaurant	Address	Contact information	Price per person	Distance
Le Shang Concept Restaurant	Room 2A, Building E4, TCL International E City, Nanshan District	86720613	48	956 m
Duo Ziwei Fast Food	No. 10-25 Jiuzhang Road, Nanshan District	26968696	10	1.5 km
Qinyuan Garden Zhongyuan Wild Fish	Under the intersection of Liuxian Building in Nanshan District	13802575058	50	2.2 km
Zui Wenting	No. 14, G, Building A, Yuanwei Street, Kexing Science Park, Nanshan District	13859108126	14	522 m
Taipei Steak	B1, Dongli Commercial District, Wankeli, Yuncheng, Nanshan District	26929291	73	952 m
Bahe Lihai	No. 18-20, L1, C Gallery, Wankeli, Yuncheng, Nanshan District	82536164	65	488 m
Tongren Four Seasons Coconut Chicken	2nd Floor, Wanke Dongli, Nanshan District	86728814	88	660 m
Wooden house barbecue	No. 20, L1, D Gallery, Yuncheng, Nanshan District	86717234	73	977 m

*You need to add the area code 0755 before the landline number.

6. Competition statement

1) Safety Instructions

All RoboMaster 2019 participants must fully understand that safety is the most important in the development of the RoboMaster robotics competition. In order to protect the rights and interest of all team members and the event organizers, and according to relevant laws and



regulations, all team members who sign up for RM2019 will be deemed as acknowledging and abiding by the following safety terms:

1. All team members who register to take part in the RoboMaster 2019 Robotics Competition state that they are fully capable of civil conduct and can independently manufacture and operate robots. Prior to manufacturing robots, all team members will use materials provided by SZ DJI Technology Co., Ltd., carefully read 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 manufacturing, testing, and use of robots will not cause any injury or damage to his or her teammates, members of the opposing teams, referees, competition staff, audience, equipment, or the competition area.

3. The team must ensure that the structural design of its robots will not hinder the safety inspection in the pre-match inspection, and agree to fully cooperate with the pre-match inspection carried out by the RoboMaster event organizer.

4. The team must guarantee that no fuel-driven engines, explosives, high pressure gas as the working gas, or any dangerous materials are used

5. Throughout the R&D stage, preparation stage as well as the competition stage, all team members must pay full attention to potential safety issues, and the team's supervisors must be responsible for instructing and supervising the team on safety issues.

6. The team must guarantee the safety of all the robots. This includes ensuring the "projectile" launchers installed on the robots are safe, and that the projectiles launchers will not cause any harm (either directly or indirectly) to any operator, referee, staff, or audience member.

7. The team should take sufficient and necessary safety measures during the R&D, training and competition stages regarding potential accidents. The measures may include preventing control systems from losing control; urging the team members to envision the steps before operation to avoid mistakes or collisions between team members and between team members and robots; forbidding isolated training to ensure there will always be team members to respond to emergencies; wearing goggles and helmets; conducting appropriate locking and adding an emergency stop switch in the robot system during commissioning.

8. The team will be held responsible for all accidents and losses that occur as a result from robots breaking down, autonomous airborne robots losing control, and any other unexpected circumstances.

9. The materials bought from or provided by SZ DJI Technology Co., Ltd., the event organizer, such as batteries and the referee system, must be used in accordance with the instructions. SZ DJI Technology Co., Ltd. will not be held responsible for any injuries that arise from improper use of these materials. The team will be held responsible for any injuries caused to its own members or any third party, as well as for property losses arising from manufacturing and operating the robots.



10. All participants must remain in strict compliance with the applicable laws and regulations of the country or region. All participants must also pledge that their robots will only be used for RoboMaster events and competitions and that their robots will not be illegally modified or used for any illicit purpose(s).



2) Preparation Area Statement

To maintain the order in the preparation area during the RoboMaster 2019 competition, all competing team members must comply with the following regulations at the preparation area:

1. The preparation area will assign exclusive break area for each team. All teams are required to conduct activities in the assigned areas. Teams are not allowed to occupy public passages, to practice in the unofficially designated areas without permission or to interfere with the preparation of other teams;

2. Gas cylinders and batteries that do not conform to the regulations are not allowed to be used in the preparation area, and dangerous actions such as launching projectiles are not allowed.

3. The preparation area has a large electricity consumption. In order to regulate the power consumption behavior, each team must go to the designated maintenance area for operation when using high-power appliances and risky tools to prevent accidents.

4. Wi-Fi is strictly forbidden as well as the use any equipment for communication between team members in the preparation area;

5. There are many function-specific areas in the venue and a lot of personnel, so each participating team must wear their entry badges when entering and leaving the venue. It is strictly forbidden for the members of participating teams to enter the activity area of non-participating team members through the non-participating team member entrance;

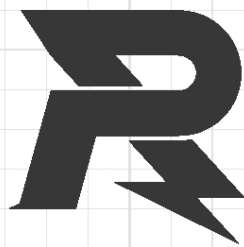
6. When teams are heading for inspection, the preparation area and competition area, or returning to the preparation area, each team must strictly follow the route plan from the organizing committee to avoid delaying the competition or causing confusion;

7. Teams are not allowed to damage the public facilities at the venues. In case of any damage, all losses will be borne by the teams themselves.

8. After preparation area is closed, each team can leave their belongings in the break area, but the organizing committee will not responsible for the safety of their belongings.

9. Teams must be responsible for their personal and safety of their belongings during the competition. The organizing committee will not be responsible for any bodily harm or property loss caused by the teams themselves.

10. In case of violation of the above regulations, the organizing committee has the right to disqualify the team.



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