

***General Rule:** Check the general rule before reading this game rule. Please be aware that the general rules apply equally to all events during the competition.

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Mission Challenge	League	Participation	Construction
	Junior/ Challenge	1~3 Person	1 Robot
			On Site

1. Game description

Mission Challenge is a category which conducts robot creatively to execute a mission provided on the day. Participants are evaluated with the ability to solve problems by applying scientific knowledge and robot technology since the game is played in a limited situation without settled platform. **This game is played face-to-face only.**

2. Robot

2-1. Types of robot No limitation

2-2. Construction of robot (on-site production) All machine part except robot controller must be produced (soldering available) on site by participant. Size must be followed by the rule.

2-2-1. Standard of robot

2-2-1-1. Size of robot Will be noticed on the day with the mission

2-2-1-2. Size measurement of robot

- 1) Self-measurement: Participant are allowed to measure their robot when producing or practicing.
- 2) Official measurement: Judge will measure the size of the robot before the game starts.
- 3) Way of measuring: Size must be measured with the robot turned on, using the measuring machine. Participant cannot object to the judgement.
- 4) Modification time: If over-sized, the participant is allowed to modify for 1 minute at the recording place of the playfield. If the participant can't modify within the limited time, they will be disqualified for the trial.

2-2-2. Sensor of the Robot Numbers of sensor will be limited based on the mission given on the day, and must not exceed the number written on the table below.

TYPE OF SENSOR	MAX NUM
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IR sensors	8
Ultra-sound sensors	4
Touch sensors	2
Color sensors	2
Camera sensors	1

2-2-3. Power of robot

2-2-3-1. Composition of power Autonomous movable independent power must be used, and combustion engine is not allowed to use.

2-2-3-2. Capacity of power No limit on current or voltage

2-2-4. Drive of robot No limitation

2-2-5. Motor of robot Numbers of motor will be limited based on the mission given on the day, and must not exceed the number written on the table below.

TYPE OF MOTEOR	MAX NUM
Continuous Revolution Motors	4
Servo Motors	6
Encoder Motors	2
Stepping Motors	2

2-3. Programming and controlling Robot must be programmed to move automatically, and no extra controlling is allowed except when starting.

2-4. Disconnection between motor horn and wheel Wheel and tire doesn't need to be disconnected, and they are not supposed to be connected in advance.

3. Competition Site

Composition, arrangement and size of playfield will be announced at the day of match.

4. Competition progress

4-1. Way of game process Game is processed by recording, and the chances are given twice. Rectifying time will be given between chances.

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4-2. Robot production and practicing time At least 2 hours will be given for producing robot and practicing, and will be noticed on the day.

4-3. Assignment of playfield Depends on number of participants and level of difficulty.

4-4. Production and practicing Participant can practice on the playfield until production and practicing time noticed, but cannot before playfield assignment.

4-5. Production and end of practicing When time for production and practicing finishes, the participant must stop the robot and go back to their seat following staff and referee's instruction.

4-6. 1st trial 1st trial starts right after the production and practicing time (or after lunch).

4-6-1. Preparing competition All participants must bring their robots and wait in line following the instruction of staff and referee.

4-6-2. Stand by after competition All participants should not go back to their seat, but must wait in line after their trial until all participants finishes their trial.

4-7. Modification Time for modification will be given to all participant after 1st trial for robot modification and practicing. Modification time will be noticed on the day.

4-8. 2nd trial 2nd trial will be held right after the modification.

4-8-1. Preparing competition All participants must bring their robots and wait in line following the instruction of staff and referee.

4-8-2. Stand by All participant must go back to their seat after their trial.

5. Competition progress

5-1. Performing mission For the missions without assigned way of path and mission sequence, they must be chosen by participant themselves.

5-2. Acquiring score Score will be acquired by the number of succeeded targets. Points per targets will be opened on the day at the site with the mission.

5-3. Start Start by referee's start sign.

5-3-1. Miss start Announced when the robot doesn't start in 5 counts. 2 more chances will be given.

5-3-2. False start Announced when starting before referee's start sign. Another chance will be given.

5-3-3. Restart When miss started twice or false started once, chances to restart will be given twice. (When restarting after false start, only one chance will be given to restart.)

5-4. Limited time Time limit will be open on the day at the site with the mission.

5-5. Mission open Missions such as shape of playfield, numbers and locations of targets

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and destinations will be noticed on the site before the competition starts.

5-5-1. Before starting the game, referee will describe the mission to a representative of each team.

(i.e. Build a robot that can carry a 500g weight target over 1m wall, Arrive at the destination by climbing a 1m wall.)

5-5-2. Referee will also give a description of the scoring formula.

(i.e. The robot must carry three metal balls across the water as quickly as possible. If a robot loses a ball, then a 60 second penalty will be added to the time.)

5-5-3. Standard of scoring system is based on quantitative standard: time record, distance record and the number of moved targets, but in special occasions, knock-out competition or subjective evaluation may also be held.

5-5-4. The referee may also announce special restrictions or rules that sbe based on the mission.

(i.e. Participants must use more than three rubber bands.)

5-5-5. Participants can use general materials not related to robot freely.

(i.e. Paper, Styrofoam, wood stick, chopstick, paper cup, paper plate, plastic dish, paper clip, binder clip, hairpin, needle, thread, tape, pen, cable tie, rubber band, etc.)

5-5-6. Special tools and items that may be restricted by host due to safety issues.

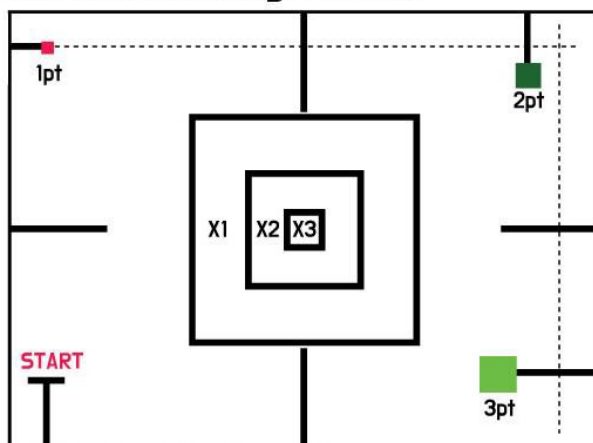
International Robot Olympiad Committee

EX

Mission Example

INTERNATIONAL ROBOT OLYMPIAD

Mission Challenge_Junior



⚠ Participants are not allowed to go outside with this Mission map until the end of the match.

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1. Restriction on using sensors and motors

Sensor/Motor Type	Quantity
DC Motors	2
Servo Motors	2
Encoder Motors	0
Stepping Motors	0
IR Sensors	8
Contact Sensor	X
Ultra-sound Sensors	X
LEDs	X

2. Mission performed

Participants get the point when the robot moves 3 type of cubes to the center of target.

3. Size of robot

Less than 20cm x 20cm

4. How to score the points

3cm cube = 1 point,
6cm cube = 2 point,
10cm cube = 3 point,
According to the point of target, Points will be multiplexed.



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5-6. Finish of competition

5-6-1. Mission fulfill If robot finishes the mission before the limited time, the competition finishes, and time the robot went through the line and mission points will be accepted as a record.

5-6-2. Time over If robot doesn't finish before the limited time, the points at the moment when time limit finishes will be accepted as a record.

5-6-3. Robot stop If robot doesn't move during the competition, referee gives 10 counts. If the robot doesn't move again while counting, robot stop will be declared, and the points when robot stops will be accepted as the record.

5-6-4. TKO (Technical Knock Out) If moving ordinarily is impossible, referee may declare TKO conforming to robot stop without 10 counts. (i.e. when moving around the same places repetitively, when blocked by a structure or obstacle and not moving, when moving out of the playfield (falling from the playfield), etc.)

5-7. Game over due to disqualification If the participant violates game rules or interrupts the game, game will finish due to disqualification, and the record of the trial will not be accepted.

5-7-1. Robot touch If the participant touches robot without an acceptance of referee or staff, robot touch will be declared, and will be disqualified for the trial.

5-7-2. Robot modification while competition Adding, removing, exchanging or modifying component of the robot during the competition is not allowed, and if holding extra components, tools, or batteries while waiting in order to modify the robot, the trial will be disqualified.

5-7-3. Tuning sensor If trying to tune sensor before competition, the participant will be disqualified for the trial.

5-7-4. Defaulting assigned playfield If playing or practicing at the playfield other than the assigned field, the participant will be disqualified.

5-7-5. False start When starting false for twice at the trial, the participant will be disqualified.

5-7-6. Miss start When not starting for three times at the trial, the participant will be disqualified.

5-8. Rematch When accident such as blackout or trouble in timer happens, rematch may occur by decision of referee.

5-9. Decision of referee Referee has authorization to control all situations and participants at all times during the competition. Judgement of the competition result is referee's own authorization and referee has authorization for the final judgement.

6. Competition record

6-1. Recording items Mission points, time record, etc.

6-2. Time record For the missions that reflect time record, time counted at the timer will be acknowledged as the time record. (Robot stop, robot falling, TKO will not be acknowledged as time record.)

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6-3. Final record Better record among 1st and 2nd trial will be considered as the final

6-4. Priority of record Group will be divided by score of clearing mission, and the ranking will be decided by comparing the driving record, and when arrived at the finishing point, the one who succeeded the destination mission takes the priority.

Mission success point > Time record availability > Comparison between time record

6-4-1. Priority on trial If tied at the same trial, record of another trial will be compared.

6-4-2. Priority when tied Better score among 1st or 2nd trial will be acknowledged, but when tied, the participant with better score on the 1st trial takes the priority.



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