

* These rules are not final and may be updated up until the day before the competition.



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Tagout	Division	Team	How to Create
	Junior	1 person (individual)	Preproduction

1. Description

Tag-Out is a [piloting and coding event in which teams compete to](#) eliminate targets while avoiding obstacles on a given mission map. Points are deducted if the robot touches any of the mines placed on the playing field along the way, [requiring](#) robot maneuverability and the ability to [control and code the](#) robot to effectively eliminate targets. <Revised June 14, 2024

Sectors	
Tagout standards	Proceed with piloting
Tagout expansions	Progress to autonomous driving

<Revised June 14, 2024

2. Robotics

2.1 Robot type: Wheeled robot

2.2 Robot's Configuration

2.2.1 Built: The robot must be pre-built and will be provided programming time to drive the robot.

2.2.2 Weight: 1 kg or less (including batteries)

2.2.3 Structures: Robots must not be equipped with structures that push or launch objects, and must not be equipped with structures that are dangerous, such as those that cause electromagnetic disturbances.

2.2.4 Voltage: Limit the maximum output voltage to 12 V ($\pm 10\%$ tolerance).

2.2.5 Motor: Limit RPM to 300 or less.

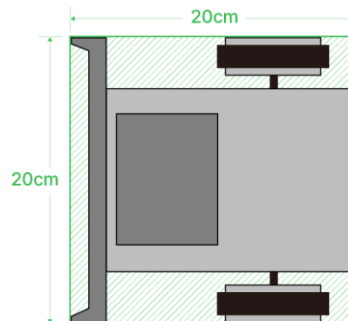
International Robot Olympiad Committee

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2.3 Dimensions of the robot

2.3.1 The size of the robot: No more than 20 cm x 20 cm (w x h)



<Figure 1> Example of size acceptance standard for robots

2.3.2 Measuring size

- 1) Before the match starts, the referee will personally measure the size of the robot.
- 2) **Measurement Method:** After the robot is powered on, it will be measured using a size measuring tool, and the contestant cannot dispute the referee's decision.
- 3) **Correction of size:** If the size is exceeded, the competitor will have one minute to correct it and must do so at the scorer's table. Failure to correct within the allotted time will result in disqualification. Any change in size due to a change in the shape at the time of measurement and the shape at the start line above the arena will result in disqualification.

2.4 Sensors on a robot: Unlimited

2.5 Power source and capacity of the robot: The robot must use an autonomous, mobile, off-grid power source and cannot use a combustion engine. There are no usage restrictions on the current and voltage of the robot's power source.

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2.6 Communication Standards

- 2.6.1 Zigbee / Bluetooth / 2.4Ghz wireless communication only.
- 2.6.2 No wired control.
- 2.6.3 If there is any miscommunication, the team that fails to change channels will be disqualified.
- 2.6.4 Expansion Division Autonomous Driving Participants are not allowed to use communication equipment <Revised June 17, 2024

2.7 Program modification time: You will have 1 hour to practice and modify the program to drive the robot.

2.8 Spare Robots: Competitors may possess a spare robot in addition to the main robot, and both the main robot and spare robot must be verified by the referee prior to the start of the competition. The use of a spare robot may be replaced only with the permission of the Referee, and the timing of such replacement is as follows

- 2.8.1 **Before a league match:** Before the start of your group's matches.
- 2.8.2 **Pre-Tournament: Before the** start of every match

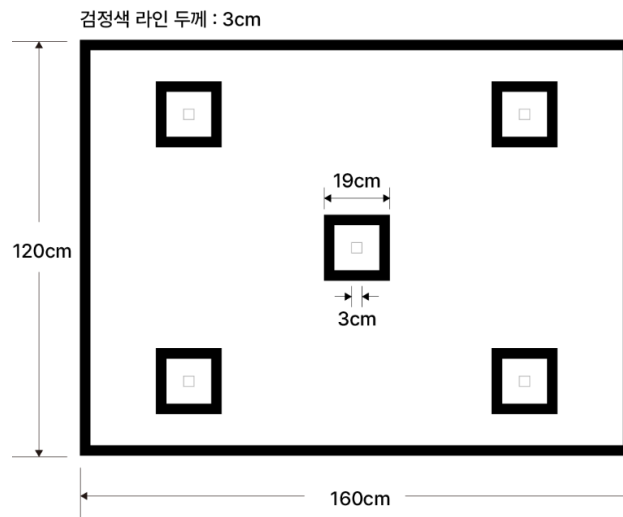
3. Stadiums

- 3.1 **Authorized venue:** Use an authorized venue as defined by the International Robotics Olympiad Committee.
- 3.2 **Playing field dimensions and configuration:** Two playing fields of 160 cm x 120 cm ($\pm 10\%$ margin of error). two stadiums.
Two playing fields are placed side by side with no more than 30 centimeters of space between them.

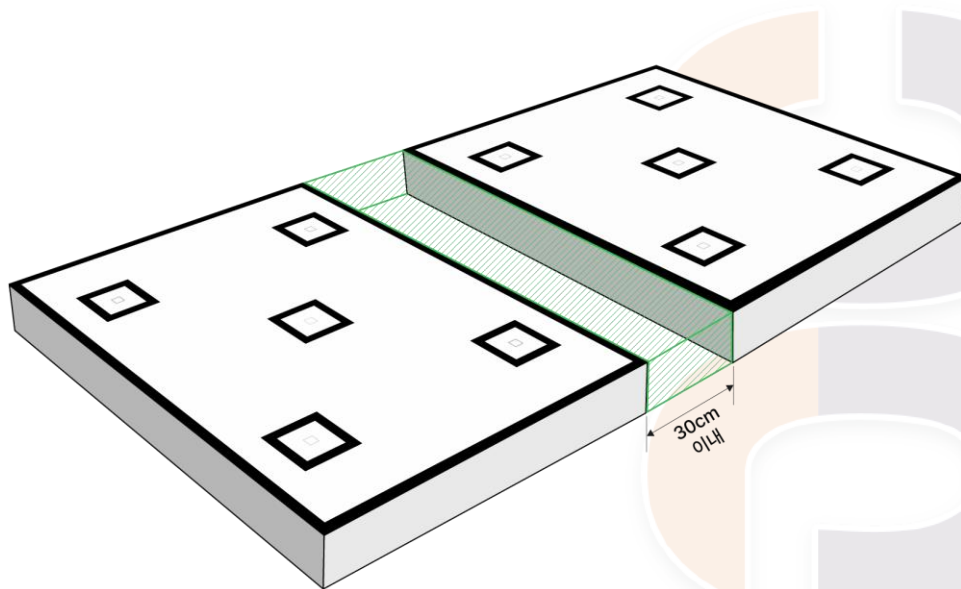
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<Figure 2> Stadium dimensions



<Figure 3> Example of stadium configuration

3.2.1 Stadium tolerance: Stadiums can have a tilt of no more than 2° ($\pm 10\%$ tolerance) and bumps or gaps of no more than 0.3 cm ($\pm 10\%$ tolerance).

3.2.2 Robot falls: There will be no separate arena walls to prevent robots from falling.

3.3 Stadium field: The floor is made of padded paper, has a white color, and may be partially covered with advertising or the organizer's logo.

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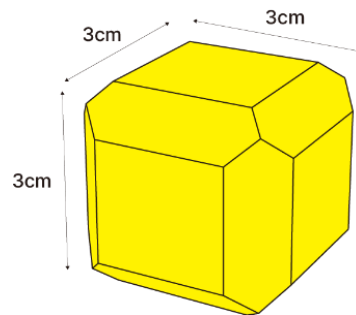
3.4 Accessories

3.4.1 Landmine

3.4.1.1 Shape: Hexahedron

3.4.1.2 Weight: 10 grams or less ($\pm 10\%$ tolerance)

3.4.1.3 Size: 3cm x 3cm x 3cm (W x D x H, $\pm 10\%$ tolerance)



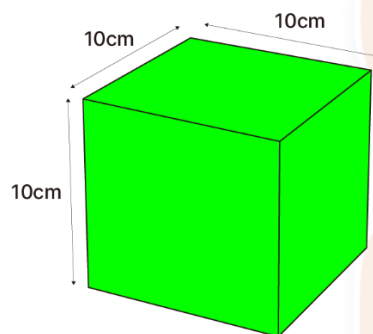
<Figure 4> Example of landmine shape and dimensions

3.4.2 Avatar

3.4.2.1 Shape: Hexahedron

3.4.2.2 Weight: 300 grams or less ($\pm 10\%$ tolerance)

3.4.2.3 Size: 10 cm x 10 cm x 10 cm (W x D x H, $\pm 10\%$ tolerance)



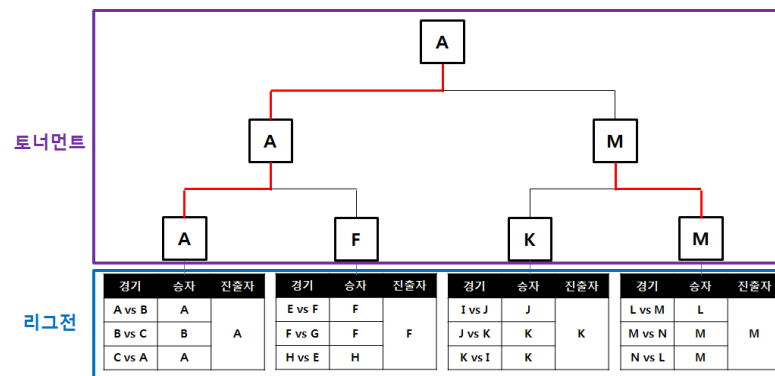
<Figure 5> Example of avatar shape and dimensions

4. Match progression

4.1 How it works: The match is organized as a league, with a selection match that is followed by a tournament between the successful participants.

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<Figure 6> Example of how a match is played

4.2 Tournament (Main Event)

4.2.1 Opponents are randomly determined by the organizer's program.

4.2.2 If there are three teams in this match, it will be a league match.

4.3 **Robotic Corrections:** For tournaments, all teams may be given the same amount of time to make corrections at the discretion of the referee after the end of the match.

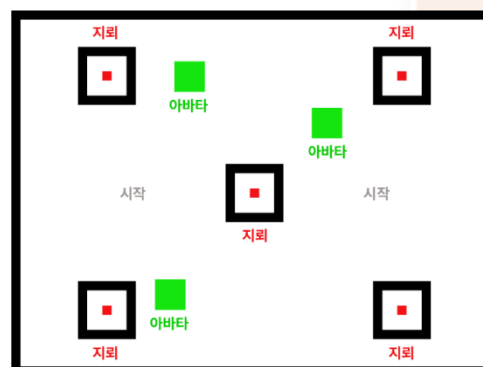
5. Match

5.1 **Mission:** After the referee's starting signal, the robot avoids the mines and knocks the avatar off the field.

5.2 **Start:** The robot must be activated on the referee's signal, and if it is activated before the referee's signal, the team will be disqualified.

5.2.1 **Avatar placement:** Avatars can be placed in multiple locations on the Mission Map, the number and location of which will be revealed on match day.

5.2.2 **Mine placement:** Mines can be placed in locations that impose physical constraints on removing avatars; mines are shown in Figure 7 and exist within mine lines.



<Figure 7> Example of attachment placement

5.2.2.1 Changing Robot Form: A robot must compete in its starting configuration. If the robot changes shape at the starting line, it will be disqualified.

5.2.3 Restart: If a competitor is given one restart per arena, a competitor who has two false starts in a match will be disqualified.

5.3 Game time: 2 minutes

5.4 Officiating matches

5.4.1 Avatar Out: 1 point is awarded for each avatar pushed off the field. If all avatars are knocked off the field within the time limit, the referee will declare the avatars out and the match will end immediately, and the score will be counted as the end state.

5.4.2 Deductions: If the robot touches a mine and the mine's position changes, deduct 1 point. The change in position of the mine is based on the space between the mine and the mine location marker line.

5.4.2.1 Tagout Standard: Mines moved by a robot while moving an avatar are considered a deduction. <Revised June 17, 2024

5.4.2.2 Tagout Expansion: Mines that are moved by a robot while moving an avatar are not considered a penalty. <Revised June 17, 2024

5.4.3 Stopping the Robot: If, in the judgment of the referee, the robot does not move or hovers in a certain space during the match, preventing normal progress, the referee will issue a 10-second count. After the count, the measurement will be paused and the robot will be returned to its starting position and the match will resume.

5.4.4 Robot Out: If a robot falls outside the playing field on its own, the referee will end the match with a robot out and declare the opposing robot the winner. A robot out is based on whether or not the robot touches the floor outside the playing area.

5.5 Disqualification

5.5.1 Robot Touch: If a competitor touches the robot without the referee's permission before the end of the match is declared, a Robot Touch will be declared and the competitor will be disqualified.

5.5.2 Warning: The referee will issue a warning to a contestant if he/she disobeys the referee's instructions or is deemed to be disruptive to the match. A cumulative total of two warnings will disqualify the competitor regardless of the outcome of the match.

5.5.3 False Start: A second false start will result in disqualification under Section 5.2.3.

5.5.4 Robot modification: Any robot morphing, such as lifting an avatar with a gripper, will result in disqualification, as will [hitting an avatar with an elastic plate](#). <Revised June 5, 2024

5.6 Rematches: In the event of a power outage or unforeseen circumstances, rematches may be held at the discretion of the referees and supervisors.

5.7 Referee's Rulings: The referee has the authority to preside over all situations and supervise the participants from the start to the end of the match. Deciding the outcome of a match is the sole authority of the referee and his/her declaration is final.

6. Evaluation methodology

6.1 Result Placement is determined by the number of avatars removed from the arena during the match and the number of mine penalty points.

6.2 Game over

6.2.1 Avatar Out: The match ends immediately with all avatars removed, and the match is counted as the final score in that state.

6.2.2 Time Over: If both robots fail to complete the mission within the time limit and the match time is exceeded, the match will end and the final score will be counted.

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6.3 Tiebreakers

6.3.1 League play: Goal differential will be compared to determine the tournament winners. In the event of a goal differential tie, the following rules apply

6.3.1.1 In the event of a goal difference tie, the lighter weight is the winner

6.3.1.2 If both teams are tied in weight, a rematch will be held.

6.3.1.3 In the event of a tie in the rematch, the robot will be weight corrected. Both teams have one minute to make the corrections simultaneously from the judges' table at the front of the arena.

6.3.2 Tournaments

6.3.2.1 In the case of a tie, the lighter weight wins.

6.3.2.2 If both teams are tied in weight, a rematch will be held.

6.3.2.3 In the event of a tie in the rematch, the robot will be weight corrected. Both teams have one minute to make the corrections simultaneously from the judges' table at the front of the arena.

