

**\*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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|                     |        |                  |              |
|---------------------|--------|------------------|--------------|
| <b>Store Keeper</b> | League | Participation    | Construction |
|                     | Junior | Person 1 Robot 1 | Pre-made     |

## 1. Game Description

Store keeper is a 1:1 confronting category that throws cube from their camp to the designated section to earn points, It is a 1:1 competition event. Since the scores of the Megacube and the general cube are different, it is important to have a good control over the robot and a strategy to operate the game.

## 2. Robot

**2-1. Type of robot** No restriction

### 2-2. Composition

**2-2-1. Production** All robots must be pre-made before the competition, and no extra time for producing robots will be given on site.

**2-2-2. Size** Within 20cm x 20cm (W x L)

#### 2-2-2-1. Size measurement

- 1) Official measurement: Judge will measure the size of the robot before the game starts.
- 2) Way of measuring: Size must be measured with the robot turned on, using the measuring machine. Participant cannot object to the judgement.
- 3) 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.

**2-2-3. Weight** Under 600g (Including battery, Without controller)

#### 2-2-3-1. Weight measurement

- 1) Official measurement: Judge will measure the size of the robot before the game starts.
- 2) Way of measuring: Size must be measured using scale, and the participant cannot object to the judgement.
- 3) Modification time: If over-weighted, 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.

**2-2-4. Motor** The type of motor shall be restricted as follows.

- DC Motor: Under 300rpm
- Servo Motor : 5Kg Tork, Under 100rpm

**2-2-5. Remote controller** Robots are radio-controlled using remote controller, and only the communication module controllers included in the KIT are allowed. (IR controller or ordinary PS2 Bluetooth controllers are not allowed.)

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**2-2-6. CPU board and interface board** Able to use 1 each.

**2-2-7. Frame** Frame constituting the framework is used without limit within same manufacturer of the kit. However, the frame shouldn't transform its shape.

**2-2-8. Elastic board** Regardless of the manufacturer, the elastic plate for the mission needs to be made of the following specifications and materials

If satisfied, it can be used without restrictions, and the number of elastic plates is limited to one.

**Size:** 4.5cm x 6cm (error  $\pm 1$ cm)

**Material:** Polycarbonate (PC)

**Thickness:** 1T

**2-2-9.** Whether or not to use the flexible plate for performing the mission is not required to be used, and may not be used depending on the participant's choice. However, when using the elastic plate, the provisions of 2-2-8 must be satisfied.

### 2-3. Power

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

**2-3-2.** Charger is allowed to use, and number of battery has **no limit**.

**2-3-3.** No limit on number of battery cases, but only the ones included in the certified KIT is allowed.

### 2-4. Drive

No limitation

### 2-5. Program and control

**2-5-1.** Both robot moving itself and moving by remote controller are allowed.

**2-5-2.** If robot moves before referee's declaration of start, the participant(team) will be disqualified.

**2-5-3.** If problem in communication happens and changing channel is impossible, the participant(team) will be disqualified.

### 2-6. Spare robot

**2-6-1. Robot preparation** The participant may have a spare robot other than the main robot, and both robots must be certified by the referee before starting.

**2-6-2. Usage of spare robot** Changing to the spare robot is allowed when referee certified before starting the competition. (Available timing of the changing robot may differ based on progress, whether held by league or a tournament.)

**2-6-2-1. League** Allowed to change before group match starts

**2-6-2-2. Tournament** Allowed to change before each match

**2-7. False start** If the shape or size of the robot changes with the one measured, the player may be disqualified due to size regulations. However, changing its size and shape after starting the match is allowed.

## 3. Competition site

**3-1. Official Playfield** Playfield approved by International Robot Olympiad committee

**3-2. Size and Composition** Each team uses one playfield with 160cm x 120cm (error  $\pm 10\%$ ) in

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size. Two playfields will be placed within 30cm distance.

**3-2-1. Connection** Two straight bridges connecting the playfields will be 25cm (error  $\pm 10\%$ ) in its width, and will be stick to the playfield using sheets and tapes.

**3-2-2. Allowable range of error in the stadium** The slope that is under  $2^\circ$  (error  $\pm 10\%$ ) and a gap or bump under 0.3cm (error  $\pm 10\%$ ) is allowable.

**3-2-3. Prevention for falling robot** Outer wall will be installed on the playfield to prevent the robot from falling.

**3-3. Playfield** Covered with a matte coated white sheet paper, and an advertisement or a logo of the host may be inserted.

**3-3-1. Starting point of the playfield** Each robot must start in their participant's designated camp.

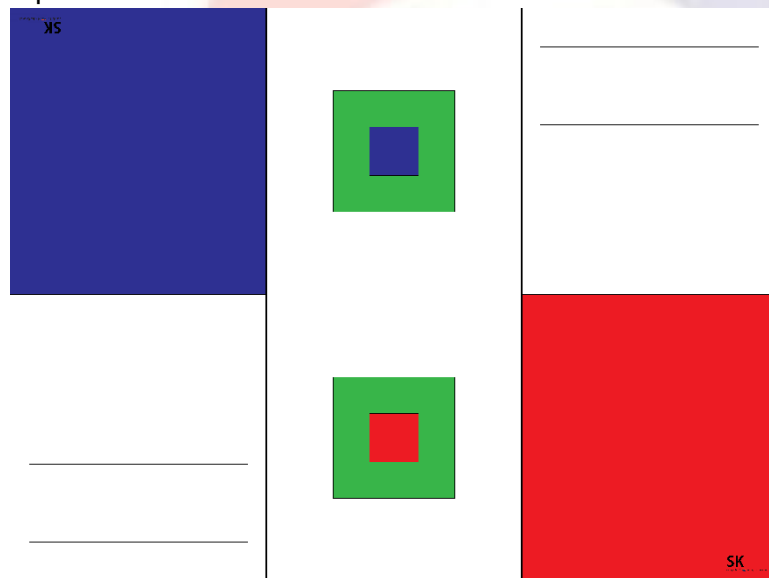
**3-3-2. Destination of target** Each participant will get a designated area colored with the same color of their designated camp in the middle of the mission map.

**3-3-3. Mission map**

**3-3-3-1. Area for starting and launching** 59cm x 53cm (error  $\pm 10\%$ )

**3-3-3-2. Destination for target** 25cm x 25cm (error  $\pm 10\%$ ) with the same color with their camp in the middle of the map.

**3-3-3-3. Penalty line** A penalty line that robot cannot go through exists in the middle of the map.



<Mission Map>

**3-4. Playfield adjuncts**

**3-4-1. Target** Two polyhedron blocks of 10~30g (error  $\pm 10\%$ ) in weight will be used.

**3-4-1-1. Standard of target**

Large cube: 6cm x 6cm x 6cm (W x L x H, error  $\pm 10\%$ )

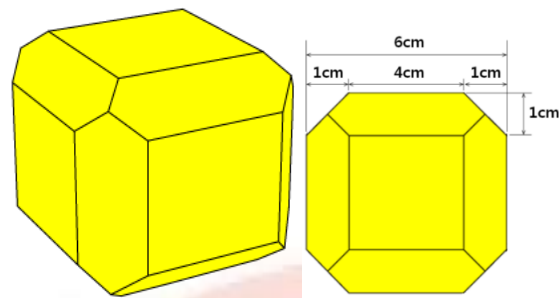
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EX



<Large Cube>

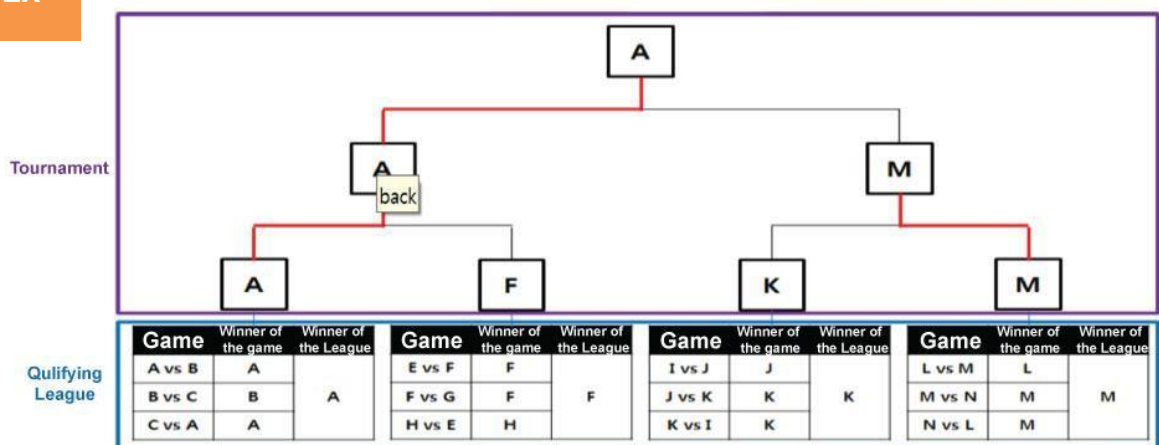
**3-4-1-2. Color of the target** Color used freely

**3-4-1-3. Arrangement of the target** Will be assigned in the designated place in the mission map.

#### 4. Competition progress

**4-1. Game process** Participant who went through the league will constitute the tournament for main competition.

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#### 4-2. League (Qualifying game)

**4-2-1. Constituting group** All participant must constitute a group of three for league by lottery.

**4-2-2. Points and advance to tournament** Earn 3 points when winning, 1 point when tied, 0 point when lost, and a team with the highest point gets a chance to advance to tournament.

#### 4-3. Tournament (Main game)

**4-3-1.** Counterpart of the game will be decided by lottery when choosing team for league.

(ex. Team A 1<sup>st</sup> place vs Team C 1<sup>st</sup> place, Team B 1<sup>st</sup> place vs Team D 1<sup>st</sup> place)

**4-3-2.** Tie doesn't exist, and comparison between weight and extra play will be held till winner gets decided.

**4-4. Robot modification** All teams may get same amount of time for modification after game finishes on referee's decision.

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## 5. Competition progress

**5-1. Performing the mission** Place the target to their own place as much as possible.

**5-2. Points** Numbers of missions held will be added when counting points.

**5-2-1. Counting points** Total points will be counted by adding points per mission.

- a) Moving 1 mega cube worth 3 points.
- b) Moving 1 ordinary cube worth 1 points.

**5-2-2. Points not accepted** If cube moves totally out of their area, the points will not be accepted.

Ex) If bottom of the cube is partly on their area: Points accepted

If bottom of the cube is totally out of their area: Points not accepted

### 5-3. Choosing camp

**5-3-1. Team league** All participants gets to play two competitions at different camp.

**5-3-2. Tournament** A participant who wins games such as rock scissor paper, lottery or throwing a coin gets to choose competing way.

### 5-4. Moving or launching cube

**5-4-1.** Participant can move more than one cube at once.

**5-4-2.** Cube that went out the playfield while moving cannot be reset during the trial, and will be excepted when adding the score.

**5-4-3.** Launching cube must be held only at the launching area.

### 5-5. Start and restart

**5-5-1. Start** Participant must start by sign of referee, and if robot moves before the sign, the team will be disqualified.

**5-5-2. Restart** Chance to restart will be given twice, and if the participant doesn't follow referee's sign when restarting, the participant will be disqualified.

**5-6. Time limit** Game will be held 1minute 30seconds in maximum.

### 5-7. Judging competition

**5-7-1. Time end** Mission point will be recorded in a limited time, and the participant with higher score wins.

**5-7-2. Robot stop** If the robot stops or move repetitively within a particular place, referee must give 10 counts. If the robot doesn't move ordinarily in 10 counts, referee may declare robot stop, and the robot will be excluded from the game. The counterpart may proceed the game.

**5-8. Game stop due to disqualification** Participants can be disqualified when violating regulation or disturbing the progress, the game ends due to disqualification, and the record doesn't get accepted.

**5-8-1. Robot Touch** If participant touches the robot without judge or supervisor's authorization, robot touch will be declared and will be disqualified for the trial. It also applies when the body of the participant touches the robot that went out of the playfield.

**5-8-2. Repair during the match** Adding, removing, exchanging or modifying component of the

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robot during the competition is not allowed, and if holding extra components, tools, or batteries while waiting for modifying robot, the trial will be disqualified.

**5-8-3. Violation on launching** If launching in area not designated, the participant will be disqualified from the moment.

**5-8-4. Invasion of penalty line** If the robot invading the penalty line exceeds more than half of the penalty line, it will be immediately disqualified. Here, the term "robot" means including all accessories connected from the main body to equipment that performs an operation of the relevant event.

**5-9. Rematch** If unexpected situation, such as blackout or breakdown of measuring instrument, occurs during the match, referee can decide to go on a rematch.

**5-10. Robot plunge** If robot falls out from the playfield (if part of a robot touches floor outside the playfield), the robot must go back to the starting point then count 10 with judge's permission. The robot may go through the round again after 10 counts.

**5-11.** Referee has authorization to control all situations and participants at all times during the competition. Judgement of the competition is referee's own authorization and referee has the authorization for final judgement.

## 6. Evaluation

### 6-1. Tiebreakers

**6-1-1. League** Finalists are decided by comparing difference between earned and lost points. If the difference between points are same, the tied players are considered by followings.

**6-1-1-1.** If difference between points are same, robot with lighter weight wins.

**6-1-1-2.** If both robots' weight is same, rematch will be held.

**6-1-1-3.** If rematch ties, the robot has to be modified to lessen their weight, then go on a rematch. 1 minute will be given for modifying, and they must modify at recording place at the same time.

### 6-1-2. Tournament

**6-1-2-1.** Robot with lighter weight wins.

**6-1-2-2.** If both robots' weight is same, rematch will be held.

**6-1-2-3.** If rematch ties, the robot has to be modified to lessen their weight, then go on a rematch. 1 minute will be given for modifying, and they must modify at recording place at the same time.



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