WORLD ROBOT OLYMPIAD™

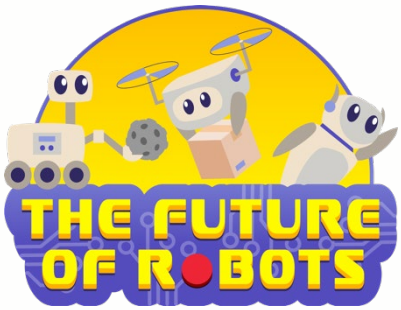
WRO®

JAPAN

RoboMission ミドル競技

Senior Game Rules

Ver. 1.0



The Future of Robots

Rocket Assembly

WRO International Premium Partner

aramco

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ROBOROBO
LEARNING FUTURE

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Important information for reading this document:

- The general rules have changed drastically for 2025. Make sure to read them entirely.
- These game rules are made for local and national competitions.
- National Organizers in WRO countries are allowed to simplify the missions.
- For the International Final, one extra mission will be released on October 8th 2025. The extra challenge will work with the same game mat and brick set. It is not mandatory to do this extra mission to participate in the event.
- Because of possible surprise rules and the extra mission for the International Final, the game field may contain areas and markings that are not used at local or national events.
- For greater clarity, the robot missions are explained in multiple sections. But the teams can decide which missions they will do and which order.
- The game missions have easy and more complicated tasks. This makes the competition suitable for beginning and more experience teams. It is not necessary to solve all missions to enjoy a WRO participation.
- General information on game table setup and fixing of game objects on the field you find in the WRO RoboMission General Rules, chapter 7.

We wish everyone much success and a lot of fun with our WRO 2025 challenges!

Your team of World Robot Olympiad Association

※ このルールブックは，WRO 2025 RoboMission Senior のルールをもとに，WRO Japan RoboMission 競技委員会が WRO 2025 Japan 決勝大会 ミドル競技 Senior 部門用に一部を修正し，作成しています．

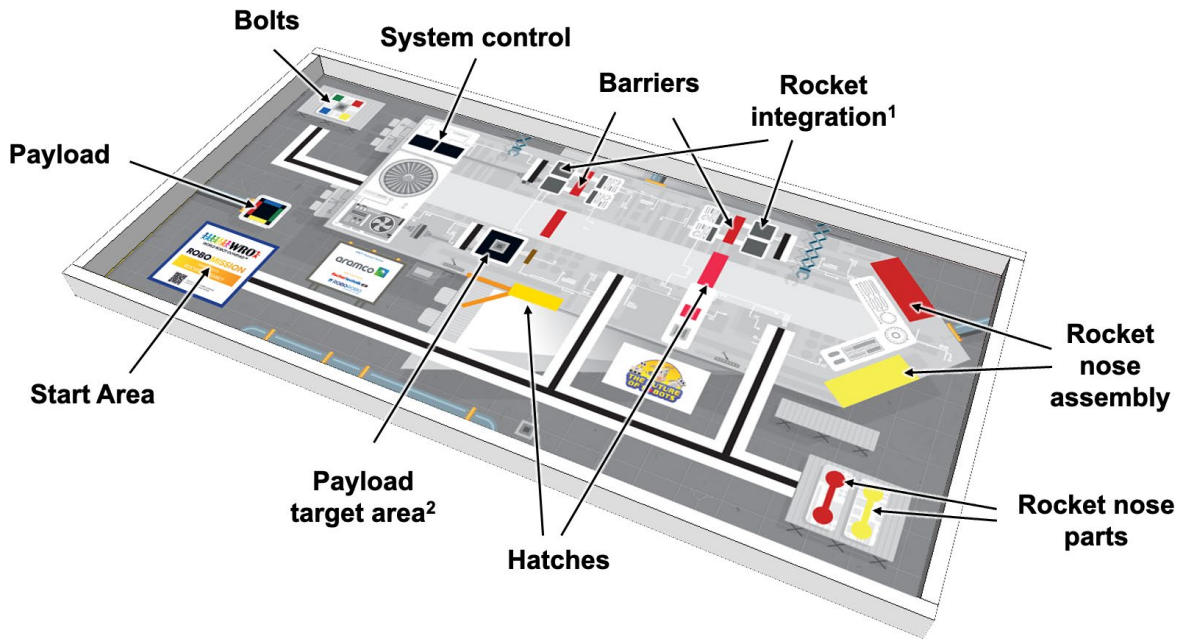
1. Introduction

Launching rockets into space is crucial for advancing society by enabling scientific exploration, satellite deployment, global communications, and the development of new technologies. It allows humanity to better understand the universe, monitor Earth's environment, and improve global connectivity. Building and assembling rockets requires extreme precision, as even minor errors in design or construction can lead to catastrophic failures. Every component must be accurately aligned, from the fuel systems to navigation controls, to ensure a successful launch. Robots play a vital role in this process, supporting tasks such as welding, drilling, and assembling intricate parts with unparalleled accuracy and consistency, reducing human error, and speeding up the manufacturing process. This automation ensures higher quality, safety, and efficiency in rocket assembly.

Can your robot help assembling the rocket and make it ready for a space launch?

2. Game Field

The following graphic shows the game field with the different areas.



1) Rocket integration: *Positions of corresponding marking blocks are on the other side of the barriers.*

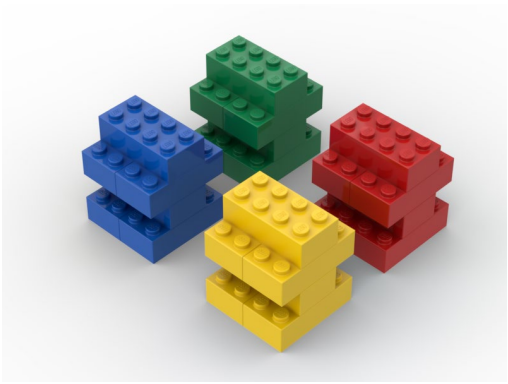
2) Payload target area: *Position of marking block is on the right side next to the target area.*

If the table is larger than the game mat, place the mat against the wall with the two sides closer to the start area (in the picture: left and bottom side).

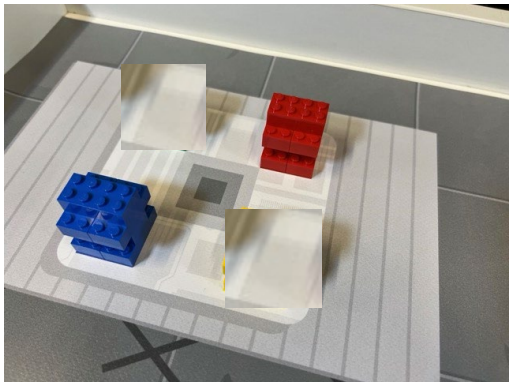
3. Game Objects, Positioning, Randomization

Bolts and marking blocks for rocket integration

There are **2 bolts (1x blue, 1x red)** on the field. The position on the game field is in the top left corner on the coloured squares.

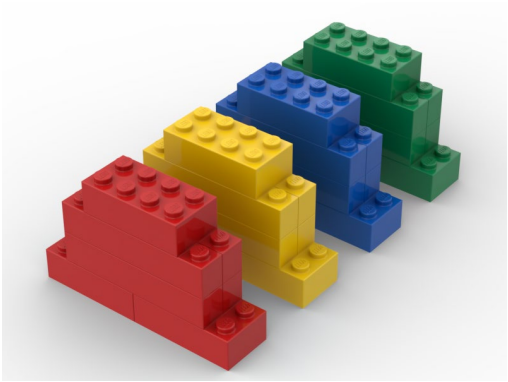


Bolts



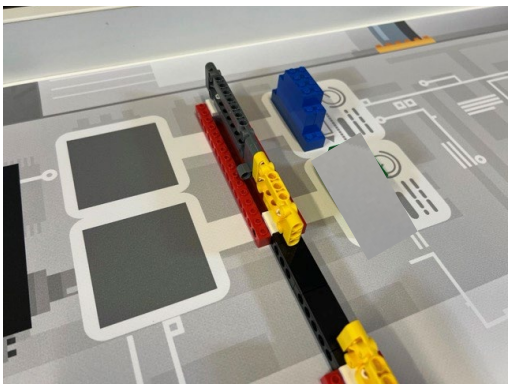
Position on the field

There are **2 marking blocks (1x blue, 1x red)** on the field. The positions are grey rectangles on the upper end of the field next to the barriers. Which colour fills which position is randomized.

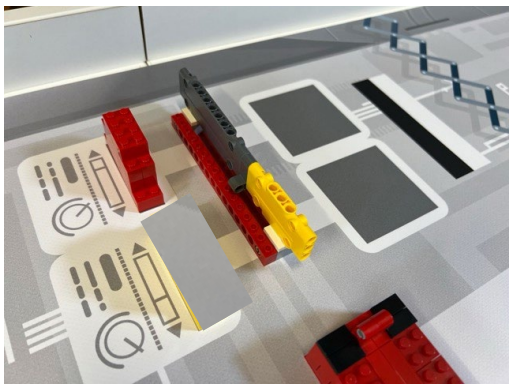


Marking blocks (1x blue and 1x red)

All 2 marking blocks are always on the game field. The positions are randomized. The following pictures show one potential randomization.



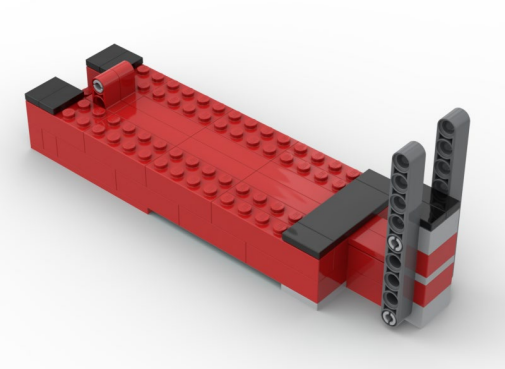
Blue marking block is placed on the right side of the left barrier



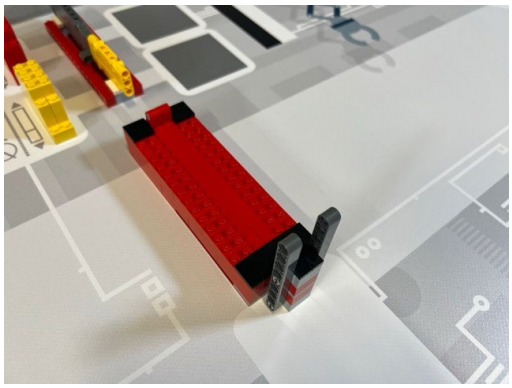
Red marking block is placed on the left side of the right barrier

Hatches

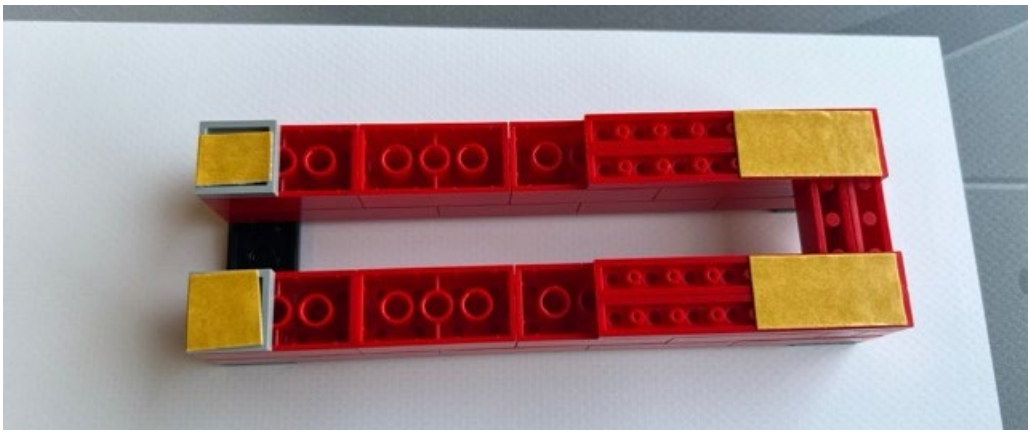
There are **2 hatches (1x yellow, 1x red)** on the field. The positions are marked in red and orange. The hatches are fixed on playing field with double-sided adhesive tape.



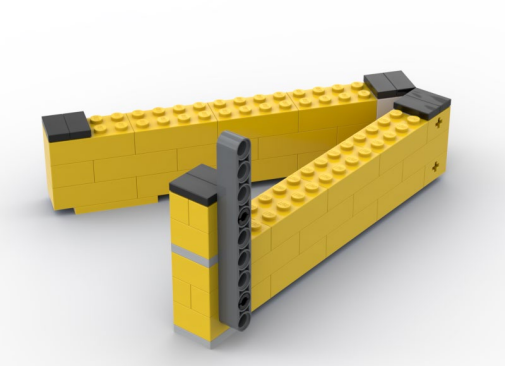
Red hatch (sliding)



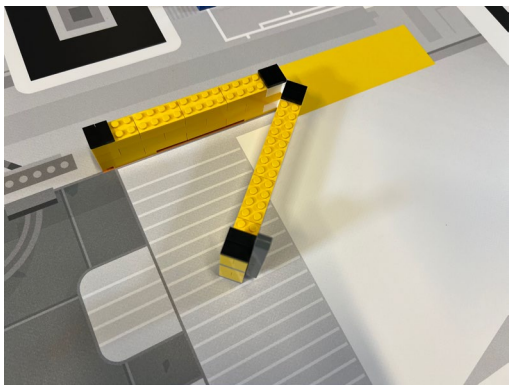
Position on the field



Recommended positions of double-sided adhesive tape.



Yellow hatch (swinging)

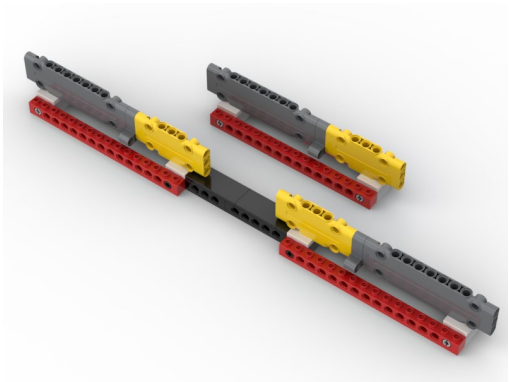


Position on the field

Recommended positions of double-sided adhesive tape. It is recommended to add additional double-sided adhesive tape between game mat and game table below the yellow hatch.

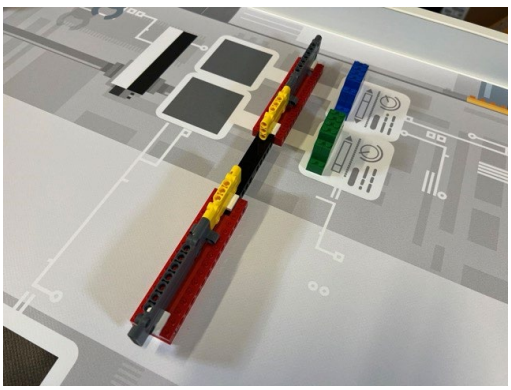
Barriers

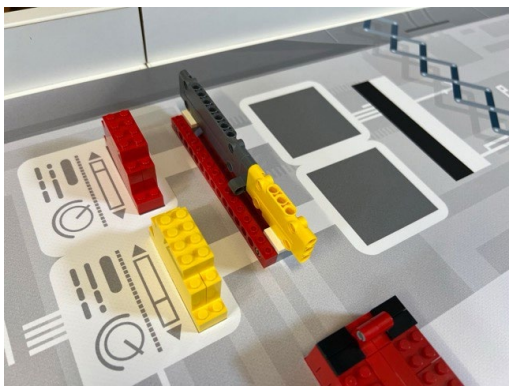
There are **2 barriers (1x short, 1x long)** on the field. The positions are marked with red rectangles.



Barriers

The flat sides of the panels on the barriers face inwards towards each other.



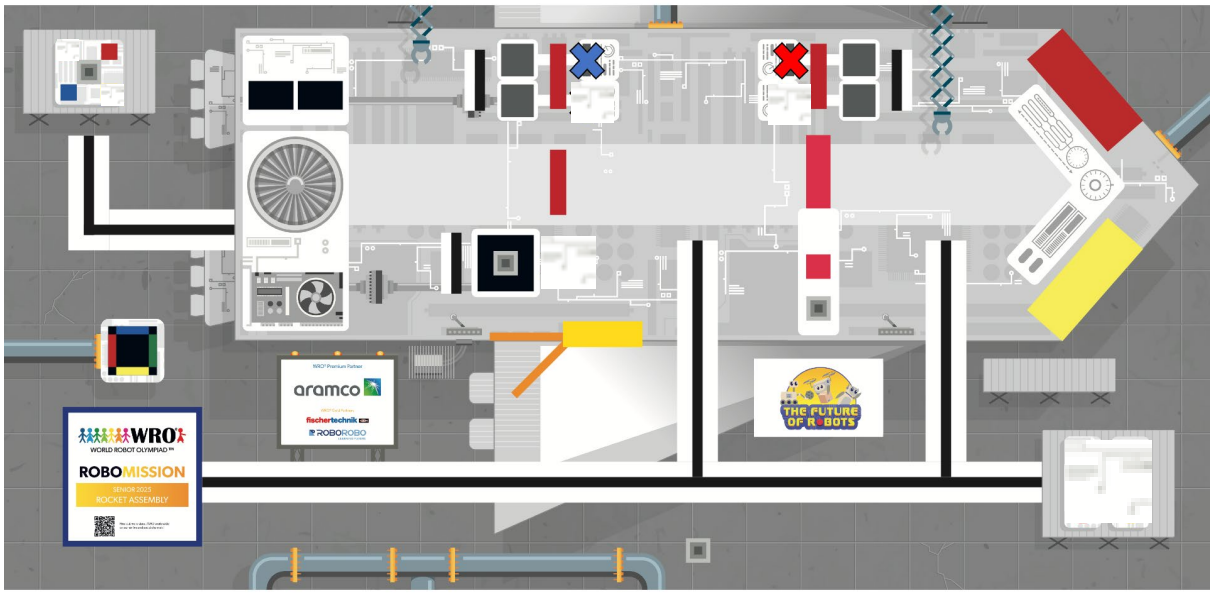


Summary randomization

On this field, the following objects are **randomly placed in <u>each round</u>**:

- Red and Blue marking blocks for rocket integration

You can see one possible randomization here (only randomized objects are marked):



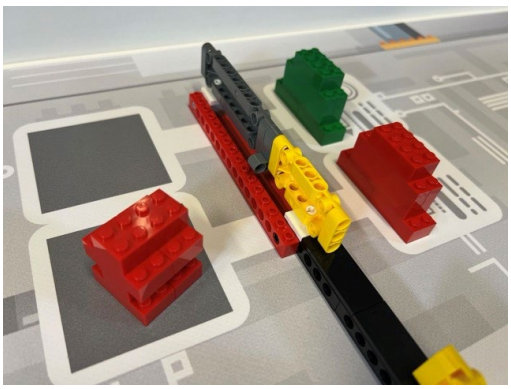
Robot Missions

3.1 Integrate rocket sections

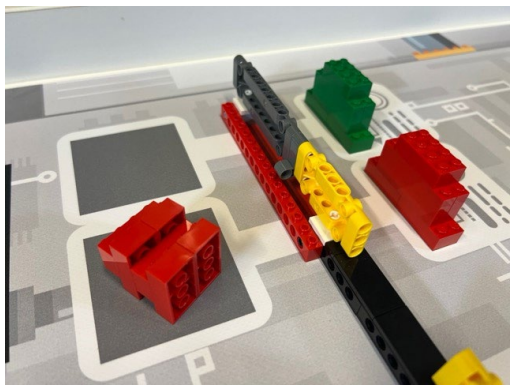
The rocket is divided in three parts by the barriers. The matching bolts must be used to firmly connect the parts together. The marking blocks on the other side of the barriers show which bolt is needed.

- Definition “completely in”: Completely means that the game object is touching the corresponding area only.
- Only one element scores points per target area.

	Each	Max.
Bolt is completely out of the initial square area	**5**	**10**
Bolt is completely in the rocket integration area and its colour is matching the colour of the corresponding marking block	**25**	**50**
Bolt is partly touching the rocket integration area and its colour is matching the colour of the corresponding marking block	18	
Bolt is partly touching any rocket integration area where the marking block with different colour is in.	5	



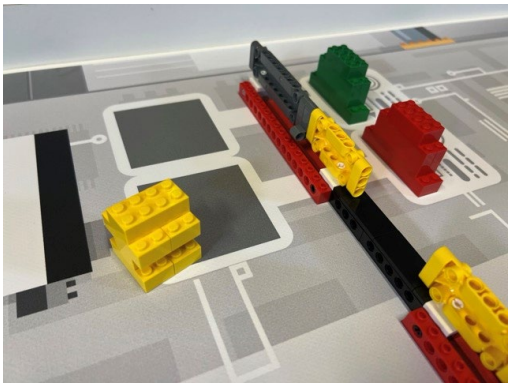
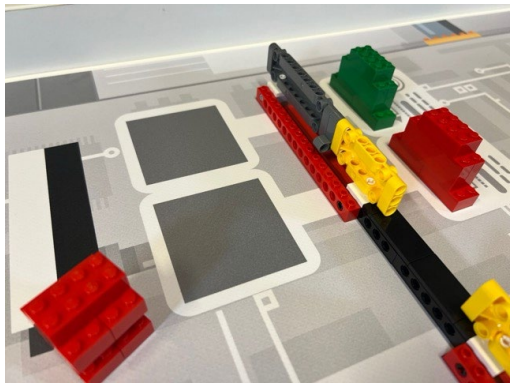
25 points
(correct coloured bolt completely in area)



25 points
(Bolt does not have to be upright)

18 points
(bolt partly in area)

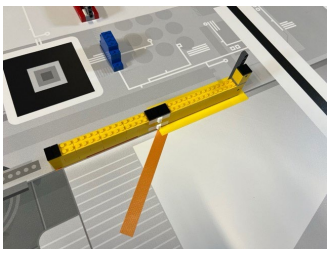
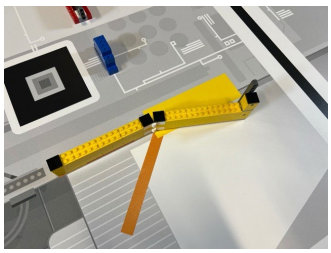
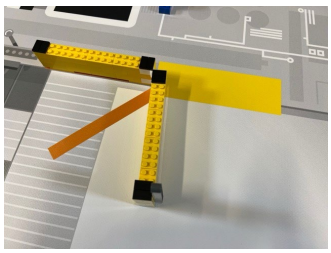
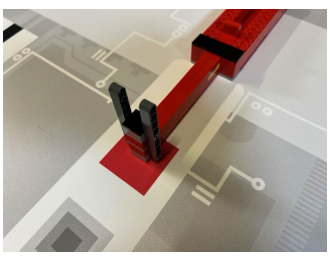
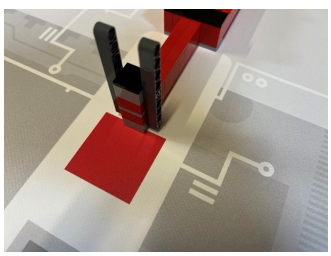
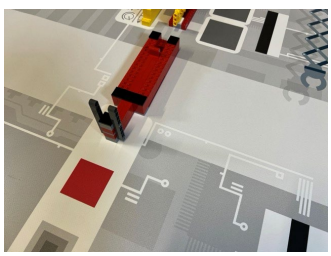
5 points
(completely in but wrong colour)

 5 points (partly in and wrong colour)	 0 points (bolt not touching target area)

3.2 Close the hatches

Two hatches are on the field. The yellow one is a swinging hatch. The red one is a sliding hatch. Both hatches score points when they are fully closed. The following table shows when hatches are considered closed.

	Each	Max.
Hatch is fully closed • Yellow: Swinging part is completely in yellow area • Red: Sliding part touches red rectangle	**15**	**30**

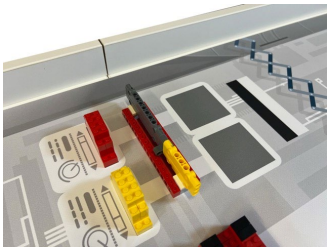
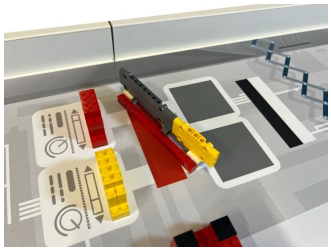
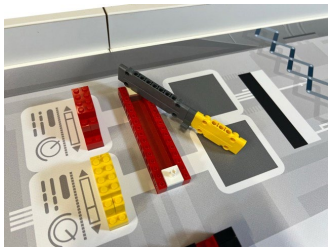
 15 points (fully closed, completely in yellow area)	 0 points (touching outside of yellow area)	 0 points (touching outside of yellow area)
 15 points (fully closed, touching red rectangle)	 15 points (fully closed, touching a little bit is enough)	 0 points (not reaching red rectangle)

3.3 Bonus for barriers

Working on a rocket requires absolute precision. It is therefore not permitted to move the two barriers. The playing field does not provide any tolerances for moving. Minimal shifts that may have been caused by imprecise positioning before the run, have to be counted in favour of the team in case of doubt. Final decision of this is with the judge.

- Definition “damaged”: Any situation that means that the game object is not exactly like at the start of the run, e.g. a brick fell off.
- Definition “moved”: The game object is considered as moved if a part of the game object is touching the mat outside of the red areas.

	Each	Max.
Barrier is not damaged or moved	**5**	**10**

		
5 points (barrier still on red area)	0 points (barrier moved)	0 points (barrier damaged)

※ Some objects are not used in the Japan Finals because the pictures are from the original rules.

4. Scoring Sheet

Team name: _____ **Round: _____**

Tasks	Each	Max.	#	Total
Integrate rocket sections				
Bolt is completely out of the initial square area	**5**	**10**		
Bolt is completely in the rocket integration area and its colour is matching the colour of the corresponding marking block	**25**	**50**		
Bolt is partly touching the rocket integration area and its colour is matching the colour of the corresponding marking block	18			
Bolt is partly touching any rocket integration area where the marking block with different colour is in.	5			
Close the hatches				
Hatch is fully closed • Yellow: Swinging part is completely in yellow area • Red: Sliding part touches red rectangle	**15**	**30**		
Bonus for barriers				
Barrier is not damaged or moved	**5**	**10**		
Maximum Score		**100**		
			Total Score in this run	
			Time in full seconds	