

# FAQ

Aug 1, 2017

**IMPORTANT: Read before going onto the FAQ.**

## About the Concept

Robots of tomorrow are expected to play an active role in the “real world” inhabited by objects with uncertainty, rather than in the standardized and controlled environments of manufacturing lines.

When robots work with entities from the natural world such as people, animals, plants, or minerals, they cannot possibly function effectively if they are designed under the same assumptions of precision found in industrial products.

For this year, we encourage designing and building robots that accommodate for this uncertainty and variability.

## About the FAQ

*Among the questions received, too many are found to address matters clearly stated in the Rule Book. These will make the FAQ unnecessarily long, and cause high inconvenience to the other teams. Be sure to read and re-read the Rule Book before sending questions. We are all working under a finite time schedule, so your cooperation in the smooth operation is vital.*

\*From questions received by July.31, 2017. All questions will basically be addressed unless redundant or pertains to strategies specific to a team. Supplementary information may also be provided.

New items are boxed in.

The new FAQ is "Others (O)" in P28.

## Game Field / Articles

### Game Field (F)

F-1] Which is the correct position of the start zone in the first page or the 8 page?

A: Please refer to the Top View Figure.

You can download all Figures from the ABU Robocon official website

<http://aburobocon.net/> FIGURES tab. The Top View Figure is the first page.

F-2] What is the width of the white line used in the arena for line following?

A: As shown in the Top View Figure (can be downloaded at link provided in F-1), the width of the white line is 30mm.

F-3] What is the type and thickness of the vinyl sheets?

A: At the ABU Robocon 2017 Tokyo contest, Lonleum, a product of Lonseal Corporation, will be used. Its thickness is 2mm.

<https://www.lonseal.co.jp/english/products/floor/pl/>

F-4] What is the exact colour and paint specification of the Spot? (Paint¥ No paint¥ Polished)

A: The color of the spots is white. Specifications are on the Side View Figure, which can be downloaded from the link provided in F-1. The Side View Figure is the second page.

F-5] When will the material of column of spot be announced?

A: It was released on 15-September, and notice of the release was given via twitter. Please download the latest information from the FIGURES tab at

<http://aburobocon.net/>

Participants are advised to keep track of updates on the official website via the twitter account @ABURobocon2017. A link is also available at the bottom of the official ABU Robocon website.

F-6] Is the height of the fence separating Throwing area and No contact area 20mm only?

A: Yes.

F-7] Are all the fences painted or polished? What are the exact colors ?

A: The fence will be coated with grey emulsion paint.

**Nov.22, 2016**

F-8] Is the height of pole include the landing area of the disc? ?

A: The height of each spot is the total height including the landing area of the discs.

F-9] Regarding "Game Field: Side View," there is no mention of how the top board is attached to the pole for each spot. How will they be fixed?

A: The pole and board will be attached using glue and screw.

F-10] Regarding spots.

What is the depth of the hole in the spot with  $\phi 150$ ?

A: Each spot consists a doughnut shaped board attached to an open-ended pole.

F-11] Will the vinyl sheet on the game field be laid out without any seams or bumps?

A: Any seams of the vinyl sheets used in the ABU Robocon Tokyo contest will be joined using vinyl tape to minimize bumps.

F-12] What is the strength of the fence around the game field? How will it be fixed?

A: The fence will be screwed on. The strength will not be such that robots can ram into it full force in order to change directions, etc.

F-13] Will the vinyl sheet be laid or glued onto the floor?

A: At the ABU Robocon Tokyo contest, the vinyl sheet will be laid.

F-14] Is the fence circling the game field made of solid wood, or is it hollow inside?

A: At the ABU Robocon Tokyo contest, the fence will be made of solid lumber.

F-15] Is the height of the fence measured from the platform or the vinyl sheet?

A: The height is from the vinyl sheet. All heights of fixtures on the ABU Robocon contest field are measured from the vinyl sheet.

F-16] Regarding FAQ F-1.

The height of the nearest spots for both teams in the movie on the official website appears to be different from that indicated on the Side View figure. Should we go by the Side View figure?

A: Yes.

## Discs (D)

D-1] I want to know about the material that is used for making dice with its few material specification like density and Material Name or Composition.

A: The ABU Robocon 2017 Tokyo contest will use the below product as is.

Product: Volley® Soft Saucer (red and blue)

as sold through BorneLund Corporation (Japan)

BorneLund's product number: VO250/FBR (red) / VO250/FBB (blue)

D-2] We have procured 4 Volley Soft Saucers as mentioned in the rulebook from Germany. It was observed that:

1. One of the discs is slightly oval that is the diameter is not exact 240mm.
2. Also the dimensions and shape of each disc are different that is the upper surface of one is concave, one is convex and one is flat.

Due to the above, the aerodynamics of each disc is different.

How are you going to ensure that every disc will be of same dimensions and shape?

A: We cannot.

D-3] Have you considered the randomness in the Volley Saucers? The trajectory of every disc is different. Have you designed the theme for the same or its a wrong decision that you have taken to choose a manufacturer which manufactures disc for children of below 10 age and thus ensuring no precision in manufacturing at all?

A: The uncertainty of the article is part of this year's game concept. Participants are advised to design and build with this in mind.

### Nov.22, 2016

D-4] Could you provide the friction coefficient of the frisbee to the plywood?

A: We cannot.

### Jun.24, 2017

D-5] Is the disc prepared for the competition committee?

- A: 1. The discs used in "ABU Robocon 2017 Tokyo" will be VO 250 / FBR and VO 250 / FBB sold by Bornelund Inc.. For details, please check the website. (<https://roboconsaucer.jp/en/>)
2. The discs used in the game of "ABU Robocon 2017 Tokyo" will be prepared by the Tokyo organizing committee.
3. If the team needs discs for robot design and practice, please purchase them on Bornelund's website. (<https://roboconsaucer.jp/en/>)
4. For discs used in national competitions in each country, please contact the organizing committee of each country.

D-6] For each match, will the new discs be prepared?

A: Discs shall be 50 reds and 50 blues as one set, and 3 to 4 sets will be prepared at the "ABU Robocon 2017 Tokyo committee", and they will be replaced every game. The damage condition of the disc is confirmed by the competition staff and will be replaced by the judgment of the judges.

**May 25, 2017**

D-6] Will the same discs used during the test run be used for the actual game as well?

A: No, the contest organiser will prepare discs separately, for test run and for the actual game.

## Beach ball (B)

B-1] What is the exact dimension of the Beach Ball?

A: The inflated diameter of the beach ball is approximately 28cm.

ABU Robocon will use the "16-Inch Beach Balls" available at the following online shop as is. <https://www.beachballs.com/16-inch-beach-balls.asp>

The same link is also available from the ABU Robocon official site.

While "16-Inch" is part of the product name, explanations for why are given in the above online shop.

### **Jun.16, 2017**

B-2] At the time of the contest, how will much air be put in the beach ball?

A: The contest committee does not measure the air pressure of the beach ball.

At the first, we inflate the beach ball diameter to be about 28 cm.

Next, the apex of the beach ball (at this time, the air hole is positioned at the top) is positioned at a height of 1 m, and when the ball was fall freely to a plywood (thickness of 12 mm / unpainted plywood), the top of the ball is bounced back within 500 - 600 mm, in one bounce.

### **May 25, 2017**

B-3] The official beach ball supplier by the contest committee, Beachballs.com has run out of stock of balls that will be used in the ABU Robocon 2017. What Can I do?

A. Please try to use the similar sized beach balls as much as possible.

# Rules

## 1 Contest Outline (R1)

### 1.1 (R1.1)

R1.1-1] \*Moved to R1.11-1

## Nov.22, 2016

### 1.7 (R1.7)

R1.7-1] The beach balls have holes for inflating them, and therefore not uniform.  
How will be the balls placed on the spots at the beginning of the game?

A: At the ABU Robocon contest, the balls will be placed with the holes for inflating them facing down.

### 1.8 (R1.8)

R1.8-1] Are the discs placed inside the LA or beside the LA (outside the game field) and what should be the orientation and position of the discs?

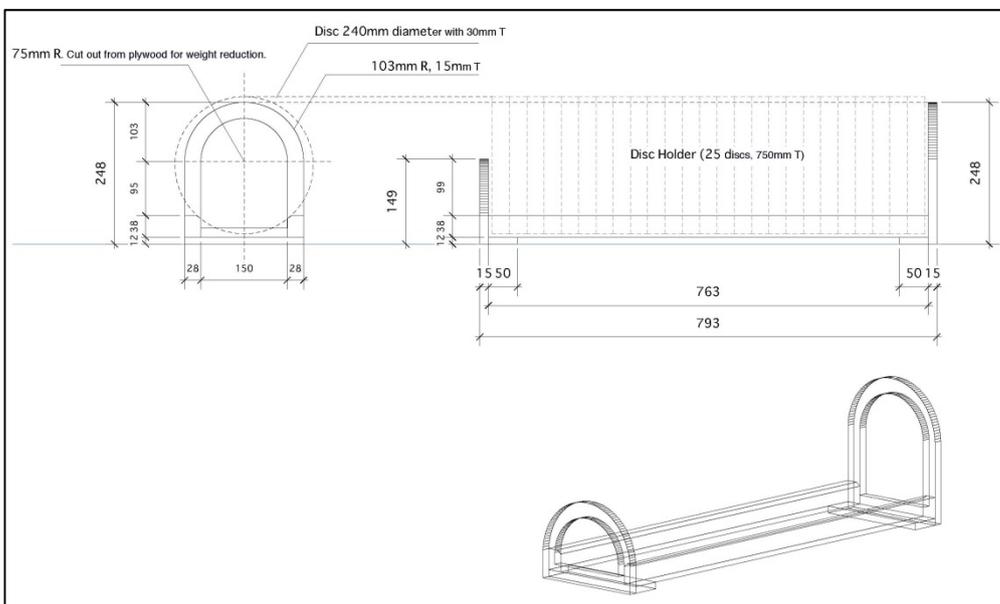
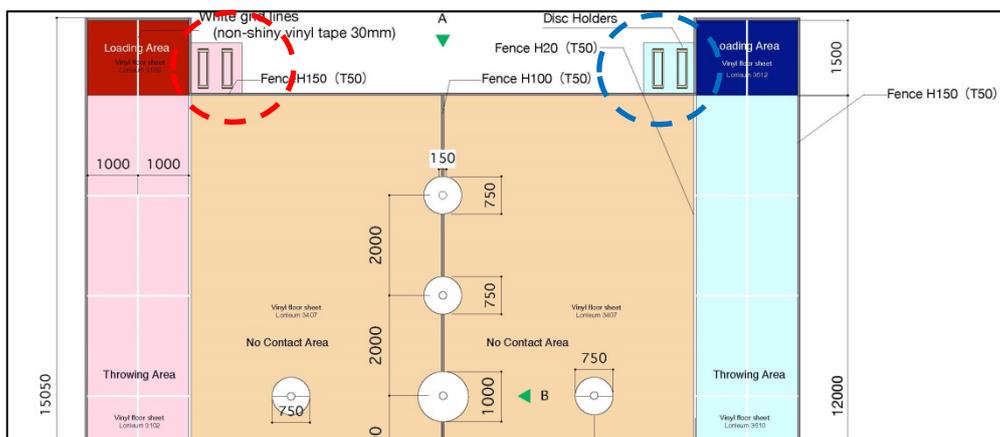
A: The discs will be placed immediately outside LA in a container. During loading, team members may move the discs inside LA, etc., as necessary.

## Jun.16, 2017

R1.8-2] According to R1.8-1, it is said that the disk is placed outside the LA in a dedicated container.

In where area, what kind of dedicated containers are put on?

A: Please check the following figure. The figure is released on HP.



## 1.9 (R1.9)

R1.9-1] What is the definition of 'Loading the disc'? What if the disc falls off during loading in the LA?

A: "Loading the disc" is the action where the discs are loaded onto the robot inside the Loading Area. Discs that fall in LA or outside the game field during loading can be reused. Those that fall inside the game field (other than LA) however will be invalid. Also, after the robot leaves LA, rule 2.4.7 will be applied, and discs that fall on the floor in or outside the game field will become invalid.

R1.9-2] Is it possible that at the start of the game, magazine containing discs is not attached to the robot and it is then attached in the Loading Area when loading the discs? given that robot with magazine is in the dimension and weight limits

A: The use of magazines containing discs is allowed. But placing discs inside the magazine can be done only at set-up time or after.

R1.9-3] Apart from filling discs in loading area, can we load pneumatic air again into the cylinders when bot comes to loading area?

A: No, it is not allowed.

## 1.10 (R1.10)

R1.10-1] Is it necessary to knock of the beach balls using discs only? Is it allowed to use any other means?

A: The balls are knocked off using discs. As for other means, a ball that was hit by a disc knocking off a different ball would be valid.

## 1.11 (R1.11)

R1.11-1] \*Moved from R1.1-1

So my question is whether the team which will hit the ball on pole will secure that pole?

For exaple. if A team hits the ball on pole and B team throws the disc...Will the team A secure that pole..??

A: A team cannot "secure" any spot or pole by hitting its ball. Points are awarded to the team with its disc on the spot at the end of the game.

## Nov.22, 2016

R1.11-2] In which position DISC can land on the pole i.e.either upside or downside of the disc?

A: The disc can land with either side facing up to be valid.

## 1.12 (R1.12)

R1.12-1] Regarding 1.12. Does a disc that touches a spot only momentarily meet the definition of a "successfully landed" state?

A: A disc that remains on the spot at the end of the game meets the definition.

R1.12-2] Regarding 1.12. When is APPARE! reached? For example, what if a team's disc touches on the final spot but is immediately knocked off by the opponent's disc?

A: APPARE! is reached at the point where the referee can confirm by sight. If the disc is knocked off the second it touches the final spot, it will not be APPARE! unless the referee deems otherwise.

**Nov.22, 2016**

R1.12-3] Regarding rule 1.12, when all the balls have been knocked off of their spot and a team successfully lands its discs on all the spots, that team reaches "APPARE!" If:

(1) both teams have their discs on all of the spots

(2) one spot still has its ball resting on it

above are both true, and one team hits the remaining ball, and the ball falls off without any of the discs falling off, which team has reached "APPARE!"?

A: The team that hits the ball off will be awarded "APPARE!" and declared the winner. (related topic: R2.7-1)

R1.12-4] Regarding R1.12-1 and R1.12-2.

How will the referee judge "APPARE!"?

A: The referee will decide that a disc has landed by visually confirming that the disc in question has reached a stationary state on the spot. "APPARE!" will be declared the instant a disc has landed on all the spots

**1.13 (R1.13)**

R1.13-1] What are the total numbers of games in one match?

A: One.

**Jun.24, 2017**

R1.13-2] Is the way to count game time 0 to 3 minutes, or 3 to 0 minutes?

A: It starts from 0 and ends in 3 minutes.

## 2 Game Procedure (R2)

**May 25, 2017**

2.1 (R2.1)

R2.1-1] In the rulebook and FAQ, 'during the game' or 'in the game' frequents but does that expression include set-up time?

A: As per written under FAQ R7.6.1-3, 'during the game' or 'in the game' doesn't include set-up time.

2.1.1 (R2.1.1)

R2.1.1-1] Regarding Rule Supplement 2.1.1-1, is it OK for the magazine and the jig placed in LA to extend to, or make contact with the surface of the area other than LA, such as the contest field or out of the field?

A. Please make sure to keep the magazine and the jig within LA including its space above from the end of set-up time till the end of the game.

2.2.1 (R2.2.1)

R2.2.1-1] Is it allowed to shoot discs during set-up time?

A. No, it is not allowed.

2.3.1 (R2.3.1)

R2.3.1-1] While loading discs, is it allowed for the team members to work in the field or outside of the field, not in LA?

A. Once the referee allowed disc loading, team members can load discs in their team's LA, TA or from outside of the field. When the loading is completed, team members should move out of the field immediately.

2.3.3 (R2.3.3)

R2.3.3-1] What exactly is designated area for Manual Operator?

A: The operator should be outside the game field, while not entering the opponent team's side beyond the middle of the field.

**Nov.22, 2016**

R2.3.3-2] Is there possible that the team leader and operator of robot's may same person or not?

A: Yes.

2.4.1 (R2.4.1)

R2.4.1-1] Is it allowed to squeeze the soft saucer disc while loading inside the bot?

A: Yes, it is allowed. But the squeezing must not cause serious damage to the discs.

R2.4.1-2] According to Rulebook 2.4.1, a team may load the discs once the robot enters LA. Then, would it be recognized as violation or disqualification to load the discs while the set-up time or before the set-up time in advance?

A: Loading discs in advance is a violation. However, as in R1.9-2, discs can be set inside a container during set-up.

**Nov.22, 2016**

R2.4.1-3] How many number of DISC can be loaded at a time during competition?

A: There are no limits as to the number of discs that can be loaded onto the robot at any time.

R2.4.1-4] Regarding rule 2.4, can the robot be loaded as many times as needed?  
Or can we load only once?

A: The robot can be loaded as many times as needed. Each loading must happen in LA.

R2.4.1-5] Regarding 2.4.

If a robot has multiple loading mechanisms, could the team transfer the discs in one mechanism to a different mechanism when the robot returns for reloading?

A: Yes.

R2.4.1-6] Rule 2.4.1 says, "during the game, a team may load the discs when all parts of the robot touching the game field floor completely enter the Loading Area, and permission is given by the referee."

And FAQ R4-2 says, "Contact refers to the robot coming in contact with the floor. It does not include touching the wall."

Combined, loading is allowed once every part of the robot that is in contact with the floor completely enters LA, even if the robot is also touching the wall. Is this understanding correct?

A: Yes.

R2.4.1-7] Regarding rule 2.4.1.

After the start of the game, can team members touch the unloaded discs?

A: They may touch the discs only in LA during loading.

R2.4.1-8] As to setting the discs into the containers (magazines), are we allowed to do so during setting, and at any time during the game?

A: The team may touch its discs only during loading in LA after the start of the game.

R2.4.1-9] Regarding rule 2.4.1.

Could a disc be taken out and reloaded, if it has not been thrown yet?

A: If it is done in LA, yes.

R2.4.1-10] Will it be considered damaging the discs if using rollers leaves dark residue on them?

A: If the contest committee deems the effects left on the discs is too large, you may be asked to reduce its power.

R2.4.1-11] Regarding rule 2.4, are we allowed to use tapes, etc., that can be removed without damage on the discs?

A: Anything will be considered to be a part of the robot, and its separating from the robot will be cause for violation by splitting into parts.

R2.4.1-12] Will there be time to check the discs that will be used before the game?

A: Not immediately before each game. Each team is asked to use the set of discs provided by the contest staff.

**Nov.22, 2016**

R2.4.1-13] Regarding FAQ1 R2.4.1-2.

Regarding FAQ 2.4.1-2, are the team members allowed to touch, measure, or weigh the discs that will be used in the game before the set-up time?

A: They may do so the day before the contest, during test runs.

R2.4.1-14] Regarding rule 2.4.1.

If the structures of the robot need transforming manually in order to load and throw the discs, are the team members allowed to transform them when members are loading discs in LA simultaneously?

A: Yes.

**Jun.16, 2017**

R2.4.1-15] Regarding rule 2.4.1.

Do I have to ask for retry when reloading discs?

A: You don't need to ask for retry. Whenever the robot enters the LA during the competition time, you can adjust and reload the disc as many times as you like. However, within LA, you can't remove the opponent team's disc on your robot. Please ask for retry when you want to remove the disk of the opponent team. (Reference R2.4.7-6])

**Feb.3, 2017**

R2.4-1-16] Is it only allowed to load the discs on the robot in LA?

For example, may I adjust the other parts of the robot?

A: Please refer to FAQ; R2.4-1-14]. However, if you need to adjust other parts of the robot, you have to ask for a retry and adjust the robot in the Start Zone.

**May 25, 2017**

R2.4.1-17] Loading discs must be done in LA but is it Ok to test operation after loading?

A. Testing loading function and delivery mechanism are allowed but shooting discs is not allowed.

**Nov.22, 2016**

2.4.2 (R2.4.2)

R2.4.2-1] Regarding rule 2.4.2.

If disc loading is done automatically, could the robot begin loading without waiting for permission from the referee, once it completely enters LA? And, could the robot touch the container for loading before completely entering LA?

A: The team is requested to begin loading after permission from the referee, even if it is done automatically. The referee will give permission in a speedy manner. The robot may not touch the container for loading prior to completely entering LA.

**May 25, 2017**

R2.4.2-2] While loading discs in LA, if opponent's discs are on our team's unloaded discs and the magazine, can we remove those discs by our team members?

A. Please ask referee for permission before removing the discs.

### 2.4.3 (R2.4.3)

R2.4.3-1] (Reference 2.4.3) While reloading the discs, can we replace our emptied disc container with a preloaded identical disc container in the LA?  
(Given that robot with new identical disc container is in the dimension and weight limits)

A: Replacing one container with another identical container in order to reload discs is allowed. In this case, the size and weight requirements apply to the two containers combined.

### Nov.22, 2016

R2.4.3-2] Regarding rule 2.4.3.

- Is it allowed to build the container with motors, board, battery which is like a part of a machine?
- Could the magazine that will be attached have actuators?
- Could the throwing mechanism be part of the container?
- Could the magazine have power source/battery?
- Could the magazines at LA have driving mechanisms, batteries, and other mechanisms for purposes other than throwing, to be attached to the robot during the game?
- Is it allowed to attach the controller to the magazine and not the robot?

A: ~~If the containers are such that the contest committee deems them to be individual robots, they will not be allowed.~~ (✖This answer revised to R2.4.3-5!.)

R2.4.3-3] Regarding rule 2.4.3.

Could we place jigs and containers with discs already inside at LA, or do we have to set the discs inside jigs and containers after the start of the game?

A: Discs can be set inside jigs and containers during set up time.

(related topic: R1.9-2)

R2.4.3-4] Regarding rule 2.4.3 and 7.4.

Will it be considered splitting the robot into parts if containers such as magazines are replaced with another magazine?

A: No, it will not be considered as splitting into parts. Please refer to R2.4.3-1.

### Jun.16, 2017

R2.4.3-5] The answer of "magazine FAQ R2.4.3-2" will be revised as follows.;

- A: 1. Regarding teams using a magazine, if the robot loaded with the magazine leaves LA, the magazine is regarded as a part of the robot. In such a case, the magazine itself can have functions as the robot. However, the magazine should fit in the robot size regulation (**Revision** R7.5.2) AND the robot weight regulation (R7.6.1).
2. On the other hand, if the magazine is only used for loading discs and it doesn't come out of LA, the magazine is not regarded as a part of the robot. Therefore it won't be included in the robot size regulation. However, in this case, the magazine should NOT be equipped with the functions not necessary to the disc loading tasks. Further, the magazine should fit in the robot weight regulation. (R7.6.1)

## May 25, 2017

R2.4.3-6] FAQ R2.4.3-5.A-1 mentions that the magazine itself can have functions as the robot. Then can I use the magazine itself as the robot?

A. No, you cannot. As per rule 2.4.3, the magazine should be just a container to load discs. However, if the robot loaded with the magazine is leaving LA, the magazine is regarded as a part of the robot. Therefore you may have the function of the robot that is required as a magazine.

R2.4.3-7] FAQ R2.4.3-5]A1 mentions that when the robot loaded with the magazine leaves LA, the magazine is regarded as a part of the robot. What is the definition of 'the robot loaded with the magazine'?

A. 'The robot loaded with the magazine' means that the magazine is completely loaded or mounted to the robot.

R2.4.3-8] FAQ R2.4.3-5]A2 mentions that the magazine should not be equipped with the functions not necessary to the disk loading tasks. Can it be equipped with batteries, motors and etc., if such functions are necessary for disc loading?

A. Yes, the magazine can be equipped with functions necessary for disc loading. However, please make it visible and convincing for referees and other teams that no other functions other than loading discs are equipped to the magazine.

## Jun 26, 2017

R2.4.3-9] Regarding R2.4.3.5, excluding magazines, is it allowed to use jigs to adjust the position of the robot in LA? Is it OK to touch the robot to adjust the position when it starts from LA?

A: No it is not allowed. As stated in Rule 2.3.4, the jigs allowed to use in LA are limited to what are needed for loading discs only. If you need to adjust your robot for start, please ask for retry and do it in the SZ as stated in FAQ 2.4-1-16.

## 2.4.5 (R2.4.5)

R2.4.5-1] Can we use flying quadcopter or robot for throwing discs?

A: No, it is not allowed.

R2.4.5-2] According to Rulebook 2.4.5, the robot is allowed to throw the discs only when it is in contact with TA and no other area. Then, would it be recognized as violation or disqualification if the robot puts the discs on the spots directly (the robot doesn't throw the discs) while the robot is hovering or flying? Our intention here is use of a multicopter.

A: The use of multicopters is not allowed. The robot may not hover or fly.

## Nov.22, 2016

R2.4.5-3] - We have doubt that are we allowed to throw 5 disc at a time all together in bone pack.

- Can the bot shoot 7 disc at a time?

A: Yes.

R2.4.5-4] May I know that while throwing the saucer a holder like something can come out of its hand and throw the saucer

A: Yes, discs may be thrown by holder/hand as long as the robot stays within its size regulation.

R2.4.5-5] Which part of the arena robot cannot touch while throwing discs?

A: Please refer to rule 2.4.5.

R2.4.5-6] Can we throw the disc using air pressure?

A: Yes.

### **Nov.22, 2016**

R2.4.5-7] Regarding R2.4.5-2.

Could we use a multicopter if the robot does not throw discs while in flight, and only throws while it is in contact with TA?

A: No.

R2.4.5-8] Regarding R2.4.5-1.

If the robot cannot throw discs while flying, could the robot be disqualified if it flies but never throws discs during the game?

A: Flying is not permitted, so that is grounds for disqualification.

R2.4.5-9] Will a robot be disqualified for not having the ability to throw discs?

A: No, it will not be disqualified.

### **2.4.6 (R2.4.6)**

R2.4.6-1] Will the damaged disks be replaced during the competition?

A: The discs will be replaced as needed upon instructions from the referee.

R2.4.6-2] Will the frisbee be provided to us in national competition or we have to buy it on our own

A: Contact the organisers of the local/national competition in your country. For ABU Robocon, they will be prepared by the organiser, as stated in rule 2.4.6.

### **2.4.7 (R2.4.7)**

R2.4.7-1] Can the team members clear the discs falling in the path of the robot inside the Throwing Area or the discs falling on the robot?

A: No, the opponent team's discs that have fallen may not be removed or collected by the team members.

R2.4.7-2] If the Opponent's disc lands in our Throwing Area, obstructing the movement of our robot, can the disc be picked up manually by the team members?

A: No, the opponent's discs that have fallen may not be removed or collected.

R2.4.7-3] Regarding 2.4.7. What happens if discs thrown by the opponent hit our robot, and discs loaded on our robot falls? Also, will there be any penalties for the opponent?

A: 2.4.7 will be applied and the fallen discs will become invalid. If the referee however decides that the opponent's actions are clearly intended to pose danger to the robot, that team may be disqualified.

**Nov.22, 2016**

R2.4.7-4] Regarding R2.4.7-1.

Will there be a penalty if the opponent's discs that have fallen in our TA moves as result of our robot moving? Also, if a ball is in our TA, is it also not allowed to collect and remove them?

A: There is no penalty. The same will apply for balls. Removal and collection by team members is not allowed.

R2.4.7-5] Regarding rule 2.4.7.

What happens if a disc lands on our robot? Is reloading allowed?

A: If your team's disc lands on your robot, you may reload it at LA.

R2.4.7-6] According to FAQ1 R2.4.7-1,

- Team members are not allowed to remove discs that have fallen on TA. Then, if the discs (meaning both opponent team's disc and our team's disc) have fallen on our team's SZ, are the team members allowed to remove the discs that prevent the robot from putting on SZ when the team declares retry?
- Team members are not allowed to remove discs that have fallen on the robot. Then, are the team members allowed to remove the discs that prevent the robot from reloading when they try to reload? For example, when the opponent team's discs stuck in loading structure, can the team member remove the discs?

A: The team may remove discs in SZ after getting permission from the referee for a retry. (related topic: R3.4-1)

**2.5.1 (R2.5.1)**

R2.5.1-1] Even though the Score is counted once can I through the saucer to near spot so that I can remove Saucers of opposite tem.

A: Yes.

R2.5.1-2] Suppose the team A strike down the beach ball from any one pole(center most pole) but the team B PERFECTLY made their disc to land on the same pole just after the team B successfully strike down the beach ball .... so my question is that on whose side the score will be counted?

A: Please read rule 2.5.

**Nov.22, 2016**

R2.5.1-3] Regarding rule 2.5.1.

At what point does a disc "land" on a spot? For example, the instant that a disc touches the spot?

A: When the referee makes visual confirmation. It will not be the instant that a disc touches the spot.

R2.5.1-4] Regarding rule 2.5.1.

- If our disc is gets land into apponent teams loading mechanism, and they successfully land this our disc on the pole, then who will get this point?
- If a disc thrown by the opponent's robot lands on our robot without touching the floor, and that disc lands on a spot, whose point will this be?

A: The game will be conducted using discs of two colors, red and blue. The referee will count the discs according to color. If the disc in question is the opponent team's color, then the points will be awarded to the opponent.

## Jun 26, 2017

R2.5.1-5] If the distorted discs fall into the hole of the spots, will it be a score?

A: The scores will be registered only for the discs landed on the surface of the round table which consist spots. Therefore, scores won't be registered when the discs fall into the hole of the spots.

## 2.5.2 (R2.5.2)

For R2.5.2-1 through 6, please read rule 2.5 carefully.

- R2.5.2-1] If my disc lands on the spot and the ball is not knocked off. Again I throw a disc which now knocks off the ball from the same spot, will I get the point of the previously landed disc too?
- R2.5.2-2] My question is that when the team A throw the disc and ball is not knocked off and same condition is happens may times through out the game with same team on same pole then can team A got the points of this pole at the end of the game?
- R2.5.2-3] If as per above situation when on the same pole two teams, team A and team B are throw the disc and ball is not knocked off through its position and disc of both the placed on the pole without knocked off of ball then which team got the points at the end of the game?
- R2.5.2-4] If A team has thrown the disc on the spot, but the ball is not knocked off. After that B TEAM throws the disc and ball is knocked off, which team will get the points?
- R2.5.2-5] If A team has thrown the disc on the spot, but the ball is not knocked off. After that B team throws the disc and the ball as well as disc of A team falls, whether A team will get points?
- R2.5.2-6] If our team land disk on platform & then if due to other team our disk fall on arena then it's pont will be counted or not??

## Nov.22, 2016

R2.5.2-7] Regarding rule 2.5.2.

If a ball that has fallen off returns to that spot, what happens to the points from the discs on that spot?

A: No points will be awarded if the ball remains on the spot at the end of the game.

## 2.6 (R2.6)

Supplement R-2.6] Discs that are thrown or are in mid-air at the moment the game ends are invalid. Discs that alter the state of the spots after the game has ended will not affect the score, even if the disc is thrown before the game ends. The referee will judge according to the state at the end of the game.

## Nov.22, 2016

### 2.7 (R2.7)

R2.7-1] Regarding rule 2.7.1.

What if both teams reach "APPARE!" at the same time? Will the winner be the team with more points?

A: A winner will in principle always be determined, based on the referee's visual confirmation. Both teams reaching "APPARE!" at the same time is not considered a possibility at this time. (related topic: R1.12-3)

## 3 Retry (R3)

### 3.2 (R3.2)

R3.2-1] Can we replace a damaged part with an identical one during loading in LA? Or is it obligatory to take an explicit retry for replacing the damaged part?

A: By 3.2, team members must ask for a retry and replace the part at the Start Zone.

R3.2-2] Are the retry positions different for a mandatory retry and demanded retry?

A: No. For all retries the robot must go to the Start Zone, and restart there after permission from the referee.

### May 25, 2017

R3.2-3] When we ask for retry, is it allowed to fill the air pressure to the robot within the SZ?

A. Yes, it is allowed. However, the use of air compressor connected to the power supply is not allowed.

### 3.3 (R3.3)

R3.3-1] In point 3 it is stated that a team may ask for as many retries as necessary. During this retry will the clock be stopped?

A: The clock will proceed.

### Nov.22, 2016

#### 3.4 (R3.4)

R3.4-1] Regarding rule 3.4.

During a retry, could team members remove discs from the opponent team that have landed onto our robot, by hand?

A: Yes. (related topic: R2.4.7-6)

#### 3.5 (R3.5)

R3.5-1] Is it allowed to adjust discs already loaded on the robot during a retry?

A: Yes.

### May 25, 2017

R3.5-2] FAQ R3.5-1] mentions that it's allowed to adjust discs already loaded on the robot during a retry but can I remove discs jammed in the robot mechanism and reload them?

A. Loading discs is allowed only in LA. You can touch discs during retry but discs removed from the robot should be kept out of the field and cannot be used again.

### Jun 26, 2017

#### 3.6 (R3.6)

R3.6-1] When the robot is returned to SZ during retry, is it OK to restart even if a part of the robot is extended beyond the space above SZ?

A: It is OK. However, all contact surfaces of the robot must be within SZ.

## 4 Violations (R4)

- R4-1] After any violation (mentioned under rule 4) takes place, is the mandatory retry position always the loading area?  
A: By 3.2 and 3.6, a retry requires the robot to restart from the Start Zone. The only exception is during loading (2.4.4), for which the restart is from the Loading Area.
- R4-2] Regarding 4.1.1. Does contact (with the No Contact Area) refer only to a part of the robot touching the floor? Or does it include touching the wall?  
A: Contact refers to the robot coming in contact with the floor. It does not include touching the wall.
- R4-3] Can the robot touch the wall (fence H150 & fence H20) during the game?  
A: Yes, the robot may touch the fence.
- R4-4] Regarding Figures and 4.1.1. Can the robot touch the fence (H20mm) between TA and NC?  
A: Yes.
- R4-5] Is the robot allowed to touch inside of the fence or hold inside and outside of the fence in order to secure the stability of the robot while throwing discs and in order to move rapidly?  
A: Yes, the robot may touch the inside of or hold the fence. But holding cannot be with such strength that it results in considerable damage to the field. In such cases, the referee may disqualify the team.
- R4-6] Regarding 4.1.1. Is the robot allowed to enter the space above the area outside the game field? If yes, could the robot touch the fence around the field from the outside?  
A: Yes, the robot may enter the space above the area outside the game field. The robot is also allowed to touch the fence from the outside.
- R4-7] Can the projection of the robot cross the fence on any side of the Throwing Area without making contact?  
A: Yes.
- R4-8] Can the opponent's disc be displaced from the spot by using our disc only? Is it possible to use any other means?  
A: Yes, opponent's discs may be displaced by using your disc only. Other means are allowed.

### Jun.24, 2017

- R4.8-1] The answer of " R4.8]" will be revised as follows.;  
A: Yes, opponent's discs may be displaced by using your disc only. Other means are not allowed.

- R4-9] Which are the conditions for false start?  
Which are the areas Robot must not touch?  
A: A false start occurs when the robot leaves the Start Zone before the referee's signal stipulated in 2.2.1. Regarding areas the robot must not touch, please read rule 4.1.1, etc.
- R4-10] What happens if the disc/beachball gets damaged by a team?  
A: If the damage is serious, and the referee decides it was an intentional act, that team may be disqualified.

**Nov.22, 2016**

- R4-11] - According to the FAQ, we cannot remove the disc that landed on our throwing zone. We then must intentionally roll over the disc, and hence might damage the disc seriously. Does this count as intentionally damaging the disc?
- If opponent's disc is being thrown into our robot's moving parts, hence damaging the disc, does this counts towards our responsibility?

A: Please refer to R4-10.

R4-12] Regarding rule 4.1.1.

Will it be considered a violation for the robot to enter the No Contact Area indirectly by using discs?

A: By rule 2.4.7, discs that fall on the floor in or outside the game field are invalid and can no longer be used.

R4-13] Regarding FAQ R4-8.

If we throw our disc and bump a ball off, and its falling off causes the opponent's disc on that spot to also fall off, will this be considered a violation? It is assumed that our disc never touches the opponent's disc.

A: No, it is not a violation.

**Feb.3, 2017**

R4-14] If we violate, how many points will be deducted?

A. There won't be any point deduction in the case of violation. However points gained by an act of violation will be invalid. If you drop opponent's discs from a spot by a violation act, the opponent's discs will be returned to that spot by the referee.

## 5 Disqualifications (R5)

R5-1] Regarding 5.1.1. Will the use of discs to hit the opponent's discs be considered an obstruction?

A: No.

R5-2] It is written in the rule book that "Any other act that goes against the spirit of fair play, that team will be disqualified". But in the theme video, the robot from blue team is shown to have throw disc in such a way that the discs of other team falls, so is that allowed?

A: Yes, it is allowed.

R5-3] According to Rulebook 5.1.2, a team would be disqualified if they use wind as obstruction. Then, would it be recognized as disqualification to use wind in order to knock off balls or knock off opponent team's discs from the spot?

A: Yes.

R5-4] Regarding 5.1.2. Could wind be used for purposes other than obstruction? Also, if wind used not intended as obstruction results in being one, would this be cause for a disqualification?

A: The use of wind is not allowed.

R5-5] Would it be recognized as disqualification to conduct such activities: throwing the discs at the spot in order to knock off the opponent team's discs, throwing the discs at SZ, TA, and LA of the opponent team in order to obstruct movement of the robot, throwing the discs at the opponent team's discs while they are flying and hit them in the air in order to change trajectory of the opponent team's discs?

A: None of the actions mentioned will be cause for a disqualification.

### **Nov.22, 2016**

R5-6] According to R5-4, the use of wind is not allowed. Does this include using wind to exert force on the ground in order to increase friction?

A: Yes.

R5-7] Regarding FAQ R5-4.

- Does the answer include wind resulting from suction of the floor, even if its objective is not obstruction?
- Could a team use floor suction in order to prevent the robot from falling over?
- Could a team use suction cups to adhere to the floor?

A: Adhesion to the floor using air suction or suction cups is not allowed.

R5-8] Regarding FAQ R5-4

- Is a team not allowed to use wind to throw discs?
- Is a team not allowed to use fans to assist propulsion of the robot or remove discs that have dropped in the Throwing Area, even if it is clearly not an obstruction to the opponent?

A: No.

**Nov.22, 2016**

R5-9] Regarding R5-4, are cooling fans that are part of motors or circuit boards allowed?

A: Fans used for cooling motors and circuit boards are allowed. However, the referee may still ask a team to remove the fan if s/he judges them to be possibly obstructive to the other team.

R5-10] Regarding rule 5.1.1,

- If a disc flies into the spectators' seats or the judges' seats, will this be cause for a disqualification?
- If a disc is destroyed by mistake, will this be deemed as damaging the field and therefore cause for disqualification?

A: If the referee judges that the act was intentional, the team will be disqualified.

R5-11] Regarding rule 5.1.2, if my team throws a disc that causes problems for the opponent's robot (for example, gets lodged into their throwing mechanism which makes them unable to throw discs, or hits the emergency stop button), would this be considered obstruction?

A: If the referee judges that the act was intentional, the team will be disqualified.

R5-12] What is the limit for the energy to shoot the disc, in J?

A: No limits are stipulated. But participants must consider safety first.

**Jun.16, 2017**

R5-13] There are numbers of FAQs regarding the use of wind such as FAQ[ R5-3][ R5-4][ R5-8][ R5-9], and Rule 5.1.2, but what exactly do they mean?

A: The use of compressed air necessary to fulfill the competition task, that of fans to cool the motor and the circuit, etc. are approved. However, if it is judged that the wind generated during the competition moves the discs or the beach balls or changes their trajectory, it is regarded as a violation act and the team will be disqualified.

## 7 Robot (R7)

### 7.3 (R7.3)

R7.3-1] Are we allowed to put sensors on the disk and communicate that sensors with controller on bot ?

A: By 2.4.6, the teams will use discs prepared by the organiser. Placing sensors onto these discs is not allowed.

R7.3-2] Regarding 7.3. Is it allowed to use sensing for lines and spots to assist in the the manual operation?

A: Yes.

### Jun.16, 2017

R7.3-3] Regarding Rule 7.3, what is allowed to control the robot wirelessly?

A: The wireless communication allowed during the completion of ABU Robocon 2017 Tokyo is visible light, infrared ray, sound wave and radio wave. When using radio waves, you must comply with the radio law of the host country.

As for the equipments that can be used at the Tokyo contest, only Bluetooth conforming to IEEE 802.15.1 is allowed. For the use of Bluetooth devices, please observe the following conditions 1 and 2:

Condition 1. A wireless device that can be confirmed as Bluetooth SIG certified by Bluetooth SIG's authentication logo

Condition 2. The output shall be class 2 (2.5 mw) or 3 (1 mW).

Since ABU Robocon 2017 will not conduct radio management by the host organizer, please prepare to cope with communication problems by the team themselves.

### Jun.24, 2017

R7.3-4] Regarding rule 7.3, when manipulating the robot by wires, is there a regulation on the length of the wire?

A: In the case of operation through cable, the length of cable must be over 1,000mm and less than 3,000mm.

### Jun.16, 2017

#### 7.4 (R7.4)

R7.4-1] According to the rulebook 7.4, the robot must not split into parts during the game. However, when exchanging parts by SZ, or when detaching and attaching a magazine by LA at the time of a retry, is it regarded as robot separation?

A: No, such work during the setting time, retry and disc loading will not be regarded as robot separation.

**Nov.22, 2016**

**7.5.2 (R7.5.2)**

R7.5.2-1] Rule 7.5.2 says, "throughout the game, the robot together with any containers used in disc loading shall not exceed length 1500mm x width 1500mm x height 1800mm." Do the dimensions include the discs themselves?

A: No.

R7.5.2-2] Regarding rule 7.5.1 and 2, what happens to the X, Y, and Z axes used to measure robot size if the robot tilts?

A: The axes will not accommodate for the robot's tilt. Throughout the game, the robot needs to fit into a rectangle with width 1500mm and depth 1500mm that is placed parallel to the game field plane.

**7.6.1 (R7.6.1)**

R7.6.1-1] Is the weight of the discs included in the 25 kg limit?

A: No.

R7.6.1-2] Regarding 7.6.1. Is it allowed to bring in different robots for each side, red and blue? If yes, will the weight regulation apply for the weight of the two robots together?

A: By 7.1, one robot is brought in to participate in the contest.

R7.6.1-3] Regarding 7.6.1. Does any other equipment the team brings for use in the game include items that will not be attached directly onto the robot, for example jigs used during retriees and PC for data processing? Also, does game time include set-up?

A: Jigs and data processing PCs that are not attached directly onto the robot are not included in the weight regulations in 7.6.1. Also, by 2.2.1, the game starts after set-up time. Therefore, set-up is not included in the game time.

**Nov.22, 2016**

R7.6.1-4] Is it allowed to use a laptop (PC) as a controller? If yes, will this be included in the weight of the robot?

A: Laptops are allowed as controllers. Controllers are included in the robot weight, as stipulated in rule 7.6.1. (related topic: Supplement R9)

R7.6.1-5] Regarding rule 7, is it allowed to use a PC from outside the game field to control the robot? For instance use the PC to communicate with the robot and adjust its parameter.

A: Yes. (related topc: Supplement R9)

R7.6.1-6] Is it allowed to build a PC into the robot as a data processor? If yes, is it allowed to have its power on before the game starts?

A: Yes for both questions. The rules for size and weight will apply to the robot in its entirety including the PC.

R7.6.1-7] We are considering bringing a step or a table on which operator stands so that she/he can see the field easily. Then, if we do so, would the weight of the step or the table be counted as the robot weight? In another word, would the step or the table be considered as "any other equipment the team brings for the use in the game" as mentioned in the Rulebook 7.6.1?

A: The use of stepladders/table during the game is not allowed.

**May 25, 2017**

R7.6.1-8] Can I leave the controller on top of the robot in order to operate the robot manually after automatic operation?

A: Yes, you can. It is allowed to attach, detach or place the controller while the robot is in SZ and LA.

**Jun.16, 2017**

R7.6.2-1] Rule 7.6.2 says that back up batteries are not included in 25kg. So, are repair parts, circuits, and units included in 25 kg?

A: No, they are exempt.

**Nov.22, 2016****7.7.2 (R7.7.2)**

R7.7.2-1] - All batteries used in the robot, controller, and any other device used during the game shall not exceed 24V. That's mean Every single Batteries must under 24V? so we can make serial Batteries for increase the voltage.

- Can we use 3 batteries, 12 volts each, in series??

A: The resulting serie must stay within the 24V limit.

**7.7.3 (R7.7.3)**

R7.7.3-1] on Abu Robocon Rule, The maximum voltage within the circuit(s) shall not exceed 42V. That's mean every single circuit has voltage under 42V, or the total voltage in all circuit must under 42V?

A: The circuit(s) must be constructed such that the voltage between any two points within the robot remains under 42V. If more than one circuit exists, the ground/earth must be in common so that the voltage can be measured.

**Feb.3, 2017**

R7.7.3-2] Can I use a 24 V DC battery as a power supply, convert it to 220 V or 120 V using an inverter, and run the AC motor?

A: Please refer to rule 7.7.2, 7.7.3 and FAQ; R7.7.3-1]. The rule of maximum voltage is not distinguished by DC/AC. However, please note following;

- 1) 42 V is the absolute value of the voltage difference, and in the case of AC, it is applied to the peak value instead of the effective value.
- 2) In the case of multiphase alternating current, not only against the grounding point but also between any two wires are limited.
- 3) If there are multiple power supplies, regardless of direct current or alternating current, it is applied between any two wires.

## 8 Safety (R8)

**Nov.22, 2016**

8.2.1 (R8.2.1)

R8.2.1-1] Are we allowed to use bipolar batteries?

A: It is not allowed to use anything that is not available as a manufactured product that has had its safety tested, including the charging/discharging device.

8.2.2 (R8.2.2)

R8.2.2-1] Regarding rule 8.2.2, are we allowed to use class 2M laser?

A: Only class 1 and 2 laser are allowed. Classes 1M and 2M are not allowed.

R8.2.2-2] Regarding rule 8.2.2, do we need to use laser sensors with the possibility of the opposing team members squatting low or lying on the floor?

A: Please design and build robots taking care the laser won't get in the eyes of people in the venue including children and those sitting down. If the contest committee deems anything to be dangerous, the team will be asked to make the necessary changes.

## 9 Others (R9)

### 9.1 (R9.1)

R9-1] Regarding 9. Is it allowed to place sensors outside the game field? If yes, would those sensors be included in the weight regulation?

A: Placing of sensors outside the game field is not allowed.

### Jun.24, 2017

R9.1-1] During the game where will the referee be standing?

A: Judgement will be done by "chief referee", and two "assistant referees". The position of the chief referee shall be at the place where the whole competition can be seen. The assistant referees move according to the progress of each team's competition.

### Nov.22, 2016

R9-2] Is it allowed to place a camera as part of the controller outside the game field?

A: Cameras are allowed as part of the controller, but they cannot be fixed outside the game field.

R9-3] Is it allowed to place cameras outside the field to film the discs?

A: No.

R9-4] Is it allowed to have workstation outside the gamefield?

A: No.

R9-5] Regarding FAQ R9-1, is it allowed to use sensors to sense team members and objects outside the game field?

A: Yes, but it is not allowed to station sensors outside the game field.

Supplement R9] Regarding controllers

- 1) Controllers shall be limited to those the operator carries during the game. (the use of carts, etc. are not allowed)
- 2) Cables from the controllers are not allowed to be laid out in the venue or on the game field. Excepting that for operating the robot, cables cannot touch the field, objects other than the team's robot, or anyone other than the operator. (except during retries and loading of discs)

## Others (O)

O-1] What is the number of students, that are allowed in a team from one college to participate in Robocon 2017?

A: One team from each country/region will participate in ABU Robocon 2017 Tokyo. For participation in the local competitions to decide the representative team of that country/region, please check with your local contest organiser (broadcaster).

### **Aug.1, 2017**

O-2] Will the air conditioners and fans at the venue be switched off during the competition?

A: The air conditioning of the venue will be on during the competition. The test run on the previous day will be carried out under the same condition as the competition day. Please make sufficient adjustment of the robot for the test run, if necessary.

O-3] Is it allowed to use the robot parts that brought by ourselves?

A: It will not be allowed. The team must complete the packing of all robots and accessories. Only batteries are allowed as hand-carry.