

Q&A3_Real

For questions received by March 15, 2021.

New questions and answers from Nov. 14, 2020 to Jan. 15, 2021 are shown in the red letters.

New questions and answers including revised answers from Jan. 16, 2021 to March 15, 2021 are shown in the blue letters.

Note that the Q&A is only intended to explain the game rulebook, and it is not the basis for the judgement in the game. The only basis for the game is the rulebook.

Please send your questions after carefully reading the Rulebook and express your meaning as clearly as possible. Thank you in advance for your cooperation.

If you can't find the answers for the question you submitted in ASK page of ABU Robocon official website, these questions may fall into following two situations:

- 1. The answer to the question can be found directly from the rulebook.**
- 2. They duplicate with other question.**

1 Terms and Definitions

Q1-1) Can the whole rack being used for storing the arrows be lifted by the robot?

A: No, it is not allowed. The arrow rack as a game facility is part of the game field and can only be placed in the storage area and may not be moved.

2 Game Procedure and Competition Tasks

2.1 Game Facilities and Score Objects

Q2.1-1) What is the material of the arrow wings?

A: The arrow wings are made of silicone rubber.

Q2.1-2) Our team is having a difficulty in recreating the arrow rack. So could you send us some data with measurements and materials specifications about the arrow rack?

A: Please download the Figures on the GAME RULES page. 05.00 is the drawing of the Arrow Rack.

Q2.1-3) Will the arrow rack be hold to the ground and cannot be moved?

A: The arrow rack itself is heavier and is not fixed to the ground, but it can't be obviously moved out from the storage zone. If the robot strongly impacts the arrow rack, it will be warned.

Q2.1-4) How will the arrow be positioned on the rack?

A: The arrow head is placed downward on the rubber ring of the lower beam, the plume is upward, and the body is leaning against the groove of the upper beam.

Q2.1-5) What is the material and the dimension of the ring shape on the arrow rack?

A: The translucent rubber ring is sized 22.5 mm in outer diameter, 17 mm in inner diameter, and its outer edge has a groove of 1.2 mm in depth.

Q2.1-6) It is given that hollow carbon fiber pipes are to be used for arrows. Will the pipe be open at both the ends, closed at front & open at end, or closed at both the ends? Please clarify this.

A: Both ends of the pipe are open.

Q2.1-7) Will arrow's head be well-fixed during the match? For example: by epoxy. as we found out during shooting and collecting arrows. The arrow's head might be detached.

A: After improvement, there will not be what you say.

Q2.1-8) Because the arrows needs local manufacturing, please help with technical specifications mentioned below: 1. Silicon Bulb: i> Shore A Scale ii> Density 2. Carbon fiber rod: i> Density 3.

Plume: i> Shore A Scale ii> Density iii> Weight

A: Sorry, we can't provide you the information you want, as the arrow manufacturer only sales the product, not its intellectual property. You can buy some arrows first, measure the arrow dimensions in detail and analyze its materials, and then manufacture them locally. In ABU Robocon 2017, the soft frisbee produced in Germany was used. In that time, we did so.

2.2 Before the Game Starts

Q2.2-1) Can the direction of the arrows on the rack be changed freely? Or is it specified?

A: The arrow on the arrow rack must be head down, plume up, as shown in the video.

Q2.2-2) Will the orientation of the pots at the start of the game be the same as shown in the Game field figure?

A: Yes, exactly the same.

2.3 At the start of the game and during the game

Q2.3-1) In Rulebook 2.3, is the direction of the arrow setting in free up and down?

A: No. The Arrow must be arranged in the Arrow Rack in the way as the head is down and the plume is up.

Q2.3-2) Can we use zig to replenish all the arrows on the arrow rack? It means that we will put the 5 arrows on the zig and move the zig to the arrow racks to replenish the arrow.

A: It is allowed to use no powered auxiliary tool for setting arrows on the Arrow Rack, providing that it may not damage the arrow and must be removed out of the game field immediately after replenishing.

2.4 Tasks of Robots

Q2.4-1) Does this condition of TR also apply to DR in Rulebook 2.4.1 b)?

A: Yes, the requirements for TR in rule 2.4.1 b) apply to the DR that throw arrows in its team's outer area.

Q2.4-2) What is the definition of being in the outer area in the Rulebook 2.4.2?

A: Rule 2.4.2 does not contain the phrase "in the Outer Area". If we say that a robot is in the Outer Area, it means that the orthographic projection of its any part on the ground does not exceed the Outer Area.

Q2.4-3) Can DR take arrows from Arrow Rack before using 5 arrows?

A: No, it's not allowed.

Q2.4-4) Can TR shoot arrows without moving nor turning its direction by using the two shooters on a robot aiming at different pots in turn?

A: Yes, it can.

Q2.4-5) When opponent's DR holding type II or type III table and shaking table, can DR catch the table and try to stop it? If it is OK, DR may unintentionally impact opponent's DR trying to stop table. How is the action judged?

A: As you said, this impact was unintentional. There is no need to judge on unintentional conduct, even with consequences.

Q2.4-6) Can DR take arrows from pots of own team in order to shoot the arrow again or use it for blocking opponent's shooting?

A: The arrow in your team's pot has been scored. If you want to give up this score, your DR can take it out, but can't put it back again. If you want to use the removed arrow for other purpose,

should be careful not to violate other rules.

Q2.4-7) Can DR use arrow holding in order to change course of our team's arrow?

A: You didn't say where the DR is. If DR is in the inner area, this is equivalent to DR throwing arrow in the inner area.

Q2.4-8) Do I need to make a declaration when replenishing the arrow to Arrow rack?

A: No, you needn't.

Q2.4-9) Which is the responsibility if the handles are damaged while turning the pot table handles to each other?

A: Damage to the game facilities is the responsibility of the team. The referee will decide according to the circumstances.

Q2.4-10) If TR and DR aim at the same spot at the same timing or consecutively in rule book 2.4.2 b ii, does it violate the rule?

A: What you say should be Rule 2.4.1 b) ii. Although this is rare, if it happens, it does not violate the rules, since the subject of Rule 2.4.1 b) ii is TR or DR.

Q2.4-11) 2.4.2 g says that DR can throw the arrows from outer region to the pot if it gives up defensive task, does this mean that it won't be able to shift back to defending after it is done with throwing this arrow?

A: No. as long as DR goes back to its team's inner area completely, it can take on the defensive task again.

Q2.4-12) Can the DR shoot an arrow from above the inner area while in the outer area?

A: No, it is not allowed. Any part of the DR throwing arrow in the outer area may not extend into the inner area and its above.

Q2.4-13) If the other team DR is holding Type II or Type III pot table handle, can my team DR grab it?

A: Don't recommend you taking this risk, see Q2.4-7).

Q2.4-14) Is it possible for the robot to hold 6 or more arrows during the game?

A: Except the preloaded arrows, the game rules do not limit the number of arrows held by robot.

Q2.4-15) If TR throws an arrow successfully in the first POT and throws the next arrow towards some other POT which is Unsuccessful, Can it now throw the next arrow in the first POT?

A: Yes, it can.

Q2.4-16) In which case can the robot re-aim the pot that it has put an arrow in?

1. when a player aims at another pot and an arrow is placed there
2. When you aim for another pot, regardless of whether the arrow is in

A: After the robot throws an arrow to another pot, whether or not the arrow enters into the pot, the robot can re-throw an arrow to the pot that has already been thrown an arrow into.

Q2.4-17) If the DR throws in an arrow, does the rule in 2.4.1 b of TR apply? The following three patterns of answers are expected to be given to this question.

1. The rule in 2.4.1 b does not apply to DR: DR can throw more than one arrow at a time, or they can throw more than one arrow in a row into a single pot.
2. The rules in 2.4.1 b also apply to DR, and these rules apply to each robot. That is, the DR can throw arrows at the same time as the TR is throwing arrows, and the DR can throw them into the pot that the TR threw them into immediately afterwards
3. The rules in 2.4.1 b also apply to DRs, and these rules apply to teams. That is, the DR cannot throw an arrow at the same time the TR is throwing an arrow, and the DR cannot

throw an arrow into a pot thrown in by the TR immediately afterwards.

A: You thought too much. The DR that runs in own Outer Area can be regarded as another TR, that is, it, to be as TR, can complete TR's tasks according to rule 2.4.1, and is also subjected by the restrictions to TR. Also, rule 2.4.1 is for a single TR, whether one or two TR in the outer zone. This answer is closer to the second answer pattern in your question.

Q2.4-18) For 2.4.1c, does the term "used" mean that five arrows were launched from the robot? For example, can't the robot pick up the arrows from the rack while the DR is using its preloaded arrows for jamming?

A: DR's intercepting with preloaded arrows is also considered as "use". That is, if four preloaded arrows have been thrown out by robots, while DR is using a preloaded arrow to intercept the arrow thrown by opponent, at this time, robot can pick up arrows from the arrow rack.

Q2.4-19) "According to Rule 2.4.1b)ii, "if an arrow is thrown into a certain pot, TR must immediately turn to another Pot,"

1. is it right that after one of TR or DR throws an Arrow into a Pot, can the other robot throw another Arrow into the same Pot? It is difficult for a referee to memorize the order in which TR and DR throw arrows.

A: Two robots can throw arrows into the same pot at the same time. You don't have to think about how judges remember.

2. after TR throws an Arrow into a Pot, does this rule prohibit TR from throwing another Arrow into the same Pot? Thus, after TR throws an Arrow into a Pot, is TR allowed to throw another Arrow into the same Pot only after TR throws an Arrow into another Pot or after TR drops an Arrow on the ground? We mean two following situations by the phrase ""TR drops the Arrow on the ground.

Situation 1: TR fails to throw and the Arrow lands on the ground.

Situation 2: TR intentionally throws the Arrow on the ground.

A: As long as the arrow you said is thrown into next pot or falls anywhere whatever the reasons are, TR throws the next arrow into the previous pot again is not considered as continuous entering into the same pot.

3. if TR cannot throw Arrows into the same Pot in series, what penalty is imposed on the team when TR throws an Arrow into a Pot after TR throws another Arrow into the same Pot? We think it is appropriate that a referee returns one Arrow in the Pot to the team in addition to the compulsory retry.

A: Certainly, the compulsory retry is required. The arrow you said stays in the pot, and the referee will make a record. It has no value in scoring and Great Victory.

Q2.4-20) According to Rule 2.4.1c), "Only after the five (5) Arrows preloaded on TR and/or DR are used up, TR can i. pick up the Arrows from its team's Arrow Rack; or ii. pick up the Arrows that landed on the ground of the Outer Area; or iii. directly receive the Arrows delivered by DR,"

1. after the five Arrows in TR or DR during the setting time have been removed from the TR or DR, can TR do the actions described in Rule 2.4.1c).i, ii, and iii? We wonder whether TR or DR can use the five Arrows in any way. For example, we think TR can pick up the Arrows from the Arrow Rack after the DR drops five Arrows on the ground that were loaded in DR during the setting time.

A: In a common sense, the preloaded arrows in this game are used to complete the task and gain score. If you think that throwing an arrow onto the ground is also a valuable use, we do not

encourage, but we do not object.

2. do Rule 2.4.1c).i, ii, and iii apply to Arrows other than the five Arrows that were loaded in TR or DR during the setting time?

A: In the rulebook, the conditions stated in 2.4.1) c relate only to five arrows preloaded on TR and /or DR.

Q2.4-21) Can the DR continue to rotate a particular Pot or wave Arrows DR have in order to interfere with it that the opponent can't throw or launch Arrows to it at all?

A: Yes, it is allowed.

Q2.4-22) According to the rule book, the DR can stride and jump over the baffle. Is it allowed to touch the top surface of baffle?

A: Yes, it is allowed.

Q2.4-23) How long DR can hold the Handle of Pot? Please specify.

A: It can hold the handle as long as it wants.

Q2.4-24) Can any mechanism mounted on DR body be used to deflect arrows from the other team without using an intercepting arrow or without establishing any physical contact with the arrow?

A: It is not allowed.

Q2.4-25) Can the orthogonal projection of the robot move under the Type II and Type III pot?

A: It is allowed. But, pay attention to Rule 2.4.2 c).

Q2.4-26) If the thrown arrow into certain pot didn't score, can TR throw again into it or turn to another pot?

A: If the arrow didn't score, it didn't enter into the pot, and the TR can throw to that pot again or turn to another pot. If that arrow is in the scoring status, the TR must turn to another pot.

Q2.4-27) If DR threw an arrow into a pot from the inner area, will it count as a retry and robots should return to start zone?

A: The DR fouls. It should be retried mandatory. The retry can be done in its retry zone.

Q2.4-28) Rule 2.4.2a) says that "After the DR starts from its Start Zone, it can directly stride or jump the Baffle or through the opening into the Inner Area." 1. When the DR directly strides or jumps the Baffle into the Inner Area, is the DR allowed to touch the Baffle? 2. If the DR has reached a height of over 1000mm when it directly strides or jumps the Baffle into the Inner Area, it may reach a height of over 1000 mm in the Inner Area. Would this be a violation of Rule 4.6.b) "When DR runs in the Inner Area, its height must less than 1000mm"?

A: 1. Any regulation in the rulebook doesn't restrict the robot contacts with the baffle. 2. The DR has not run in the inner area when it strides or jumps the baffle, moreover the rules 2.4.2 a) and 4.6 b) deal with two different moments.

Q2.4-29) During waving arrow for defensive purpose, is the arrow included as a part of the DR?

A: The arrow is not a part of DR at any time.

Q2.4-30) In rule 2.4.1(e) it mentions that TR can extend above the space over the outside fence for a short period, what is that short period?

A: No need to specify how long this short period is. If your TR extends above the space over the outside fence, the referee orders it to shrink back, and you do as the referee asks, it is okay.

Q2.4-31) Can a team member the path for scoring by removing any arrow landed on the pot in a way that it does not score points and also blocks the path of other arrows and also the arrows fallen in the inner or outer field such that they block the path of DR or TR respectively

A: It is not allowed. The team members shall not contact the arrows falling on the pot or on the

ground at any time.

Q2.4-32) Is it allowed for the DR bot to wave the arrow above its height limit in the inner zone to intercept the arrows?

A: When waving an arrow, any part of the DR must not exceed the height limit, but not including the arrow itself, because the arrow is not a part of DR.

Q2.4-33) While throwing arrows is it necessary to prepare an arrow by a robot for throwing arrows with a robot? Or can be prepared by hand while retiring

A:, The team members can only adjust and change the position of the Arrows carried on the robot by hand during retry.

Q2.4-34) Can TR throw more than one arrow at the same time?

A: It is not allowed. See Rule 2.4.1 b) i, please.

Q2.4-35) As when DR is considered as another TR when operating in throwing zone, can DR pick arrows from arrow rack after first 5 preloaded arrows are finished using.

A: There is not throwing area in the game field for the real contest. We suppose you asked the question about the online contest. If AR runs in the throwing area, it is another TR, and it can pick arrows from the arrow rack after the first 5 preloaded arrows are used up.

Q2.4-36) 2.4.1 c) states "Only after the five (5) Arrows preloaded on TR and/or DR are used up, TR can..". Now, if we load an arrow on the DR to be used as a "waving arrow", is it counted as one of the 5 arrows which we will preload on DR/TR? And if it is counted as one of the 5 arrows, then, since the waving arrow will always be attached to DR, can TR pick up the arrows from the arrow rack once the 4 preloaded arrows on it are used up?

A: The arrow preloaded on DR and used to wave is one of the 5 preloaded arrows before the game starts. After other 4 preloaded arrows on the robot are used up, the arrows on the rack can be picked up by robot. But, you should show the following facts to the referee:

1. When other 4 preloaded arrows on the robot are used up, DR holding the waving arrow is completely in the inner area, that is to say, it is DR indeed and not another TR running in the outer area.
2. That arrow used for waving can be waved indeed and isn't put in a stationary position on DR.

2.5 Retry

Q2.5-1) During retry, if the arrow happened to be simultaneously in contact with the robot and the game field, could we adjust the position of the arrow during retry?

A: As per Rule 2.5 d), during retry, the team members can only adjust and change the position of the Arrows carried on the robot.

Q2.5-2) In the Rule 2.5.d), there is "During retry, the team members can adjust and change the position of the Arrows carried on the robot." If TR is in contact with an Arrow on the ground when a team applies for a retry, can team members load the arrow on the robot during retry, according to Rule 2.5.d)?

A: It is not allowed. The arrow you mentioned is on the ground but not on the robot that needs retry.

Q2.5-3) For the retry after DR access to the Inner zone completely, can we retry DR at DR start zone in Outer zone?

A: ~~Allowing DR to fully enter the inner zone to use its retry zone is a convenience provided for it.~~

~~If you are willing to give up this convenience, you can certainly retry in the DR start zone. It is not allowed. The DR fully entering the inner area can only be retried in the DR retry zone.~~

Q2.5-3) Rule 2.5d) says that "During retry, the team members can adjust and change the position of the Arrows carried on the robot." 1. When preparing for a retry, are team members allowed to remove and keep the Arrows that TR or DR picked up from game field? 2. If team members can keep Arrows, team members are allowed to do following actions? a. load the Arrows in TR or DR in next retry b. load the Arrows to the Rack

A: 1. When preparing retry, for example moving the robot to its retry area, the team member can remove the arrows from the robot and hold them in his hand, whether or not these arrows are picked up by the robot from the ground. If the team member throws or puts these arrows on the ground, they can't be picked up artificially. 2. a. Allowed before the robot restarts; b. Not allowed.

2.6 Scoring

Q2.6-1) What if the arrow that scored falls down due to rotation of the POT table by DR?

A: For score, only the status at the end of the game is considered. If the arrow scored originally in the Pot is in the no-scored status at the end of the game due to the rotation of the Pot Table, it will not be scored.

Q2.6-2) What if the arrow shown in Rulebook Fig.5-k falls in POT after some time?

A: For score, only the status at the end of the game is considered. If the arrow meets the scoring conditions at the end of the game, it can be scored.

Q2.6-3) In fig. 5(c)(d)(g)(j) of Real Game Rules, if arrow falls due to centrifugal force outside the pot, will the point be retained or lost?

A: As stated in Rule.6.1, after the game ends, the referee checks the scores of the two teams. Therefore, only the arrows that meet the conditions in Rule 2.6.2 at the end of the game can score.

Q2.6-4) If an arrow hits DR of the other team or the same team who has shot it and goes into the pot then is it counted as a valid point?

A: If the arrow thrown by your TR hits the opponent's DR and then enters into your pot, the score is valid, and if it hits your own DR and then enters into your pot, the score is invalid.

Q2.6-5) What if robot failed in the contest during the time, total point considered as 0?

A: No. The score before the failure is valid.

2.7 End of the game

3 Deciding the winner

4 Robot

Q4-1) Can robots use wind power to thrust themselves on the ground?

A: It is not allowed.

Q4-2) Is it okay to stretch an arm or robot connected by a flexible cord from one robot?

A: The robots are allowed to stretch an arm. The two robots connected each other by a flexible cord can't be considered as one robot.

Q4-3) Can we connect 2 batteries in series to have a total voltage of 42 volts with individual batteries being less than 24 V?

A: It is not allowed. As Rule 4.8 c) says, when connecting batteries in series, the total voltage must be 24V or less.

Q4-4) Can we put different parts with completely different functions on the robot for each game?
In the other words, is it possible to change the mechanism of the robot for each game?

A: It is not allowed.

Q4-5) What the maximum limitation of length and width of the TR robot on a outer start zone after the game start?

A: As described in rule 4.6 b), after the game starts, the TR may expand, stretch or extend without any limitation, provided that it does not violate other rules in the Rulebook.

Q4-6) Rule4.10 says that "Also, some parts that may block Pot Table and Pot and that go against the spirit of fair play are not allowed to fit on the robot DR. They include but are not limited to back plate and net etc." And Rule2.4.2b)iii says "Standing next to the I-type Table in its team's Inner Area, to block or intercept the arrow thrown by the opponent team with its own body or holding arrow. However, it must meet the following conditions...". 1. Is waving the Arrow above the opponent's Pot as mentioned in Rule 2.4.2b)iii prohibited because it is thought as the action of blocking Pot written in Rule4.10? 2. If it is not prohibited to wave the Arrow above the opponent's Pot, for example, holding a Handle on the Table of a II-type Pot while waving the Arrow above the opponent's Pot would make it difficult for the opponent to put the Arrow in the Pot. Is this kind of action acceptable?

A: 1. The rule 4.10 refers to those parts that are not allowed to be installed on the robot, and arrows are not any parts of the robot and are not bound by rule 4.10. 2. Don't understand what you mean.

Q4-7) Rule4.3 says that "Each robot cannot be split into sub-units or connected by flexible cords during the game." Does this rule prohibit the robot from dividing into several parts connected only by the following things? 1. Variable shape sheet 2. Extendable stick 3. Chains 4. Pantograph 5. Bellows As listed above, a number of robots that are effectively separate but are not prohibited by the description of the current rule, may participate and affect the progress of the competition. Will this rule be revised more strictly? Specific suggestions for improvement could include "the grounding points of each robot with the surface of the field must fit within 1000mm*1000mm on the field."

A: 1. Note that this rule does not restrict the robot consisting of several parts in rigid connections; 2. Using variable connection things, e.g. extendable stick that you listed, the robot can change its size and shape, it can be considered as deformation, but not split; 3. Since 2008, the rulebooks of the ABU Robocon have included the regulation on that the robot can't split into several parts or subunit; 4. Thank you for your suggestion, but it can't become more strict restriction.

Q4-8) Are we allowed to use fire laser at the pot? What if the pot is on the opponent side?

A: No matter in which side the pot is, you can aim with a laser, but the rules 7.6 and 7.7 must be followed. If the laser hits the pot, it's easy to get into the eyes of team members, referees and staffs standing outside the game field!

Q4-9) If the team design only one robot playing the game to do both throwing arrow and intercepting, which starting zone of this robot should be?

A: When this robot runs in the outer zone, it can be TR or DR, and it can start from either TR start zone or DR start zone.

Q4-10) Can we use air thrust to throw the arrows?

A: No prohibition. However, the throwing mechanism is one of the main parts which interact with the arrow in the robot, and it should not cause damage to the arrow.

Q4-11) Can we use magnet repulsive force on robot?

A: If you want to use magnetic repulsion on the robot, you must make sure that it does not violate the game rules.

5 Violations

Q5-1) Is it a violation, if the nth arrow thrown by our robot enters in the same POT (in which (n-1th) arrow was thrown) due to Interference of the opponent's DR?

A: Yes, it is violation, because these two Arrows are thrown by your robot in succession.

Q5-2) Fence has rules on what surfaces the robot can touch, is there any rules for Baffle as well?

A: The robot can touch any surface of the baffle. But be careful, it can't break other rules at this time.

Q5-3) If DR drops the arrow on the ground in inner zone, is it considered as violation?

A: If DR accidentally drops the arrow on the ground of the inner area or intentionally throw the arrow to the pot but the arrow does not enter into the pot, it is not considered as violation

Q5-4) If opponent DR is spinning the table, can our DR stop the spinning table?

A: Yes, it can. But, be aware that if your robot is damaged when it stops the spinning table, the opponent is not responsible.

Q5-5) Can DR keep spinning only one table from the beginning until the end of the game?

A: During the game of three minutes, DR can turn any pot table. Of course, if you like, it can turn a certain pot table, no matter how long.

Q5-6) If both robot holds the handle of the turning table and the robot which later hold the handle breaks while both robots is trying to turn the table in opposite directions, will the robot which holds the handle first be disqualified or considered as violation?

A: If the opponent's robot holds the handle and turns the pot table first, and your robot tries to touch the rotating pot table, it will be considered as that your robot takes the risk being damaged itself.

Q5-7) If one robot turns the table while the other robot is moving and the turning table hits the robot which is moving, will this be counted as a violation? If yes, is this a violation to the robot which is moving or the robot which is turning the table?

A: The orthographic projection of the rotating pot table sweeps a circular area on the ground. For convenience, it can be called as a forbidden area. If the robot A enters the forbidden area before the robot B holds the handle and start turning the pot table, and the robot A is hit by the rotating table, then the robot B fouls. If the robot A try to enter the forbidden area while the robot B is turning the pot table, and the robot A is hit, then neither robot is foul regardless whether the robot A is damaged or not.

Q5-8) Can any part of TR touch the rack?

A: TR can touch the arrow rack, but can't move it.

Q5-9) If the first robot holding the table is weaker, and the second robot damages the first robot, who's fouls?

A: None is foul.

6 Disqualifications

7 Safety

8 Teams

9 Others

Q9-1) When we ask a question on <http://www.robocon2021.com/ASK.html>, we can enter text, but we can't enter drawings. Is it possible to use drawings for questions? If we can, in what format should we send it?

A: Sorry, the ASK page does not support the upload of any drawings.