

ROBOBATTLE

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COMPETITION RULES

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1. Match description

1.1 Terminology of the competition

The following are definitions of additional concepts that describe competing in the match.

1.1.1 Definitions of the tournament

These are the main concepts used in the tournament. Some of them are better explained in the following paragraphs.

Match – A standard format used in the tournament qualifiers, where two combat robots compete one vs one or, as an exception, there can be two combat robots on each side.

Rematch – A match between two or more competitors. Rematches are declared when the previous match was stopped or deemed unfinished due to a certain factor.

Arena – A reinforced area where matches are being held.

Round – A series of matches where all the remaining contestants are split into pairs and compete between each other to get out of the group stage.

Qualifiers – The standard format of the tournament which consists of continuous rounds of battle until one overall winner is declared.

Lifting – happens when one combat robot lifts the other to limit its movement, not allowing it to use its moving mechanics.

Gripping - happens when one combat robot takes the enemy's side movement under its control. It is done by a robot using its weapon to clinch or get a grip of the enemy, stopping it from moving.

Clinching – happens when one combat robot holds the other immobile (typically by pushing onto the edge of the arena) by sheer force, making it combat incapable.

Dangers – obstacles and other powered devices that are in the arena. Someone outside of the arena controls them.

Field referee – someone who observes and leads the ongoing in the arena and around it, before, during and after the match.

1.1.2 Terminology connected to the match

The following terms are used to describe situations that may occur during a match:

Disqualification – the combat robot and its team are no longer permitted to compete in the tournament.

Avoidance of contact – a situation in which a combat robot intentionally and consistently avoids contact with an opponent robot that is actively pursuing it.

False start – occurs when a combat robot begins moving in the arena, activates its weapon, or performs any other action before the official start of the match. Robots may be tested in the arena after the doors have been closed and before the match countdown begins, provided they remain within their designated area and have received permission from the arena referees.

Incapacitation – in the judges' opinion, a combat robot has not been responsive for a specified period of time.

Knockout – occurs when, as a result of an attack or intentional action by one combat robot, the opposing robot becomes incapacitated.

Radio interference – refers to a situation in which a combat robot no longer responds or becomes uncontrollable due to the remote-control signal of the opposing robot.

Restart – takes place after a false start or timeout has been declared and the competing combat robots are ready to continue.

Withdrawal – a situation during a match in which the operators of a combat robot decide they no longer wish to continue and concede victory to the opposing team. Withdrawal is not permitted.

Timeout – a temporary suspension of the match. A timeout may be declared by the match referee or by the event organizers.

1.2 Matches

1.2.1 Format of the match

At the start of the fight, two or more combat robots stand on opposite sides of the arena.

Beforehand, both robots have to stay motionless on their designated square. After announcing the official start, both robots begin to fight.

1.2.2 Time limit of the match

The duration of a match is 2 minutes unless it ends prematurely. The time taken for timeouts is separate and not counted into the 2 minutes.

1.2.3 Premature ending of the match

A match can end prematurely due to a disqualification or the robot becoming combat incapable. Withdrawal is prohibited.

1.3 Referee of the competition

The tournament referees make informed and subjective decisions based on the results of matches.

1.3.1 The number of referee members

Every match has at least three match referees. In addition, there can be one or many guest referees.

1.3.2 Appointed head referee

The organisers may appoint one head referee who also completes the tasks of a referee. The head referee decides the winner of the match only when the votes of the referees are divided equally.

1.3.3 Tasks of the referees

Specific methods of decisions and criteria for referees are given in the chapter “Procedures of the competition”. The overall tasks of a referee are:

- a. Starting a match
- b. Suspending a match
- c. Declaring a winner by knockout
- d. Calling a timeout and managing it
- e. Deciding on the result of a match that doesn't end prematurely
- f. Making sure security regulations are being followed

1.4 Field referees

Field referees watch and guide competitors before, during and after the match.

1.4.1 Appointing a field referee

Two field referees are appointed by the organisers for the matches.

1.4.2 Tasks of a field referee

Specific tasks and actions for field referees are given in the chapter “Procedures of the competition”. The overall tasks of a field referee are:

- a. Keep an eye on technical and security regulations.
- b. Give guidance and recommendations to the teams and transmit the decision to disqualify a robot.

1.4.3 Authorization of the field referee

If the field referee notices disturbing behaviour from either the operator or the team's support person, before or during the match, in the arena or around it, then the field referee has the right to demand the person to leave the arena immediately.

2. Procedures of the competition

Robot operators are forbidden to remotely control their robot in any way while there are people in the arena and the door is not locked from the outside. In the event of this error, the head referee has the right to disqualify the team that committed the error.

2.1 Before the match

Robot operators will have the opportunity to check the functionality of their robot before the match if there are no people in the arena and the arena door is closed.

2.2 Start of the match

2.2.1 Start check

The referees make sure that both fighting robots are stationary and ready in their respective positions, which is indicated by the operator of each team raising their hand. When both teams have signalled their readiness, the countdown begins.

2.2.2 Start of the match

A match starts when the head referee gives a verbal or electronic start command.

2.2.3 Foul

A referee can call a foul and request a restart when they spot one robot moving before the start signal or notices any other violations. For a restart to happen, the operators need to stop moving the robot and follow the field referees' instructions. If the combat robot commits more than two fouls, then it can be disqualified.

2.3 During the match

2.3.1 The decisions of a field referee

Both field referees need to watch over their operators and combat robots to keep an eye on and react to one or many of these situations:

- a. Lifting and gripping
- b. One or both robots have gotten stuck
- c. Combat incapability
- d. Avoiding contact
- e. Radio disturbance

2.3.2 Timeouts

Every referee can declare a timeout to stop the match. All operators need to stop the movement of their robots and their weapons immediately. What the referee, operators and organisers will do next depends on the situation caused by the timeout.

2.3.3 Clinching

A robot can not win by purely clinching. Clinching can happen for only 10 seconds at a time; then, the field referee will command the other robot to be released. If the command has been given and the attacker can release the other robot but refuses to do so, it could lead to disqualification.

A weapon meant to partially or entirely cover (suffocate) the enemy robot is allowed. Covering a robot can also be seen as clinching, depending on which robot is in control.

2.3.4 Lifting

A robot cannot be defeated by being lifted from the floor. Lifting can happen for only 10 seconds at a time in one place, except for when the lifter is actively moving around. If the robot is actively moving around while lifting, then the limit is 30 seconds starting from the moment it starts lifting. After 10 or 30 seconds, the field referee will order the lifting robot to stop. If the command has been given and the lifting robot can release the other robot but refuses to do so, it could lead to disqualification.

2.3.5 Gripping

A robot cannot win if it uses a weapon or another device to grip or clinch the enemy robot and leave the opponent in its hold. Field referees allow gripping to be used for up to 30 seconds. After that, the field referee will order the robot to release the other robot. If the command has been given and the gripping robot can release the other robot but refuses to do so, it could lead to disqualification.

2.3.6 One robot gets stuck

If, during a match, a combat robot or a component of a multibot becomes stuck, the subsequent course of action depends on the timing and other circumstances. If a combat robot or multibot component becomes stuck to any part of the arena during the match, the operators must be able to free the stuck robot by remote control within 20 seconds or less. Otherwise, the combat robot or multibot component may be declared incapacitated.

The opposing robot is permitted to free a stuck opponent robot. Depending on the circumstances and in the interest of maintaining entertainment value, the referees have the right to declare a timeout in order to determine the condition of a robot that has become stuck or stopped moving on its own.

2.3.7 Both robots get stuck

If during the match, both robots get stuck simultaneously, then the following procedures will depend on the situation at hand and be as follows:

- a. If a part from two separate combat robots or one combat robot and multi-robot get stuck to each other or both in the arena, then the field referee will call a timeout.
- b. If a multi-robot's two or more parts get stuck to each other or simultaneously into the arena, then the field referees will call a timeout.
- c. During a timeout, team members can try to get the parts loose if it's safe. After that, the match will be continued if the stuck robots are combat-ready.
- d. If the separation of robots is not safe and 60 seconds have passed from the start of the match, then the referee will decide on the winner.
- e. If the separation of robots is not safe and less than 60 seconds have passed from the start of the match, then a rematch will be organised. If a rematch is impossible, the referee will decide on a winner.

2.3.8 Radio disturbance

If a radio disturbance occurs during the match, the team has to notify the field referee immediately. A timeout will be declared, and efforts will be made to clear the disturbance. The referee will grant themselves the right to announce a winner if the radio disturbance is not solved.

2.3.9 Robot on fire

The enemy robots will be taken to a safe distance from a robot that starts smoking or catches fire. The fire department will try to put the fire out if it is safe.

2.4 Winning a match

For the competition organised by AHHA, a grant will be given to the winner for future help in engineering and robotics. The prize pool for both heavyweight and lightweight competitions is as follows: 1st place 1500 euros, 2nd place 1000 euros and 3rd place 500 euros.

At the end of every match, the winner is chosen by the following criteria: aggression, controllability, causing damage.

2.4.1 Avoiding contact

If according to the referee's assessment, one of the operators is intentionally trying to avoid contact with the opponent's robot, then the field referee will notify the operator that their combat robot needs to be physically or in any way in contact with the opponent's machine. If the operator refuses to cooperate, the referee can declare the operator's team as defeated.

2.4.2 Knockout by a one-time combat incapability

During a match, a combat robot or a multi-robot needs always to be able to prove its reacting capability. It is established as follows:

- a. Any moment or for whatever reason, a field referee can request the operator to show that their combat robot's or multirobot's part is capable of reacting.
- b. After the request has been given, the field referee provides the operator with about 20 seconds (the last ten will be counter orally) to prove that their robot or multi-robot is capable of reacting.
- c. If the combat robot's or multi-robot's part cannot show its reacting capability before the time runs out, it will be declared combat incapable.
- d. If one team's combat robot is incapable, the other team will be declared the winner. The victory will be counted as a knockout. The referees' decision on the matter is definitive and will not be appealed or disputed over.

2.4.3 Multi-robot combat incapability

A combat robot with the configuration of a multi-robot is deemed combat incapable when all of its parts are immobile.

2.4.4 Repeated combat incapability

If both robots become combat incapable, but not at the same time, the last to become combat incapable will be declared the winner. Which robot was the last to become combat incapable is for the referees' to decide. The referees' can review video materials of the match to determine in which order the robots became combat incapable.

2.4.5 Combat incapability by simultaneous actions

If one or both robots can make each other combat incapable for up to 5 seconds after attacking, then combat incapability by simultaneous actions will be declared, and the winner will be chosen as follows:

- a. If the situation happens 60 seconds after the start of the match, then the referees will decide on the winner.
- b. A rematch can be declared if the situation happens during the first 60 seconds of the match. If a rematch can not be held, the referees will decide on the winner.

2.5 Considerations of the winner by the referee

If it is inclusive of who the victor is, then the referee follows certain criteria and methods when choosing the winner:

2.5.1 The criteria of deciding

When deciding, these three factors are taken into account. For each factor, points are given as follows:

- Aggression - 1 point

Aggression is evaluated by the robot's intended attack frequency, seriousness, bravery and effectiveness. If the robot's attacks seem unintentional, it is not counted as aggression. A point for aggression can be given to only one fighter.

- Controllability - 1 point

Controllability means that the robot can attack the enemy where it matters, use its weapons effectively, avoid dangers in the arena and keep the damage given by the enemy at a minimum. A point for controllability is given to the robot whose movements and activities are more effective and thought over. A point for controllability can only be given to one fighter.

- Causing damage - 1 point

Causing damage means the robot reduces the enemy's functionality, efficiency and defence. It can be done by intended attacks or using the arena to the fighter's advantage. Damage that the robot unintentionally causes to itself does not count. When a pressure vessel or a quickly moving part of the robot brakes and causes damage to the enemy, then this is also not counted as damage. A point is awarded to the robot who does more damage. A point can only be awarded to one of the two combat robots.

2.5.2 Calculation of points

A referee gives a point to one or the other robot for every previously mentioned criterion. The points will then be added up, and the robot with the most points will be declared the winner by one referee. Afterwards, the real winner of the match will be chosen by putting together different points given by other referees to both of the robots.

For example, a referee can give a point to robot nr.1 for aggression and controllability but a point to robot nr.2 for causing damage. In this case, robot nr. 1 will be declared the winner, even if robot nr. 2 caused more damage.

If neither robot gets the majority of points from the referees, then the head referee will choose the winner.

2.5.3 Decisions

All the decisions made by different referees are definitive and connect all competitors.

The decisions made by the referees are not to be appealed or disputed over.