



RoboCupJunior Soccer – SuperTeam Rules 2017

RoboCupJunior Soccer Technical Committee

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These are the official **Soccer** rules for RoboCupJunior 2017 for SuperTeams playing on a big field. They are released by the RoboCupJunior Soccer Technical Committee. **The English version of these rules has priority over any translations. Items in red represent modifications introduced this year.**

Teams are advised to check the RoboCupJunior Soccer site (<http://rcj.robocup.org/soccer.html>) for OC (**Organization Committee**) procedures and requirements for the competition. **Each team is responsible for verifying the latest version of the rules prior to the competition. Changes are made to clarify some statements (highlighted in yellow).**

Preface

In the RoboCupJunior soccer challenge, a team of two autonomous mobile robots competes against another team in matches. They must look for a ball, trying to score into a color-coded goal in a special field built in a way that resembles the actual field for human soccer. Robots are required to have full autonomy from humans, and technical design, and ingenious programming by their developers.

The main goal of the organization of the SuperTeams is to let individual teams cooperate with teams from other countries and other cultures. It is our wish that through these efforts, teams will learn and excel together – and possibly continue exchanges beyond this event.

Participants of this challenge are required to give the best of their abilities in programming, robotics, electronics and mechatronics, but also to contribute on teamwork and knowledge sharing with other participants, regardless of culture, age or result in the competition. **All are expected to compete, learn, have fun and grow.**

These rules are released together with the current regular game rules. Wherever a change is needed because of the difference with regular games, situation have been analyzed and are ruled here. For all other situations that do not change from the regular game rules, normally they have been only mentioned here as being the same regular game rule.

Official RoboCupJunior site: <http://rcj.robocup.org/soccer.html>

Official RoboCupJunior forum: <https://junior.forum.robocup.org/>



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1. GAMEPLAY

1.1 Game procedure and length of a game

The game will consist of two halves. The duration of each half is 10-minutes. There will be a 5-minute break in between the halves.

The game clock will run for the duration of the halves without stopping (except if or when the referee wants to consult an official). The game clock will be run by the referee or a referee assistant (see Rule 7.1 for the description of a referee assistant).

SuperTeam are supposed to be at their big field 10 minutes before their game starts. To be at the inspection table does not count in favor of this time limit. SuperTeam can be penalized one goal per **each elapsed 30 seconds** at the referee's discretion if they are late for the game start. **In any situation, when the goal difference reaches 10, the game finishes regardless of the state of the game clock.**

1.2 Pre-match meeting

At the start of the first half of the game, the referee will toss a coin. The SuperTeam mentioned first in the draw shall call the coin. The winner of the toss can choose either which end to kick to, or to kick off first. The loser of the toss will settle for the other option. After the first half, SuperTeams will switch sides. The SuperTeam not kicking off in the first half of the game will kick off to begin the second half of the game.

1.3 Kick-off

The kick-off is used to start each half of the game or to restart the game after a goal is scored (see rule 5.6). All robots must be located on their own side of the big field. All robots must be halted. The ball is positioned by a referee over one of the neutral spots in the direction of the robots that are kicking off.

Each SuperTeam has to position one robot as a goalie (fully inside their penalty area), and the rest of the robots can be located anywhere on their side of the playing field, as long as they are at a maximum distance of 10 cm from any white line. Robots cannot be placed nor remain behind the goal line or in the outer area.

The SuperTeam kicking off places their robots on the big field first. Robots cannot be repositioned once they have been placed.

The SuperTeam not kicking off will now place their robots on the defensive end of the big field.

A referee may adjust the placement of the robots to make sure that the robots are placed properly within the big field positions.

On the referee's command (usually by whistle), all robots will be started immediately by each assigned SuperTeam member. Any robots that are started early will be removed by the referee from the field and treated as a damaged robot (see penalty description of rule 5.11).

1.4 Human interference

Except for the kick-off, human interference from SuperTeam members (e.g. touching the robots) during the game is not allowed unless explicitly permitted by a referee. Violating SuperTeam /SuperTeam member(s) can be disqualified from the game.

A referee can help robots to get unstuck, but only if the ball is not being disputed near them, and also if that situation was created from the interaction between robots (i.e. it was not a design or programming flaw of the robot alone). The referee or a referee assistant will pull back the robots just enough for them to be able to move freely again.

1.5 Ball movement

RoboCupJunior Soccer Rules 2017 rule 1.5 applies.

1.6 Scoring

A goal is scored when the ball strikes or touches the back wall of the goal. Goals scored either by an attacking or defending robot have the same end result: they give one goal to the SuperTeam on the opposite side. After a goal, game will be restarted with a kick-off from the SuperTeam who received the goal against. After the referee signals that a goal was scored, the referee will invite SuperTeam members to capture their robots or ask a referee to help capture them and get ready for kick-off. Before a kick-off, all damaged or out-of-bounds robots are allowed to return to the playing field immediately if they are ready and fully functional.

1.7 Goalie

The robot moving first into the penalty area on a SuperTeam's defending side completely (with every part of it) is designated as goalie until a part of it leaves the penalty area.

1.8 Pushing

RoboCupJunior Soccer Rules 2017 rule 1.8 applies.

1.9 Lack of progress

RoboCupJunior Soccer Rules 2017 rule 1.9 applies.

1.10 Out of bounds

If a robot's entire body moves out beyond the white line of the big field completely, it will be called for being out of bounds. When this situation arises, the robot is given a one-minute penalty, and the SuperTeam is asked to remove the robot from the big field. There is no time stoppage for the game itself. The robot is allowed to return if a kickoff occurs before the penalty has elapsed.

The one-minute penalty starts when the robot is removed from play. Furthermore, any goal scored by the penalized SuperTeam while the penalized robot is on the field will not be granted. Out-of-bounds robots can be fixed if the SuperTeam needs to do so.

After the penalty time has passed, the robot will be placed inside the playing field at the nearest corner where it has been taken off, and not directly aiming towards the ball.

A referee can waive the penalty if the robot was accidentally pushed out of bounds by any other robot. In such a case, a referee may have to slightly push the robot back onto the big field.

The ball can leave and bounce back into the playing field. The referee calls “out of reach”, and will move the ball to the nearest unoccupied neutral spot when one of the following condition occurs:

- the ball remains outside the playing field too long,
- any of the robots are unable to return it into the playing field (without their whole body leaving the playing field), or
- the referee determines that the ball will not come back into the playing field.

1.11 Damaged robots

If a robot is damaged, it has to be taken off the big field and must be fixed before it can play again. If SuperTeam members cannot reach the damaged robot by themselves without stepping inside the field, they should ask a referee to hand over the damaged robot. A damaged robot must remain off the big field for at least one minute.

If a robot is damaged, it has to be taken off the field and must be fixed before it can play again. Even if repaired, the robot must remain off the field for at least one minute or until the next kickoff is due. If all robots have moved out of bounds, the penalties are discarded and the match resumes with a neutral kickoff.

A robot is damaged especially when:

- it does not respond to the ball, or is not able to move (it lost pieces, power, etc.).
- it continually moves into the goal or out of the playing field.
- it turns over on its own accord.

Computers and repair equipment are not permitted in the playing area during gameplay. Usually, a SuperTeam member will need to take the damaged robot to an “approved repair table” near the playing area, located inside the competitors working area. A referee may permit robot sensor calibration, computers and other tools in the playing area, only for the 5 minutes before the start of each half.

After a robot has been fixed, it will be placed at the nearest corner where it had been taken off, not directly aimed towards the ball. A robot can only be returned to the big field if the damage has been repaired. If a referee notices that the robot was returned to the big field with the same original problem, s/he could ask the robot to be removed, and proceed with the game as if the robot had not been returned.

Only a referee decides whether a robot is damaged. A robot can only be taken off or returned with a referee’s permission.

If all robots from the same SuperTeam are deemed damaged during gameplay, the clock continues and the remaining SuperTeam gets one initial goal and rests while waiting for the opponent's return to play. The remaining SuperTeam will also get one additional goal for each minute the opponent's robots remain damaged. After five minutes of absence, the SuperTeam with no functional robots forfeits the game. However, these rules only apply when none of the robots from the same SuperTeam were damaged as the result of the opponent SuperTeam violating the rules.



1.12 Multiple defense

Multiple defense occurs if more than one robot from the defending SuperTeam enters its penalty area with some part and substantially affects the game. The robot farther from the ball will be moved to the nearest corner. The referee could take this action at any time when more than one robot lingers in their penalty area.

If multiple defense happens repeatedly, the robot will be deemed damaged.

1.13 Interruption of Game

RoboCupJunior Soccer Rules 2017 rule 1.13 applies.

2. SUPERTeam

2.1 Regulations

A SuperTeam is a team of 3 or more regular teams with their corresponding robots, all from the same sub-league. Regular team is defined on RoboCupJunior Soccer Rules 2017 rules 2.1 and 3.1. Each regular team is required to provide at least one robot for each SuperTeam game.

Each SuperTeam must have a captain. The captain is the person responsible for communication with referees. The SuperTeam can replace its captain during gameplay. SuperTeam is allowed to have only the fewest possible members beside the field during game play: they will usually be the captain and one member from each individual team who has a robot as an active SuperTeam player (see rule 2.1).

2.2 Violations

RoboCupJunior Soccer Rules 2017 rule 2.2 applies.

3. ROBOTS

3.1 Number of robots / substitution

The SuperTeam will have all the robots from their respective individual teams available to play. In the playing field, the SuperTeam is allowed to use a maximum of 5 robots simultaneously, and they are its active players. The rest of the robots constitute their reserve players. Since the playing field is big, it is suggested that the SuperTeam establish positions for the robots inside the playing field (goalkeeper, backs, midfielders, forwards, etc.), by adjusting robot's mechanics and programming.

The substitution of robots during the competition with other SuperTeam is forbidden. Robots will be issued a special code that will distinguish them from other SuperTeams. **Each robot that belongs to a SuperTeam will receive an ID identifying the robot as being a member of a team. Example: Robot A-2: the referee would identify robot with sticker A-2 as robot number 2 belonging to team A. These IDs will be written on the Top Markers of robots (see RoboCupJunior Soccer Rules 2017 rule 3.7).**

Each individual team is required to have at least one of its robots as an active player, with the exception of a sixth team in which case SuperTeam is required to have individual team rotation allowing with that to include all individual teams evenly. SuperTeam members can decide freely how to substitute robots between the current



players and the reserve players during gameplay, but the captain is required to ask a referee for robot substitution authorization. Substitutions are allowed only at every kick-off (see rule 5.3).

3.2 Interference

RoboCupJunior Soccer Rules 2017 rule 3.2 applies.

3.3 Control

RoboCupJunior Soccer Rules 2017 rule 3.3 applies.

3.4 Communication

Robots are not allowed to use any kind of communication during game play unless the communication between the robots in the same SuperTeam is via Bluetooth class 2, class 3 (range shorter than 20 meters), **class 4 or via any other device that communicates using the 802.15.4 protocol (e.g., ZigBee and XBee)**. Teams are responsible for their communication. The availability of frequencies cannot be guaranteed.

3.5 Agility

RoboCupJunior Soccer Rules 2017 rule 3.5 applies.

3.6 Handle

RoboCupJunior Soccer Rules 2017 rule 3.6 applies.

3.7 Top Markers

RoboCupJunior Soccer Rules 2017 rule 3.7 applies.

3.8 Additional regulations of the sub-leagues

RoboCupJunior Soccer Rules 2017 rule 3.8 applies.

3.8 Violations

Robots that do not abide by the specifications/regulations are not allowed to play. If violations are detected during a running game, the SuperTeam is disqualified for that game. If similar violations occur repeatedly, the SuperTeam can be disqualified from the tournament.

4. BIG FIELD

4.1 Kind of field

There is only one kind of field for all sub-leagues.

4.2 Dimensions of the big field

The big field is 540 cm by 340 cm. The big field is marked by a white line that is part of the playing field. Around the playing field, beyond the white line, is an outer area of 30 cm width. Total dimensions of the big field, including the outer area, are 600 cm by 400 cm. The playing area is divided in sides for each SuperTeam by a black line. The field is located 70 cm above the floor.

4.3 Walls

Walls are placed all around the big field, including behind the goals and the out-area. The height of the walls is 22 cm. The walls are painted matte black. RoboCupJunior Soccer Rules 2017 rule 4.3 applies with regards to the landmarks placed on the walls.

4.4 Goals

The big field has two goals, centered on each of the shorter sides of the playing field. The goal inner space is 60 cm width, 10 cm high and 74 mm deep, box shaped. It has a cross-bar on top (to prevent robots from entering the goal and to allow checking if the ball scored). The goal “posts” are positioned over the white line marking the limits of the big field. The cross-bar is exactly over the white line. The height of the cross-bar is 2 cm. The interior walls and the cross-bar of each goal are painted, one goal yellow, the other goal blue. The exterior (including the goal post and frame) are painted black.

4.5 Floor

The floor consists of green carpet on top of a hard surface. The carpet should be of a quality that will resist the wear and tear of spinning wheels. All straight lines on the big field should be painted and have a width of 20 mm. It is recommended the floor near the exterior wall to have a wedge, which is an incline of 10 cm base and 2 cm rise for allowing the ball to roll back into play when it leaves the playing field.

4.6 Neutral spots

There are five neutral spots defined in the big field. One is in the center of the big field. The other four are located over the diagonals that go through the corners of the playing field, half the distance between the center of the field and each corner. The neutral spots can be drawn with a thin black marker. The neutral spots ought to be of circular shape measuring 1 cm in diameter.



4.7 Center circle

A center circle will be drawn on the big field. It is 80 cm in diameter. It is a thin black marker line. It is there for Referees and SuperTeam members as guidance during kick-off.

4.8 Penalty areas

In front of each goal there is a 35-cm wide and 120 cm long penalty area.

The penalty areas are marked by a black line of 20 mm width. The line is part of the area.

A robot is considered inside the Penalty Area when it is completely inside.

4.9 Lighting and Magnetic Conditions

RoboCupJunior Soccer Rules 2017 rule 4.9 applies.

5. BALL

RoboCupJunior Soccer Rules 2017 rules 5.1, 5.2, 5.3 applies.

6. CODE OF CONDUCT

RoboCupJunior Soccer Rules 2017 rules 6.1, 6.2, 6.3, 6.4, 6.5, 6.6 applies.

7. CONFLICT RESOLUTION

7.1 Referee and referee assistants

All decisions during the game are made by the referee or the referee assistants who are in charge of a field, and the persons and the objects surrounding the field. During gameplay, the decisions made by the referee and/or the referee assistants are final.

Any argument with the referee or referee assistants can result in a warning. If the argument continues or another argument occurs, this may result in immediate disqualification from the game.

At the conclusion of the game, the **result recorded in the scoresheet is final. The referee will ask the captains to add written comments to the scoresheet if they consider them necessary. These comments will be reviewed by the OC members.**

7.2 Rule clarification

RoboCupJunior Soccer Rules 2017 rule 7.2 applies.



7.3 Rule modification

RoboCupJunior Soccer Rules 2017 rule 7.3 applies.

7.4 Regulatory statutes

RoboCupJunior Soccer Rules 2017 rule 7.4 applies.

