

Sony Four Legged Robot Football League Rule Book

RoboCup 2001 in Seattle

1. Setup of the Environment

1-1. Field Size

Figure 1-1(Field Size)

The size of the penalty area has changed.
(350mm in width)

1-2. Field Color

Figure 1-2(Field Color)

The floor of the goal has changed.
(It becomes to be a green carpet)

1-3. The Results of Spectrum

1-4. The Lighting Condition

1-5. White Line

All the lines on the soccer field --- the halfway line, the penalty lines, the goal lines, and the center circle line --- are drawn by white lines of 25mm width.

2. Robot Players

2-1. Teams

2-2. Goal Keeper

A goal keeper is the only player who is allowed to stay within the penalty area of his own team. "staying within the penalty area" is defined as "having three feet in the penalty area". A goal keeper should have a mark on it to be easily identified by the referee. This mark will be provided by Sony before the games.

2-3. Size and Shape

2-4. Body Color

2-5. Ball Handling Mechanism

2-6. Communications

Communications using the wireless technology is strictly prohibited.

Communications between the robots and the human is also prohibited.

2-7. Global Vision System

2-8. Sensing System

3. Game Process

3-1. Length of the Game

Each game consists of three parts; the first half, break, and the second half. Each half is 10 minutes, and the break is also 10 minutes. The referee can adjust (extend or shorten, depending on the situations) this period of time. A court change and an uniform change will occur during the break. If the game is draw, no extension game will be played. Instead of it, there will be a penalty kick match employing a kind of sudden death rule. In this penalty kick match, each kicker can choose (only once) the side of goal to kick the ball in.

3-2. Winner

The team that marked more goals than the other is the winner of that match. If the both teams have the same scores, the game will be a draw. In case of draw, according to the rule above 3-1, the winner and the loser will be decided. The following points will be given based on the results of each game.

Winner	= 3 points
Loser	= 0 point
Draw-Winner	= 2 points
Draw-Loser	= 1 point

Additionally, it is judged that the goal is achieved when the entire ball (not the center of the ball) goes over the field-side edge of the goal line. Refer to the Figure 1-1 (Field Size).

3-3. Start-up

3-4. Kick-off/Restart/Stop

3-5. Robot Positions at Kick-off/Restart

3-5-1. Kick-off/Restart

The ball is placed on the center point of the center circle. All the robots

should be located in their side of the field. (No leg can go beyond or be on the center line.) The attacking team will locate their robots first, and then the defensive team will locate their robots. All the robots should never move their legs before the game starts, notified by patting their head-pad. There is no restriction about who touches the ball first.

The "Kick-off shoot" can never achieve a valid goal. Moreover, in such a case, all the robots should restart from the kick-off formation, changing the attacking side. The "Kick-off shoot" is defined as an immediate shoot after the kick-off. The term "immediate" means "before the entire ball goes out of the center circle, including the boundary line".

The restart after the goal shall adopt the same rule as the kick-off.

3-5-1a. The robots of the attacking team

No robot can be placed inside the center circle. Putting its leg(s) on the center circle line is allowed, but no leg is allowed to be inside the circle line.

3-5-1b. The robots of the defending team

Only a goal keeper can stay within the penalty area of his side. The other robots should put one or two legs on/inside the penalty line of their side. Remember that "having three legs inside the penalty area" is the definition of "staying within the penalty area" and that situation is not allowed for the field players.

3-5-2. Free Kick

3-5-3. Penalty Kick

Penalty kick is a game carried out only by a robot of the attacker side. Other robots should be powered-off and stay outside of the field. It is allowed to switch to a specially designed software for the penalty kick game.

The attacker is given a chance to make a goal within a minute. The robot should not move his legs before the game starts, notified by

patting his head-pad. All the rules such as "Ball Holding" or other are equally applied in case of the penalty kick.

The initial position of the ball and the kicker depends on the situations. Typically, the ball is somewhere on the penalty line and the kicker is on the center circle, but the referee can decide those arrangements.

The penalty kick ends

- if the kicker scores the goal.
- if the time has expired. The time limit for the kicker is 1 minute after the game starts.

3-5-4. Throw-in

3-6. Forbidden Actions

3-7. Game Stuck

In the event of no substantial change in the game state for more **than 30 seconds**, the referee shall pick up the robots which are jamming around the ball and move them to the halfway line and start them immediately heading for the center circle. (The referee tries not to replace the ball.)

If no robot seems to be recognizing the ball for more than **30 seconds**, the referee shall stop the game and restart the game from the kick-off formation, with the kick-off of the previously attacking team. (Previously attacking team is the side that didn't have a ball within their half.)

3-8. Manual Interactions by Team Members

Manual interaction with the robots, either directly or via some communication mechanism, is not allowed except during the kick-off, restart, finish of the game, and when ordered by the referee. When a robot seems malfunctional for some reasons, the referee asks the team member whether he requests the robot to be picked up. The team member may request permission to pick up the robots from the field. With the robots picked up, changing batteries, fixing some mechanical problems, or just rebooting the robots are allowed. Changing or adjusting their software programs or data are strictly prohibited. The

robot will be replaced back on the halfway line heading for the center circle at least **30 seconds** after the pick-up. This request-for-pick-up must not be used as a part of some strategy. It is clearly against the spirit of the RoboCup League.

4. Forbidden Actions of Robots and Penalties

The following actions are forbidden.

In general, the penalty is "removing the robot from the field and replacing it on the center line later". The ball shall not be moved as a part of penalty in case the game is active and goes on.

4-1. Ball Holding

Ball holding for more than **3 seconds** is not allowed. In case of the goal keeper inside the penalty area, he can hold the ball up to **5 seconds**. [The definition of holding](#) is given in another note.

Intentionally continual holding is prohibited even if each holding time doesn't continue for up to the time limited. In this case, the continual holding is regarded as a continuous holding from the very beginning and the rule above is strictly applied.

The violation of this rule will result in having the penalized robot outside of the field for **30 seconds**. Then he will be placed back to the field on the halfway line heading for the center circle. In case of the goal keeper violation, he will be placed on the halfway line immediately(no need to be kept outside of the field).

Our intention is to encourage the accurate passing or shooting technology. Therefore, the robot is requested to release(throw away) the ball immediately after the holding.

Encouraging the "dribbling while holding the ball" is not our intention at all.

4-2. Damage to the Field/Robots/Ball

A robot that damages the field, other robots, or the ball will be removed from the field for the rest of the game. A robot that threaten the

spectators safety will also follow the same rule.

In this case, the penalty kick will be employed.(The kicker cannot choose the goal on this situation.)

4-3. Prohibited Defense

Only a goal keeper can stay within the penalty area of his side. When other robots enter the area, they will be removed immediately and replaced on the halfway line heading for the center circle.(Called "Two Defenders Rule")

This rule will be applied even if the goal keeper is outside of the penalty area.

In case if this "remove and replace" operation advantages the robots to be penalized(typically, the ball is near the halfway line or the robots are of the attacking side), this rule may not be applied.

For the definition of "staying within the penalty area", refer to 2-2. "Goal Keeper" section.

The vertical projection of the goal keeper to the goal line should not occupy more than 50 percent of the length of the goal mouth. Those robots that commit this action (intentionally) will be replaced immediately on the halfway line heading for the center circle.

4-4. Obstruction

Note that this rule is for the field players and will never be applied to the goal keepers staying inside the penalty area:

if the robot to be removed is the goal keeper inside the penalty area, this rule will not be applied to him. (But may be applied to other players.) In case the goal keeper is outside of the penalty area, he is treated as just a normal field player.

4-4-1. Among the Players of the Same Team

When two or more robots of the same team make a physical contact with each other and the same situation continues for **30 seconds**, all the robots involved shall be removed and left outside the field for **30 seconds**. Then they shall be replaced back on the halfway line, heading for the center circle.

4-4-2. Among the Players of both teams

When two or more robots of both teams make a physical contact with each other and this situation continues for a while,

- a) in case that at least one robot is aware of the position of the ball and is heading for it, those robots that are clearly unaware of the ball position will be removed and replaced immediately on the halfway line, heading for the center circle.
- b) in case that all the robots involved seems unaware of the ball position, and this situation continues for **30 seconds**, or in case that all the robots seems aware of the ball position and this situation continues for **30 seconds**, then all of them shall be removed and replaced immediately on the halfway line, heading for the center circle.

4-5. Goal Keeper Charge

No robot is allowed to make a physical contact with an opponent goal keeper staying inside the penalty area with the "Ball Holding" situation. This means that if you find a ball already in the penalty area and also find a goal keeper already near the ball, you must not rush to the ball thoughtlessly.

A robot that violates this rule will be strictly penalized:

removed immediately and kept outside the field for **60 seconds**. Then it will be replaced back on the halfway line heading for the center circle.

4-5 Jamming

5. Judgment

5-1. Selection of the Referee

5-2 Referees during the Match