



RoboCup Junior Australia

# OnStage Performance Rules 2024

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## OnStage Performance State & Territory Contacts

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For State and Territory enquiries, contact information can be found on the RCJA Website:

[ACT](#) [NSW](#) [NT](#) [QLD](#) [SA](#) [TAS](#) [VIC](#) [WA](#)

## Code of Conduct

### Spirit

It is expected that all participants, students and mentors, will respect the aims and ideals of RoboCup Junior as set out in our mission statement. In turn, the volunteers, referees and officials will act within the spirit of the event to ensure the event is competitive, fair and most importantly, fun. "It is not whether you win or lose, but how much you learn that counts."

### Sharing

It is the overall desire of RoboCup Junior events that any technological and curricular developments will be shared with other participants after the event. Any developments including new technology and software examples, may be published on the RoboCup Junior website after the event, furthering the mission of RoboCup Junior as an educational initiative. Participants are strongly encouraged to ask questions of their fellow competitors to foster a culture of curiosity and exploration in the fields of science and technology.

### Local Variations

These rules will be in use for the RoboCup Junior Australia Australian Open for the titled year. State and Regional events may implement variations of these rules. These variations will be communicated to the participants through email and/or on the relevant State Webpage on the RoboCup Junior Australia website prior to the state or regional event.

### Notes/Advice vs. Rules

This document may include notes/advice to participants and mentors, plus rules that are firm. This has been done to remove ambiguity. There is a notation to indicate whether the content of this document is to be read as a note/advice or as a rule. Advice is noted in **green**. Rule changes for the new year are noted in **red**.



## Change Log

Revision	Change(s) Made
24.0	<p>Initial release for the season. Key changes from 2023 include:</p> <ul style="list-style-type: none"> <li>• Change to division requirements and international qualification (see section 1.2 &amp; 1.3)</li> <li>• Change to floor coverings for Open Teams (see section 2.1)</li> <li>• Added Battery Section (see section 3.2)</li> <li>• Change to reusing robots between RoboCup seasons (see section 4.1.2)</li> <li>• Add section around Bluetooth interference advise (see section 4.1.4)</li> <li>• Change to the Technical Description Paper submission format and details (see section 6)</li> <li>• Change to Final Score calculation and number of teams for finals (see section 7.1.4 &amp; section 8)</li> </ul>



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## 1 The Challenge

### 1.1 Challenge Description

- 1.1.1 RoboCup Junior OnStage Performance challenges teams of students to design, build and program a robot or robots to perform to music. This performance can be in the form of a dance in time with the beat of the music or a theatrical presentation that complements the music. Teams are scored on their Performance, Technical interview, and a submitted Technical Description Paper.

### 1.2 Novice Division

- 1.2.1 Any team where all members have 2 years or less experience in the OnStage Challenge and are in Year 8 or below can enter the NOVICE Division. Teams with one or more members in Year 9 or above may enter the NOVICE Division if they have not participated in the OnStage Challenge in a previous year. Teams in the Novice Division may consist of two to four team members.

### 1.3 Open Division

- 1.3.1 Any team may enter the OPEN division. Any team that is not eligible for the Novice division must enter the Open Division. Teams in the Open Division may consist of two to four team members.

The Open Division is recommended to teams who are developing advanced robotic solutions and teams with less than two years' experience may wish to join to have the opportunity to explain their technical solutions.

Please contact your state or territory OnStage Chair if you are unsure of what league to enter.

- 1.3.2 Subject to age limitations and other criteria, Open Division teams who perform well in the National Event may qualify for the annual RoboCup Junior International Event. Other international events may have other divisions/qualification requirements.

### 1.4 Students

- 1.4.1 RoboCup Junior Australia OnStage is open to all students enrolled and studying at a recognised Primary or Secondary education provider.

## 2 The Performance Area

All measurements in the rules have a tolerance of 5%.

### 2.1 The Stage

- 2.1.1 The Stage will be a 2.0m x 2.0m firm, flat, square surface with a maximum vertical differential of 3mm.
- 2.1.2 The boundary will be marked with 50mm black tape, leaving a useable floor of size 1.90m x 1.90m
- 2.1.3 The stage floor must not be modified or damaged in any way.
- 2.1.4 Teams entered in the Novice and Open Divisions may use a floor mat/covering.
- 2.1.4.1 Floor mats/coverings **must not** exceed 1.80m x 1.80m.
- 2.1.4.2 Floor mats/coverings **must not** cover any part of the stage floor tape boundary.
- 2.1.5 Teams **must not** attempt to stick props/floor coverings to the competition mat.

### 2.2 Student Work Area

- 2.2.1 Teams will be allocated space in a working area known as 'Student Work Area', away from The Stage and Public Access Area(s). Mentors are required to supervise Student Work Area from the Public Access Area(s).



## 2.3 Technical Interview Area

- 2.3.1 Teams and (optionally) Mentors will attend a technical interview in a quiet, reflective area away from The Stage, the Student Work Area, and the Public Access Area(s).
- 2.3.2 Mentors who have indicated that they wish to attend the Technical Interview with their team will be collected by the marshals from the entrance to the Student Work Area once the team has been marshalled.

## 2.4 Restrictions

- 2.4.1 Mentors, Parents and Supporters are not permitted in The Student Work Area, The Stage and the Technical interview Areas at anytime unaccompanied by an organiser or marshal (Interview only).

# 3 Equipment / Music / Props

## 3.1 Safety

- 3.1.1 Performances must not include explosions, untethered projectiles, smoke or flame, liquids, or other hazardous substances. This includes any aerial robotic platforms such as drones.
- 3.1.2 240v 'Mains' electricity is not allowed on or near The Stage as part of an OnStage Performance.

## 3.2 Battery Safety

- 3.2.1 Due to safety reasons, Lithium-based batteries can only be used in conjunction with commercially produced, dedicated balanced Lithium-based battery chargers and fireproof charging bags. These batteries can explode due to incorrect charging and discharging (check manufacturer's recommendations), or if they are damaged.
- 3.2.2 Protection circuits for Lithium-based batteries are strongly encouraged. The use of swollen, damaged, or otherwise dangerous batteries is not allowed.
- 3.2.3 At any event venue all teams charging lithium-based batteries (including LiPo (Lithium Polymer) and Li-ion (Lithium-Ion) batteries) must charge their batteries at the lower of either:
  - 3.2.3.1 the manufacturer's recommended charging rate (if available)
  - 3.2.3.2 a maximum charging rate of 1C.

The charging rate equivalent of 1C for a given battery can be identified through its capacity. For example, a 1500mAh (1.5Ah) LiPo battery would have a 1C of 1500mA (1.5A), where as a 2200mAh (2.2Ah) LiPo battery would have a 1C of 2200mA (2.2A).

If the manufacturer's recommendations are not available, teams should charge lithium-based batteries at a rate within the range of 0.5C to 1C.

## 3.3 Music

- 3.3.1 Any team using inappropriate music that includes explicit language, implied violence or sexual lyrics/sounds will be excluded from the event.
- 3.3.2 Music is to be supplied as indicated by the organisers of the event. It should be high quality, clearly labelled with the team's name, school, division, and contain only the music for the team's performance.

## 3.4 Props

- 3.4.1 Static or non-robotic props must not exceed a height of 50cm
- 3.4.2 All props must fit clearly within the black boundary of the stage. There are to be no props outside the boundary. Props are not judged outside the mat.



## 4 Robot(s)

### 4.1 Construction and Programming

- 4.1.1 The construction and programming of the robots must be the work of participants.
- 4.1.2 **The robots may be from previous competitions but innovated and programmed for the current challenge season.**
- 4.1.3 Parents, Mentors and Supporters must not directly assist student team members with any aspect of the construction or programming of the robots during an event.
- 4.1.4 Communication between robots is acceptable as long as it does not interfere with the performance of other robots, is not detectable outside the venue and complies with local regulations regarding frequency use and safety.

Advice: Teams should perform checks on messages sent between robots. For example, you can prepend a unique string to their message, and check that the string exists, to reduce the possibility of receiving interfering messages from other teams.

## 5 The Technical interview

### 5.1 Scoring

- 5.1.1 The Technical interview will be scored using the Official RCJA OnStage Technical Interview Scoresheet (for the relevant division), or equivalent electronic form. The Scoresheets are available from <https://robocupjunior.org.au/onstage>
- 5.1.2 Technical interview scores for OPEN division will be moderated by the teams' experience and capabilities. That is, a more experienced team will be expected to demonstrate a higher level of technical competence to achieve the same score as a team with less experience.

### 5.2 Requirements

- 5.2.1 All participants present at the event must attend the Technical Interview.
- 5.2.2 All robots must be presented at The Technical Interview in working condition.
- 5.2.3 Mentors are permitted in the Technical Interview for their Team(s) but must not attempt to influence the Technical interview.
- 5.2.4 The Technical interview panel will not be influenced by any Mentors attending The Technical Interview.

## 6 The Technical Description Paper

### 6.1 Scoring

- 6.1.1 The Technical Description Paper will be scored using the Official OnStage Technical Interview Scoresheet. The guidelines for the Technical Description are available from <https://robocupjunior.org.au/onstage>.

### 6.2 Requirements

- 6.2.1 **The Technical Description Paper must be submitted as a PDF by the team electronically by the nominated closing date indicated in the event registration system.**



- 6.2.2 The Technical Description Paper can be presented in any format. Examples include a Paper, PowerPoint, or Poster. Judges will have access to the TDP via the system, but teams are recommended to bring a hard copy as a backup.

## 7 The Performance

### 7.1 Scoring

- 7.1.1 Team Performances will be scored using the Official RCJA OnStage Performance Scoresheet (for the relevant division), or equivalent electronic form. The Scoresheets are available from <https://robocupjunior.org.au/onstage>

- 7.1.2 The number of rounds and the format of the competition will be announced during the team briefing at the beginning of the competition.

- 7.1.4 Where teams are given more than one performance opportunity, only the highest performance score will be used to determine the performance score component to determine the finalists.

### 7.2 Conditions

- 7.2.1 The total time allowed for a performance is six minutes.

- 7.2.1.1 Once time expires, judges will stop watching the performance and determine the score.

- 7.2.2 Within the time limit, teams are required to setup all equipment on the Stage, complete the performance and then leave the Stage completely.

- 7.2.2.1 Only participants can setup or remove equipment from the Stage.

- 7.2.3 The performance must be between one minute and two minutes. Any supporting music/sound effects will be muted once two minutes has elapsed.

- 7.2.4 The performance must occur only on The Stage. A robot is considered off The Stage if all parts of the robot are no longer inside the outermost edge of the tape boundary on The Stage.

- 7.2.5 Before the routine begins, the student team leader must inform the judges of any human-robot interactions planned within the routine.

- 7.2.6 The performance is to be performed autonomously. Where code is run from a device other than the robot itself, that device must be placed within the stage and not touched after the performance has started.

- 7.2.7 Any performance that includes music, themes and costumes that features violent, military, sexual, threatening, or criminal elements will be excluded. Mentors are reminded to check their team(s) music choices before competition to prevent causing offence to others.

- 7.2.8 Teams are permitted to change programs, performance routines or robots between round(s)

### 7.3 Restarts

- 7.3.1 A team can request a restart of the performance within the first 30 seconds of the performance.

- 7.3.1.1 A restart is signalled clearly to the judges verbally by the Team Leader (who must be a student).

- 7.3.1.2 A performance can have a maximum of two restarts.





- 7.3.1.3 Where the circumstances of a restart are not caused by the team, this will not count towards their restart count, nor will it incur any points deduction. Time will be added to the performance to reflect the time consumed by this restart.

## 7.4 Unrecoverable Malfunctions

- 7.4.1 Where a team indicates that they cannot recover due to hardware and software malfunction, The performance clock can be stopped at the discretion of the judges. The performance clock would then continue once the performance starts again. All points and deductions would carry over and the performance total time is maintained.

## 8 Results

### 8.1 Score Totals

- 8.1.1 Teams competing in the finals will be the top 3 teams.
- 8.1.1 The Technical interview Score will come from Official 2024 RCJA OnStage Technical interview Scoresheet
- 8.1.2 The Final Performance Score will come from Official 2024 RCJA OnStage Performance Scoresheet
- 8.1.2 A teams' final score will be the Final Performance score and the Technical Interview score.

## 9 Interference, Conflicts and Protests

### 9.1 Teams

- 9.1.1 Mentors, Parents and Supporters found to be assisting teams on the day, both within, or outside The Event Venue, will see teams incur an official warning. Further infringements may see the team disqualified and/or excluded from The Event.

### 9.2 Parents, Mentors and Supporters

- 9.2.1 Parents, Mentors and Supporters are only permitted in Public Access Area(s). Additionally, Mentors are permitted in The Technical interview Area when their team(s) are attending their technical interview and must be escorted by a marshal.
- 9.2.2 Any continued infringement will incur an official warning for the relevant team(s) and further infringements may see the team(s) disqualified and/or excluded from The Event.

### 9.3 Protests

- 9.3.1 Only the Mentor may lodge a protest with the organisers. A protest can only be heard if there is an alleged breach of the rules.
- 9.3.2 The protest must be made in writing not more than 30 minutes after the Performance or the Technical Interview.
- 9.3.3 Protests must be lodged with the OnStage Performance Coordinator or other relevant person at The Event and will be referred to the judges for consideration.
- 9.3.4 Any protest must include:
- 9.1.4.1 All relevant facts and any corroborative evidence
- 9.1.4.2 The rules that are believed to have been breached.