UKSEDS COMPETITIONS

OLYMPUS ROVER TRIALS 2025-26

BASIC STREAM

REQUIREMENT SPECIFICATION

SPONSORED BY

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UKRI Science and Technology Facilities Council

RAL Space

Contents

Document Information

Written By	Responsibility
Beth Nicolson	ORT Volunteer
Amber Barlow	ORT Volunteer
Aamir Sarpal	ORT Team Lead
Oliver Lee	ORT Team Lead
Verified By	**Responsibility**
Geethanjali Gopinath	Competitions Team Lead
Jason Richards	Competitions Vice Team Lead
Approved By	**Responsibility**
Anna Kalapurakkal	UKSEDS Chair

Version	Changes	Date
ORT-RS-001	Initial Release	19/10/2025

1 ACRONYMS & REFERENCE DOCUMENTS

1.1 Acronyms

Acronym	Description
ECSS	European Cooperation for Space Standardisation
RS	Requirements Specification
SOW	Statement of Work
ORT	Olympus Rover Trials
UKSEDS	UK Students for the Exploration and Development of Space
PDR	Preliminary Design Review
CDR	Critical Design Review
LiPo	Lithium Polymer
PPI	Pixels Per Inch

1.2 Reference Documents

1.2.1 Competition Documents

There are two other documents related to the competition to make a total of **three regulatory documents** this year. The three documents are as follows:

ID	Document	Description
ORT-RB	Rulebook	Outlines the overall competition rules, funding, team structures and so on - the competition logistics.
ORT-SOW	Statement of Work	Outlines the main deliverables teams shall be expected to deliver - the competition project requirements.
ORT-RS	Requirements Specification (this document)	Outlines the technical requirements the rover must be designed to meet

1.2.2 Useful Reference Documents

No.	Document	Description
1	ECSS-M-ST-10C Rev. 1	**Space project management** - Project planning and implementation
2	ECSS-S-ST-00-01C	**Glossary of Terms** - A list of commonly used terms in ECSS documents

1.3 Requirement Numbering Definition

The following describes the layout of the requirements within this document.

ORT RS-<A>-<n> | Rev: <R>

<Title>

<text>

VV Method: *<v>*
Parent: *<p>*

Key
<A>: Acronym for the section the requirement falls under.
<n>: Requirement number of 3 digits, starting from 001.
Note: *<A> and <n> combine with the competition and document name acronyms to create the requirement ID.*
<R>: Revision indicator, with "A" denoting the first version, "B" the second and so forth.
<Title>: Requirement title.
<text>: Requirement text.
<v>: The verification method(s) needed to demonstrate compliance to each requirement. The letters shall be only the following:

Letter	Verification Method	Description
I	Inspection	Physical examination of the relevant system(s) using one or more of the five senses
A	Analysis	Use of calculations/models to provide a prediction of the relevant system(s) performance
D	Demonstration	Use of the relevant system(s)as intended to be used
T	Test	Use of the relevant system(s) with a controlled, predefined set of inputs or environments

<p>: Denotes if a requirement is derived from another requirement. Parent requirements shall be listed by the Requirement ID. If no Parent Requirement exists, the value shall be N/A.

2 REQUIREMENTS

2.1 Mission Requirements

The technical specification given here contains all the mission requirements that must be met by a team's rover to progress through both the PDR and CDR and to progress to the competition event.

2.1.1 Structure and Mechanics

ORT RS-SM-001 | Rev: A

Mass

The integrated rover shall have a combined mass of no more than 5kg.

VV Method: I,A
Parent: N/A

ORT RS-SM-002 | Rev: A

Volume

The rover shall be limited to a boxed volume envelope of 0.03 cubic metres. There are no specific dimension limits.

VV Method: I,A
Parent: N/A

ORT RS-SM-003 | Rev: A

Vibration Environment

The rover shall be designed to survive the launch vibration environment as specified in Appendix SOW-1.
Note on the use of adapter plates: Simple spring adapter plates typically lead to low resonant frequencies which would cause large increases in the loads experienced by the rover and hence, are not recommended. Complex designs, which would be allowed for space use, are likely to be cost prohibitive.
The mass and volume of any adapter plates will be included in the calculation of Requirement ORT RS-SM-001 and Requirement ORT RS-SM-002..
VV Method: T,A
Parent: N/A

ORT RS-SM-004 | Rev: A

Vibration Test Attachment Mechanism

The rover shall be attached to the vibration system with the interface described in Appendix SOW-2.
VV Method: I
Parent: ORT RS-SM-003

ORT RS-SM-005 | Rev: A

Static Stability

The integrated rover system shall be statically stable in all directions to an angle of at least 30 degrees.
VV Method: D,A
Parent: N/A

ORT RS-SM-006 | Rev: A

Minimum number of interfaces

The rover shall have a minimum number of 3 M5 bolts to interface with the vibration bed.

VV Method: I
Parent: ORT RS-SM-004

2.1.2 Image Collection and Submission

ORT RS-ICS-001 | Rev: A

Image Collection

The rover shall have a method of taking images.

VV Method: D
Parent: N/A

ORT RS-ICS-002 | Rev: A

Image Submission

The rover shall have a method of sending images taken to the Team such that the images are able to be displayed on a digital screen.

VV Method: D
Parent: ORT RS-ICS-002

2.1.3 Power and Propulsion

ORT RS-PP-001 | Rev: A

Atmosphere

In fitting with the Mars setting of the competition, the Rover shall use a form of locomotion that does not require a significant atmosphere (i.e. no aircraft).

VV Method: I
Parent: N/A

ORT RS-PP-002 | Rev: A

Surface

The rover shall be able to traverse an unknown surface of gravel and rocks (a description of material conditions is available in Section 3.3 in ORT-SOW-001). Rock dimensions range from a vertical height of between 5 to 40 cm, with a nominal diameter range of 5 to 30 cm. The rock distribution should be considered random. The maximum incline of the slope is approximately 15 degrees.

VV Method: T
Parent: N/A

ORT RS-PP-003 | Rev: A

Travel Distance

The expected distance of travel that the rover will have to cover during the test is 60 m in total. Adding a safety margin to this value is recommended.

VV Method: T
Parent: N/A

ORT RS-PP-004 | Rev: A

Time on Surface

The rover must have sufficient power to enable 30 minutes of on-gravel operations.

VV Method: T,A
Parent: N/A

2.1.4 Command and Control

ORT RS-CC-001 | Rev: A

Primary communication

Communication between the operating base and the rover shall be wireless (refer to the range in the test pit specification). No time delay is added to the communication system.
***VV Method:** D*
***Parent:** N/A*

ORT RS-CC-002 | Rev: A

Backup communication

An alternative communications capability shall be included. This may be wired (e.g. Ethernet) and will only be used if unpredictable external factors influence the testing (such as interference). An Ethernet cable will be available for use on the day.
***VV Method:** I*
***Parent:** N/A*

ORT RS-CC-003 | Rev: A

Legality

All wireless communications must use UK legal frequencies and should be used responsibly.
***VV Method:** I*
***Parent:** ORT RS-CC-001*

ORT RS-CC-004 | Rev: A

Equipment placement

RF Equipment may be placed at the starting area.
VV Method: I
Parent: ORT RS-CC-001

ORT RS-CC-005 | Rev: A

Line of sight and sensing

The team shall be able to operate the rover using its onboard navigation systems only.
VV Method: D
Parent: N/A

2.1.5 Safety

ORT RS-SAF-001 | Rev: A

Live Voltage

No exposed point or area of the vehicle shall carry a live voltage > 12V at any point during operation for the rover.
VV Method: I
Parent: N/A

ORT RS-SAF-002 | Rev: A

Battery

The vehicle's batteries shall be protected from the following conditions - over voltage, under voltage, over current, over temperature, short circuit and reverse connection. Lead Acid batteries are not allowed. The batteries shall be removable. Battery good practice shall be followed (check out the Resources page of the competition website). In the case of LiPo batteries, charge bags and a CE marked LiPo charger shall be used.
VV Method: I, T
Parent: N/A

ORT RS-SAF-003 | Rev: A

Kill Switch

The rover shall have an external and easily accessible manual hardware kill switch that isolates battery power from the rest of the rover.
VV Method: *D*
Parent: *N/A*

ORT RS-SAF-004 | Rev: A

Declaration of Autonomy

Rovers with autonomous capabilities shall be highlighted to the judges to ensure that sufficient safety measures are in place.
VV Method: *I*
Parent: *N/A*

ORT RS-SAF-005 | Rev: A

Locomotion Design

Motors & motor connections must be protected from the environment to reduce the risk of exposed wires in the event of a collision.
VV Method: *I*
Parent: *N/A*

END OF DOCUMENT