

# UKSEDS National Rocketry Championship 2015-2016

## Introducing the 2015-16 UKSEDS Rocketry Championship.

Teams are challenged with designing, building and launching a mid-power rocket with the primary goal of reaching the greatest apogee possible. Motor selection will be limited to ensure a fair competition between teams.

### Teams will be scored on the following criteria:

1. Maximum altitude of a successful flight.
2. Quality of technical reports.
3. Carrying a payload of scientific or technical value or incorporating a novel design into their rocket.
4. Build and finish quality, including adherence to original design.
5. Mentor meeting

Teams wishing to enter the competition must [register](#). Please direct any [rocketry@ukseds.org](mailto:rocketry@ukseds.org) for any enquires.

### Mentorship

Teams will be assigned a mentor once they have registered. We recommend having a minimum of three skype or equivalent meetings (design review, construction and pre-launch meetings) with your mentor. Points will be awarded to teams for attending these meetings.

### Motor Selection:

Motor selection is limited to one *'2-grain 29mm Cesaroni reloads of G impulse.'* These are classified as mid-power motors and so do not require UKRA certification to purchase or fly.

### Key Dates:

- Registration: Monday 28<sup>th</sup> December 2015
- Design and build report due: Monday 28<sup>th</sup> March 2016
- Teams must launch by: Monday 4<sup>th</sup> July 2016
- Launch Report due: Monday 11<sup>th</sup> July 2016

The scoring criteria, competition rules, and document deliverables tables are included below.

### Deliverables

The format we require for each deliverable has been specified in the 'Deliverables table' below. Images should be put into sub folders related to their deliverable e.g. images of rocket design drawings should be in a folder called DRB2.

Where we request a report you should produce no more than two A4 pages, font size 12. Any images, calculations or data you cannot fit into the report can be put in an appendix. Title pages are not included in this limit. If you feel you need more space for report please contact us.

All deliverables are to be sent as a zip file to [rocketry@ukseds.org](mailto:rocketry@ukseds.org)

## UKSEDS National Rocketry Championship Rules

The UKSEDS N.R.C. is organised in the spirit of healthy competition. Rules & regulations have been drawn up to maintain a high standard of safety and fairness for all participants.

1. This competition is open to all UK Students for the Exploration and Development of Space branches. Other teams wishing to participate are welcome but must get consent by e-mailing [rocketry@ukseds.org](mailto:rocketry@ukseds.org).
2. All rocketry activities must abide by the United Kingdom Rocketry Association (UKRA) Safety Code, which can be found [here](#).
3. All rockets must be original designs and scratch built by members of the team. Commercial kits are not permitted.
4. All designs must be capable of measuring altitude. The altimeter needs to be tested and calibrated prior to installation to ensure it is in working condition. This process should be documented in the technical report. Teams are allowed to make their own altimeter or buy a commercially available device. Contact us if you need any assistance.
5. Rockets may carry an additional payload, which has scientific, technical or novel value for additional points.
6. The competing team is responsible for organising a suitable launch venue. Teams should contact the UKSEDS at [rocketry@ukseds.org](mailto:rocketry@ukseds.org) if they require assistance in identifying a suitable site.
7. A certified Range Safety Officer (RSO) must certify any launches. Should one not be available, teams must contact the UKSEDS at [rocketry@ukseds.org](mailto:rocketry@ukseds.org) to arrange an alternative solution. The competing team is responsible for having the launch certified.
8. All launches must be performed entirely through the motor's own power. No specialty launch systems (i.e., Rockoon, projectile launching) are permitted.
9. All rockets must be successfully recovered with minimal damage. Minimal damage shall be defined as being able to be flown again and effectively 'motor ready'. The team and the certifying person (RSO) must document successful recovery.
10. All teams must take video and/or photographs of the design and construction of their vehicle, as well as its launch, which should be submitted with the relevant documentation.
11. All teams and launches must abide by local laws and CAA regulations for unmanned rocket launches. Safety must take the highest priority in launch preparations and flight operations. UKSEDS retains no responsibility for the launch rules and regulations that the competing teams shall be required to follow.
12. If a group wishes to use their own telemetry system then the equipment to be used at the launch site must be certified by the Radio Standards Authority and subsequent documentation submitted to the RSO on the day of the launch as part of the pre-launch checklist.

**UKSEDS National Rocketry Championship Deliverables**

<b>Deliverable</b>	<b>Document #</b>	<b>Requirements</b>	<b>Format / Due Date</b>
<b><u>Design &amp; Build Documentation</u></b>			<b><u>Monday 30<sup>th</sup> March 2015</u></b>
Rocket design drawings	DBR 1	Please submit design drawings of your rocket. Images from Rocksim or OpenRocket or any other rocketry simulation software are suggested.	Images
Launch simulations	DBR 2	Please submit launch simulations of the rockets predicted flight. Including graphs of altitude, speed and acceleration vs. time with clear scales and units, plus time to apogee and velocity at parachute deployment.	Images
Recovery system schematics	DBR 3	Please submit details of any electrical on board recovery systems	Include in report
Build process validation	DBR 4	Please submit a document detailing the build process of your rocket i.e. what you did and how you did it. Include details of the construction of the motor mount, fins, payload bay, and airframe. Pictures and videos are recommended.	Report
Launch Ready Rocket	DBR 5	Please submit pictures of your rocket showing construction is complete.	Images
<b><u>Launch Report Deliverables</u></b>			<b><u>Monday 21<sup>nd</sup> September 2014</u></b>
Launch summary	LR 1	Please provide a brief description about your launch experience i.e. what when well ? what did not ?	Report
Flight Data	LR 2	Please submit data on you maximum altitude, and any other data recorded during the flight.	Include in report
Rocket Preparation Summary	LR 4	Images of engine preparation, engine retention with loaded motor, payload, payload (integrated into the rocket), packed recovery systems and rocket on pad.	Images
Recovery Operations Summary	LR 5	Images of undisturbed rocket at the landing site, deployed parachutes, airframe, & any damage.	Images
Flight Verification Form	LR 6	The person certifying your flight must verify the flight and sign the flight certification form, found <a href="#">here</a> .	Image

<b>UKSEDS National Rocketry Championship Scoring Criteria</b>		
<b>Scoring Component</b>	<b>Possible Points</b>	<b>Notes</b>
<b><i>Flight Scoring</i></b>	<b>100</b>	
Launch	10	Successful launch off the pad
Maximum altitude	50	Points will be awarded based on results relative to the rest of the competition
Successful parachute deployment	20	Recovery system deployed successfully.
Successful recovery with minimal damage*	20	The rocket is recovered successfully and is in flyable condition
<b><i>Payload Scoring</i></b>	<b>50</b>	
Onboard Camera	15	Teams are awarded 15 points for flying a camera on their rocket and submitting the video
Scientific/Technical Payload	35	Teams can earn up to 35 points for flying a scientific or technical payload. Points are awarded according to the design of the payload and value of data returned at the discretion of the scoring committee. Teams have wide discretion as to the purpose of their payload and its execution.
<b>Documentation</b>	<b>50</b>	
Reports	25	Teams are awarded up to 20 points for the quality and detail of document deliverables.
Videos and Picture	25	Teams are awarded up to 20 points for pictures and videos documenting the projects entirety
<b>Mentorship</b>	<b>50</b>	
Design review	20	Teams will be awarded 20 points for having a design review meeting with their mentor.
Pre-Launch meeting	20	Teams will be awarded 20 points for having a pre-launch meeting with their mentor.
Team effort	10	Mentors will give their team a mark out of 10 for effort.
<b>Total Possible Points</b>	<b>250</b>	
<b><i>IMPORTANT: Teams will be assessed a penalty of 10 points per missing deliverable.</i></b>		
<b><i>The scoring committee reserves final judgment on all competition scoring.</i></b>		

\* Minimal damage shall be defined as being able to be flown again and effectively 'motor ready'. The team and the certifying person (RSO) must document successful recovery.