UKROC Rules 2026

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1. OVERVIEW

All teams are required to read this document in full, as it contains detailed rocket specifications not included on this page. Failure to comply with these rules may result in disqualification.

- **Rocket length** must be no less than 650 millimetres and weight at take-off must be no greater than 650 grams
- **Rocket body tube** must have the same diameter the entire distance between the nose cone and the fin, this diameter must be **at least** 47 millimetres (BT70)
- **Motors:** single stage with no more than 80-Newton seconds of total rocket motor power using one or more motors from the approved UKROC motor list (type F and smaller)
- **Payload** of one raw hen's egg of 55 – 63 grams weight, carried in any orientation that must survive the flight uncracked
- **Parachutes:** all parts of the rocket must descend safely connected (tethered) together using one or more parachutes for recovery
- **Target altitude** is 750 feet (229 meters)
- **Target flight duration** is 36 – 39 seconds
- **Important update:** Estes altimeters and TSP motors are no longer permitted for UKROC 2026. Only rail launchers are allowed at the regional events and the national final.
- Rockets flown at the national final should have previously flown safely and successfully.

2. ROCKET REQUIREMENTS

Rockets must not exceed 650 grams gross weight at liftoff. The overall length of the rocket must be no less than 650 millimetres (25.6 inches) as measured from the lowest to the highest points of the airframe structure (including fins) in launch configuration. It must use a body tube that has the same diameter the entire distance between the nose cone and the fins. This body tube may have an outside diameter **greater than or equal** to 47 millimetres (size BT70) and be capable of holding one raw egg internally in any orientation that could be up to 45 millimetres in diameter. All parts of the rocket (other than disposable recovery wadding) must descend safely tethered together using one or more parachutes. Rockets must have the team's name and address to aid recovery. Rockets flown at the National Finals will be required to have a painted surface, 3D printed items may be self-coloured or painted. Non-compliant rockets will incur a 5-point flight score penalty on their first flight at the National Finals. Rockets may not be commercially made kits designed to carry egg payloads with the only modification being the addition of an altimeter compartment. They must have only one stage i.e. the motor(s) must ignite at take-off.

3. PAYLOAD

Rockets must contain and completely enclose one raw hen's egg of 55 to 63 grams mass and a diameter of up to 45 millimetres. The egg can be carried in any orientation. The egg must both return from the flight without any cracks or other external damage. The egg will be issued to the teams by event officials during the Regional Qualifying events and National Finals, but teams must provide their own egg for testing or self-qualifying flights (if allowed). The egg and altimeter must be removed from the rocket at the end of a Regional qualifying flight and National Finals flight in the presence of a designated UKROC official and presented to that official, who will inspect the egg for damage after their removal and will read the altimeter score. All coatings, padding, or other materials used to protect the egg must be removed by the team prior to this inspection in the presence of a UKROC official. Any external damage to the egg noted after its flight and removal from the rocket by the team will lead to disqualification.

4. DURATION SCORING

The duration score for each flight shall be measured from first motion at lift-off from the launch pad until the moment that the section of the rocket containing the egg touches the ground (or a tree) or until it can no longer be seen due to distance or to an obstacle. Times must be measured independently by two people not on the team, one of whom will be an official UKROC observer, using separate electronic stopwatches that are accurate to 0.01 seconds. The official duration will be the average of the two times, rounded to the nearest 0.01 second, with .005 seconds being rounded up to the next highest 0.01 seconds. If one stopwatch malfunctions, the remaining single time will be used. The flight duration goal is a range of 36 to 39 seconds. Flights with duration in the range of 36 to 39 seconds get a perfect duration score of zero. Duration scores for flights with duration below 36 seconds will be computed by taking the absolute difference between 36 seconds and the measured average flight duration to the nearest 1/100 second and multiplying this by 4. Duration scores for flights with durations above 39 seconds will be computed by taking the absolute difference between 39 seconds and the measured average flight duration to the nearest 1/100 second and multiplying this by 4. These duration scores are always a positive number or zero. The target duration range for flights at the Finals will be the same regardless of the altitude target.

5. ALTITUDE SCORING

Rockets must contain one electronic altimeter approved for use in UKROC Regional Qualifying events (estes altimeters are not permitted). This must only be a commercially available altimeter, including Perfectflite APRA (no longer available to purchase but still allowable) pnut or firefly, or Jolly logic one and two. Other commercial altimeters may be considered, but please contact the UKROC organisers if you want to use any other type of altimeter (one off individual designs are not permissible). The altimeter bay must be able to accommodate the APRA. The altitude performance goal for qualification flights is 750 feet (229 metres). The altitude score will be the absolute difference in feet between the altitude performance goal in feet and the altimeter-reported actual flight altitude in feet (always a positive number or zero). At the international final altimeters are provided by the organisers.

6. SAFETY

All rockets must be built and flown in accordance with the UKROC Best Practices document. Rockets flown at the National Finals must have previously flown safely and successfully. Rockets will be inspected before launch and observed during flight by a UKROC official, whose judgment about the safety of the flight and with these rules will be final. Teams are encouraged to consult with designated UKROC officials well before the fly-off to resolve any questions about design, safety, or these rules. UKROC will provide teams with a rocket safety checklist, which must be completed and submitted to the organisers upon arrival at Regional Qualifying events. Teams are also encouraged to complete their own, more detailed preflight checklist to ensure all aspects are covered.

7. TEAMS

The application for a team must come from a single school, a single non-profit youth or educational organisation, or a home-schooled group. (Excluding UK Rocket clubs and organisations and UKRA). Minimum team size is three students, and the maximum is six students. There is no limit to the number of teams that may be entered from any single school or organisation, but no more than three teams containing students who attend the same school or who are members of the same organisation, regardless of whether the teams are sponsored by that school or organisation, can be invited to attend the National Finals. Team members must be students who are aged 11 to 18 on 1 January of the year of the National Finals and may not be acting in any staff capacity at the school. Teams may have members from other schools or other organisations and may obtain financing from any source, not limited to their sponsoring organisation. Teams must be supervised by an adult approved by the head of the sponsoring school, or by an officially-appointed adult leader of their sponsoring organisation. Each student member must make a significant contribution to the designing, building, and/or launching of the team's entry. No part of any of these activities for a rocket used to compete in UKROC may be done by any adult, by a company (except by the sale of standard off-the-shelf components available to the general public, but not kits or designs for the event), or by any person not a student on that team. No student may be on more than one team. The supervising teacher/adult may supervise more than one team. For national fairness, only teams from Northern Ireland, Scotland, and Wales are eligible to place first at their respective regional events; other teams may attend if necessary, but their scores will only be considered for the remaining 11 places at the national final.

8. MOTOR SAFETY

Rockets must be powered only by commercially-made model rocket motors of “F” or lower power class that are listed on the UKROC Approved Motor List posted on the UKROC website. Any number of motors may be used, but the motors used must not contain a combined total of more than 80 Newton-seconds of total impulse based on the total impulse ratings in the UKROC list. Motors must be retained in the rocket during flight and at ejection by a positive mechanical means (clip, hook, screw-on cap, etc.) and **not** retained simply by friction fit in the motor mounting tube or glued in situ. Rockets must not contain any pyrotechnic charges except those provided as part of the basic commercially-made rocket motor used for the flight, and these must be used only in the manner prescribed in the instructions for that motor. At the International final only one motor is allowed. We suggest teams seriously consider using one motor for the national competitions as this will greatly aid the transition by the winning UK team, to the International Rocket Competition, but is not mandatory. Additionally, rail launching is mandatory at the International Final.

9. FLIGHTS

Team members cannot be changed after the first flight, with one exception as noted below for the National Final. At the regional events, teams may make a maximum of two flights if time, conditions and weather allow and will be ranked based on the best score for one of their two flights. After a flight, the results of that flight must be recorded and submitted to UKROC, even if the flight is unsuccessful. A rocket that departs the launch pad under rocket power is considered to have made a flight, even if all motors do not ignite. If a rocket experiences a rare "catastrophic" malfunction of a rocket motor (as determined by an authorised person or the UKROC official observer), a replacement flight may be made, with a replacement vehicle if necessary. Flights which are otherwise fully safe and qualified, but which result in no altimeter reading despite correct usage of the altimeter by the team will be counted as “no flight” and may be re flown without penalty.

10. SAFE RECOVERY

The rocket must return to earth safely and at a velocity that presents no hazard. An entry which has any heavy structural part, or an expended motor casing separate from the rest and fall to earth without any form of recovery device will be disqualified. An entry whose parachute(s) does not come out of the rocket body at all will be disqualified. It is the RSO decision to determine whether the flight is either safe or disqualified they will announce that at flight completion their decision is final. The rocket must be allowed to land at the end of flight without human intervention (catching) and the flight will be disqualified if there is such intervention.

11. RETURNS

Return of the entire rocket is required by the deadline time on that same day that was established at the beginning of the day's flying. If the rocket cannot be returned after an otherwise safe and stable flight because it cannot be located or because it landed in a spot from which recovery would be hazardous (as determined by an authorised person or the UKROC official), a replacement vehicle may be substituted for a replacement flight without penalty. Once the authorised person or UKROC official has declared that a rocket has landed in a place from which recovery would be hazardous, the results from that rocket’s flight may not subsequently be used even if it is recovered.

12. LAUNCH SYSTEMS

Teams may use the electrical launch system and the launch pads provided by the event officials or may provide their own launch system as long as it provides at least at least six feet of rigid guidance and this must be approved by the Range Safety Officer in advance and can only be rail systems. Please contact ADS if you wish to use your own rail. Rail size is 2metre min length, 30 mm square 6mm slot, RS PRO 761-3284 or similar is acceptable. All launches will be controlled by the authorised person or event Range Safety Officer.

13. FLIGHT CONTROL

Rockets may not use an externally - generated signal such as radio or computer control (except GPS navigation satellite signals) for any purpose after lift-off. They may use autonomous on-board control systems to control any aspect of flight as long as these do not involve the use of pyrotechnic charges. Any on board flight-control electronics must use only commercially made altitude and/or timing devices that are available to all participants.

14. TEST FLIGHTS

Teams are encouraged to test fly their rockets before the regional finals preferably at one of the recommended rocket clubs identified on the UKROC Website. A major benefit of this approach is the potential for mentoring. Provided they meet all safety requirements teams can use their own or local launch locations for test flights. Teachers or the Supervising Adult must familiarise themselves with the UKRA Model Rocket Safety Code and ensure it is followed.

15. QUALIFICATION PROCESS

Teams will be required to qualify at designated regional events, with the top scoring team from each Regional Qualifying **event** getting a place at the National Final (9 places). The remaining places (11 in total, with a limit of no more than 3 teams from one school / organisation*) will be allocated based on scores across all the Regional Qualifying events. Teams will be ranked based on the score of their best flight. Teams will be notified by ADS of the results and will be invited to participate in the UK National Final to be held on Thursday 25 June 2026, subject to weather and other considerations. Teams who qualify for the National final must be available to attend the National Final in person and commit to attend the International Final which for 2026 will be held at the Farnborough Airshow on Thursday 23 and Friday 24 July 2026. *If a school has more than three teams who quality for UK National Finals, they may adjust the top three teams' members to include students from other qualifying teams, with a maximum of six students per team.

16. ADVERSE WEATHER CONTINGENCY AT THE REGIONAL FINALS

A weather decision will be made three days prior to the Regional Qualifying events. If adverse weather results in the cancellation of a Regional Qualifying event, teams will have the option to either attend an alternative Regional Qualifying event or complete a self-qualification flight under adult supervision. If neither option is feasible, the team will unfortunately need to withdraw from the competition.

17. THE NATIONAL FINAL PRESENTATION AND LOG BOOK

At the National Final each team must give a presentation of 10 minutes. Whilst logbooks are not a requirement at the National Final they are an essential requirement at the International Final, so teams are encouraged to compile a logbook to support their presentations although this is optional an*d not* a requirement. The presentation **must not** use PowerPoint or other software. The presentation will be marked for content and scoring will be:

- 0-4 points for participation of team members in the presentation; maximum score of 4 points will be awarded if each team member actively participates in presentation and answers questions and teams are encouraged to have all members participate at the same level during the presentation
- 0-10 points for design; maximum of 10 points will be awarded if the team explains one or more design features unique to their rocket and can confidently answer questions from the judges about the design. The number of design features explained is not a judging criterion (i.e. the judges will not score higher for teams solely based on presenting multiple design features)
- 0-6 points for lessons learned; a maximum of 6 points will be awarded if the team explains one or more lessons learned about their rocketry challenge experience and can confidently answer questions from the judges.
- 0-10 points for technical and scientific competency; maximum of 10 points will be awarded for the team's technical and scientific explanations of their project and answers to questions; this will include a detailed explanation by the team of at least one design feature unique to their rocket.

18. ADVERSE WEATHER CONTINGENCY AT THE NATIONAL FINALS

A weather call will be made 3 days in advance of the National Final. In the event that adverse weather causes the National Final to be cancelled, teams will be asked to make a virtual presentation and the marks from that added to their scores from Regional Qualifying events to determine final placings.

If you have any questions or require technical support, please contact
ukroc@adsgroup.org.uk