



Rules in Full

Effective from 19th September 2013

1. The spirit of the N-Prize Challenge

The N-Prize Challenge is intended to encourage creativity, originality and inventiveness in the face of severe odds and impossible financial restrictions. The remainder of these rules have been drafted to reflect and ensure this as far as possible. Nevertheless, it is possible that loopholes in these rules may make it possible to complete the challenge in a spirit not intended by the N-Prize organisers, but nevertheless within the letter of the rules. The organisers therefore reserve the right to exclude entrants (or to require entrants to modify their entry) if the organisers feel that the spirit of the N-Prize challenge is not being adhered to, regardless of literal compliance with the rules. Such decisions will be made fairly and after discussion with the entrant, but the decision of the organisers in these matters is final. All entrants are therefore urged to discuss their plans with the organisers from the outset to ensure compliance with both the rules and the spirit of the N-Prize Challenge.

Contact the organisers at info@n-prize.com

2. Amendment of Rules

These rules may be amended *at any time* without prior notice. Such amendments will normally (but not necessarily) be made in order to clarify points, to close loopholes in order to ensure that all entrants remain within the spirit of the N-Prize, or for unavoidable legal reasons. Therefore, all entrants are strongly advised to contact the organisers before and during the preparation of their entry. Continuation of entrants' registration for the N-Prize Challenge is dependent upon acceptance of any such amendments to these rules. The only rule that is not subject to change is the rule regarding withdrawal from the N-Prize challenge.

Contact the organisers at info@n-prize.com

3. Prizes offered

Prizes are offered in two categories. One prize (the "single-spend-to-orbit", or "SSO" category) will be awarded to the first entrant to complete the challenge using a non-reusable launch system. The other prize (the "reusable vehicle" or "RV" category) will be awarded to the first entrant to complete the challenge using a partially or wholly reusable launch system. Both prizes carry equal status. All of these rules apply equally to both prizes, except where stated otherwise. The two prizes differ primarily in the way in which the budget for the launch is calculated (see below).

Entrants need *not* specify at the time of registration which of the two Prizes they are competing for, but must do so prior to launch.

No single entry may win both prizes. In brief (see below for definitions and budget details) any entry for which the total cost of the launch vehicle exceeds £999.99 will be eligible only for the RV Prize. Any entry for which the cost of the launch vehicle is £999.99 or less will be eligible only for the SSO Prize, even if part or all of the launch vehicle is recovered. However, one team may, if they wish, make separate entries in both categories.

4. Eligibility

Individuals or teams are permitted to enter; teams must do so under the name of a single individual who will be the point of contact for the challenge; this person must be at least 21 years old at the time of registration. The N-Prize is aimed at amateurs, enthusiasts, would-be boffins and foolhardy optimists. Individuals or organisations connected with aerospace and other relevant industries are eligible, but must satisfy the organisers that they are acting without substantial support from their current (or former) employer, and are not making unreasonable use of facilities, donated equipment or resources etc. provided by established industry contacts. If in doubt, ask the organisers.

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5. Safety

Safety is entirely the responsibility of the entrants. The N-Prize organisers offer no advice whatsoever on safety, and it is assumed that entrants are aware of all risks to themselves, to third parties, and to property, whether on the ground, on water, in the air or in space. Entrants are liable for any and all injuries to, or deaths of, humans or animals, and for any and all damage to property arising through preparation for, or participation in, the N-Prize Challenge. This includes any injury or damage arising after completion of the challenge, for example through re-entry of devices. The organisers accept no responsibility or liability, and in any case are not responsible people.

6. Legalities

Compliance with all necessary regulations (for example those relating to the handling or construction of hazardous materials or devices; permissions to launch devices, and so on) is entirely the responsibility of the entrants, and the N-Prize organisers offer no advice on this matter. The N-Prize organisers do not require proof of compliance with regulations, but entrants should make themselves aware of the penalties for non-compliance. Any penalties incurred as a result of failure to comply with relevant local, national or international regulations are entirely a matter for the entrants.

7. Confidentiality

Entrants are strongly encouraged to discuss their plans with the organisers, to ensure that their proposals fall within the rules and spirit of the N-Prize Challenge. The organisers encourage entrants to exchange ideas and share experiences for their mutual benefit or amusement. However, any information divulged to the organisers will be kept confidential as far as possible *if* this is explicitly requested; any communications that are to be kept confidential should carry the words 'IN CONFIDENCE' at the beginning of the confidential material. This confidentiality cannot be guaranteed in all circumstances (for example, if the organisers are required to divulge information for legal purposes). The organisers reserve the right to use any material communicated to them, in publications, websites etc, unless the material has been marked as 'IN CONFIDENCE'; where such non-confidential information is used, its source will be credited. Contact the organisers at info@n-prize.com

8. Intellectual Property

Entrants are entirely responsible for any intellectual property issues arising from their entries. If you believe you have invented a valuable new way to get things off the ground, and would like to protect the idea, please go ahead. The organisers cannot become involved in the entrants' IP issues. We will not sign confidential disclosure agreements (CDAs), nor can we get involved in patent disputes and similar issues.

9. Definitions

For the purposes of this challenge, the following definitions apply:

- a. The '**Launch Site**' is defined as the area of land from which the launch takes place; launches may also be made from water, in which case the "Launch Site" is the ship, raft or other vessel from which the launch takes place.
- b. The '**Launch Equipment**' is defined as all items of hardware required for the launch, but which remain on the ground. These may include, for example, ignition systems, monitoring equipment, safety screens etc. Any items which are *not* required after a time 24 hours prior to the launch (for example, pumps to transfer fuel, battery chargers) are *not* considered to be part of the launch equipment.
- c. The '**Launch Vehicle**' is defined as all items of hardware that leave the ground, including any fuel or other consumables. In a conventional satellite launch, for example, the launch vehicle by this definition would include the rocket (with all onboard telemetry and control devices), its fuel, and the satellite. In the example of a rocket launched from a balloon, the balloon and its lifting gas are considered part of the launch vehicle. In the case of a device launched from a ground-based gun, the gun and propellant are considered part of the launch

equipment, whilst the projectile (with any shielding, sabots etc) is considered the launch vehicle.

d. The 'Satellite' is defined as the part of the launch vehicle that enters orbit around the Earth. Note that, if more than one item enters orbit (for example, if the satellite separates from a rocket but both the satellite and the spent rocket remain in orbit), the entrant must define, prior to launch, which item is to be considered the 'Satellite'.

10. Acceptable Methods of Attaining Orbit

Any method of attaining orbit is acceptable, provided it does not breach the rules or spirit of the N-Prize Challenge. Examples might include (but are by no means limited to) conventional rockets; balloon-launched rockets (rockoons); gun-launched projectiles; or combinations of these or other methods. All entrants are strongly advised to contact the organisers at the outset to ensure that their proposal falls within the rules and spirit of the N-Prize Challenge. Contact the organisers at info@n-prize.com

11. The Satellite

The satellite must have a mass of between 9.99 and 19.99 grams, including the weight of any propellant or fuel. The organisers reserve the right to weigh the satellite before launch (or to have it weighed by a third party) to ensure compliance. The satellite must be a single object; for example, a cloud of un-connected co-orbiting particles does not count. The satellite may include (for example) shielding or fuel that takes its weight over the 19.99 gram limit, but orbits will not count toward the 9 orbit target until such over-weight items have been jettisoned or consumed. As noted, other items (spent rockets; shielding etc) may enter orbit with the satellite, but must not remain attached to it.

12. The Orbits

The satellite must complete a minimum of 9 orbits of the Earth, after its separation from or consumption of any items or consumables which put its weight over 19.99 grams. The orbits need not be regular, nor do they need to be at a constant altitude. No part of any orbit may be lower than 99.99 km above the surface of the earth.

13. Budgets

The budget for each launch is calculated differently for the SSO and RV categories, as follows:

i) Budget for the SSO category

For the SSO category, the budget for each launch is £999.99, and all costs are entirely the responsibility of the entrant. The budget must cover the following:

- a. The total cost of the launch vehicle, including the satellite itself, and any fuel, gases or other materials which it carries; in other words, anything which leaves the ground.
- b. Any items of the launch equipment that could not be re-used for a second identical launch (for example, gun-type propellants, or railgun rails which are rendered unusable in the course of the launch).
- c. The cost that would be incurred for refurbishing, refilling, re-testing or otherwise preparing any launch equipment or any aspect of the launch site, if a second identical mission were to be carried out.
- d. Any manufacturing costs for any parts of the launch vehicle; or for any parts of the launch equipment that would require replacement in order for a second identical mission to be carried out (for example, such costs would include the custom machining of a piece of metal forming part of the launch vehicle, if this is contracted out).

As a rule of thumb, the budget of £999.99 should enable you to conduct a repeat of a successful mission, assuming that no part of the launch vehicle is recovered. However, all entrants are advised to contact the organisers to confirm that their calculation of expenditure is acceptable.

Items which need *not* be covered by the budget include prototyping costs; launch equipment or the launch site (*except for costs which would be incurred for a repeat mission, as stated above*); licence

fees, permissions etc; charges made for attendance by safety personnel (provided that such personnel play no direct role in the mission); legal costs; medical costs; insurance costs; fines, penalties or loss of earnings arising from any cause whether prior to, during or after the mission; travel costs of people associated with the mission.

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ii) Budget for the RV category

For the RV category, the budget for each launch is £999.99, and all costs are entirely the responsibility of the entrant. The budget must cover the following:

- a. The cost of the launch vehicle, including the satellite itself, and any fuel, gases or other materials which it carries; in other words, anything which leaves the ground. However, any parts of the launch vehicle may be recovered by the entrants. In this case, the costs of the recovered components *do not* form part of the £999.99 budget. In order to qualify, the components must be recovered within one week from the time at which the 9th orbit is completed and must be shown to be in a state fit for use in a second, identical mission. If the recovered components require refurbishment, refuelling etc. to render them ready for reuse, then the costs of such refurbishment, refuelling etc. *will be counted* as part of the £999.99 budget. The cost of locating and recovering the components does *not* count as part of the budget (though of course any transmitters etc carried on the recovered components to aid recovery do count). In determining the reusability of components of the launch vehicle, the organisers' decision will be final. It is the responsibility of the entrants to satisfy the organisers that they have recovered the original components, and that the components are in a fit state for use or can be rendered so within budget. The organisers reserve the right to seek the opinions of impartial experts in judging reusability. The organisers may (depending on circumstances) request visual inspection, structural tests, demonstration of function or other tests that are reasonable and necessary in order to show reusability. The costs of such tests are to be borne by the entrant but do *not* contribute to the £999.99 budget. The tests may include a repeat of part or all of the mission *only* if there is no other way to reasonably confirm reusability.
- b. Any items of the launch equipment that could not be re-used for a second identical launch (for example, gun-type propellants, or railgun rails which are rendered unusable in the course of the launch).
- c. The cost that would be incurred for refurbishing, refilling, re-testing or otherwise preparing any launch equipment or any aspect of the launch site, if a second identical mission were to be carried out.
- d. Any manufacturing costs for any parts of the launch vehicle; or for any parts of the launch equipment that would require replacement in order for a second identical mission to be carried out (for example, such costs would include the custom machining of a piece of metal forming part of the launch vehicle, if this is contracted out).

As a rule of thumb, the budget of £999.99 should enable you to conduct a repeat of a successful mission, once the savings made by recovering and reusing part or all of the launch vehicle are considered.

However, all entrants are advised to contact the organisers to confirm that their calculation of expenditure is acceptable.

Items which need *not* be covered by the budget include prototyping costs; launch equipment or the launch site (*except for costs which would be incurred for a repeat mission, as stated above*); licence fees, permissions etc; charges made for attendance by safety personnel (provided that such personnel play no direct role in the mission); legal costs; medical costs; insurance costs; fines, penalties or loss of earnings arising from any cause whether prior to, during or after the mission; travel costs of people associated with the mission.

14. Currency Conversion

Expenditure in foreign currencies will be converted to £UKstg, based on the most favourable exchange rate published in the London Financial Times between the opening of the N-Prize and the lift-off date of the entry. For example, if the rate of the \$US/£ peaked at \$1.90/£ over this period but has fallen to \$1.55/£ by the time of the lift-off, US entrants can use the more favourable rate of \$1.90 (giving them a budget of £999.99 x 1.90 = \$1899.98). Please note that the prize itself will be paid only in UK pounds sterling.

15. Use of Salvaged and Donated Items

Entrants are encouraged to make imaginative use of items that are salvaged, recycled, donated etc, provided this is within the spirit of the N-Prize Challenge. Broadly, it should be possible for any skilled person to replicate your entry for the same budget and with the same amount of luck and negotiating skills. So, for example, using a discarded mobile phone as part of the telemetry equipment, or the tube from a vacuum cleaner as part of a rocket nozzle, are acceptable. On the other hand, using a complete rocket assembly from a satellite launch system, bought as scrap from a close friend at NASA for \$10, would not be considered acceptable. Donations of hardware will be judged on a case-by-case basis. If your neighbour gives you five metres of surplus electrical cable, that's fine. If a local machine shop custom builds a complete rocket casing and 'gives' it to you in exchange for a little publicity, that's less likely to be acceptable. Entrants are *strongly advised* to contact the organisers to confirm that they are remaining within the rules and spirit of the N-Prize Challenge. Contact the organisers at info@n-prize.com

16. Piggybacking and Shared Resources

Entrants may not 'piggyback' on other aerospace projects (for example, by launching a satellite as a passenger on a larger launch vehicle). If they do so, the entire cost of the launch will be considered part of the budget of their N-Prize entry. Similarly, no two entries (whether simultaneous or consecutive; whether by the same entrant or different entrants) are allowed to 'share' the cost of common hardware (for example, if a single launch vehicle carries two satellites, then the total cost of the launch vehicle will be considered part of the budget for each of the two satellites; in such cases, please contact the organisers for further clarification).

17. Orbital Monitoring

All entrants must be able to provide evidence that their satellite has completed a minimum of 9 orbits of the Earth. The costs of providing this evidence must be borne by the entrant, but **do not** form part of the £999.99 budget, **except** for the costs of any equipment (transmitters, reflectors etc) mounted on the launch vehicle (including satellite) to enable detection. For example, the cost of a radio transmitter on the satellite **will** be considered part of the budget, but the cost of ground-based equipment to detect and monitor transmissions from the satellite **will not** be considered part of the budget. All entrants must explain *before* launch how they will provide proof of orbits, and must agree with the organisers that this proof will be acceptable. There is no need to observe or track the satellite throughout its orbit, as long as sufficient data is collected to confirm that 9 orbits have taken place. Entrants are welcome to recruit third parties to assist with orbital verification. The organisers must be satisfied that the collection of proof-of-orbit data is reliable, unambiguous and (if judged necessary) validated by disinterested parties. Note also that proof may be required that a detected signal originates from the satellite itself. The acceptability or otherwise of proof of orbit will be decided by the organisers.

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18. Monitoring and compliance with the rules

The organisers must be satisfied that all rules have been adhered to. Receipts must be produced, if requested, for all items or services purchased which fall within the £999.99 budget; in the absence of receipts, the entrant must be able to provide proof of the actual costs of items used. Entrants should keep the organisers informed of their plans and activities. The organisers or their nominated representatives reserve the right to inspect any part of the launch site, launch equipment or launch vehicle (including the satellite) during the construction process, if they consider this necessary (for example, to satisfy themselves that no costly components have been hidden inside the launch

vehicle). The organisers also reserve the right to be present during the launch, and must be given reasonable notice (at least one month) of any intended launch. The organisers reserve the right to ask for construction or a launch to be delayed if, for example, they wish to make an inspection but are unable to do so at the necessary time; such delays will not be made unreasonable. Entrants are welcome to offer food and drink to visiting organisers, but such offerings (unless of a particularly high standard) are unlikely to secure favouritism from the organisers. Entrants should be aware of the possible amendment of rules and of the need to comply with such amendments. Contact the organisers at info@n-prize.com

19. Post-orbit recovery of the satellite

There is no requirement for the satellite to be recovered. However, if the N-Prize winner is able, within 99 days of completing their 9th orbit, to recover any part of their satellite weighing more than 0.99 grams, they will be eligible for the N-Plus Prize *instead of* the N-Prize. There is no limit on the cost of any recovery programme, except insofar as it impacts on the cost of the launch vehicle or launch equipment. The value of the N-Plus Prize is £10,000.00 (ten thousand pounds sterling).

20. Repeat attempts

Each entrant may make as many attempts at the N-Prize as they wish. The budget of £999.99 is allowed for each attempt. If a repeat attempt is significantly different from the earlier attempt, the organisers should be consulted to make sure that the revised plan still conforms to the rules and spirit of the N-Prize challenge. If any hardware, fuel etc is re-used in a repeat attempt, its value will be considered to be the cost of its original purchase or construction. Any failed attempts can be considered prototype development, and hence do not count towards the budget of a later attempt, unless (as noted above) items are recycled.

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21. Judging and Awarding of Prizes

The decision of the organisers of the N-Prize will be final in all matters of judging and eligibility. The prizes in each category will be awarded to the entrant whose satellite first completes its 9th orbit of the Earth. A period of 19 days (from completion of the 9th orbit) will be allowed for the entrant to collate and present evidence of the success of the mission; this period may be extended at the discretion of the organisers. The N-Prize will be awarded as soon as the organisers are satisfied that the criteria have been met, and as soon as suitable arrangements can be made (without unreasonable delay).

22. Termination of the N-Prize Challenge and Exclusion of Entrants

The organisers reserve the right to close or suspend the challenge in exceptional circumstances, though every effort will be made to avoid this. Such circumstances may include, for example, unacceptable levels of injury, loss or death (particularly amongst innocent third parties), whether actual or anticipated, arising from attempts to win the N-Prize; or unforeseen legal reasons. In the event of premature termination of the challenge, the organisers may, entirely at their discretion, award one or more prizes to entrants who have made most progress towards completing the challenge, or who are otherwise deemed to deserve a reward. The organisers also reserve the right to exclude applicants on a case-by-case basis, at any point during the challenge. Possible reasons for exclusion might include, for example, a clear disregard for the safety of the entrant or of innocent bystanders, or a proposal which is so clearly in contradiction of the laws of physics as to be considered frivolous or unworkable (though such attempts may, at the organisers' discretion, be allowed). The organisers accept no liability for any losses arising from premature termination of the N-Prize challenge or from the exclusion of entrants at any point.

23. Funding and Sponsorship

No funding whatsoever, other than the prize money, is available from the organisers of the N-Prize. Entrants are strongly encouraged to fund their entry from their own pockets. If entrants seek sponsorship, the entrant should refer the potential sponsor to the current version of these rules, and

the sponsor should be aware of the uncertain nature of this venture and consider any potential liability that they may incur as a result of their sponsorship. Any sponsorship money that is spent on the launch vehicle and non-reusable launch equipment will, of course, be considered part of the £999.99 budget. Any sponsorship in kind may also be considered part of this budget depending on the circumstances. The organisers cannot provide publicity for the sponsors of individual entrants. Entrants may provide publicity for sponsors, but only within reason and only with the prior agreement of the organisers. The organisers reserve the right to exclude entrants whose primary objective seems to be to promote or advertise a particular product, company etc, rather than to successfully complete the N-Prize challenge

24. How to Enter

There is no entrance fee. Interested parties should contact the organisers in the first instance, explaining their interest and intent. If the organisers are confident that the applicant is in earnest, the organisers may (at their discretion) register the applicant as an N-Prize contender. All registered contenders will be given a unique entrant number, and only registered contenders will be considered for the N-Prize. The organisers reserve the right to suspend or withdraw the registration of any entrant at any point. Reasons for suspension or withdrawal might include (but are not limited to) a clear disregard for the safety of the entrant or of others, or actions which are in contradiction of either the rules or the spirit of the challenge. However, registration (or failure of the organisers to withdraw registration) does *not* constitute an opinion by the organisers that the entrant is competent to undertake the challenge, nor that the entrant's proposals do not violate any laws (local, national, international or physical), nor that the entrant's proposals are safe. Contact the organisers at info@n-prize.com

25. Limitation on Number of Entrants

Depending on the level of interest, it may be necessary to limit the number of entrants by refusing to accept new registrations. In such cases, every attempt will be made to accommodate earnest contenders. The organisers reserve the right to withdraw the registration of any applicant whom they judge (after appropriate discussions with the entrant) not to be an earnest or active contender, in order to allow registration of new contenders.

26. Withdrawal of Entrants

Any entrant is free to withdraw from the N-Prize challenge at any time, with no obligations to the organisers whatsoever and with no period of notice, provided that they notify the organisers as soon as they wish to withdraw.

$$R = \frac{v_0^2 \sin 2\theta}{g}$$

$$g = 9.8 \text{ m/s}^2$$