NATIONAL ROCKETRY CHAMPIONSHIP 2023-24

DESIGN & BUILD REPORT

<INSERT TEAM NAME>

UKSEDS COMPETITIONS

SUPPORTED BY

UNITED KINGDOM ROCKETRY ASSOCIATION

SPONSORED BY

SKYRORA

Guidance

The Design & Build Report details the team's final rocket design and discusses how the team arrived at the design. This template has been provided as a guide, but its structure can be altered to better reflect the team's work. Notes have been added to clarify what is expected from each section. Reports are recommended to be no more than **3000** words. Appendices are optional and could contain background or contextual information that is not essential to the project.

The deadline for the submission of this report is the **15th March 2024**, please submit as a PDF and send it to rocketry@ukseds.org (large files, >25MB, can be shared via Google Drive, Dropbox, OneDrive, WeTransfer, etc.). When submitting, please clearly state who you are submitting on behalf of and what you are submitting, plus any relevant notes for competition organisers. We provide folder templates and a submission email template on our resources page.

Contact rocketry@ukseds.org if you have any further questions.

NATIONAL ROCKETRY CHAMPIONSHIP 2023 - 2024

<Team Name>

<Team Logo>

Issued by (Project Lead): <Project Lead Name>
Please note: The project lead must be a member of the team.
University: <University Name>

Contents

1 Introduction

Use this section to introduce your project, team and concept. Feel free to include further information in the appendices to avoid this section becoming too cluttered.

1.1 Mission Statement

The mission statement is a short statement that describes the overall goal of the project.

1.2 Objectives

Objectives are criteria used to measure the success of a project.

1.3 Requirements

Given this year's brief, describe the requirements your team set out. Requirements detail what is needed technically to complete the project.

2 Project Management

2.1 Assigned Roles and Team Roster

Include a table of team members and their assigned roles.

Name	Role	Year/Course	Email

2.2 Preliminary Schedule

Include your proposed schedule for the project, from inception to competition date. Include a work breakdown structure and a proposed test plan.

2.3 Preliminary Budget

Include your proposed budget for the project, covering the rough build costs of the rocket.

2.4 Project Risks and Mitigations

Identify the major risks associated with your project and rocket design, and how you expect to manage these throughout the development process.

2.5 Project Plan

Teams will be required to produce a Gantt chart of the project, including a critical path analysis. This will be essential in risk identification and management. Be sure to add slack to your Gantt chart to ensure each task can be completed.

3 Preliminary Concept

Use this section to describe your design choices, provide justifications and highlight tradeoffs where appropriate. Below is a suggestion for the different areas to cover.

3.1 Rocket

3.1.1 Motor selection

Include simulations of your design, showing the **expected apogee** and highlighting any **assumptions** you've made.

3.1.2 Component

At a component level show the design of your nose cone, body tube, payload bay, parachute and cords, fins, motor mount and retention and launch rails.

3.2 Payload

3.2.1 Description

3.2.2 Motivation

3.2.3 Schematics

3.2.4 System integration

3.2.5 GPS implementation (if applicable)

4 Design Drawing/Models

Please include any design drawings, CAD models or any other relevant models of your design.

5 Manufacturing Processes

Briefly describe the manufacturing processes you used to construct individual components if they were not commercial off the shelf components e.g. 3D printed fin can and the manufacturing process of integrating all your components into your rocket.

5.1.1 Body tube

5.1.2 Nose cone

5.1.3 Fins

5.1.4 Payload bay

5.1.5 Issues and solutions

6 Testing

Include any tests and results conducted on your individual component or overall rocket.

6.1.1 Test matrix

There are many different formats a test matrix table can take, but the table should show all the tests you are planning to carry out and the corresponding requirements these tests are trying to verify/validate. See example.

6.1.2 Fin deflection

6.1.3 Avionics & altimeter calibration

6.1.4 Stability

All teams must submit a stability vs time plot. All UKSEDS NRC rockets must have a stability between 1.5 and 2.5 diameters between the rocket leaving the rail and just before apogee

7 Final Design

Describe any changes to your design if it deviates from your original design concept.

7.1.1 Any changes to initial design

7.1.2 Improvements or future work

8 Acknowledgements

Use this section to recognise anyone who assisted with or contributed to the project, but was not part of the team.

9 References

No particular reference style is preferred. Include citations in the text.

Appendices

Any supplementary material, which is not essential to the project, but will provide a more comprehensive overview of the project, can be included as appendices. e.g. OpenRocket simulation graphs, additional drawing(s)