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Documentation of my Singapore's Rocketry Team experience:

Overview of the Rocket's Components:

ROCKET SYSTEM

SYSTEM ARCHITECTURE

Project Mynah will be competing in the **10,000 ft (3km)** Above Ground Level apogee with **commercial-off-the-shelf (COTS)** in the **hybrid rocket propulsion system** category.

For effective recovery of the rocket, a novel **dual parachute deployment system** is developed using **compressed CO2 gas** and **no pyrotechnics!** Two parachutes are ejected from two compartments, sandwiching onboard avionics, circuitry and payload.

Our team has developed a rocket system capable of flying to an altitude of 3km whilst carrying a **4kg nanosatellite payload**.

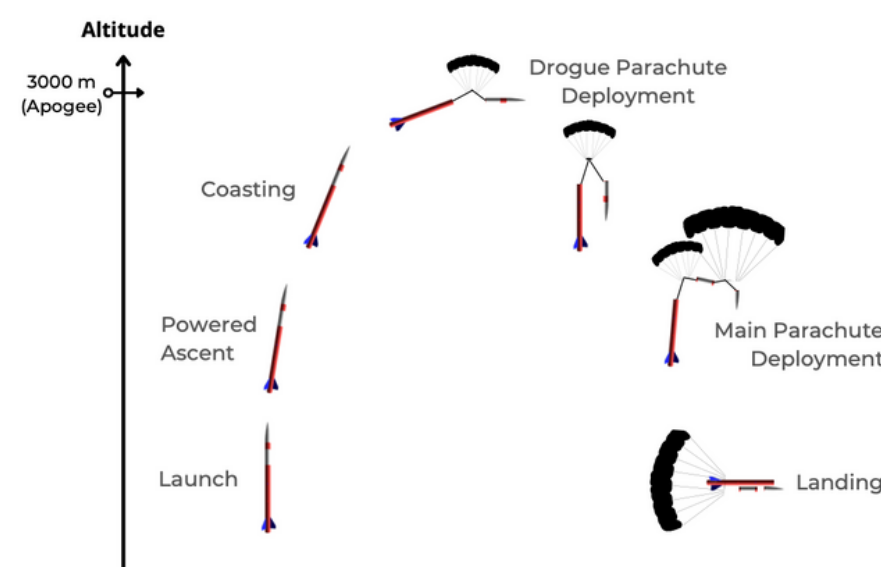
The rocket body comprises **fibreglass airframes** and **aluminium fins**.

Powered by a **HyperTEK hybrid rocket motor!**



Launch Plan:

MISSION CONCEPT OF OPERATIONS



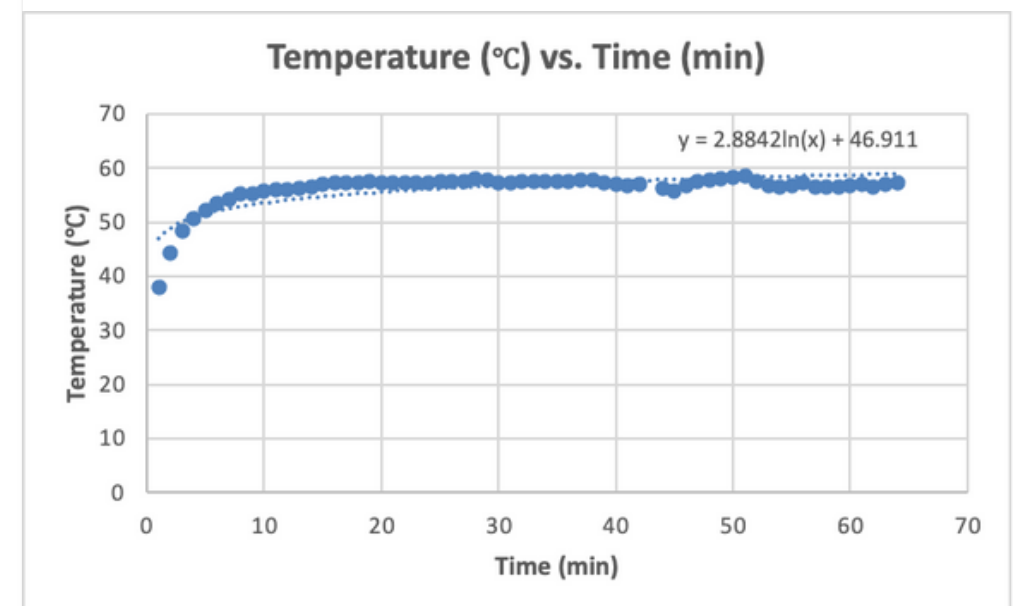
Skills that I learned:

Due to the complexity of the project, I was constantly exposed to multi-disciplinary skillsets, both Technical and Managerial - From **fundamentals of aerospace engineering**, to **CAD, Simulations** and software and lastly Project Management, Teamwork and Leadership.

Results:

- Came **2nd-runner** up at a Rocket Launching Competition at Mojave Desert in California. (FAR51025).

Analyzing data for Run Camera Temperature during propulsion:



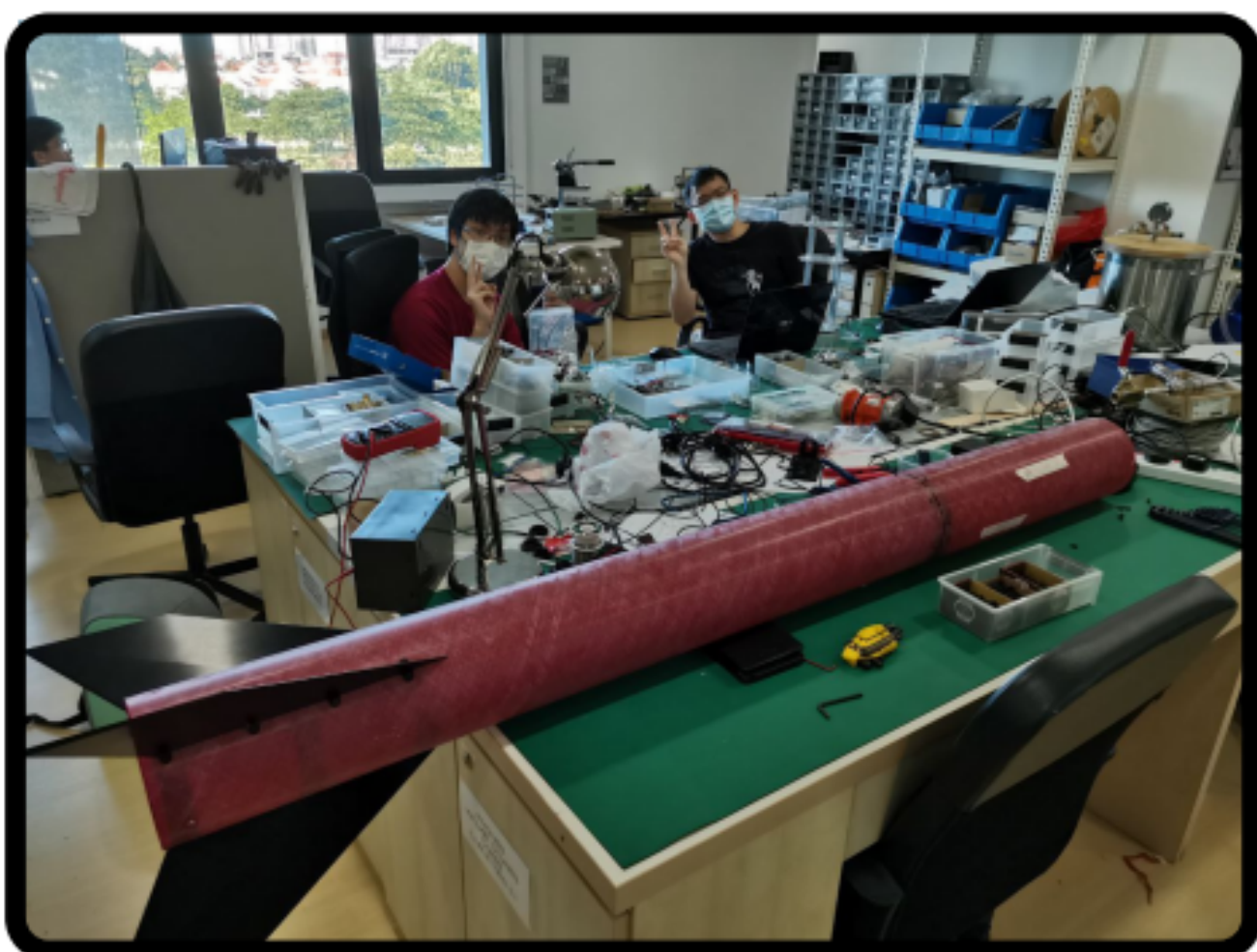
- Gathered **Telemetry Data**
- I needed to monitor how heated up the camera would get and if it would be **functional during the final launch** by **static-testing** and eventually doing a trial launch to see the temperature trend across a time period.
- This helped us to see the **structural limits** of the camera and the kind of **thermal insulation** that would be required.

Aryaman Sharma

Year 2 undergraduate at National University

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TEAM

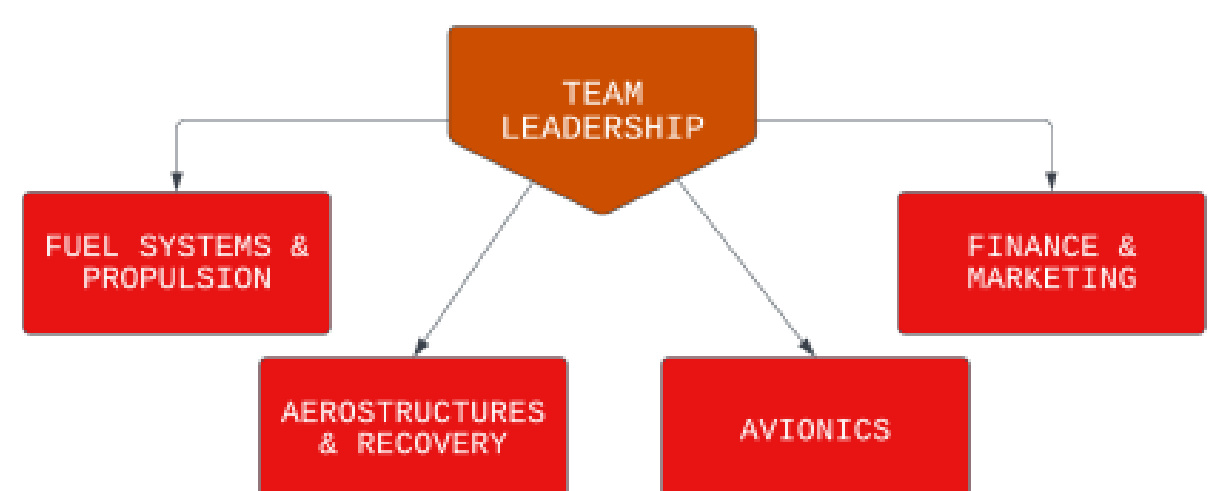


WHY DID WE START THIS TEAM?

Singapore is becoming a powerful hub for **industry 4.0 technology**. However, **propulsion technology** development is impeded by geographical and infrastructural obstacles. This implies that there's a massive gap in resources and value from the imminent New Space industry, which is reserved for more expensive holdings. Our intention is to bridge that gap, develop competent SEA (South-East Asia) infrastructure and flatten the learning curve for available skilled assets in the future.

Our small size, while a geographical limitation, is in fact a strength due to our ability to **unify all local universities**. Hence, we're able to rapidly impact a **broader spectrum of stakeholders** as well as learning methodologies. Project Mynah in the SPL Rocketry team, is the initiation of this vision.

TEAM

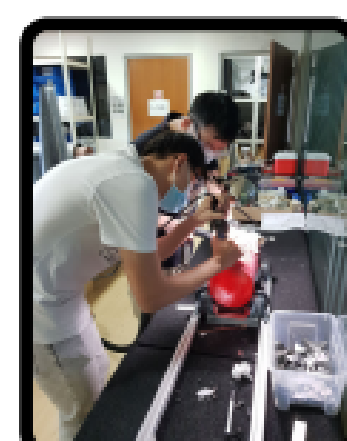


FUEL SYSTEM & PROPULSION

The fuels team focuses its energies in analysing **rocket motors** and designing **ground-support equipment**. Not only do they apply **principles of rocket propulsion** but also conduct **static motor tests** and **launch tests**. We always put safety as a priority and hence, launch procedures and safety protocols are very strictly followed.



AEROSTRUCTURES & RECOVERY



Team members perform **flight profile analysis** and **structural analysis** to select the best airframe components and craft recovery systems. All designs stringently adhere to the core requirements of **Fluid Dynamics** and **Rocket Stability**. Here, there are opportunities to get hands on with complex **simulations, wind tunnels, parachute deployment** and **launch tests**.

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