

OptoSat: Utilizing the Unicorn-1 Platform for In-Orbit Demonstration and Space Heritage

Project Summary -

The main objective of the project is to develop a space platform and ground segment to test and qualify electronic components and units in-orbit, offering regular flight opportunities and providing an economically feasible alternative for technology validation. The most outstanding feature is the standardization of the testing procedures that facilitates the integration and evaluation of multiple payloads, providing access to space for new technologies. This approach will increase the maturity level of European space technology at a competitive cost and lead time.

According to ESA criteria, in flight performance is the highest level of qualification for space products, so there is an increasing demand for in-flight services to accommodate new technologies, devices and systems for their validation. During the last years the low cost and scalability of Cubesats have made possible a dedicated single payload service for developers, optimizing system utilization and customizing mission-specific platforms. Lower TRL payloads can be accepted by Cubesats, increasing the potential return for developers by providing in-orbit performance data at an earlier stage in development.

This proposal is intended to be based on Unicorn-1 platform as provided by Alba Orbital.

The main idea of this project is the definition of **standardized processes** for qualification and validation of non qualified parts with specific focus on both critical areas (i.e. photonics) as well on the validation activities regarding the future use of automobile grade parts for New Space concepts. To achieve this goal, it will be necessary to study the platform requirements, data handling, payload classification, payload/platform interfaces, experiments definition and execution, data user interfaces, and validation /certification services.

To achieve the maximum level of standardisation, parts are proposed to be tested at chip level based on custom packaged criteria as provided by OPTOCAP to define a suitable common mechanical and electrical interface to be used on the maximum range of potential technologies.

As conclusion, The main purpose of this project is to define a service to significantly accelerate the space technology maturity levels, focusing on four critical aspects: time, cost, standardization and volume of components to qualify.

About OptoCap Ltd

OPTOCAP Ltd, a company of the Alter Technology group, TÜV Nord SAU is a technology oriented company active in the field of optoelectronics, microelectronics and MEMS packaging design and assembly services. Its turn-key packaging services enable its customers to reduce development and manufacturing costs, accelerate time to market and reduce risk with new product developments.

Optocap Ltd. Provides sub-contract design and assembly for optoelectronics and microelectronics devices.

Focus on specialised engineering and assembly services (high added value) for high-tech fields.

Main target market in Hi-Rel areas.

Space, Aerospace, Defence, Oil and Gas, Automotive.

Optocap is currently involved in a number of Space Flight Module assembly projects including: ESA METEOSAT (MTG), ESA JUICE (JUper ICy Moons Explorer) explorer and NASA MEDA (Mars Environmental Dynamics Analyser)

About Alba Orbital Ltd

Alba Orbital pioneers in PicoSat technology and have been at the forefront of building the PocketQube standard through their work on the PQ60 standard which already has been on the International Space Station.

Traditionally satellites have been very expensive, even the smallest commercial satellites like Cubesats cost six-figure amounts to build and launch. Alba Orbital develop pico-Satellites which weigh <1kg, and cost significantly less. While, offering almost all of the advantages of a CubeSat. Being leaders in this niche, they are closely partnered with ESA and provide research in this area to them.

Alba Orbital aims to 'democratise' space, allowing affordable access to anyone. They are currently working on 2 platforms - Unicorn-1 and Unicorn-2 and will be launching Unicorn-1 soon.

The main application for PocketQube technology is IOD and Earth Observation.

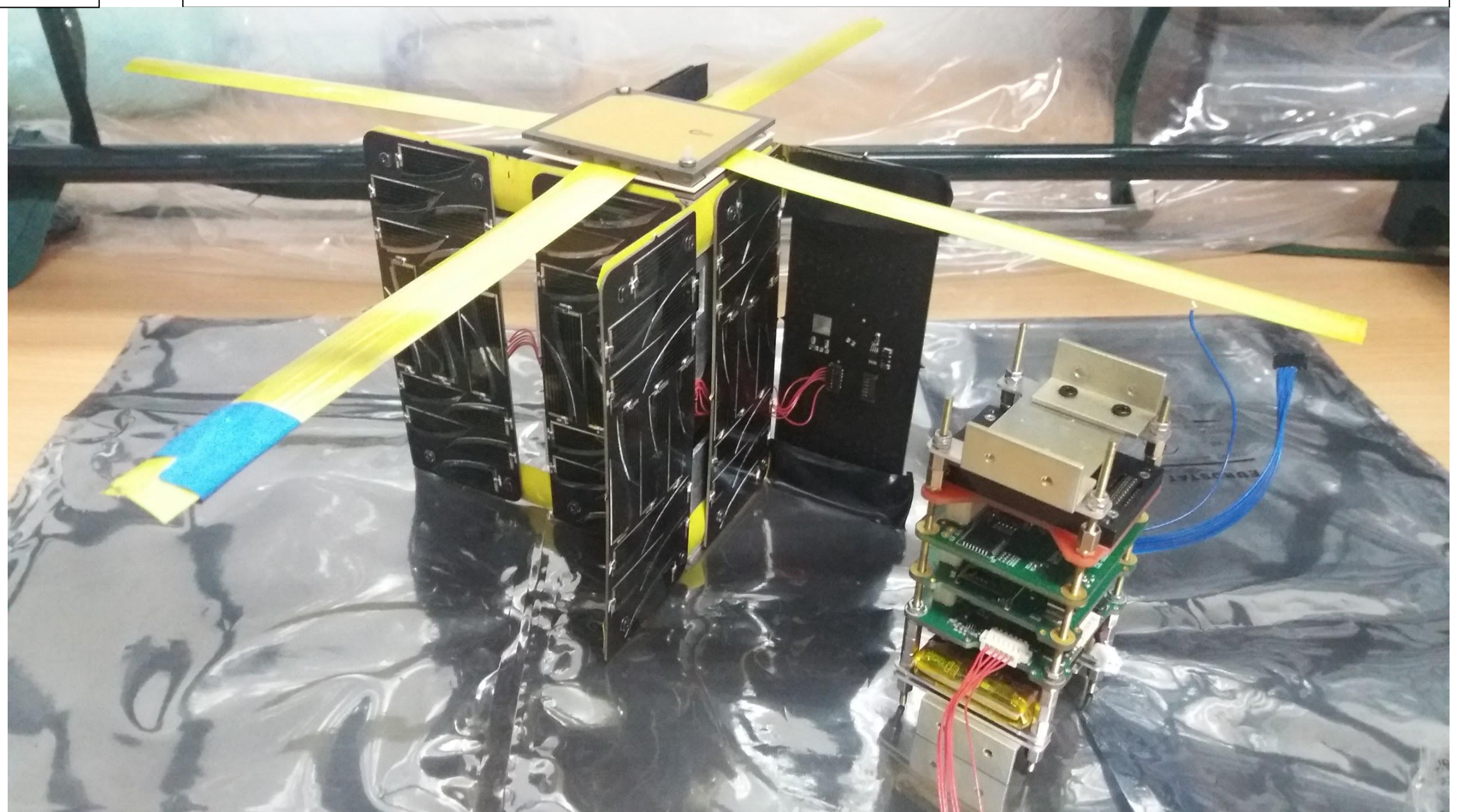
Alba Orbital also provide technical support and parts for those launching, designing and building picoSatellites.

Unicorn- 1 Platform Specifications

Designed in partnership with the European Space Agency

- Passive Attitude Stabilisation
- PQ60 Compatible - www.pq60.net
- 3.3v, 3.6V, 5V Switchable Power Lines
- 3.5 Wh Li-Ion Battery
- I2C, UART, SPI Protocols Available
- Flash Memory expandable with MicroSD
- Platform Mass 400g

- 100g available payload mass (1p Payload Volume)
- 1W On-Orbit Average Power



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