



TASKMASTERS

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PROJECT OVERVIEW

Overview and objectives of the areas composing our team.

AFFILIATES

Instituto Superior de Engenharia de Lisboa | Agência Espacial Portuguesa | Stars Edge | Spacengineer



Bráulio Silva, Guilherme Costa, Ana Rita Marques, Diogo Oliveira, Margarida Matos, Martim Silva, Nuno Cordeiro, Paulo Nascimento, Ricardo Fernandes, Rodrigo Lourenço, André Silva, Gonçalo Silva, Artur Encarnação, Mário Véstias, Manfred Niehus, Rui Duarte

THE MISSION

Promote and support the principles of the European Space Agency's **Zero Debris Charter**.

Survive debris impacts using a protective shield.

Integrate innovative electric propulsion for orbit correction and controlled self-disintegration on re-entry

Collect and transmit system and Atlantic buoys' data.

Test space qualified RISC-V processors.

AEGIS SAT-01

EMBEDDED SYSTEMS

- Develop and validate Cubesat firmware;
- Firmware runs on the OBC;
- Controls sensors, actuators and subsystem interactions.

ONBOARD COMPUTER

- Custom PCB to manage all subsystems;
- Data Retrieval, processing, and command execution;
- Ensures autonomous operation.

SENSORS AND ACTUATORS

- Monitor impacts, temperature, pressure and oxidation;
- Validate debris shield performance;
- Interface with propulsion for system response.

TELECOMMUNICATIONS

- Telemetry, command, payload data and system updates;
- Half-duplex;
- VHF uplink (ground → Cubesat);
- UHF downlink (Cubesat → ground);
- Data uplink from buoys in the Atlantic ocean.

ENERGY

- In-house power system with COTS components;
- Capture, regulation, storage, and distribution.

GROUND STATION

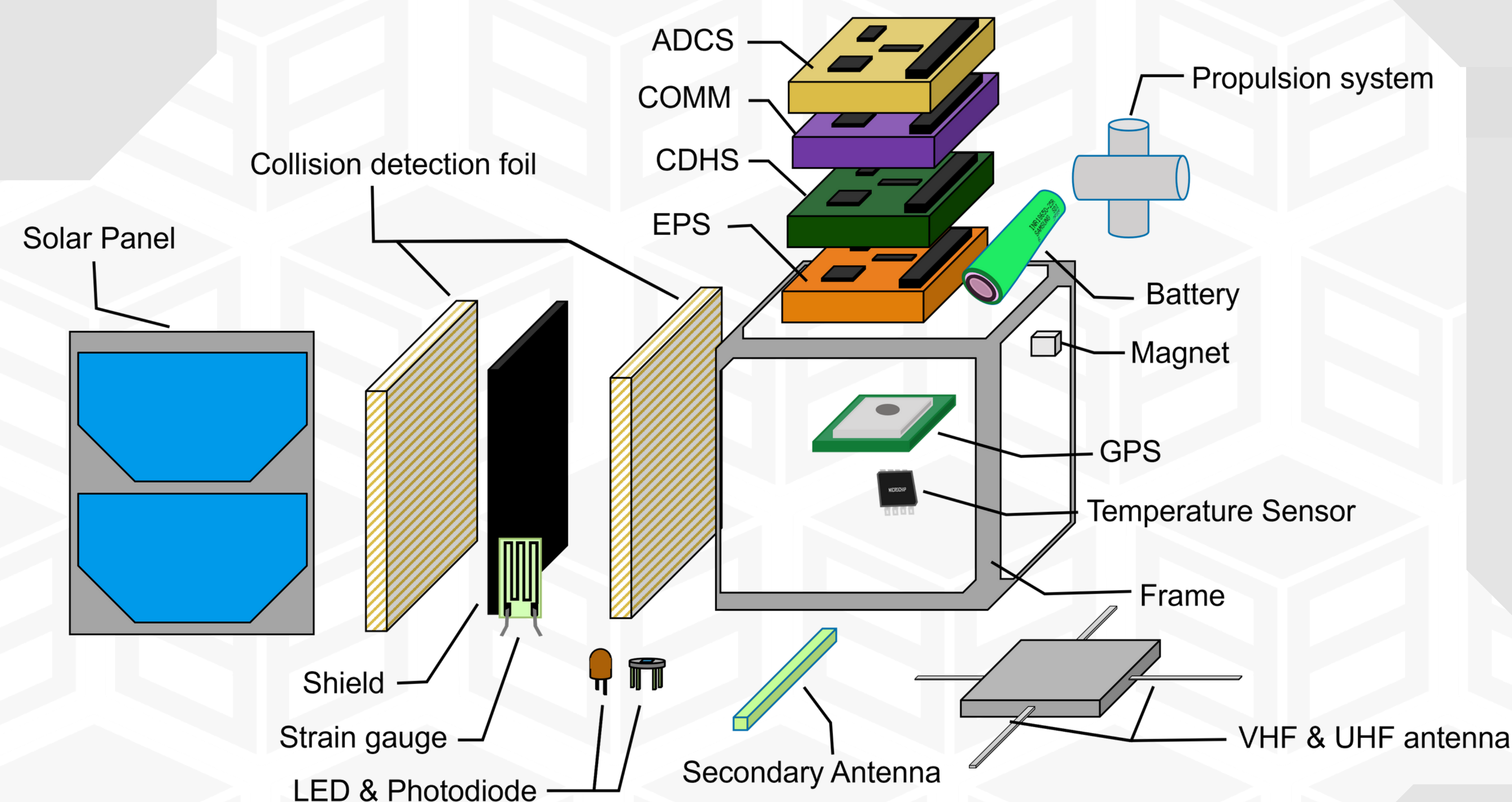
- Provides uplink/downlink for command and telemetry between the cubesat and the ground station;
- Stores and distributes mission data.

STRUCTURE

- Supports mechanical loads during launch and operation;
- Ensures structural integrity during deployment;
- Integrates shielding components (space debris and radiation).

THERMODYNAMICS

- Thermal modeling via FEM (finite element method);
- Passive temperature control (no active systems);
- Ensure safe operation in all orbital conditions.



Ciências
ULisboa



STARS EDGE

SPACENGINEER
HIGH VELOCITY IMPACT PROTECTION

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