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CROWN PRINCE FOUNDATION



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# United Nations\ Jordan Workshop

Global Partnership:  
In space exploration and innovation Jordan-2019

**MASAR Initiative**  
**Crown Prince Foundation**



- ❖ Masar initiative aims to inspire and address our youth's passion for innovation in space technology.
- ❖ Our first NASA interns' research and interest in nanosatellite technology inspired them to establish the CubeSat program and its design of "JY1-SAT" — Jordan's first satellite — in memory of His Majesty the late King Hussein (who held the call sign of JY1).
- ❖ As the program's mentors and advisors today, they guide volunteer engineering students in their exploration of satellite engineering through training, research and practical hands-on experience that will result in the JY1-SAT's launch into space.



مسار  
MASAR

# JY1SAT



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- JY1SAT is Jordan's first satellite, it is a 1U CubeSat.
- Launched in 3<sup>rd</sup> Dec, 2018 with falcon 9.
- Orbit: 585 Km, Sun Synchronous .
- Three main objectives:
  - Promote tourism in Jordan by sending images of Jordanian landmarks using SSDV technology.
  - Ham radio.
  - Promote a peace message from HRH prince Hussain.

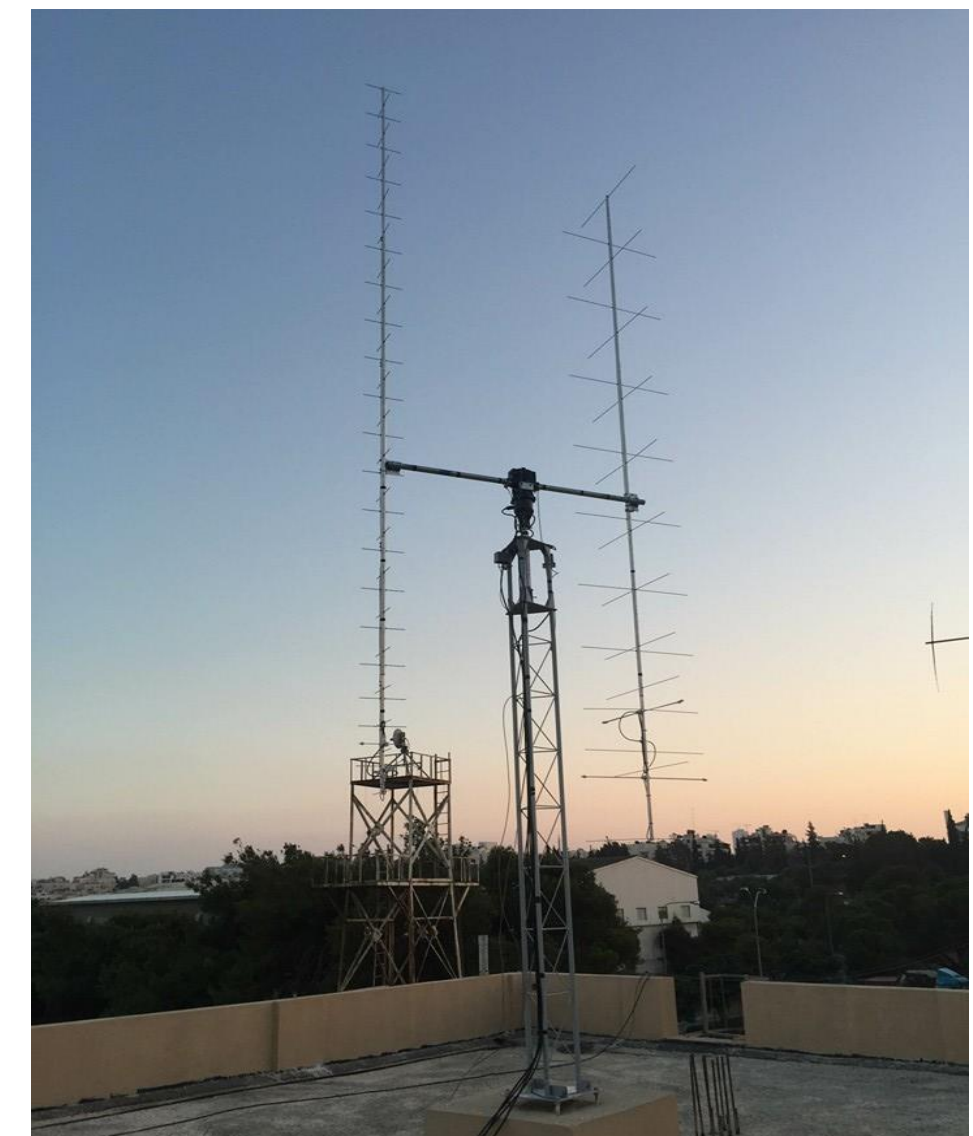
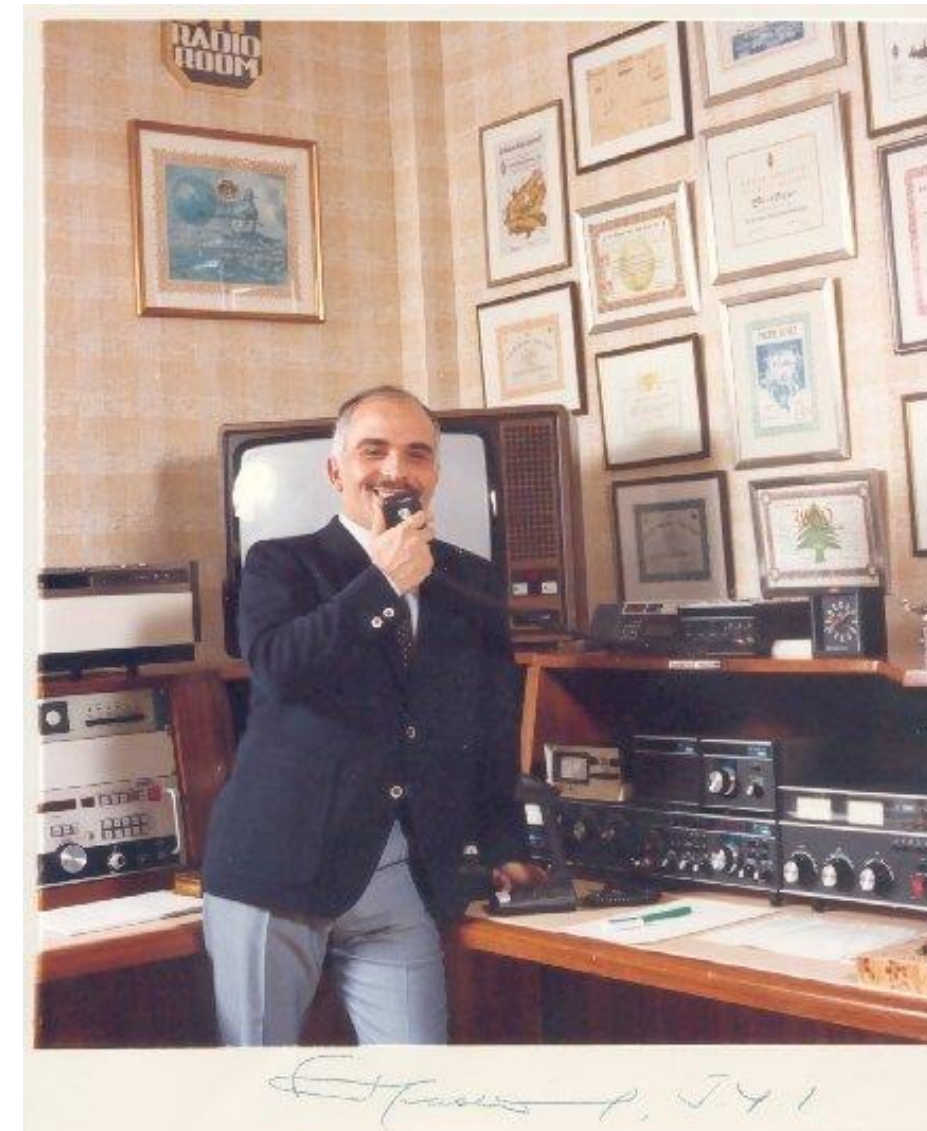


# Ground Station



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- ❖ MASAR team built the ground station (JY6JY).
- ❖ It is used to control and receive the satellite data, also it used by Jordanians ham radio.
- ❖ It has two antennas (VHF and UHF).
- ❖ Downlink: 145.840 MHz.



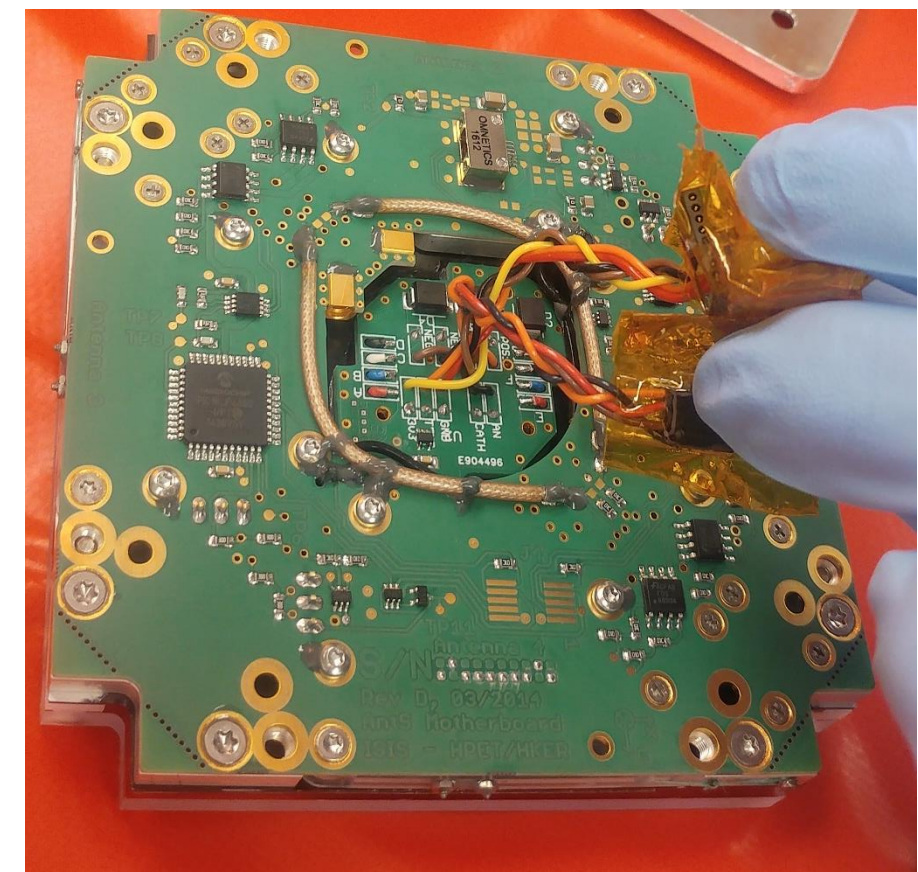
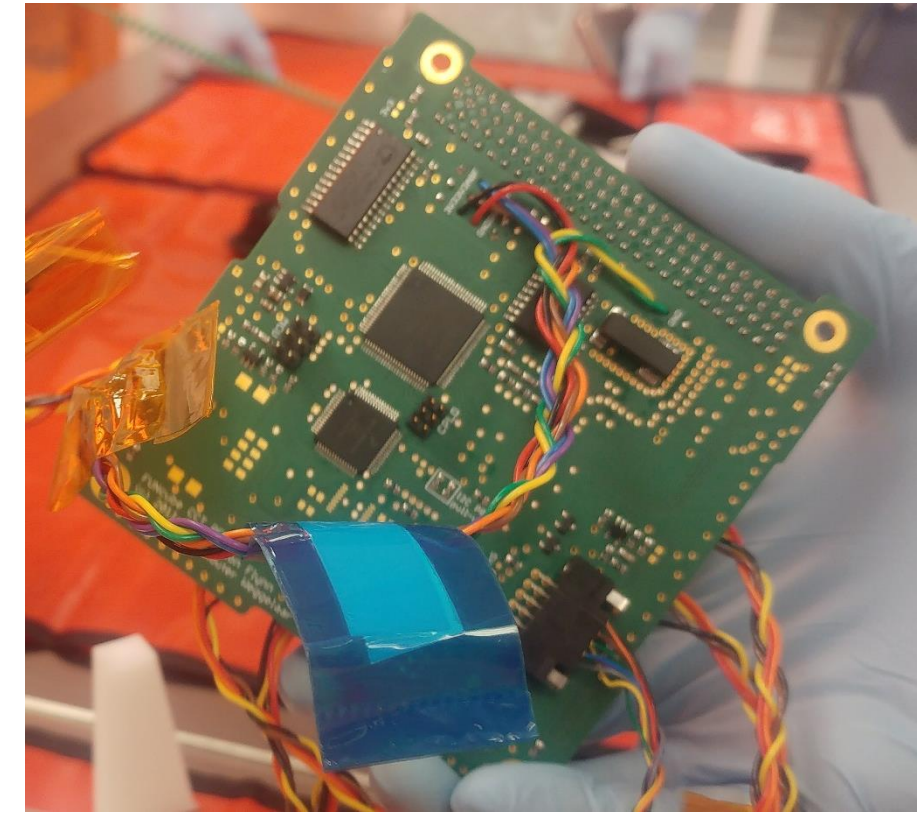
# Payload



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## ❖ JY1SAT payload consists of:

- CCT (Command, Control and Telemetry).
- RF (Radio frequency).
- Power Amplifier.
- CCT stores 30 images and two versions of the sound clip
- 1 image/pass.

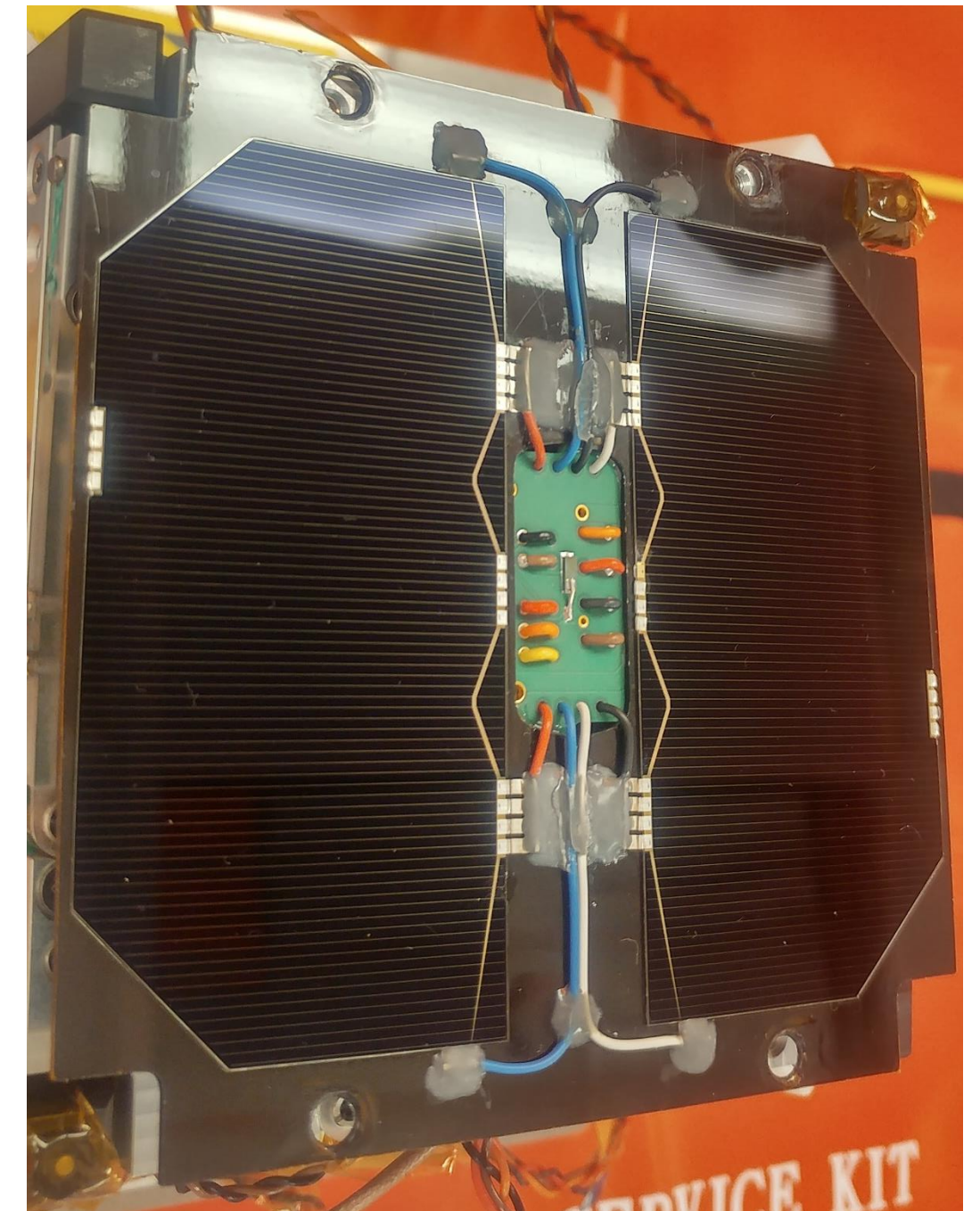
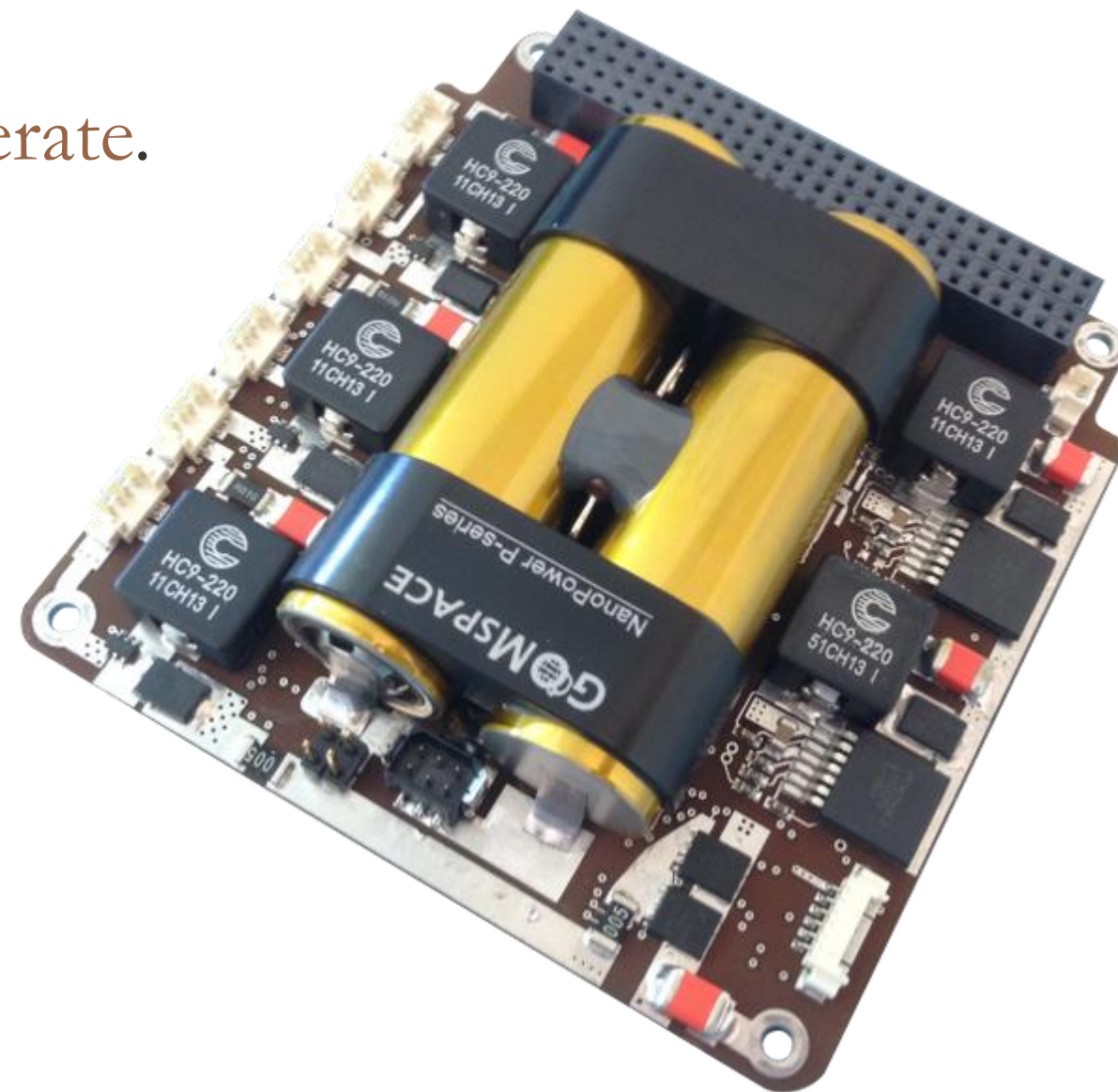


# EPS



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- ❖ Electrical Power Subsystem consists of:
  - EPS board to regulate power (3.3v and 5v)
  - Solar panels to generate power (2.3w).
  - Li-Ion Batteries (20Wh).
  - JY1SAT requires 2.2 W to operate.

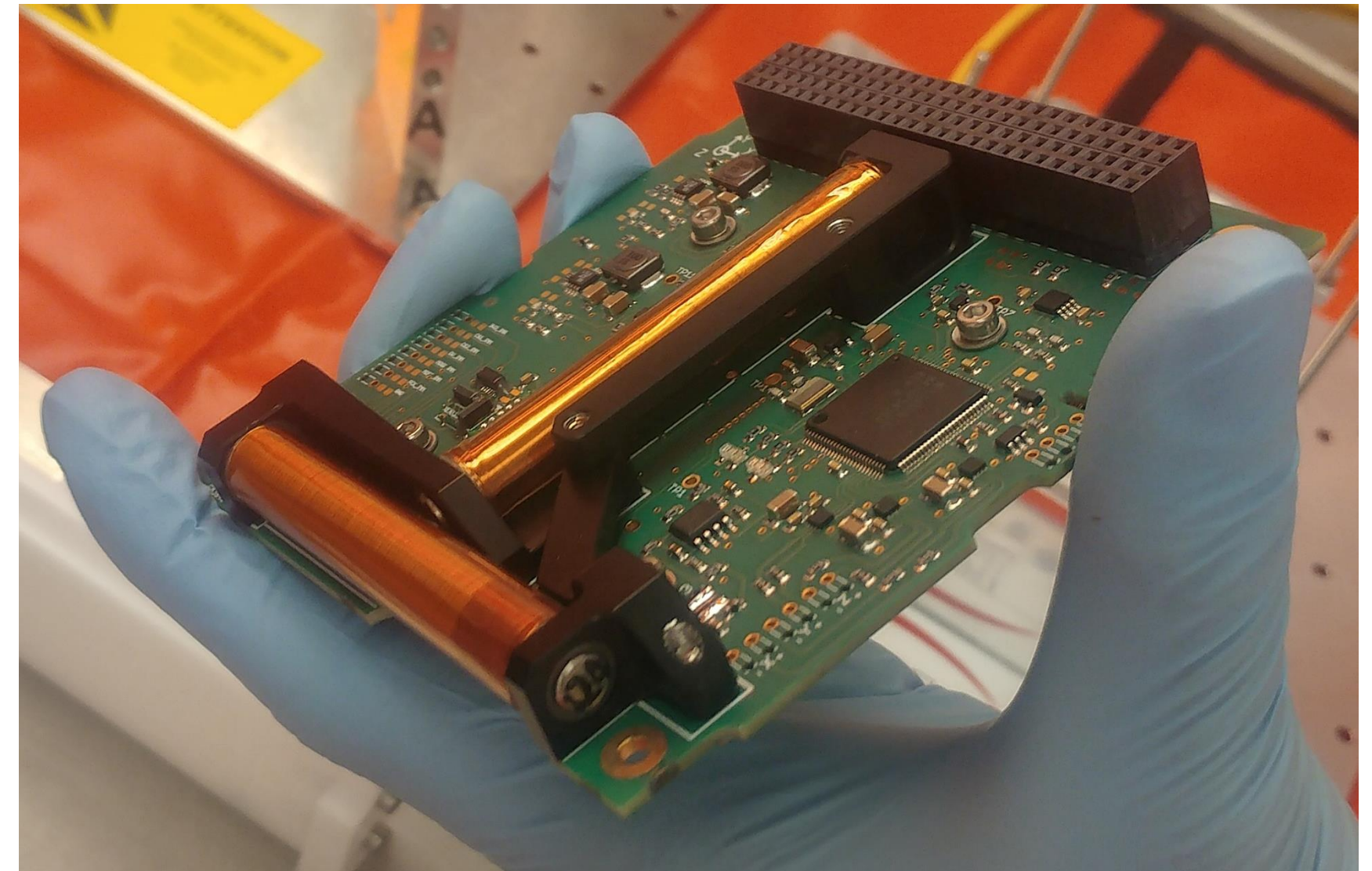


# ADCS



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- Attitude Determination and Control System used to detumble JY1SAT after deployment.
- It uses 3 axis magnetorquers.
- ADCS will detumble the satellite during the mission.
- JY1SAT does not need to control the attitude, but to damp angular velocities.





# Mechanical



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- ❖ JY1SAT structure is made of AL-7075.
- ❖ Structure is used to:
  - Provide a mechanical Interface with the Launch Vehicle
  - Provide a housing for Electronic boards.
  - Protect the satellite components from the space environment.



## Successful Stories



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- ❖ Montaser Sallam is working in ISIS.
- ❖ Khalid Sharif is working in NASA.
- ❖ Osama Mutie is continuing his PhD in self driving cars.
- ❖ Mohammad Okour is working in a drones startup company.
- ❖ Hamze Issa is working in YahSat Space LAB in UAE.
- ❖ Ahmad Fares is doing his research with Dr. Ahmad Bani Younes from SDSU in spacecraft attitude control using reinforcement learning.

# Partners and Sponsors



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Thank you