

# QUALITY ASSURANCE FOR CUBESAT MISSION

HERMES → CACTUS-1

BY ANH HO

**TEXTRON** Systems

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# About me...

- Graduate from Capitol Technology University
- System Engineer at Textron System: Unmanned System
- Have worked on various NASA mission include TRMM, TERA, MMS
- Operated multiple communication satellites at Intelsat
- Software Development Lead for HERMES

**TEXTRON** Systems



INTELSAT.



# PROJECT HERMES

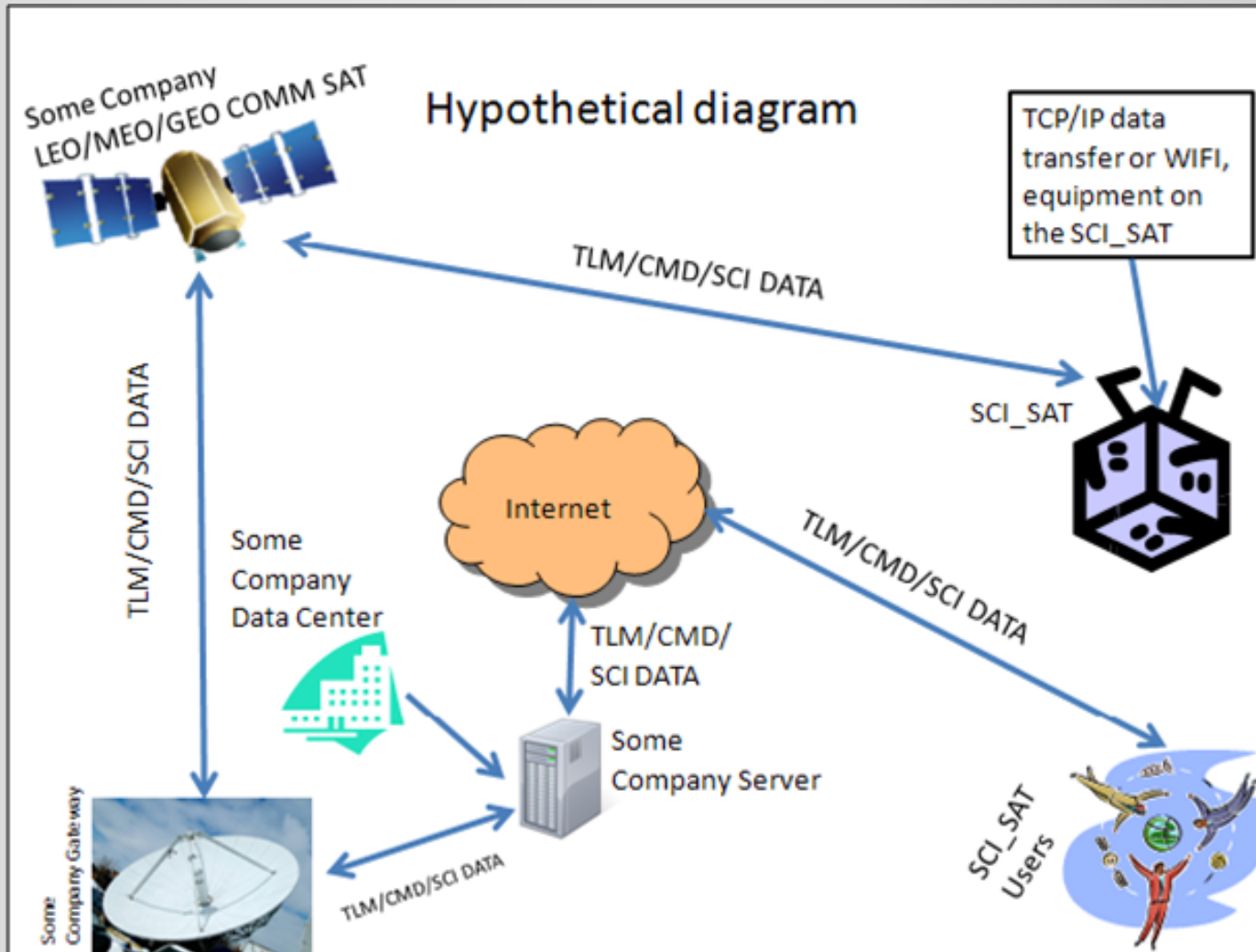
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**TCP/IP based bus concept using TCP/IP protocol for telemetry and commanding by tapping into an existing constellation of communications satellites using COTS components.**

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# Diagram



# CACTUS-1

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## Coordinated Applied Capitol Technology University Satellite-1

- A 3U CubeSat consist of two project: Hermes and Trapsat
- Selected by NASA Cubesat Launch Initiative
- Scheduled to launch in 2018 from ISS.

### Technical Info:

Weight – 3kg

Cube size: 3U

Altitude requested: 250 km – 500 km

Proposed mission life: 3 months

Class D Payload

# CLASS D PAYLOAD

Characterization	Class D Payload
Priority/Acceptable risk level	Low priority and High Risk
National Significant	Low to medium
Mission lifetime	Less than 2 years
Cost	Low
In-Flight Maintenance	Very low
Launch Constraints	May be feasible and planned
Alternative Research opportunities or re-flight opportunities	Significant alternative or re-flight opportunities
Achievment of Mission success criteria	Medium or significant risk of not achieving mission success is permitted. Minimal Assurance standard.

# SOME IMPORTANT QUESTIONS

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1. Since it's a class D mission, should we invest most of our time into quality assurance?
2. What define mission success?
3. How do we ensure we reach our goal?
4. What if something fail?
5. What are our back up plans?
6. Should we go with "failing is acceptable" mindset?

# THE KEYS FOR QUALITY ASSURANCE

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A lot of research  
Rigorous Testing

**DOCUMENT PROBLEMS AND  
CORRECTIVE ACTIONS**



## **AWESOME RESOURCES FOR CUBESAT QUALITY ASSURANCE:**

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**[http://emits.sso.esa.int/emits-doc/ESTEC/AO8352\\_AD2\\_IOD\\_CubeSat\\_PQA\\_Reqs\\_Iss1\\_Rev1.pdf](http://emits.sso.esa.int/emits-doc/ESTEC/AO8352_AD2_IOD_CubeSat_PQA_Reqs_Iss1_Rev1.pdf)**

**<http://www.jhuapl.edu/techdigest/TD/td2903/Rogers.pdf>**

**<http://nepp.nasa.gov/workshops/etw2015/talks/24%20-%20Wed/0930%20-%20NASA%20NEPP%2024%20June%202015%20-%20JR.pdf>**

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# Discussion

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