

NANORACKS



Small Satellite Deployment from ISS



Presentation to Cal Poly SLO Cubesat Workshop

NANORACKS



Operates with NASA via Space Act Agreement.

Self funded first hardware. Investors for later rounds.

NASA as landlord, safety regulator and customer for services.

Today we are the first company that owns, operates and commercially markets its own hardware on the International Space Station.





Initial customers

Federal Agencies

Basic and Applied Researchers

Universities

Israeli, German, Saudi and other international

All Commercial Contracts

Pipeline

Currently over 80 payloads under contract

Average time to date from contract signing to delivery to NASA for launch is 9 months



Late Load of Biological Payloads—Cancer, Stem Cell on from Florida lab.

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ISS Goldilocks Orbit

- 51.6 degree inclination
- 385 – 425 KM
- Stay in orbit 8 – 12 months
- Cubesat launched 45 degrees away in two axis
- 1.1 - 1.7 meters per second delta V

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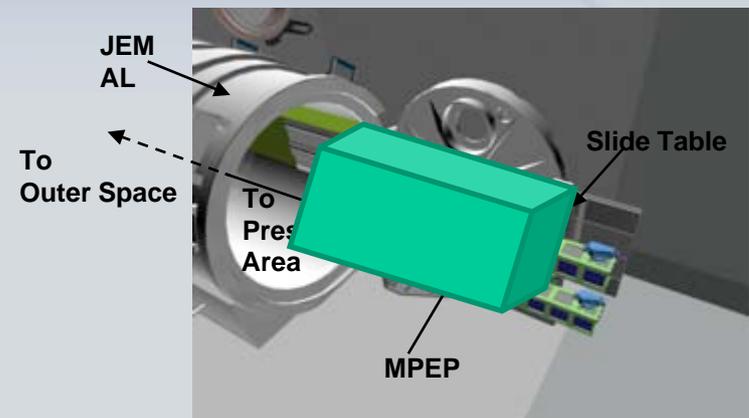
1. Cubesats are loaded into CTB



2. Launched to ISS by Visiting Vehicle



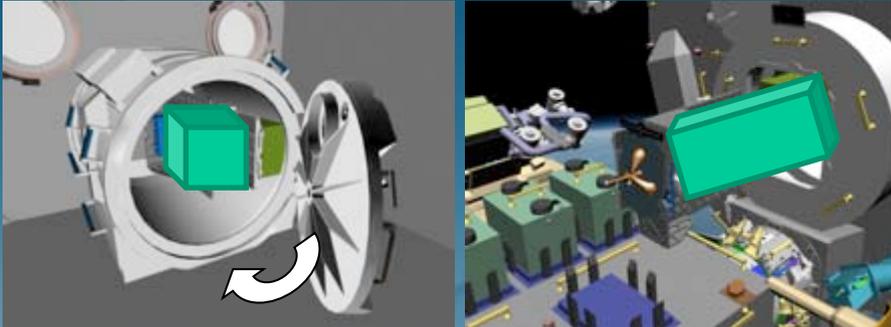
3. Cases Unpacked/Stacked and Installed on MPEP



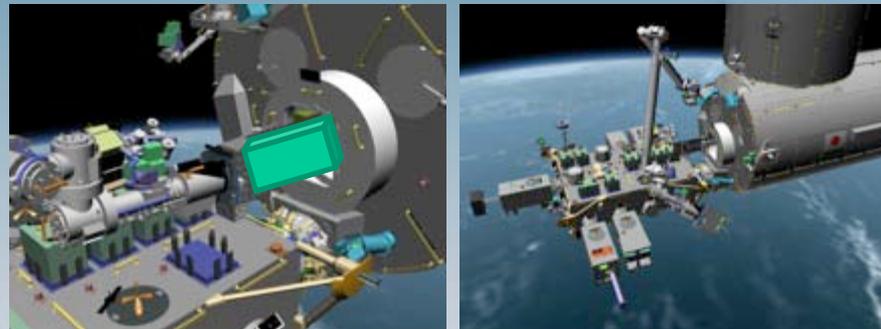
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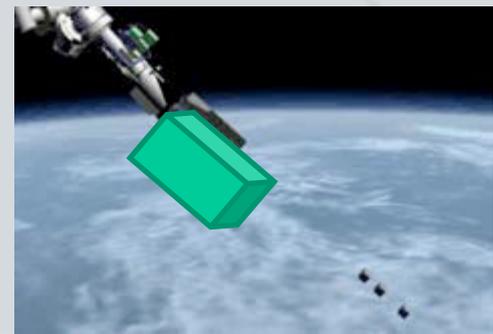
4. JEM AL Depress & Slide Table Extension



5. Grapple by JEM RMS



6. Deployment (8 Cases, 1 Case Deployed/Orbit)

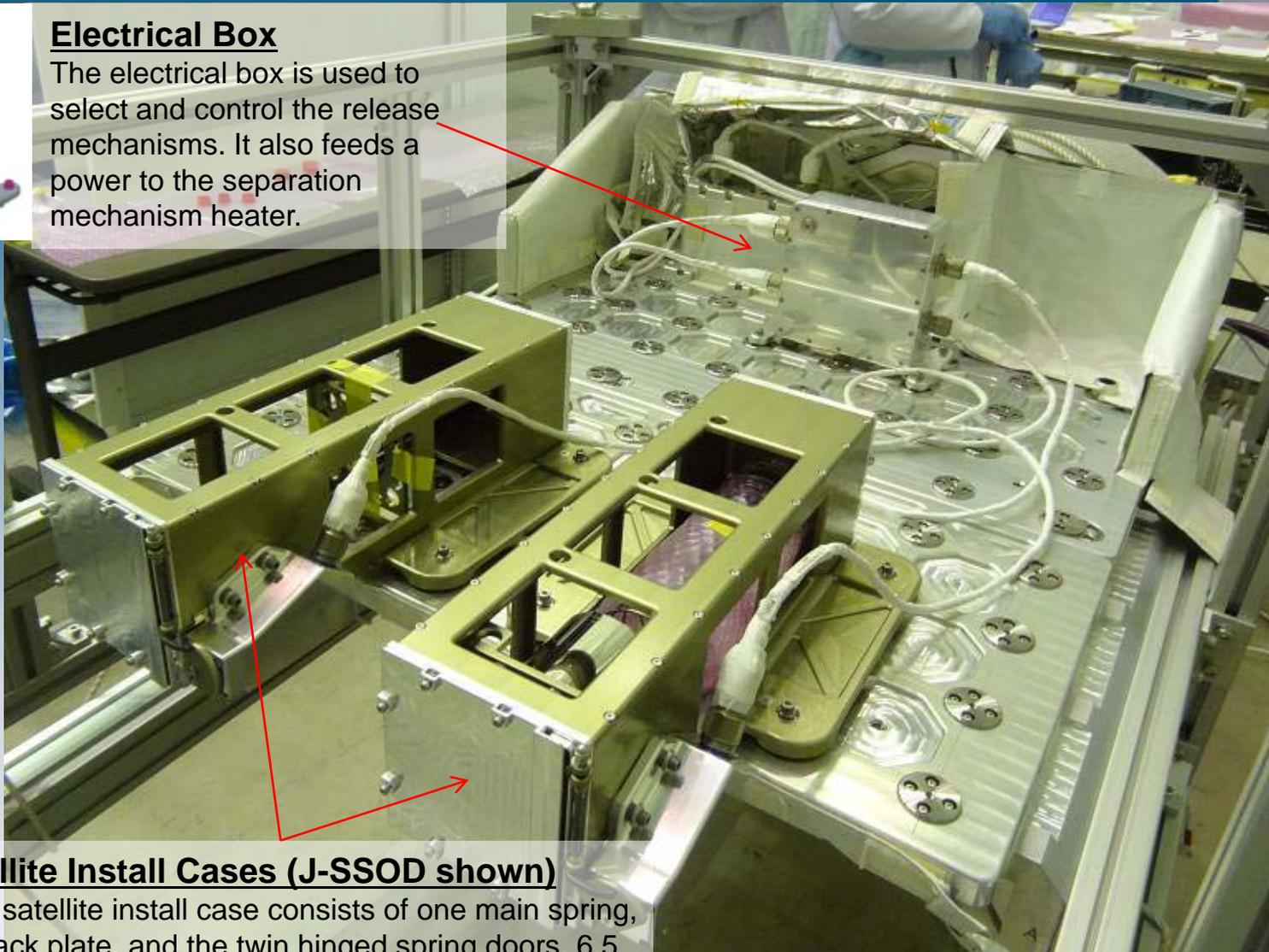


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Electrical Box

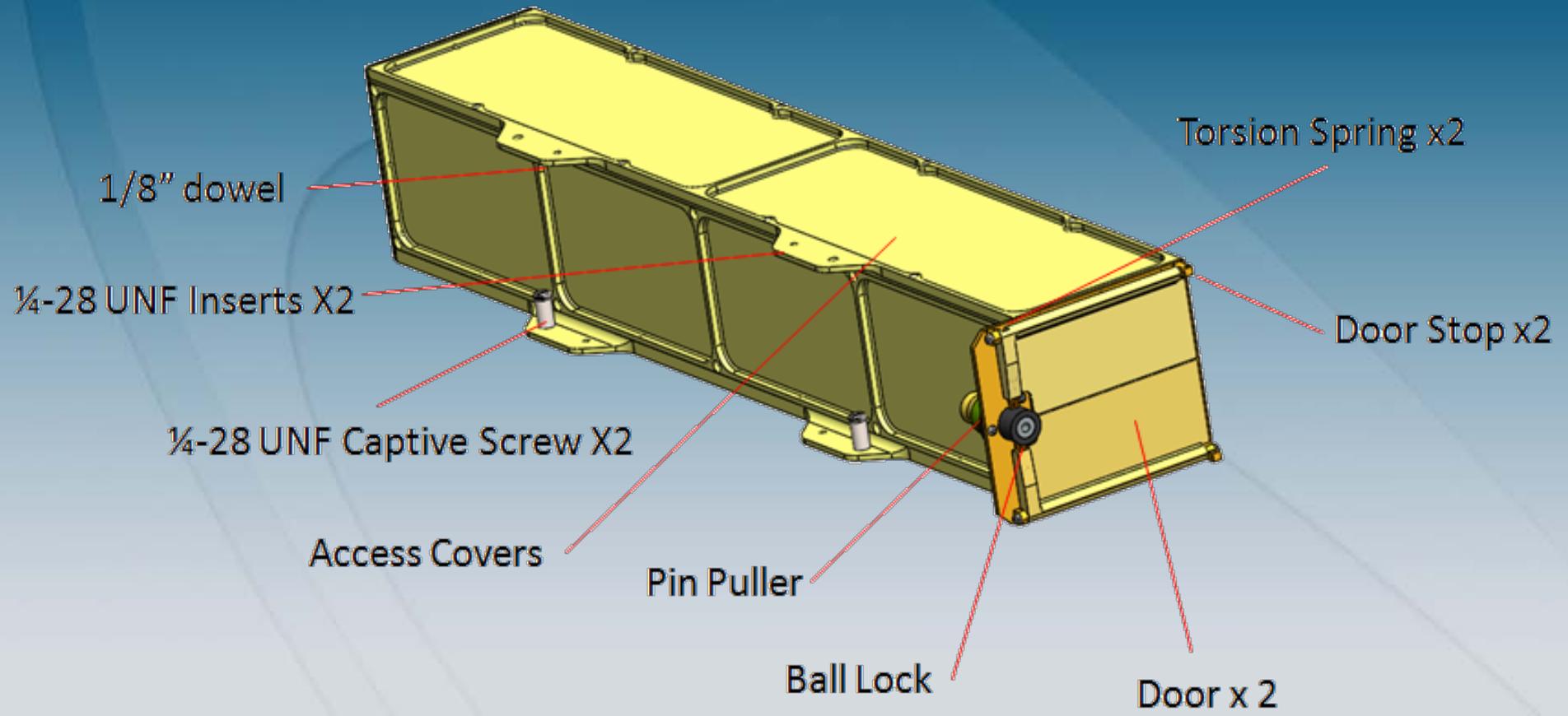
The electrical box is used to select and control the release mechanisms. It also feeds a power to the separation mechanism heater.



Satellite Install Cases (J-SSOD shown)

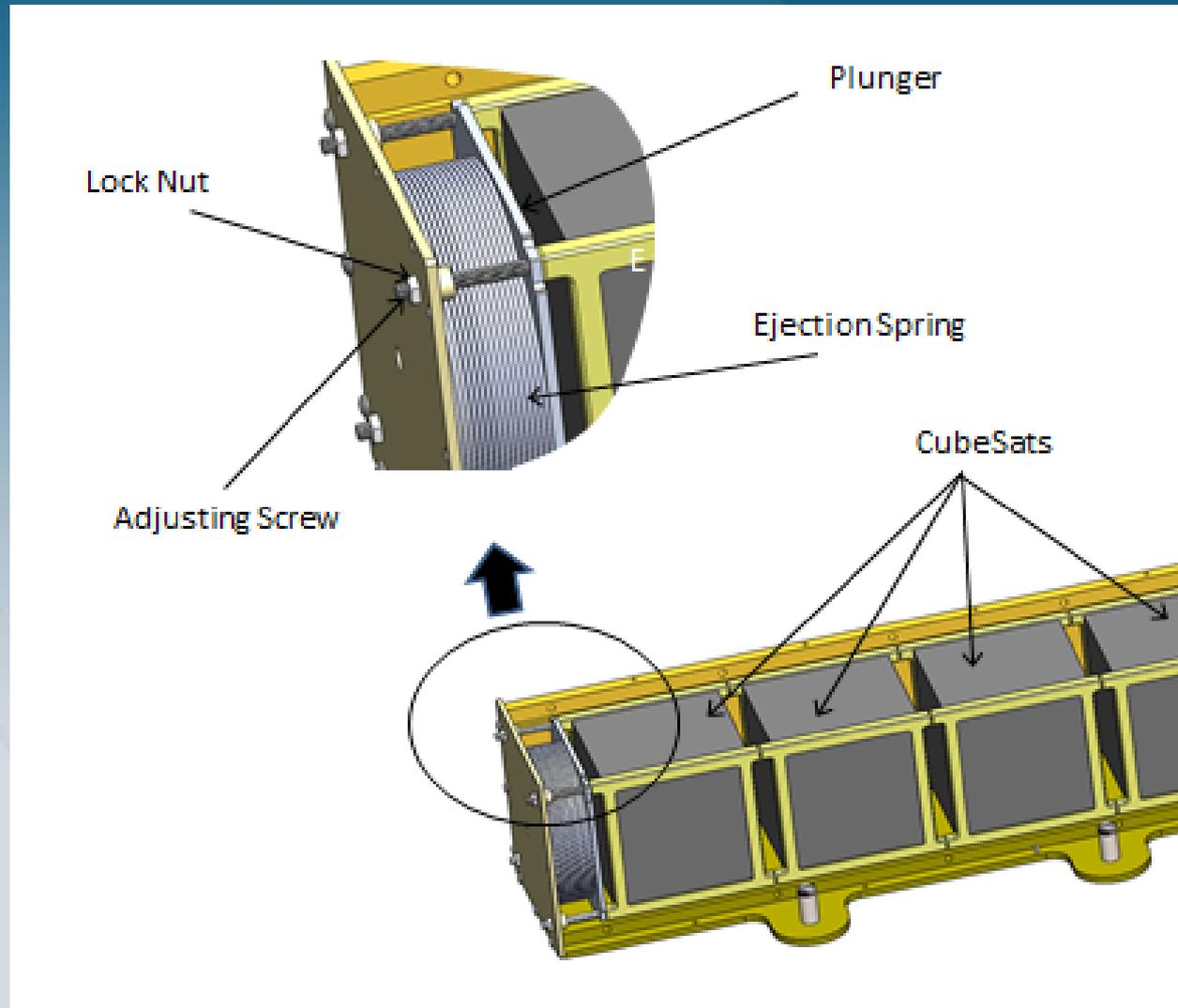
Each satellite install case consists of one main spring, the back plate, and the twin hinged spring doors. 6.5 U CubeSats are accommodated.

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Illustrative Draft

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Illustrative Draft



Availability

Currently taking orders for SpaceX 4 in spring 2014. Slots available on these vehicles:

- SpaceX Dragon
- Cygnus
- ATV
- HTV

Pricing:

- \$85,000 per U
- Price is all inclusive – off gassing test, shake test, safety review. Everything but building.
- Volume discounts available
- 30% deposit due upon signing with milestone payments at safety review and deployment



Scheduling

- Need to provide hardware detail including drawings to start hardware
- Placeholder hardware due six months before flight.
- Final hardware due ~ two months before flight
- Hardware will stay on station for about a month before deployment

Things to Consider

- Batteries need to be lot-tested and NanoRacks can sell you pre-approved batteries
- Minimum of three inhibits
- Customer is responsible for broadcast license
- Astronaut will handle satellite

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