



# Trailblazer, SPA and Radiation Testing Overview for CubeSat Workshop

August 2011

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Brian Zufelt

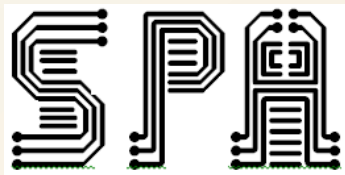
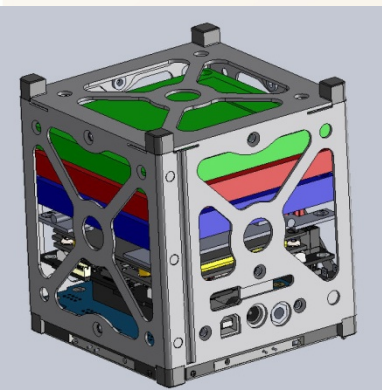
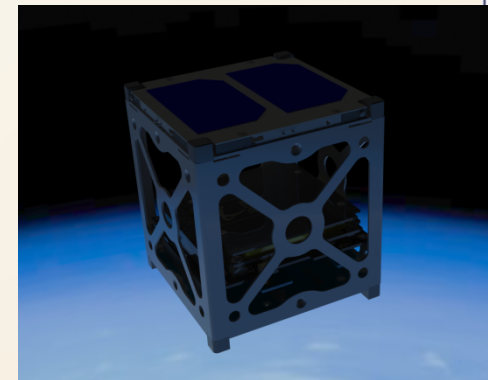


# Trailblazer Satellite



## •Trailblazer Missions

- Trailblazer satellites are proof of concept missions for SPA as well as Space Weather science research
- Trailblazer-I satellite will be launched through the NASA Educational Launch of Nanosatellites (ELaNA) program in March 2012
- Trailblazer-II satellite will be a 6U CubeSat flying a series of Space Weather experiments

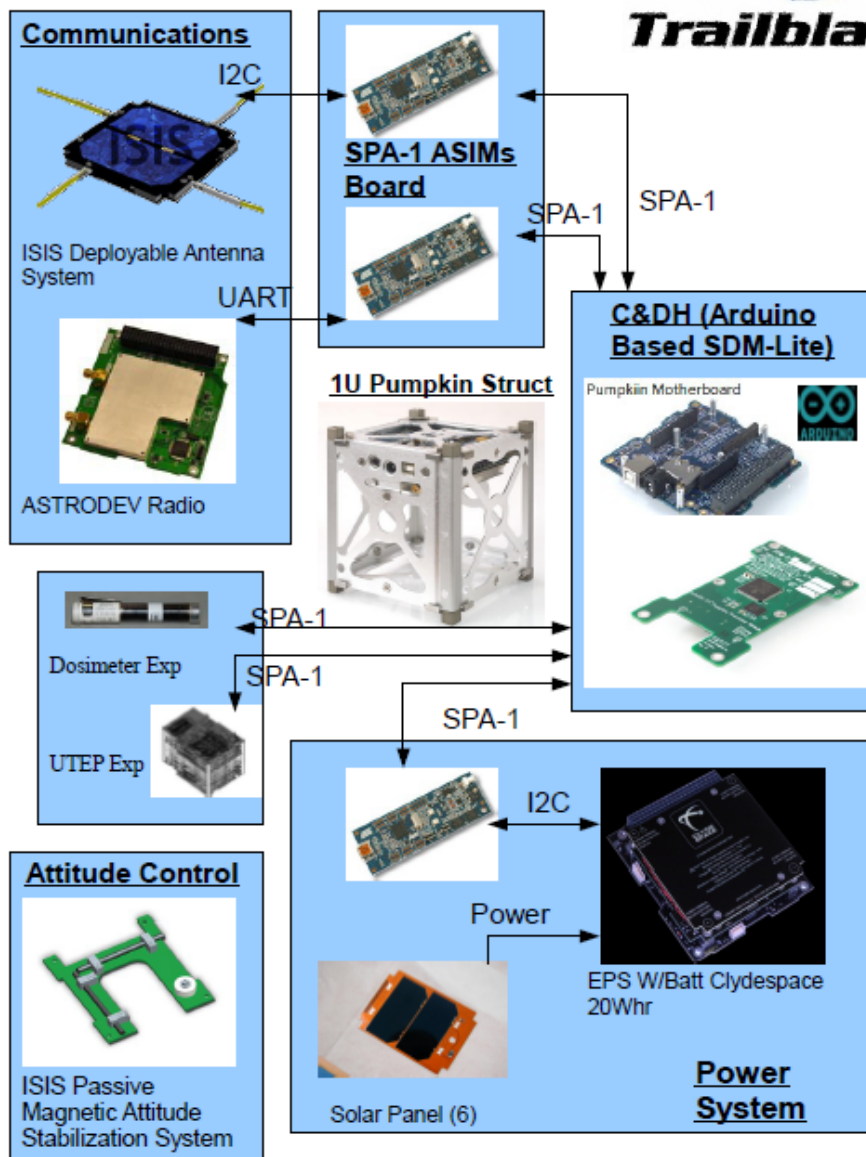




# Components



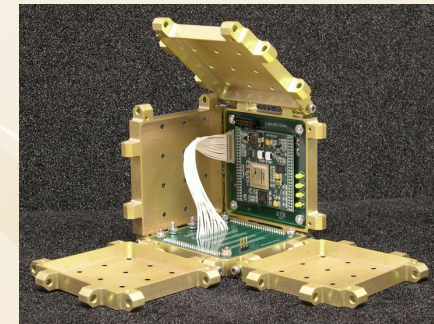
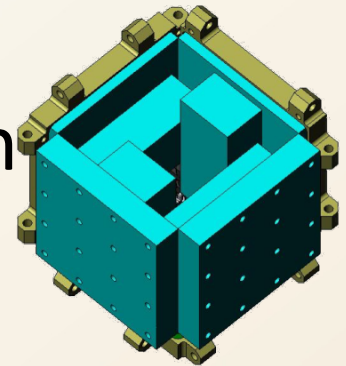
- Clyde Space Powersystem
- Astrodev Radio
- ISIS PMASS
- SPA Dosimeter
- UTEP 3D PCB
- Pumpkin Structure
- Pumpkin Motherboard
- SPA ASIM conversion Board



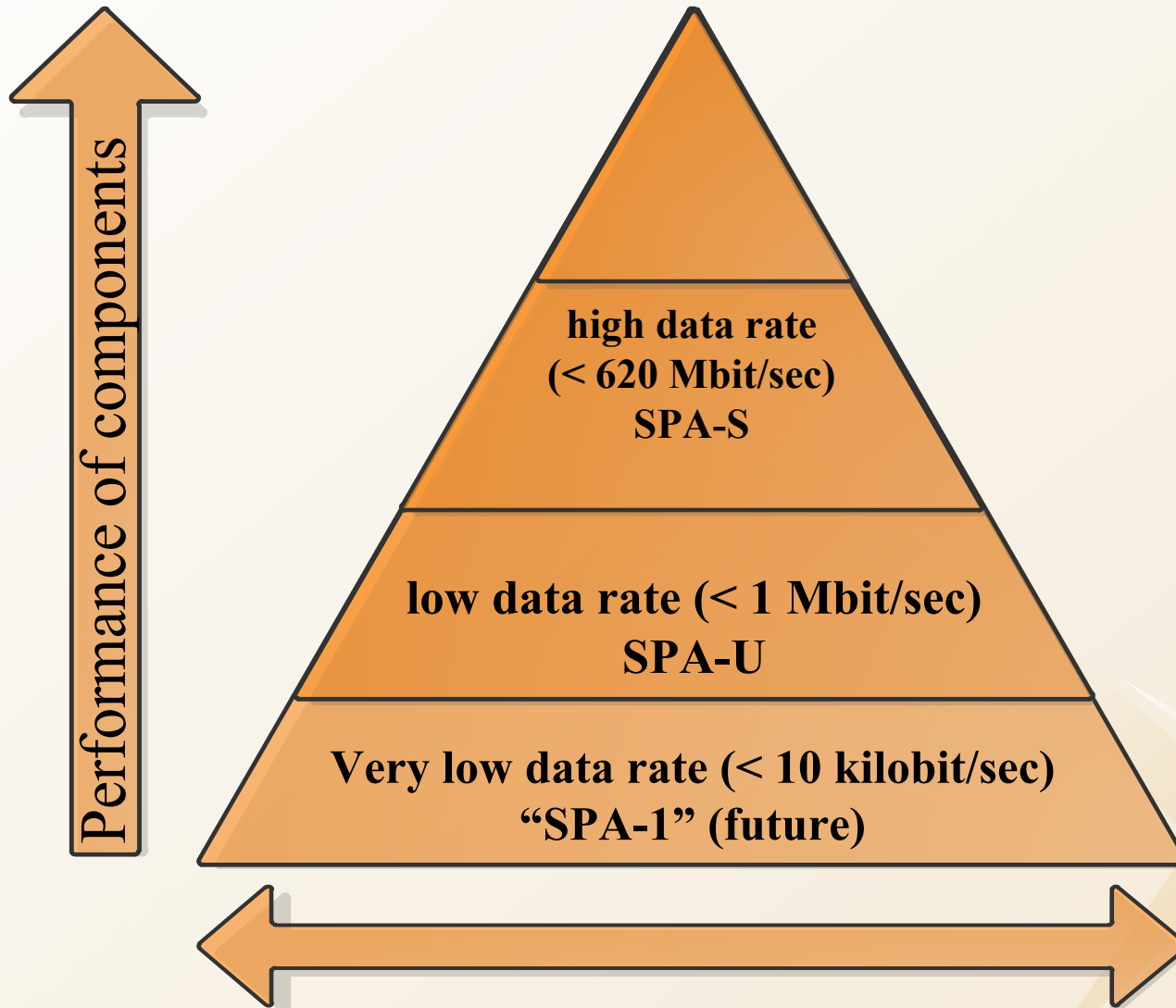


# Space Plug-and-play Architecture (SPA)

- CubeFlow & SPA provide “rapid design modeling” framework for responsive integration of spacecraft subsystems
- Have taught SPA to more than 700 individuals in 24 months
- SPA Fundamentals
  - Xteds
  - ASIMs
  - SSM



# One size DOES NOT fit all: Distribution of bandwidth in systems

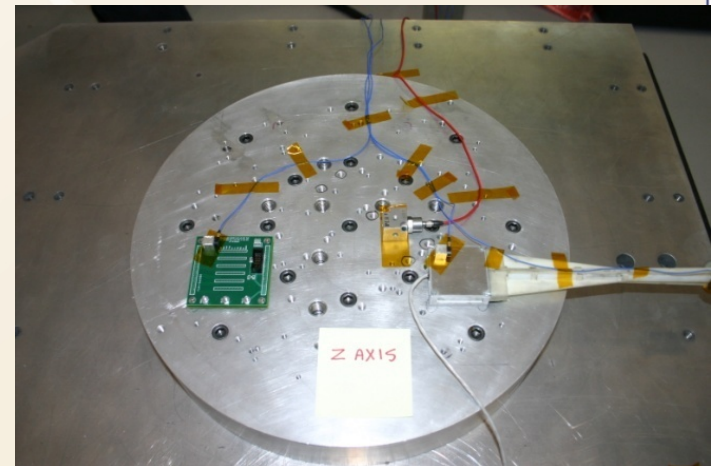


# Environmental Testing

- Environmental Testing of parts in progress
- Main piece of concern is UTEP 3D module
- Ease of access makes processing multiple iterations possible
- Currently completing test plans for TV and Vibe
- Have received PPOD



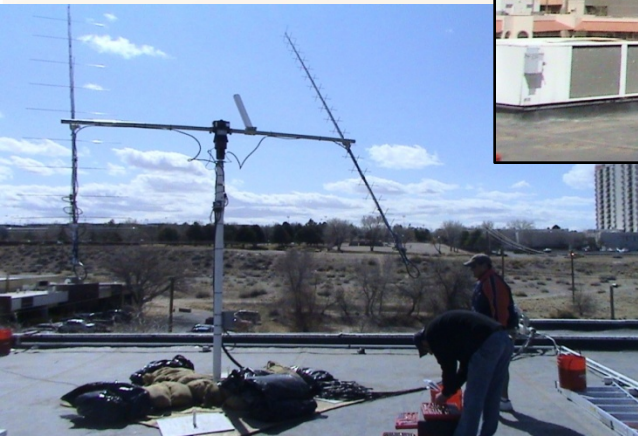
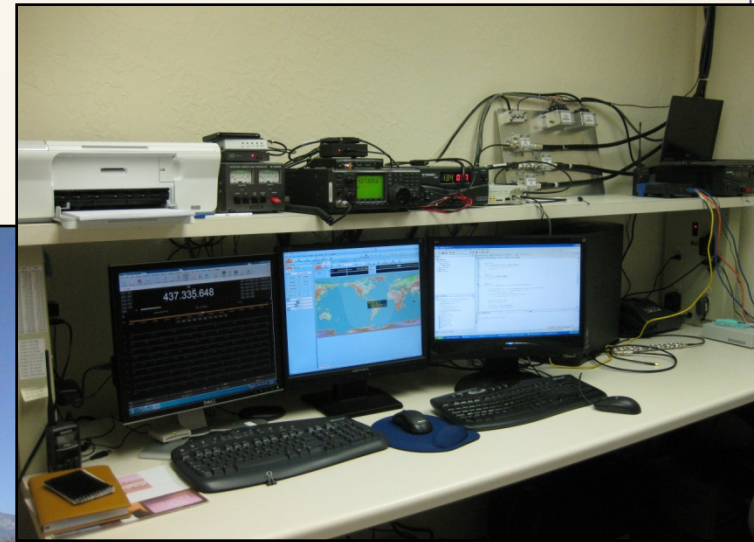
AFRL Vibration  
Table and  
testing of parts





# Ground Station

– GENSO is running 24/7





# Lessons Learned so Far

- Publicity is great – everyone wants to be part of a winning team. Pick the right person for TV
- Everything takes longer than you think it will

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# BUSINESS WEEKLY

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**LAUTMAN** Kudos to Farmington leaders for facing their economy's dismal future and making plans now **5**

**VIEWPOINT** Boy, has the world of employment changed since the turn of the century, and especially since the recession **27**

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## UNM's COSMIAC advances space technology

BY KEVIN ROBINSON-AVILA | NMBW SENIOR REPORTER

Next March, NASA will blast into orbit a coffee cup-sized satellite built by students and engineers at the University of New Mexico.

The device, known as a "CubeSat," is composed of off-the-shelf commercial parts and cost \$50,000 to build. If all goes well, it will be UNM's first satellite sent to space.

The project aims to help government and industry radically reduce the costs of building, launching and operating satellites and other space technology, said Brian Zufelt, a research engineer at UNM's Configuration Laboratory.

SEE UNM **25**



SBS

United Stoneworks polishes its business for growth **12**



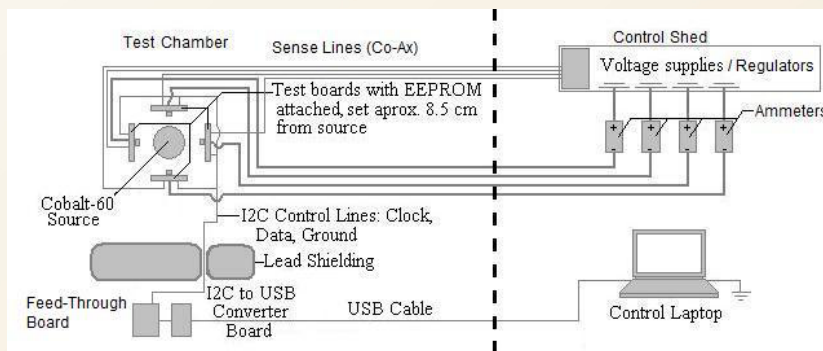
C O S M I A C





# Radiation Testing of Parts

- Are you interested in finding out how commercial parts that are often used in CubeSats operate in a radiation environment?
- COSMIAC has performed Total Ion Dose testing on devices such as COTS microcontrollers, COTS memory components, and some radiation hardened components. Results are available at [cosmiac.org](http://cosmiac.org) (publications)





# Phillips Scholars and Space Scholars

- **AFRL wants US students. If you are looking for an exciting research opportunity, contact me.**

**AFRL Phillips Scholars Overview**

The Air Force Research Laboratory Phillips Scholars Program offers you the experience of a lifetime!

Discover the exciting world of science, technology, engineering and math as you work with Air Force scientists on cutting-edge research and technology. Gain personal and professional experience that looks great on any resume as you contribute to the future vision of space exploration and energy systems.

Phillips Scholars is normally for high school through Junior in college

**Mission Statement:** Dedicated to preparing students for leadership positions in the science, technology, engineering and mathematics fields through the integration of education and experience in research and development.

**THE SPACE SCHOLARS PROGRAM**

Prepare for the Future

## Information for Applicants

If you have questions about the program or are having problems, please contact the [Space Scholars Program administrator](#).

### Requirements/Eligibility

- Space Scholar selectees are made offers at one of the following levels: GS-4, GS-5, GS-7, or GS-9. The Program is generally geared toward college students from Sophomore/Junior undergraduates up through Ph.D. candidates. The requirements governing eligibility for each GS level can be found on the [Office of Personnel Management](#) website. Our Personnel Office will use these requirements in determining which level (if any) each selectee qualifies for. The requirements listed below, while not exhaustive, cover the major aspects of eligibility.
- **Applicants must be US Citizens; the scholars programs are not open to**

Space Scholars is normally for Juniors in college through PhD



# Further Questions?

- Craig Kief: [craig.kief@cosmiac.org](mailto:craig.kief@cosmiac.org)
- Brian Zufelt: [brian.zufelt@cosmiac.org](mailto:brian.zufelt@cosmiac.org)
  
- If you want further training or education for your team, we offer a free 60 minute Skype presentation

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