


ANTARCTIC BROADBAND

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I'M NOT A SCIENTIST, BUT...

- » *Frozen out of broadband*
 Juan Pablo Conti, 2009
- » Orcadas Base, Laurie Island



- » Why not make a 3G cell phone video call?



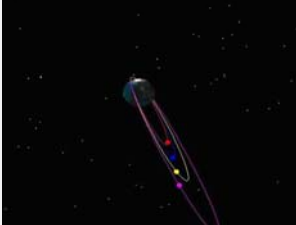

THE TEAM

- » International Consortium
 - Partnership opportunities
- » Funded
 - Australian Space Research Program
- » Development path
 - Three phases






TECHNICAL CONCEPT

- » One or more satellites
 - Inclined orbits
- » Ground Antennas
 - Smaller than 50cm
 - Bigger than 2m
- » Cost of dish \approx size³
- » Data rate \approx size²
- » New Applications
 - Video Conferencing
 - 3G cell phone network
 - Satellite TV
 - Real-time monitoring & control

DEVELOPMENT PATH

- » Design and Feasibility
- » Demonstration Satellite
 - Limited 2-way communication
 - Several GB per day
 - 75cm antenna dome
 - Operational in 2012
- » Operational Satellites
 - Several thousand GB per day
 - Various antenna sizes
 - Operational in 2014

Demonstrator Satellite

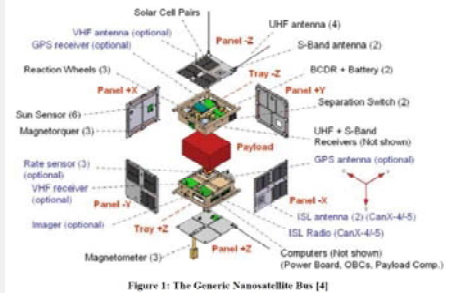



Figure 1: The Generic Nanosatellite Bus [4]



SCIENCE BENEFITS

- » Current ANU research
 - GPS uplift studies
 - Metrological data
 - Low-fidelity
- » Wish list
 - High-fidelity data
 - Snow depth v. reflectivity
 - Seismology
 - Laser sounding of the atmosphere



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USER INPUT

- » System definition
- » Participate in trials
- » Secondary payloads
- » Open for proposals



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USER NEEDS

- » What is the biggest problem with existing systems?
- » What drives the data transfer need?
 - Inbound or outbound?
- » How critical is voice?
 - Is there a distinction between Voice and Data delivery?
- » Connectivity to academic and research networks?
- » Different requirements at different locations?
 - Bases
 - Field camps
 - Remote equipment
 - Land, Air and Sea mobile
- » Criticality of internet for "safety of life"?

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PERFORMANCE

- » Bandwidth
- » Latency
- » Availability
 - Windows of availability
- » Coverage
- » Cost
- » Reliability

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CONSTRAINTS

- » Antenna size, mass, power
- » Maintainability
- » Packaging, Handling, Transport
- » Installation
 - Antenna foundations
- » Integration with existing equipment
- » Special constraints for different scenarios, e.g. ships.

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SUSTAINING THE CAPABILITY

- » Participate in trials
 - Reference station at Mt Stromlo, Canberra
 - Terminal at an Australian base
 - Terminal at the South Pole
 - Terminal(s) on the ice at "remote experiments"
 - Install in 2011/2012 season
- » Ongoing support
 - Logistics
 - Financial
 - Organization
- » Payload opportunities

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