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# **Future ARISS Projects and Capabilities**

## **ARRISS-I July 2008 Meeting**

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**ISS Program Office, Mission Integration & Operations Office – Code OC7**

**July 2008**



# Benefits of Ham Radio on ISS



- **Educational Outreach**

- School contacts for NASA, IP and SFP crew members
- Over 50% US schools
- Exceedingly popular & positive
- High Visibility

- **Public Outreach for NASA & IP Agencies**

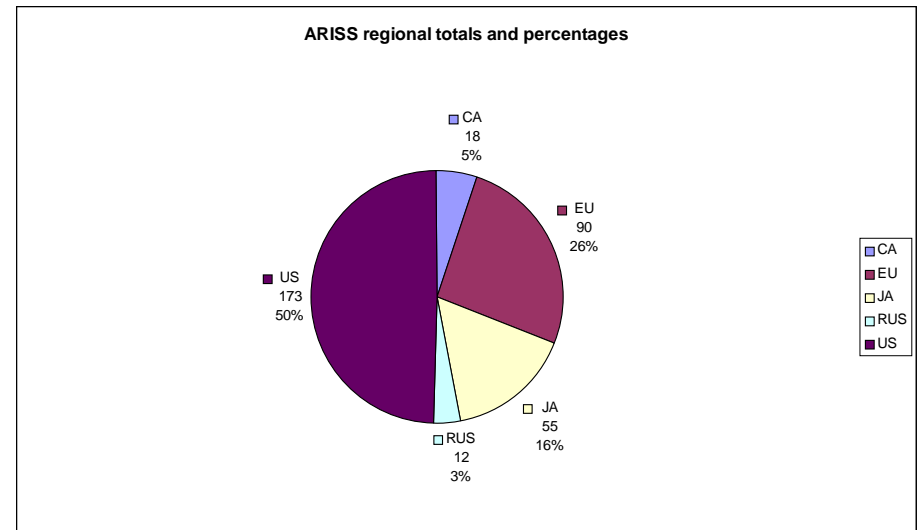
- School contacts as local PAO events
- Public events (NASM, Scouts etc.)
- Ham Radio community world wide
- High Visibility

- **Crew Psych Support**

- Some crew enjoy the diversion provided by ham ops

- **Contingency Comm**

- SDTO in work for Exp 18
  - » Comm from ham stations to MCC-H
  - » Comm from ham radio to NASA VHF ground stations
    - > Ham radios can be battery powered



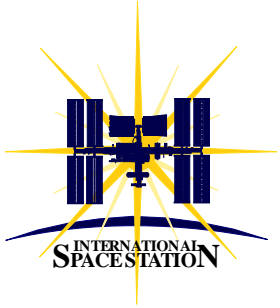


## Future ARISS Projects and Capabilities

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- **NASA Education believes we have “just scratched the surface” of this outreach resource. The desire is to “go beyond the school contact”**
  - **Crew participating activities**
    - » School contacts
    - » Video transmission of crew activities
  - **Non-crew participating activities**
    - » Automated video transmission
    - » “Student telemetry”
    - » Satellites or Suitsat follow on
  
- **The IP’s desire expansion**
  - **ESA**
    - » Use the L/S Band antennas for digital television
    - » Possible use of an ARISS antenna as the payload for a prototype EVA attachment mechanism and as a shared resource
  - **CSA**
    - » Desire educational outreach - “What can we do to help?”
  - **JAXA**
    - » Offered HTV upmass and gear from Japanese vendors - “What do you need?”<sup>3</sup>



## Near Term Future ARISS Projects and Capabilities

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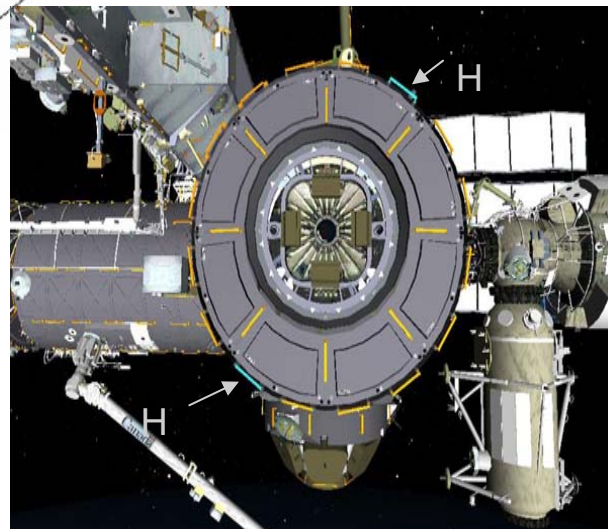
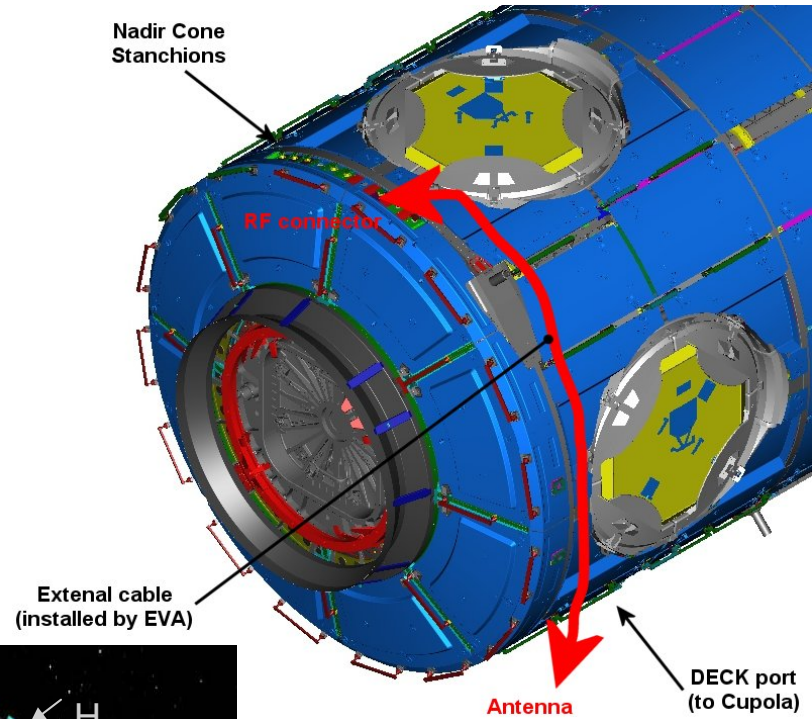
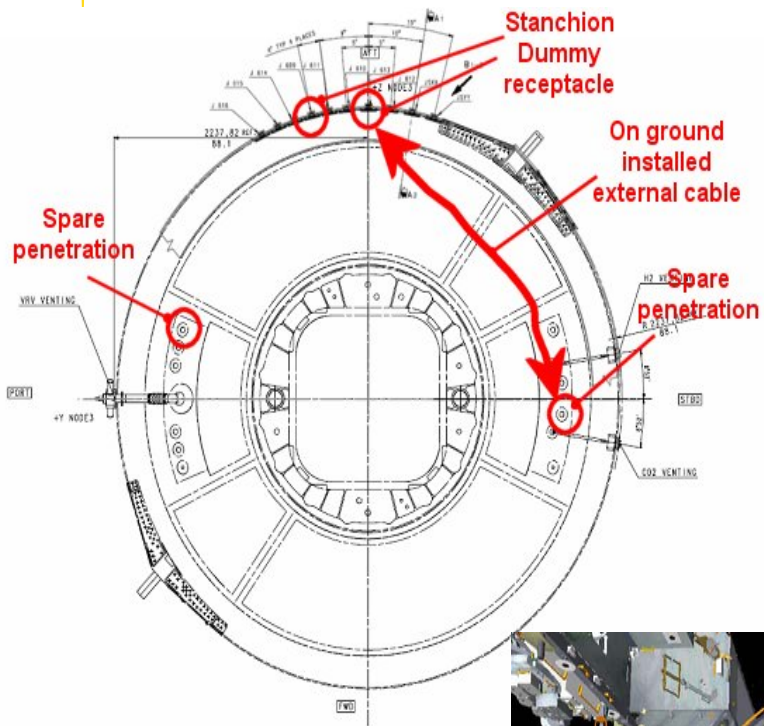


- **Node 3 Installation**

- Relocation/Reclocking of Node 3 presented this possibility
- Alenia ECP for 2 antennas – technically doable
- Offers omni-directional capability for contingency comm
- Crew psych support by operating from Cupola
- Utilizes unused hardware (Ericson VHF & UHF), redeployed to Node 3



# Near Term Future ARISS Projects and Capabilities (con't)





## Near Term Future ARISS Projects and Capabilities (con't)

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- **ESA use of ARISS antenna as for prototype handrail clamp SDTO & AIS experiment**
  - Modified VHF/UHF ARISS antenna offered in exchange for handrail clamps for Node 3
  - I was requested to be a co-sponsor of SDTO
  - Modified antenna currently under test
- **ARISS desire is to use antenna as a shared ARISS/AIS resource**
  - ESA has agreed to shared use with a coaxial switch
- **Schedule is challenging**
- **Delivery of modified ARISS antenna for installation during ESA/Frank DeWinne Increment 20 EVA**
  - Progress launch, delivery dates etc



# Longer Term IP Agency Goals and Projects for ARISS

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- **Mark's unvetted Ideas, "food for thought"**
- **Anything we do must related to the 4 basic tenets**
- **Projects construed as Educational Outreach should have formal educational outreach approval at the ARWG level**
- **Some project ideas ("Going Beyond the School Contact")**
  - **"Student Telemetry"**
    - » VHF and HF transmission
  - **Amateur Video**
    - » SSTV
    - » Fast scan
    - » Internal/external
  - **ARISS-Sats as a follow on to Suitsat**
    - » 6 experiment ports for ARWG IP agencies and AMSAT/ARRL
    - » Cargo vehicle, or Cargo LV deployed



## Longer Term IP Agency Goals and Projects for ARISS (con't)

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- **Student workforce augmentation:**
  - Engage High School and University level participation for design, fab and test
    - » Be as sophisticated as practical for the student workforce
    - » Hardware and software
    - » On-orbit and ground segments
  - All ARWG IP Agencies participating
  - Retain ARISS and AMSAT expertise as advisors
  - AMSAT IP agency hardware/software integration/validation as in-kind support to ARISS
    - » Student participation as much as possible