

ARISSat-1 Overview



ARISSat-1 Team
Space Symposium 2010

ARISS



- Amateur Radio on the International Space Station
- International organization that coordinates the amateur radio activities on the ISS
- Primary mission is education (STEM)



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SuitSat



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ARISSat-1



- Originally planned as SuitSat-2
- Significantly upgraded electronics
- Whoops! Orlan #27 discarded due to lack of “*space*” on station
- New space frame developed to house electronic modules
- Renamed ARISSat-1

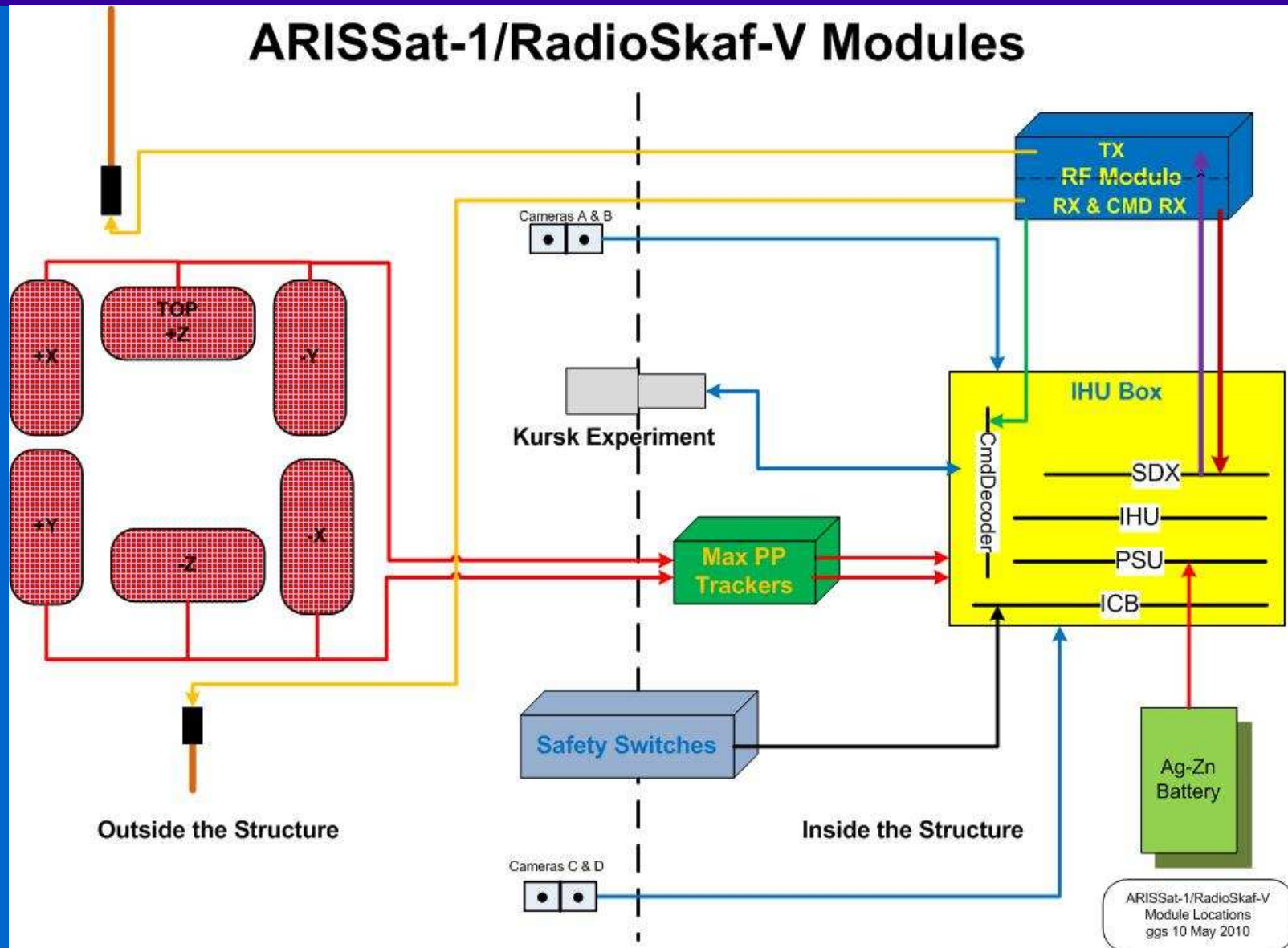
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System Modules



- Solar panels
- Max Power Point Trackers
- Battery
- Control Panel
- SSTV Cameras
- Kursk Experiment
- RF Transceiver
- Internal Housekeeping Unit (IHU)

System Diagram



SMEX Solar Panel



- 6 solar panels
- 19" x 10.5"
- 19 watts each
- Donated by NASA (from SMEX project)

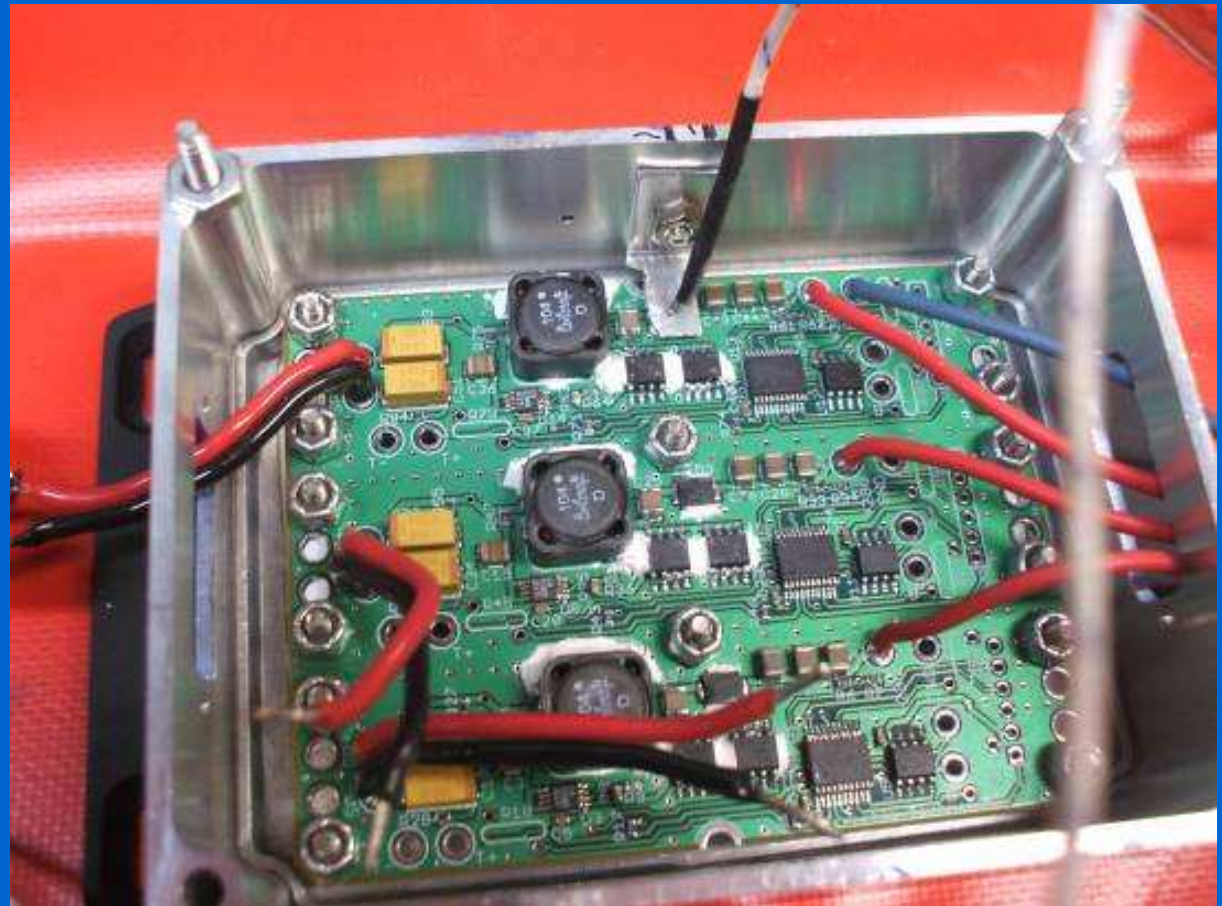


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Max Power Point Trackers



- DC to DC Power Converters
- 1 per solar panel
- Extract max power from solar panels



Battery



- 825M3 Orlan Space Suit Battery
- 18 AgZn cells
- Rechargeable
- 28 Volts



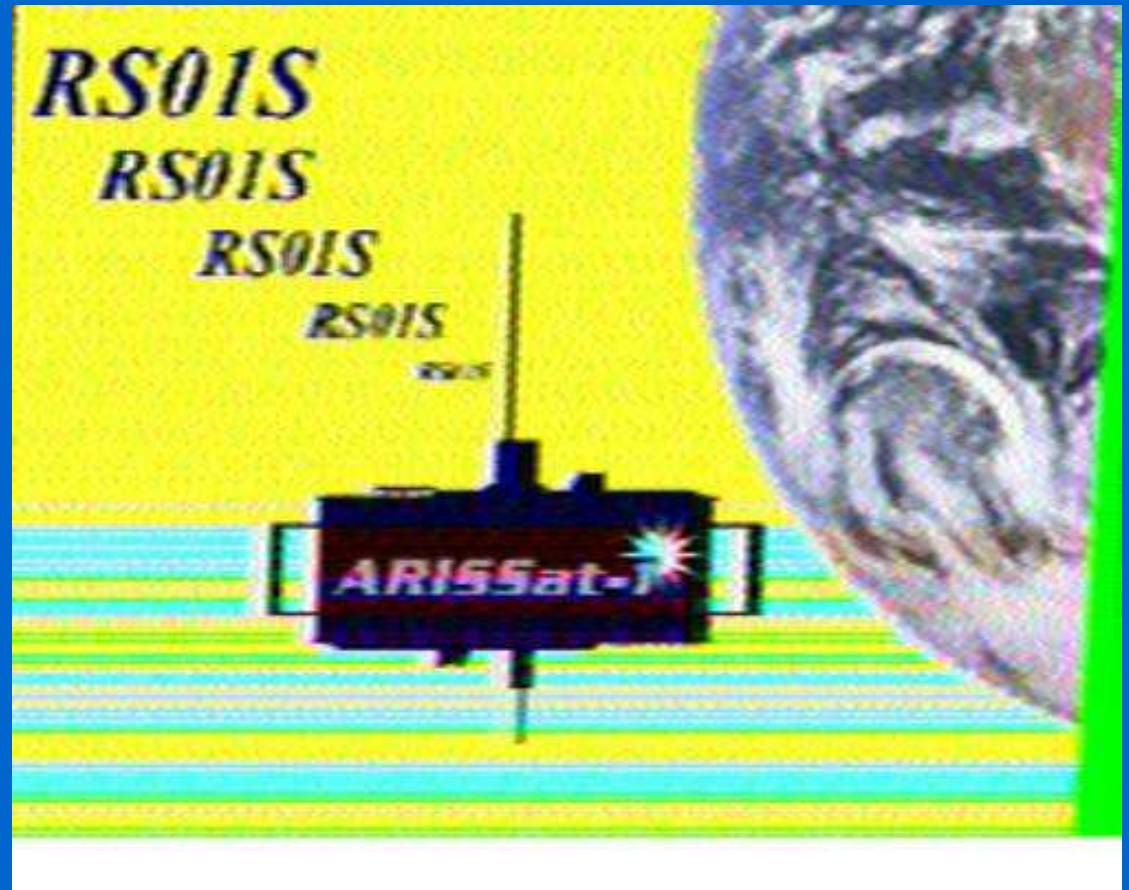
Control Panel



SSTV Cameras



- 4 cameras
- Mirrors to point in 4 different directions
- Transmitted as FM audio
- Robot-36 format



Kursk Experiment



- Developed by students at the Kursk State University
- Measures the vacuum of space
- On for 1 orbit every 24 hours



RF Transceiver

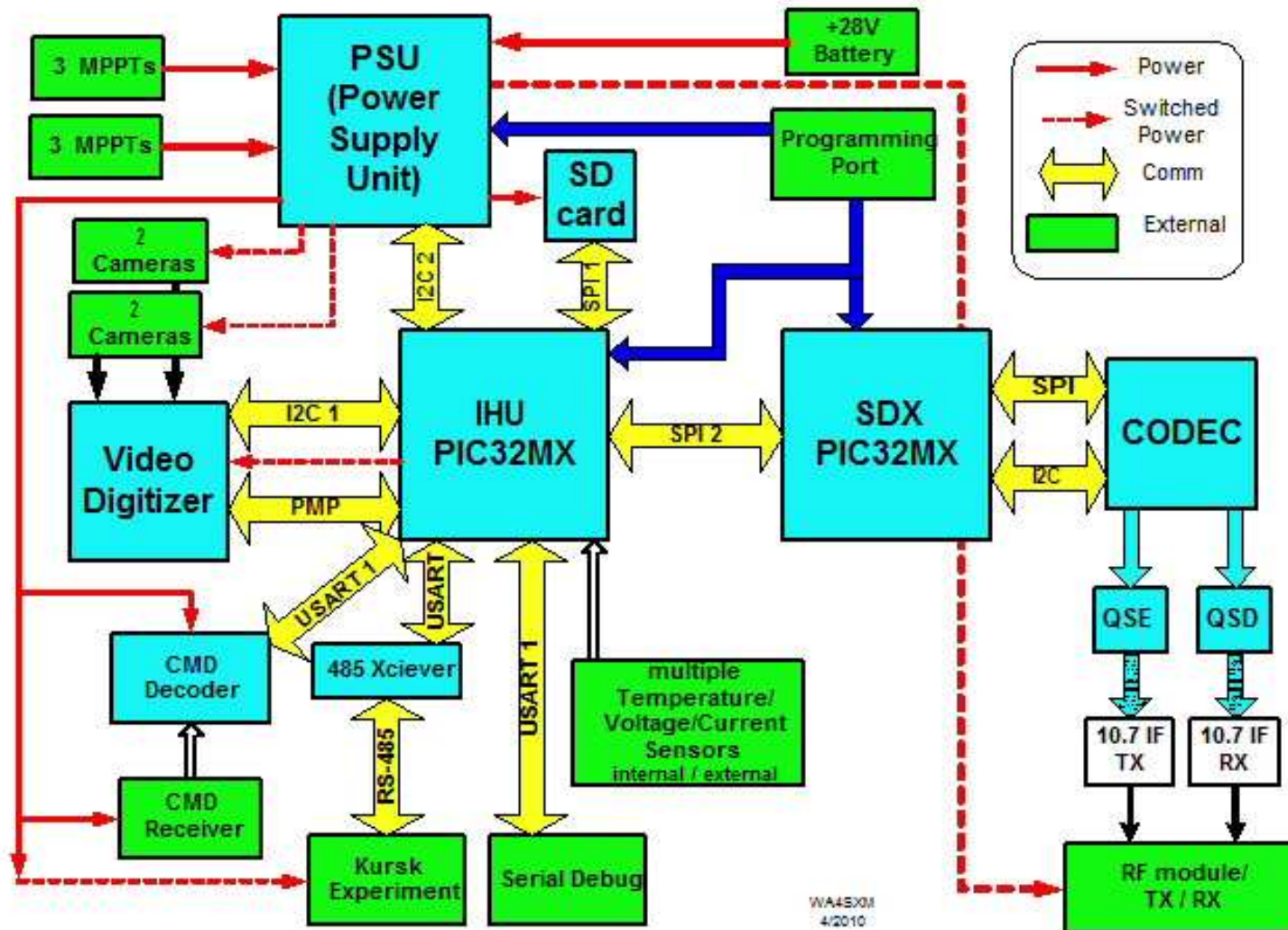


- I/O at 10.7 MHz
- Linear 2m Tx
- Linear 70cm Rx
- Command Rx

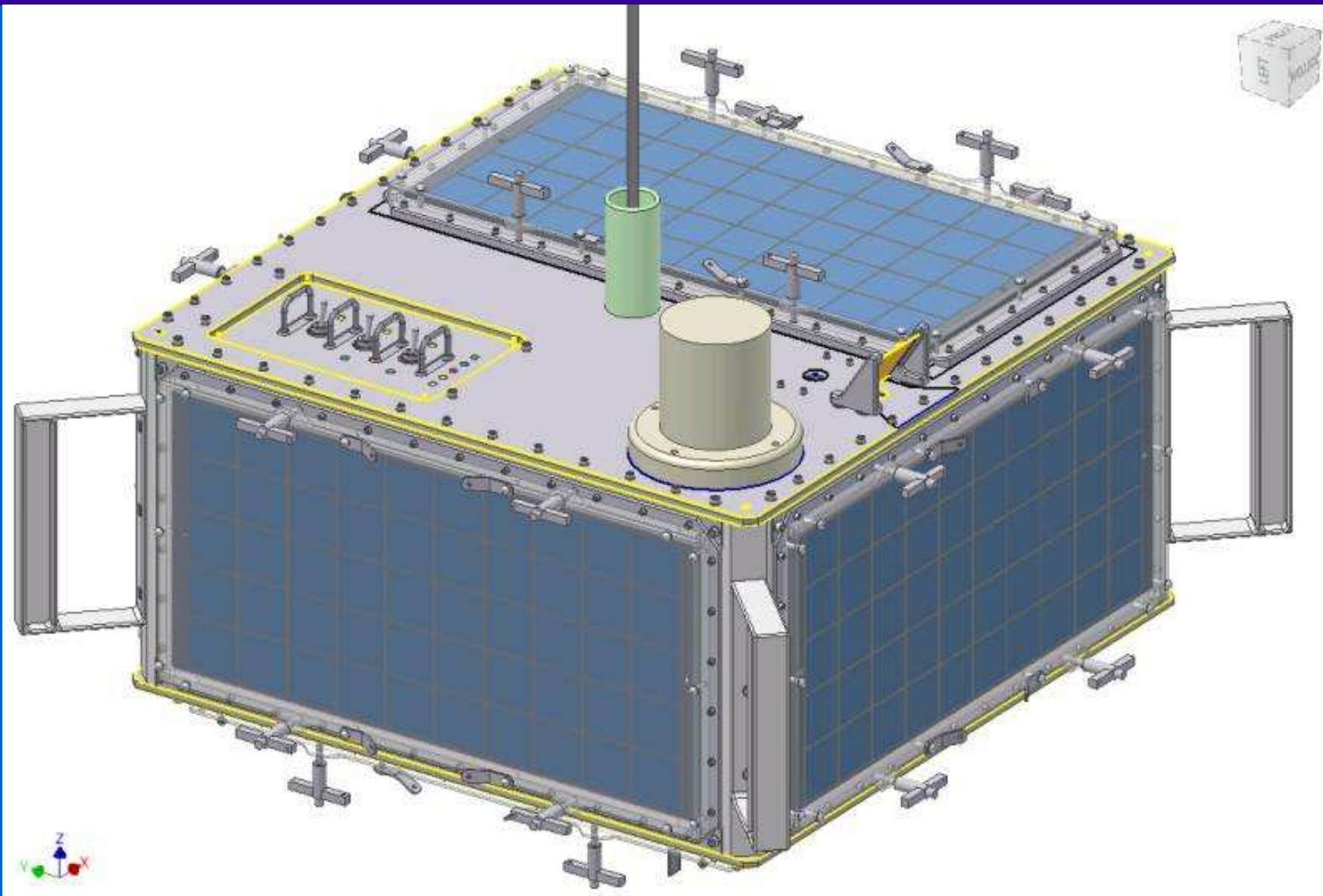


IHU Module

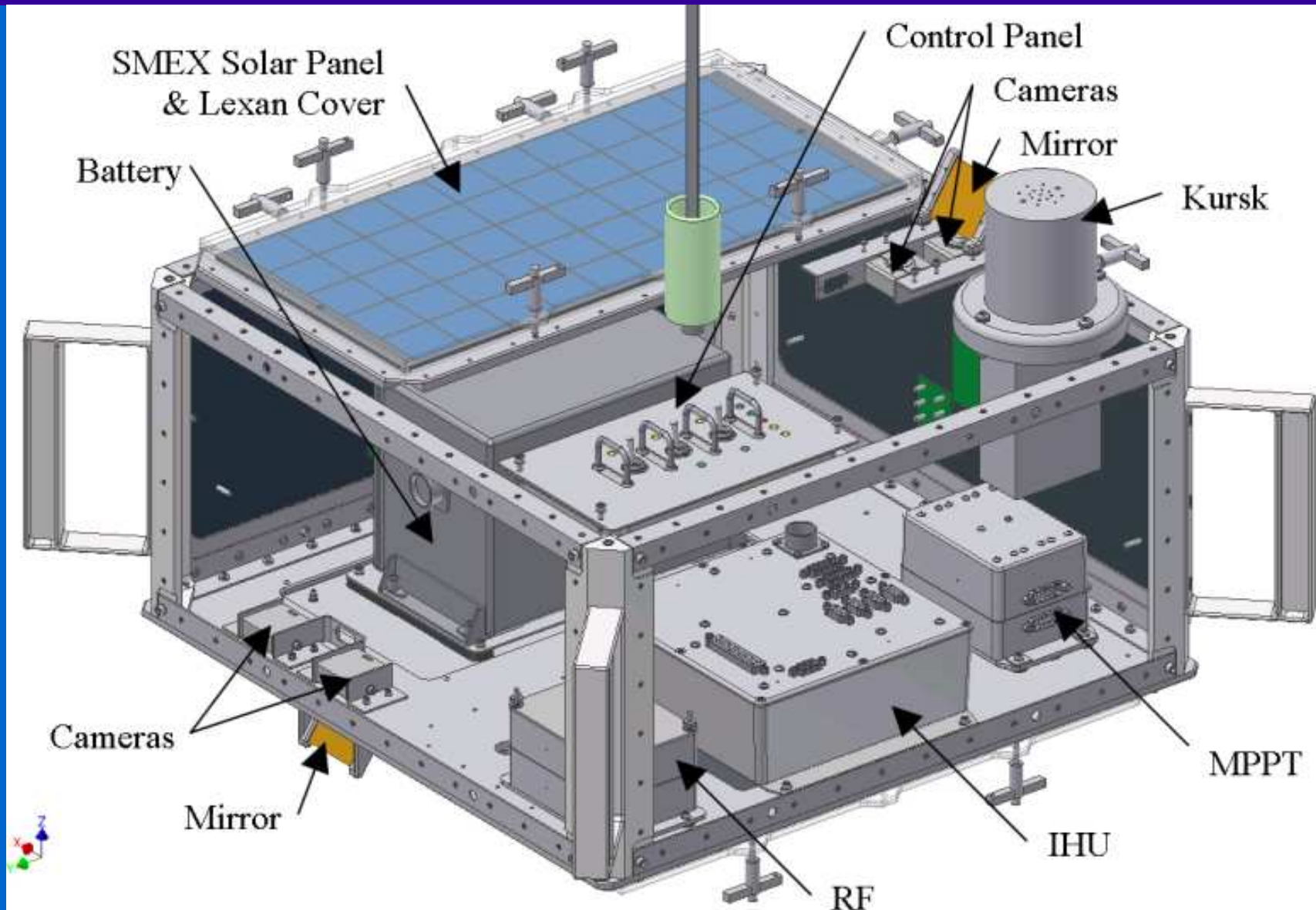
ARISSat-1 IHU Module Diagram



Space Frame

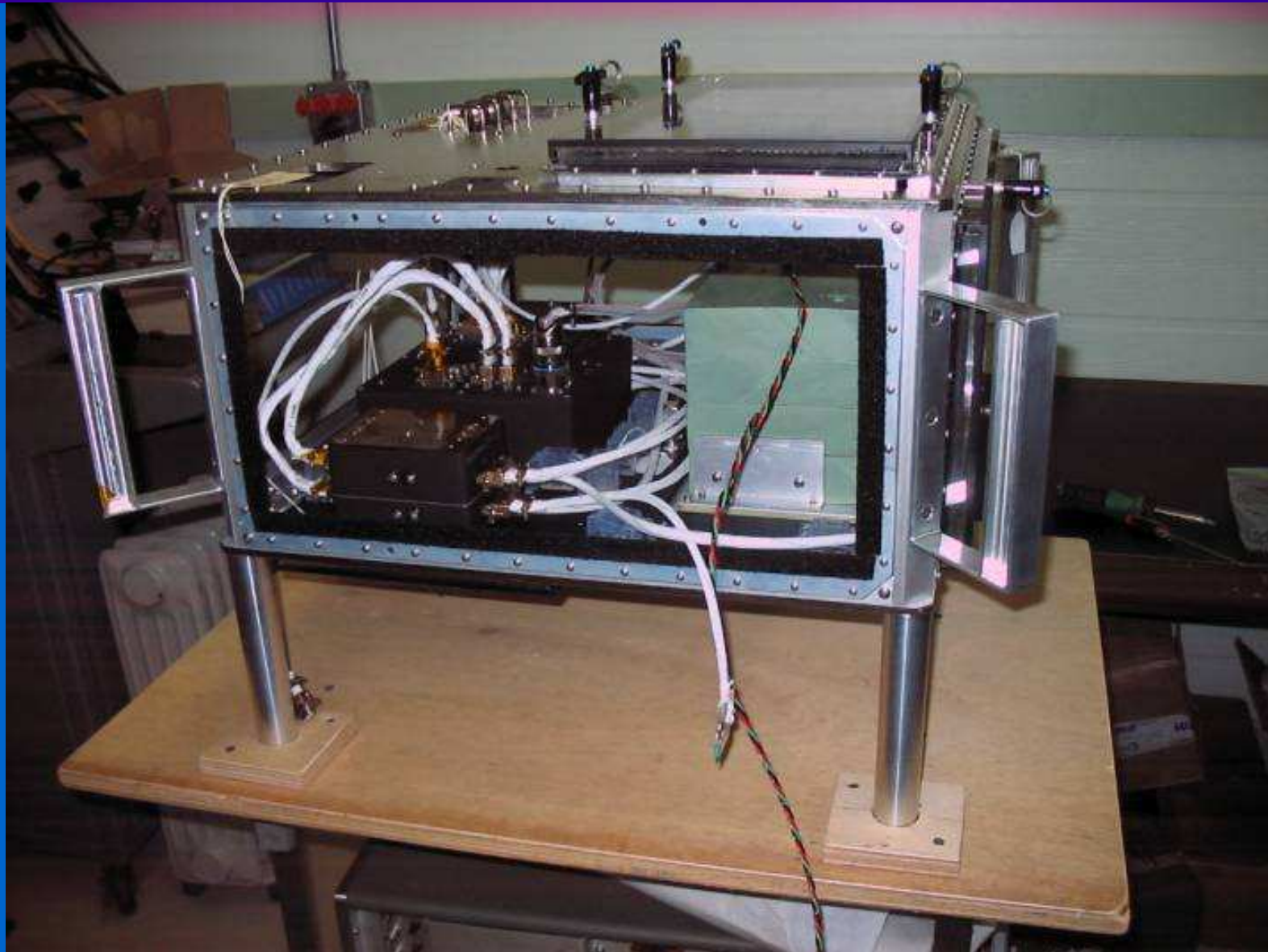


Space Frame Cutaway



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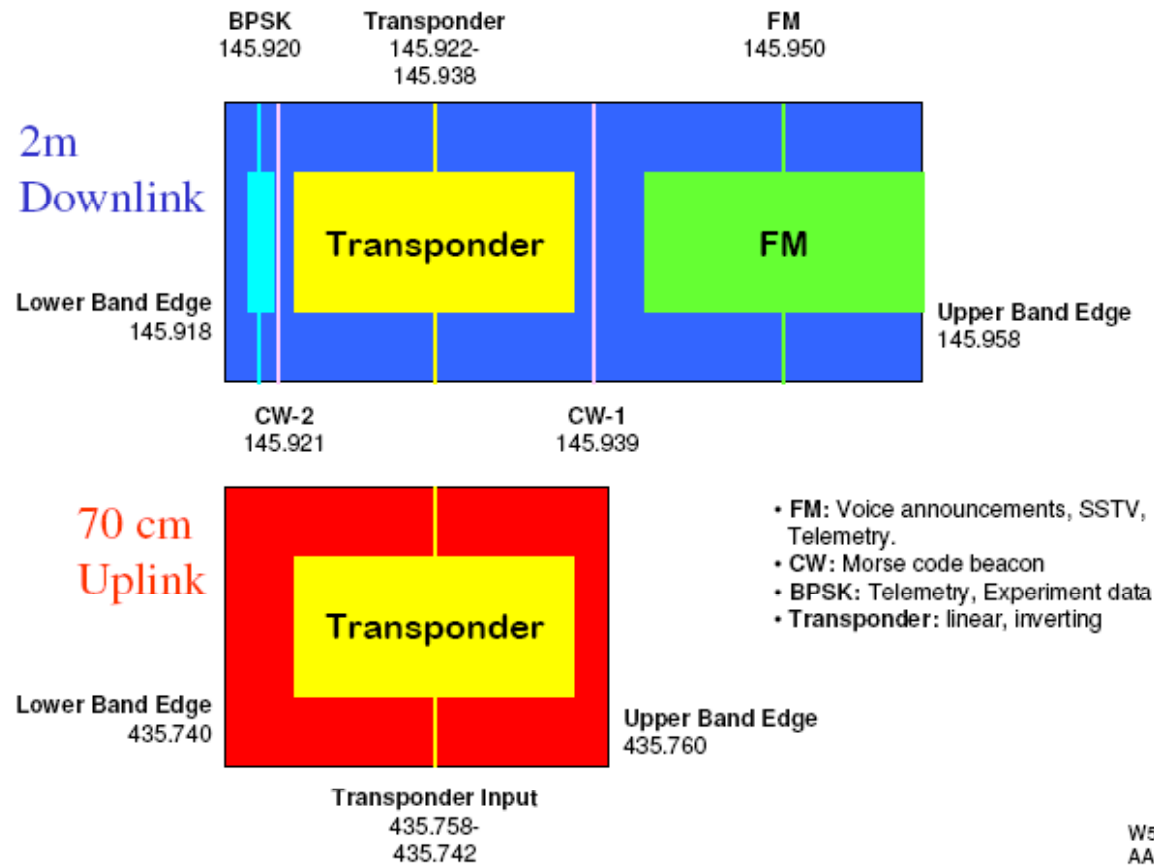
Flight Unit



RF Band Plan



ARISSat-1 Band Plan



W5DID
AA2TX
SEP-21-2009

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Transponder



- Mode U/V (70 cm Up, 2m Down)
- Linear
- Inverting (Tx LSB, Rx USB)
- 16 kHz bandwidth
- Can be worked with QRP transmitter and omni antennas

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Digital Beacon



- BPSK-1000 w/FEC by Phil Karn KA9Q
- Legacy mode 400 BPSK (P3 type)
- Telemetry Data
- Experiment Data
- PC/Mac demodulator & decoder software

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CW Beacon



- Call sign = RS01S
- CW Telemetry (subset)
- Call signs or names of developers
- CW1 or CW2 identifies BPSK mode

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FM Audio



- Call sign = RS01S
- Voice Telemetry (subset)
- SSTV video in Robot-36 format
- Voice Greetings

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Voice Greetings



- 24 different greetings
- Mostly children
- Special one from Yuri Gagarin
- Secret word
- 15 different languages

English	Spanish	Russian	French
Italian	Dutch	Swedish	Japanese
Chinese	Catalan	Bengali	Portuguese
Hebrew	Nepalese	German	

Cosmonaut Training - Video



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ARISSat-1 Launch



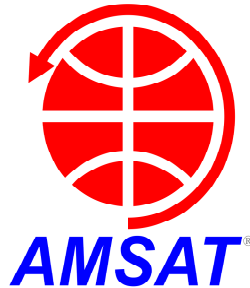
- Progress #41 launch to ISS scheduled for January 2011
- Deployment by cosmonauts from the ISS scheduled for February 2011
- Reentry in about 1 year

Any Questions?





Thank You!



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