



# NASA SpaceWire Status

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SpaceWire Working Group Meeting

ISAS/JAXA, Sagamihara, Japan  
*November 15-17, 2005*

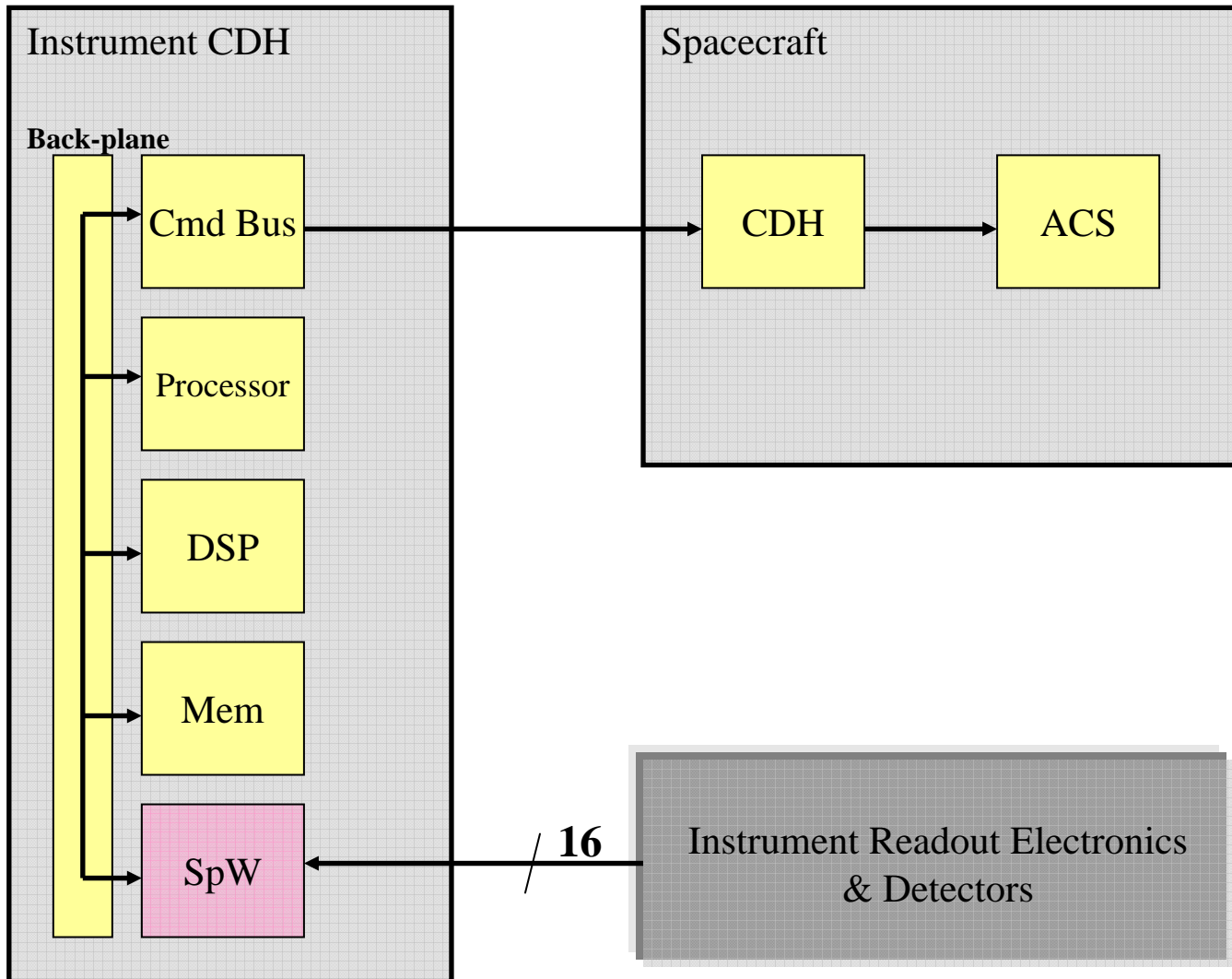
Presented by  
Glenn Rakow - NASA/GSFC

# Agenda

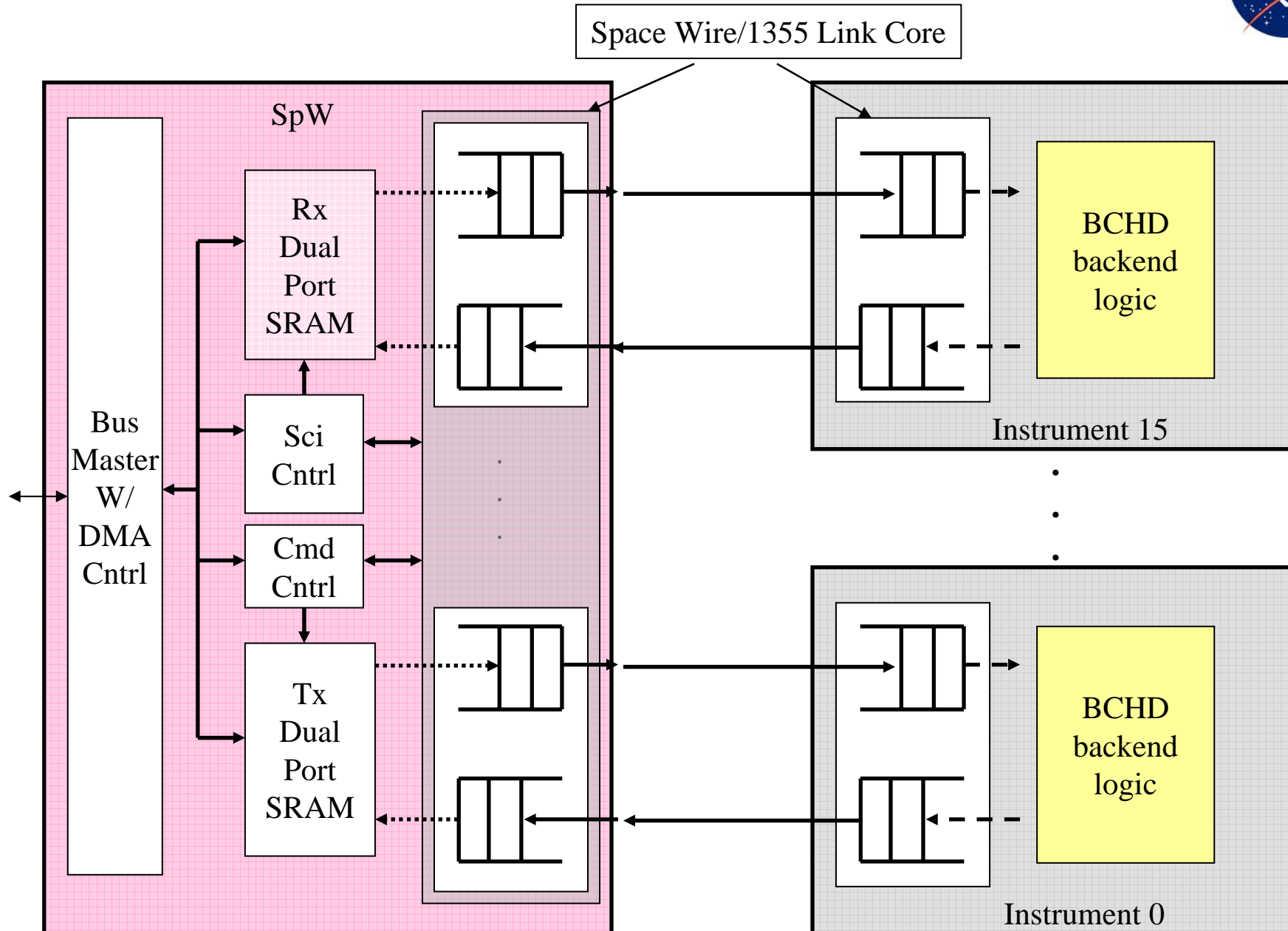


- Overview of some spacecraft architectures using SpW
- Protocol recommendations for standardization
- Improvements to standard

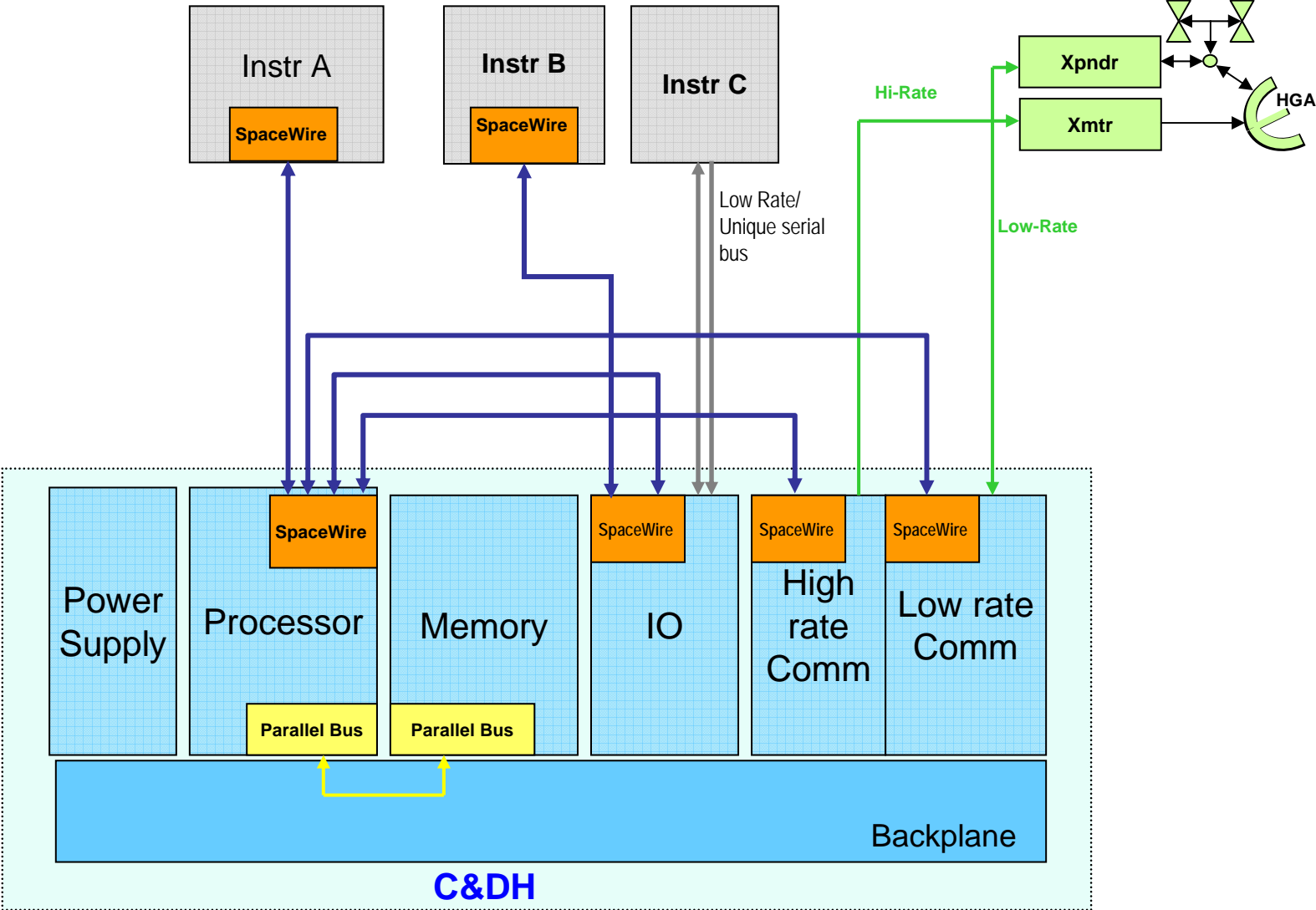
# Mission # 1 SpW Data Flow



# Mission # 1 SpW Architecture



# Mission # 2 SpW System Architecture



# Protocol Recommendations for Standardization



- **CCSDS is an international standard**
  - Recommend assigning it a protocol ID
- **MIL-STD-1553 exists in many architectures using SpW and should be considered as a candidate for a protocol over SpW**
  - Assumes alternate path for all destinations
  - Assumes ability to broadcast mode codes to all destinations
    - Present Time-Code definition does not have enough information to encode all mode codes
    - Consider expanding use of Time-Code to multiple bytes
      - Based upon Time-Code upper 2 reserved control bits
    - Sent mode code to all nodes in a sequential fashion and trigger by time-code
  - Suitable alternative for robotic missions
  - For man missions physical layer issues need to be resolved
    - Galvanic isolation (mostly for lower ESD susceptibility)
    - Connector ruggedness
  - Recommend to replace command & control functions
  - Science data needs another protocol to reduce overhead

# General Recommendations to Standard



- **Standard needs method to provide for validation of compliant interfaces**
  - Loop-back capability for stand-alone links (no routers)
    - Physical level
    - FIFO level
  - Ability to program links (codec) remotely
- **Recommendations for standard to include an interface circuit that allows the ability to monitor bus traffic without breaking harness configuration or modifying signal characteristics**