Bomber Modular Data Acquisition System Overview

419 FTS / 412 TW / 812 AITS
JT4 LLC Bomber Design Team
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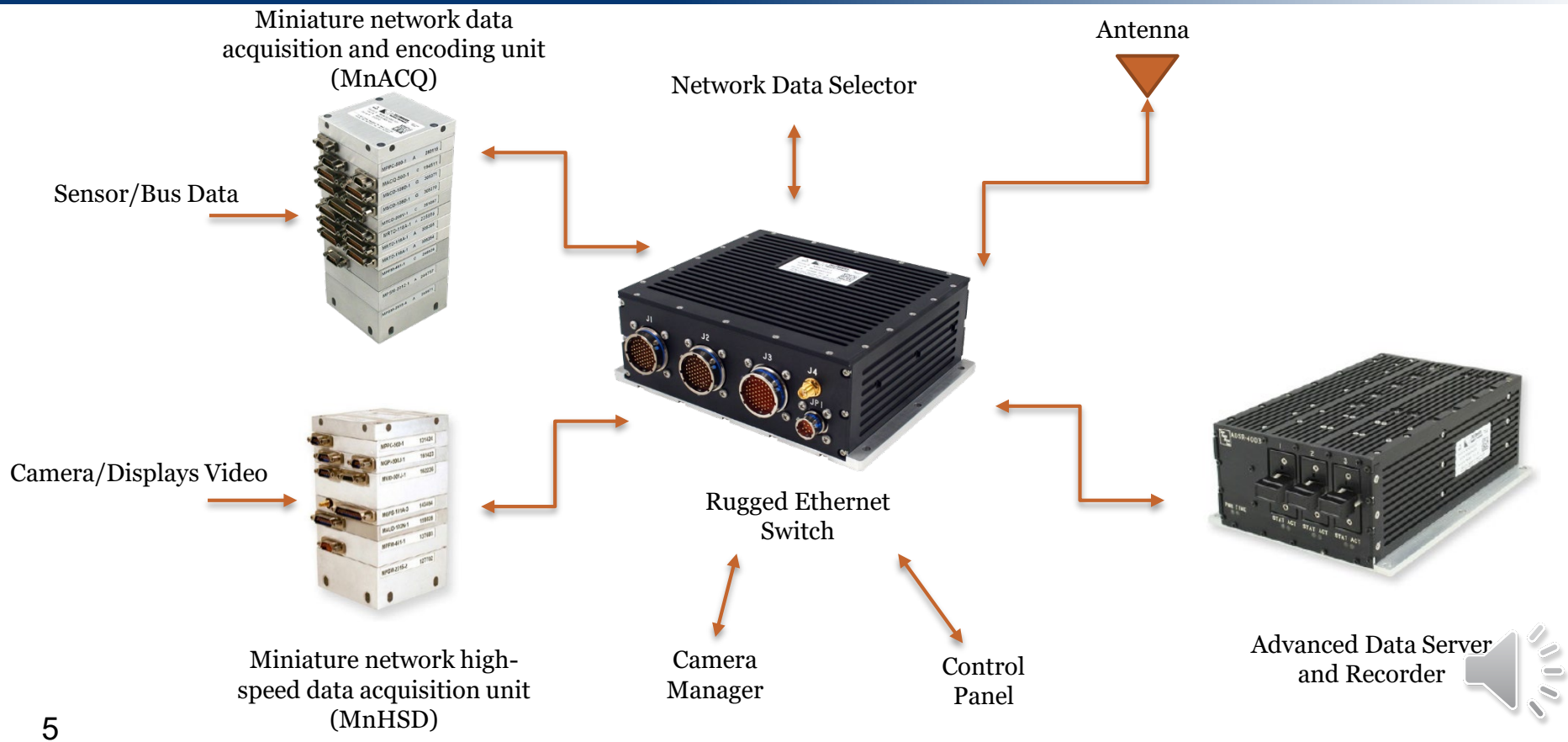
Presentation Agenda

- Design Requirements
- BMDAS Base
- BMDAS Modularity
- BMDAS Expandability
- Operations
- Future Efforts
- Challenges & Lessons Learned
- Successes and Benefits

Design Requirements

- Bomber Modular Data Acquisition System
  - Modular, Scalable, Reconfigurable
    - Reduce aircraft down time for mods
  - Gov’t Designed, Installed, and Maintained
    - Data Independence
  - Based on COTS Components
    - Fully Networked (Ethernet Based)

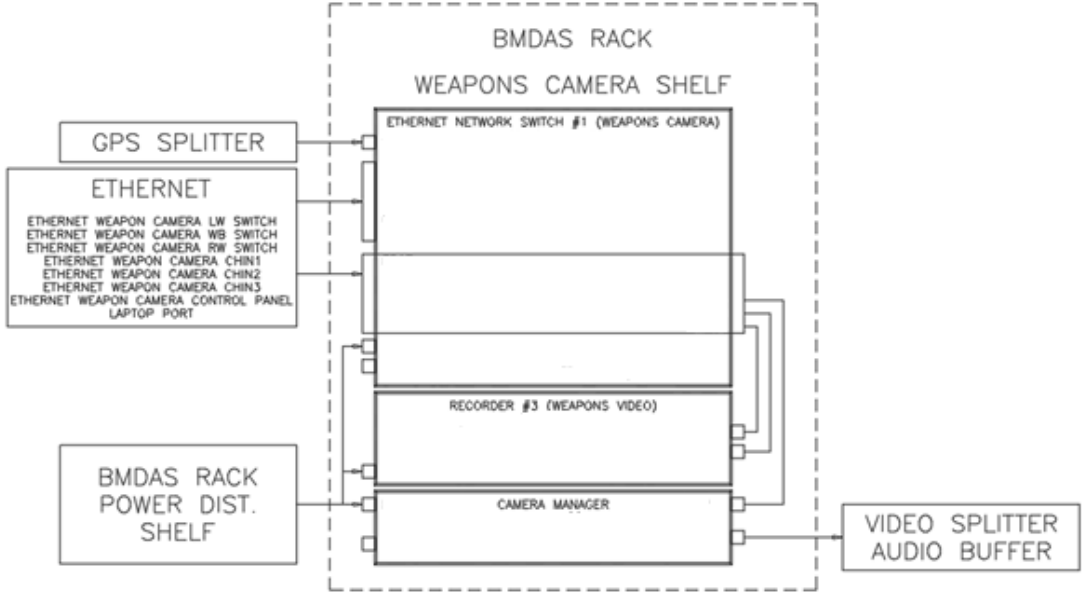
BMDAS Base (Electrical)



BMDAS Base (Mechanical)

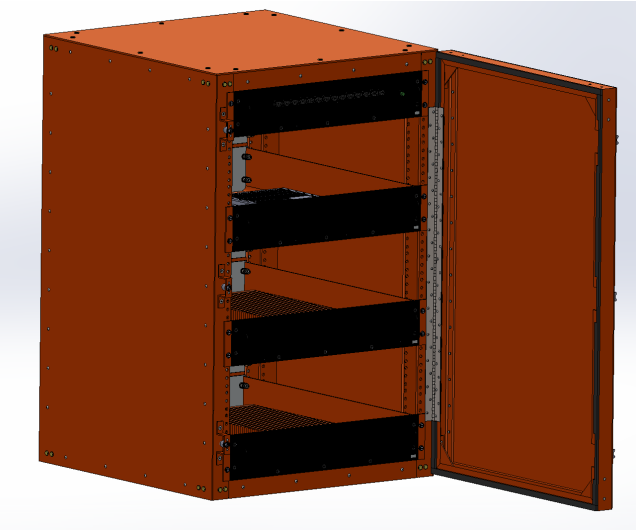
- EIA-310
  - Current/Future Design
  - Lab use
  - Pre-existing production mods
- ARINC 404A / DZUS
  - Interchangeability
  - Production mounting

BMDAS Modularity (Electrical)



- Standalone Subsystem
  - Location independent
  - Packaging independent
- Ethernet based system allows for more remote Data Acquisition Units
  - MnACQ in the Pylons
  - Power Junction Box and Ethernet Switch in the wings

BMDAS Modularity (Mechanical)



- Network Weapon Separation Camera to BMDAS
  - Rack upgrade
  - WSC Tray reutilization
- B-52 Network Weapon Separation Camera to B-1
  - Repackage Electrical to new mechanical

BMDAS Expandability (Electrical)

New Mod Data

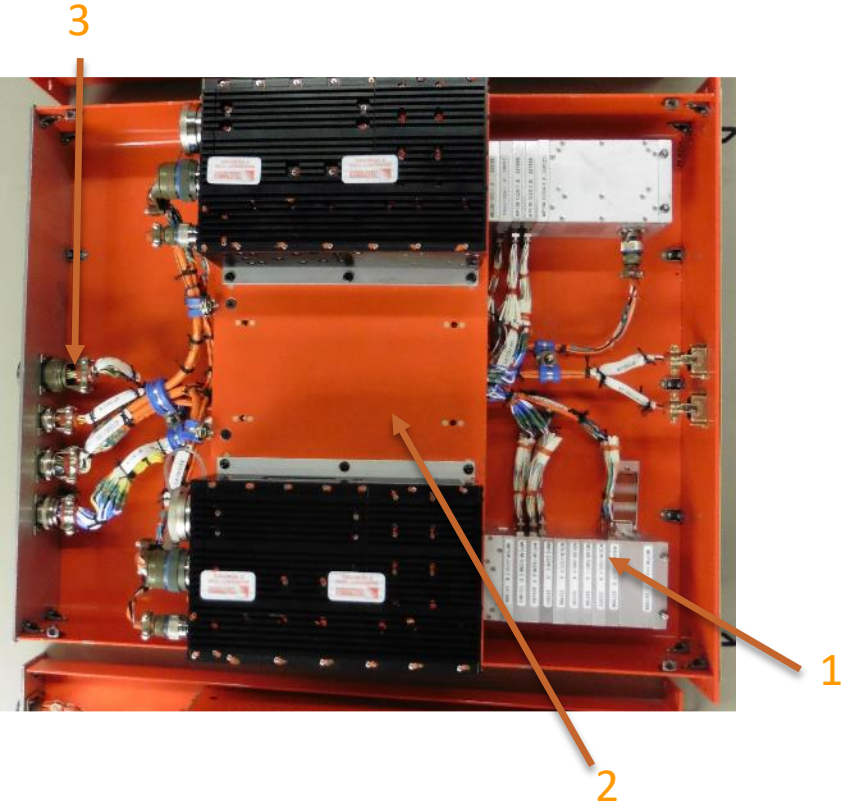
MnACQ

Rugged Ethernet Switch

New Instrumentation

Existing BMDAS

BMDAS Expandability (Mechanical)



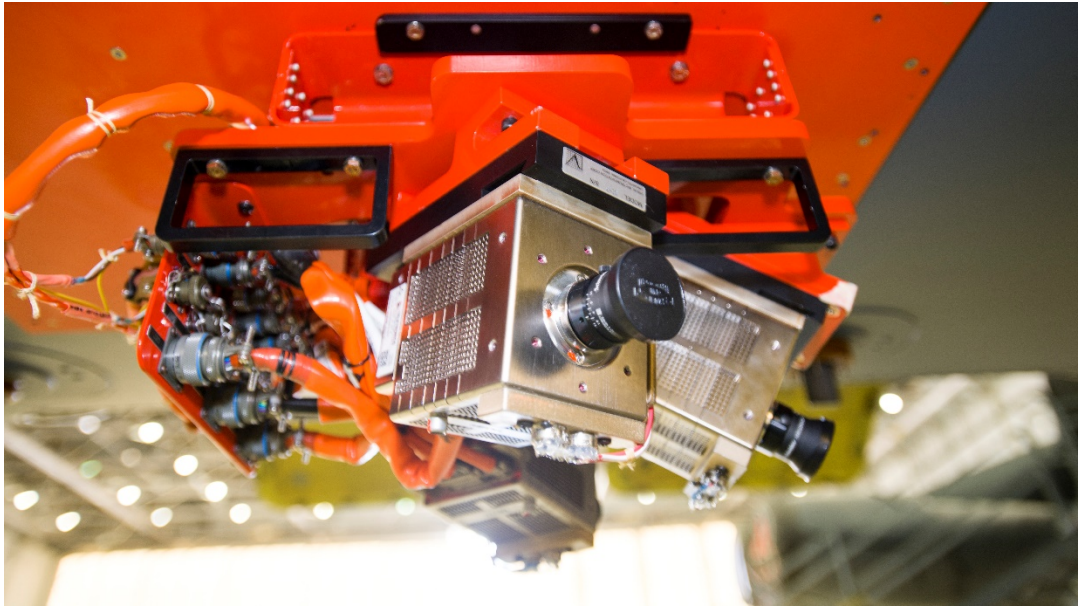
1. TTC Stacks
   - Multiple MDUMs (Dummy Module)
2. Provisioned for additional recorder
   - ADSR mounting Provisions
3. Connectors
   - Oversized for extra pins

BMDAS Operations (Customer)

- For the first time in bomber history at Edwards, real time video has been telemetered to the control room allowing them to watch live asset releases

- Test data can be delivered to customer the same day instead of 3-4 days
  - Used for troubleshooting
  - Increases operation tempo

BMDAS Operations (Internal)



- Modularity allows for ease of subsystem troubleshooting
- Network backbone allows for a single tapping point during ground test
- Compatibility with Lab
- Common Hardware
- Spare Shipset

Future Efforts

- Expansion BMDAS on next two aircraft
  - Increase maintainability
  - Expand Ethernet capability
- Use BMDAS as backbone for future projects
  - Radar Modernization Program (RMP)
  - Commercial Engine Replacement Program (CERP)
- Implement BMDAS on B-1 platform
  - Feasibility study

Challenges and Lessons Learned

- Balancing end user desires with scope creep impacts to cost and schedule
- Procurement supply chain issues for non COTS items
- Resource sharing and management with other projects
- Update trays as we go

Successes and Benefits

- Successfully integrated subsystems on multiple platforms
- Increased control room capability
- Drastically decreased time to get data/video to customers
- Provided an expandable and flexible backbone to build off of for future instrumentation needs

QUESTIONS???