



CRIS INSTRUMENTATION CAPABILITY ENHANCEMENTS

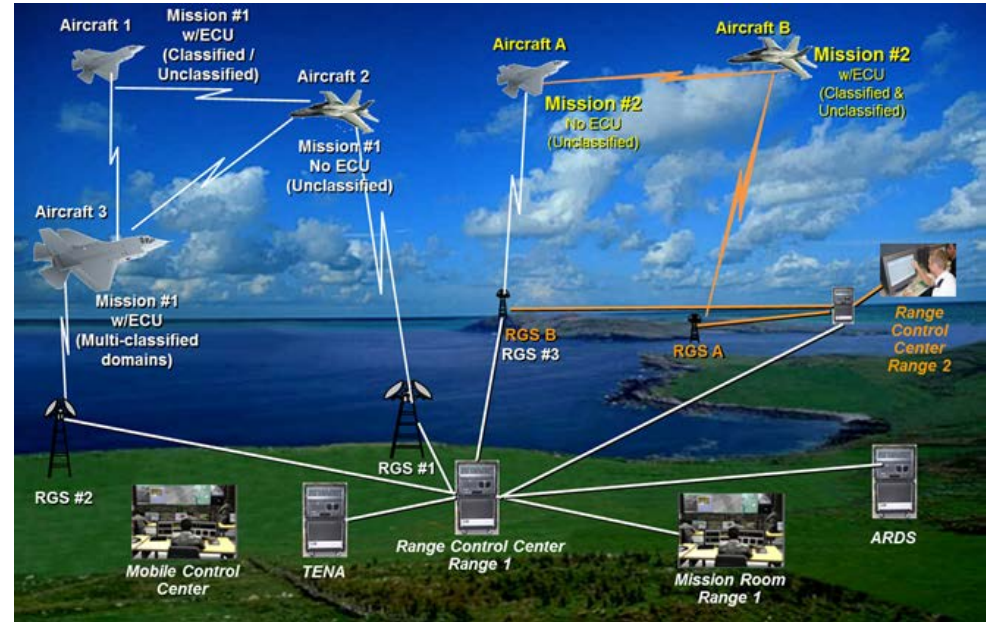
*EXTENDING CRIS FOR SPECTRUM NEEDS, RANGE
APPLICATIONS, AND LVC-ENABLED TEST AND TRAINING*

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CRIS INSTRUMENTATION OVERVIEW

DT/OT TEST PROJECTS
TYPE 1 DOD SECURE INSTRUMENTATION
FUTURE CAPABILITIES



WHAT IS CRIIS & WHERE IS CRIIS TODAY?

COMMON RANGE INTEGRATED INSTRUMENTATION SYSTEM (CRIIS)

CRIIS is a Test/Training Mission data collection toolset.

- MILS Secure Bi-Directional Telemetry
 - Built-in MILS, processing, mesh network, & high accuracy TSPI
 - MIL-STD-1553, JSF ASM F/C, Ethernet bus data available for TM and other test data (avionics, aircraft health/status, weapons targeting, weapons status, etc)
- Multiple form factors, multi-platform support
 - F-15, F-16, F/A-18, F-22, F-35, + ground equipment

CRIIS is deployed, fielded and in use.

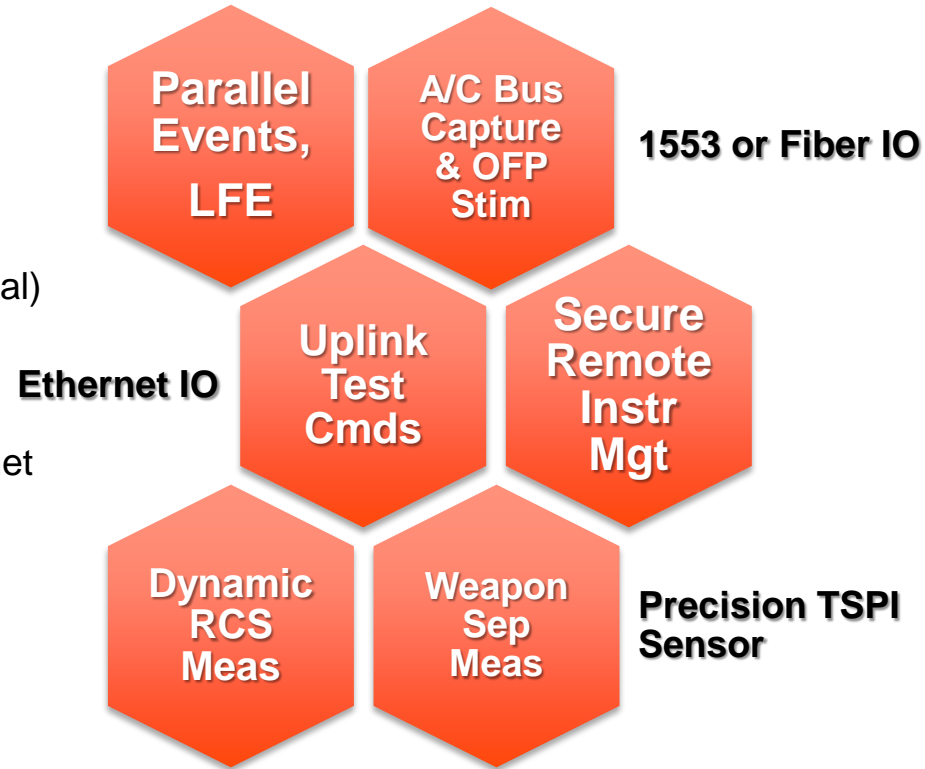
- Current Locations (US DoD):
 - Eglin, Edwards, & Nellis AFBs
 - NAS Patuxent River & Pt Mugu
 - NAWS China Lake
 - White Sands Missile Range
- Active DT/OT&E mission utilization
 - Includes Unclassified, System High, and MILS missions
- Leveraged in multiple complete and active LVC R&D efforts
 - USN ONR Live, Virtual and Constructive Training Fidelity BAA
 - USN TCTS Inc. II



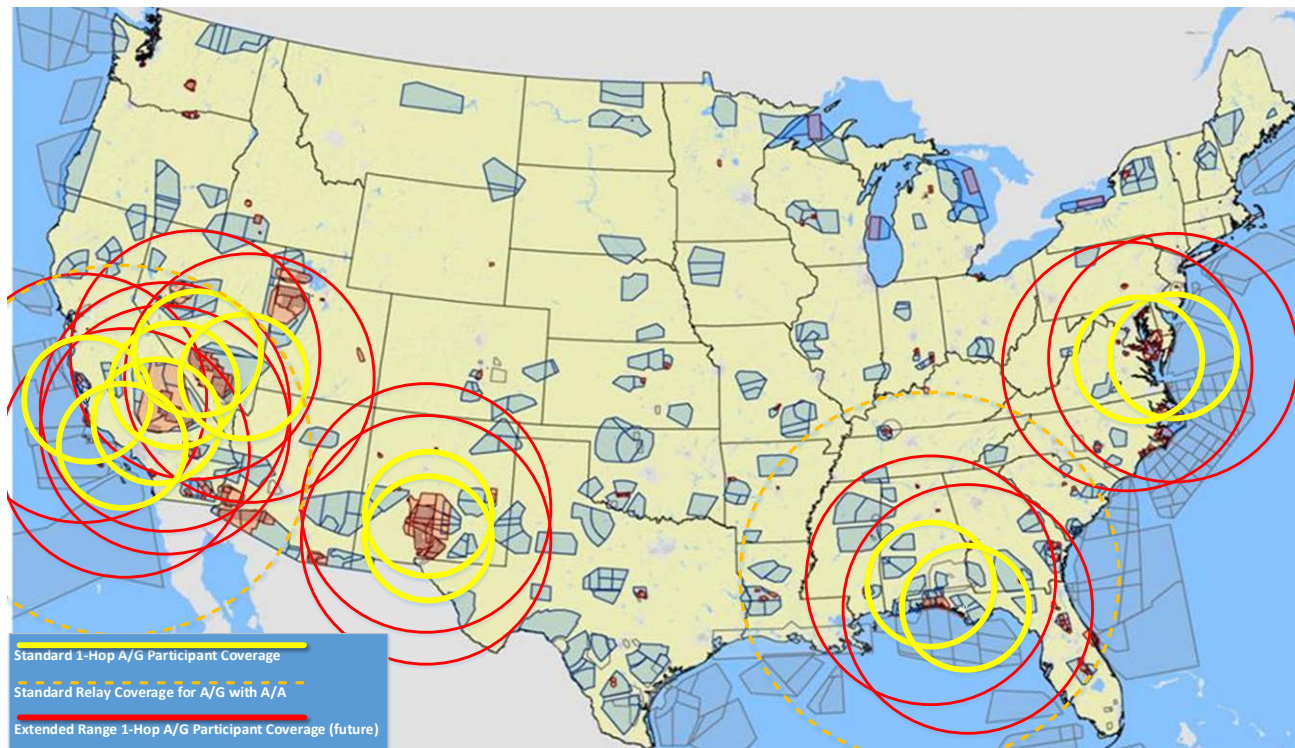
CURRENT CAPABILITY EXAMPLES

CRIIS: PROVEN, FIELDDED, & FLYING

- Status: Certified, Deployed, & In-Use
 - Lot-3 LRIP, In-production
 - Deployed and deploying on MRTFB ranges
- What CRIIS can do (*Highly Summarized*)
 - Traditional TSPI Tracking (ARDS, GAINR, et al)
 - Encrypted sub 1m GPS based TSPI
 - INS/GPS with RTK, GDGPS
 - GPS-Denied Mode
 - Processing, Uplink, Downlink to 1553, Ethernet
 - Weapons Bus & Mission Data Collection
 - Proven LVC enablement (remote simulations)
 - Cmd/Ctrl of external instrumentation gear
 - Government / Industry standards I/Fs
 - Data gateways for TENA, ARDS, et al
 - Distributed Operations



SAMPLE CRIIS COVERAGE-DOD RANGES AIRSPACE



- Pax
- Eglin
- WSMR
- NTTR
- China Lake
- Pt. Mugu
- *Not all ground stations shown*

CRIIS UPDATES: ONGOING

CONTINUED RMF SECURITY POSTURE AND USER I/F ENHANCEMENTS

Upgraded Security Controls

- Quarterly updates to fielded systems to meet RMF mandates & maintain ATO(s)

Upgraded Planning Tools:

Guard Policy Designer & Visualization Tool

- Planning Visibility
- Operational Visibility
- Quick Turn Project-specific Policies and Flows

CRIIS UPDATES: ONGOING, 1-3 YEARS OUT

JOINT SECURE ACMI/ACT SYSTEM (JSAS) PRODUCT LINE TECHNOLOGY INSERTIONS

Updated DLT HW & SW

- SW includes **QoS** data services updates and Range-less/**Autonomous** Operations
- HW **adds S-band** (2200-2400) frequency ops in addition to L-band (1350-1450;1780-1850)

Updated Ground SW

- **Streamlined pre-mission MILS planning** flows
- Transition to **Linux OS** for all SW (minimizes OS & RMF churn)
- Additional data management functions
 - More gateways (DIS/HLA)
 - Better recorder management

Updated Airborne Configurations with **embedded high performance GPP**

- Enables additional processing capability for user applications and/or weapon sim/stim
- FACE Conformant SW environment to enable re-hosting and new 3rd Party developed applications

CRIIS UPDATES: 1-3 YEARS OUT

FULL-FUNCTION DLT (REPLACE ARDS DATALINK WITH CRIIS DATALINK)

Full-Function DLT (CRIIS HT-DLT/FF)

- Brings legacy instrumentation sources (ARDS, et al) into CRIIS network
- More platforms and sensors in single CRIIS Net
 - Hybrid packages using HT-DLT with external Ethernet or SDLC port
 - TSPI and A/C instrumentation collection using “Msg Proc” API
 - Type 3 encrypted data coverage

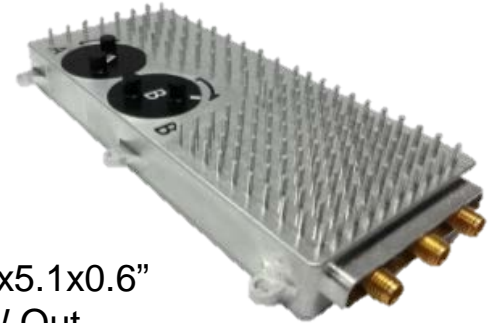


CRIIS UPDATES: 1-3 YEARS OUT

LOW COST CRIIS DLT NODE FOR ATTRITABLE/EXPENDABLE USAGE

Attritable / Expendable Participants

- Small form factor CRIIS RF Node for Air or Ground assets
 - Use case is similar to FFDLT, but with instrumented targets or units potentially in harms way
 - TSPI Tracking
 - “Message Processor” API for TSPI & other Range payloads
 - Unclass/encrypted bus, discrete, state xfer
 - Type 3 security coverage



ExDLT:

- 2.25x5.1x0.6”
- 2.5W Out

CRIIS UPDATES: 1-3 YEARS OUT

MOBILE “RANGE IN A BOX” CRIIS

Mobile Mini-CRIIS Range

- Unclassified but Encrypted, or US Classified
- Transportable: Load racks per project needs
 - Pre/Post/Live Mission Rack + DLC
 - Supports RF cases/towers as needed (0, 1 to #)
 - Works with all variants of CRIIS participants

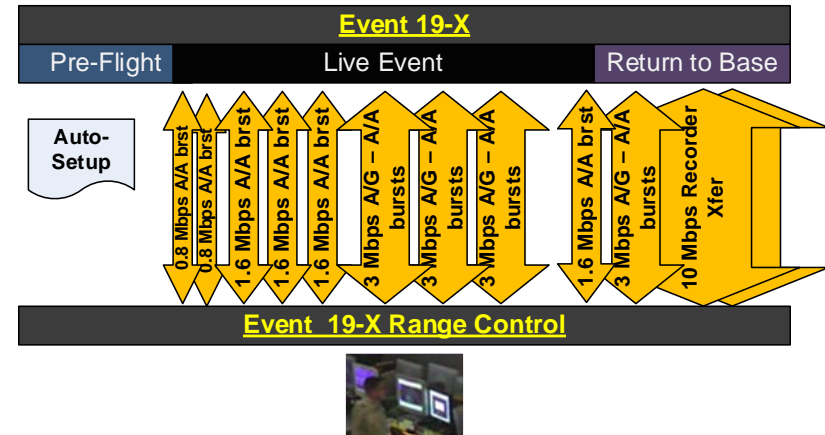
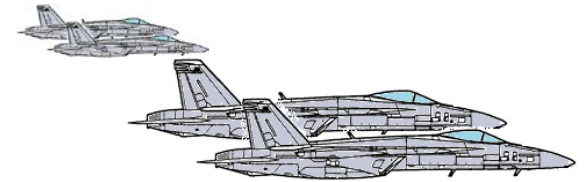
Supports off-range, deployable missions or temporary CRIIS range setups



CRIIS UPDATES: 1-3 YEARS OUT

ADDITIONAL DATALINK RATES, MODES, & WAVEFORMS

- Variable Datalink Rates, Blended Mesh Network
 - “Half-Pack” for extended range or low-power-emitters at double distance
 - Wideband rates for heavy instrumentation loads on single or multiple aircraft
 - New Uplink, Downlink Services for greater flexibility
 - Build on existing secure IP Instrumentation Network
 - Bulk Xfer for Imagery,
 - User Host UDP/FTP instrumentation,
 - Bulk Recorder download to pull data from “visiting players”



CRIIS: LVC NETWORK-ENABLED TEST & TRAINING

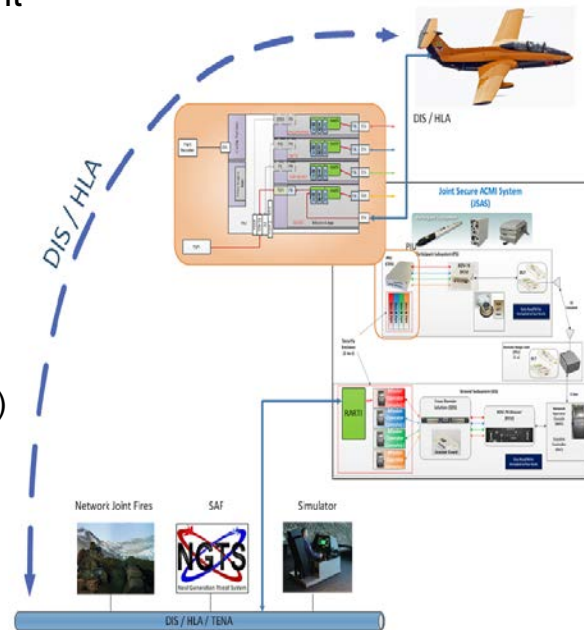
PRODUCTION OPEN SYSTEMS ARCHITECTURE ENABLING LVC FOR DT/OT & TRAINING

Advanced Technology Demonstrations, Development, and Deployment

- Industry & Government-standard protocols via secure MILS net
- Complex, real-time demonstrations & operations
- Simulation of sensitive capabilities

Built-in Extensions to support more complex environments

- Create complex blended live-synthetic environments
 - Dynamic, interactive threats
 - Distributed operations (full kill chain)
 - Complex ECE environments (weapons/threats + red/blue/gray CGF/SAF)
- Utilize LVC functionality for complex SoS testing:
 - Adaptive testing without risking vehicles
 - Failure testing of GPS/data/comm channels
 - Synthetic effects testing via LVC (e.g. A2AD)



Networked Test Env + LVC is powerful and extensible

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QUESTIONS?