

UNCLASSIFIED



Interoperability Testing & System Certification

Joint Interoperability Test Command

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Overview



- DoD Directives & Policy (Certification)
- System Certification Process
- Testing Data Links toward Interoperability



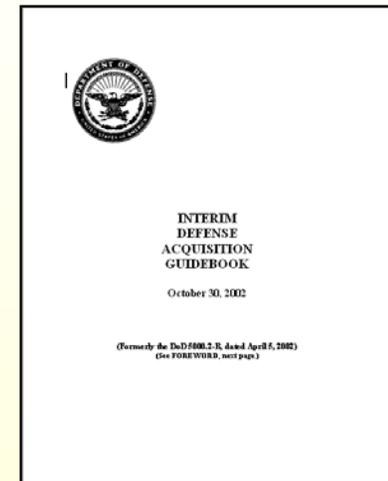
Interim 5000.2 Guidance



Dated Oct 30, 2002

Applies to:

- All DoD MDAPs
- Programs on OSD T&E Oversight list
- Post-acquisition (legacy) systems
- All programs & systems that interoperate with them



“All acquisition programs shall satisfactorily address interoperability and integration. Users shall specify, and the appropriate authority shall validate, thresholds and objectives during the requirements generation process.”

JITC shall provide system interoperability test certification memoranda to the Director, Joint Staff J-6, throughout the system life-cycle and regardless of acquisition category.

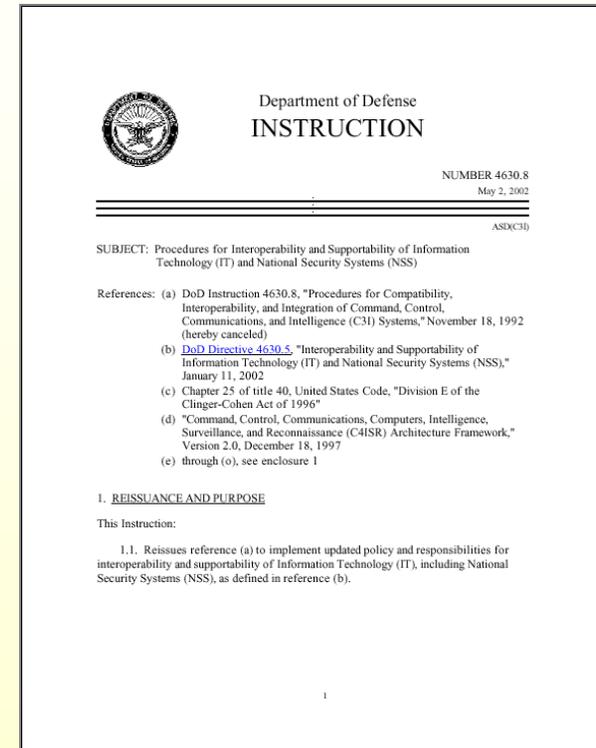


DoDI 4630.8

Interoperability Requirement



- Interoperability **KPP shall be defined** during the requirements definition and validation process.
- Certification shall be successfully completed prior to fielding.
- Heads of DoD Components shall ... submit to DISA (JITC) for certification, those systems acquired or modified through non-ACAT acquisitions or procurements (ACTD, C2IP, etc) ... and fielded systems when modified with changes to requirements, interfacing systems or supportability.





CJCSI 6212.01B

Test/Certification Guidance



- DISA (JITC) evaluates interoperability in the **most operational realistic environment possible.**
- ...determine if the system conforms to applicable standards
- ...data collected is adequate for evaluating interoperability issues.
- **Interoperability for each system will be based on testing the Interoperability KPP.**
- Typically the threshold criterion for the interoperability KPP will be 100 percent (KPP = 100% Top Level Critical IERs)



CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

J-6

DISTRIBUTION: A, B, C, J

CJCSI 6212.01B

8 May 2000

INTEROPERABILITY AND SUPPORTABILITY OF NATIONAL SECURITY
SYSTEMS, AND INFORMATION TECHNOLOGY SYSTEMS

References: See Enclosure F

1. Purpose. This instruction:

- Establishes policies and procedures for the J-6 interoperability requirements certification of mission need statements (MNSs), Capstone Requirements Documents (CRDs), and operational requirements documents (ORDs) required by reference a.
- Details a methodology to develop interoperability key performance parameters (KPPs) derived from a set of top-level information exchange requirements (IERs) as required by reference a and based on the format and content of the integrated architecture products described in the C4ISR Architecture Framework (reference b).
- Establishes policies and procedures for the J-6 supportability certification of command, control, communications, computers, and intelligence (C4I) support plans (C4ISPs).
- Establishes policies and procedures for the J-6 interoperability system validation.

2. Cancellation. CJCSI 6212.01A, 30 June 1995, "Compatibility, Interoperability, and Integration of Command, Control, Communications, Computers, and Intelligence Systems," is canceled.

3. Applicability

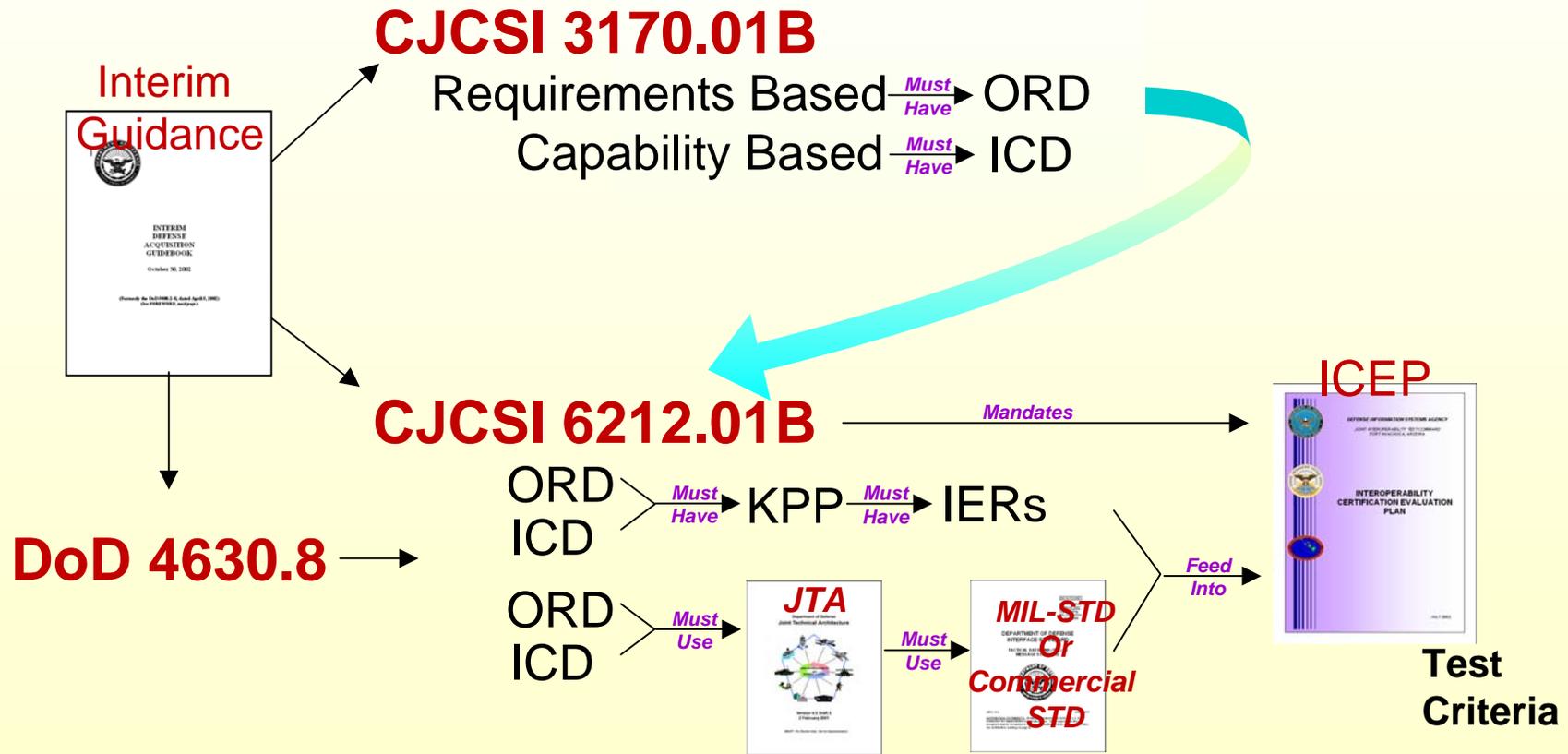
- This instruction applies to the Joint Staff, Services, unified commands, and those DOD field activities and Defense agencies



Certification Testing Walkthrough



New Acquisition Guidance



“Interoperability for each system will be based on testing the interoperability **KPP**.”



Interoperability Testing Precepts



- Conduct system level certifications
- Test to Joint Staff certified requirements
- Provide operationally realistic and affordable testing
- Support legacy as well as traditional and non traditional acquisitions
- Document incremental system progress toward certification
- Use ICEP as system certification vehicle where applicable



Certification



KPP & IERs To Test Metrics

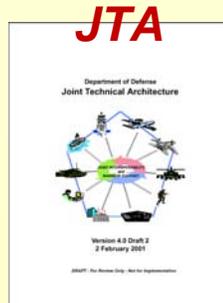


- Interoperability Key Performance Parameter (KPP).

Key Performance Parameter	Threshold and Objective
Interoperability	Accomplishment of all critical top-level IERs (T) Accomplishment of all IERs (O)

- Information Exchange Requirements

1	2	3	4	5
UJTL	EVENT	INFORMATION CHARACTER	SENDING NODE	RECEIVING NODE
OP 2.2.5 Collect Target Information	Acquire info that supports the detection, ID, and location of enemy targets.	Situation Awareness. Target ID, Target Location, Target Track Updates	Strategic/operational/tactical sensors	Operational/tactical C2 nodes and sensors
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What does this mean for Testers
ie: Test Criteria



Categories & Environments



Categories

1. Standards Conformance

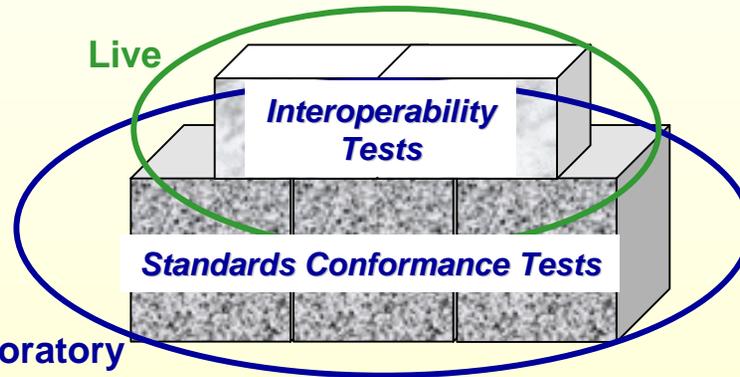
Standards conformance is the ability to adhere to rules contained in the applicable Military Standards (MIL-STDs) is tested in both environments.

2. Integrated Interoperability

Ensure that system effectively exchanges information with joint participants in both environments.

Note: MIL-STDs provide a necessary building block for ensuring interoperability, but are not sufficient to ensure that systems are interoperable in a joint environment.

Certification



Building Block Approach

Environments

1. Laboratory/HWIL

Comprehensive data collection for multiple tests under controlled conditions. Can include realistic loads and Hardware In The Loop. Test asset availability provides a representative sample of joint service participation.

2. Live Exercise/OT Event

Tests ability to effectively exchange information with joint participants in an exercise or test environment with conditions as realistic as possible. Ensures end-to-end interoperability (after component integration) to assure total system interoperability effectiveness

Tests are conducted in both environments to address both categories of interoperability



Test Metric Development



CJCSI 3170.01B **CJCSI 6212.01B**

"Standards conformance testing, as well as interoperability interface testing, will be planned and conducted."

"JITC evaluates interoperability in the most operational realistic environment possible."



IER Table

IERs	Sending Node	Receiving Node

Extracted from ORD or C4ISP

Who

Sub-Systems/Interfaces

Sub-Systems	

This table is derived from coordination with the Program Office

What

Test Criteria

IERs	Sub-Systems	Categories	Environments	Test Metrics

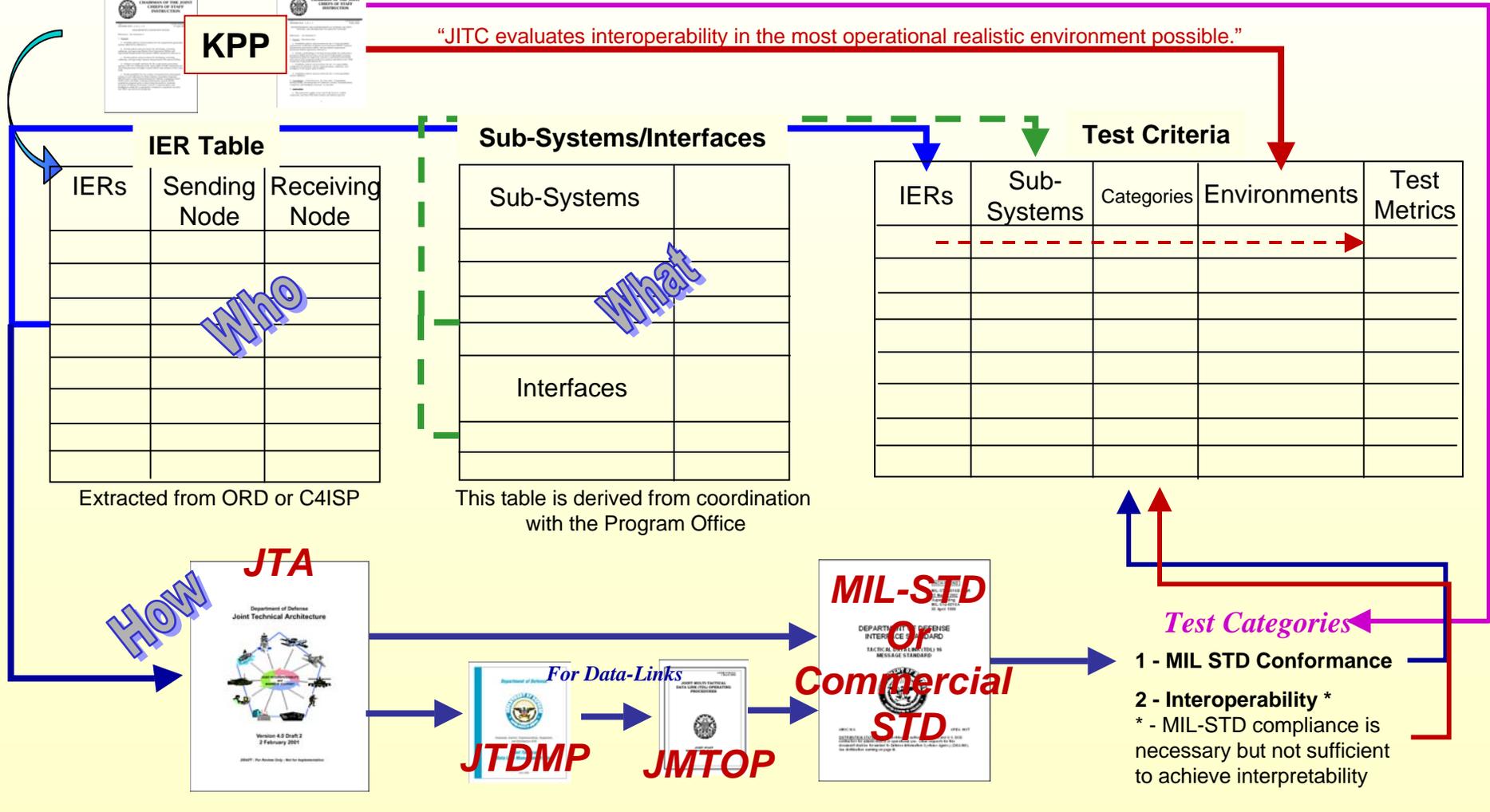


How



Or Commercial STD

- Test Categories**
- 1 - MIL STD Conformance
 - 2 - Interoperability *
- * - MIL-STD compliance is necessary but not sufficient to achieve interpretability

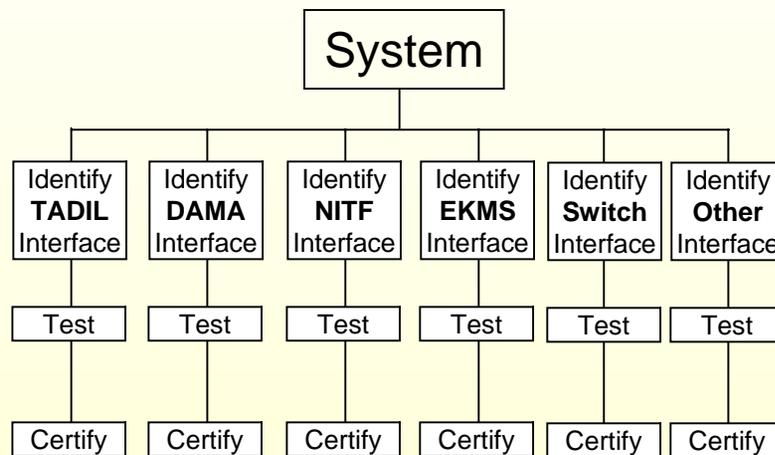




System Certification Process



Previous Process



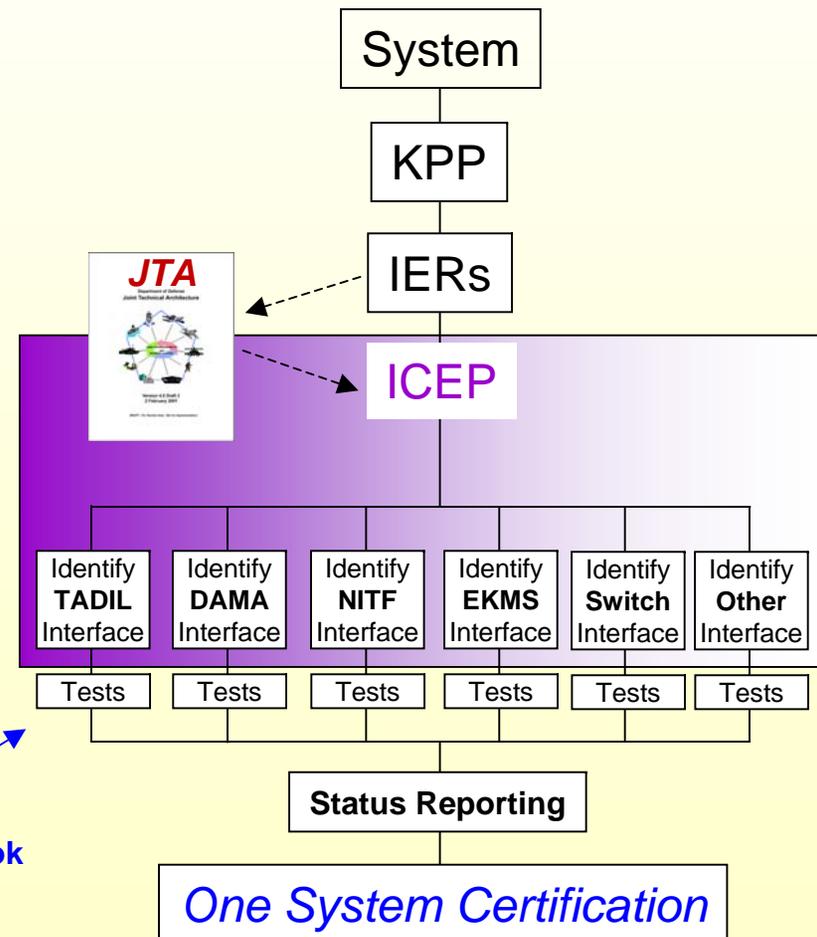
Multiple Certifications (one for each test)

- Potential for program to show valid certification despite remaining test interfaces.

- Difficult to know when system is done.

Multiple test venues
Ensures more thorough look to ensure interoperability

System Approach Model



One System Certification



Tactical Data-Link Testing



	<u>Focus</u>	<u>Venues</u>
Standards Conformance →	T/R Rules Content Format	→ Service Level Testing DT Events
Joint HWILT →	Joint Systems Network Loads Information Accuracy Operational Architecture	→ Joint Testing Experiments
Live Event →	Live Operators/Systems Operational Environment Interference & Integration	→ OT Events Exercises



Status Reporting



- Standards Conformance Certified (CJCSI 6212 & Mil Std)
 - Specified Interface Certification (CJCSI 6212.01C)
 - System Certified (CJCSI 6212)
 - Not Certified (CJCSI 6212)
-
- Interoperability Assessment



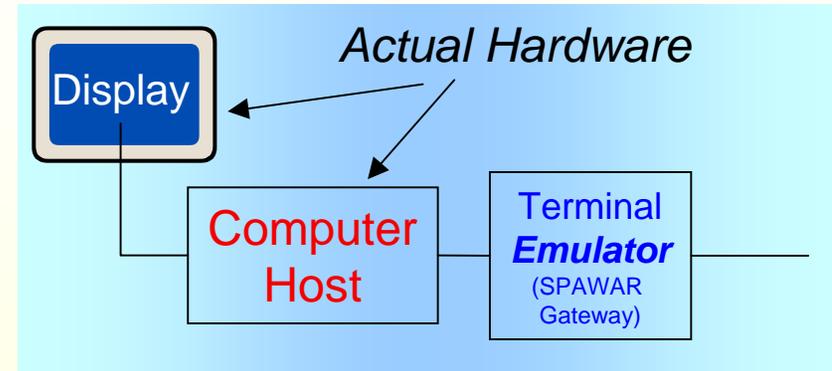
Data-Link Test



Current JIT Limitations



- Hardware does not include entire data path.
- Limited testing of:
 - Correlation
 - Data Registration
 - Reporting Responsibility Shifts
 - Network Loading
 - Accuracy
- Less than operationally realistic scenarios, and equipment lay down to represent operational architectures
- Single interface focused
 - TADIL/TIBS/VMF/USMTF
 - Not - 1553, X.25, Serial, Socket, Satellite



Current data and analysis available as a result of JITs is necessary but not sufficient in and of itself to determine interface or system interoperability

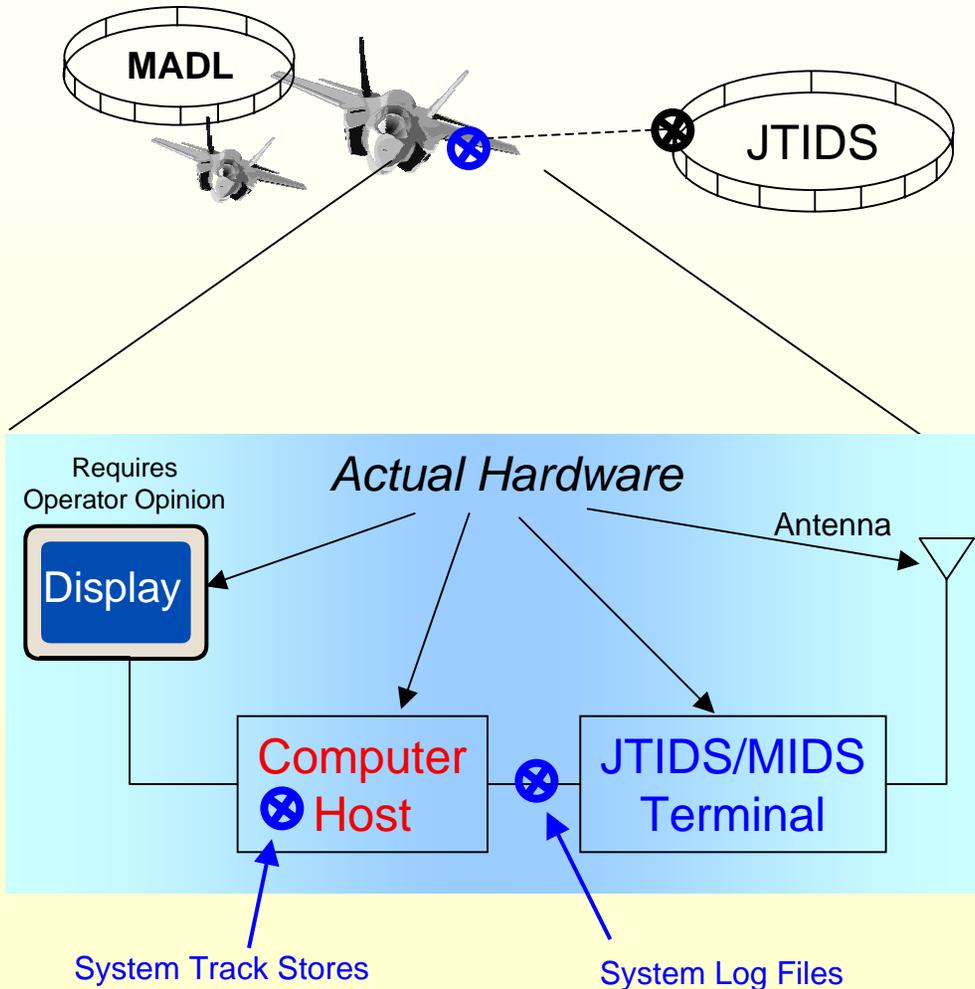


Tactical Data Link Distributed Network





Live Data-Link Test Data Collection



2 Types of Internal Data Files

Computer Host – Creates & Formats messages. Decides what messages to process & display. Prioritizes messages to go to display and terminal.

JTIDS/MIDS Terminal – Includes Crypto, Frequency Hopping, Basic network entry & management functionality. Prioritizes messages prior to transmission.

What & when you thought you sent, is not necessarily what & when you sent it.



Summary



- Interoperability requirements must be defined and validated by Joint Staff.
- System Level Test Certifications will be based on the capability of the system to meet validated requirements.
- Incremental system progress provided in interoperability assessment or certification letters.
- Tactical Data-Link testing is evolving to ensure interoperability (entire data path).
 - Operationally Realistic & Affordable



Questions