



# CENTRAL TECHNICAL SUPPORT FACILITY

"WHERE IT  
ALL COMES  
TOGETHER"

## CAPABILITIES BRIEFING





# Central Technical Support Facility



*“... it is the synergy of being collocated that speeds cycle time and allows for near real time solution finding and problem fixing. I’m also very encouraged by your increasing capability to work issues “virtually” via teleconference, FTP, and automated updates. **You are not only challenging the way we’ll fight and sustain, but the way we even think about it.”***

18 February 2003, BG Michael R. Mazzucchi, PEO C3T



# Central Technical Support Facility



**Presented by**

**Bob Kidwell  
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CTSF Test Cell  
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# Central Technical Support Facility



## AGENDA

- **Who (and What) We Are**
- **What We Do (and How we do it)**
- **Test Accomplishments**
- **Conclusion**



# Central Technical Support Facility

## Mission

To rapidly develop, field, and support leading edge, survivable, secure and interoperable tactical, theater and strategic command, control and communications systems



- Provide System of Systems Integration Testing, Configuration Management, and Field Engineering to Army Digitized (ABCS 6.X) and **BCS Warfighting Units**
- **Execute OEF/OIF Command & Control Validation Facility**
- **Execute C4ISR Intra-Army Interoperability Certification**
- **Execute Material Fielding Exceptions (Non-DAMPL Fieldings)**
- Provide Field Engineering Support for all ABCS-based Training and **Real World Events**

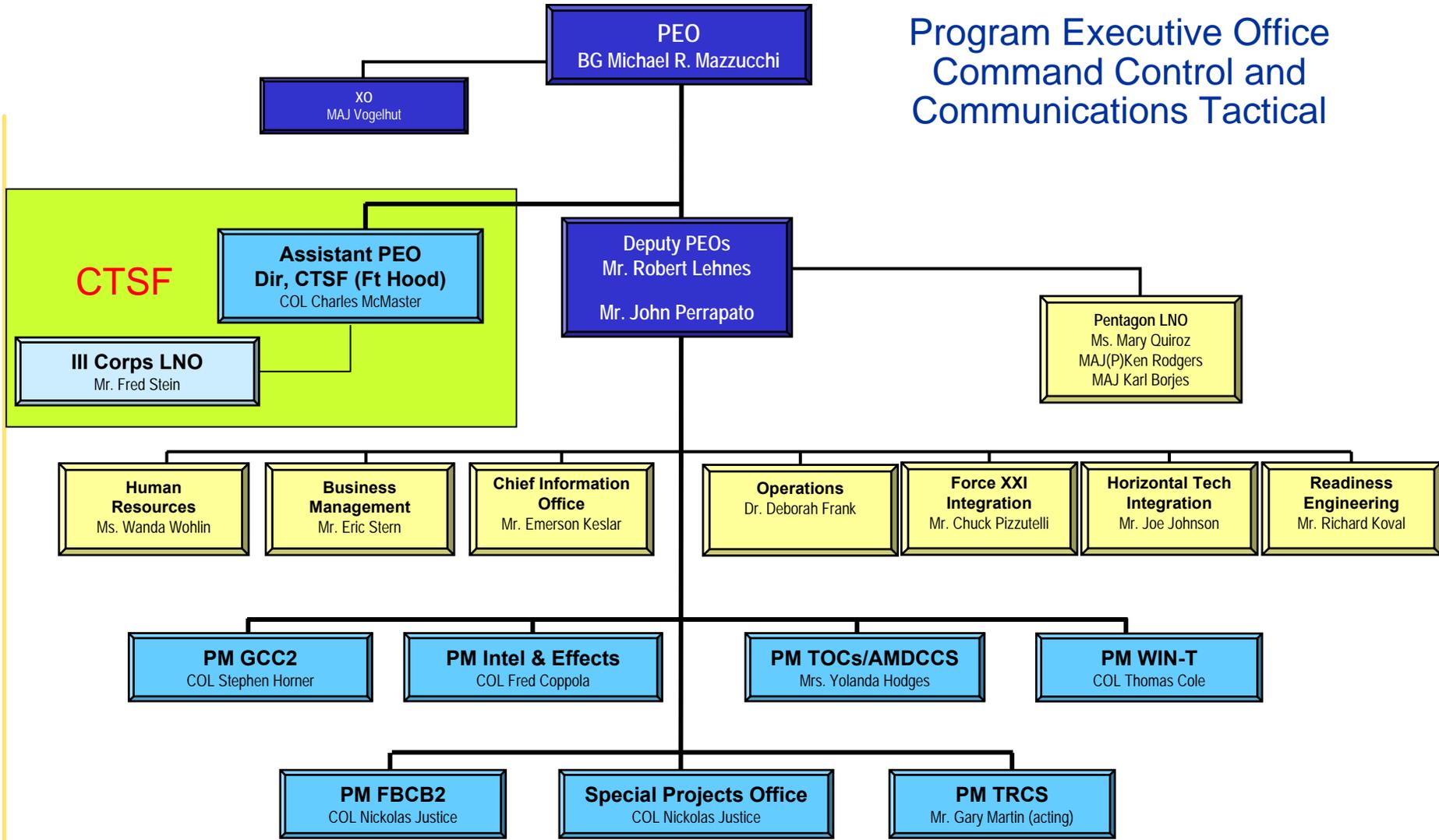
## Bottom Line:

**Support Army Digitization and Transformation Requirements**



# Central Technical Support Facility

Program Executive Office  
Command Control and  
Communications Tactical



# Central Technical Support Facility

Fort Hood, Texas

Close Combat  
Tactical Trainer  
Facility

Aviation & Missile  
Technical Integration  
Facility



Reconfigurable  
Scaleable  
TOC Facility  
(CTOC)

Install Yard

Bldg 8

Bldg 6

Bldg 4

Bldg  
12

Intra-Army  
Interoperability  
Certification Facility



PEOs  
PMs  
OTC  
TRADOC  
STRICOM  
CECOM  
EPG  
UNIV XXI  
NSC

***“Brings Together in one Place”***

- Soldiers
- Industry
  - Software Programmers
  - Technicians
- Test Community
- Trainers
- Warfighter Systems

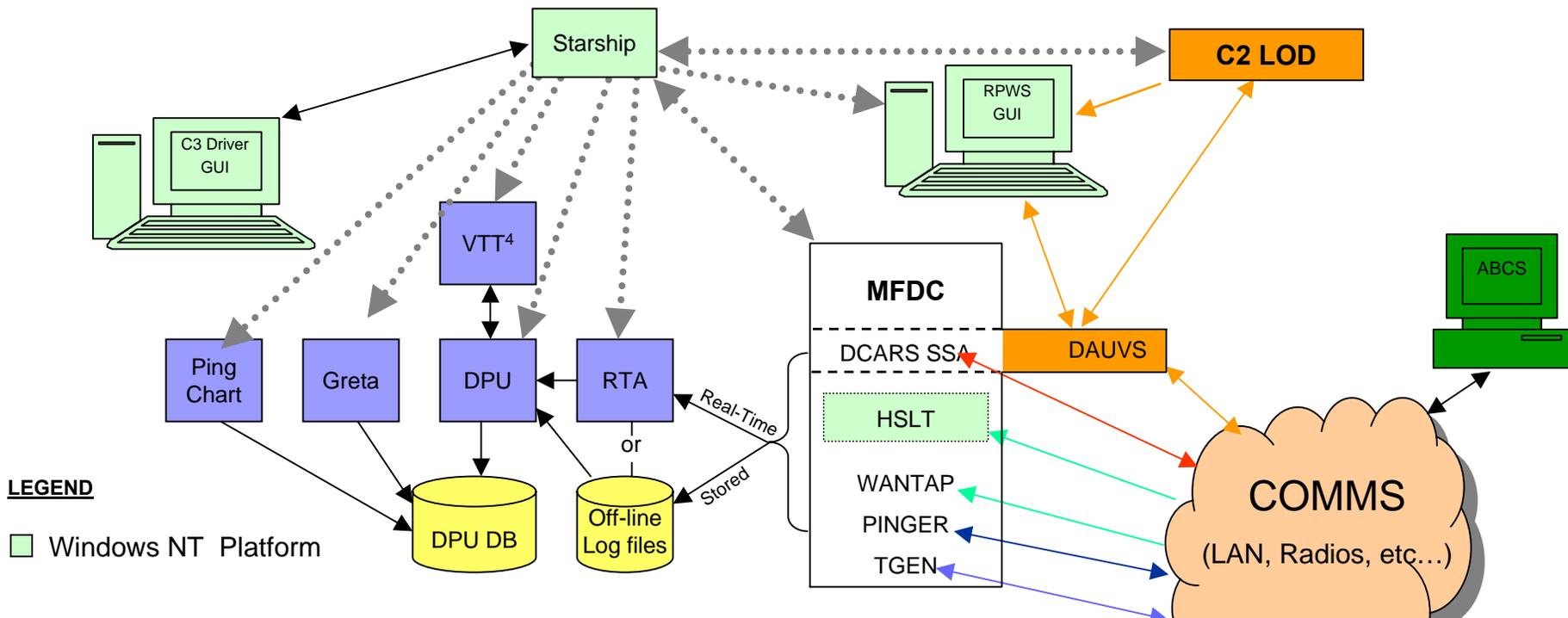




# Central Technical Support Facility



## EPG Instrumentation Suite



### LEGEND

Windows NT Platform

Stimulation Links for Lower TI (JVMF) and Upper TI (USMTF)

Monitoring Taps

Bandwidth Loading

Address Status

ABCS Status

C2 and H&S



# Central Technical Support Facility



## The STATS...



- **264,000 sq ft Facility** of which 38,425 square feet are dedicated to integration, testing and certification (which also includes SW integration, testing Configuration Control, SIM/STIM integration and tactical communications integration).
- **Fully wired Infrastructure** with tactically representative routers, switches, hubs, fiber, 10Base2, 10BaseT and video to provide flexibility for test and exercise reconfiguration.
- **Instrumented facility** for data collection and reduction with Computers and Communications equipment to support a vehicle platform to Corps level architecture, fully instrumented with SIM/STIM and data collection/reduction capability.
- **Configuration Control Capability** to support integration and fielding of Software
- **High Speed Communication Links** to facilities at Ft. Hood (i.e., Battle Simulation Center Bldgs, the Close Combat Tactical Trainer) and externally to sister service sites, battle labs and contractor facilities.
- **Established Processes** to support integration, testing, configuration management and training “Go to War” software.

### Hardware Vehicle Install Facilities

- Approximately 40,000 sq Ft
- 4 Large Bays
- 10 Small Bays

### Centralized Shipping and Receiving

- Centralized shipping and receiving for all organizations located at the CTSF

### Digital Maintenance

- Common Hardware Repair
- Cable repair and fabrication

### Training Facilities

- 24 Classrooms (includes the Configurable Tactical Operations Center (CTOC))

Over 580 **soldiers**, government **civilians**, and **contractors** form the **Team** of the CTSF to support, maintain & sustain the Army's digital systems supporting new and varied missions deployed world wide.



# Central Technical Support Facility

## Contractor Team



AAI Corporation

ABTech

AERA

ARL

ASAT-ASAS

AST

Austin Ino Systems

BIC

Booz-Allen & Hamilton

BPV/DaVinci

C31-AMDWS

Camber

CAS

CATC

Coleman Research Corp.

COLSA Corporation

Computer Science Corporation

Computing Devices

Computing Technologies

Cubic

DaVinci

DCMC-Dallas

DCMDW-GBONA

DMSO

EER

ELMCO INC.

Eagle Support Svcs

Eclipse Networks

ENSYNC

EPG

ESP Incorporated

EWA

FC Business

General Dynamics

IITRI

ILEX

ITT

JB Management

JPSD

Lockheed Martin

Logicon

Madentech

Mantech

MITRE

MSA/ATEC-AEC

NewTec

Nichols

NIMA

Northrop Grumman

NreTec

PKMM

Proactive Communications

PTG

Raytheon

Robbins – Gioia LLC

SAIC

Shonborn-Becker Systems Inc

SIGCOM

SIMCI (Anteon)

SYTEX

TASC

TEK

Telesis

Telos

TEXAS A&M

Titan

TRAC-WSMR

UDLP

United Defense

University of Texas

VEA/GDIS

Vitronics

Volt

**75  
Different  
Contracts**



# Central Technical Support Facility Government Team



PEO, C3T	PM, GCC2	GCCS-A, MCS, CSSCS, , CTIS, Common SW
	PM, Intel & Effects	ASAS, AFATDS, IMETS
	PM, AMDCCS/TOCS	AMDWS, FAADC2, TOCS, PLATFORMS, Common HW, A2C2S, BCTOM
	FBCB2	FBCB2, BFT
	TRCS	EPLRS, INCS, NTDR, SINGARS
	WIN-T	ISYSCON V2, ISYSCON V4, SPITFIRE, SCAMP, SMART-T, GBS
	Force Integration	Systems Architecture
	Readiness Engineering	Battle Command NET
PEO, STRI		JANUS, Storm, C3 Driver
PEO, Aviation	PM, Aviation Systems	ATC – TAIS; Aviation Mission Equipment; Scout/Attack – Kiowa Warrior
	PM, Apache Attack Helo	Longbow Apache
	PM, Comanche	Comanche
	PM, TUAV	TUAV
TRADOC	TPIO ABCS	
	National Simulation Center	DBST, RTM
	BCTID ( <i>Warrior-T</i> )	
CECOM	Help Desk / CATC	
	RDEC	CAPES
ATEC	OTC	Test Support
	EPG	DAUVS, Instrumentation, Test Support
University XXI		Texas A&M, UT Austin
TRAC-WSMR		Information Assurance



# Central Technical Support Facility



## Test Floor Capabilities



Test Floor 4a



Test Floor 12-E



# Central Technical Support Facility Communications Room Capabilities



**Instrumentation  
Computers**



**Patch  
Panels**



**TOC  
INCs  
and  
Radios**

# Central Technical Support Facility

Support Joint Contingency Force and Transformation Implementation



Fort Irwin, CA



CTSE NW, Fort Lewis, WA



SWA



Fort Hood, Texas



CTSE Facility, Fort Drum, NY



Korea

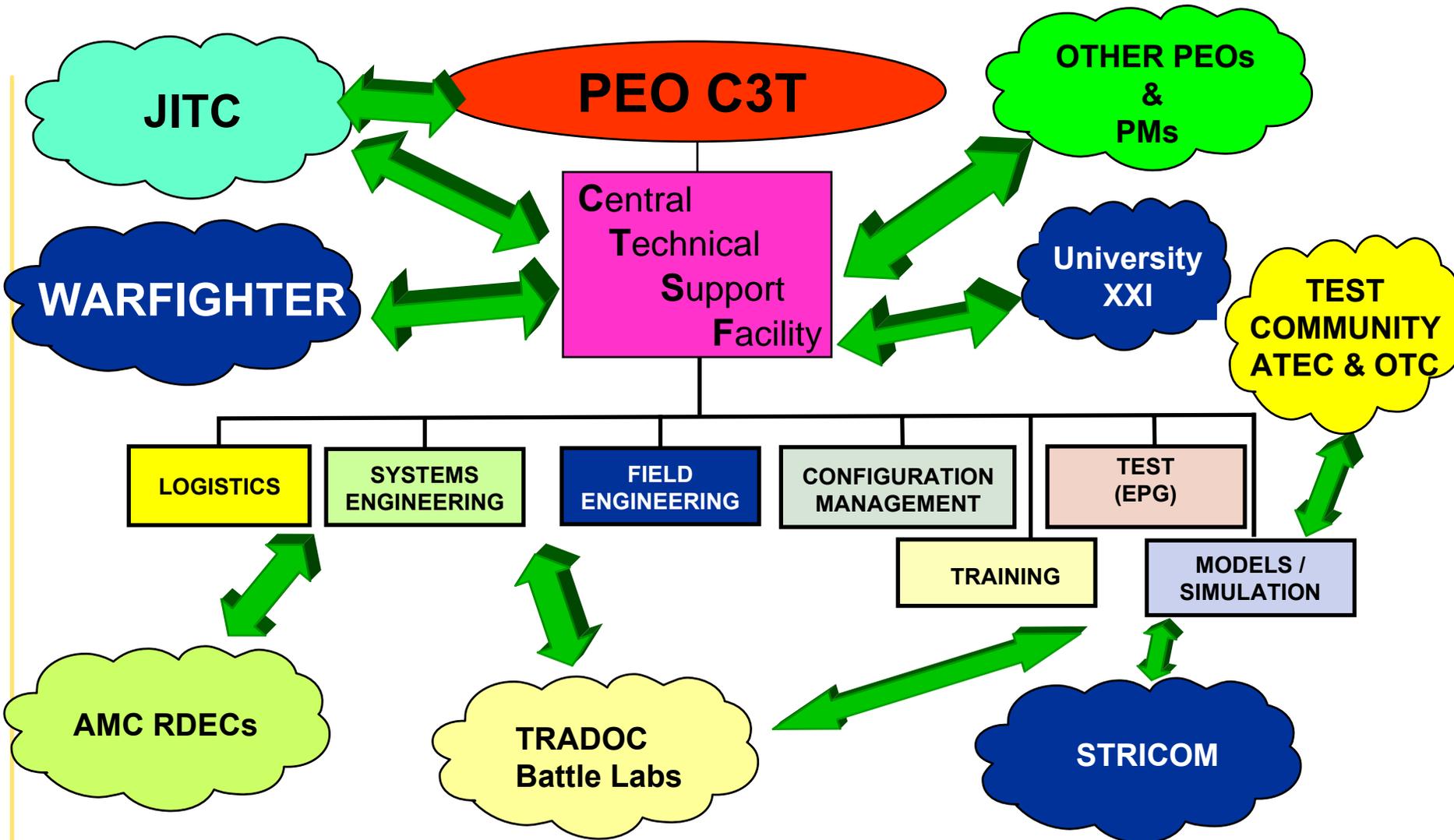


CTSE Facility, Fort Polk, LA



# Central Technical Support Facility

(The Right Partnership)





# Central Technical Support Facility



## Extended Capabilities

- **Capability to integrate locally deployed units into scenario play driven from the test floor**
- **Capability to conduct remote (distributed) testing**
- **Established relationships with many organizations**
- **Tactical TOC Checkout program (includes A2C2S, BCOTM and C2V).**



# Central Technical Support Facility



## Extended Capabilities

- **Over 80 separate contractors and organizations assigned to support the CTSF**
- **On-site presence from other PEO's, PM's, OTC, EPG**
- **Local access to MSE, ground combat systems, aviation assets**



## CTSF Test Process

The CTSF's focus is on end-to-end, multi-thread/multi-echelon testing with realistic operational simulation and simulation based on information and data exchanges. The following characteristics are endemic to CTSF testing:

- Testing is conducted on a *physically secure floor*, with tight configuration management (CM) procedures.
- Test events are generally *executed one at a time*, in an isolated environment.
- Instrumented data collection compliments the manual data collection from operators, data collectors and the test officer.
- Software changes, *fixes and patches are not allowed* during testing.
- An event must *successfully execute three consecutive times* to be considered successful.
- The test is *executed from a test case*, prepared by the test officer.
- The test case may be in the form of a *Master Event List* (MEL).



# Central Technical Support Facility



## CTSF Test Process

**Determine Test Requirements**

**Develop Test Threads/Test Cases**

**Develop/Configure Architecture**

**Run Test Cases/Collect Data**

**Assess Data vs Requirements**

**Report Results**

**Standard  
Process**

**Based on Test  
Community  
Standard**



# Central Technical Support Facility



## Test Requirements

Type	Characteristics	CTSF Use
OV-5 & OV6c	System by System Discrete Events Comms & Echelons	New format – Will use when available – can define AUTL mission threads
CIDD	System by System Discrete Events Comms & Echelons	Not a widely accepted format – Very useful for the CTSF – defines AUTL mission threads in detail
IER	No Echelon info No System info Interface info only	Not very helpful – may be used to verify that threads are complete, however, does not define a mission thread
ACCS-A3-400-013E	Specific to ABCS Systems Not TSM Approved	Helps with ABCS testing but not with non-ABCS system testing



## Test Plans

Development of the test plan requires complete test requirements. Planning cannot proceed until we are satisfied that the TSM approved test requirements are complete enough to allow the test officer to complete the following tasks:

- Develop the test architecture
  - Ensure mission threads will execute on architecture
- Determine if there are shortfalls in hardware or software (availability)
  - Resolve shortfalls
  - Document shortfalls (Test Limitation)
- Determine (and task) level of staffing required
  - Operators
  - Engineering staff
  - Instrumentation staff



# Central Technical Support Facility



## Test Plans

PM Supplied  
TSM Approved

TSM, PM and  
CTSF Agreement

Test  
Requirements

CTSF Analysis

Test Case

T-90 Days

T-90 thru T-30  
Days

T-30 Days



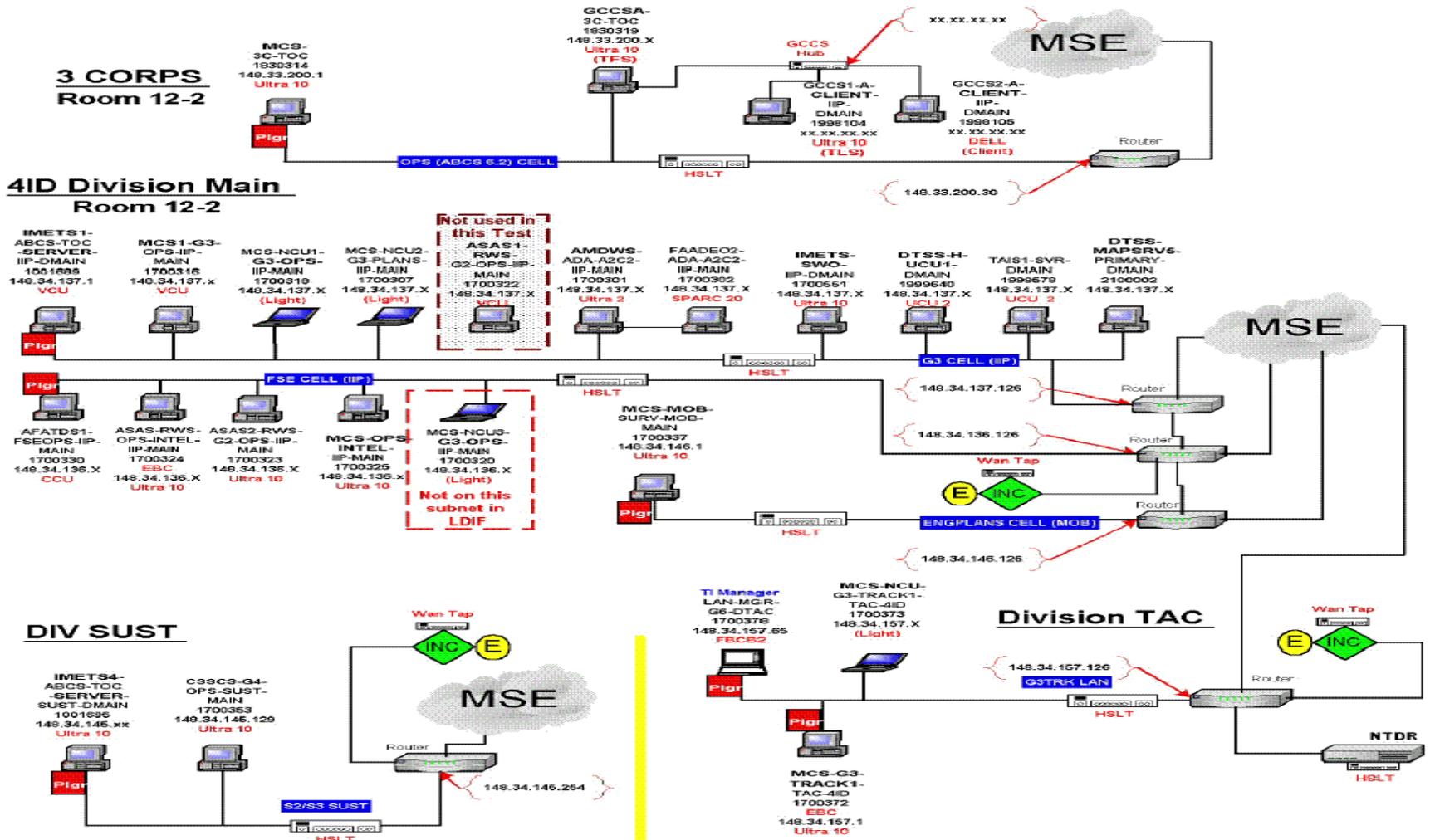
# Central Technical Support Facility



Version 1  
2/25/02

ABCS 6.3 Window 1  
Room 12-2

LDIF dated 9/21/01  
Page 1 of 4



Not in LDIF

Not used in this Test

Subnets	Routers
x = 1-125	.126
xx = 129-253	.254





## CTSF Test Accomplishments



# Central Technical Support Facility

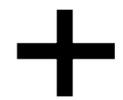


## CTSF Test Accomplishments

- **ABCS Baseline Testing**
- **Certification Events**
- **Simulation/Stimulation Interoperability Assessments**
- **Army Software Blocking**



# ABCS Interoperability Baseline Testing



## What We Test

### \*\* ABCS \*\*

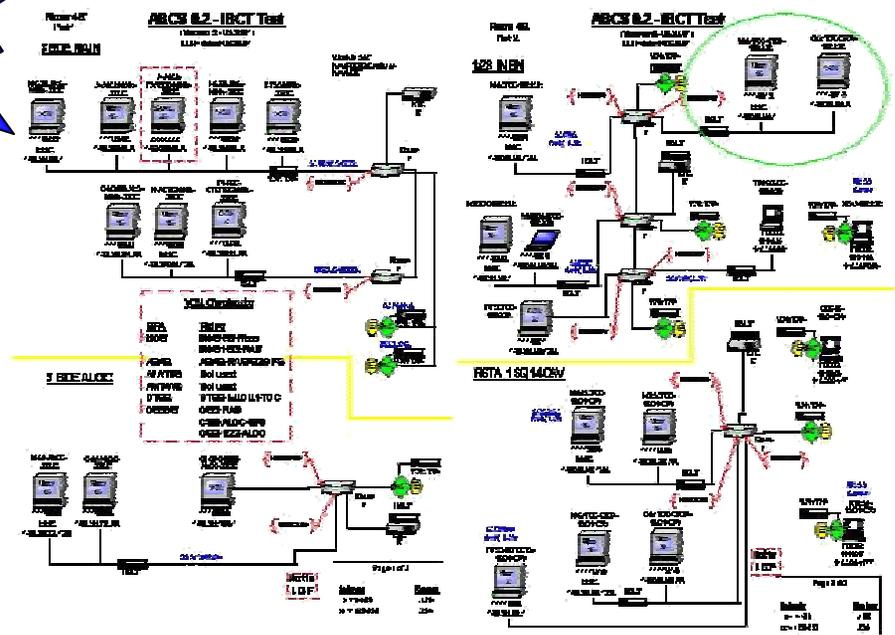
- MCS
- ASAS
- CSSCS
- AMDWS
- FBCB2
- GCSS-A
- AFATDS
- IMETS
- TUAV
- FAAD-EO
- MCS-Light
- ASAS-Light
- DTSS
- DTSS Map Svr
- CGS
- JSTARS
- DTSS-L
- TBMCS

### ABCS 6.2 Architecture



## How We Test

- Determine Test Requirements
- Write EDP
- Develop Test Plans/Threads
- Develop Architecture
- Build Architecture
- Build Automated Data-Collection Architecture
- Run Test





# Central Technical Support Facility



SAIS-IAA

3 DEC 2000

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Intra-Army Interoperability Certification

This memorandum establishes an intra-Army interoperability certification requirement for communications/data interfaces for all Army operational-through tactical-level command, control, communications, computers and intelligence (C4I) systems.

Under the provisions of the DOD Directive (DODD) 4630.5, Compatibility, Interoperability, and Integration of Command, Control, Communications, and Intelligence (C3I) Systems, November 12, 1992 and the Chairman, Joint Chiefs of Staff Instruction (CJCSI) 6212.01B, Interoperability and Supportability of National Security Systems and Information Technology Systems, May 8, 2000, the Joint Interoperability Test Command (JITC), a component of the Defense Information Systems Agency, conducts joint level interoperability certification and recertification testing for C3I systems. This testing currently applies to C3I systems only (reference Army Regulation 73-1, Test and Evaluation Policy, February 27, 1995, paragraph 4-2b(8) and 4-4b(5)) and is not sufficient for certifying horizontal and vertical interoperability for intra-Army C4I systems at the operational and tactical levels.

Intra-Army interoperability certification applies to all Army operational-through tactical-level C4I systems prior to release to the field, regardless of the acquisition category. Communications/data interfaces testing in support of intra-Army interoperability certification will be addressed in Operational Test Readiness Reviews and considered entrance criteria prior to decision reviews, operational testing, and materiel release. Any modifications that impact previously established interface requirements to fielded systems require re-certification prior to approval for materiel release.

Once a system is certified as interoperable, it is considered a base case system. The Program Manager or System Manager shall make no unilateral changes to the base case system that have the potential of affecting interoperability unless agreed to by the Director, Deputy Chief of Staff for Operations and Plans (DCSOPS) Directorate of Integration. If requested changes are approved, the Program Manager or System Manager must bear the re-certification cost of all affected systems within a period not exceeding 12 months from date of approval

The following responsibilities are assigned:

a. The Director of Information Systems for Command, Control, Communications and Computers will:

(1) Serve as the intra-Army interoperability certification authority. The certification authority may be delegated to the system milestone decision authority. All certification actions will be returned to the test facility for distribution and record keeping.

(2) Approve the Central Test Support Facility (CTSF) test requirements and criteria for the intra-Army interoperability testing.

b. Director, DCSOPS Directorate of Integration is the approval authority for interoperability changes to a base case system.

c. The Program Managers and System Managers will program and budget funding for interoperability testing. The Program Managers and Systems Managers, in coordination with the U.S. Army Training and Doctrine Command System Managers, will provide the CTSF with a set of approved test requirements and criteria for intra-Army interoperability testing. Intra-Army interoperability testing and certification will be addressed in the individual program Test and Evaluation Master Plan or in a test concept document.

d. The CTSF, operated and funded by Program Executive Office, Command, Control and Communications Systems and located at Ft. Hood, Texas, is identified as the intra-Army interoperability testing facility to perform the communications/data interfaces testing. CTSF testing in support of the intra-Army certification process will not duplicate or limit testing conducted by the JITC, the U.S. Army Test and Evaluation Command, or other test activities. The CTSF conducts the required intra-Army interoperability certification testing and provides the test results to the certification authority.

The following definitions are provided:

a. Intra-Army Interoperability Certification. Confirmation that the candidate system has undergone appropriate testing and that the applicable standards and requirements for compatibility, interoperability, and integration have been met.

b. Interoperability. The ability of the systems, units, or forces to provide data, information, materiel, and services to and accept the same from other systems, units, or forces and to use data, information, materiel, and services so exchanged to enable them to operate effectively together.

c. Operational-through tactical-level C4I. Information systems designed to support from Army Forces headquarters down to the squad level.

This policy is effective immediately. Point of contact for this action is Ms. Marlu Vance, commercial: (703) 697-4883, DSN: 227-4883, email: [Marlu.Vance@HODA.Army.Mil](mailto:Marlu.Vance@HODA.Army.Mil)

(signed)

PETER M. CUVIELLO  
Lieutenant General, GS  
Director of Information Systems  
for Command, Control,  
Communications, and Computers

(signed)

Paul J. Hoepfer  
Army Acquisition Executive

Intra-Army interoperability certification applies to all Army operational-through tactical-level C4I systems prior to release to the field, regardless of the acquisition category. Communications/data interfaces testing in support of intra-Army interoperability certification will be addressed in Operational Test Readiness Reviews and considered entrance criteria prior to decision reviews, operational testing, and materiel release. Any modifications that impact previously established interface requirements to fielded systems require re-certification prior to approval for materiel release.

## Paul J. Hoepfer

### Army Acquisition Executive

(December 2000)

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# Central Technical Support Facility



## **Test Authority:**

**IAW the Hoeper Letter dated December 2000:**

**“The CTSF ... is identified as the intra-Army interoperability testing facility ... conducts the required intra-Army interoperability certification testing and provides the results to the certification authority.”**



# Central Technical Support Facility



## Four System Categories

1. **Systems Requiring Certification** – C4I<sup>1</sup> systems which create, send, receive, manipulate, parse and use information.
2. **Systems Requiring a Waiver** – Systems that have intra-Army Interoperability requirements, but cannot currently meet the requirements.
3. **Systems Not Applicable** - Systems without an organic C4I interface (current or planned) are categorized as “**exempted from IAIC testing**”.
4. **Systems Requiring an Interoperability Assessment** - Systems which meet the requirements outlined in this SOP and are required to conduct interoperability testing as entrance criteria to another test or exercise, but are not scheduled for an operational test or material release.



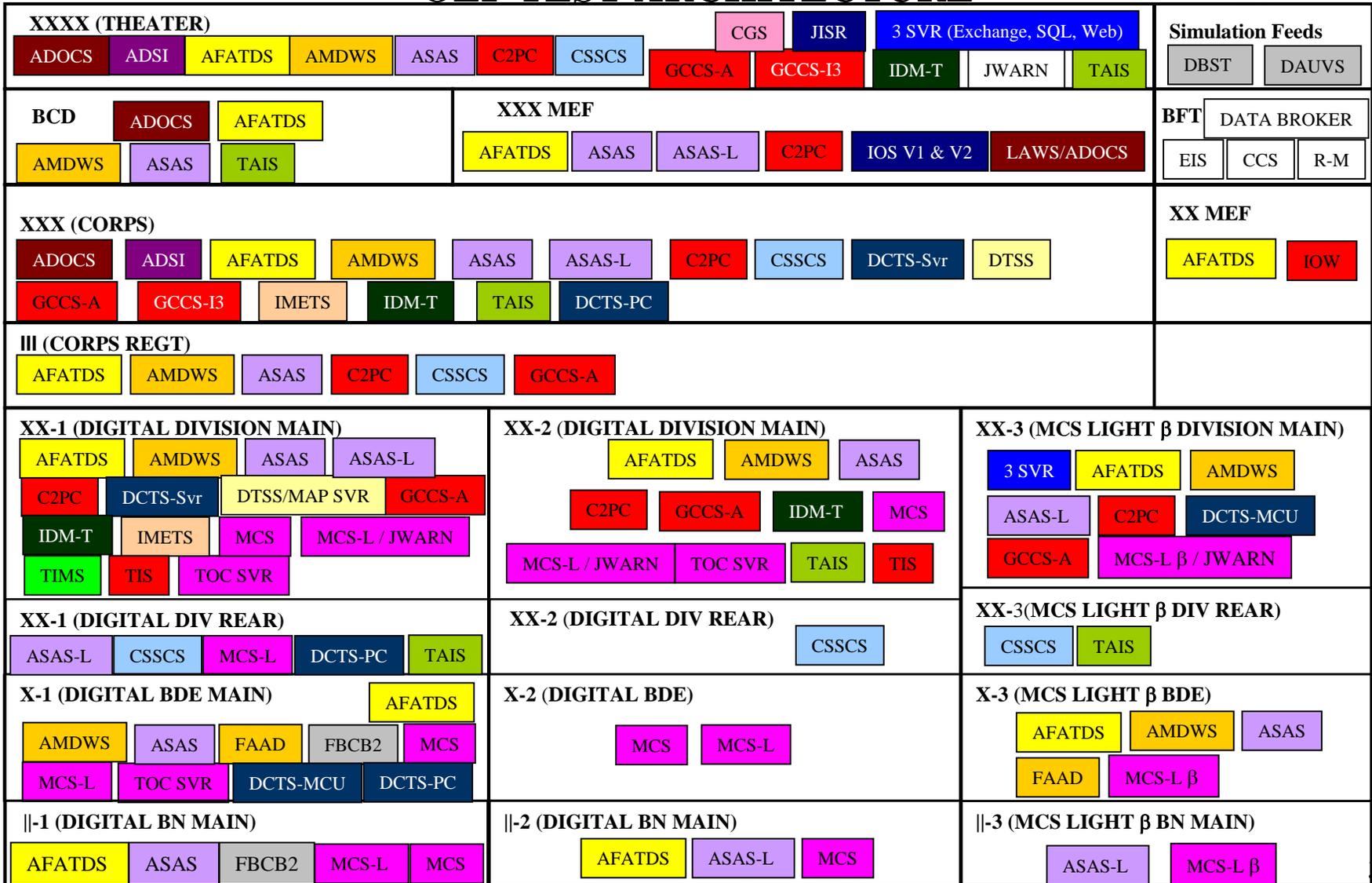
## HQDA Guidance

- **Project Managers will complete Intra-Army Interoperability Certification Testing prior to submitting their system to JITC for joint testing**
  
- **Testing will consider all interoperability requirements**
  - **Requirements which cannot be tested will be listed as “test limitations” in the test plan**



# Central Technical Support Facility

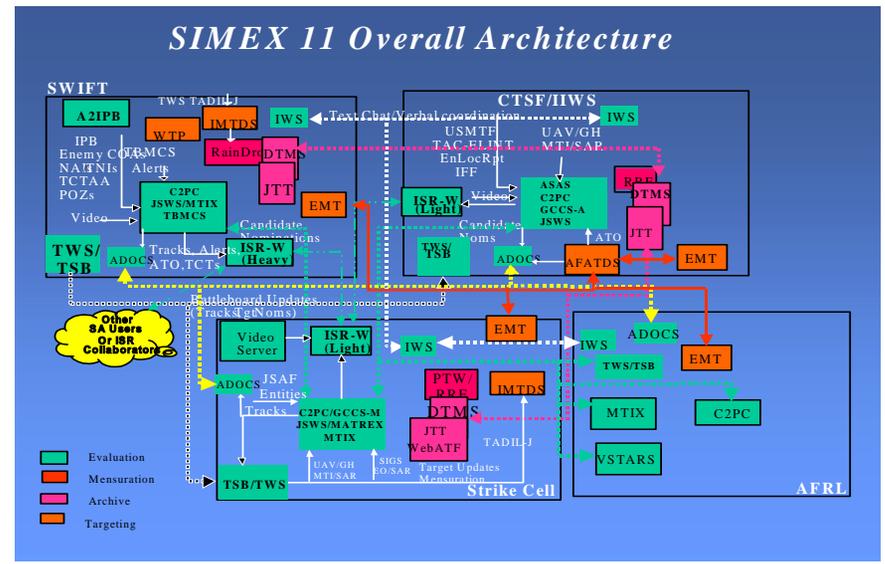
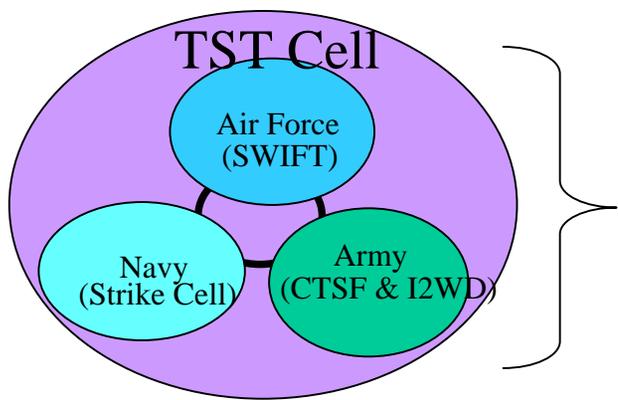
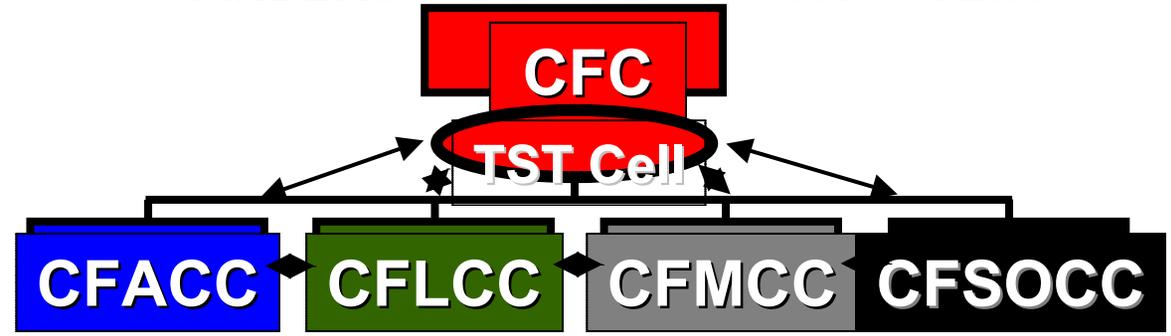
## OEF TEST ARCHITECTURE





# Central Technical Support Facility

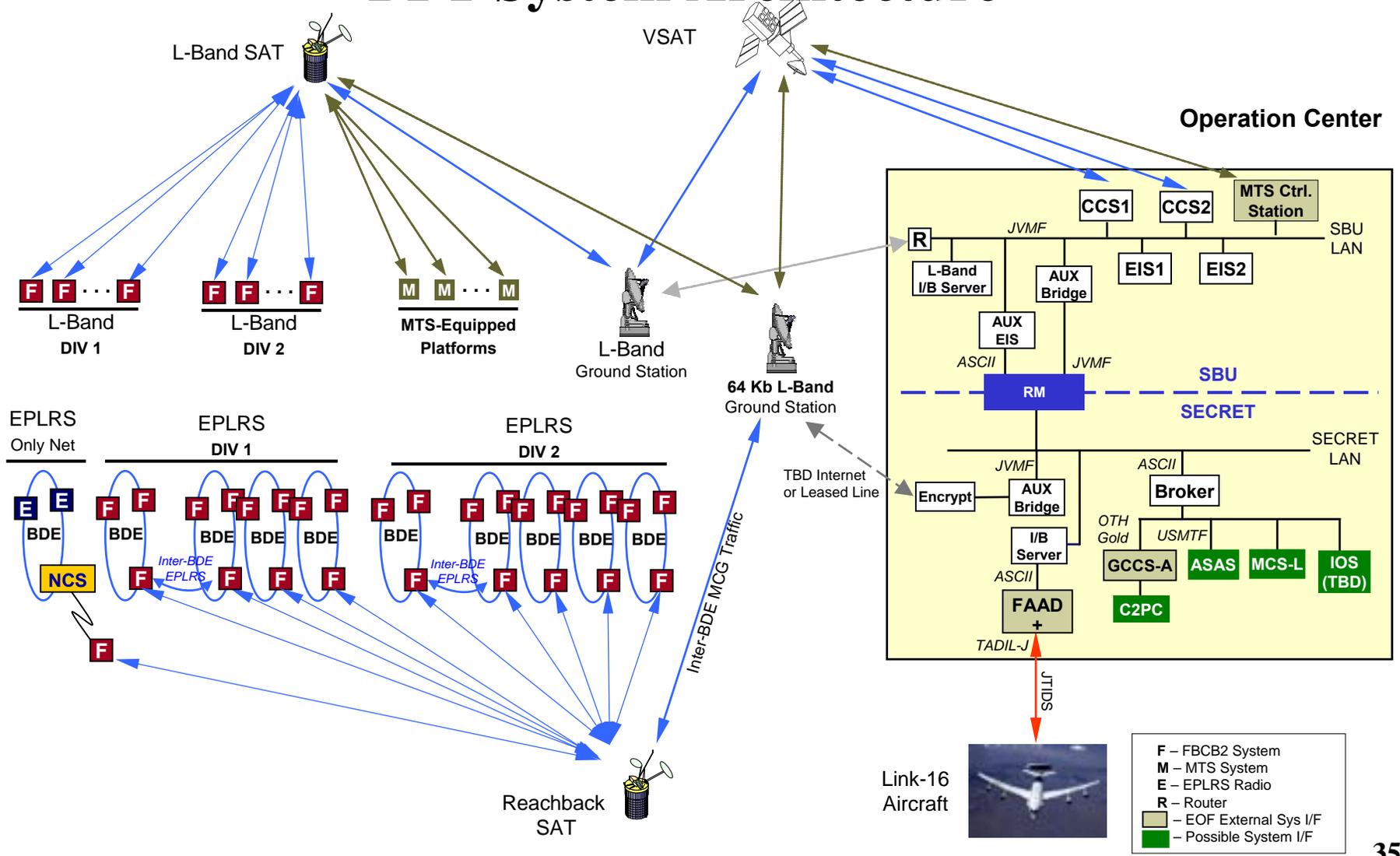
## Time Sensitive Targeting (TST) Process





# Central Technical Support Facility

## BFT System Architecture



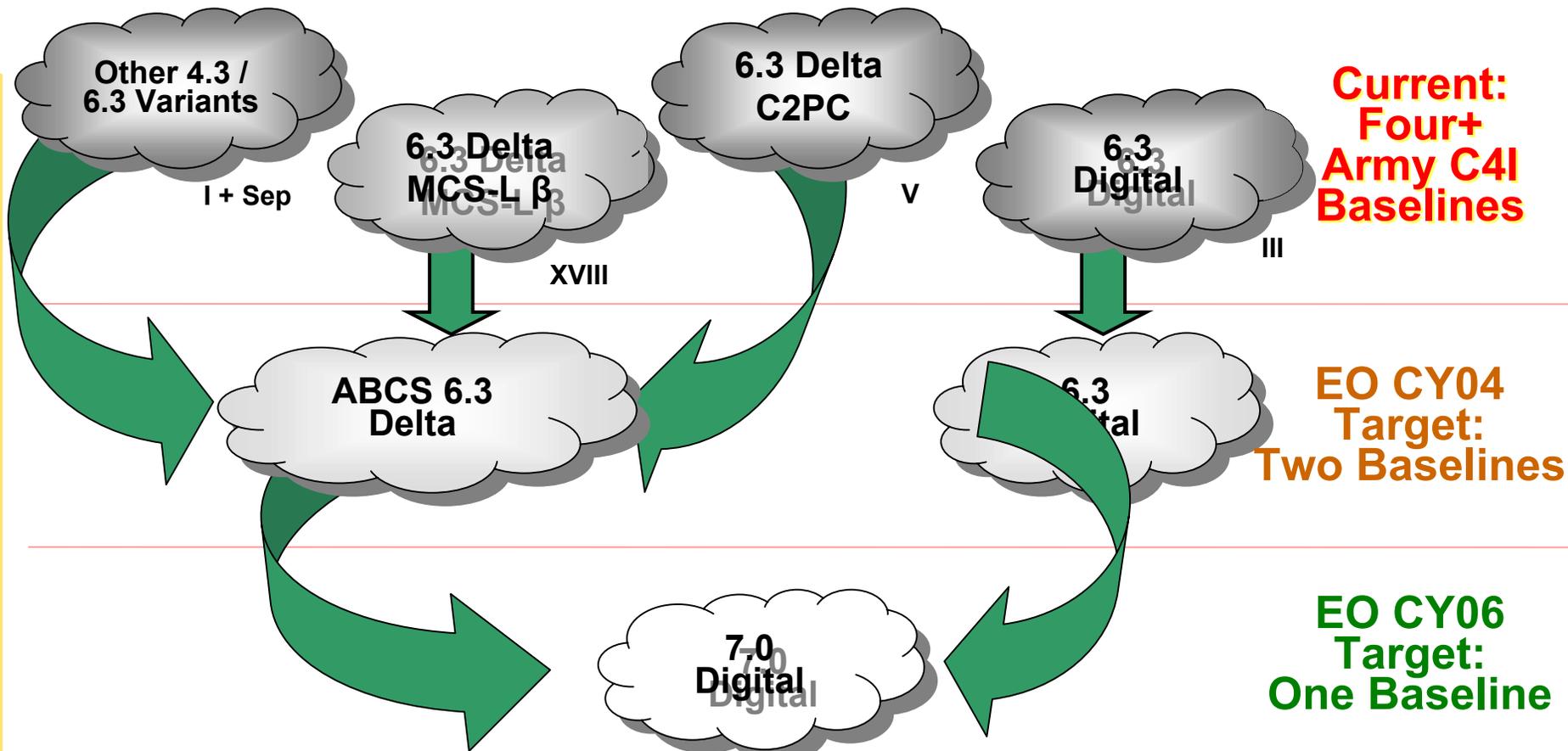
- F - FBCB2 System
- M - MTS System
- E - EPLRS Radio
- R - Router
- - EOF External Sys I/F
- - Possible System I/F



# Central Technical Support Facility



## 4 ⇨ 2 ⇨ 1 Strategy



**One Army - One Battle Command Baseline**

**Improves C4ISR Warfightability:**

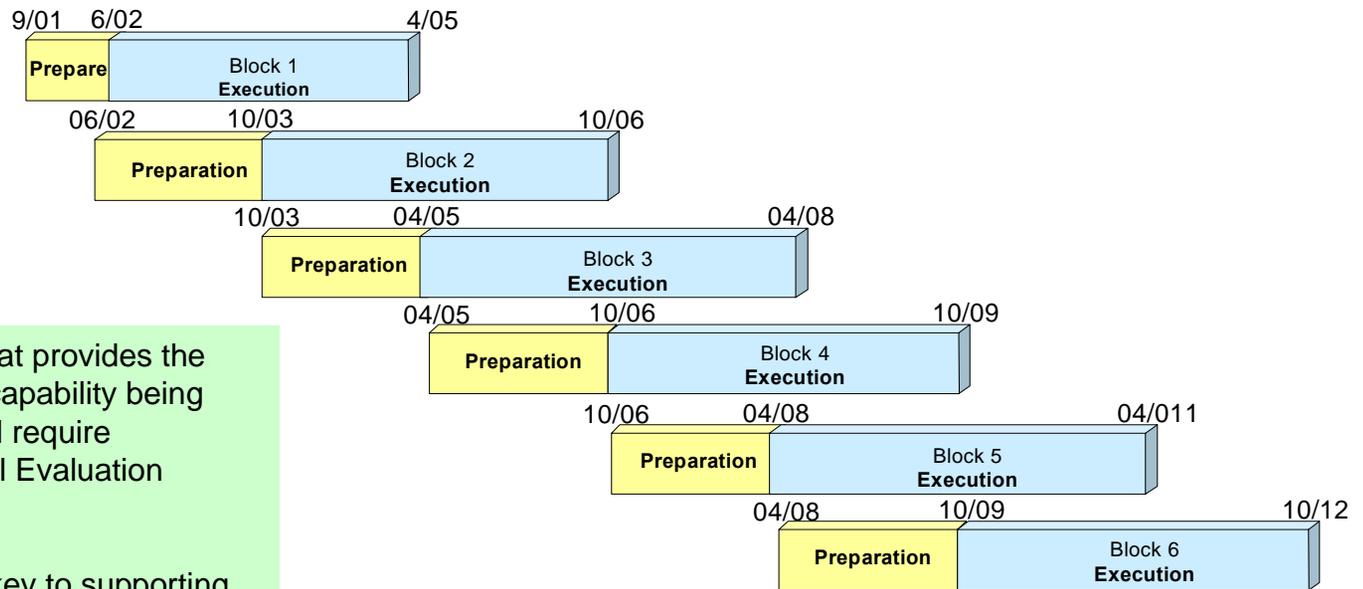
**Transferable Digital Skills | Simplified Task Organization | Standardized Training & Simulation**



# Central Technical Support Facility



## Software Blocking Planning Schedule



**Core System:** A system that provides the critical overall operational capability being incorporated in Block 1; will require certification and operational Evaluation participation.

**Enabler:** A system that is key to supporting interoperability of core systems but may not require certification or operational evaluation. If a system requires certification it will be done as part of Software Blocking.

**Interfacing System:** A system that provides a significant capability and is required to undergo certification but not operational evaluation as a part of Block 1.



## Conclusion



# Central Technical Support Facility



## CTSF Test “Lesson Learned”

The CTSF test and support processes are continually refined based on analysis of test requirements, PEO C3T Guidance and HQDA Guidance and customer needs ;

### Lessons Learned

Since the Hooper memorandum has been published requiring Intra-Army Interoperability Certification testing, three M&S systems have gone through, or are going through, certification testing. The DBST in Dec 00/Jan 01, the RTM in Jul 01, and the C3 Driver in Jan 02. The lessons learned from each event have contributed to our knowledge and understanding of the certification process and, in fact, to the development of the CTSF Certification Standard Operating Procedures (SOP). An examination of these certification tests and their lessons learned is beneficial not only to avoid repeating the same mistakes, but also to understand certification’s evolution over the last twelve months and future evolution in support of software blocking.

**Breaking New Ground: Simulation to C4I Intra-Army Interoperability Certification**



# Central Technical Support Facility



## In Conclusion, The CTSF is .....

- **A relevant integration and testing facility to the Army – not just the Digitized Forces (III Corps (4ID, 1CD) & SBCTs)**
- **An independent assessor of Army-wide systems using a transparent set of processes that provide a complete, honest evaluation to developers and Warfighters**
  - **A digital interoperability assessment facility focused toward C3I interoperability across disparate Army-wide and Joint systems to provide SA/SU and CROP**
  - **A Software Center of Excellence for C4ISR systems at all command and control levels**
    - **A valued and critical enabler supporting Information as an element of combat power**



# Central Technical Support Facility



## In Conclusion, The CTSF is .....

- **CTSF is a task organized, multi-disciplined organization**
  - **Capable of rapidly maturing software through a rigorous test-fix-test methodology**
    - **In a multi-echelon, end-to-end test and evaluation environment**
      - **Utilizing both manual data collection and state-of-the-art instrumentation**