

Army Technology Investments: The Joint 21st Century Range



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Presentation to the 2004 ATEC Test Technology Symposium
28 April 2004



Testing and Training in a Joint Environment



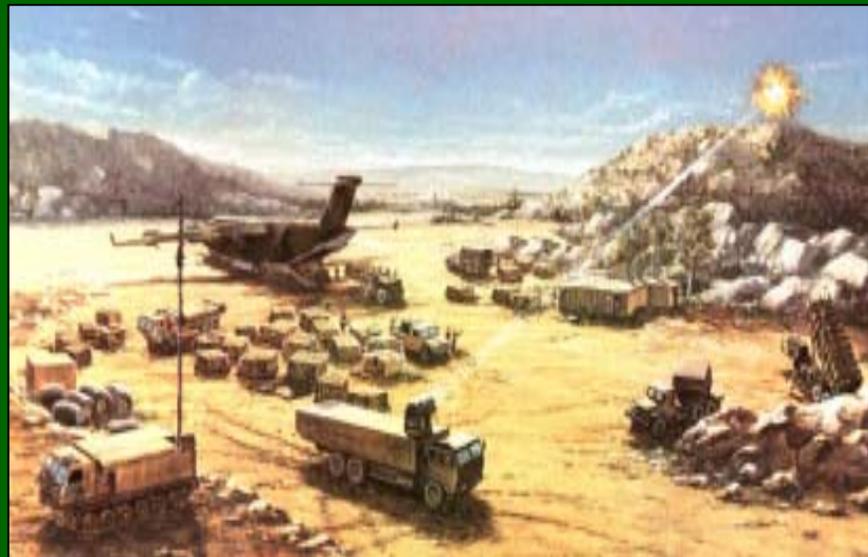
Testing ensures that we equip our soldiers properly;

Training ensures that we prepare our soldiers properly.

JOINT exercises verify BOTH in the realism of the joint combat environment.

Our challenge: Serve the Army while enabling Affordable and Relevant Joint
Operations and Evaluations

Joint Ops Enable us to:
See FIRST!
Understand FIRST!
Act FIRST!
Finish Decisively!





Testing in a Joint Environment



The Strategic Planning Guidance (SPG) for Fiscal Year 2006-2011 tasked the Director, Operational Test and Evaluation (DOT&E) as follows:

“Joint Testing in Force Transformation”



“Developing and fielding joint force capabilities requires adequate, realistic test and evaluation in a joint operational context. To do this, the Department will provide new testing capabilities and institutionalize the evaluation of joint system effectiveness as part of new capabilities-based processes.

The Director, Operational Test and Evaluation (D(OT&E)) will develop a roadmap for the Deputy Secretary of Defense no later than May 2004 that identifies the changes needed to ensure that test and evaluation is conducted in a joint environment and facilitates the fielding of needed joint capabilities.”



Technology is the Key



- Current Army T&E Investments Aligned with Joint Testing and Training:
 - Shared Architectures:
 - Test and Training Enabling Architecture (TENA)
 - Embedded Instrumentation
 - FCS Real Time Casualty Assessment
 - Digital Data, Imagery, and Networking
 - Advancing Range Telemetry
 - Multi-Service Target Control System
 - Flexible Interoperable Transceivers
 - Shared Operations, Threat Portrayals, and Analyses
 - Information Assurance Test Tool
 - Threat Systems Capabilities
 - Realistic Targets
 - Shared Requirements Identification for the Future





Shared Architecture Technologies

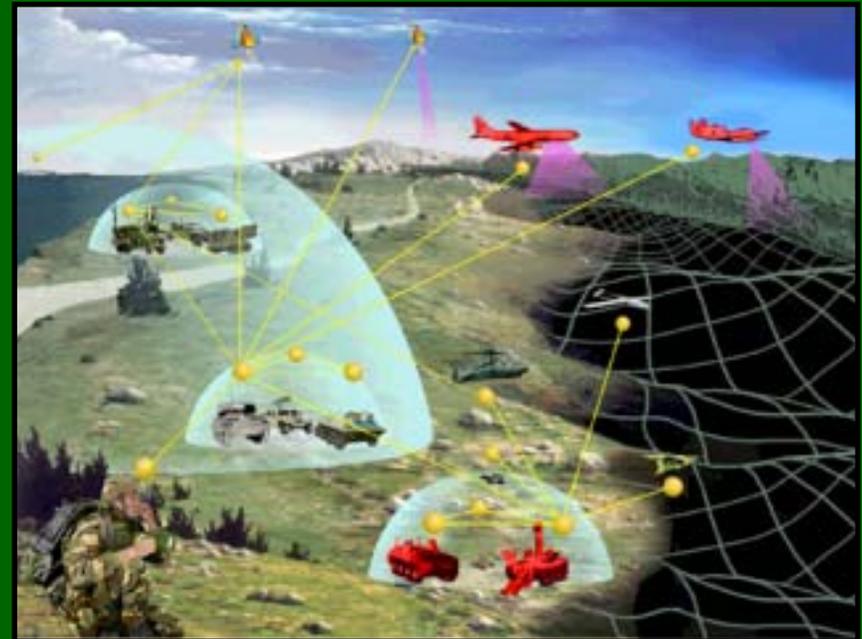
Standardizing the Army Ranges
In Support of Joint Operations



Test and Training Enabling Architecture (TENA) Vision



- Design and prototype a technological infrastructure to enable interoperability and reuse within the DoD range community.
 - Improve the scope and scale of testing and training.
- We need to:
 - Satisfy the core operational and performance requirements
 - Work with the range community so solutions are implemented
- Lay the groundwork for full lifecycle support.





Embedded Instrumentation (EI) for Testing, Training, and Diagnostics/Prognostic Capabilities



- MEMS technologies can be leveraged to provide EI capabilities
- Incorporated into the platform's design and development
- Reduces the burden on intrusive "black box" add-ons
- Can provide system cradle-to-grave performance, logistics, and training information
- HSTSS provides EI to bullets
- EI is a requirement for FCS
 - Enhances DOTMLPF
 - Realism and Reliability essential to success
 - Single Data Stream saves money
 - Combat realism optimized in JOINT environment
- TRULY JOINT Testing/Training Capability



FCS: Able to test and train anywhere, at any time, simultaneously, in a Joint Battlespace Environment



FCS Real Time Casualty Assessment

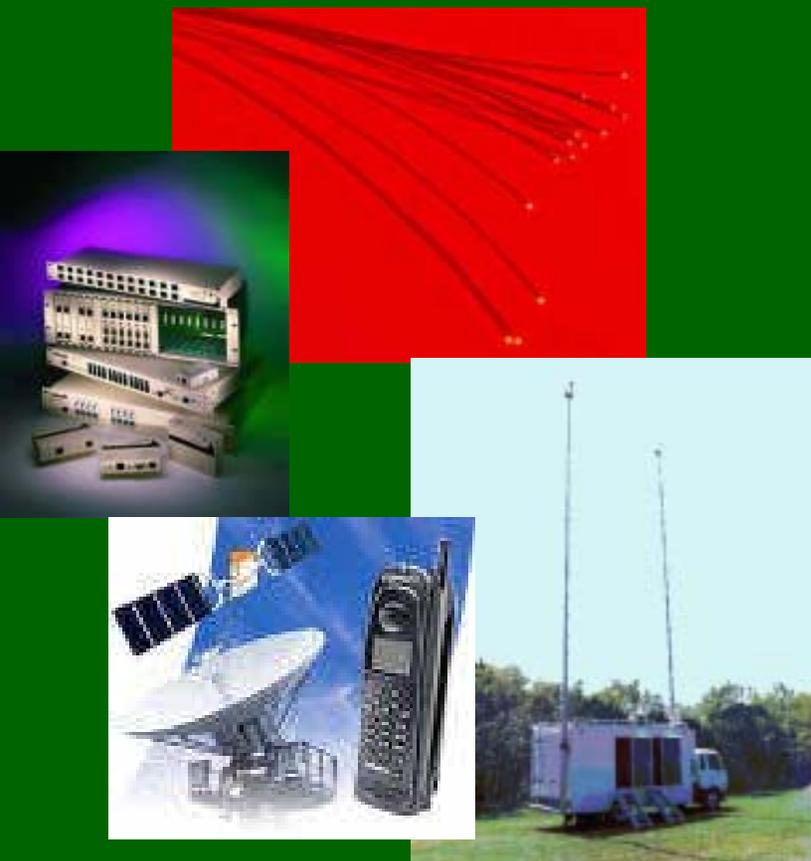


Embedded RTCA:
Making FCS more Agile, Deployable,
Versatile, Lethal, Survivable, and Sustainable
across the entire spectrum of military operations

- A joint testing and training capability embedded in a weapon system platform
 - Replaces:
 - MAIS (T&E)
 - MILES (Training)
 - Based on OneTess (Training)
- Saves money, weight, resources
 - But adds new challenges
 - Requirements unification
 - Funding across domains
 - O&M responsibility
- The Army is addressing these challenges successfully through teamwork
 - ATEC
 - TRADOC
 - FCS PMO
 - FCS LSI
 - PM TRADE/PM CATT/PEO STRI
 - PM ITTS (host/coordinator)



Digital Data, Imagery, and Networking

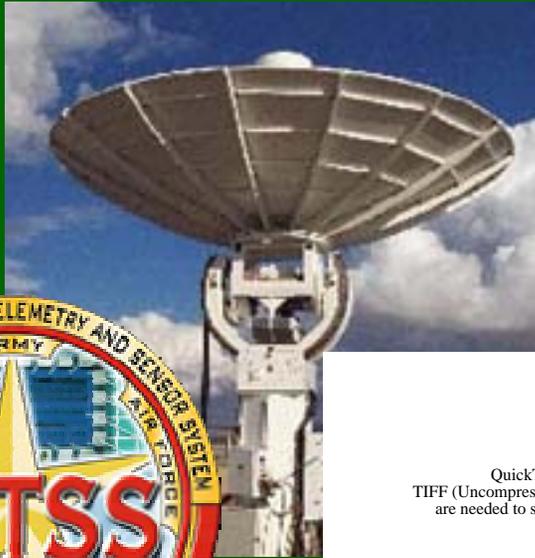


- Data demands are substantial in a networked, system of systems warfighting environment
 - Establishing range digital data networks
 - Fiber optic
 - Wireless
 - Wired
 - Converting to digital photography and video
 - Integrating network architectures
 - Sharing virtual environments
- Work in progress:
 - Versatile Information System, Integrated, On-Line Nationwide (VISION),
 - Digital Video Systems Development (DVSD),
 - Range Digital Transmission System (RDT)S,
 - Test Support Network (TSN), Fiber Optic Network (FON),
 - Land and Sea Vulnerability Test Capability (LSVTC),

Digital Systems enable unified and/or shared operations across Joint Testing and Training Ranges



Advancing Range Telemetry



QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

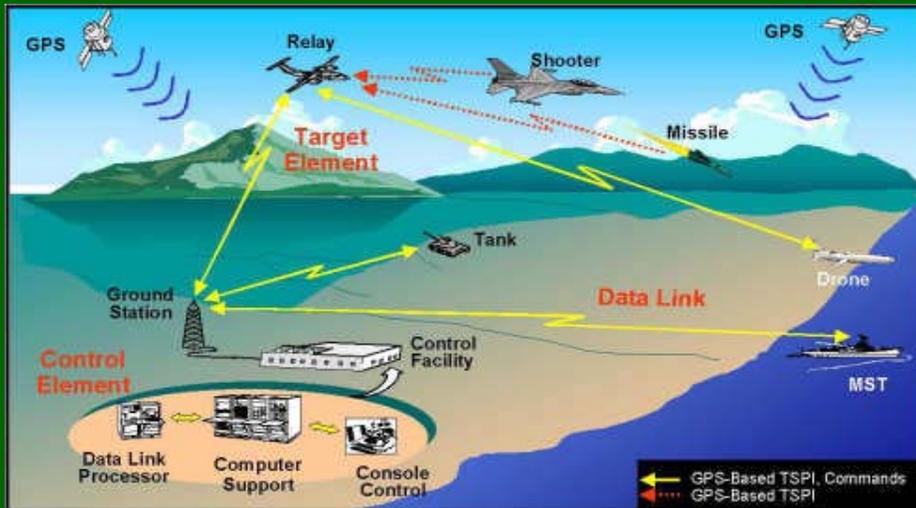
QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

- Advanced Range Telemetry (ARTM):
 - Better waveforms
 - Better use of radio spectrum
 - Longer distance capabilities
 - Joint standard
- Hardened Subminiature Telemetry and Sensor System: Embedded Telemetry
 - Can now track bullets in flight
 - Many joint applications - even used on space shuttle by NASA
- Telemetry Acquisition Stations
 - Fixed and Mobile capability investments
- Key elements for data throughput at all DoD Ranges

Advancing Telemetry across DoD Ranges



Multi-Service Target Control System



- Enables Target interoperability across Service ranges
- Ensures realism in testing and training
- Single architecture and interface for target operations across DoD
 - Air
 - Ground
 - Sea
- Challenge is to make MSTCS a reality

Universal Target Control:

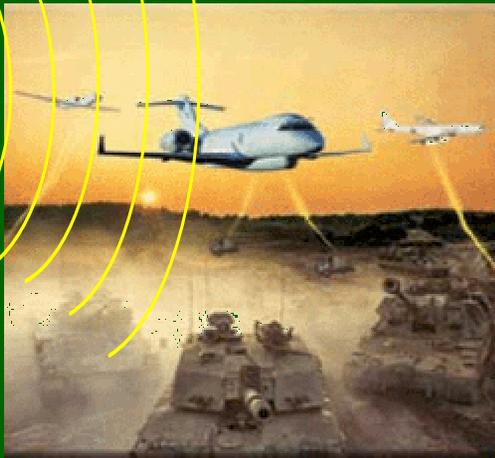
A key step towards consistent testing and training range architectures 11



Flexible Interoperable Transceivers



- Program History:
 - Standard Interoperable Datalink System (SIDS) - Navy Lead
 - Family of Interoperable Range System Transceivers (FIRST)
 - Flexible Interoperable Transceiver (FIT)
 - Family of Interoperable Transceivers - Enhanced (FIT-E)
- One standard for Data Link Systems
 - Usable across testing and training
 - Program eliminated need for eight other data link systems through unification on one standard
 - Converted MAIS/MILES transceivers to one low cost, lightweight transceiver design
 - Compression algorithms now applied in Advanced Range Telemetry and other DoD data programs



FIT-E: Setting new standards and sharing resources wisely
For DoD range datalink systems



Shared Operations, Threat Portrayals, and Analyses

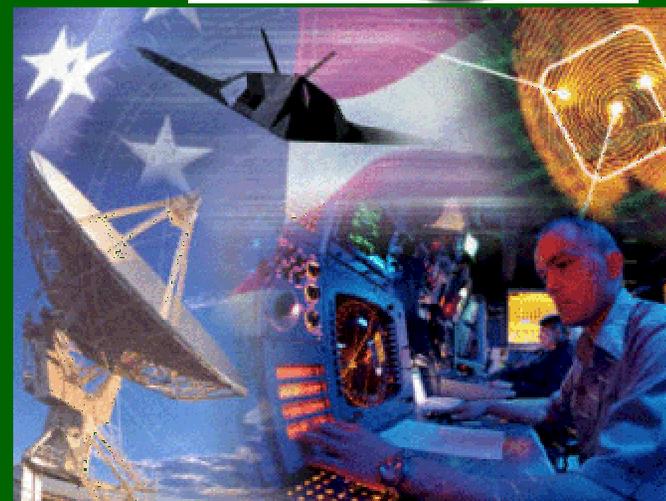
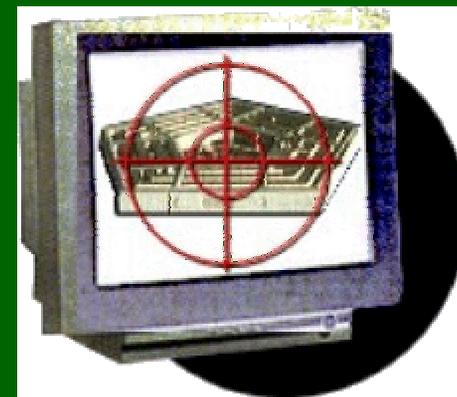
Exercising the Army Ranges
In Support of Joint Operations



Information Assurance Test Tool (IATT)



- C4ISR is the key to situation awareness
 - It **will be** attacked in joint combat
 - Must train and test for that reality
- Information Assurance Test Tool attacks C4I
 - Wired and wireless versions in development
 - Launches every conceivable form of attack
- IATT gives the joint warfare environment to C4ISR Training and Testing Operations



Joint Combat Realism in Service Test and Training Ops



Threat Systems Capabilities



- Joint Combat will include attempts to Jam/Intercept US Signals
 - Personnel and equipment must be prepared to deal with hostile weaponry and signal intelligence efforts
- Army T&E providing key threat systems to testing and training operations
- Army T&E working with other Services to provide full threat portrayal to our range battlespaces



Ensuring realism in OPFOR systems



Realistic Targets (Actual, Surrogate, and Virtual)



- Live targets ensure that equipment can identify, track, and defeat enemy systems
- Surrogate targets provide real target size and identification at a fraction of the cost
- Virtual targets ensure that training operations are realistic
- Together, actual, surrogate, and virtual targets provide a full spectrum of realistic opposition to our Joint forces



Full Spectrum Target Portrayals
improve readiness and realism



Shared Requirements Identification for the Future

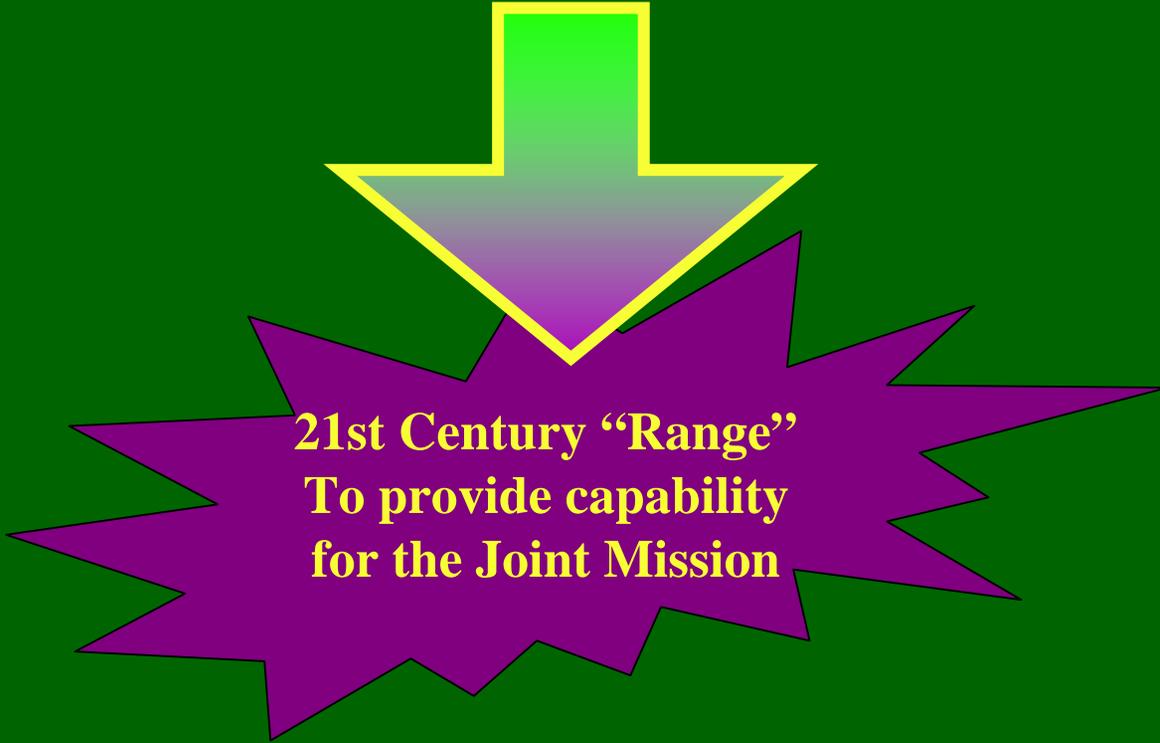
Moving towards a Joint Test and Joint
Training Environment



Requirement for a Joint Environment



- Joint National Training Capability - In Place
- Testing in a Joint environment - SPG Guidance



**21st Century “Range”
To provide capability
for the Joint Mission**



Addressing joint challenges early leads to greater and shared success stories



SUMMARY

- Joint Testing and Training is the future
- Army Testing is addressing Joint challenges
- Army Training is a valued partner in this process
- Army Technology Investments are in line for success
- Army 21st Century Range will be a Joint environment



BRAC
Budget Realities

