



# The DoD T&E/S&T Program

**George Rumford**  
Program Manager

**Test Resource Management Center  
Test & Evaluation / Science & Technology Program  
(TRMC, T&E/S&T)**

**NDIA 13<sup>TH</sup> Annual Science & Engineering Technology Conference**



# The STEWARD of the DoD Test Infrastructure

## Major Range and Test Facility Base (MRTFB): The "Critical Core"

24 Sites: Army-9; Navy-6; Air Force-7; Defense Agency-2

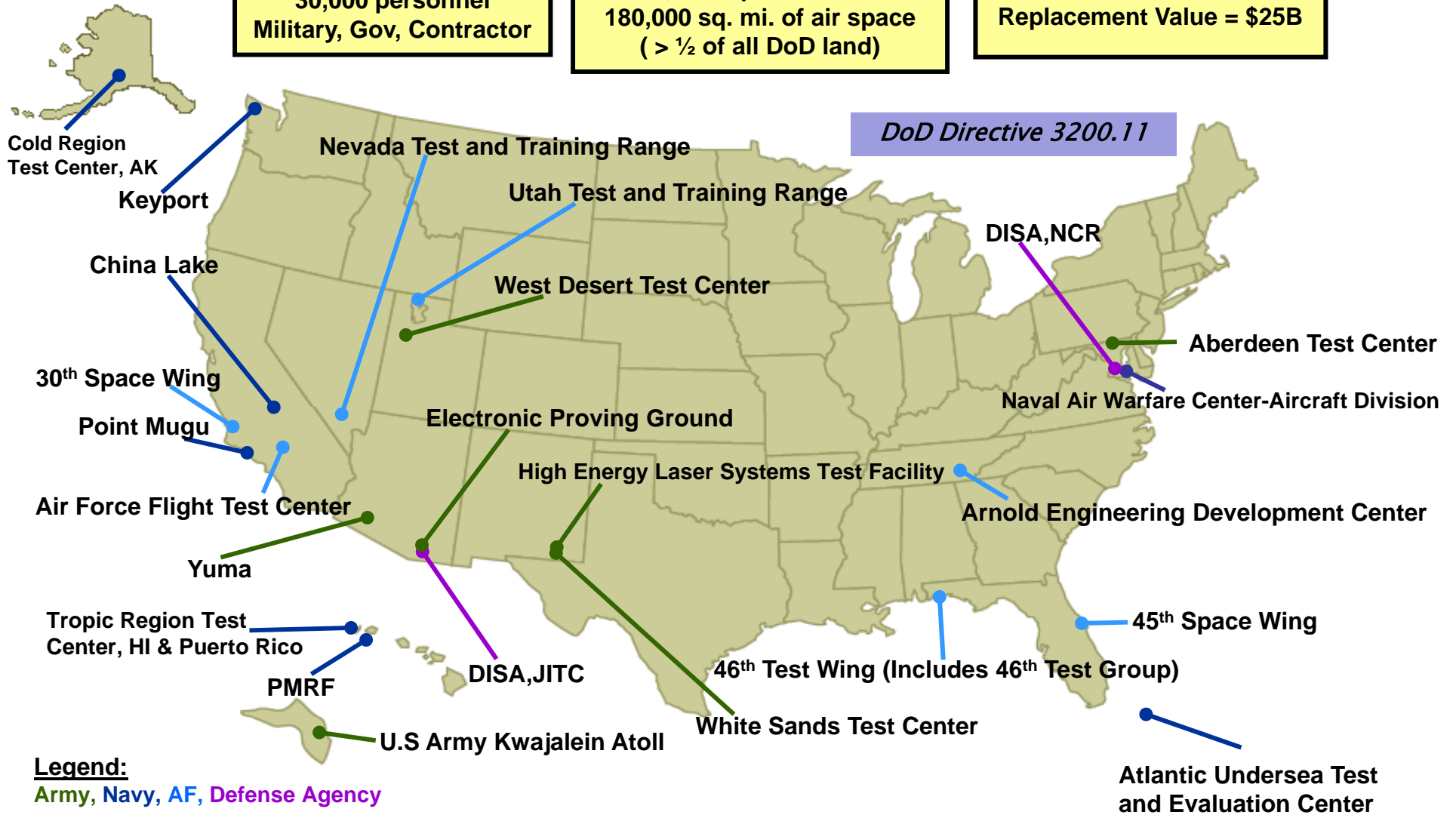


30,000 personnel  
Military, Gov, Contractor

18,000 sq. mi. of land  
180,000 sq. mi. of air space  
( > 1/2 of all DoD land)

Replacement Value = \$25B

*DoD Directive 3200.11*





# TRMC Investment Programs Overview



## T&E/S&T



- Established in FY2002
- Develops technologies required to test future warfighting capabilities
- BA 3 RDT
- BA 4 RDT

**Test Technology Development**

- Speed/Hypersonics
- Autonomous Systems
- Net-Centric Systems
- Directed Energy
- Advanced Instrumentation
- Spectrum Efficiencies

## CTEIP



- Established in FY1991
- Develops or improves test capabilities that have multi-Service capability
- BA 4 RDT
- BA 5 RDT

**Test Capability Development**

- 13 projects improving threat representations used in testing
- 18 projects addressing near-term OT shortfalls

## JMETC



- Established in FY2007
- Provides infrastructure for distributed Joint and Cyberspace testing
- BA 5 RDT
- BA 6 RDT

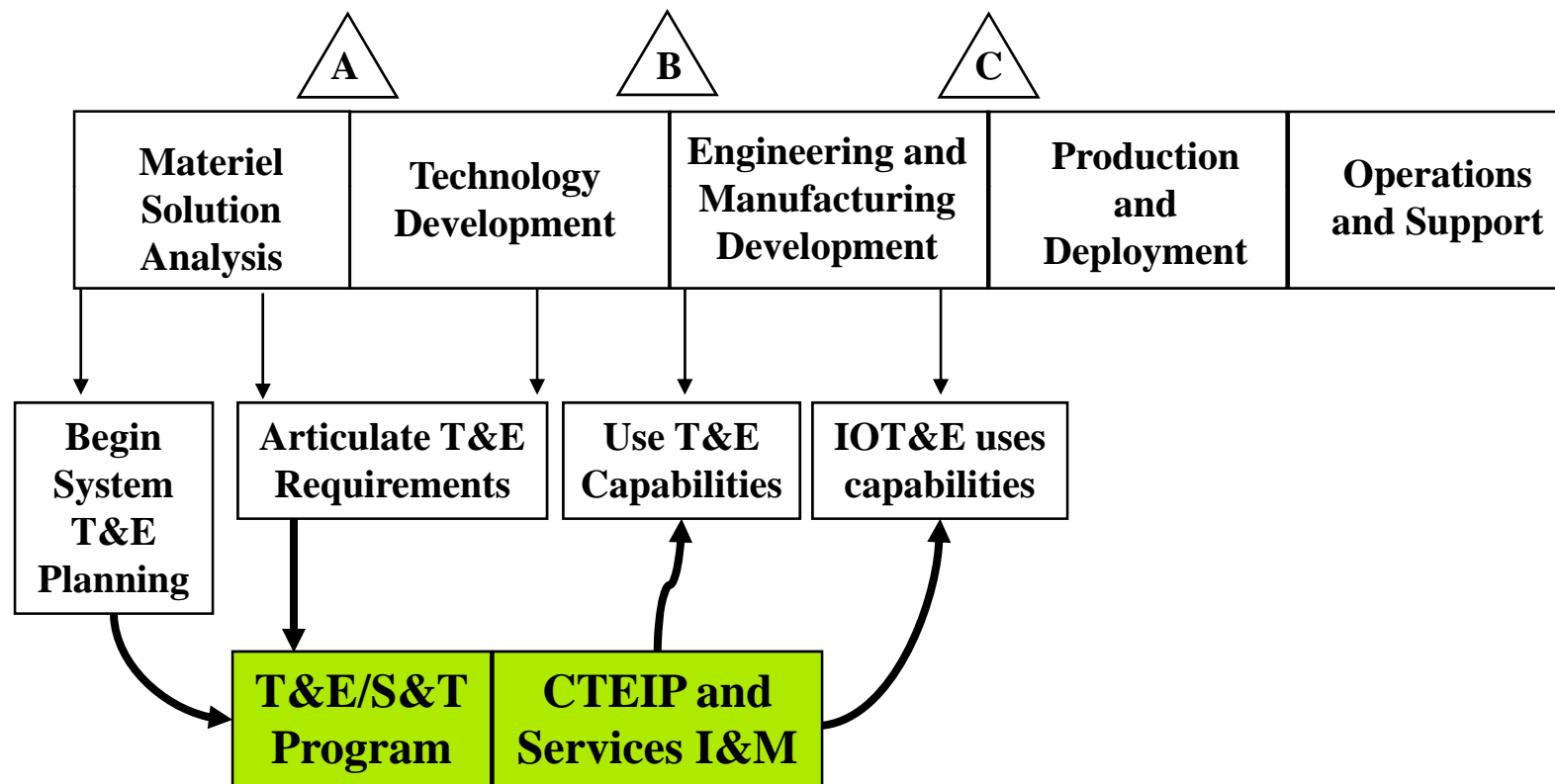
**Distributed Test Integration**

- Network connections
- Security agreements
- Integration software
- Interface definitions
- Distributed test tools
- Reuse repository



# T&E Capability Development Cycle

**Challenge: T&E Capabilities must be available in time to provide useful insight to decision-makers and warfighters**



**Cycle for Test Capability Development Must Begin Early**



# T&E/S&T Program Overview

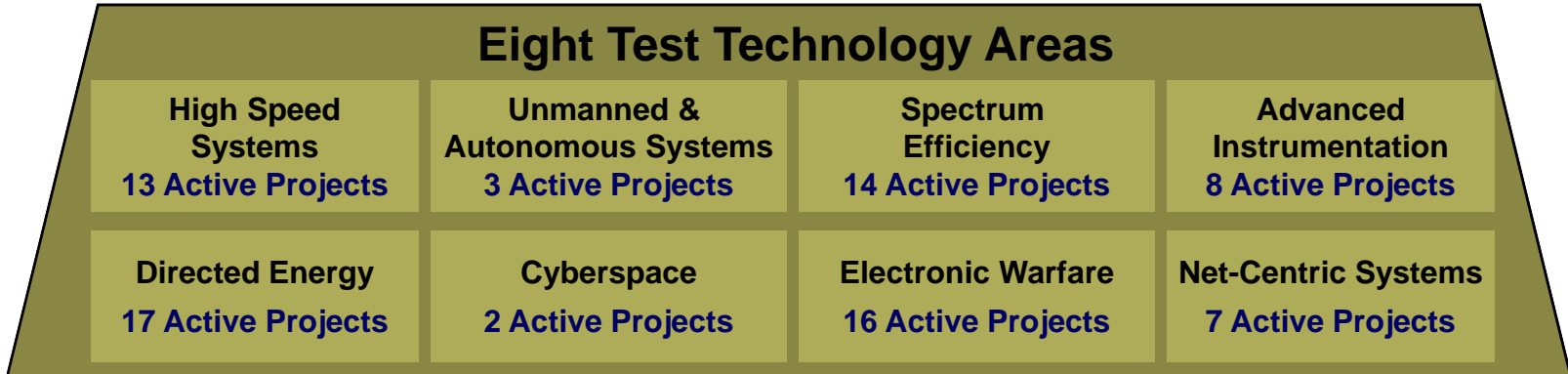


**Mission: Develop Technologies Required to Test Future Warfighting Capabilities**

- Established in FY02
  - Joint DDR&E / DOT&E Initiative
  - Transitioned to TRMC in FY05
- RDT&E Budget Activity 3 funds
- Purpose
  - High Risk / High Payoff R&D for Testing
  - Foster technology transition to major DoD test ranges
  - Risk reduction for test capabilities developments

**80 Active Projects**

- Annual Broad Agency Announcements (BAAs)
  - Academia
  - Industry
  - Government Laboratories
- Tri-Service working groups
  - Validate requirements
  - Evaluate proposals
  - Facilitate technology transition
- Central Oversight – Distributed Execution



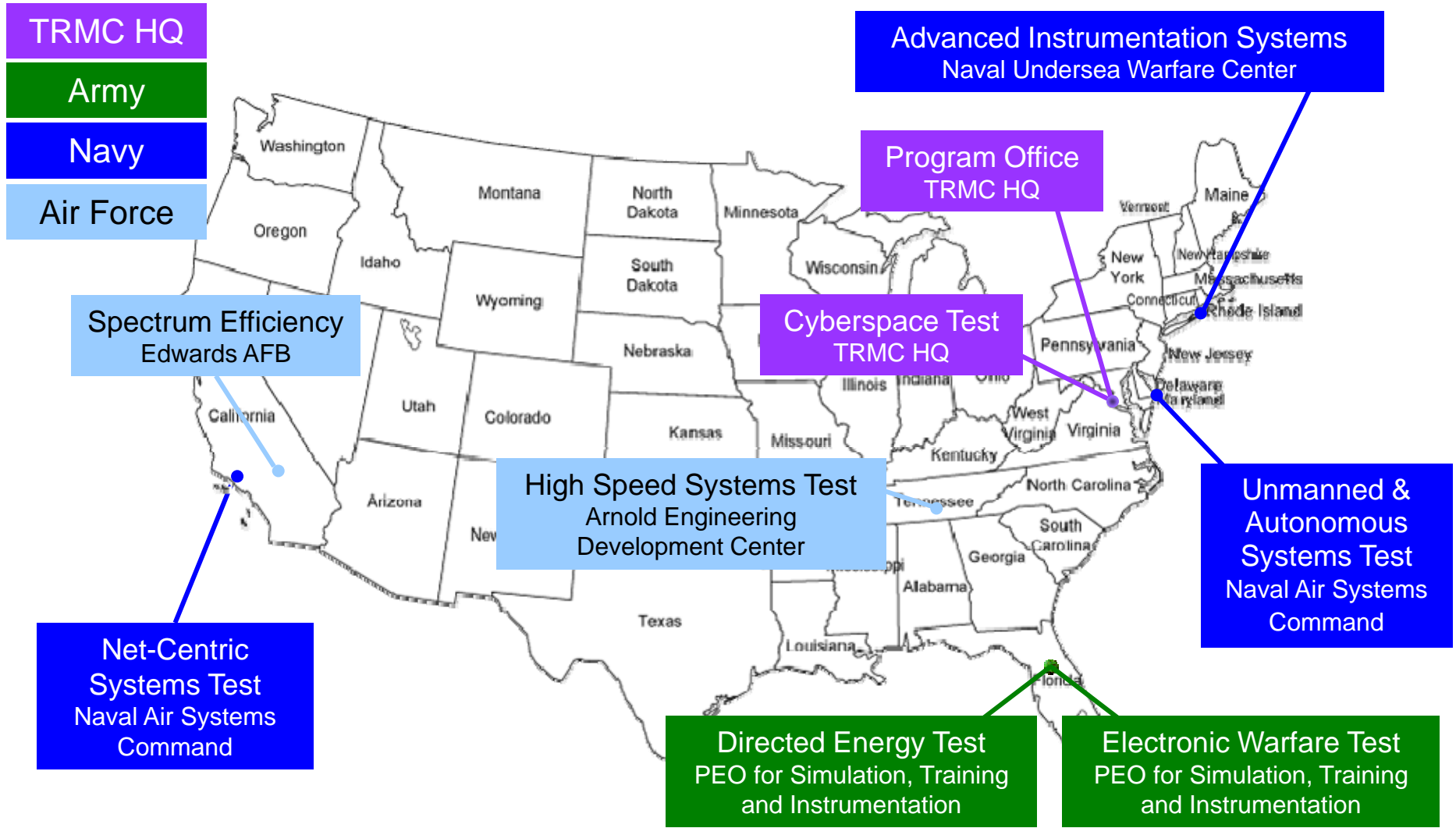
FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
\$94.6M	\$96.6M	\$92.6M	\$94.0M	\$95.8M	\$98.4M	\$100.2M

**Shaping Technology into Tomorrow's T&E Capabilities**



# T&E/S&T Test Technology Area

## Executing Agent Organizations



Central Oversight – Distributed Execution



# T&E/S&T Program

## Broad Agency Announcements



- Topics for Industry, Academia, and Government Laboratories to propose test technology solutions
- **In-cycle Process**
  - Declared schedule for white paper submissions (deadline)
  - Requires an allocation of available funding
  - Priority over out-cycle white papers (must be processed first)
- **Out-of-cycle Process**
  - White papers submitted anytime after "in-cycle" deadline
  - Offerors "highly encouraged" to contact Executing Agent before submitting white paper
    - Ensures interest
    - Can address whether a 'chance' exists for funding
- All BAAs include an **"Other Test Technologies"** topic to enable offerors to propose test technology developments that were not previously identified by the Government

**All T&E/S&T BAAs are always open for new white papers**



# T&E/S&T New Project Selection Schedule



Activity	T&E/S&T New Project Selection Schedule											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Draft BAA Topic Areas												
Industry/Academia Days		18-20 October in Atlanta										
Refine BAA Topics												
BAA Topics Finalized												
BAA Topics Announced					Call for White Papers							
White Paper Submissions								White Papers due 20 March				
White Paper Reviews												
Proposals Requested from Selected Offerors										Proposals to be Requested on ~22 May		
Proposal Submissions												Proposals due 26 June
Proposal Review & Clarifications												
Executing Agents Recommendations to PM												
PM New Start Decisions												
Contract Awards Initiated												

**Program Manager Action**

**Executing Agent Action**

**Contracting Officer Action**

**Offeror Action**





# T&E/S&T Program

## Test Technology Needs Structure



- **T&E/S&T Program**
  - Program Manager & Deputy Program Manager
- **Test Technology Area (TTA)**
  - Executing Agent in field organization within a Service
  - Each TTA has a separate BAA announcement at <http://www.fbo.gov>
  - There are currently 8 TTAs in the T&E/S&T Program
- **Domains**
  - Sub-division of TTA for categorization
  - TTAs are currently divided into 2 to 6 domains
  - There are currently 27 domains across the T&E/S&T Program
- **Topics**
  - Test Technology Need for an offeror to propose a development
  - There are currently 99 test technology topics across the 8 BAAs
- **Enabling Technologies**
  - Some test technology topics could be addressed by a multitude of different technologies that could enable an aspect of the overall solution
  - In some domains, we also identify enabling technologies to clarify different technology approaches to a test technology need



# Location of T&E/S&T BAAs

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**[www.fbo.gov](http://www.fbo.gov)**

**Keyword: TRMC**

**Note: Posted in January so may need to change search for “Posted Date” to beyond “Last 90 Days”**



# Electronic Warfare Test T&E/S&T Test Technology Area



**Executing Agent**  
Minh Vuong  
U.S. Army PEO-STRI  
407-384-5238  
minh.vuong@us.army.mil

- **Current Portfolio: 16 Projects**
- **FY12 Budget: \$19.9M**
- **2 Domains with 15 Current Topics**
  - **Electro Optics: 8 Topics**
  - **Radio Frequency: 7 Topics**
- **Significant Technology Needs**
  - **Full-Range Surrogate Missile Technology**
  - **High-Speed EO/IR Scene Generation**
  - **Missile Body & Plume Attitude Measurement**
  - **Real-time, High-Fidelity, High-Density RF Signal Generation**
  - **Multi-Beam Characterization**
  - **Radar Clutter Simulation**



# High Speed Systems Test T&E/S&T Test Technology Area



**Executing Agent**

Ed Tucker

Arnold Engineering  
Development Center

931-454-7469

ed.tucker@arnold.af.mil

- **Current Portfolio: 13 Projects**
- **FY12 Budget: \$19.3M**
- **5 Domains with 16 Current Topics**
  - **Advanced Propulsion: 6 Topics**
  - **Aerodynamics & Aerothermal: 2 Topics**
  - **Flight Test and Evaluation: 3 Topics**
  - **Computational Tools for Flow Fields: 1 Topic**
  - **Instrumentation for Flow Fields: 4 Topics**
- **Significant Technology Needs**
  - **Propulsion Scaling Test Techniques**
  - **Combined Cycle Propulsion Test Methods**
  - **Hypersonic Flight Erosion Test Methods**
  - **Thermal Protection System Ablation Testing**



# Net-Centric Systems Test T&E/S&T Test Technology Area



**Executing Agent**  
Gil Torres  
NAVAIR (Pt. Mugu)  
805-989-9521  
gilbert.a.torres@navy.mil

- **Current Portfolio: 7 Projects**
- **FY12 Budget: \$17.4M**
- **3 Domains with 11 Current Topics**
  - **System of System Testing: 3 Topics**
  - **Improved Test Automation: 3 Topics**
  - **Modeling & Simulation for Test: 5 Topics**
- **Significant Technology Needs**
  - **Flexible Test Harness Generator**
  - **Automated, Rapid, Agile Test Planning**
  - **Removing biases in Distributed Testing**
  - **Rapid Analysis of Voluminous Unstructured Data (“Test Data to Decision”)**
  - **Determining Required M&S Fidelity in Tests**



# Directed Energy Test T&E/S&T Test Technology Area



**Executing Agent**  
Minh Vuong  
U.S. Army PEO-STRI  
407-384-5238  
minh.vuong@us.army.mil

- **Current Portfolio: 17 Projects**
- **FY12 Budget: \$13.8M**
- **3 Domains with 10 Current Topics**
  - **High Power Microwave: 6 Topics**
  - **High Energy Laser: 3 Topics**
  - **Special Interest Area: 1 Topic**
- **Significant Technology Needs**
  - **Neutron Environment Simulator to replicate required nuclear effects test environments**
  - **In Chamber HPM Source**
  - **HPM Electronic Failure Analysis**
  - **Characterizing beam propagation through atmosphere & maximizing laser test windows**



# Advanced Instrumentation Systems

## T&E/S&T Test Technology Area



**Executing Agent**  
Dr. George Shoemaker  
NUWC-Newport  
401-832-5304  
george.shoemaker@navy.mil

- **Current Portfolio: 8 Projects**
- **FY12 Budget: \$10.6M**
- **6 Domains with 24 Current Topics**
  - **Time Space Position Info: 7 Topics**
  - **Advanced Sensors: 9 Topics**
  - **Advanced Energy & Power: 4 Topics**
  - **Non-Intrusive Instrumentation: 2 Topics**
  - **Range Environment Encroachment: 1 Topic**
  - **Human Systems: 1 Topic**
- **Significant Technology Needs**
  - **TSPI without GPS (or with limited GPS)**
  - **Measuring body armor / helmet effectiveness**
  - **Measuring cognitive workload**



# Spectrum Efficient Technology

## T&E/S&T Test Technology Area



### Executing Agent

Tom Young

Air Force Flight Test Center

(661) 277-1611

tom.young@edwards.af.mil

- **Current Portfolio: 14 Projects**
- **FY12 Budget: \$9.6M**
- **3 Domains with 8 Current Topics**
  - **Wireless Technologies: 5 Topics**
  - **Telemetry Networking: 2 Topics**
  - **Spectrum Management: 1 Topics**
- **Significant Technology Needs**
  - **Multiple Access Schemes for Serial Streaming Telemetry**
  - **Modulation Agile Radio for Test Applications**
  - **Channel Estimation and Equalization**
  - **Steerable Multiband Antenna (L-band, S-band, & C-band) for Airborne Test Articles**





# Unmanned & Autonomous Systems Test T&E/S&T Test Technology Area



**Executing Agent**  
Bill Hamel  
NAVAIR (Pax River)  
301-342-6373  
william.hamel@navy.mil

- **Current Portfolio: 3 Projects**
- **FY12 Budget: \$3.3M**
- **2 Domains with 7 Current Topics**
  - **Autonomous System Test Planning: 3 Topics**
  - **Autonomous System Performance Assessment: 4 Topics**
- **Significant Technology Needs**
  - **Predicting Autonomous Behavior for Testing**
  - **Enhancing Safety of Autonomous Testing**
  - **Testing of Autonomy Functional Components**
  - **Measure Autonomous System Reliability and Performance**

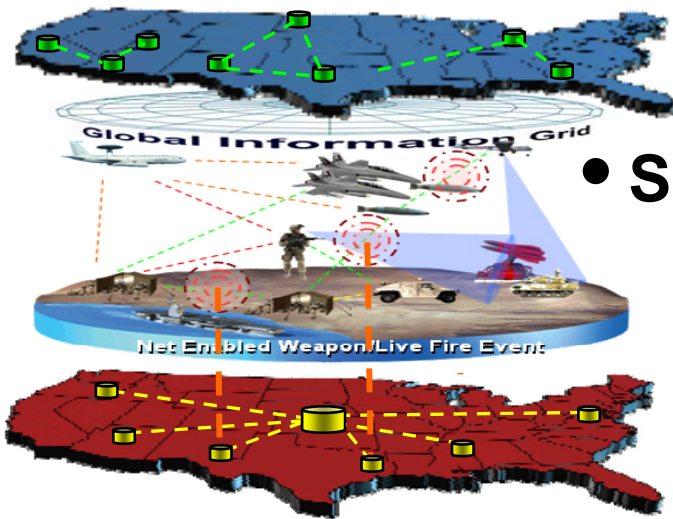


# Cyberspace Test T&E/S&T Test Technology Area



Interim Executing Agent  
Arjuna "AJ" Pathmanathan  
Test Resource Management  
Center  
571-372-2702  
arjuna.pathmanathan@osd.mil

- **Current Portfolio: 2 Projects**
- **FY12 Budget: \$2.6M**
- **3 Domains with 8 Current Topics**
  - **Cyberspace Test Planning: 3 Topics**
  - **Cyberspace Threats: 2 Topics**
  - **Cyberspace Test Execution/Analysis: 3 Topics**
- **Significant Technology Needs**
  - **Cyberspace test visualization**
  - **Defining cyberspace test measurements**
  - **Improved, scalable cyberspace threat representations**
  - **Advanced cyberspace instrumentation**
  - **Improved cyberspace analysis**





# The Proposal — Key Criteria

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- **Meets a T&E Need**
- **Requires S&T work**
- **High Payoff**
- **Broad application (more than one DoD test activity)**
- **High potential for transition to development of a test capability**



# T&E/S&T Program Summary

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- **T&E/S&T Program initiated to address critical T&E needs tied to S&T drivers**
  - Advancing the state of the art in T&E technologies
- **The only DoD S&T program dedicated to T&E**
- **Annual Call to Industry, Academia, and Government Laboratories to address test capability needs**
- **Competitive technology developments to get the best technologies possible to the test community**
- **Focused on transition into needed test capabilities**

**Looking Ahead, Responsive, and Agile**



# Questions?



**Please stop by our booth in  
the exhibit hall**

## **Contact Information:**

**Mr. George Rumford**

**Test Resource Management Center  
T&E / S&T Program**

**[George.Rumford@osd.mil](mailto:George.Rumford@osd.mil)**