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Transformation of DoD Spectrum Utilization Needed to Ensure Future Access

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Outline

- **DISA/Defense Spectrum Organization Mission**
- **The Challenge: Spectrum is Congested and Contested**
- **The Solution: DoD EMS Strategy and Associated Roadmap and Action Plan**
- **The Current Bands being Squeezed: DISA Role Nationally/Internationally**
- **Take Aways**

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DISA/Defense Spectrum Organization

- Direct Combatant Command, Joint Task Force Support
 - Spectrum Advocacy - National and International EM spectrum planning and policy
- Engineering center of excellence - SME's, experience and tools required to address the complex issues associated with spectrum operations
- Enterprise capabilities/services - Enable Joint Electromagnetic Spectrum Operations (JEMSO)

DoD Spectrum Utilization transcends all Warfighting domains, including Cyber
DSO enables DoD EM spectrum access critical to success of the Joint Information Environment

Embedded Support



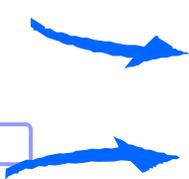
United Nations

International Telecommunication Union (ITU)

World Radiocommunication Conferences (WRCs)
• WRC-15 in Nov

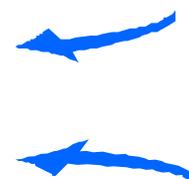
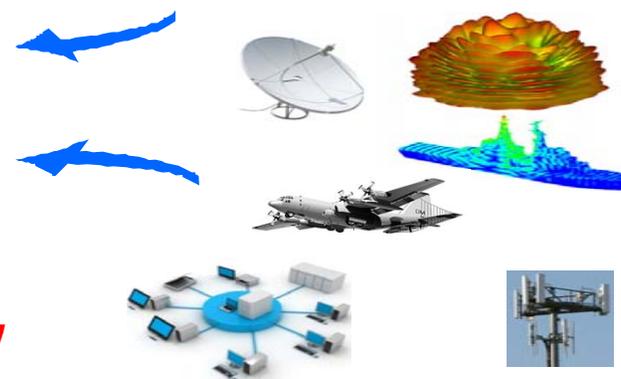
US Federal Government

Spectrum Advocacy



Supporting the Warfighter!

Engineering/SME Reach Back



Enterprise Services

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The Challenge: Congested and Contested Spectrum

DOMAINS		ADVANTAGES
Space		Integrated space, air, naval and ground systems
Air		Integrated Command & Control
Land & Sea		Operational superiority
CYBER		

“Like air, space, land, maritime, and cyberspace domains, military forces maneuver within the EMS to gain tactical, operational, and strategic advantages. The EMS transcends all these domains and enables mission execution within each and ensures overall operational superiority.”
- National Military Strategy

The Challenge

- DoD spectrum requirements are increasing – Electromagnetic Spectrum (EMS) is finite
- Commercial industry spectrum requirements are increasing – EMS is finite
- Operationally - adversaries developing technologies that further contest and congest the EMS
- Domestically, DoD perceived as inefficient; thus wireless community seeks ‘our’ spectrum and we lose access
- Internationally, DoD spectrum requirements are constrained even more

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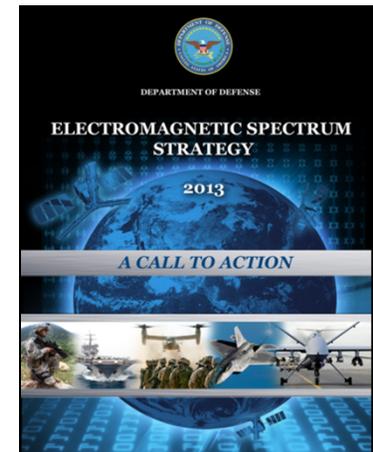
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Vision for Change: Spectrum Strategy

Vision: “Spectrum Access When and Where Needed to Achieve Mission Success”

“Call to action,” 3 goals:

1. Expedite development of SDS systems with increased efficiency, mutability, flexibility and adaptability
2. Increase agility of DoD operations
3. Sharpen responsiveness to spectrum regulatory/policy changes



Required for success

- A paradigm shift - Improvements to spectrum management and spectrum efficiency are necessary, but not sufficient - spectrum access through sharing is required to increase DoD's spectrum access opportunities
- Advancements in technology and associated policy/regulations
- Collaboration/partnerships AND Leadership/Accountability.

Working toward “win-win” for DoD, other federal users, and the wireless industry

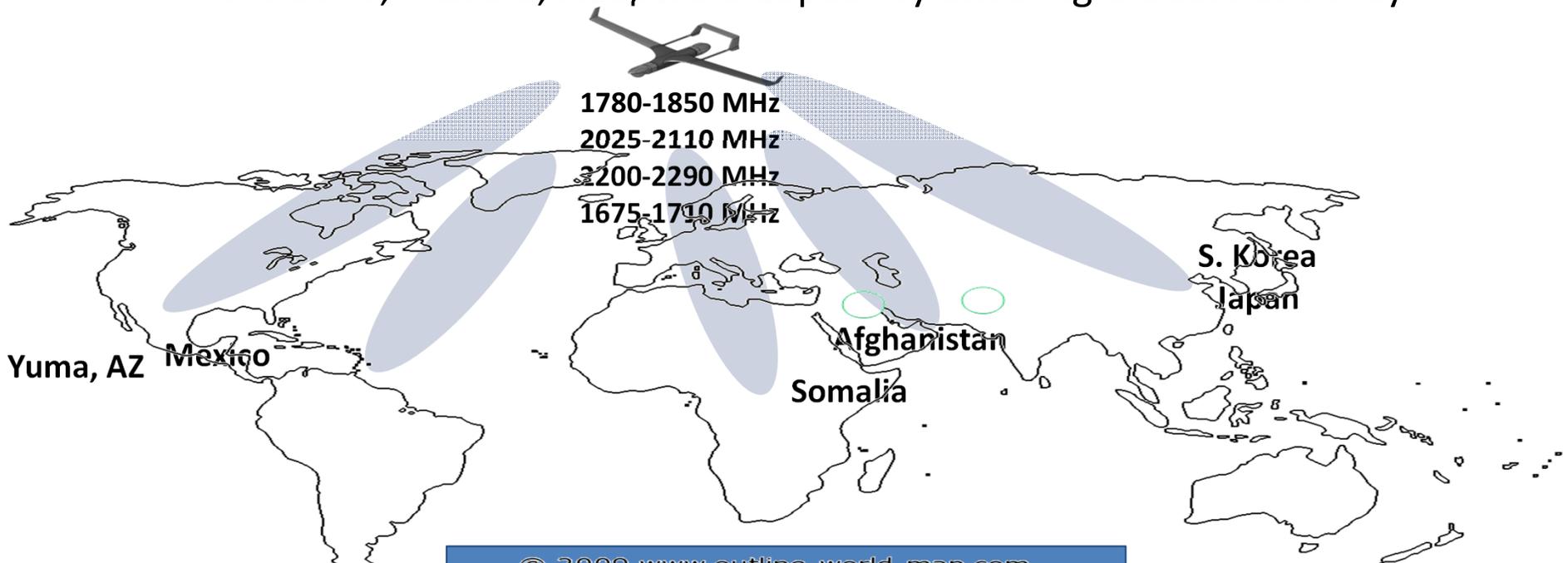
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Example:

Small Unmanned Aircraft systems

Multi-Band, Flexible, Adaptable Capability Enabling Global Resiliency



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100% Mission Effective

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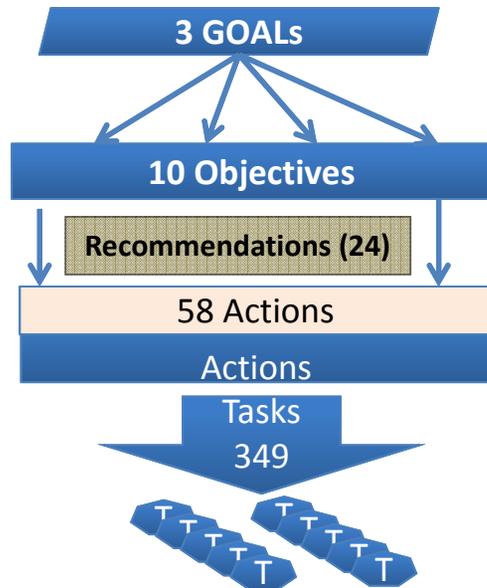


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DoD EMS Strategy RM & AP

Roadmap: provides a graphical visualization of the efforts, timeline, dependencies, and operational benefits for the execution of the actions

Action Plan: provides the essential building blocks needed to implement the Strategy's Goals and Objectives



24 Recommendations Derived From 58 Actions

Focus areas :

Goal 1: Technology Focused Partnerships/Collaboration:

- National Advanced Spectrum and Communications Test Network (NASCTN):
- National Spectrum Consortium

Goal 2: Joint EMS Operation (JEMSO)

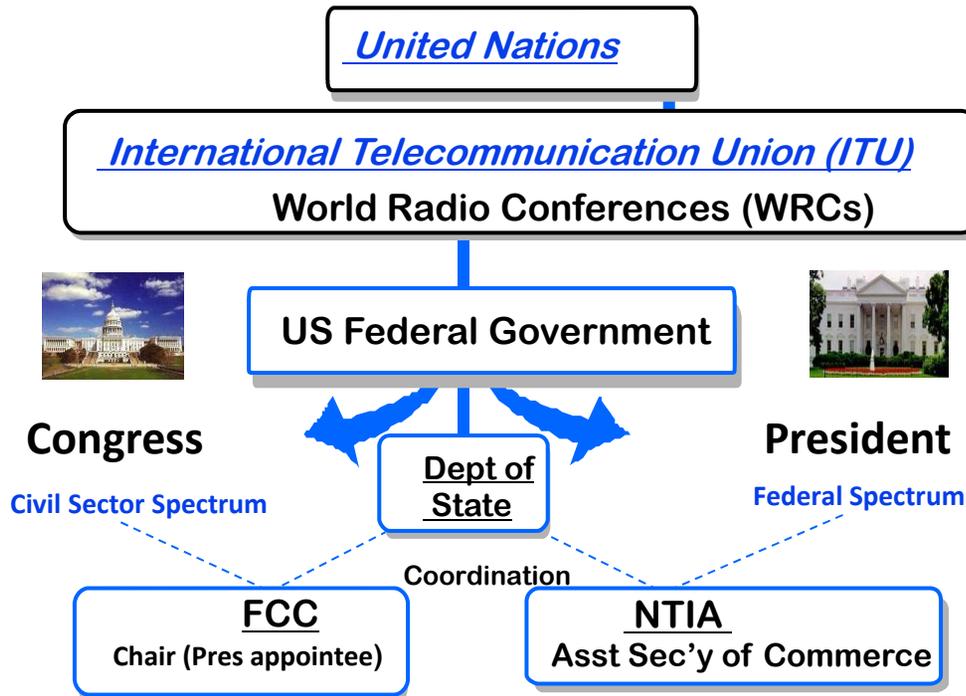
Goal 3: Spectrum Requirements Definition

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International



World Radiocommunication Conference (WRC)

DoD Top 4 WRC -15 Agenda Items

- AI 1.1 (Broadband & International Mobile Telecommunications (IMT))
- AI 1.5 (Fixed Satellite Service (FSS) for Unmanned Aircraft Systems (UAS))
- AI 1.6 (New FSS in 10-17 GHz)
- Global Flight Tracking

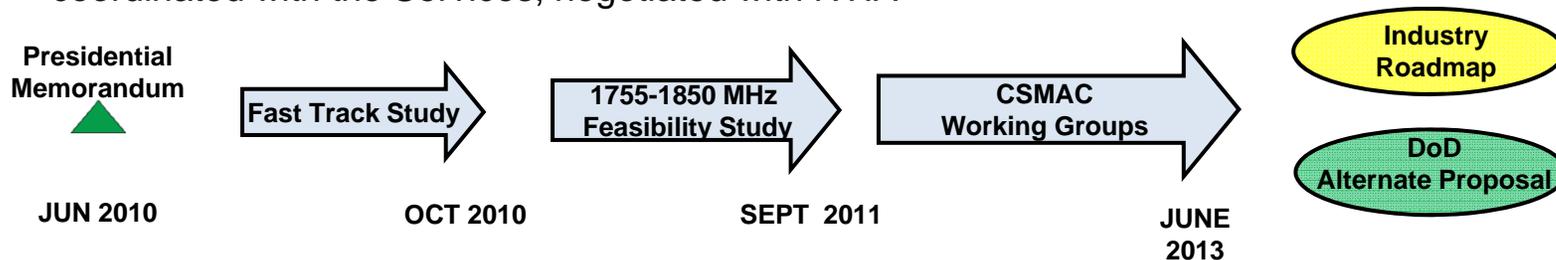
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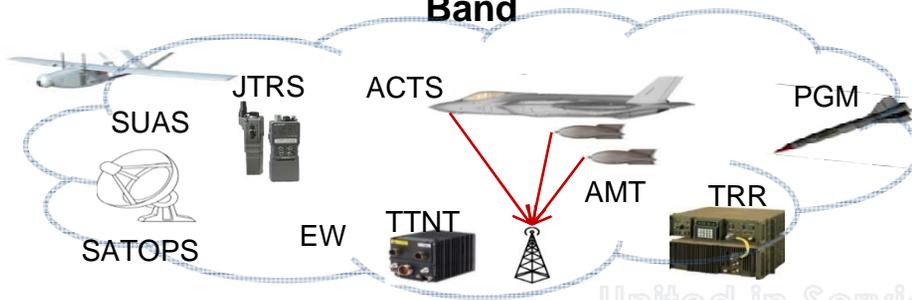
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DISA Role in AWS-3 Reallocation Formulating/Implementing Solution

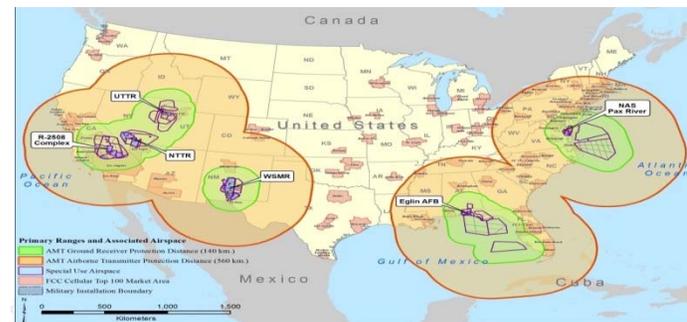
- DISA played major role in efforts leading to a AWS-3 spectrum reallocation solution that protected DoD operations
 - conducted detailed technical studies to guide informed decisions by DoD seniors
 - coordinated with the Services, negotiated with NTIA



DoD Systems in the 1755-1850 MHz Band



CSMAC Telemetry Coordination Distances



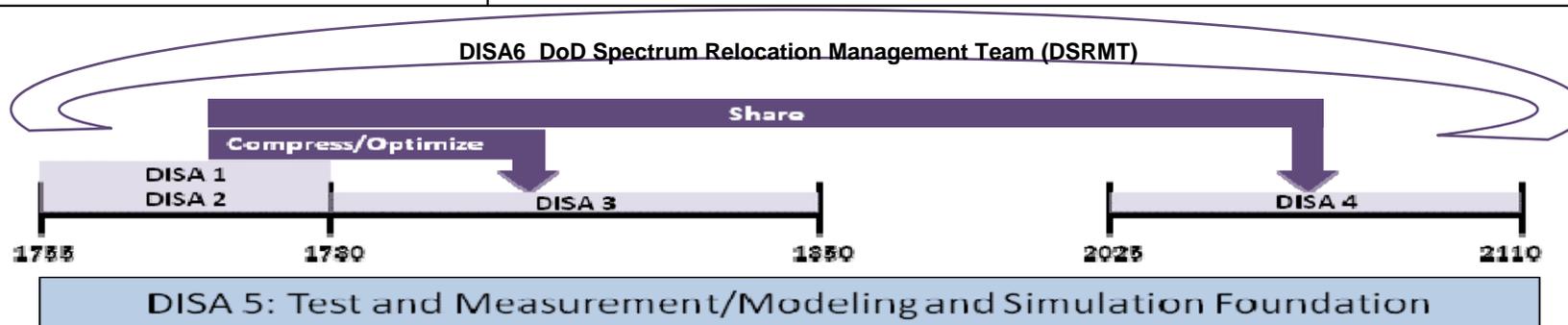
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DISA Portion of DoD Transition Plan

DISA Task Name	Description
DISA 1: 1755-1780 MHz Early Entry Analysis Capability Development and Analysis Implementation	Capability to enable industry to request DoD to consider LTE deployment possibilities - includes business process, enhancing analysis models, visualization, and performing required analysis
DISA 2: FSMS Automated Capabilities	Migrate/Automate DISA 1 activities to NTIA for long-term sharing activities
DISA 3: Compression Optimization Analysis/Test	Enhance tools to evaluate en masse frequency assignment options to optimize spectrum usage
DISA 4: 2025-2110 MHz Band Coordination & Spectrum Management Capability	Develop spectrum management tool for use by incumbent Broadcast Service and new DoD users wishing to share the 2025-2110 MHz
DISA 5: Spectrum Sharing Testing/Demo Program	A program to assess, improve, and demonstrate spectrum sharing between LTE and DoD band - includes testing (via using Service Labs) to characterize interference and evaluation of existing and future mitigation techniques available to LTE devices.
DISA 6: DoD Spectrum Relocation Management Team (DSRMT)	Personnel needed to oversee DoD DISA 1 – 5



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Take Aways

- **Challenge:** Continued lose of DoD spectrum access likely – not just near term! (e.g., legislation, Presidential initiative to repurpose 500 MHz, WRC-15, WRC-19, etc)
- **Solution:** Better spectrum management and spectrum efficiency improvements are necessary, but not sufficient --- spectrum sharing required to increase access
- **Plan:** DoD Electromagnetic Spectrum Strategy and Associated Roadmap and Action Plan – we are getting after it!
 - Efficient, Flexible and Adaptable Systems
 - Agile Spectrum Operations
 - Sharper Responsiveness to Regulatory/Policy Decisions
- **Required for success:** Technology Advancements, associated policy/regulations, and technology transition are critical in redefining how we access and use spectrum
 - Collaboration/partnerships AND Leadership/Accountability

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