Transformation of DoD Spectrum Utilization Needed to Ensure Future Access

Steve Molina
DISA/DSO/Strategic Planning Division

18 Jun 2015
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
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

Supporting the Warfighter!
The Challenge:
Congested and Contested Spectrum

**DOMAINS**
- Space
- Air
- Land & Sea
- CYBER

**ADVANTAGES**
- Integrated space, air, naval and ground systems
- Integrated Command & Control
- Operational superiority

"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
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**
Example:
Small Unmanned Aircraft Systems
Multi-Band, Flexible, Adaptable Capability Enabling Global Resiliency

Yuma, AZ  Mexico  Afghanistan  S. Korea  Japan  Somalia

1780-1850 MHz
2025-2110 MHz
2200-2290 MHz
1675-1710 MHz

100% Mission Effective
**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

---

**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

---

24 Recommendations Derived From 58 Actions
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
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
- SUAS
- SATOPS
- EW
- TTNT
- AMT
- TRR
- JTRS
- ACTS
- PGM

CSMAC Telemetry Coordination Distances

- Presidential Memorandum
- Fast Track Study
- 1755-1850 MHz Feasibility Study
- CSMAC Working Groups
- Industry Roadmap
- DoD Alternate Proposal

JUN 2010
OCT 2010
SEPT 2011
JUNE 2013

SUAS
JTRS
ACTS
PGM
TTNT
AMT
TRR

Still Available
National Forest System Wildfires
California Wildfires

DoD Systems in the 1755-1850 MHz Band

CSMAC Telemetry Coordination Distances
## DISA Portion of DoD Transition Plan

<table>
<thead>
<tr>
<th>DISA Task Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISA 1: 1755-1780 MHz Early Entry Analysis Capability Development and Analysis Implementation</td>
<td>Capability to enable industry to request DoD to consider LTE deployment possibilities - includes business process, enhancing analysis models, visualization, and performing required analysis</td>
</tr>
<tr>
<td>DISA 2: FSMS Automated Capabilities</td>
<td>Migrate/Automate DISA 1 activities to NTIA for long-term sharing activities</td>
</tr>
<tr>
<td>DISA 3: Compression Optimization Analysis/Test</td>
<td>Enhance tools to evaluate en masse frequency assignment options to optimize spectrum usage</td>
</tr>
<tr>
<td>DISA 4: 2025-2110 MHz Band Coordination &amp; Spectrum Management Capability</td>
<td>Develop spectrum management tool for use by incumbent Broadcast Service and new DoD users wishing to share the 2025-2110 MHz</td>
</tr>
<tr>
<td>DISA 5: Spectrum Sharing Testing/Demo Program</td>
<td>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.</td>
</tr>
<tr>
<td>DISA 6: DoD Spectrum Relocation Management Team (DSRMT)</td>
<td>Personnel needed to oversee DoD DISA 1 – 5</td>
</tr>
</tbody>
</table>

**Diagram:**

- **DISA 1:** 1755-1780 MHz Early Entry Analysis Capability Development and Analysis Implementation
- **DISA 2:** FSMS Automated Capabilities
- **DISA 3:** Compression Optimization Analysis/Test
- **DISA 4:** 2025-2110 MHz Band Coordination & Spectrum Management Capability
- **DISA 5:** Spectrum Sharing Testing/Demo Program
- **DISA 6:** DoD Spectrum Relocation Management Team (DSRMT)
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
Contact/POC Information

Information

www.disa.mil

Website or Program External Link

www.program.disa.mil

EMAIL
disa.meade.osbp.mb6.disa-program-office@mail.mil

Steve Molina/DISA Defense Spectrum Organization/steven.a.molina6civ@mail.mil

PHONE: 301-225-3808
United in Service to Our Nation

The IT Combat Support Agency