



Electronic Warfare / Electronic Protection (EW/EP) S&T Priority Steering Council

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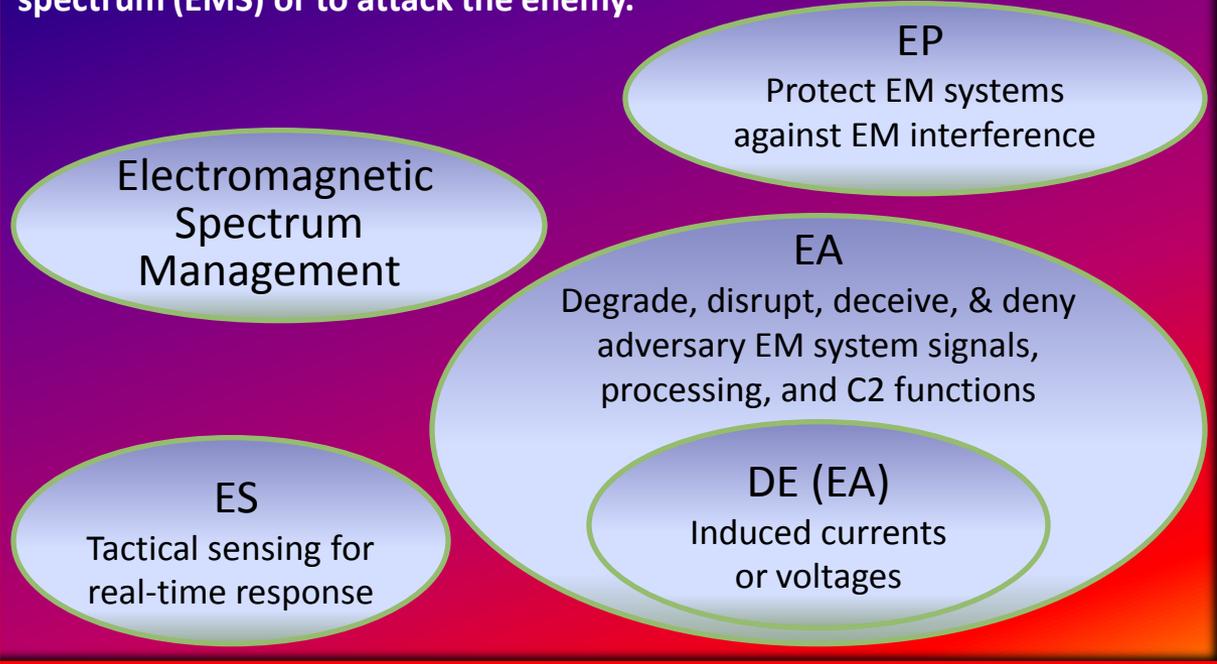


EW/EP Priority Steering Council

Scope & Domain Boundaries within the EMS



Electronic Warfare: Military action involving the use of electromagnetic (EM) and directed energy to control the electromagnetic spectrum (EMS) or to attack the enemy.



PSYOP/MISO
Induce alarms or failures / influence ideology

Counter-DE
Protect non-EM system against EM interference and DE (Weapon)

C3
Command, Control and Communications (voice, data, info)

Cyber Attack
Operations intended to manipulate adversary info and/or cyber systems

ISR/SIGINT
Intelligence, Surveillance and Reconnaissance gathering systems

DE (Weapon)
Thermal / radiation bombardment



EW/EP Problem Statement



Rapidly evolving challenges to spectrum dominance threaten blue force lethality and survivability

Exacerbating this situation are:

- The asymmetric advantage that lower cost and widespread technology offers our adversaries against our multi-billion \$ investments in military systems,
- The rapid pace of technology advancement leading to increasing potential for technology surprise,
- Pressure for EW operations across all war-fighting domains (air, sea, land, space, and cyber),
- The worldwide availability of advanced technology that is making our adversaries' use of the EMS much more complex and sophisticated, and
- The increasingly congested EM environment



EW/EP Tech Challenges & Desired End States



- **TC1: Cognitive, Adaptive Capabilities**
 - Effectively outpace adversary decision and technical options
- **TC2: Coordinated / Distributed / Network-Enabled Systems**
 - Spatially and temporally diverse responsiveness to dense and complex threat environments
- **TC3: Preemptive / Proactive Effects**
 - Real-time sensing, assessment and optimization of EA effectiveness
- **TC4: Broadband / Multispectral Systems**
 - Widest possible spectral extent to our control of the EMS
- **TC5: Modular / Open / Software-Configurable Architectures**
 - Timely deployment or insertion of advanced EW in response to rapidly changing conditions
- **TC6: Advanced Electronic Protection Techniques & Technology**
 - Allow unfettered operations in the increasingly dense EMS environment



EW/EP PSC Gaps & Opportunities



Game-Changing RF/Mixed Signal Component Technologies

- Agile, high dynamic range receiver electronics
- Agile, wideband transmitter electronics
- Affordable/modular agile beam antennas

Game-Changing EO/IR Component Technologies

- Next generation multispectral IR Focal Plane Arrays (FPAs)
- Multispectral, high power lasers
- Multispectral optics & optical phase control

Underlying technology enablers

- Nitride semiconductor family (GaN/InN/AlN)
- Ultra-precision clocks/oscillators (nsec → psec → fsec)



Broad Agency Announcements



- Industry responses to the grand challenges identified in this brief should engage in dialogue with the PSC leadership
- The following Broad Agency Announcements (BAAs) may also provide an avenue for specific ideas:

Air Force

BAA 09-01-PKS: "Sensor Technology Research, Development, Test & Evaluation Open-Ended Broad Agency Announcement (STROEB) II"

Army

BAA W15P7T-09-R-S152: "United States Army Communications-Electronics Research Development and Engineering Command Intelligence and Information Warfare Directorate Broad Agency Announcement I2WD 2009"

Navy

BAA ONR 12-001: "Long Range Broad Agency Announcement for Navy and Marine Corps Science and Technology"



Summary and Conclusion



- **Electronic Warfare is a critical enabler for Air, Land, Sea, Space, and Cyber operations.**
- **Independent systems- & components-level analyses converged on a short list of long term game-changing tech challenges...**
 - Cognitive / adaptive capabilities
 - Networked distributed coherent systems
 - Simultaneous Tx & Rx (STAR)
- **... enabled by highly linear, agile, high dynamic range, wideband / multispectral Tx & Rx components, precision clocks/oscillators, and active phase controlled apertures**
- **Roadmaps being finalized/configured to achieve an integrated systems and components EW investment strategy**



EW/EP PSC Membership



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