



Electronic Warfare (EW) S&T Community of Interest (CoI) Overview

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EW COI Membership



COI Steering Group

| Service | Principal | Alternate |
|---|-----------------------------|----------------------|
|  Air Force | Mr. Dale Parsons | Mr. Joseph Koesters |
|  Army | <i>Dr. Jeffrey Boksiner</i> | Dr. Charles Dietlein |
|  Navy | Dr. Dan Green | |
|  ASD(R&E) | Dr. Karl Dahlhauser | |
| MITRE Support | Mr. Marc St. John | |



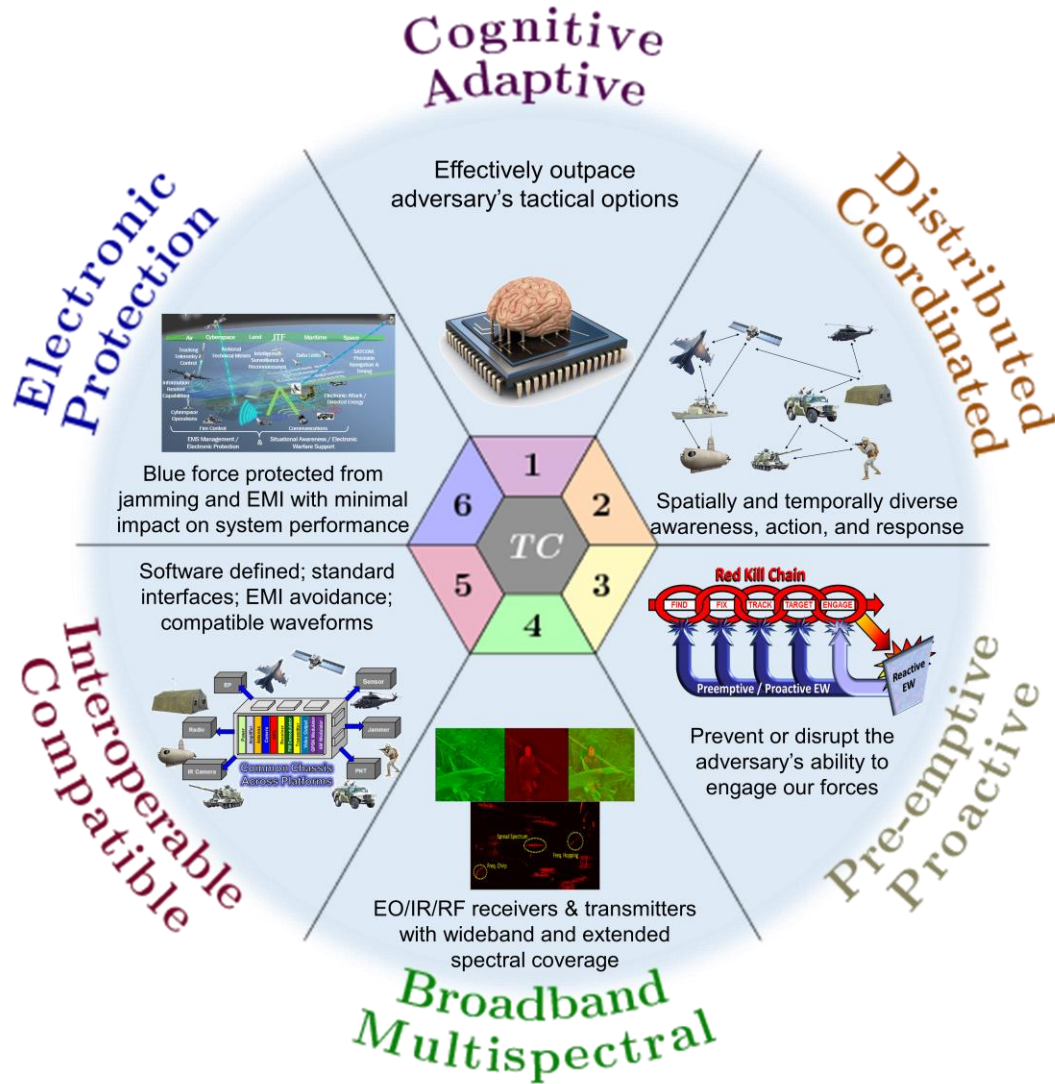
Role of the Electronic Warfare (EW) Community of Interest (COI)



- **Be the EW S&T leadership body for the DoD**
- **Define cross-cutting EW S&T investment strategy**
- **Develop experimentation strategy & recommendations**
- **Propose/define collaborations, e.g., integrated EW-Cyber effects**
- **Engage the community in its entirety**
 - Government, Industry, Academia, International
- **Develop quantifiable metrics**
 - How will we know we've met goals?
 - How do we know what level is good enough?
 - By when?
- **Incorporate (or reference) IRAD into COI strategy/roadmaps**



Technical Challenges (TCs)

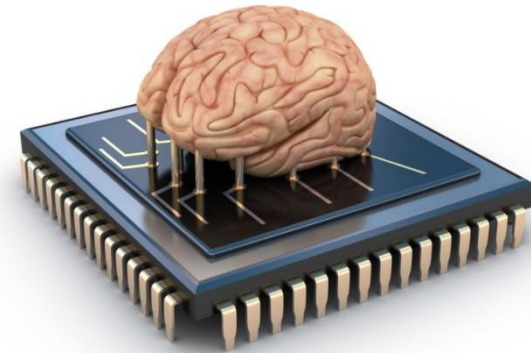




TC1: Cognitive, Adaptive Capabilities



- **Develop the ability to effectively outpace adversary decision and technical options, using:**



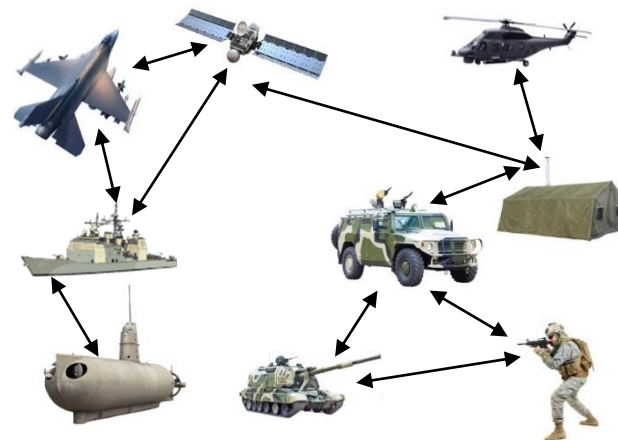
- Real time learning and predictive reasoning software algorithms
- Autonomous asset and resource optimization in response to threat behavior
- Automatic synthesis of countermeasure techniques against unknown threats
- Methods for assessing EW effectiveness



TC2: Distributed / Coordinated (Network-Enabled)



- Achieve spatially and temporally diverse responsiveness to dense and complex threat environments

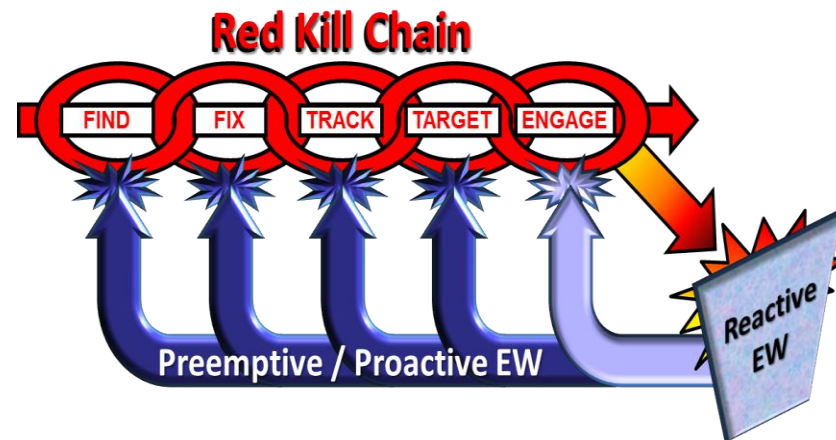


- EW architectural “layering” & integrated kinetic/non-kinetic resources
- EW Battle Management and common/shared electronic order of battle
- Real time fusion of spectral/temporal knowledge from disparate assets
- Distributed coherent phase control for sensing and attack



TC3: Preemptive / Proactive Effects

- Prevent or disrupt the adversary's ability to find, fix, track, target, and engage our forces



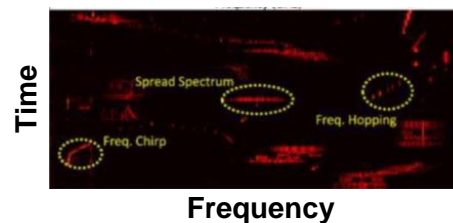
- Real-time active/passive sensing of “silent” threats
- “Spectrally agnostic” countermeasures
- Early kill chain techniques and methods
- Multispectral signature emulation



TC4: Broadband / Multispectral Systems

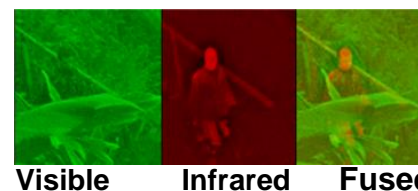


- Enable the widest possible spectral extent to our control of the electromagnetic spectrum



Broadband:

- Covers all bands at once
- Detects wideband threats



Multispectral:

- Different phenomena, observables occur at different wavelengths

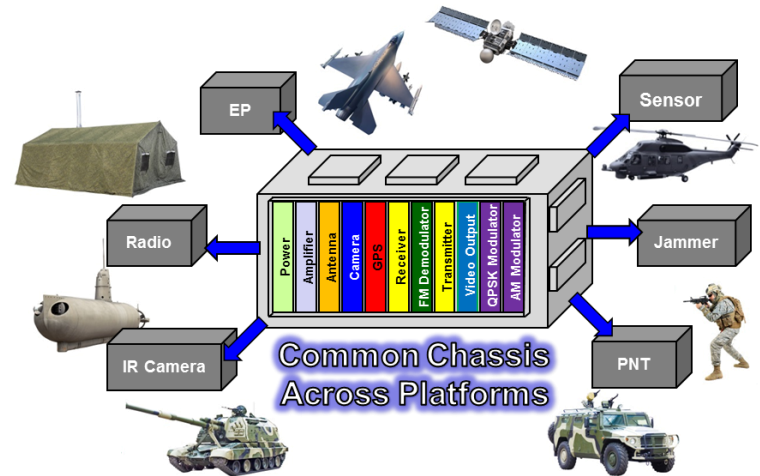
- EO/IR/RF receivers & transmitters with wideband and extended spectral coverage
- Advanced spectrum processing components (filters, modulators, etc.)
- Wide-band, high power apertures (antennas, windows, beam control, etc.)
- Spectroscopic signal sensing and ID



TC5: Interoperable & Compatible



- Achieve timely deployment or insertion of advanced EW capabilities in response to rapidly changing conditions with minimal degradation to friendly capabilities



- Adaptive protocols and standard firmware/hardware interfaces
- Techniques and waveforms usable across any EW component supplier
- Software-defined transceivers and processors
- Scheduling to optimize resource allocation
- Filters and other suppression techniques, interference cancellation



TC6: Advanced Electronic Protection



- **Protect against potentially deleterious effects of friendly or enemy use of the electromagnetic spectrum to enable unfettered operations in the increasingly dense electromagnetic spectrum**



- Focus on Electromagnetic Battle management (EMBM) and common aspects of EP
- Methods to simultaneously transmit and receive through shared or closely coupled apertures
- Predictive EM and signal modeling
- Directionality and diversity



Technology Evolution



- **Rapid evolution/advancement in technology**
 - Signal density and complexity
 - Systems becoming adaptable and software defined
 - Global advances in electronics
- **Global focus on Autonomy, Artificial Intelligence and Machine Learning**
 - Opportunity to use AI to understand/manage complexity & shorten response times
 - Training data
 - Battle Damage Assessment
 - Test and evaluation
 - Validation/trust