

We provide innovative scientific research and engineering solutions in Electronic Warfare, Wireless & RF Electronics, RF Modeling & Simulation, and Kinetics.

Whether modeling, hardware, or software design, we recognize we can't break the laws of physics, but we certainly do try to bend them!



***The Leading Edge in
Electronic Warfare***

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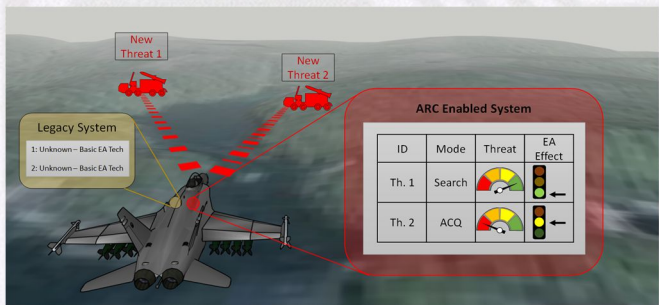
Roadmap Products

Adaptive Radar Countermeasures (ARC)

Goal: Provide real-time unknown, adaptive radar threat characterization in support of self-protection jamming countermeasure technique selection and jamming effectiveness estimation.

Techniques: Online threat model construction and radar capability analysis using physics-based and information-based inferences.

Transition: Program of Record, FY 2019.

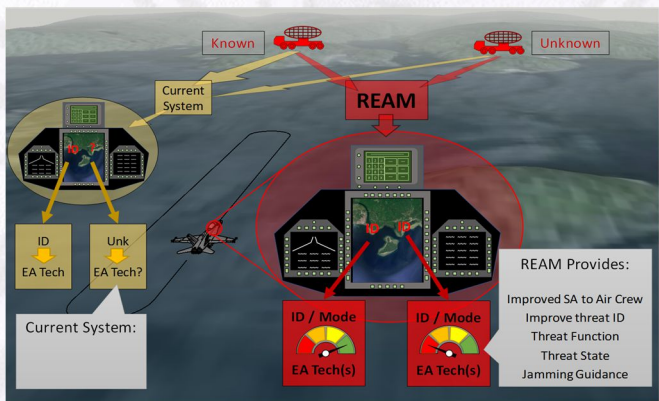


Reactive Electronic Attack Measures (REAM)

Goal: Provide real-time unknown, adaptive radar threat characterization for threat jamming support, and to identify, classify, and make jamming requests.

Techniques: Online threat model construction and radar capability analysis using physics-based and information-based inferences.

Transition: Program of Record, FY 2020.



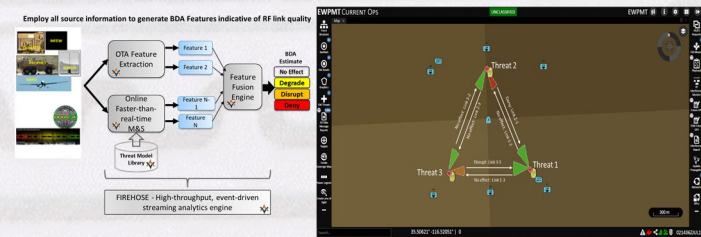
Roadmap Products (cont.)

EW Battle Damage Assessment (EW-BDA)

Goal: Provide real-time BDA estimates of threats and threat networks to an electronic warfare officer. BDA estimates are derived from streaming sensor data and intelligence information feeds.

Techniques: Data-driven BDA estimates along with confidence derived from streaming sensor readings of RF emitters and machine-learning-based emitter models. Support for analog PTT and WiFi, with expansion to tactical, digital communications and radar threats ongoing.

Transition: Army WWPMT CD4 Program of Record, FY 2019.



Research

Vadum is very active in advanced research with U.S. Federal agencies participating in Small Business Innovative Research (SBIR) programs focusing on Electronic Warfare (EW), Machine Learning, Radar and Missile Defense, Sensors, and Ballistics.

Some of our current research efforts include:

Active Phase II SBIRs

- NAVAIR: Distributed Coherent Electronic Warfare
- ARO: Vibration Enhanced Mine Detection
- I2WD: Nuclear Quadrupole Resonance Explosives Detection
- Army: Working Dog Hearing Protection/Communication System
- NGA: Signal Matching via Computationally Efficient Hashing
- NAVSEA: Scheduling Algorithm for Predicted Intercept Points (PIPs) for Multiple Targets

Active Phase I SBIRs

- SCO: Cryptographically Secure Neural Networks
- AFRL: Machine Learning for RCS Measurement Contamination

Products

Multi-shot Robotic EOD Disrupter (MRED)

- Up to 8 standard EOD 12-gauge cartridges
- Any shot (including water loads), any order
- Robot remains downrange between shots
- Reduces mission time & preserves robot battery life



Linear/Nonlinear Multi-Mode MIMO Radar

- Realtime detection of surface & shallow-buried IED components & initiators
- 0.4-2.5 GHz frequency range, 20 dBm TX power
- Modes/Waveforms
 - CW
 - SFCW
 - FMCW
 - TTFMCW



Visual Tire Pressure Gauge (VTIP)

- Low SWAP aircraft tire pressure gauge
- No RF emissions, Up to 435 PSI
- 1 PSI precision, ± 6 PSI accuracy
- -40-160°F operation
- MIL-PRF-38534 Class H



Nonlinear Automated Measurement System

- Characterize nonlinear amplitude & phase behavior of RF components
- 120 dB dynamic range, 43 dBm input power
- 0.4-6 GHz frequency range
- Applications:
 - RFIC testing
 - PIM
 - Nonlinear VNA
 - Signature extraction

