

S&T Campaign: Information Sciences Sensing and Effecting

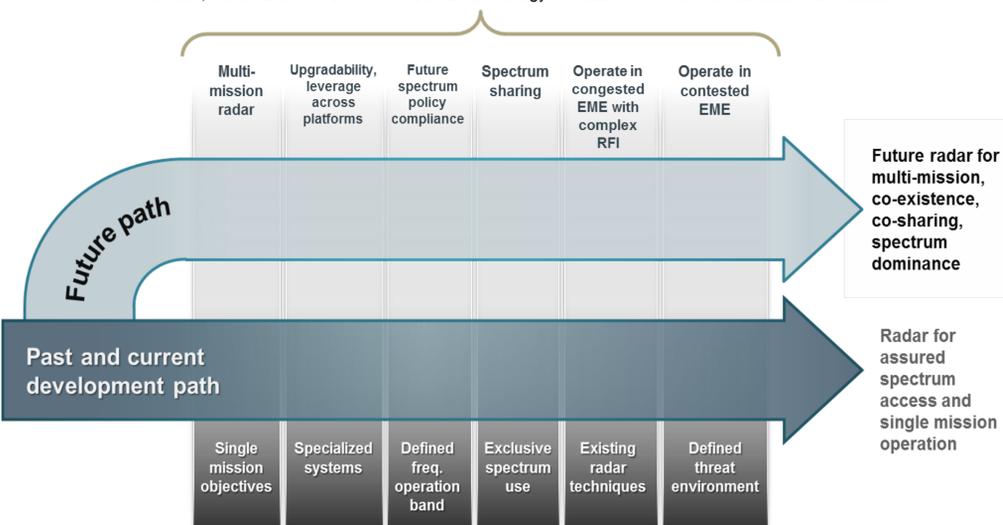
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Research Objective

- ARL is developing a technology base that could be used to develop future radars that are more:

- Adaptive
- Scalable
- Low-cost

- Cognitive RF
- Modular, multi-band HW/SW
- Adaptable RF hardware
- COTS technology for radar
- Agile waveforms/DSP
- Networked radar/multi-statics



The past and current technology development path has been tailored to produce systems for assured spectrum access and optimized for single mission objectives. A shift in technology is needed to move onto a development path for future radars that are multi-mission and capable of spectrum dominance, co-existence, and co-sharing.

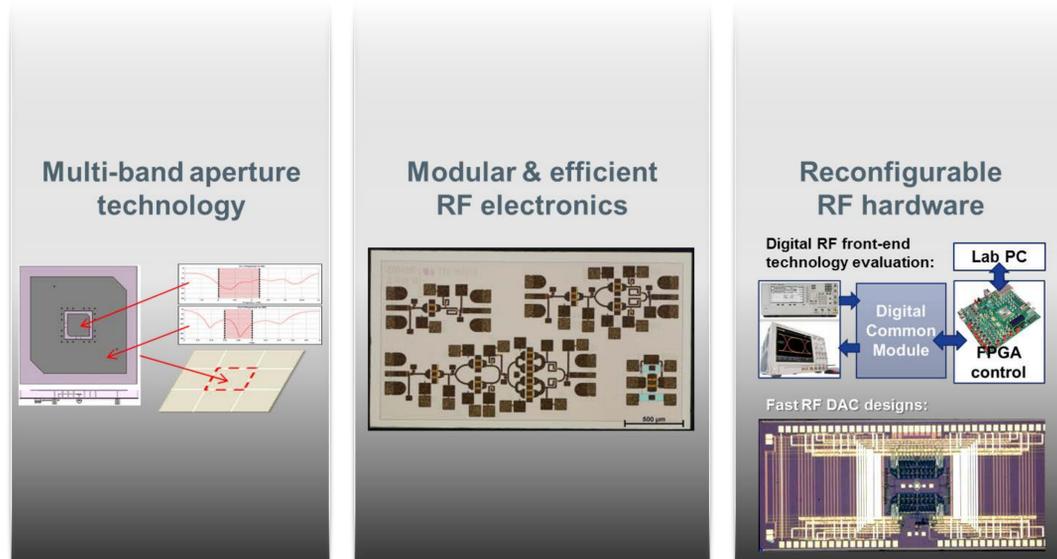
Questions driving current and future research:

1. Can we do more with fewer resources?
2. Can we increase resilience to dynamic conditions?

ARL Facilities and Capabilities Available to Support Collaborative Research

- Anechoic chamber
- Radio Frequency (RF) design & measurement lab:
 - Test equipment
 - Circuit fabrication equipment & CAD tools
 - Device measurement equipment
- Electromagnetic simulation software (HFSS, CST)
- ARL expertise:
 - Antenna design & measurement
 - Advanced RF circuit design
 - Experimental systems, technology demonstrators

Opportunity: development of a flexible technology base to facilitate multi-mission radar



Challenges

- **Limited access to Electromagnetic (EM) spectrum:** Congestion & policy changes
- **Dynamic environments:** adapt to dynamic EM environments (hardware challenges, radar performance challenges)
- **Affordability and obsolescence:** lifecycle cost issues, not scalable, no technology sharing

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Expertise in adaptable RF component / technology design
- Expertise in developing RF technology to facilitate modular, all-digital radars
- Foundry opportunities for GaN RF circuit fabrication