

# DyNAMO data sharing tests begin



Photo: Lockheed Martin

Simulation testing is set to begin for DARPA's Dynamic Network Adaptation for Mission Optimization (DyNAMO) project. The new airborne information sharing system allows the free flow of data between aircraft, including the fifth-generation F-22 and F-35.

Contractors involved in the programme include BAE Systems Information and Electronic Systems Integration, Lockheed Martin, Raytheon and Vencore Labs. The government team includes the Naval Research Laboratory and the MITRE Corporation.

'The primary challenge is to achieve the desired flexibility and adaptability without a prohibitive increase in processing or communication overhead,' explained Wayne Phoel, programme manager at DARPA's Defense Sciences Office. This will involve an information-based framework technical area and a network optimisation technical area.

Raytheon has announced that with its subsidiary BBN Technologies, it was awarded two contracts totalling \$9 million in July 2016. The team is set to develop two new capabilities in this initial development phase. The first will involve adapting radio parameters in reaction to changing information needs and conditions, which will allow current and future airborne networks to communicate. The second is to create an efficient way to share

information both across and between networks that are currently incompatible.

## Evaluation period

Simulation and emulation tests will be carried out over the next six months and additional simulation testing will be held again at the 12-month mark. This technology development stage will involve hardware-in-the-loop lab tests and over-the-air field tests. This will lead into phase two.

'Emulations involve typically one or more server-class computers running multiple virtual machines. That's one machine for each radio being emulated. The applications and software run in real time,' said Phoel. 'Smaller-scale emulations can run on a laptop. We will run example applications over the emulated networks, including dynamic jamming modelling, to measure the application-level performance improvements enabled by the DyNAMO technology.'

Final testing is set to be carried out in 2019. 'The plan is to show radios adapting

in real time to dynamic jamming and changes in the characteristics of the information being passed, such as data distribution patterns and delivery requirements,' he explained. 'The goal is to demonstrate that the new technology shares information more efficiently and reliably than today's approaches.'

As part of the DyNAMO project, DARPA is looking to utilise its Communications in Contested Environments (C2E) system as the baseline radio terminal. The agency confirmed: 'A technology/system developed under the DyNAMO programme should run on C2E.'

DARPA's vision, beyond the lifetime of the programme, is that fighters, C2 aircraft and UAVs would be equipped with C2E radios: 'The percentage will vary – starting with just a small number of platforms and increasing over time,' it stated.

'Because of the way the US military buys networks, there's not one specific product or programme we can target to transition the technology,' Phoel said. 'With that in mind, we are developing the technology in such a way that it can be taken in pieces or as a whole.'

Software developed for interoperability among separate networks will address near-term needs for various platforms to communicate and facilitate future integration of networks as needed.

'Similarly, the adaptive radio configuration software will be built to improve any wireless system needing to operate efficiently in a contested and congested spectrum,' he continued.

'Furthermore, the hardware architecture, with the flexibility being demonstrated, should usher in a new generation of much more adaptable and upgradable communication systems.'

DARPA originally published the Broad Agency Announcement solicitation for DyNAMO in October 2015.

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