

Dynamic Spectrum Access (DSA) for a Small Form Factor (SFF) Tactical Targeting Network Technology (TTNT) Radio Reaches Key Milestone

As a result of the Advanced Wireless Service auction (AWS-3), the U.S. Naval Research Laboratory (NRL) recognized a critical need to share frequency spectrum with military and commercial systems, and interoperate concurrently between current and transition bands. To address this, NRL implemented an urgent need program, led by Collins Aerospace with DSA support from Shared Spectrum Company (SSC), to rapidly develop and demonstrate a DSA enabled SFF TTNT radio.

Highlighting the complex challenges, TTNT operates with a secure, robust, and low latency Internet Protocol-based waveform providing a fast ad-hoc mesh network at the tactical edge. It permits the sharing of secure data across a dynamic battlespace and will be used for training at Navy military ranges and fleet concentrations in close proximity to large urban centers. Within the continental United States, it is becoming increasingly challenging to utilize the full capabilities of next generation Advanced Tactical Data Links due to interference with existing systems such as mobile communications, electronic news gathering equipment and range telemetry. As an Office of the Secretary of Defense (OSD) identified need, spectrum relocation and DSA will allow commercial and other military systems to share the spectrum and operate without interference while enabling warfighters using TTNT additional opportunities for training with the full suite of capabilities.

The Collins Aerospace team has been working to develop the capability to automatically adapt the radio's operating frequencies to prevent interference with other transmitters using a combination of spectrum sensing, geolocation and other temporal rules. It has been successfully demonstrated in a lab environment as the first policy engine to incorporate rules from all eleven (11) IEEE P1900 policy types, allowing these rules to operate individually and collectively to affect the desired operating behavior. Additionally, the team has demonstrated the ability to provide real-time awareness of the spectrum environment by processing sensing data provided by an internal or external sensor covering the full range of operating bands.

Capitalizing on these immediate successes, Collins Aerospace will demonstrate these capabilities over-the-air in Fall 2019 and the program will culminate in the delivery of four (4) small form factor terminals fully interoperable with the MIDS-J TTNT for follow-on experimentation and potential deployment directly supporting today's warfighters in the future.

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