

Beyond Line of Sight (BLOS) High Data Rate Communications



FIRST RF Corporation

Boulder, CO
www.FIRSTRF.com



Key Features:

- Modular and lightweight antenna array that can be configured in the field to meet specific needs of the mission.
- Modular feed network supports multiple array configurations.
- Radio agnostic transmit/receive module offers compatibility with several current and next-generation radios



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SYSCOM: Marine Corps System Command (MCSC)
www.marcorssystem.com.marines.mil

Program Sponsor: Intelligence Systems

Other Potential Programs:
None identified

Current TRL: 5

Projected TRL: Dependent on funding

Keywords:

Antenna Array, Man Portable, Tactical Common Data Link, Omnidirectional, Networking, Beyond Line of Sight, Satellite-Denied Environment

THE CHALLENGE

The Marine Corps System Command (MCSC) has a need to provide beyond line of sight (BLOS) communications between dispersed ground forces and airborne platforms. The currently fielded systems use high frequency (HF) radios to scatter energy off the troposphere to enable BLOS data links. However, these systems have difficulty sustaining a data link between ground units and unstable moving ship-based platforms.

THE INNOVATION

FIRST RF's approach features efficient, scalable directional antennas, allowing for the radiator to communicate to air or ground based systems effectively. Field-packable and -deployable systems require high antenna efficiency and low power consumption. These antennas, along with an efficient transceiver module, are the enabling technologies that allow for long-range and high-data rate communication links to be achieved in a lightweight form factor.

Antenna modules are dual-polarized to maintain compatibility with vertically polarized/single-channel radio architectures while also supporting multichannel or MIMO systems. The FIRST RF system topology eliminates costly control components, such as phase shifters and attenuators, minimizing the number of active components in the system.

THE NAVY BENEFIT

FIRST RF's approach features a low-cost, lightweight, and highly modular field-deployable array system. The advanced antenna architecture allows the system to be lightweight and maintain high-data rate communications of 20 Mbps up to 70 nmi. The system is dual-polarized and designed to operate at L-Band, S-Band, C-Band, and Ku-Band allowing a single aperture to be fielded and communicate with a variety of currently fielded TCDL communication systems. The size and modularity of this system allows it to be carried by a single warfighter in < 20 lbs. packages and operate for eight hours. It also may be fielded with an external power module that increases the time of operation up to 24 hours.

THE FUTURE

FIRST RF is seeking potential customers or partners to continue the maturation, transition, and utilization of the BLOS antenna system. The modularity, performance, and compatibility of the BLOS antenna architecture offer a solution to a variety of long-range high data rate communication systems.

Innovation Center at 2022 Navy Gold Coast



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