Department of the Navy SBIR/STTR Transition Program

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NAVSEA ##2024-0316

Topic # N211-068
S-Band Antenna System for LCS Communications Relay
GIRD Systems, Inc.

WHO

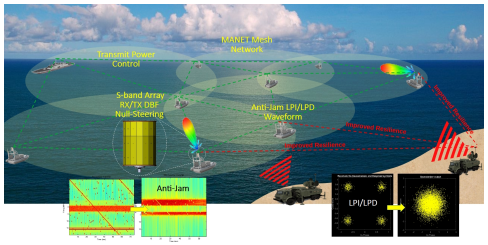
SYSCOM: NAVSEA

Sponsoring Program: NAVSEA, PMS 420 (Littoral Combat Ship (LCS) Mission Modules)

Transition Target: PEO Unmanned and Small Combatants (USC)

TPOC: (850) 230-7015

Other Transition Opportunities:
Unmanned Sensor Networks
UAV Swarms
Commercial Maritime
Coast Guard
Army
SOCOM



2024, GIRD Systems

Notes: GIRD Systems has developed a novel radio system that provides an anti-jam waveform, antenna array beam/null-steering and mesh networking for resilient, high throughput communications in jamming environments. GIRD has conducted several demonstrations at Navy facilities to validate performance.

GIRD Systems is a small business defense contractor that is innovative and agile in satisfying DoD's signal processing and communication needs.

www.girdsystems.com

WHAT

Operational Need and Improvement: The existing Littoral Combat Ship (LCS) Multi-Vehicle Communications System (MVCS) has distinct needs for improved performance, including higher data throughput, extended range support of multiple nodes (both Line of Sight (LOS) and Beyond Line of Sight (BLOS)), mesh networking support, and most significantly, the addition of Anti-Jam (AJ) capabilities.

Specifications Required: The waveform and radio system must maintain target throughput requirements while operating in jamming environments with high jammer-to-signal (J/S) power ratios at link ranges extending beyond that of the legacy system. The new radio system must be interoperable with the host platform as a "drop-in" replacement and support a network of multiple unmanned surface vehicles (USVs) operating in the mine countermeasures (MCM) mission package. The waveform must enhance communication system operation with self-healing, self-forming mesh networking, GPS-denied network timing, LPI/LPD waveform characteristics, transmit power control, Team Awareness Kit (TAK) user interface (UI) development and authentication/TRANSEC improvements.

Technology Developed: GIRD Systems has developed an enhanced AJ waveform to provide resiliency for the LCS MVCS, yielding robust, covert, and secure communications deployed with low Size, Weight, Power, and Cost (SWaP-C) hardware. The waveform and software defined radio (SDR) solution provides high-rate communications in jamming, offering multichannel operation to enhance either robustness or throughput. GIRD is currently enhancing the AJ waveform with additional novel LPI/LPD features, mesh networking and security functions, in addition to extending MVCS AJ capabilities with dynamic adaptive beam-/null-steering.

Warfighter Value: Warfighter capabilities are improved by ensuring high resiliency to contested and congested communication environments, thereby allowing access to critical information needed to complete a successful mission. The technology enables the LCS MVCS to reliably meet mission objectives in highly congested and contested environments, with a secure, high throughput waveform deployed to ruggedized hardware that integrates system functions to reduce overall MVCS SWaP-C.

WHEN

Contract Number: N68335-23-C-0240 **Ending on:** Dec 15, 2025

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Adaptive Beamforming Demonstration	Low	Throughput achieved in presence of strong jammers	4	4th QTR FY24
Mesh Networking	Low	Muti-node network communication success	4	4th QTR FY24
Field Verification Test #1	Medium	Demonstration of initial waveform enhancements	5	1st QTR FY25
Field Verification Test #2	Medium	Demonstration of finalized waveform enhancements, Gen 2 prototype units	6	4th QTR FY25
Field Verification Test #3	High	Successful operation with updates, new scenarios from Test #2	6	2nd QTR FY26
Field Verification Test #4	High	Complete system operation meeting requirements	7	2nd QTR FY27

HOW

Projected Business Model: GIRD intends to license the advanced waveform to DoD primes. The portable, hardware agnostic waveform and software design ensures the waveform is easily able to transition to capable platforms. GIRD will also seek to provide the multi-channel radio platform to host other communications and communications-related applications of government and industry customers. GIRD will engage industry partners to assess the contribution of the technology to the communication equipment market and identify a strategy for the potential market and potential customers.

Company Objectives: Development of the robust communication system ties in with GIRD's long-term goal of becoming the preferred provider of advanced waveform and communication capabilities to the DoD and other government and commercial sectors. GIRD's past and current communication system architectures and designs for Navy SPAWAR, ONR, Army and AFRL, and this program comprise major thrusts in this direction.

Potential Commercial Applications: For commercial applications, GIRD's novel AJ waveform and radio system can be parameterized to meet specifications (bandwidth, throughput, interference resilience, etc.) and integrated into communication systems supporting mission critical applications. The inherent robustness and advanced networking capabilities can guarantee that the critical information gets through in an increasingly congested RF environment.

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