

Topic: N141-064

HYPRES, Inc.

Modular, Multi-Function Digital RF Receiver

HYPRES, Inc. (HYPRES) – a superconducting electronics company – offers design, development, fabrication, testing and packaging services for their digital Radio Frequency (RF) product-lines. This Phase II effort develops technology to manufacture high quality RF transmission lines using superconductor materials with a higher transition temperature than the Nb used in the circuits. This allows a lowering of thermal parasitics on the 4K stage. HYPRES' Advanced Digital Receiver (ADR) enables full spectrum monitoring and maximizes signal reception for military satellite communication, signal intelligence, radar, electronic warfare systems and tactical data links, providing improved surveillance capabilities, detection of smaller targets, and superior range. Direct RF digitizing eliminates front-end analog components reducing size, weight, and power by 50%. A world leader in advanced digital RF superconductor technology development and production, HYPRES seeks program office and prime contractor support, and equity investors to transition ADR systems for DoD applications and commercial markets.

Technology Category Alignment:

Combat Casualty Care

Networks and Communications

Broadband/Multispectral Components and Systems

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SYSCOM: ONR

Contract: N00014-15-C-5142

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00014-15-C-5142

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #43-3252-17

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Modular, Multi-Function Digital RF Receiver

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WHO

SYSCOM: ONR

Sponsoring Program: Code 31 - Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR)

Transition Target: Shipboard Signals Exploitation Equipment next generation, Navy Multi-band SATCOM Terminal

TPOC:

Dr. Deborah VanVechten

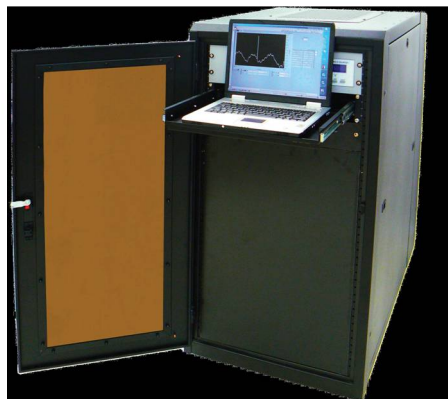
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Other transition opportunities:

Multifunctional Information Distribution System (MIDS) Link 16, Magnetic Resonance Imaging (MRI) systems for Traumatic Brain Injury (TBI)

Notes: Interested Program Offices

include SPAWAR PMW 120, PMW 150, PMW/A 170, PMW 770



HYPRES Advanced Digital Receiver

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WHAT

Operational Need and Improvement: Naval radio frequency (RF) systems have a requirement to improve spectrum utilization by implementing high speed broadband analog to digital converters. Although great strides have been made with the third generation Modular, Multi-Function Digital-RF Receiver systems in terms of functionality, these systems are being upgraded to be more energy efficient and able to accommodate smaller platforms.

Specifications Required: Demonstrate rugged connectorization – to include ease of connectorization and simplicity of connection and reconnection - and the capability of Magnesium Diboride (MgB2) conductors and any supporting substrate to exhibit lower thermal conduction than an equivalent length copper multi-trace cable spanning the same temperature gradient and carrying the same current in order to minimize the heat transfer from room temperature to the 4 Kelvin (K) cold environment

Technology Developed: HYPRES' Advanced Digital Receiver (ADR) technology eliminates many components, enhances toleration of co-located high power transmitters and enables dominance of the RF spectrum for naval multi-function RF applications such as communications, Electronic Warfare (EW), Signals Intelligence (SIGINT) and radar.

Warfighter Value: HYPRES' ADRs maximize signal reception for communication, SIGINT and EW systems, enabling full broadband spectrum monitoring and precise emitter identification (ID) in a smaller form factor. Directly digitizing at RF potentially doubles system functionality for the same SWaP when compared to legacy analog systems.

WHEN

Contract Number: N00014-15-C-5142 **Ending on:** February 4, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Develop MgB2 data and dc cables	N/A	Meets test plan parameters	3	July 2016
Measure and characterize MgB2 data and dc cables	N/A	Measure heat conduction against test plan	3	January 2017
Option1-Develop Hybrid-temperature Heterogeneous Technology (HTHT) Datalink incorporating MgB2 data cables	Med	Passes tests in cryo-cooler test bed	3	October 2017
Option 2-Implement MgB2-enabled HTHT datalink in Advanced Digital-RF Receiver	High	MgB2 cabling performs in GFE ADR	6	January 2019

HOW

Projected Business Model: The output of this Phase II will result in a product that will be incorporated into the HYPRES digital RF receiver product family which in turn will be inserted into military systems directly and through other DoD prime contractors. HYPRES has worked with L-3 Communications, Argon ST, and ViaSat on digital-RF receiver projects in the past.

Company Objectives: HYPRES seeks program office support for completion of development, test and evaluation, and transition to Ship's Signals Exploitation Equipment (SSEE) and Navy Multiband Terminal (NMT) as examples of relevant programs of record. HYPRES also seeks relationships with prime contractors, DoD program offices and equity investors for transition to major communications, EW, SIGINT and radar acquisition programs, and to the commercial market.

Potential Commercial Applications: HYPRES has identified commercial applications in MRI systems, avionics equipment and commercial SATCOM.

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