

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #

Topic # N17A-T027

Energy Efficient, Non-Silicon Digital Signal Processing (DSP)

HYPRES. Inc.

WHO

SYSCOM: ONR

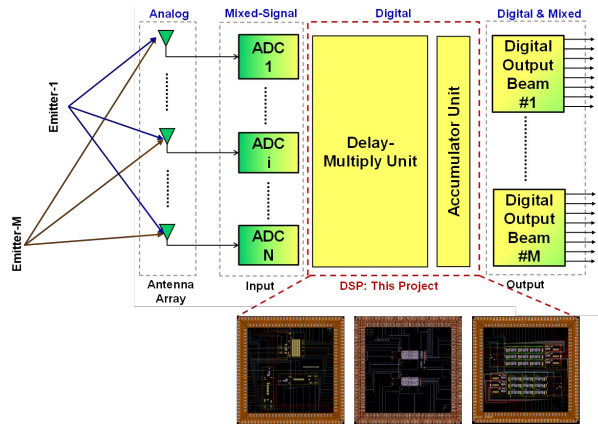
Sponsoring Program: Code 312: Cryogenically Enabled Electronics Technologies for Mixed Signal Systems

Transition Target: Surface Electronic Warfare Improvement Program (SEWIP)

TPOC:

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Other transition opportunities:



WHAT

Operational Need and Improvement: Dominance over the entire electromagnetic spectrum spanning the entire three-dimensional space.

Specifications Required: Digital true-time-delay beamforming components operating at clock frequencies exceeding 40 GHz to maintain compatibility with RF digitizers with the same sampling frequency

Technology Developed: Superconductor Microelectronics: Ultrafast Digital Signal Processor
 Precise programmable digital true-time-delay
 Spatial filtering and beamforming
 Serial-biasing technique for Rapid Single Flux Quantum (RSFQ) logic, an enabler for all digital processing applications such as image processing, and computing.

Warfighter Value: Precise location of RF emitters over the entire electromagnetic spectrum

WHEN

Contract Number: N68335-18-C-0654 **Ending on:** August 6, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Develop Digital Programmable Delay	Low	IC measurement results of proper functionality and speed	5	2nd QTR FY21
Develop Multiply Unit	Med	IC measurement results of proper functionality and speed	5	2nd QTR FY21
Develop Digital Decimation Filter	Med	IC measurement results of proper functionality and speed	5	2nd QTR FY21
Develop Inter-island Interface for Serial Biasing Digital Circuit Blocks	High	IC measurement results of proper functionality and speed	5	2nd QTR FY21
Implement Digital Beamforming Circuitry	High	IC measurement results of proper functionality and speed	5	3rd QTR FY21

HOW

Projected Business Model: Augment Advanced Digital-RF Receiver (ADR) with new chipset having multiple ADCs and the new DSP. Market DSP-enabled ADR for EW (and other) applications requiring multi-beam receive capability.

Company Objectives: Develop digital-RF receivers for the military market

Potential Commercial Applications: Fast digital data processing and computing for data centers

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