

# Department of the Navy SBIR/STTR Transition Program

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Topic # N121-104

Ultra Wideband Electronically Steered Multi-Beam Array (II.5 -1000-314)

SI2 Technologies, Inc.

## WHO

**SYSCOM:** SPAWAR

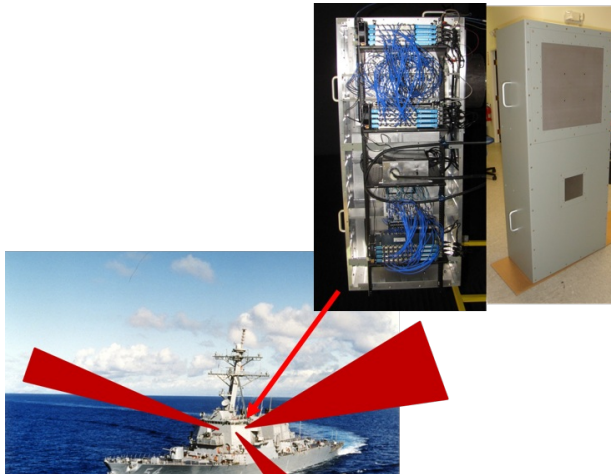
**Sponsoring Program:** PMW-120  
Battlespace Awareness and  
Information Operations (IO)  
Program Office

**Transition Target:** Ships Signal  
Exploitation Equipment (SSEE)

**TPOC:**  
(619)553-1293

**Other transition opportunities:**  
Electromagnetic Maneuver Warfare  
Command and Control (EMC2) Low-  
Band RF Intelligent Distribution  
Resource (LowRIDR) and other  
shipboard Electronic Warfare (EW),  
Signals Intelligence (SIGINT), and  
Information Operations (IO)  
programs.

**Notes:** Figure: SI2's ultra-wideband,  
multi-beam Electronically Steered  
Array (ESA) technology enables  
new capabilities for shipboard IO systems.



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## WHAT

**Operational Need and Improvement:** Navy surface ships protect against threats from ballistic missile launches and cruise missile attacks to swarming boats and unmanned aerial vehicles (UAVs). The Navy is seeking an electronically steered Multi-Beam Array that can operate over a very broad frequency band and provide new capabilities for shipboard IO systems to counter existing and evolving threats.

**Specifications Required:** A Low Cost Electronically Steered Multi-Beam Transmit Array that can operate over a very broad frequency band and transmit high power so that it can be used for multiple functions while maintaining a low radar cross-section must be developed. In addition, the array must be small size and low weight.

**Technology Developed:** SI2's innovative ultra-wideband, high power multi-beam electronically steered array provides the new capabilities for shipboard IO systems. The ESA operates in transmit (TX) and receive (RX) and is capable of producing multiple independent beams over a full horizon to zenith and 360 deg azimuth field of view. The ESA system can support a variety of functions including Intelligence, Surveillance, and Reconnaissance (ISR), EW, Electronic Intelligence (ELINT) and Communications (COMMS), and provides ultra-wideband operation across multiple RF bands with full instantaneous bandwidth.

**Warfighter Value:** SI2's wideband ESA technology will provide enhanced IO capability for surface ship and air platforms by increasing operating frequency range and lowering total ownership cost (TOC) by using a single aperture to cover both transmit/receive (TX/RX) across the full frequency spectrum.

## WHEN

**Contract Number:** N00039-15-C-0017 **Ending on:** September 30, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Spiral 1 Test - Aperture Demonstration	Low	Demonstrate aperture performance via meeting scaled requirements	6	April 2016
Spiral 2 Test - Module Demonstration	Low	Demonstrate T/R module performance via meeting scaled requirements	6	October 2016
Spiral 3 Design	High	Complete design of objective system aperture	N/A	December 2017
Spiral 3 Test - System Demonstration	High	Demonstrate compliance with requirements	6	March 2018

## HOW

**Projected Business Model:** SI2 leverages vendors from our Approved Supplier List (ASL) for fabrication of parts and components and performs final assembly and test in-house. We are also amenable to alternate arrangements including licensing.

**Company Objectives:** SI2's objective is to transition the technology under development to a program of record (POR). Initial targeted programs include SSEE Mods and EMC2 Low-Band Radio Frequency (RF) LowRIDR.

**Potential Commercial Applications:** Potential applications for the multi-function ESA include ISR, SIGINT, Electronic Attack (EA), EW, Radar, COMMS, etc. The low profile form factor enables integration to land, air and sea platforms of all sizes. As operations extend into cluttered signal environments, a wideband ESA product will be required for situational awareness and secure COMMS. The wideband nature and commonality of components of SI2's ESA solution provides a low risk development and procurement path that will support cost effective threat based upgrades that will ensure state of the art EW protection for Navy Ships.

**Contact:** Tom Goodwin, Manager, Antenna Engineering  
[tgoodwin@si2technologies.com](mailto:tgoodwin@si2technologies.com) 978-495-5305