

Topic: N101-069

SI2 Technologies, Inc.

Ka-Band Communications Antenna System for Surface Ships and Submarine Masts

This technology enables surface ship Ka-band communications links with Low and Medium Earth Orbit (LEO/MEO) satellites by developing a radome-integrated Ka-band transmit antenna system for Commercial Broadband Antenna Program (CBSP). A radome integrated antenna system implemented with additively manufacture frequency selective surface (FSS) based radiating elements is developed; this approach enables the new Ka-band transmit capability while maintaining existing CBSP system functionality. SI2 Technologies (SI2) focuses on antenna and array systems, Frequency Selective Surfaces, structural honeycomb absorbers, flexible hybrid electronics and additive manufacturing in support of the Department of Defense. Targeted defense applications include existing radomes on surface ships and submarines. SI2's prior work in antenna design and development is directly applicable to this task and mitigates development risk. SI2 is always looking for partners as the technology matures.

#### Technology Category Alignment:

RF Components for sensing, transmission and communication

Networks and Communications

#### Contact:

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**SYSCOM:** NAVWAR

**Contract:** N68335-18-C-0178

**Booth:** 197

**Room:** FST at NAVSEA HQ

 Corporate Brochure: [https://navystp.com/vtm/open\\_file?type=brochure&id=N68335-18-C-0178](https://navystp.com/vtm/open_file?type=brochure&id=N68335-18-C-0178)

# Department of the Navy SBIR/STTR Transition Program

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NAVWAR SR-2019-215/216/217

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## WHO

**SYSCOM:** NAVWAR

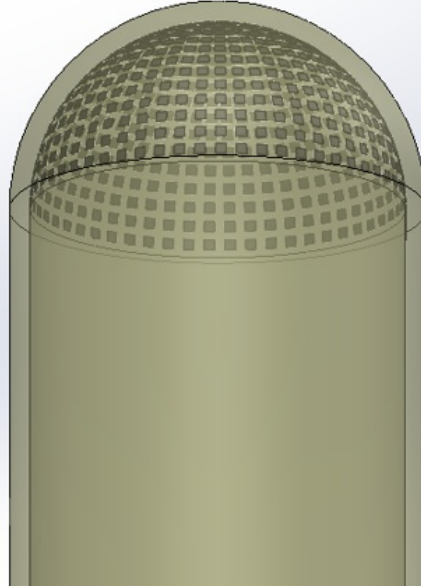
**Sponsoring Program:** Program Executive Officer, Submarines (PEO SUB)

**Transition Target:** PMW/A 170: Commercial Broadband Satellite Program (CBSP), ACAT III

**TPOC:**

**Other transition opportunities:** All communications related radomes on surface ships and submarines.

**Notes:** Conception of Radome is the Antenna (RITA)



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## WHAT

**Operational Need and Improvement:** The U.S. Navy needs the ability to communicate with Low Earth Orbit (LEO) and Medium Earth orbit (MEO) satellites without adding additional antennas on Navy ships and submarines. Additionally, the Navy requires persistent navigation and communications denied environments.

**Specifications Required:** The objective of this program is to develop a wideband antenna design and efficient wideband electronics as a step toward the long-range goal providing SATCOM capability utilizing LEO/MEO satellites. Specifically the Navy is interested in improving and expanding this capability utilizing existing radomes while maintaining current capabilities. The system must preserve current Ka band receive capability.

**Technology Developed:** SI2 has developed an innovative array technology that combined with advanced additive manufacturing enables radome-integrated Ka Band mast antenna system meets the Navy's requirements. Frequency selective surface based radiating elements maintain existing communications functions.

**Warfighter Value:** Our technology maintains the ability to communicate in a congested and/or denied electronic environment. Utilizing existing radomes reduces Electromagnetic Interference (EMI) and maintains existing topside structure requirements. Also, by utilizing a Frequency Selective Surface existing communications capabilities are maintained, which minimizes and preserves ship/submarine warfighting capabilities.

## WHEN

**Contract Number:** N68335-18-C-0178 **Ending on:** January 31, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Preliminary Design Review (PDR)	Med	measure subsystem performance	5	January 2020

## HOW

**Projected Business Model:** Leverage proven innovative array antenna technology and advanced additive manufacturing techniques to develop a radome-integrated Ka-Band CBSP antenna system. The technology can be adapted to submarine systems once demonstrated. Teaming with large business providers will be required. Depending on quantity, in-house manufacturing is expected.

**Company Objectives:** During the FST to meet with potential partners.

**Potential Commercial Applications:** Commercial telephone/internet applications, maximizing flexibility of existing antenna systems

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