

# Department of the Navy SBIR/STTR Transition Program

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ONR Approval #43-3252-17

Topic # N08-083

Fast Tuning, Analog Notch Filters Subsequent

Out of the Fog Research LLC

## WHO

**SYSCOM:** ONR

**Sponsoring Program:** Radio Frequency Antennas and Topside Program Manager, code PMW 180-D4/E2

**Transition Target:** OPNAV N201C's Cryptologic Carry-On Program (CCOP), Advanced Cryptologic Carry-on Exploitation System, and OPNAV N61411's Ship's Signals Exploitation Equipment (SSEE) Program

**TPOC:**

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**Other transition opportunities:**



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## WHAT

**Operational Need and Improvement:** Current signal intelligence (SIGINT) systems cannot effectively mitigate interference blocking the detection of signals-of-interest (SOI) in targeted frequency ranges.

**Specifications Required:** The Battlespace Awareness and Information Operations Program Office, PMW-120, for the CCOP and SSEE Programs delineate requirements for electro-magnetic interference (EMI) filters for SOIs. SOI detection is limited due to insufficient cancellation of EMI.

**Technology Developed:** Cryogenic radio frequency (RF) technologies eliminate EMI into SIGINT systems. Cryogenic RF technology achieves better EMI rejection without increasing the noise figure or impacting the demodulation of the received signals.

**Warfighter Value:** Out of the Fog's advanced EMI filtering capability increases probability of intercept (POI), and increases operational detection range; and has the capability to mitigate future EMI sources enhancing future SOI detection opportunities.

## WHEN

**Contract Number:** N00014-16-C-2038 **Ending on:** May 1, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Demonstrate low-loss superconducting tunable notch filters in this frequency range	High	Tunable Filters with loss less than 1 dB	4	May 2018
Develop the electronics to tune superconducting notch filters with high accuracy and repeatability	Med	Achieve accuracy and repeatability goals	4	May 2018
Develop prototype	Med	Delivery of prototype meeting target specifications	5	December 2018
Shipboard demonstration of improved POI using prototype	Med	Increase collection by target amounts	6	May 2019

## HOW

**Projected Business Model:** Develop a fieldable system for CCOP and the SSEE Programs of Record (PORs). PORs plan to procure and field units during the FY20-FY25 time frame. Full Operational Capabilities (FOC) are anticipated within 7 years

**Company Objectives:** Out of the Fog, LLC is looking for funding to implement/integrate its Phase II prototype, and anticipates receiving matching SBIR funds to support integration. Out of the Fog is looking for additional PORs that require enhanced EMI mitigation technology in all branches of the military to fully realize the market potential of this SBIR.

**Potential Commercial Applications:** This technology can be used to improve first responder networks. Capacity utilization can be increased in commercial networks limited by co-located services.

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