

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #0543-1316-23

Topic # N211-084

Low Cost, Single Use Precision Aiming Device for Explosive Ordnance Disposal Disrupters and Tools

Physical Sciences Inc.

WHO

SYSCOM: ONR

Sponsoring Program: ONR

Transition Target: JSEOD (Joint Service Explosive Ordnance Disposal) within PMS 408

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Other Transition Opportunities: Federal, state and local law enforcement agencies for EOD activities.

Notes: During the Phase I program, PSI demonstrated the aiming device prototype through lab scale and live fire testing. PSI verified the aiming device can successfully and accurately aim when installed on a PAN disrupter barrel either on a stand or integrated with a FLIR Kobra robot resulting in a TRL 5- testing in a relevant environment. In addition, PSI had their prototypes evaluated by both the US Navy scientists and engineers and the New Hampshire State Police Bomb Squad.



Image Courtesy of Physical Sciences Inc. 2023

Activities during the Phase II Base program included:

- Development of a semi-autonomous calibration system to reduce accuracy error and assembly time
- Design of aiming device for manufacturing
- System demonstration on various curved and colored targets in daylight to verify visibility

Planned activities during future work include:

- Ongoing test and evaluation of the aiming device in lab scale and relevant environments
- MIL-STD-810H testing and certification

WHAT

Operational Need and Improvement: The JSEOD operators need to increase the standoff distance between an explosive article (e.g. unexploded ordnances, improvised explosive device) and EOD personnel. This enables a significant increase in safety, but requires new tools and techniques to accurately aim at increased distances.

Specifications Required: EOD Disrupter and Tool Diameter: 1-6 inches
Aiming Accuracy: <0.955 inches at 50 feet
Aiming Distance: Up to 50 feet
Visibility: Day and night

Technology Developed: Physical Sciences Inc. (PSI) is developing a low-cost, precision, scalable aiming device for EOD disrupters and tools. The device is designed to meet the environmental conditions in accordance with MIL-STD-810H for temperature resistance, water submersion, and sand/dust resistance. PSI continues to test the aiming device in both lab scale and live fire testing using a Percussion-Actuated Non-Electric (PAN) barrel, one of the most common EOD disrupters, to verify aiming accuracy and system integration.

Warfighter Value: The aiming device will increase personnel safety by increasing EOD standoff distance up to 50 feet without sacrificing accuracy or performance.

WHEN

Contract Number: N68335-22-C-0412

Ending on: Jun 30, 2024

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Demonstrated aiming with the New Hampshire State Police Bomb Squad on a variety of EOD tools	Medium	Received feedback related to performance and user operation	4	1st QTR FY22
Tested aiming device in live fire situations with a PAN disrupter and integrated with a FLIR Kobra robot	Medium	Obtained real-life performance metrics for the aiming device technology	5	1st QTR FY22
Delivered prototypes to the US Navy for evaluation and testing	Medium	Received feedback related to performance and user operation	5	4th QTR FY22
Developed computer vision and control system for semi-autonomous calibration	Low	Decreases accuracy error and time to assemble	5	4th QTR FY23
Future Work: Demonstrate aiming device system by US Navy scientists and engineers	Low	Aiming device meets specifications in various scenarios	6	2nd QTR FY24
Future Work: Aiming device is validated for conformance to MIL-STD-810H	Low	Aiming device system passes MIL-STD-810H testing	6	2nd QTR FY24

HOW

Projected Business Model: The commercialization strategy is to develop the low-cost, precision aiming device through partnerships within the EOD community at the state and federal level to ensure the device meets their requirements. PSI will provide in-house manufacturing of the aiming device while engaging EOD technology contractors to ensure the broad commercialization of the technology at both the federal and state/local levels for EOD.

Company Objectives: The objective of the technology transition is for PSI to support a low rate initial production (LRIP) to deliver units to the JSEOD for hands-on testing and evaluation. PSI plans to manufacture in-house at our Wilmington facility. PSI has demonstrated our commitment to technology transition through the certification of our Wilmington facility for ISO-9001 production of advanced battery technology. As the technology becomes adopted, PSI will review the commercialization plan to ensure the production targets and cost are able to be achieved.

Potential Commercial Applications: Federal, state, and local law enforcement agencies are likely one of the largest non DoD related entities that would benefit from a low-cost precision aiming device. These entities would see significant benefits through increased personnel safety.

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