Department of the Navy SBIR/STTR Transition Program

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Topic # N22A-T026
Low-Cost, Low-Power Vibration Monitoring and Novelty Detector
ADVIS

WHO

SYSCOM: ONR

Sponsoring Program: Office of Naval Research

Transition Target: Advis' intelligent vibroacoustic sensing platform targets transition to multiple Navy, Marine Corps, and broader DoD stakeholders engaged in condition-based maintenance, machine health monitoring, and platform sustainment. Specific transition pathways include: NAVSEA, NAVAIR, PEO IWS, PEO Ships, Marine Corps Systems Command (MCSC), Office of Naval Research (ONR) and NAVWAR.

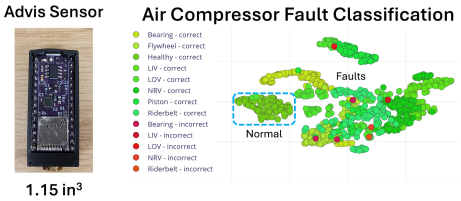

Photo source: Advis, Inc., fault classification diagram created using Advis sensor collected training and test data with Edge Impulse software.

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Other Transition Opportunities: The platform is compatible with open development frameworks and supports end-user customization, making it ideal for deployment across a wide range of Navy and Marine Corps maintenance, sustainment, and ISR applications.

Notes: With more than 20 years of experience in this area, the Advis principals pioneered the development of low-power smart vibration and acoustic sensors for machine health monitoring. Advis principals also have extensive manufacturing experience in the consumer electronics area.

WHAT

Operational Need and Improvement: There is a need for compact, low-power, and easily deployable machine health monitoring solutions that enable condition-based maintenance (CBM+) across sea, air, and ground platforms. Advis' intelligent vibroacoustic sensor platform provides early detection of mechanical faults in machinery and persistent, unattended acoustic surveillance for threat detection, vehicle tracking, and perimeter monitoring. The Advis system also provides for rapid customization and deployment by non-expert personnel in operational environments.

Specifications Required: Key specifications are: form factor: 1 cubic inch, battery-powered with 3-year service life under duty-cycled operation, sub-milli-g resolution vibration sensing with 1 Hz – 10 kHz bandwidth, optional acoustic sensing. Supports Edge Impulse, MATLAB, and Python-based toolchains, Operating temperature: –40°C to +85°C, MIL-STD-810 compliant enclosure for shock, vibration, and moisture resistance.

Technology Developed: Advis has developed a compact, low-power intelligent vibroacoustic sensing platform that integrates a custom low cost, high-sensitivity vibration sensor with an embedded ARM microcontroller capable of running onboard machine learning algorithms. The system provides support for Edge AI development using Edge Impulse, MATLAB, and open-source Python toolchains enabling rapid creation and deployment of anomaly detection and fault classification models by non-experts.

Warfighter Value: Advis' smart sensor platform enhances warfighter effectiveness by enabling real-time awareness of equipment health, reducing mission risk due to unexpected mechanical failures, and streamlining logistics through predictive maintenance. This technology directly contributes to force agility, resilience, and operational dominance.

WHEN

Contract Number: N68335-24-C-0010 **Ending on:** Mar 24, 2026

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Brassboard System Demonstration	Low	Successful demonstration of Advis vibration sensor and integrated smart sensor system	4	1st QTR FY25
Integrated and Packaged Prototype Lab Demonstration (1.15 cubic inch pkg)	Low	Packaged, battery powered, device demonstrated for training data collection and fault classification in laboratory environment	6	2nd QTR FY25
Demonstrate Level 2 integration - less than 1 cubic inch, Bluetooth radio, acoustic sensor	Low	Eliminate need to connect to sensor via wires	6	4th QTR FY25
Low volume production (50 units)	Low	Meet cost target, demonstrate reliability in relevant environment while retaining functionality	7	1st QTR FY26
Integrated system ready for deployment	Medium	Provide user friendly integrated system and end-user documentation in integrated system with all previously demonstrated functionality	8	3rd QTR FY26

HOW

Projected Business Model: Advis will employ a hybrid manufacturing and service-based business model to support scalable deployment and long-term sustainment of its intelligent sensing platform. The platform follows an open-hardware model to encourage adoption and integration flexibility. By keeping hardware costs low, Advis will ensure it remains more economical for customers to purchase Advis-built units than to self-fabricate.

Company Objectives: Advis' primary objective is to provide a low-cost, accessible entry point into intelligent machine health monitoring (MHM), condition-based maintenance (CBM), and unattended acoustic sensing for a broad spectrum of defense and civilian users. Our aim is to lower the technical and economic barriers to implementing AI-driven sensing through affordable hardware, open development tools, and user-friendly deployment workflows.

Potential Commercial Applications: Advis' intelligent sensing platform has broad applicability across commercial and industrial markets where predictive maintenance, condition monitoring, and acoustic surveillance are valuable. Key application areas include industrial equipment monitoring, transportation and fleet management, smart buildings and infrastructure, wind turbines, and heavy equipment monitoring for agriculture and construction. With its low cost, small footprint, and support for embedded AI, the Advis platform enables scalable commercial deployment and supports the growing demand for Industry 4.0 and smart asset management solutions.

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