

# Department of the Navy SBIR/STTR Transition Program

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Approval # 43-1256-16

Topic # N131-079

Compact Off-board Passive Target-Discriminator

Analysis, Design & Diagnostics, Inc.

## WHO

**SYSCOM:** ONR

**Sponsoring Program:** ONR Code  
32 - Ocean Battlespace Sensing  
Department

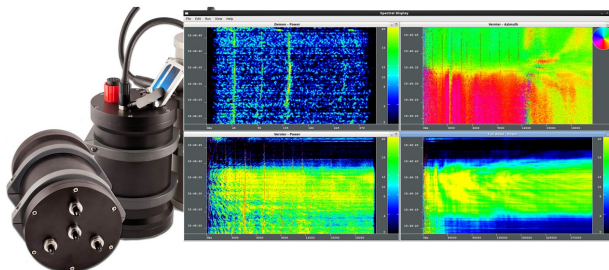
**Transition Target:** Advanced  
Undersea Weapons Systems

**TPOC:**

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**Other transition opportunities:**

The wideband, low power autonomous sensor node is ideally suited for Unmanned Undersea Vehicles (UUVs) or Autonomous Undersea Vehicles (AUVs) to detect and vessels of interest. This technology could also be back-fit onto existing submarine and surface ship platforms to provide improved situational awareness and automate the detection, classification and localization of vessels of interest.



Sensor Node and Automated Processing

## WHAT

**Operational Need and Improvement:**

Acoustic Sensor Node for the Advanced Undersea Weapons System

**Specifications Required:**

A Low Power, Long-Life autonomous Acoustic Sensor Node that has the capability to automatically detect, classify and localize (DCL) vessels of interest.

**Technology Developed:**

A Low Power Wide Band autonomous Sensor Node with Automated Detection and Classification Algorithms

**Warfighter Value:**

The acoustic sensor node developed under this program will support the Advanced Undersea Weapons System. The sensor node can also be employed independently to collect wideband acoustic intelligence on vessels of interest.

## WHEN

Contract Number: N00014-14-C-0176

| Milestone                        | Risk Level | Measure of Success                 | Ending TRL | Date         |
|----------------------------------|------------|------------------------------------|------------|--------------|
| Develop Prototype Sensor Node    | Med        | Ability to collect real-world Data | TRL 7      | October 2014 |
| Develop Automated DCL Algorithms | Med        | Pd/Pcc/Pmc/Pcc                     | TRL 7      | May 2016     |
| AUWS Modeling & Testing          | Med        | Duration/ Area Coverage            | TRL 7      | June 2016    |
| AUWS Exit Demonstration          | Med        | Auto DCL                           | TRL 7      | July 2018    |

## HOW

**Projected Business Model:**

Analysis, Design & Diagnostics, Inc. will produce the hardware, software and detection algorithms for prototype and testing of the Acoustic Sensor Node. Analysis, Design & Diagnostics, Inc. has the capability for low rate production. For mass quantities the technology will be licensed to production partners with well-established lean manufacturing processes to drive down per unit costs.

**Company Objectives:**

Our objective is to be the provider of the Acoustic Sensor Node for the AUWS program. We want to support maintenance and upgrade to the algorithms as the vessels of interest change and as new Acoustic Intelligence is obtained.

**Potential Commercial Applications:**

The acoustic sensor node can be used for multiple commercial applications. The high frequency bandwidth of this sensor exceeds other known sensor bandwidths making it unique with regard to underwater acoustic monitoring. The sensor can be used in the automated detection, classification and localization mode or in a record only mode. The sensor can be readily modified to support a wide variety of acoustic monitoring applications. The four hydrophone array supports bearing estimation to acoustic emitters. The wideband sensor can be easily modified to support any desired sample rate. More importantly, this same sensor can be modified to support automated detection and classification of any acoustic emission. Applications include: harbor/port/vessel security, marine mammal detection and mitigation as well as abundance and density estimates of marine mammals.

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