ARRAY SYSTEMS COMPUTING INC.

Underwater Acoustics
Universal Acoustic Range and Processor

Key Features:

Complete turn-key portable acoustic range and sonar processor designed for harbor surveillance and monitoring

Integrated MMI and Real time SONAR analysis including:

- DEMON
- LOFAR
- BTR/Waterfall
- Target Tracking
- Tactical Display
- Post Analysis

Conventional and High Resolution Beamforming

Extremely low cost of ownership

Tap into Array's World - Class Sonar Expertise

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Universal Acoustic Range and Processor

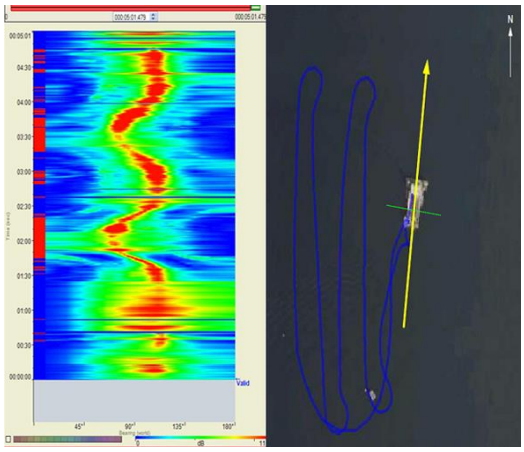
Harbor and coastal surveillance is a complex security issue which must find a balance between allowing legitimate activity to continue unhindered, and ensuring that criminal and terrorist activity is detected and halted as quickly and effectively as possible. It is a challenge for any nation with a large coastline having numerous ports and shipping lanes to provide adequate coverage in a cost-effective manner.

The Universal Acoustic Range and Processor (UARP) was developed to address the need for a reliable low cost method to provide harbor surveillance of surface and subsurface vessels. This turn-key system employs an ultra-thin line array and passive sonar processor for the detection and tracking of surface ships and underwater vehicles.

The signal processing is based on the next generation of Array's SAPPS sonar processor architecture, which is currently in operational use by the German and Swedish Royal Navies. The real-time sonar analysis provides broadband and narrowband analysis on the beamformed.

The UARP is available in two configurations:

(1) As a bottom mounted array for fixed harbor surveillance, or
(2) As a portable towed array system that can be streamed from all but the smallest harbor patrol vessels.

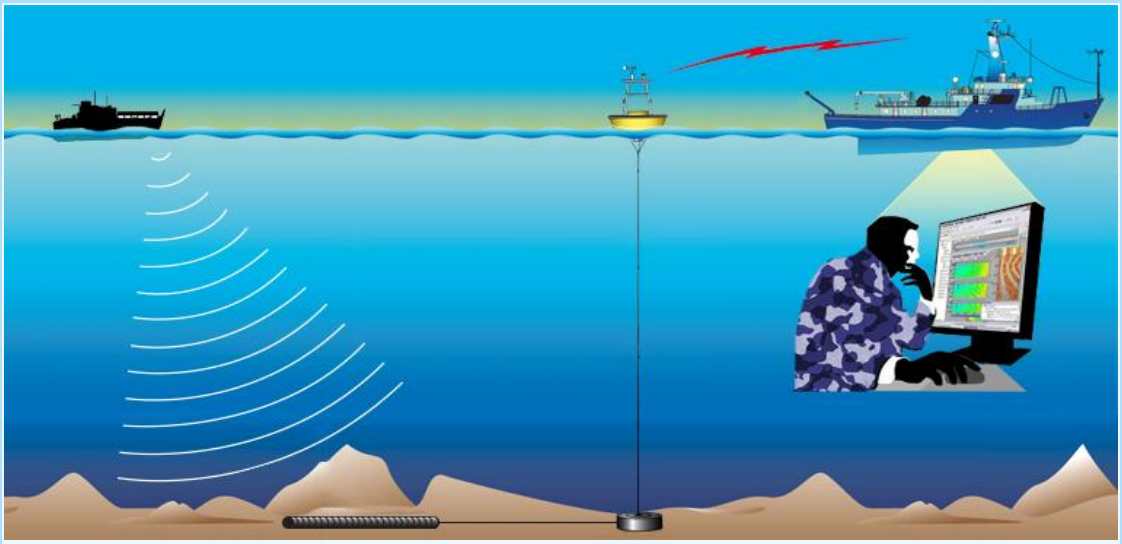


Left: Processed BTR display of target
Right: Actual GPS track of target ship

Towed Array Configuration

In this configuration, the UARP provides an excellent trade-off between long range detection, enhanced target classification, and total cost of ownership/maintainability. The light weight modularity of the system allows the array and signal processor to be easily transferred between patrol crafts with the proper winch system. This can be extremely useful if it becomes necessary to quickly move assets to a particular location. Also since the array is designed for shoreline monitoring or harbor support, the array length is shorter than conventional systems, this overcomes a major limitation of conventional towed arrays that beam forming cannot be carried out when the ship is maneuvering - which can result in downtimes as great as 50 percent. To help account for own ship maneuvers, the UARP uses a water pulley model to account for array deformation and to keep beamforming performance high.

Bottom Mounted Configuration



A bottom mounted UARP will wirelessly transmit data to nearby patrol vessel

For the bottom mounted configuration the subsea sensors are mounted to the sea floor via a protective enclosure and connect to subsea data acquisition system (DAS). It is possible to install multiple sensor arrays offering the benefit of maximum coverage as well as the ability to triangulate target positions. There is also an optional Acoustic Doppler Current Profiler (ADCP) sensor which reports the water current velocities passing over the system. A fibre optic connection transfers the digital data from the DAS to the shore based facility where the signal processing and displays are located.

Acoustic Displays

The shore processing facility houses the processor and the displays. The processor runs on standard PC COTS devices and uses an open architecture platform with well-defined open standard interfaces. Array provides a customizable display layout so that it may be configured to best match a user's current MMI requirements. The signal processing algorithms proposed here are the same ones that have been proven to be effective in handling sonar systems for the Swedish Royal Navies' Gotland and Germany's U212 submarines. Specifically the operator workstations will provide:

- Tactical Display
- Detection & Tracking
- Conventional and Adaptive Beamforming
- Broadband Processing
- Narrowband Processing

Key Benefits:

High performance, configurable, ultra-low cost acoustic array and processor for coastal monitoring and harbor surveillance

System comes in two configurations:

A bottom mounted array for fixed harbor surveillance

A portable towed array system that can be streamed from all but the smallest harbor patrol vessels

Multiple arrays can be installed for a wide coverage and triangulation

Sonar displays provide real-time broadband and narrowband analysis.

Provides a post analysis capability

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