LRAM - Long-Range Acoustic Messaging System

Long Range Covert Communication with Submarines

**Broad Range of Uses**

LRAM provides integrated under water (UW) communications covering both broad ocean areas and the shallows up to the shore line.

The common LRAM modem architecture can be applied to submarine, UUV, and diver communication as well as remote activation of underwater devices. LRAM also enables the production of a multimode receiver capable of receiving all modes, and will allow 2-way communications with a distressed submarine.

**Proven Technology**

LRAM utilises a proven scalable modem software architecture designed to provide robust, reliable, and power-efficient through-water communications to extended ranges.

**Increased Asset Value Through Interconnection**

The system enables co-operative ASW between submerged submarines and UUVs and air and surface assets. LRAM provides on-demand connectivity to submarines and UUVs operating in direct and associated support, increasing the value of UW platforms as fleet assets.

**Long range tactical communications through an expendable buoy or persistent USV**

- Targeting assignment change
- Mission change/update
- RV assignment for spec ops
- Two way communication/Intelligence of vital information in littoral waters without having to surface or transit
**Features**

- Provides a UW communications capability, from open ocean to shallow shore line
- Can be integrated as operating modes on a single receive system
- Built-in data security, anti-spoofing, national and coalition access features
- Suited for UUV communication, command, and control command Station
  - Can be upgraded for 2-way duplex communications

**Components**

**Command Base Station**

- Implemented on a standard COTS laptop
- IRIDIUM transmit/receive antenna system for connectivity
- Can be fitted with standard VHF-UHF RF link
- User interface enables message formatting/select and dial-up/control of the buoy via IRIDIUM
- Can be operated from surface, shore, and air

**Receiver Station**

- Implemented on a standard COTS laptop
- Walk-on system fit
- Interfaced to sonar via existing patch panels
- Capable of rapid fit to all NATO-operated submarines without modification
- Minimal operator training required

**Surface Link**

**Option A) Expendable Buoy**

- Common store capable of submarine, surface, or air launch
- Incorporates a SLOT buoy facility
- Incorporates signal generation algorithms
- Acoustic source can also be used for monostatic or multistatic ASW
- Fitted with IRIDIUM satcomm antenna*
- Integral GPS enables buoy position to be interrogated by SUBOPAUTH or tactical unit receiver station

**Option B) Persistent Unmanned Surface Vehicle/USV**

- Incorporates signal generation algorithms
- Acoustic source can also be used for monostatic or multistatic ASW
- Fitted with IRIDIUM satcomm antenna*
- Integral GPS enables buoy position to be interrogated by SUBOPAUTH or tactical Unit
  - Can be upgraded to include GTI’s M518 DIFAR with on board processing for passive detection

**Subsar, Submarine Safety Communications**

- Persistent submarine communications through a USV in allied operating areas
- Communication beyond what a distressed sub can provide:
  - Location
  - Reason for distress
  - DC report
  - Personnel report
  - Best plan for evac

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* for control and activation of the buoy

**Typical LRAM System Operation - Buoy and Persistent USV Options**