

NTSB
Emerging Flight Data & Locator
Technology Forum

SUPSALV Deep Ocean
Search & Recovery

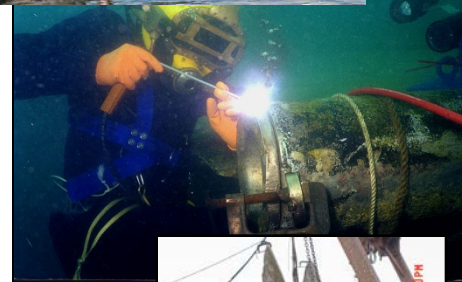
7 OCT 2014

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NAVSEA OOC



SUPSALV Assigned Missions

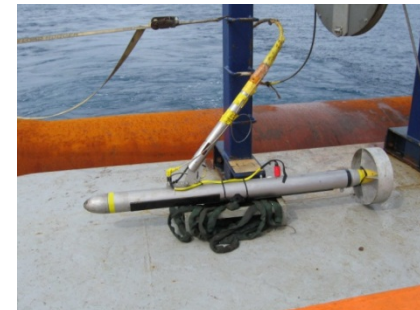
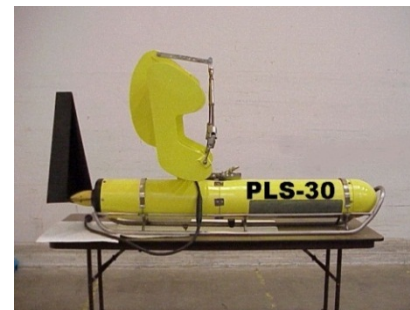
- Diving
- Salvage
- Ocean Engineering
- Oil Spill Response
- Underwater Ship Husbandry





Towed Pinger Locator History

- **Gen 1** - Developed in 1985 and used on numerous civilian and military search operations including Air France flight 447
- **Gen 2 & 3** - Designed with directional hydrophones and increased digital processing
- **Gen 4** - A return to an all analog Omni directional core system with select digital functionality





TPL-25

- **Towbody**

- Fiberglass 'bat wing'
- Normally towed between 1-5kts, stable to 10kts.

- **Pressure Housing**

- 1-atm titanium housing rated > 6,000m

- **Sensor**

- Single Omni-directional hydrophone, detection range > 1nm

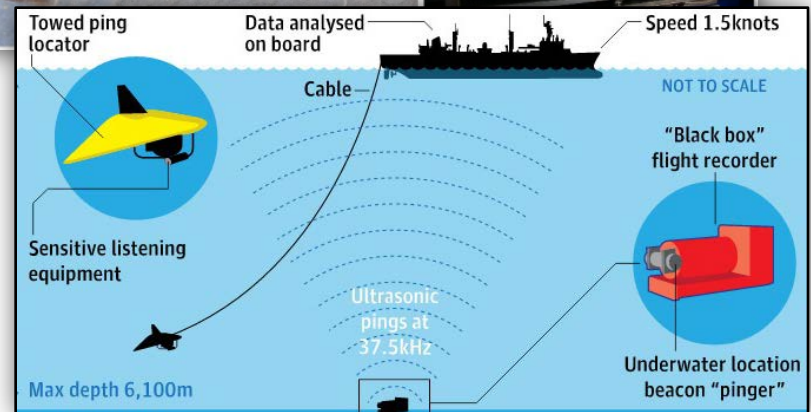
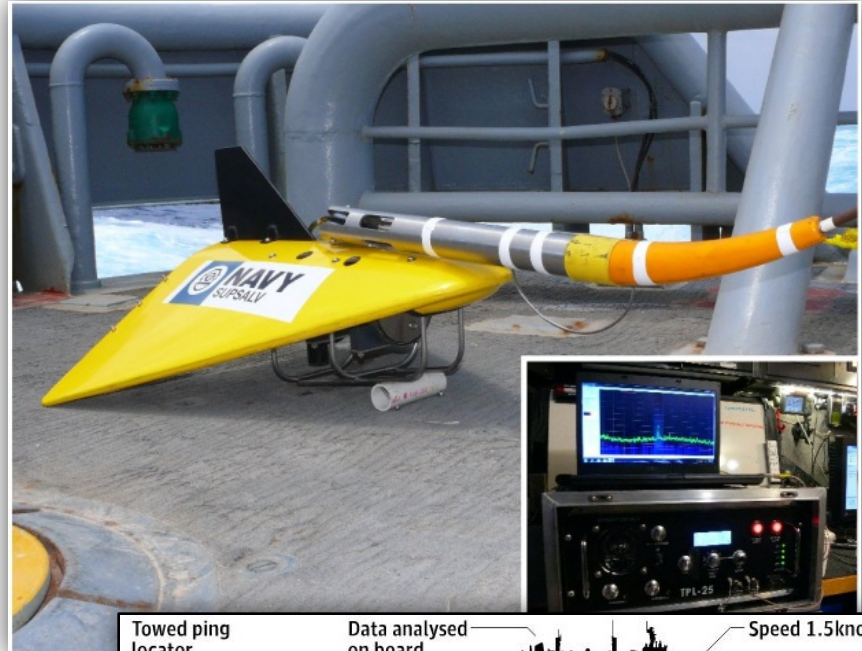
- **Digital Telemetry**

- Depth, heading, pitch, roll

- **Cable:** Any two conductor cable

- **Topside**

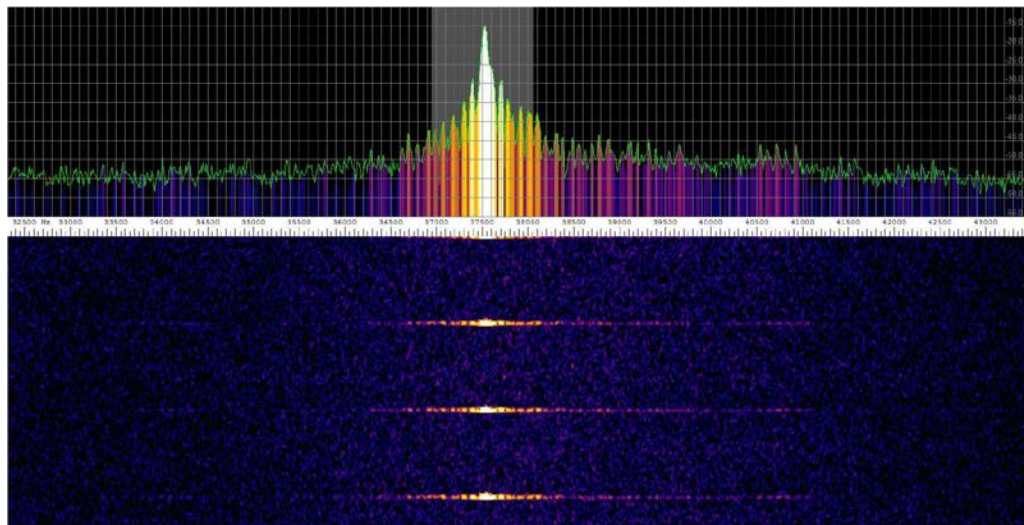
- **Console:** gain, filters, and audio speakers
- **Laptop:** spectrum analyzer, recording





Triangulation Methodology

- **Using both Audio and Spectrum Analyzer**
 - Plot First detection, Peak Signal Strength, Last Detection
 - Run reciprocal line plotting the same signal parameters
 - Then run a perpendicular line between the two peak signal strengths points followed by its reciprocal as well



- The goal is to resolve the pinger location to within the sonar range of the ROV



Pinger Location Design Considerations

- **Simple vs. Complex**
- **Towed vs. UUV**
- **Operations** [holistic fielded system perspective]
 - **Towed:** cable, winch, deck machinery, etc.
 - **UUV:** launch & recovery system
 - **Logistics:** globally transportable on short notice
 - **Sustainment:** self-sufficient for at least 30-days
 - **Operators:** trained and experienced



Thank you

**Please visit the SUPSALV Web Site for
Additional Information
(www.supsalv.org)**

