Areté

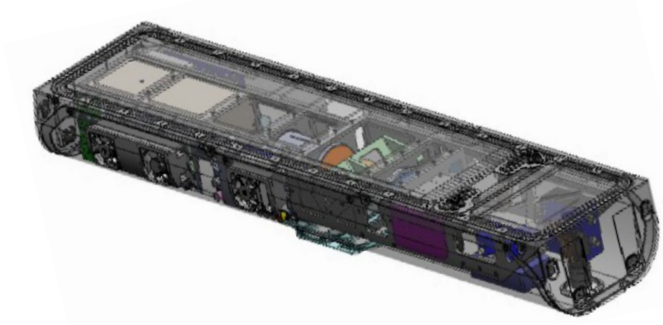
PILLS®

Pushbroom Imaging LiDAR for Littoral Surveillance

The Pushbroom Imaging LiDAR for Littoral Surveillance (PILLS®) system is a Joint ONR-NAVAIR funded SBIR program that developed and demonstrated an airborne LiDAR bathymetric capability utilizing Areté's Streak Tube Imaging LiDAR (STIL) technology. This active program includes development of a new, high resolution/high dynamic range camera, the addition of a second Areté manufactured AIRTRAC Laser to increase Pulse Rate Frequency (PRF), as well as the development and implementation of an on-board real-time processor. The PILLS system has gone through three defense related iterations and has flown on nine different commercial aircraft to date. Additionally, Unmanned Aerial System (UAS) flight tests have been completed on both the Seahunter UAS and the Schiebel CAMCOPTER® S-100. The S-100 is currently used by 45 countries and its small footprint provides a substantial payload capacity (110lbs.), power (1-kW), and volume, without requiring additional launch or recovery equipment for land or ship-based operations.

Capabilities

- Commercial Mapping
- Bathymetry



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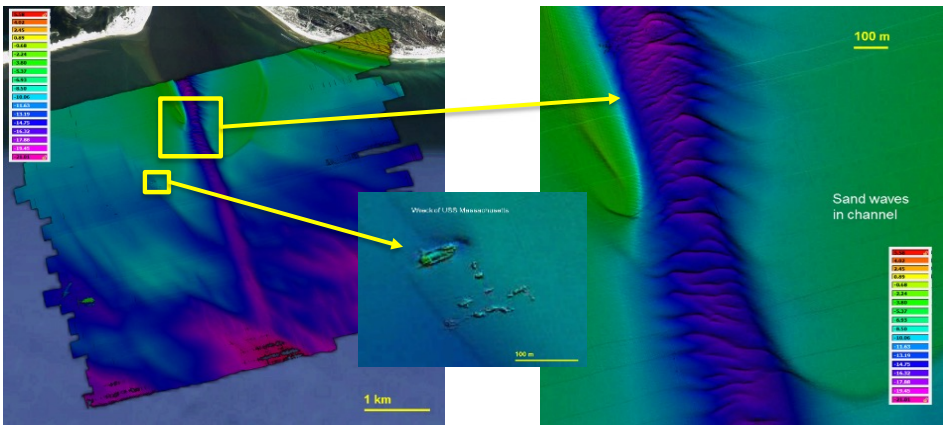
Low SWaP-C Tactical Airborne LiDAR

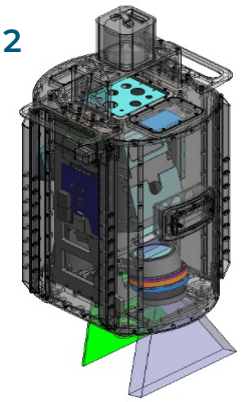
The PILLS program developed a series of advanced low Size, Weight, Power, and Cost (SWaP-C) LiDAR systems capable of hydrographic survey with an alternate detection mission capability. Designed to be compatible with tactical class Unmanned Aerial Systems (UAS), while simultaneously achieving the International Hydrographic Organization's (IHO) accuracy and depth standards (Standard 1A). The sensor has opened a new niche in small, airborne, depth penetrating LiDARs.

Commercialization of PILLS Technology

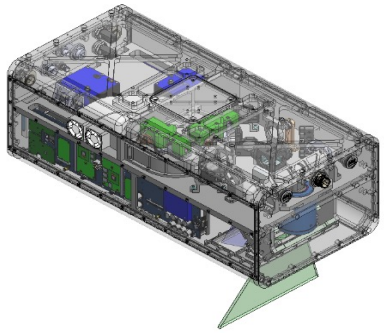
In 2018, Areté in collaboration with Fugro, USA, a commercial hydrographic mapping company, customized the PILLS technology for commercial use. The reduced SWaP-C, efficient swath coverage, comparable depth penetration, and equivalent accuracy to existing commercial LiDARs made the PILLS technology attractive to the commercial sector. Fugro has two systems in the field, under the commercial moniker Rapid Airborne Multibeam Mapping System (RAMMS), and a third to be delivered in 2022.



RAMMS 1 & 2



RAMMS 3 (2022)



Specifications

Dimensions	41" x 10" x 6" (LxWxD) | <2ft2 volume
Weight	< 13.6 kg (30 lbs.)
Power	< 250 W
Transmit Specifications	**Wavelength:** 532nm | **Repetition Rate:** 30Hz **Energy per pulse:** 37mJ | **Pulse Width:** 5.1ns
Operational Altitude	300m
Swath Width	0.9 nominal altitude
Operational Speed	**Manned:** 100-120kn | **Unmanned:** 50-60kn
Area Search Rate	**Manned:** 57 sq km/hr | **Unmanned:** 31 sq km/hr
Depth Penetration	3*kd-1
Operational Temperature Range	-20° to 50°C
Point Density	25,000 points per second
Feature Detection	2m cubic features
IHO Order	1A
Platforms	Small aircraft of opportunity (Cessna class and larger), unmanned (Schiebel S-100, SeaHunter UAS), rotary wing

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