



## 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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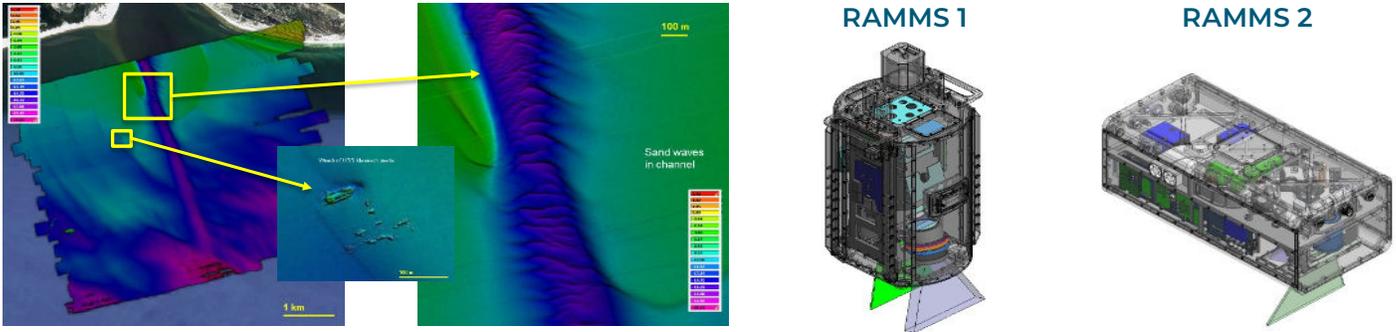


# Low SWaP-C Tactical Airborne LiDAR

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 three systems in the field, under the commercial moniker Rapid Airborne Multibeam Mapping System (RAMMS), and a third to be delivered in 2022.



## Specifications

	<b>PILLS</b>	<b>RAMMS 2</b>
Size	40" x 11" x 8" (LHW)	25" x 12" x 14.5" (LWH)
Volume	3520 in <sup>3</sup>	4350 in <sup>3</sup>
Weight	30 lbs (14 kg)	65 lbs (30 kg)
Power Draw	8A @ 28VDC (224W)	11A @ 28VDC (308W)
Pulse Rate Frequency	30Hz	60Hz
Energy per pulse	37mJ	40mJ
Pulse Width	5ns	5ns
Bandwidth	532nm	532nm
Electronics	Baseline	2nd laser circuit
Optics	Linear	Stacked
Swath	0.9x alt, 300m nominal	
Horizontal Sampling	39" (1m) x 39" (1m)	
Depth Penetration	3*kd-1	
Point Density	25,000 points per second	50,000 points per second
Field Of View	45°, rearward looking 15°	
Platform	Manned; UAS CG bay (SeaHunter, RQ-21, S-100)	Manned; UAS (S-100)
Platform Speed	120 knots (manned) and 50 knots (UAS)	120 knots (manned) and 50 knots (UAS)
Area Search Rate	Manned: 22 sq mi (57 sq km)/hr UAS: 12 sq mi (31 sq km)/hr	Manned: 22 sq mi (57 sq km)/hr UAS: 12 sq mi (31 sq km)/hr
IHO Order	1A	
Environmental	~ -4°F (-20°C) to + 122°F (50°C)	



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