

SUCCESS STORY

TOPIC NUMBER: N04-247, N06-011,
N98-035

SBIR INVESTMENT:
\$3,554,445

PHASE III FUNDING:
\$19,983,378



LOW-COST ADVANCED PROCESSOR (LCAP)

RDA, an SDi company, developed a sonobuoy test, development and evaluation product that allows for rapid low-cost prototyping.

RDA, an SDi Company

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THE CHALLENGE

As submarines become increasingly stealthy and operate in complex acoustic environments, leveraging multi-sensor data to enhance anti-submarine warfare (ASW) weapons is crucial. Collections of sonobuoy sources and receivers are employed to search for adversary submarines and function cooperatively as a sonobuoy field. Target detection requires correlating data from multiple sensors with varied detection modes. RDA, an SDi Company, developed the Low-Cost Advanced Processor (LCAP) for demonstrating command, control, recording, and processing underwater acoustics.

THE TECHNOLOGY

LCAP enables the recording, command and control, and acoustic signal processing of current, next generation, and experimental acoustic sensors. Capabilities include real-time tactical data collection and archiving in-flight analysis tools for sonobuoy development. LCAP also provides playback processing, detailed data analysis, sonobuoy health monitoring, and auxiliary sensor decoding and incorporates real-time and post-flight data analysis. As a roll-on/roll-off testbed platform, LCAP interacts seamlessly with aircraft and ship hardware when installed.

THE TRANSITION

LCAP started as an SBIR-funded R&D topic in 2003 to replace existing but limited sonobuoy recording and monitoring services. It was developed, matured, and delivered under three topics: N04-247, N06-011, and N98-035. Initially, the technology was developed for use on the P-3C Orion to support sonobuoy prototyping and associated performance enhancements. Under multiple Phase I, II, and III SBIR awards for these topics, LCAP supporting services expanded to include the P-8A Poseidon and MV-22 Osprey. In addition to aircraft platforms, LCAP operates on the NAWC-38 Research Vessel and in the NAWC prototyping, acquisition, and production laboratories. In 2019, RDA was awarded a FAR 16.306 cost-plus-fixed-fee Phase III contract to continue research and development of LCAP. LCAP successfully flew

on hundreds of test flights and is flight certified. Currently, LCAP is being used to test and support the acquisition of enhanced ASW capabilities aboard the P-8A Poseidon.

THE NAVAL BENEFIT

As a commercial off-the-shelf-based architecture, LCAP allows for rapid development at low cost with easy upgrades. The roll-on/roll-off feature facilitates rapid prototyping in a real-time environment, enabling technology experimentation before a system is installed on the aircraft, saving time and money. LCAP is compatible with all current, next generation, and experimental sonobuoy types in the Navy's inventory. It enables software updates to meet the evolving needs of the fleet and stay current with fleet requirements.

THE FUTURE

The Navy utilizes the LCAP on developmental test events to assess next generation airborne ASW. It is instrumental in tactical design, incorporating sonobuoys and modes not previously available on the aircraft. RDA actively monitors the data track and addresses any software errors or bugs in real-time during the flight. As technologies progress, LCAP will continue to provide valuable data and analysis to support its development. LCAP will be utilized in development and operational support for manned and unmanned aircraft and ships. Its capabilities will expand through integration with artificial intelligence and live, virtual, and constructive modeling and simulation technologies. LCAP will play a crucial role in enhancing tactical design and providing valuable data analysis for ongoing program advancements.

"RDA's LCAP remains an invaluable tool in the air and at sea for collecting data to provide critical real-time information to the Fleet, as well as support future development for the Navy. RDA's tools and staff are vital to the success of future Anti-submarine Warfare (ASW) operations."

Sharon Johnson, Air ASW Systems Program Office
(PMA-264)/NAWC AD21400, Airborne ASW Battlespace
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