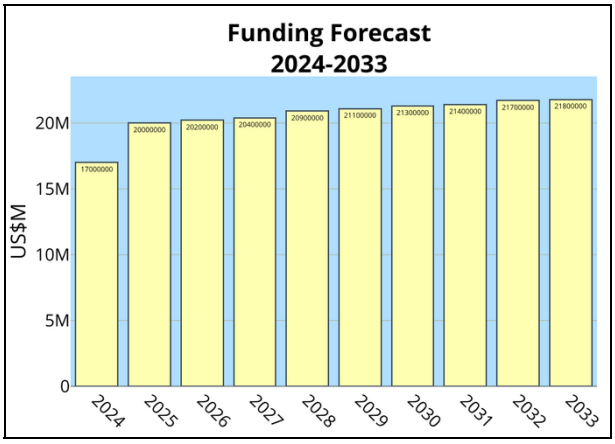
ASW Systems Development

Outlook

- Focus on high-altitude deployment of sonobuoys
- Increased attention on ASW in South China Sea and Arctic Ocean
- Some efforts will shift to production around 2028



Orientation

Description. This U.S. Navy research and development effort is intended to advance developmental testing of airborne anti-submarine warfare systems. These include aircraft, equipment, and devices for use against all types of submarine targets, and advanced, high-performance underwater mobile targets for use in fleet ASW training exercises. Also included is the operational evaluation of the Mk 30 and Mk 48 torpedo weapons system improvements.

Sponsor

U.S. Navy

Naval Air Warfare Center

Aircraft Division Indianapolis

Indianapolis, IN USA

Naval Surface Warfare Center

Crane Division

Crane, IN USA

Status. Continuous R&D, with much of the program classified.

Total Produced. This is an RDT&E program. Only test models are believed to have been produced.

Application. To improve ASW performance in countering the projected hostile submarine threat. This program develops sonobuoys, software, training targets, and airborne signal processors.

Contractors

Prime

Lockheed Martin Rotary and Mission Systems	https://www.lockheedmartin.com/en-us/who-we-are/business-areas/rotary-and-mission-systems.html, 1210 Massillon Rd, Akron, OH 44315 United States, Tel: + 1 (330) 796-2800, Fax: + 1 (330) 796-3274, Program Participant
Mantech International Corp	https://www.mantech.com, 2251 Corporate Park Dr, Herndon, VA 20171 United States, Tel: + 1 (703) 218-6000, Program Participant
Raytheon , Seapower Capability Center (SCC)	https://www.rtx.com/raytheon, 1847 W Main Rd, Portsmouth, RI 02871-1087 United States, Tel: + 1 (401) 847-8000, Program Participant

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Science Applications International Corp (SAIC)	https://www.saic.com, 4015 Hancock St, San Diego, CA 92110 United States, Tel: + 1 (858) 826-6000, Fax: + 1 (858) 826-6634, Consortium Member
Washington, University of	https://apl.uw.edu, Applied Physics Laboratory, 1013 Northeast 40th St, Seattle, WA 98105-6698 United States, Tel: + 1 (206) 543-1300, Program Participant

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

This program is intended to improve the effectiveness of ASW warfare platforms through the development of advanced hardware and software for airborne acoustic systems. Primary efforts being funded are development of the Advanced Active Sonobuoy (AAS), which is a potential replacement for the Directional Command Active Sonobuoy System (DICASS) in severe oceanographic conditions, and the Advanced Active Adjunct (AAA), an air-dropped sound source for the Air Deployed Active Receiver (ADAR). Among early work, in FY91 and FY92, counter-countermeasures (CCM) systems were evaluated, and an ice exercise (ICEX) was conducted in FY91.

Much of this program appears to have been classified in recent years, but the latest information shows it to currently contain two projects. (In past years, as many as five projects were listed.)

Project H1292 Advanced ASW Sensors and Processors. This project provides ASW platform effectiveness through the development of advanced hardware and software for airborne acoustic systems. These systems include sensors, processing and post-processing systems, and data recording and display systems, all of which address regional threat scenarios against conventionally powered and nuclear-powered submarines. Key objectives are platform accommodation of advanced active and passive sensors; improved detection, classification, localization, and tracking; and incorporation of increased capacity and flexibility to handle multisensor data loads.

Programs being funded investigate technologies such as over-the-horizon (OTH) communications, distributed netted sensors, transient signals, and source and receiver technologies that will enhance passive and multistatic active sensor system capabilities. Other programs being funded provide for the development of persistent tactical search technologies that will allow transition to the localization and attack phase in all operationally relevant environments. In addition, the program will provide for the development and subsequent experimentation, including data collection and engineering measurement, of multistatic active coherent (MAC) sources and receivers, laser technologies, electro-optical and multispectral camera technologies, radar, and magnetic anomaly detection (MAD) sensors. The test articles, which consist of passive/active sensors and associated processors, will support at-sea trials and experiments.

Project H3222 Advanced High-Altitude ASW. This project was an FY10 new start that is to develop the capability for precision standoff delivery of sonobuoys from high altitude in order to improve the tactical flexibility and mission performance of P-8A aircraft. NAVAIR Small Business Innovative Research (SBIR) companies are exploring promising technologies and are assessing the feasibility and practicality of proposed solutions for the precision placement of sonobuoys. This program leverages SBIR technology to refine system concepts and to conduct field experiments and tests to evaluate technology solutions and assess their performance and cost. Two hundred R&D test articles would be used for concept demonstration. Pending successful demonstration of precision placement technology, design modifications to current sonobuoy sensors will be matured and prototyped for qualification and testing, leading to transition into the P-8A.

Variants/Upgrades

The rapid change in ASW from blue water to brown water environments, along with the proliferation of highly effective conventional submarines on the international market, has resulted in numerous upgrades and modifications of sonobuoys. These changes are covered in the **Program Review**.

U.S. Navy P-8A Poseidon Aircraft for ASW

Source: U.S. Navy

Program Review

Background. There were early indications that a final report for the Airborne Acoustic Intelligence project would be generated in 2001 and that the project would then move to the RDT&E phase. No further information on this project was forthcoming until FY08, when budget documentation indicated that integration of the digital recording suite had been completed, the post-mission processor had been upgraded, and the aircraft calibration unit had been enhanced. Other recent activity included development of "target strength" processing and the testing of prototype processors.

Project work in 2008 included data collection support at operational wings and ongoing collection of acoustic and non-acoustic data in support of naval requirements. Other activities included the evaluation of essential performance modeling and the design of advanced-technology sensor systems.

The FY02 through FY04 RDT&E Program Element Descriptive Summary (PEDS) was something of a mystery. This particular program and its projects were referenced in documentation for other programs, and some funding information was available. But no information could be found on the progress of this program. The funding line for the program showed a substantial increase for FY01 and a marked drop for FY02, but that was the only concrete information contained within documentation.

There was mention of this funding line in FY03/FY04 documentation and some cursory financial information was provided, but the details normally available were conspicuous by their absence. The financial figures that were released showed a continuous fall in funding, with nothing beyond FY05. The published data for FY04 / FY05 did, however, show that some of the funds had been slightly redistributed (a small proportion of the FY03 money was pushed back to FY04, and about half the FY05 funding was pushed forward a year).

Into the Black

The descriptive summaries remained confusing for FY06 and FY07. Once again, there was no information on the work carried out under this program or on its achievements, plans, or focus of activity. However, it appeared that the funds allocated to the effort had been marked up by over $3 million for FY05 and by no less than $7 million in FY06. Furthermore, the pattern was consistent: each year, funding was added to this program and incrementally "topped up" until the total averaged out at around $17 million. The FY07 PEDS changed this pattern in style if not in substance –

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specifically (although once again, no information on the program was provided), the funding line did show that this program's allocation had been overtly maintained at the $17 million level without need for an additional markup.

In the FY08 PEDS, the funding line was extended through to 2013. Navy funding for FY07-FY09 supported the development, integration, and testing of the Electro-optical Passive ASW System (EPAS) and the delivery of eight fieldable prototype systems that would be used to demonstrate a 24-hour air ASW capability for fixed-wing, helicopter, and UAV platforms in multiple geographic locations.

The FY09 fiscal data went some way toward resolving the inconsistencies of previous years and filling the data void. More details on the EPAS program were provided, along with limited data on the Claymore Marine blue-green laser light detection and ranging (LIDAR) system used for ASW purposes.

Some of the additional EPAS data were related to scheduling issues. It was noted that the EPAS was not ready for operation in FY08 and that fielding had been rescheduled for FY10.

Meanwhile, EPAS field development testing was delayed to 2009, and EPAS fleet aircraft testing was delayed by a year to the fourth quarter of 2008. Further information has been limited, and, in common with other R1 funding lines, no information was provided for funding beyond FY10.

Project H0490 Airborne Acoustic Intelligence. Project H0490, Airborne Acoustic Intelligence, was moved to a new program element (0303354N) in FY11 for enhanced tracking. Little information on this project is available, and many aspects of this program are classified. What has been reported to date is that the project continues the "active measurement validation" of targets of interest, and has conducted acoustic analysis of echo characterization (which includes signal excess measurements, trend analysis, and pulse duration measurements) and target strength.

Project H1292 Advanced ASW Sensors and Processors. This project conducts system performance assessments toward development of multistatic active (coherent) ASW algorithms and other system enhancements, both acoustic and non-acoustic. The test articles, which consist of passive/active sensors and associated processors, support at-sea trials and experiments.

Efforts continued through FY23 to develop and validate air-deployable vertical line array prototype sensors for undersea warfare. Many of these prototypes were deployed in FY24 and FY25 for demonstration.

Project H3222 Advanced High-Altitude ASW. This program began in FY10 with an effort to improve airborne ASW capability by providing for precision delivery of sonobuoys from P-8A aircraft at high altitude. Various concepts were analyzed. In other efforts, the "technology readiness level" was improved to support the transition to acquisition. This work continued through FY11 and was completed by the end of FY12.

More recently, various prototype production contracts were expected to be awarded beginning in FY13 for the particular projects at hand.

During FY14, modeling and simulation analysis was begun with the aim of further modifying high-altitude sonobuoys for P-8A application, and potential new sonobuoys for the P-8A were evaluated.

FY15 and FY19 work included the analysis and early prototyping of both acoustic and non-acoustic technologies suitable for high-altitude ASW operations by P-8A aircraft.

Much of the schedule for FY20 through FY22 called for sensor and system performance assessments. No further funding appears to have been allocated under this program.

Note: *To view the forecast for a specific high-altitude sonobuoy, see the Forecast International report "SSQ-125 Sonobuoy."*

Project H9177 EPAS. In FY10, development and demonstration of the EPAS turret was completed. Project work has thus concluded and no further funding has been allocated.

Project H9347 Claymore Marine. In FY09, the blue laser brassboard LIDAR ASW system produced under this project was delivered. No further funding has been allocated for this project.

Congressional Add-Ons. Starting in FY10, congressional add-ons have included development of a marine mammal detection system and a marine mammal alert system, as well as the conduct of a marine species migration study. An air-readiness system to counter existing submarine threats was also funded. A project to develop a wave energy module that would allow a sonobuoy to harvest energy from ocean waves in order to supplement or replace its battery power was added as well.

Funding

U.S. FUNDING

	FY23 QTY	FY23 AMT	FY24 QTY	FY24 AMT	FY25 QTY	FY25 AMT	FY26 QTY	FY26 AMT
RDT&E (U.S. Navy)								
PE#0603254N								
ASW Systems Development	-	15.6	-	17.0	-	20.0	-	20.2

	FY27 QTY	FY27 AMT	FY28 QTY	FY28 AMT	FY29 QTY	FY29 AMT	FY30 QTY	FY30 AMT
RDT&E (U.S. Navy)								
PE#0603254N								
ASW Systems Development	-	20.5	-	20.9	-	21.3	-	N/A

All $ are in millions.

N/A = Not Available

Source: U.S. Department of Defense FY25 Biennial RDT&E Descriptive Summary

Note: Includes RDT&E funds for advanced development and developmental testing of airborne ASW systems, including aircraft, equipment, and devices for use against all types of submarine targets. This program is funded under Advanced Component Development and Prototypes because it includes all efforts necessary to evaluate integrated technologies, representative models, or prototype systems in a high-fidelity and realistic operating environment.

Contracts/Orders & Options

No recent contract awards having a value of over $5 million have been identified for this program.

Worldwide Distribution/Inventories

This is a **U.S. Navy** program.

Forecast Rationale

It is the goal of the U.S. Navy's ASW Systems Development program to conduct studies and analyses toward better performance of the anti-submarine mission and of the equipment hosted by the U.S. Navy's principal ASW aircraft platform the Boeing P-8A Poseidon.

With China's increasingly aggressive actions in the South China Sea – specifically around Taiwan and the Spratly Islands – this program is expected to see increased attention.

Additionally, Russia is quietly strengthening its position in the Arctic Ocean by rebuilding both its surface and submarine fleets to operate in this region. These actions are the result of global warming, which is melting the polar ice caps and expanding the breadth of sea lanes available for commercial maritime fleets. At the same time, more area is being exposed for mining of untapped natural resources.

There may be minor fluctuations, but overall funding will show a slow and steady increase.

Note: See the Forecast International report "SSQ-125 Sonobuoy" for a market forecast on a specific high-altitude sonobuoy.

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Ten-Year Outlook

ESTIMATED CALENDAR YEAR RDT&E FUNDING (in millions US$)												
Designation or Program		High Confidence				Good Confidence			Speculative			
	Thru 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
MFR Varies												
ASW SYSTEMS DEVELOPMENT <> United States <> Navy												
	623.58	17.00	20.00	20.20	20.40	20.90	21.10	21.30	21.40	21.70	21.80	205.80
Total	623.58	17.00	20.00	20.20	20.40	20.90	21.10	21.30	21.40	21.70	21.80	205.80