

# Department of the Navy SBIR/STTR Transition Program

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Topic # N06-010

Sonobuoy – Electronic Function Selector (EFS) Replacement  
SEA CORP

## WHO

**SYSCOM:** NAVAIR

**Sponsoring Program:** Maritime Patrol and Reconnaissance Aircraft (PMA 290)

**Transition Target:** P-8A

**TPOC:**  
(301)342-2079

**Other transition opportunities:**  
MH-60R

**Notes:** The figure at the right depicts SEA CORP's TRL 6 Hand-Held Device (HHD) prototype programming an infrared-capable sonobuoy.



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## WHAT

**Operational Need and Improvement:** Advanced capability sonobuoys have data requirements that exceed the capabilities of the legacy manual programming interface. It's necessary to upgrade this interface to enable more rapid, efficient, accurate, and extensive data transfer.

**Specifications Required:** The developed user interface must be a small handheld, battery-powered device, usable in very low light conditions and cost less than \$200. The Hand-Held Device (HHD) should comply with DOD requirements for electromagnetic frequency interference (EFI) as applied to Navy aircraft and be able to interface to a standard personal computer (PC) through a universal serial bus (USB) connection for programming and record keeping. Commercial-off-the-shelf (COTS) technology maximization is encouraged. The system must operate while the sonobuoy is in the shipping launch container (SLC). In addition to the HHD, the proposed concept should be adaptable to the multi-mission maritime aircraft (MMA) so that function selection and confirmation can be accomplished via direct interface with the mission computer while the sonobuoy is in the launcher.

**Technology Developed:** The Remote Electronic Function Select (REFS) System HHD is a low-light readable, low-cost, stand-alone device capable of programming, verifying and reprogramming sonobuoys via an infrared interface in less than one second per buoy. The HHD battery life exceeds 8 hours. The HHD data transfer capability is virtually unlimited and will support advanced development sonobuoys as they come into service. The full REFS system [comprising a HHD and charging cradle, an Electronic Control Unit (ECU), and in-launcher Infrared Transceivers (IRTs)] programs and verifies sonobuoy settings in under a second and will interface directly with multi-mission maritime aircraft (MMA) mission computer enabling in-launcher buoy programming.

**Warfighter Value:** REFS provides the only means to rapidly program, verify and reprogram advanced development sonobuoys. REFS also adds the capacity for in-launcher programming, enabling fleet operators to adjust buoy settings as the tactical picture warrants, a never-before-available capability. In addition, REFS provides a means of rapid data transfer in other applications where hard-wired and radio frequency interfaces are impossible.

## WHEN

**Contract Number:** N68335-13-C-0389 **Ending on:** January 29, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
REFS Critical Design Review (CDR)	N/A	Completed CDR with government participation.	HHD 6/ REFS 4	September 2014
Complete EQT Testing for REFS HHD	Med	Verify REFS HHD can withstand environmental conditions associated with in-flight operation.	HHD 7/ REFS 4	December 2015
Demonstrate REFS data transfer capability.	Low	Verify REFS system can rapidly program sonobuoys.	HHD 7/ REFS 6	January 2016
Test Full REFS System in Government Lab	Med	Verify REFS system operability in a realistic laboratory environment.	HHD 7/ REFS 7	September 2016

## HOW

**Projected Business Model:** SEA CORP plans to manufacture the HHD units in-house by implementing our standing manufacturing plan. Upon achieving TRL 8 subsequent to REFS System DT/OT in July 2019, SEA CORP would be ready to initiate Low-Rate Initial Production (LRIP) in January 2020. Presuming 130 HHD units to support MMA aircraft, full production would be complete before the end of FY20. Production of full REFS Systems are subject to the needs and schedule of the MMA and other sonobuoy-deploying platforms such as the MH-60R.

**Company Objectives:** SEA CORP wishes to be the manufacturer of the REFS Systems including HHDs and to remain the primary In-Service Engineering Agent's (ISEA) support contractor over the life of the system, regardless of which platforms in which it is ultimately deployed. Consequently, SEA CORP is also very interested in meeting principles in the MH-60R program and other similar helicopter programs.

**Potential Commercial Applications:** The MH-60R Multi-Mission Helicopter (MMH) carries a 25 sonobuoy payload. Buoys are presently set manually with manual records of settings and no opportunity to change settings once loaded. REFS would provide the MMH with the enhancements projected for the P-8A MMA thereby enhancing the operational effectiveness and versatility of two already extremely capable platforms. Allied navies employ sonobuoys from a variety of platforms [including the UK's Nimrod MR2 and MRA4 reconnaissance planes, the European NM-90 Helicopter and the Canadian Maritime Helicopter (MH)]. Standardizing and optimizing the sonobuoy interface across multiple allied navies would increase the tactical efficacy of this critical element of an increasingly-dynamic worldwide ASW problem and would serve to permit more time and flexibility in other mission areas thereby increasing overall operational effectiveness. In other military applications, hand-held wireless devices that monitor weapons or engineering systems could reduce workloads on our heavily-burdened forces.

**Contact:** Scott Smith, Business Area Manager  
[ssmith@seacorp.com](mailto:ssmith@seacorp.com) 401-339-2880