

# Department of the Navy SBIR/STTR Transition Program

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Topic # N08-143

Long Endurance, High Power Battery

MaxPower, Inc.

## WHO

**SYSCOM:** NAVAIR

**Sponsoring Program:** PMA-290, PMA-264

**Transition Target:** AN/SSQ-101 ADAR Sonobuoy

**TPOC:**  
(301)342-2094

**Other transition opportunities:** MaxPower is also looking at this technology for small UAVs. We have built prototypes in a relevant configuration for this application.

A similar battery technology is also being used for a primary conformal battery for the Army and was previously used in a development of the Rifleman Radio battery for the Army.



Image Courtesy of the U.S. Navy: File 050415-N-3122S-003, April 15, 2005

## WHAT

**Operational Need and Improvement:** MaxPower is seeking to integrate their Li/CFx battery technology as the primary energy source for the Air Deployable Active Receiver (AN/SSQ-101 ADAR). If integrated into the production sonobuoy line, the Navy will realize significant cost saving in terms of reduced sonobuoy quantity requirements for given missions and streamline logistics for on-board stores management.

**Specifications Required:** Targeted improvements for the power source would include longer run time or reduced size as well as using lower cost materials to reduce battery price.

**Technology Developed:** MaxPower has developed a Li/CFx primary battery technology that capitalizes on the very high energy density of lithium batteries while pairing it with a very high energy cathode in CFx. Testing has demonstrated a specific energy of 360 Wh/kg and energy density of 591 Wh/L at a discharge rates up to 1/4C, with an operating temperature range of -40 to 35°C. This technology is also highly configurable, allowing for its use in various form factors and applications.

**Warfighter Value:** MaxPower is seeking a 100% increase in battery life from the current option while maintaining the same size and weight, all while using more affordable materials. This will decrease mission frequency and support resources needed for the sonobuoy fleet. In UAV applications, it would allow for extended flight times or reductions in battery weight.

## WHEN

**Contract Number:** N68335-14-C-0041 **Ending on:** December 17, 2015

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Baseline Cell Design	Med	Cell design projects acceptable performance and reliability based on cell prototype testing	TRL 6	September 2015
Baseline Battery Design	Med	Battery design projects acceptable performance and reliability based on scaled cell test data	TRL 5	October 2015
Cells on Storage Tests	N/A	Validate storage life capabilities of cell chemistry and hardware	TRL 4	August 2015
Battery Deliverables	Med	Batteries delivered to customer for testing	TRL 6	May 2016

## HOW

**Projected Business Model:** MaxPower will develop the technology through prototyping all the way to manufacturing readiness. MaxPower currently has low level production capabilities in the range of 5,000-8,000 units annually with potential for expansion as required. Alternatively, MaxPower would partner as needed for larger production scales.

**Company Objectives:** MaxPower continues to target DoD, DoE, commercial, and other applications where there is a need for a tailored battery design that provides high power and energy. MaxPower specializes in a variety of lithium primary and Li-ion rechargeable chemistries, allowing them to design a battery around the specific needs of the customer. MaxPower has expertise and experience in the entire design process, including prototyping, testing, and production readiness, with also being able to support low-level production.

**Potential Commercial Applications:** The Li/CFx battery technology accounted for a growing 9% of the world's primary battery market in 2009, and that growth is expected to continue. With the desire for increasing battery life for commercial electronics, the superior energy density of the Li/CFx system provides an increasingly desirable option. Commercial drone usage is also on the rise, providing for a potential direct transition from battery designs for defense related UAVs.

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