

NAVY Transition Assistance Program

N07-191 - Cobra Design & Engineering, Inc

A Lightweight, UHF SATCOM Diplexer for use in Expendable Buoy Systems

NEED & CUSTOMER REQUIREMENT

Need: New technologies are desired for smaller, lighter, more cost effective Ultra High Frequency (UHF) Satellite Communications (SATCOM) diplexers.

Value to the Warfighter: This technology will reduce communications systems foot print and extend mission endurance for small platforms.

Operational Gap: Compared to commercial off the shelf (COTS) technology, Cobra's design will reduce the weight to .77 pounds, a 5X reduction with the same performance.

Customer Specifications: Using innovative and novel materials and filter design techniques to enable a full duplex UHF SATCOM capability meeting electrical requirements as specified by the customer.

Technology Description: Cobra Design & Engineering, Inc. is developing a full duplex Diplexer/Triplexer supporting legacy UHF SATCOM plus Mobile User Object System (MUOS) frequency bands. The unique design approach utilizes high-Q resonators fabricated from silver plated thin-wall aluminum tubing in place of the traditional machined solid aluminum block. The resulting structure is extremely strong and lightweight. The Diplexer will support MUOS existing and growth capability, but eliminates legacy UHF SATCOM capability. The mechanical designs of the Triplexer and MUOS Diplexer are extremely small and lightweight as compared to commercial versions, but most importantly the designs are easily adaptable to fit the users' specific applications. This means our design geometry can be quickly adapted into various shapes: circular segments, rings, ellipses, and rectangles.

The Advanced Cobra Lightweight UHF SATCOM Triplexer developed under this SBIR weighs 12.3 oz (.77 lbs) and measures 7" long x 2.9" wide x 2.0" tall.

SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: SPAWAR

Transition Target: Communications systems in munitions systems and Unmanned Vehicles (UV)s

Original Sponsoring Program: PEO Command, Control, Communications, Computers and Intelligence (C4I)

TPOC Phone Number: 619-524-7922

Note: We are experienced at simulating harsh thermal, structural and dynamic military environments per MIL-STD-810, MIL-STD-167, MIL-S-901 and others. We provide printed circuit board design services and analysis of electronics packaging and platform installation.



TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Develop a Diplexer that meets the Phase I requirements for a full duplex UHF SATCOM	2	Moderate	Technology concept and/or application formulated	January 2009
Develop a Triplexer that meets the Phase II requirements supporting Legacy UHF SATCOM plus MUOS Existing frequency	3	Moderate	Analytical and experimental critical function and/or characteristic proof of concept	August 2010
Incorporate bottom coupled filter resonators to reduce size and weight	4	Low	Component and/or breadboard validation in a laboratory environment	October 2010
Verify grounding and shielding scheme supports the 90 dB stopband requirements	5	Moderate	System/subsystem model or prototype demonstration in a relevant environment	June 2011
High Power	6	Moderate	System prototype demonstration in	November

Open contract: N66001-10-C-5205 ending January 15, 2012

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TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications: This technology can be quickly re-engineered to adapt to various package shapes. Potential applications include buoy communications, missile communications, and Unmanned Systems. It is also applicable to devices requiring MUOS communications capabilities.

Business Model: The business model for bringing this technology to market is the differentiator model. The organization shall use the lower footprint and weight as a differentiator to enter the market. Production will be conducted with low volume initial production using in-house and local resources. Current in-house production volume is to be determined. When 80% of internal production capacity is reached, Cobra Design & Engineering will outsource production to a higher volume facility. The technology will be marketed by internal and external personnel.

Objective: Cobra Design & Engineering is seeking near term opportunities for partnering, testing, and transition of their unique Diplexer/Triplexer technology within the Department of Defense (DoD). The current design can be easily modified to fit a variety of shapes and sizes that may be needed. Prime contractors using Diplexers/Triplexers in unmanned vehicles or other devices which require communications components, could benefit from the reduced weight and form factor our product supplies.

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