

# NAVY Transition Assistance Program

N08-001 - Tethers Unlimited, Inc.

SVELTE: Lightweight MAD Sensor Towing System for UAVs and Small Helicopters

## NEED & CUSTOMER REQUIREMENT

**Need:** Current state of the art towing reels, tow cables, and tow bodies designed for the AN/ASQ-233 magnetometer are too large, too heavy and too unstable for use by small rotary wing and fixed wing manned and unmanned aircraft. These aircraft are constrained in available payload weight and their ability to handle large aerodynamic forces.

**Value to the Warfighter:** A lightweight, reliable, automated sensor towing capability that will enable key Anti-Submarine Warfare (ASW) missions currently performed by manned helicopters to be carried out at lower cost and lower risk to Navy personnel on Unmanned Aerial Vehicle (UAV) systems.

**Operational Gap:** One of the key mechanical requirements that is very difficult to achieve with current technology is a very light weight < 40 pounds for the entire system (tow body, tow cable, reeling machine) while meeting the aerodynamic qualities below.

**Customer Specifications:** The system should consist of a non-magnetic, stable tow vehicle, non-magnetic tow cable, and light weight reeling machine that can deploy and tow the MAD sensor at speeds between 50 - 350 knots from small rotary wing and fixed wing manned and unmanned air vehicles (UAVs). The solution technology must be stable in 3-axes to  $\pm 1/2$  degrees while being towed, and not add more than 10 pounds to the AN/ASQ-233 magnetometer/sensor package.

**Technology Description:** Tethers Unlimited, Inc. (TUI) developed a Small VEHICLE Lightweight Towing Equipment (SVELTE) system to enable small aircraft and UAVs to deploy and tow magnetic anomaly detection (MAD) sensors with highly stable sensor attitude.

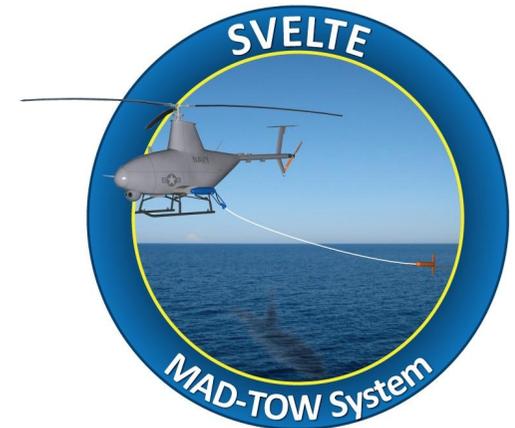
## SPONSORSHIP of original SBIR/STTR Topic

**SYSCOM:** NAVAIR

**Transition Target:** MQ-8B Navy Fire Scout

**Original Sponsoring Program:** PMA 264-Joint Multi-Mission Electro-optical System (JMMES)-ACAT IV; PMA-290

**TPOC Phone Number:** (301) 342-2552



## TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Concept Design for Lightweight, Stable Sensor Towing System for UAVs	2	Moderate	40 lbs or less, stable to better than 0.5 deg	27Sept08
Demonstrate Lightweight Winch Mechanism	3	Moderate	Functional Orbital Winch & Tow Body Prototypes	24Mar09
Flight Demo of Passively Stabilized Tow Body	4	Moderate	Tow Body Prototype Tested on Helicopter	20Mar10
Demonstrate Winch and Cable Lifetime	5	Moderate	Orbital Winch & Tow Cable Qualified in Life Testing	11Jun11
Flight Demo of MAD Sensor Tow System	6	Moderate	MAD Tow System Demonstrated on Helicopter Platform	11Dec11

**Open contract:** N68335-09-C-0182 ending 06/11/2011

## TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

**Other Potential Applications:** The primary platform is the FireScout UAV; however, the MAD tow system could also enable the P-8A aircraft platform to implement a MAD capability with minimal system and cost impacts. The sensor towing system may also enable new capabilities for precise geolocation of Radio-Frequency (RF) signals from UAV platforms.

**Business Model:** TUI and Polatomic have agreed to collaborate between their respective SBIR efforts to develop an integrated system, with TUI supplying tow body, winch, and cable and Polatomic supplying the sensor payload.

**Objective:** Secure opportunity and funding to conduct flight validation testing of the MAD Sensor Towing System on a FireScout or other relevant platform.