

# NAVY Transition Assistance Program

N112-094 - American GNC Corporation

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## Autonomous Intelligent Store Tracker Sensor (AISTS)

### NEED & CUSTOMER REQUIREMENT

**Need:** A monitoring device that will accurately measure, log, and report captive carry exposure hours for fixed and rotary wing external stores with minimized size, weight and power (SWaP) characteristics.

**Value to the Warfighter:** This device will provide a basis for quantifying actual carriage life and indicate to the Fleet when a store is approaching the end of its life so that it can be removed from service or reconditioned for continued use.

**Operational Gap:** Current logistics and unique store mission use-functionality does not allow for manual tracking and logging of carriage life exposure.

**Customer Specifications:** The device should be a self-generating and standalone sensor able to sense, record, and log a wide range of dynamic events and then correlate the measured events with mission use statistical information for estimating store carriage hour accumulation. The device must be able to log data for extended periods and data should be downloadable for input into a store environmental exposure-accumulation software tool.

**Technology Description:** The technology consists of a sensor installed in an aircraft's external store that determines the exposure time to different events. The sensor is a standalone device that does not interface with any of the payload's other components, and is assumed physically inaccessible. During on-ground debriefing operations, access to the sensor is only possible with a through-metal wireless link based on an ultrasound communication and powering system. With this system, the sensor's battery is charged and event information is downloaded into a hand-held device which uploads event data into a server application through a wired link or wireless local area network.

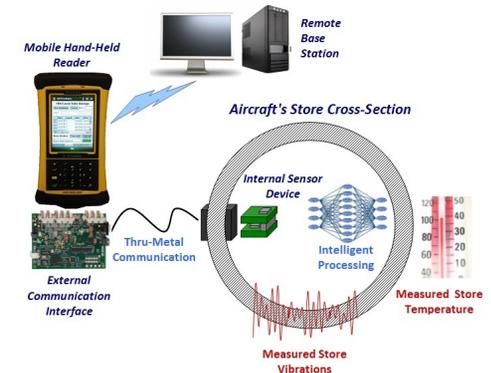
### SPONSORSHIP of original SBIR/STTR Topic

**SYSCOM:** Naval Air Systems Command (NAVAIR)

**Transition Target:** Advanced Precision Kill Weapon System II (APKWSII)

**Original Sponsoring Program:** Direct and Time Sensitive Strike Warfighting Capabilities (PMA 242)

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### TECHNOLOGY DEVELOPMENT MILESTONES

Milestone	TRL	Risk	Measure of Success	TRL Date
Phase I technology prototyping	3	Low	Proper interaction of system components	April 2012
Phase II (Year 1) - sensor software realization	4	Low	Correct event classification percentage > 95%	Oct. 2013
Phase II (Year 2) - base station and reader unit realization	4	Low	Download event data with packet loss < 0.1% Charge sensor with power efficiency > 90%	Sept. 2014
Phase II (Year 2) - sensor hardware realization	5	Moderate	Optimized SWaP: size < 2.5" circular diameter and < 0.6" thickness, power < 40 uA (sleep mode) and < 500 uA (active mode)	Sept. 2014
Phase II (Year 2) - IMV Deployment	6	Moderate	Satisfy above with lifetime of 1 month (active mode) to 1 year (sleep mode) between charges (for very small 450 mAh battery)	Sept. 2014

**Open contract:** N68936-12-C-0035 ending 09/30/14

### TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

**Other Potential Applications:** The initially targeted DoD platform was the Advanced Precision Kill Weapon System II (APKWSII). However, other potential applications include weapon systems such as the Guided bomb unit 12 (GBU-12), Advanced medium range air-to-air missile (AMRAAM), Advanced anti-radiation guided missile (AARGM), Sidewinder, Joint stand-off weapon (JSOW) and Small diameter bomb 2 (SDB-II).

**Business Model:** The market entry strategy includes the following stages: (i) establish a strategic partnership with mature service providers and original equipment manufacturers (OEM); (ii) provide field application engineering with the strategic partners for system introduction and deployment to the interested market; (iii) technology licensing after market introduction and seeking market expansion while assisting in maintaining a profit margin after the maturation of the technology; and (iv) technology transition where transition is conducted for the technology re-innovation and further technology exploration.

**Objective:** To introduce self-generating and standalone sensor technology into the market that will provide a way for government and contractor users in charge of aircraft payload development and sustainment to understand events experienced by payloads as to optimize designs and maintenance. Then, the technology will be deployed in other applications beyond store monitoring such as vibration-based health monitoring, corrosion detection, and others.