

NAVY Transition Assistance Program

NAVAIR Public Release 10-1571

Approved for public release; distribution is unlimited.

N08-153 - Adaptive Technologies, Inc.

Improved Hearing Protection from Non-Invasive Ear Scans

NEED & CUSTOMER REQUIREMENT

Need: Flight deck and other warfighter personnel who work in loud noise need improved hearing protection. Noise induced hearing loss is a problem throughout the military and heavy industry. Earplugs that are custom fitted to a user's ears can provide significant protection from noise. Currently, a major challenge to fielding custom earplugs is that the process of measuring ears for fitting is slow, expensive, and unpleasant.

Value to the Warfighter: Adopters of this technology will be able to better protect the hearing, and thus mission effectiveness, of their personnel by deploying custom earplugs faster, at less cost, with minimized logistical burden, and more comfortably than is otherwise possible today.

Operational Gap: Making custom earplugs traditionally requires measuring ears by way of ear impressions. An ear impression is formed by injecting liquid rubber into the ear, waiting for the rubber to solidify, and then removing the solid to show the inside shape of the ear. Manufacturers use the shape from the solid impression to design the earplug. Although common today, this process is cumbersome and can be uncomfortable for the end user.

Customer Specifications: NAVAIR's topic solicitation specifies the need for an accurate, efficient, robust capability to digitally capture ear canal geometries and to share, archive, access, and manipulate those digital datasets to provide custom earplug products with a minimized logistical burden. An innovative solution is sought that will eliminate the need for acquiring physical ear canal impressions.

Technology Description: This technology simplifies custom earplug deployment by eliminating the ear impression. Our system uses mobile, low-dose Volume Computed Tomography (VCT) scanners to measure ears quickly and non-invasively. The measurement process is comfortable and the digital output can be transferred electronically. Significant cost and manpower savings are possible as compared to using the traditional process.

TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Concept Validation	5	Low	Demonstrate recording earshapes, non-invasively, by VCT scanner	Feb. 2009
Business Case	5	Low	Analysis shows a positive return on investment for using this system	Nov. 2009
System Enhancement	6	Low	Demonstrated capability to measure left and right ears with a single scan, for faster throughput	Mar. 2011
Qualification	6	Low	Real Ear Attenuation Testing (REAT) shows performance of earplugs created using this system meets that published for traditional approach	Mar. 2012

Open contract: N68335-10-C-0011 ending March 2012

SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: NAVAIR

Transition Target: F-35 - Joint Strike Fighter; PMA-202; PMA-276

Original Sponsoring Program: F-35 - Joint Strike Fighter, ACAT I; PMA-202 Aircrew Systems; PMA-276 USMC Light/Attack Helicopter Program

TPOC Phone Number:
301-342-9218



TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications: Navy flight deck maintainers will be the first beneficiaries of this technology. Initial customers will be program managers responsible for supplying protective equipment to flight deck personnel (ex. PMA-202 Aircrew Systems). Subsequent applications will serve military and industrial organizations whose personnel work in noisy environments. Our ear measurement system can also benefit manufacturers of custom earplug products as they are often tasked with collecting the requisite measurements.

Business Model: Adaptive Technologies seeks to transition this technology to entities responsible for collecting ear measurements.

Objective: This non-invasive ear measurement system will be ready for validation in an operational environment by March 2012. We are seeking interest from DoD acquisition programs, with needs to deploy significant quantities of custom hearing protectors, to endorse SBIR Phase II.5 or program office Phase III funding for demonstration in an operational environment. Following success of the pilot program demonstration, we will seek widespread adoption by the Navy community.