TOPIC NUMBER: N98-106, N97-090, N03-074, N04-065

SBIR INVESTMENT: $1,815,889

PHASE III FUNDING: $81,322,450

MISSION PACKAGE COMPUTERS, SOFTWARE AND TRAINER (MPCST)

Advanced Acoustic Concepts developed Mission Package Computers, Software and Trainers (MPSCT) for use with the Littoral Combat Ship (LCS) mission modules.

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THE CHALLENGE

The technology was developed from three challenges: to develop the capability for automated localization and tracking of multiple wideband acoustic signals, both intentional and unintentional; to develop the capability to detect and adaptively reject a ship's acoustic interference during tracking and localization of wideband acoustic signals in the presence of countermeasures and the ship's own radiated noise; and to enable training developers and instructors to better monitor and assess training lessons and curriculum effectiveness.

THE TECHNOLOGY

Advanced Acoustic Concepts (AAC) built, delivered and installed three mission package computing equipment (MPCE) kits, one mission package portable control station (MPPCS), and one common mission package trainer (CMPT) for use with Littoral Combat Ship (LCS) mission modules. Through a Rapid Capability Insertion (RCI) program and commercial off-the-shelf (COTS) technology, AAC provided common computing and networking architecture on both LCS sea frames for all tactical mission package application software deployments employing AAC's mission package services (MPS); supported cohesive team training for mine countermeasure (MCM), anti-surface warfare (ASUW), and anti-submarine warfare (ASW), both standalone and integrated within LCS seaframe trainers; and developed a portable computing and communications platform to enable test and evaluation or tactical operation from any Naval vessel or pier-side.

THE TRANSITION

The MPSCT technology evolved from four Navy SBIR topics and projects: N98-106, N97-090, N03-074 and N04-065. Advanced Acoustic Concepts was awarded a $13M firm-fixed-priced, cost-plus-fixed-fee, and cost-only contract from NAVSEA to complete the hardware and software that comprise the MPSCT System, including the computing environment Mission Package Computing Environment; hosted software (Mission Package Operating Environment); Mission Package Services; associated training equipment (Common Mission Package Trainer); and a portable computing environment (Mission Package Portable Control Station). Work on the contract was completed by September 2020, with the option to extend to September 2023.

THE NAVAL BENEFIT

The MPCE and MPPCS systems help the Navy carry out shallow water ASW against quiet submarines. Additionally, the technology allows an acoustic intercept system to provide detection, classification and localization capability throughout a weapon engagement scenario. The common mission package trainer's (CMPT) metrics expose expected and actual levels of performance identifying areas that can be addressed with additional training, performance support, and process or application improvement. CMPT can record expert users' performances. These recordings can be edited, annotated, and then published as sharable content. This technology is a significant enhancement to the existing AAC learning management system (LMS), data driven learning system (DDLS), and knowledge management system (KMS) suite.

THE FUTURE

Leveraging COTS technology enables Naval platform's onboard computing power to grow at the same rate as commercial industry. AAC continues its tradition of RCI leadership through AAC's prime contractor role for LCS' integrated systems, which includes the latest technology in integrated, flexible, open architecture, COTS-based systems. The MPCE kits and MPPCS' technology can be applied to interference rejection for non self-defense systems and sensors, as well as acoustic imaging and seismic signal processing systems. The CMPT training technology can be applied to any environment involving training effectiveness evaluation, mentoring, or team interaction.

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