

ACOUSTIC

Performance Solutions

Acoustics and Structureborn Noise

Services and Technology for Acoustic Performance – Anywhere, Anytime

ManTech is an established leader in acoustics and structureborn noise. Our staff features extensive technical expertise, education and to support programs both the public and private sectors:

- Acoustics and structureborn noise programs
- Instrumentation design and development
- Automated test and simulation systems
- Signal acquisition and analysis
- Field test engineering

Acoustics and Structureborn Noise Programs

Full-Scale and Model-Scale Signature Acquisition and Analysis

ManTech is experienced in conducting trials for the Surface Ship Radiated Noise Measurement (SSRNM) program and providing support for Assessment & Investigation of Mine Susceptibility (AIMS) Program Trials. We support the U.S. Navy Submarine Acoustic Trials at the Navy's premier acoustic measurement facilities – SEAFAC (Ketchikan, AK) and STAFAC (Bahamas). These operations may be conducted in U.S. waters or in foreign locations. During the signature trials, ManTech provides systems installation and preparation, trial direction, acquisition system operations and data analysis. ManTech personnel also support scale model testing at the Naval Surface Warfare Center, Carderock Division's Acoustic Research Detachment (ARD). Direct support to the U.S. Navy surface fleet includes analysis of all Maintenance Requirement Card (MRC) / Planned Maintenance System (PMS) quarterly sonar self noise activities.



Environmental Acoustics

ManTech conducts active sonar marine mammal studies by performing propagation modeling to assess the impact of shipyard operated sonar. We support commercial construction projects by performing passive acoustic monitoring to aid in compliance with NMFS guidelines. ManTech has also participated in developing municipal code for addressing environmental acoustics and subsequent enforcement of the code.



Special Acoustics

ManTech conducts a number of oceanographic ship acoustic tests to measure radiated noise related to environmental and fishery issues and to verify noise reduction efforts. ManTech has also managed commercial ship testing for oil exploration and fish catch improvement applications.



Instrumentation Design and Development

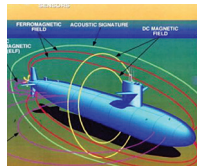
Submarine Own-Ship Noise Monitoring

ManTech has developed and provides on-going support for systems using the submarine's passive sensors such as hydrophones, hull and machinery mounted accelerometers to monitor the ship's acoustic and vibration signatures. These systems include functions such as radiated noise estimation, noise source localization, machinery health monitoring and transient noise detection.



Acoustic Trials Systems

Our systems development expertise includes in-water sensors and arrays, data acquisition and analysis systems to acquire and analyze signals. We also develop and operate tracking and ranging systems using acoustic, radar and GPS inputs.



Automated Test and Simulation Systems

Array Simulators

ManTech designed and fabricated numerous digital array simulators for over 25 years. Our most recent simulator system is the Advanced Dual Towed Array Simulator (ADTAS), capable of simulating two arrays simultaneously. Simulation signals include uncorrelated background noise and multiple coherent targets. Bearing and bearing rate, range and range rate, multi-path, spectral content, modulation and array shape changes can be controlled in the simulation. These simulators are used to support combat system performance assessment and acceptance testing.



Automated Test Equipment

ManTech developed the ATTENDS digital towed array test unit with software based on our MAPS II system. ATTENDS provides automated testing for TB-16, TB-23, TB-29/29A/29RL and TB-34 towed arrays in support of array test and groom at Navy Depot and IMA facilities.



Signal Acquisition and Analysis

Acoustic Processing Systems

ManTech developed the Multi-Channel Array Processing System II (MAPS II). MAPS II includes both electrical and optical interfaces to array telemetry interfaces and incorporates ManTech proprietary software with functions such as auto and cross spectral processing, wave number (k-w) processing, beamforming and transient detection. ManTech also developed the Navy's Littoral Towed Array Sonar (LTAS) test bed for competitive evaluation of the TB-34 towed array.



Mobile Acquisition Network Node (MANN) Box

ManTech designed and built a 16-channel data acquisition unit that interfaces to a computer running the NSWC MOMARS program. Data from the Mobile Acquisition Network Node (MANN) box is transferred across the Gigabit Ethernet MOMARS network with each channel having a unique IP address. This unique solution allows for the



“box” to physically reside at the shipboard interface and connect to the acquisition system located elsewhere using inexpensive CAT5 cabling (vice heavy and costly audio quality cable). MANN boxes can be “ganged” on the network to supply up to 254 channels.

Calibration

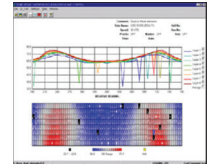
We support calibration of all submarine tactical and special purpose arrays. The MAPS II system generates calibration signals which are applied to an external projector and MAPS then acquires all array hydrophone channels simultaneously.



Field Test Engineering

Sonar System Engineering: Hull Mounted and Towed Configurations

ManTech developed tools such as Estimation and Prediction of Components (EPOC32) and Element Level Interface (ELI) that provide ManTech the capability to support Depot and IMA testing as well as at-sea performance evaluations.



Towed Systems

ManTech developed the CHINOOK system for towed array field tests at the Naval Surface Warfare Center, Carderock Division's (NSWCCD) Acoustic Research Detachment. ManTech is also involved in towed array fleet support and array certification.



SSRNM Acoustic Level Test System (SALTS)

ManTech designed a low cost, portable, forward deployable site test system using the Navy Standard Surface Ship Radiated Noise (SSRNM) data acquisition/measurement system and AN/SQQ-53F sonobuoys to measure the ships radiated noise. The system meets the ever increasing need for robust operational systems that offer quick installation and small footprints.



Monitoring Systems

Working alongside NSWCCD, ManTech designed and delivered the Monitoring Signal Data Converter (MSDC) replacement for Trident submarines. MSDC is a COTS-based unit that replaced the existing, obsolete equipment, integrating custom interfaces for existing ship's cables, and to the extent possible, matched existing connectors so that cable connector changes were minimized onboard.



LEARN MORE

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