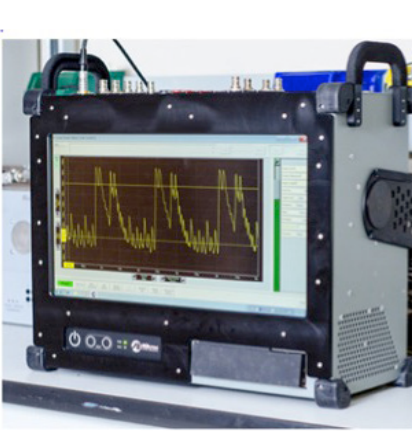# Navy SBIR/STTR Success
Adaptive Diagnostic Electronic Portable Testset (ADEPT)

A maintenance workstation for AEGIS SPY-1 radar, designed to maintain, diagnose, align, repair, and calibrate this complex electronic system while supporting remote predictive analytics and Condition Based Maintenance.

Mikros Systems, Inc.
Founded 1978
Ft. Washington, PA

TOPIC NUMBER:
N02-039

SBIR INVESTMENT:
$2,091,331

PHASE III FUNDING:
>$100M

THE TECHNOLOGY

ADEPT automates PMS procedures by integrating test equipment functionality and eliminating the need for paper Maintenance Requirement Cards (MRCs) for the checks that ADEPT covers. ADEPT eases the burden on system maintainers by automating the test process and configuring the embedded instrumentation for each test step. ADEPT provides instrumentation setup, calibration and data storage for after action analysis, off line training, and fault diagnosis.

THE CHALLENGE

Naval ship combat systems, particularly AEGIS, are a complex system-of-systems. Sailors maintain system readiness manually, using paper maintenance procedures and hand-held test equipment, a laborious and time-intensive process. As ship combat systems become more complex, combat systems maintainers face increasing problems with allocating the time and expertise required to meet these requirements in the traditional way. The Fleet has been looking for the best way to field a remote "one-stop shop" for combat systems maintenance that incorporates sailor training, diagnostics, alignment, and calibration functions.

THE NAVAL BENEFIT

ADEPT increases Fleet readiness by providing an automated testing process that improves the accuracy, precision, and speed of AEGIS preventative maintenance. ADEPT meets all requirements and standards for AEGIS test equipment, and in the future could be scaled to other classes of ships. The ADEPT Distance Support Sensor Suite (ADSSS) is being investigated for use in future Condition Based Maintenance programs.

THE TRANSITION

Working closely with Dahlgren, Crane, and Port Hueneme Naval Surface Warfare Centers, Mikros originally developed ADEPT as a maintenance workstation for the AEGIS SPY-1 radar system, then extended ADEPT to cover other radar variants and developed a logistics support suite for surface combatants. Mikros focused on an LCS maintenance application by adding the ADEPT Distance Support Sensor Suite (ADSSS).

THE FUTURE

ADEPT continues to expand its footprint into new radar and other systems, with a planned enhancement to provide remote support to the AEGIS Mk 99 Fire Control System, a collaboration with IBM that will provide big data analytics for combat systems CBM data. ADEPT will be installed in varied ship classes to help manage a broad inventory of Combat System Elements.

"Mikros ADEPT Support Sensor Suite -- a PEO IWS SBIR effort with PEO LCS and PEO Ships support, creates reasonable developing hopes/plans for the Naval AEGIS system, and varied platforms." Mike Bosworth, Science & Technology Director, PEO LCS

"Remote Condition Based Maintenance (CBM) is expected to provide significant benefits to the Navy. CBM will not only reduce travel time of subject matter experts to resolve system issues aboard ship, address storage of spares aboard ship, and optimize timing of replacement parts installations, but it will also raise confidence in availability of combat systems and their associated weapon systems." Douglas Marker, Senior Technical Advisor, NAVSEA PEO Integrated Warfare Systems