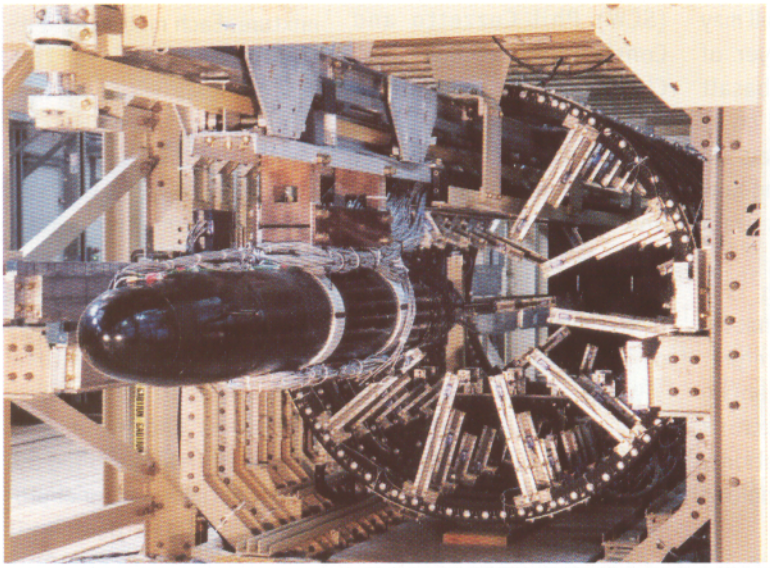



# Magnetic Fields Lab Opens

STORY BY LESLIE SPAULDING AND TOM WARRING
PHOTOGRAPHS BY PAM LAMA

Naval Surface Warfare Center Carderock Division (NSWCCD) dedicated a Magnetic Fields Laboratory on Oct. 7, 2002 at its main site in West Bethesda, Md. This facility replaces the Navy's previous magnetic silencing labs at the Naval Ordnance Laboratory White Oak in Silver Spring, Md., and Carderock Division's Annapolis Detachment, Annapolis.

The $7.6 million complex totals 39,000 square feet and houses unique facilities for measuring magnetic fields of scaled surface ship and submarine ferromagnetic models and full-scale shipboard equipment. The Navy uses such facilities reducing the susceptibility of ships and submarines to magnetic sea mines and magnetic detection systems. Accomplishing this demands comprehending the underlying physics and testing with physical models. The payoff for the Navy is affordable, effective systems with minimized costs associated with full-scale testing.

The complex incorporates an Electromagnetic Signature Facility, Deperming and Assembly Laboratory, Background Sensor Laboratory, and Magnetic Fields Laboratory. The latter is unique, a facility simulating ambient magnetic conditions a ship will encounter anywhere on Earth — the only U.S. laboratory allowing accurate measurement of magnetic fields underneath of full-size operating equipment and magnetic scale physical models.

The Magnetic Silencing Complex provides 21st Century laboratories and offices for the magnetic silencing groups consolidated from other closed facilities. Combining and rebuilding those assets generate a coupling of resources and talent that create a powerful nexus in sensor technology, design, development and testing of signature control system for Navy submarines and ships. The Signatures Directorate, under the leadership of Gary Jebsen, operates this Navy Center of Excellence, ensuring Navy vessels maintain a significant advantage over adversaries.

Magnetic silencing first became important during World War II, when the Allies discovered that Hitler's Navy posed an increased mine threat. The Earth's magnetic field corresponds roughly to that of a very large magnet near its center, orientated north-south. Its magnitude at the Earth's surface is roughly half a gauss or 0.4 ampere turns per centimeter. Any mass of iron stressed in the Earth's magnetic field becomes a magnet.

A ship during construction accumulates a sizable magnetization, which then changes gradually, depending on its heading and location, when the ship is under way. Before WWII the Germans had developed sensors capable of detecting a ship's field and detonating a charge close enough to the hull to cause major damage. This development prompted the U.S. and the U.K. to develop countermeasures for mines triggered by magnetic fields — and a new field of technology openeed.

# GY GETS TWO NEW HOMES

## Acoustic Test & Analysis Center Debuts

STORY BY TOM WARRING
PHOTOGRAPHS BY PAM LAMA

The Navy's Acoustic Research Detachment (ARD) conducted a ribbon cutting August 13, 2002 for the 26,000-sq ft Acoustic Test and Analysis Center (ATAC).

Capt. Steven W. Petri, USN, Commander, Carderock Division, parent organization of ARD, welcomed Idaho Senator Larry Craig as the special guest speaker.

The senator remarked that the facility enhances the Navy's capabilities in designing submarines.

"It means that we're constantly investing in modern equipment to build the very best submarine in the world." Senator Craig said.

The $7.7-million ATAC project was designed and built by WPC, Inc., of Gig Harbor, Wash., under the direction of the NAVFAC Engineering Field Activity Northwest. ATAC is the centerpiece of a major construction plan, consolidating ARD offices, computer laboratories and industrial facilities into a single, modern facility.

The project represents the culmination of the ARD's Facility Master Plan, which is transforming ARD from a collection of converted World War II-vintage boat repair shops and 1970-era buildings into a state-of-the-art test facility.

The new ATAC structure is a multifunction building, consolidating 80 percent of the primarily civilian government employee workforce. It houses the capability for analysis of acoustic data from large-scale model lake tests.

ATAC boasts an approximately 9,000 square-foot secure laboratory for analysis of model data, with fabrication shops for metal, fiberglass, wood and repair of boats, motors and equipment, plus offices and conference rooms for resident and visiting engineers and analysts, engineers and the detachment managers. Two rooms allow video teleconferences.

The sophisticated ARD employs state-of-the-art facilities to test technological innovations improving submarine signature as well as certain hydrodynamic characteristics.

ARD is often the last stop in the research process prior to full-scale acquisition decisions.

The ARD is located on the site of the former Farragut Naval Training Center. On October 31, 1946, the Secretary of the Navy established a shore installation at Bayview called the David W. Taylor Model Basin Field Station.

Today the Model Basin is known as the Carderock Division, Naval Surface Warfare Center, Naval Sea Systems Command.

The earliest experiments at ARD evaluated acoustic countermeasures. Up to 1965, the Navy conducted a variety of acoustic experiments, including surface ship sonar calibration, acoustic and radar countermeasures evaluation, towed array tests and acoustic measurement on small, freely rising buoyant shapes.

ARD operates under the cognizance of the Carderock Division's Signatures Directorate, with the mission of ensuring the U.S. Navy maintains a powerful advantage in a dangerous world.