

NAVAIR DNet supports MIDS integration

OPPORTUNITY TO STUDY NCW CONCEPTS



WSIC—Reconnaissance aircraft “flew” in the F-14 Weapons System Integration Center at Point Mugu.



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Launch of the NAVAIR Defense Network (DNet) in November 2000 marked the advent of a new and revolutionary tool. DOD weapon developers, tacticians, and network centric warfare strategists were suddenly freed from the constraints of single-site testing and instead could “mix and match” the capabilities of nine laboratories, facilities, and ranges located on the East and West Coasts. The DNet environment embraces huge open-air ranges, specialized laboratories and facilities, and live and virtual assets ranging from actual ships and aircraft to complex missile flyout simulations.

Supporting a Developmental System

An important step in DNet’s evolution occurred in June 2001 when a major Navy program carried out several hours of operations on DNet. The Multifunctional Information Distribution System (MIDS) was tested on DNet as part of the MIDS/F/A-18 integration effort.

This exercise involved all nine DNet facilities: China Lake’s F/A-18 Advanced Weapons Lab (AWL), IBAR, and Land Range; Point Mugu’s F-14 Weapon System Integration Center (WSIC) and Sea Range; and Patuxent River’s Air Combat Environment T&E Facility (ACETEF), E-2C Systems T&E Lab (ESTEL), P-3 Program Hardware Integration Center, and Atlantic Test Ranges.

MIDS is an advanced Link-16 command, control, communications, and intelligence (C3I) system, incorporating high capacity, jam resistant, digital communication links to exchange tactical data among ships, aircraft, and ground elements. It will provide a quantum leap in situational awareness for the F/A-18 and other U.S. and ally aircraft.

One Scenario, Three Operations

The MIDS scenario pitted a Blue Force (friendly) against a Red Force. The time frame was Day 20 of an extended engagement. All Red air defenses had been destroyed, but there were still some Red air forces operational.

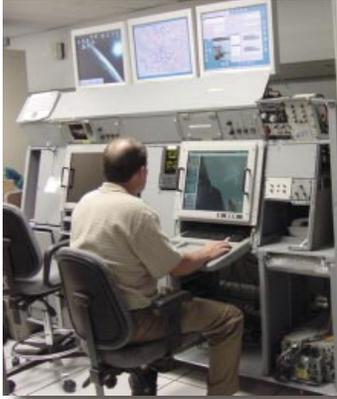
A Blue Force P-3C and an E-2C were orbiting in the battlespace. Two pairs of F/A-18C/Ds—a barrier combat air patrol and a strike flight—and an F-14 were also in orbit awaiting orders. An Aegis cruiser was located off shore.

Red Force had fielded two MiG-29s and two Su-27 interceptors, which awaited engagement assignments from their commanders. To complicate matters, three civilian commercial aircraft (represented by live aircraft on the Land Range, Sea Range, and Atlantic Test Range) were crossing the northern edge of the battlespace.

The first operation thoroughly tested Link-16 messaging capabilities among all friendly parties. Traffic included surveillance checks, fighter-to-fighter checks, and air-intercept control. The purpose was for the MIDS to exercise as many types of Link-16 messages as possible.

The second operation began when the F/A-18 strike flight proceeding toward the enemy command post was challenged by the MiGs. The F/A-18 air patrol left orbit to counter the MiGs and defend the strike flight with a Sidewinder missile.

In the third operation, the F-14 reconnoitered the enemy command post and transmitted coordinates via Link-16 to the E-2C and Aegis and, by relay from the Aegis, to the orbiting P-3C. The F-14 also sent a target image to the P-3C. The command-and-control authority on the Aegis issued an attack order to the P-3C, which left orbit, proceeded to the designated waypoint, and launched a SLAM-ER. The F-14 then overflew the target for battle damage assessment.



ESTEL—The Blue Force E-2C was “flown” from the E-2C Systems T&E Lab at Patuxent River.

Players Span 3,000 Miles

In the virtual DNet environment, the action took place within a 150-mile radius. But in fact, the players spanned 3,000 miles. The bandits were part of the Joint Interim Mission Model at Patuxent River’s ACETEF, the F-14 was flown by a pilot in the hardware-in-the-loop simulator at Point Mugu’s WSIC, and the Sidewinder and SLAM-ER flew in digital simulation at China Lake’s IBAR.

“It would have taken me 3 years and a battle group to get the data I got in 2 hours of test time today,” said Frank Achille, who works for the MIDS Program Office. “I wish this capability had existed 3 years ago.”

Repeatability, Repeatability, Repeatability. . .

One of the most valuable features of DNet is the ability to run the same scenario repeatedly with tightly controlled parameter changes. For example, a strike mission with multiple ships, aircraft, and ground combatants can be rerun several times; on each mission, the strike aircraft can release their weapons at different altitudes or at different launch ranges.

The outcome of such repetitive, realistic testing provides enormous amounts of data that would be prohibitively expensive to acquire solely through live-asset testing.

But enough live elements can be inserted into the simulation—such as real weapon hardware in the IBAR, an actual pilot in the AWL’s flight simulator, and tactical communications and navigational equipment—to create high operational fidelity and produce realistic and reliable data.

Implications for Network Centric Warfare

The backbone of network centric warfare is a comprehensive secure network across which critical data moves at lightning speeds. This network is replicated on DNet. Unlike live combat operations, however, or even Fleet Battle Experiments, DNet affords the opportunity to study network centric warfare concepts under controlled conditions.

Built with the bigger picture in mind, DNet is complementary to the NAVSEA Distributed Engineering Plant (DEP), a high-fidelity distributed shore-based battle group with all the attributes of an at-sea battle group.

While the DEP has both a surface-warfare and an operational focus, DNet’s focus is RDT&E. Systems tested and refined in DNet could move into the DEP environment as they become operational.

VADM Joe Dyer, in a congratulatory message to Eileen Shibley, the DNet Program Manager, summed up the significance of the recent MIDS exercise. “Thank you and the great folks all over NAVAIR who bring this tool to our Navy. The ability to develop and test the equipment necessary to deliver network centric warfare in a controlled and operationally representative environment is an important step forward.”

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