

NATIONAL IMAGERY AND MAPPING AGENCY

EDGE

GUARANTEERING THE INFORMATION EDGE
AUGUST 1999



*NIMA Receives
Joint Meritorious
Unit Award*

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On The Cover

On July 30, Deputy Secretary of Defense John J. Hamre presented NIMA with its first Joint Meritorious Unit Award for imagery, imagery intelligence and geospatial information support from Oct. 1, 1996 to July 25, 1999. The award comes with a battle streamer, pictured above the NIMA flag. It also comes with a ribbon for the military and a decorative pin for civilian attire. See story, page 4. *(Photo by Rob Cox)*

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Director • Lt. Gen. James C. King
Office of Congressional and Public Liaison

Director • Laura B. Snow

Deputy Director • Terence S. Meehan

Chief, Public Liaison • Eric Berryman

Editor: John Iler

Assistant Editor: Muriidith Winder

Staff Writers: Don Kusturin, Jennifer Lafley, Sharon Alexander

Designer: Linda Miller

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Correspondence should be addressed to:

The Edge, Public Liaison Office, 4600 Sangamore Road, Mail Stop D-39, Bethesda, MD 20816-5003

Telephone: (301)227-3105, DSN 287-3105. or in St. Louis: (314) 263-4142 or DSN 693-4142, or e-mail to The Edge.

COMMAND POST

As we approach the third anniversary of NIMA's creation, you, the people who make up this great agency, already are creating an enviable heritage. Just last month—on July 30—Deputy Secretary of Defense John J. Hamre presented to NIMA the highest honor the Department of Defense can bestow upon an organization, the Joint Meritorious Unit Award.

As I watched Dr. Hamre attach the battle streamer on our flag, I thought what a great day it is to be assigned to NIMA and to be able to participate in this well-deserved reward! It was your faith, hard work, enthusiasm and moral and strategic vision that earned the award.

It's great to be recognized for a job well done. NIMA is making a significant place in the history of our nation. But, remember where much is given, much is expected. I challenge you to receive this and future recognitions with pride, but the battle is never over. You have large shoes to fill now—your own.

Again, a well deserved thanks to each of you who contributed to make this happen. Our nation is fortunate to have you "GUARANTEEING THE INFORMATION EDGE."



James C. King
James C. King
Lieutenant General, USA

NIMA Receives Joint Meritorious Unit Award

by Sharon Alexander

Deputy Secretary of Defense John J. Hamre presented a Joint Meritorious Unit Award to the National Imagery and Mapping Agency for imagery, imagery intelligence and geospatial information support from Oct. 1, 1996, to July 25, 1999.

The award, one of the highest given by the Department of Defense and the first received by NIMA, was presented during a ceremony held on the ellipse in front of Bethesda's Erskine Hall on July 30. In front of assembled employees and agency top management, Hamre pinned a battle streamer on the NIMA flag.

"If anybody deserves the Joint Meritorious Unit Award, it's NIMA!" he said. "I don't know of an organization that has worked harder and done better in the last three years than NIMA." He added that's why Secretary of Defense William S.

Cohen wanted to give NIMA the award.

The citation accompanying the award stated that NIMA, "while establishing itself as the Nation's newest Department of Defense Combat Support Agency and a key member of the Intelligence Community, provided world-class imagery, imagery intelligence and geospatial information support to the combatant commanders and the National Command Authority to achieve United States National Security Objectives."

Specifically, the award recognized the agency's support to military forces conducting operations in Bosnia, Iraq, Afghanistan, Sudan, Kosovo and Serbia, all while maintaining a global intelligence watch.

"NIMA is at the very core of our ability to fight the kind of wars we have to fight today," Hamre said. During the Kosovo crisis, he said, he repeatedly witnessed NIMA exercising the "great precision, enormous sophistication and tremendous care" needed "to get the right target."

NIMA Director Lt. Gen. James C. King accepted the award on behalf of NIMA and heartily congratulated the employees. "You've earned it," he said. "You deserve it. You have done the things that our nation has asked you to do to be able to achieve the excellence and reputation for success that you have established."

The Joint Meritorious Unit Award comes with a ribbon that can be worn on the military uniform or metal pin to wear with civilian attire. Both King and Hamre encouraged NIMA employees to wear the award with pride. Hamre told employees to tell anyone who asks the meaning of the award to say, "I'm the one who makes it possible for our forces to fight and win wars."

"I hope you wear the badge with pride," Hamre said, "because you've earned it." ❖



Deputy Secretary of Defense John J. Hamre (left) clips the Joint Meritorious Unit Award streamer onto the NIMA flag. Looking on are (l-r): NIMA Deputy Director Leo Hazlewood; Lt. Gen. James C. King; Senior Civilian Official Arthur L. Money, Office of the Assistant Secretary of Defense (Command, Control, Communications and Intelligence); Charles Allen, Assistant Director of Central Intelligence for Collection; Roberta Lenczowski, Deputy Director for Operations; William Alder, Deputy Director for Systems and Technology; and Marcus J. Boyle, Acting Director for Corporate Affairs.

(Photo by R. Cox)

The Joint Meritorious Unit Award And the Battle Streamer's History

by Sharon Alexander

The Joint Meritorious Unit Award (JMUA) is an honor bestowed by the Department of Defense upon organizations for outstanding achievement performed during periods of war, international tension, national emergencies or extraordinary situations that involve the national interest.

Until 1982, the accomplishments of joint activities such as NIMA could only be recognized with unit awards granted by the military services. The components of the award include a ribbon for military personnel, lapel pin for civilian personnel and battle streamer for display on the organizational flag.

History of Battle Streamers

Beginning with the Civil War battle of Wilson Creek, Mo., the names of battles were inscribed on the organizational flag of Union troops to recognize the extraordinary service of soldiers from Iowa, Kansas and Missouri. These troops fought a Confederate force that was five times larger, and in so doing secured a moral victory for the Union. On Aug. 25, 1861, Maj. Gen. John C. Fremont, commanding the Western Department, ordered the word "Springfield" to be emblazoned on the flags of the units involved in the fighting.

On Feb. 22, 1862, the War Department prescribed that all regiments and batteries should have inscribed on their flags the names of the battles in which they had participated meritoriously.

The use of the inscribed battle honors upon the national and regimental flags was discontin-

ued on Feb. 7, 1890, when engraved silver rings (now called silver bands) were authorized. This practice continued until 1918, when silver was in short supply and the War Department authorized Gen. John J. Pershing (Commanding General of the American Expeditionary Forces (AEF)) to procure ribbon as a substitute.

On the ribbon stripes were inscribed the names of special battles and major operations that flag-bearing units of the AEF had been engaged in during World War I. These ribbons became the forerunners of our present day campaign streamers.

Hand-embroidered silk streamers were introduced on June 3, 1920. The original directive stated that the organization would receive a silk streamer for each campaign within a given theater of operations in which the organization participated. The streamer displayed the colors of the theater of war. The name of the battle or campaign was embroidered on the ribbon.

Unit Award Streamers

Unit award streamers were also first organized in 1920, when the War Department authorized a blue silk streamer with the name of the action embroidered on it. The streamer was adopted to reflect organizations "Mentioned in Orders" by the War Department for meritorious service in action.

Unit award streamers indicate the unit or organization has been awarded a unit decoration. The inscription is normally a location or a date. NIMA's streamer is inscribed "NIMA 1996-1999." ❖

DCI, Deputy Secretary Clear NIMA Map in Chinese Embassy Bombing

House Hearing Cites Other Factors as Causes of Accident

by Laura Snow
Director, CP

In an open hearing on July 22, Director of Central Intelligence (DCI) George J. Tenet and Deputy Secretary of Defense John J. Hamre refuted press accounts that a NIMA map was the cause of the inadvertent bombing of the Chinese embassy in Belgrade, Yugoslavia. Both the DCI and Deputy Secretary cited a chain of events in the target development and approval process as the cause of the accidental bombing.

The hearing by the House Permanent Select Committee on Intelligence was the first time the facts on the May 7 incident have been placed in the public record, ending two months of press speculation. Hamre said, "There has been an awful lot of criticism...in newspaper articles and editorials...that NIMA was the cause of this failure. That's not the case." Added Hamre, "I think people who say that either don't know the facts here or they have a different agenda, frankly."

Tenet further downplayed the role of the NIMA map in the mistaken embassy attack. "Too much public emphasis has been given to

the fact that the 1997 U.S. government map did not reflect that the Chinese embassy had been moved," he told the Committee. "This criticism overstates the importance of the map itself in the analytical process." In fact, Tenet said, "Maps of urban areas will be out of date the day after they are published. What is critical is having accurate databases."

Three Failures Blamed

Tenet cited three basic failures as causing the bombing. The techniques used by an intelligence officer to locate the intended target were severely flawed, he said. None of the databases used to validate targets contained the correct location of the Chinese embassy, and nowhere in the target review process was either of the first two errors detected. In short, the mistake happened because a number of systems and procedures used to identify and verify possible targets did not work.

Flawed Target Locating Methods

The first major error occurred when an intelligence officer used inappropriate methods to locate the planned target, the Yugoslav Federal

Directorate of Supply and Procurement (FDSP). The officer consulted three maps, including two local commercial maps and one produced by NIMA. None had any reference to the FDSP. Working from a street address, the officer used military land navigation techniques called "intersection and resection" to determine FDSP's approximate location. He mistakenly identified a building on a map as the directorate, which now is known to be the Chinese embassy. The actual location of the target was 300 meters away.

The officer's geo-locating methods went unquestioned through the target approval process. "Had we known that the method used was not one that is reliable for...precise targeting in urban areas," testified Hamre, "we would not have executed the target."

Inaccurate Databases

The second failure occurred because no military or intelligence database used to screen targets contained the current location of the Chinese embassy in Belgrade. When the incorrect FDSP location was fed into the databases, they failed to indicate that any facilities considered off-limits to targeting were nearby. These include embassies, schools,

hospitals, cultural landmarks and religious sites. Imagery also offered no clue that the target was an embassy. "No flags," said Tenet, "no seals and no clear markings" were observed.

"Despite the fact that U.S. officials had visited the embassy on a number of occasions in recent years," he explained, "the new location was never entered into intelligence or military targeting databases. If the databases had accurately located the Chinese embassy, the misidentification of the FDSP building would have been recognized and corrected."

Why wasn't the Chinese embassy correctly located in the databases? Tenet candidly assessed the difficulties. "It is impossible," he said, "to keep current databases for cities around the globe. The databases are constructed to catalogue targets, not non-targets." Diplomatic facilities were generally given little focus because they are not targets, he added.

The DCI described a larger problem as one of competing priorities for limited intelligence resources. "Database production is often the first activity curtailed when resources are tight," he said.

Target Approval Process Errors

The third failure was that reviewing elements at the European Command and the Joint Staff failed to detect either the incorrect location of

the FDSP or the correct location of the Chinese embassy. This resulted from both database shortcomings and procedural errors. Database reviews were limited to validating target coordinates with the incomplete information in the database—a circular process that never uncovered the original data errors and omissions. Experts with on-the-ground experience in Kosovo were never consulted because the target area was not considered densely populated.

Corrective Actions

One likely recommendation to come from DoD's After Action Assessment of military operations in Kosovo will be to strengthen the target development and approval process. Hamre emphasized, "We have to have a process when we submit a target folder. That folder has to indicate the method that was used for geolocating the target, and the confidence that the analysts have in the location of the target when it deals with inherently uncertain targets."

Another likely recommendation will focus on enhancing database accuracy. "I find it embarrassing that we didn't have in our databases the precise location of the Chinese embassy," said Hamre, "and that did contribute to this failure where we didn't catch the mistake and possibly could have."

DCI Tenet announced that a series of near-term corrective actions was underway, even as

his in-depth review of the incident continued. Among the fixes:

The Defense Intelligence Agency and NIMA have established rapid response procedures for critical database updates. The Intelligence Community is strengthening internal mechanisms and procedures for selecting and validating targets and increasing priority on database maintenance. Agencies also will report whenever foreign embassies are built or moved, and databases will be updated accordingly.

In future conflicts, other governments will be contacted to help identify and locate their facilities.

What About NIMA's Maps?

"NIMA produced over 12 million maps for our operation," Hamre said. "They did a splendid job helping us fight this air operation in Kosovo. In this instance a map was used—it wasn't designed for the purpose that it was used, when it was used to develop the target, and an inappropriate technique was used on that map. And the checks and balances in the system that hopefully could have caught this error were not NIMA's responsibility."

In conclusion, Hamre said, "We have great confidence in Lt. Gen. Jim King and all of the folks out at NIMA, who have done a terrific job helping us in this operation and in every other operation the department had since it was formed." ❖

Commission Absolves NIMA in Italian Gondola Tragedy

by Don Kusturin

The Italian and U.S. governments, through a bilateral commission, have absolved the National Imagery and Mapping Agency of responsibility in the gondola accident near Cavalese, Italy.

In the "Report of the Tricarico-Prueher Bilateral commission," dated April 13, 1999, the Commission concluded, as did the U.S. Marine Corps' Command Investigation Board on March 11, 1998, that the accident was caused by aircrew error, and that supervisory error occurred within the aircrew's chain of command.

The focus of the commission was the events of Feb. 3, 1998, when a Marine Corps jet flying a low-level training mission from Aviano Air Base, Italy, hit and severed two cables supporting a ski gondola near Cavalese. The gondola fell more than 300 feet to the ground, resulting in the deaths of 20 civilians.

Although one of the aviators of the EA-6B Prowler argued in a military court that NIMA was at fault because its Tactical Pilotage Chart (TPC) did not show the cable, the commission pointed out that the chart "was prepared to [U.S. and NATO] product specifications and pursuant to internationally accepted standards."

Additionally, the TPC and accompanying Flight Information Publication (FLIP) showed the area around the Cavalese cableway as a "special use" airspace with a minimum altitude specified as "1,000 feet above ground level," since raised to 2,000 feet. The gondola cable was struck at 370 feet.

Warnings on the Chart

The commission, as well as the earlier Marine investigation board, found that the aviators had all the information they needed to have avoided the accident. They cited two warnings found on

the chart. The first was, "All vertical obstructions 200 feet above ground level and higher cannot be portrayed due to the chart scale and feature density." The other: "Vertical obstructions, including power lines, have been extracted from the most reliable sources available; however, there is no assurance that all are shown or that their locations or heights are correct." The commission also noted that obstructions were displayed for use as "visual aids," not "hazard avoidance."

...the Commission concluded, as did the U.S. Marine Corps' Command Investigation Board...that the accident was caused by aircrew error, and that supervisory error occurred within the aircrew's chain of command.

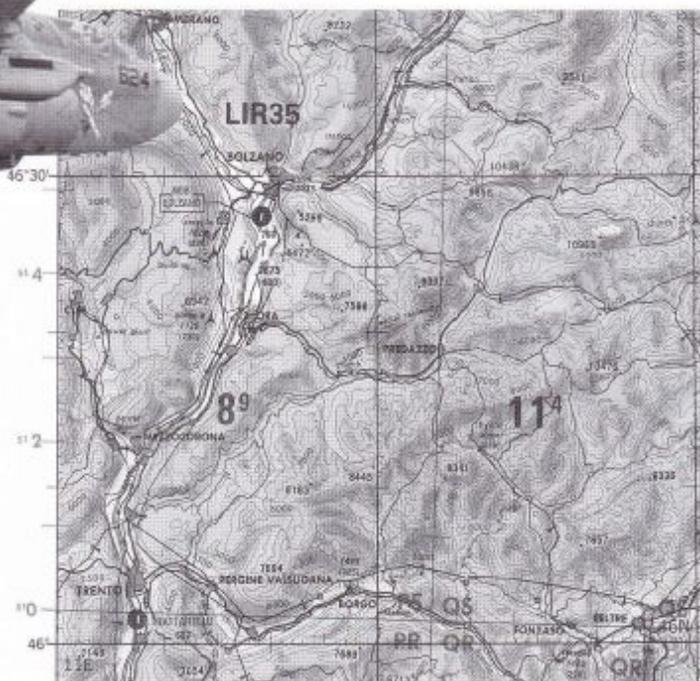
Neither the obstruction data NIMA obtained from the Italian Low Flying Manual, nor the Italian chart portraying the cableway, it added, showed the towers in positions that would indicate that the cable spanned the valley. "Having no source information which indicated that a cable spanned the valley at the mishap location, NIMA cartographers made no depiction on the TPC."

"The cable itself would have been characterized as a horizontal, not a vertical, obstruction, specifically a cableway," the report stated. "NATO cartography standards do not address cableways, but U.S. standards direct their inclusion when they span valleys."

The cableway has been rebuilt since the time of the accident, and still does not meet the minimum criteria to be included on the TPC or FLIP.



On Feb. 3, 1998, a Marine Corps Prowler EA-6B like the one above cut through the cable of a ski gondola while on low-flying exercises in the Italian Alps. One pilot blamed NIMA's Tactical Pilotage Chart (TPC) (right) for not depicting the cableway; however, a bilateral Italian/U.S. commission cited two warnings found on the TPC (below right). The commission also noted that obstructions were displayed for use as "visual aids," not "hazard avoidance."



Changes Resulting From the Accident

Immediately following the accident, changes were made to improve flight safety in the area. New measures were introduced, including minimum-altitude restrictions, radio contact with Italian air traffic controllers, briefings from Italian air traffic control and the use of Italian charts for flight planning.

Some of the recommendations made by the commission include:

- establishing new procedures for U.S. low-level flight training;
- appointing a U.S. commander at each Italian air base as the designated U.S. authority responsible for monitoring and enforcing U.S. and Italian safety of flight regulations;
- assigning U.S. and Italian liaisons, or exchange officers, to selected units to facilitate communications;
- appointing U.S. flight safety representatives to work with the Italians;

All vertical obstructions 200 feet AGL and higher cannot be portrayed due to chart scale and feature density. In general, the highest obstruction in each 1 minute by 1 minute matrix (originating at full degree intersection) is shown; however, in areas of dense culture, this pattern is further reduced to enhance clarity.

CAUTION

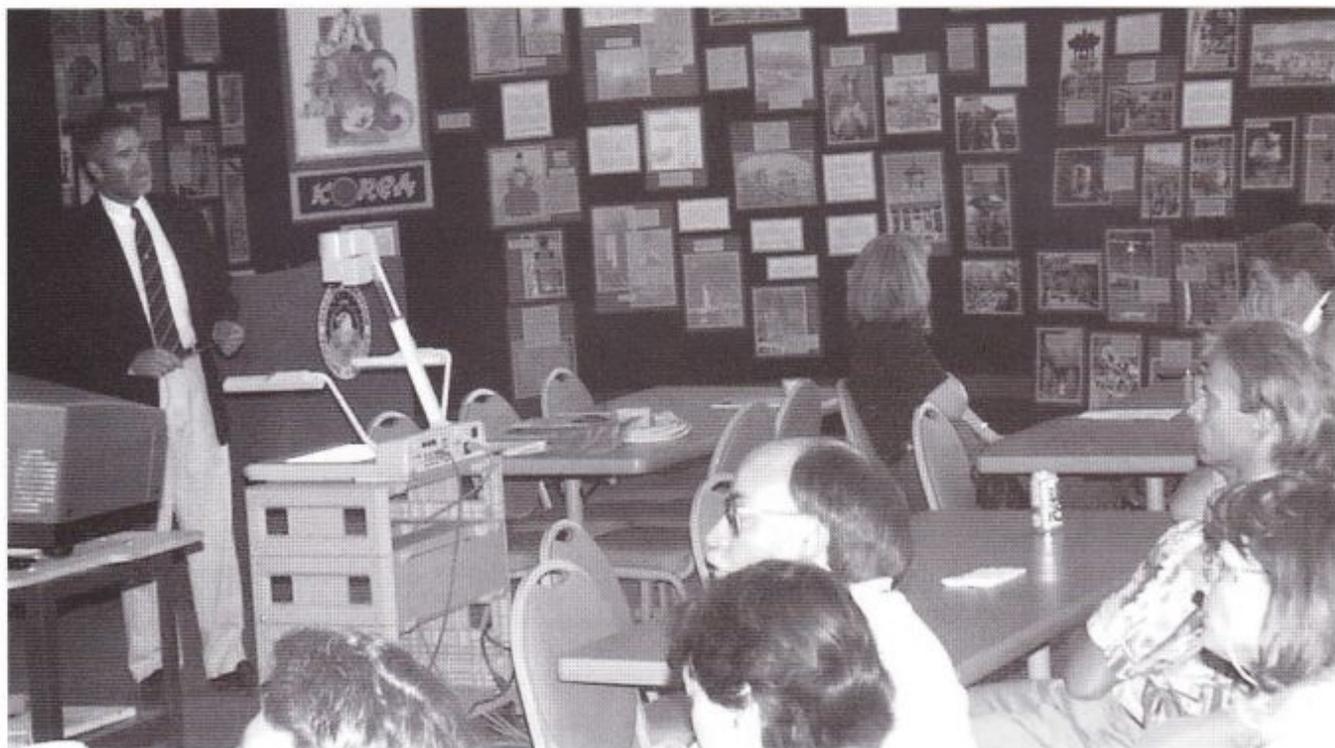
Vertical Obstructions, including powerlines, have been extracted from the most reliable sources available; however, there is no assurance that all are shown or that their locations or heights are exact.

- developing a web-based flight information file;
- reviewing and institutionalizing new implemented procedures.

The commission was formed as part of an agreement between President Bill Clinton and Italian Prime Minister Massimo D'Alema. U.S. Navy Adm. Joseph W. Prueher and Italian Air Force Lt. Gen. S. A. Leonardo Tricarico were appointed to head the bilateral commission to conduct a review of operational and safety measures in the area to determine whether additional measures are warranted. ❖

Jet Propulsion Lab Scientist Visits NIMA

by Don Kusturin



(Photo by Don Kusturin)

Tom Farr addresses a NIMA audience in St. Louis.

Tom Farr, the Jet Propulsion Laboratory's (JPL's) deputy project scientist for the Shuttle Radar Topography Mission (SRTM), recently visited NIMA St. Louis for a tour and chat with employees.

SRTM is a joint endeavor between NIMA and the National Aeronautics and Space Administration (NASA) to collect elevation data over more than 80 percent of the earth's landmass. NIMA will use the data collected to con-

struct Digital Terrain Elevation Data (Level 2), thus enhancing the information available to NIMA's customers.

Farr, a geologist by training, has the primary role as NASA's civilian point of contact to ensure the data meet the needs of scientific and commercial interests. He has been in radar science at JPL for more than 23 years, specializing in geologic remote sensing. His research interests center on understanding the weathering and modification of geologic surfaces and

how those processes affect remotely sensed and digital topographic data.

Farr explained how SRTM will make use of a technique called radar interferometry, where two radar images are taken simultaneously from a fixed distance apart. Differences between these images allow for the calculation of surface elevation.

This is where the shuttle will make use of a 60-meter mast. The shuttle houses the mast in a canister in the payload bay

along with the main radar antenna. The mast has a second antenna attached to its end. While in the canister, the mast is collapsed to only 3 meters. As it deploys, it unwinds to 60 meters, or about 200 feet, making it the largest rigid structure ever flown in space.

For SRTM, the main antenna located in the payload bay of the space shuttle will illuminate a portion of the surface of the earth. But instead of using light rays, a beam of radar waves is transmitted.

When the radar waves hit the surface of the earth, rays are scattered in various directions. These scattered waves will be collected by the two SRTM antennas, giving two perspectives of each feature the shuttle passes over and supplying more accurate information than from a single antenna.

"The fact that it supplies its own illumination at a long wavelength makes SRTM independent of solar illumination and immune to cloud cover," said Farr.

When the two interferometric radar data sets are combined, the first product made is called an "interferogram," or "fringe map." It looks similar to the bands of color seen when light is reflected on a film of oil. Each of these colors represents a different height. Once this is tied to baseline and navigation information, an accurate elevation can be determined.

While this is the first spaceborne use of dual-antenna radar interferometry, the

Joint NIMA/NASA Space Shuttle Mission Postponed

The Shuttle Radar Topography Mission (SRTM), scheduled for Sept. 16, has been postponed until at least Oct. 7 because of potential technical problems similar to those that threatened NASA's July launch.

Technicians will inspect the cabling running behind the walls of the cargo bay that will house the SRTM payload, which is capable of mapping most of the Earth's surface. A short circuit shut off two of Columbia's main engine computers moments after liftoff on July 27. Had another computer failure occurred, NASA officials say, an engine shutdown would have resulted.

NASA officials say the wire insulation may have been damaged when a technician stepped on it during preflight preparations. According to NASA spokesman Lisa Malone, postponing the mission was the "prudent" thing to do.

technique has been used with antennas attached to aircraft.

Farr said he was excited about the possible scientific uses of the SRTM data. Information like this can be used to study flooding, erosion, landslide hazards, earthquakes, ecological zones, weather forecasting and climate change. Other possible uses include finding optimal locations for cellular antenna sites and improving topographic maps for backpackers, firefighters and geologists.

This information also can be tailored to assist NIMA's customers in achieving national security objectives. Military applications benefit-

ting from the SRTM data will include flight simulator systems, logistical planning, missiles and weapons guidance systems, and battlefield management tactics. Civilian benefits will include enhanced ground proximity warning systems for aircraft, civil engineering, land-use planning and line-of-site determination for communications. There also will be a host of scientific benefits to the fields of ecology, hydrology, climatology and even archaeology.

More information on SRTM can be found at the JPL SRTM web site: <http://www.radar.jpl.nasa.gov/srtm/>, and at NIMA's website at <http://www.nima.mil>. ❖

Doug Smith Retires

by John Iler



Well-wishers surround Doug Smith, former deputy director for Corporate Affairs, during his retirement ceremony.

W. Douglas Smith, NIMA deputy director for Corporate Affairs (CA), retired July 2 after 30 years of government service.

Born in Mt. Vernon, Ill., he began his career at the National Military Command System Support Center of the Defense Communications Agency in 1969. In 1981, he became its chief financial officer and in 1986 joined the Defense Mapping Agency (DMA) as deputy comptroller. In 1994, Smith was named comptroller and, the following year, became deputy director of DMA. He was the last deputy director before the formation of NIMA.

As DMA deputy director, Smith established joint military mapping exercises in collaboration with the Army and National Reconnaissance Office, directed implementation of DMA reinvention concepts and obtained Department of Defense approval for the Shuttle Radar Topography Mission (SRTM), which will collect 3D elevation data from much of the earth's surface using a 200-foot radar antenna extending from the payload area (see story, page 10).

In October 1996, he became deputy director of NIMA's Corporate Affairs Directorate.

"It's been my considered privilege to serve the nation for 30 years," he said at his retirement ceremony, held July 2 at Bethesda's Erskine Hall. "Thirty years doesn't seem like very long, really, but a lot has happened." He cited the end of the Vietnam conflict, the U.S. victory in the Cold War, the Persian Gulf War and the conflict

in Kosovo. "I was a part of each one of those things." He added, smiling, "I'm a very modest person, actually, but I'm here to claim credit for a portion of that."

Smith praised NIMA's Y2K management program as "the best in the community" and pointed out that the agency has won an enviable number of Hammer Awards and Meritorious Unit Citations.

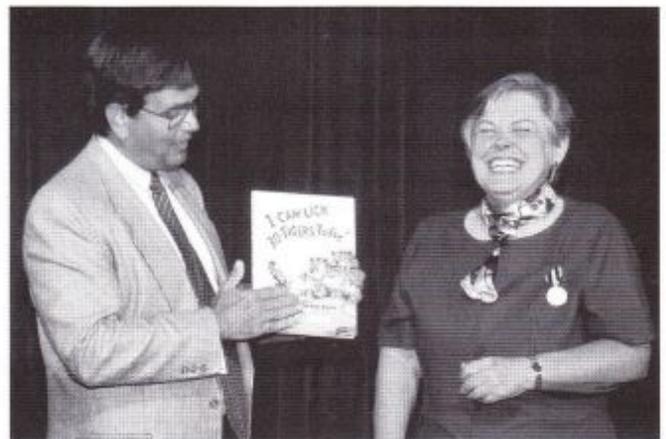
"We're way out in front," he said. "Way out front in Human Resources, with *WORKFORCE21* and the use of new contract authorities that have been made available to all of the federal government."

In conclusion, he quoted from "A Nation's Strength," by Ralph Waldo Emerson: "*Not gold, but only people can make a nation great and strong. People who stand for truth and honor's sake and stand fast and suffer long. Brave people, who work while others sleep, who dare while others fly. They build a nation's pillars deep, and lift them to the sky.*"

"I see a lot of NIMA in this," he said. We've worked hard. We've suffered some. We've come through a lot. ...Thanks for letting me carry the torch a little way!" ❖

Dr. Annette Krygiel Retires

by Wells Huff



Dr. William R. Alder, director of ST, presents Krygiel with a book he thinks is representative of her career.

Dr. Annette J. Krygiel, whose distinguished career with NIMA and its predecessors spans more than 40 years, retired July 30.

A native of St. Louis, Mo., Krygiel completed her undergraduate work in mathematics at St. Louis University and her doctorate in computer science at Washington University, St. Louis, where her research was directed at modeling techniques for parallel computing architectures.

Krygiel began her government career in August 1958 at the (then) Aeronautical Chart and Information Center, later reorganized into the Defense Mapping Agency (DMA). She held many assignments, including management of geodetic and gravimetric programs, as well as management of research and development of computer science and telecommunications programs.

As a senior executive she was responsible for establishing DMA's Office of Telecommunications Services, where she was instrumental in designing the agency's infrastructure for telecommunications. For her contributions, she was

awarded the Distinguished Civilian Service Award by the Secretary of Defense. The Senior Executives Association also recognized her with the Executive Excellence Award for executive achievement.

Krygiel rejoined DMA's Special Program Office to manage the test, integration and delivery phases of the Digital Production System (DPS). She received a Presidential Rank Award for her work in DPS.

Krygiel subsequently served as DMA's chief scientist until her appointment by the Secretary of Defense as the Director, Central Imagery Office (CIO), a DoD combat support agency. She served as director for 27 months until October 1996, when that agency was merged into the National Imagery and Mapping Agency. The Director of Central Intelligence awarded her the National Intelligence Distinguished Service

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NIMA Regional Officer Receives Commemorative NATO Award

NIMA's regional officer for Central and Eastern Europe was awarded the honorary commemorative badge and certificate, "50 Years of NATO," by the Czech Minister of Defense in recognition of her service.

Donna Petry received the award from Vladimír Větche on April 24—the 50th anniversary of NATO—at the Czech embassy in Washington, D.C. She received the award in recognition of "her exceptional initiative and outstanding achievements in the development of mutual extensive cooperation between NIMA and the Topographic Service of the Army of the Czech Republic."

During the meeting, Lt. Gen. Jirí Martinek, deputy chief of general staff of the Czech Army, and Maj. Gen. Rostislav Kotil, Czech defense attaché, personally thanked Petry for her efforts.

"She is an outstanding NIMA representative and greatly contributes to the development of mutual cooperation between NIMA and our Topographic Service," said Lt. Col. Jaroslav Zemek, a member of the service. ❖



Donna Petry is awarded an honorary commemorative badge, certificate and a bouquet of flowers by Lt. Gen. Jirí Martinek, deputy chief of general staff of the Czech Army (center), and Maj. Gen. Rostislav Kotil, Czech defense attaché. The presentation was made at the Czech Embassy in Washington, D.C.

An Update On the Switch to the Secret Collateral Enterprise Network

by John Iler

At first, it seemed insurmountable. Take all of NIMA's legacy business systems, each with its unique computer hardware, software, networks and e-mail systems, and create a single standardized system that supports all internal and external business needs at the Secret level or below.

In short, establish connectivity across diversity. The job fell to the U.S. Imagery and Geospatial Information System Services and Systems Office (see "Connectivity Comes to NIMA," December 1998).

The goals were ambitious, calling for the conversion of 90 percent of NIMA's Sensitive But Unclassified (SBU) workstations to the Secret Collateral Enterprise Network (SCEN) within two years.

According to Debbie Davis, SCEN program manager, everything's on schedule. "By Oct. 1, the SCEN should have about 2,800 machines connected," she said. "Not all of these are coming from the SBU—almost 1,100 are from the Geospatial Information production local area networks (LANs). And 300 others are new computers bought by the production divisions to be put on the SCEN." The rest, she added—about 900—are from the SBU and are part of the Y2K Recapitalization Program, which is responsible for replac-

ing non-Y2K-compliant desktop systems.

Two Drivers

Two drivers in the connectivity push were the Y2K compatibility issue and the agency's new *WORKFORCE21* personnel system.

Progress on the Y2K issue is well along with 1,200 to 1,300 SBU workstations throughout the agency requiring conversion or replacement due to Y2K noncompliance. Despite delays in implementing PeopleSoft, Davis said "the deployment of workstations to support *WORKFORCE21* is on schedule." She praised former Human Resources Director Regina Millard and Ed Hughes, the *WORKFORCE21* lead in SBU to SCEN conversion, for making the smooth transition. "Ed has been outstanding in getting the HR folks successfully onto the SCEN," she said.

Once a SCEN workstation is operational, employees will be able to receive and send e-mail from the SCEN to the SBU via a secure mail guard. Users can send unclassified e-mail through the mail guard, the electronic barrier that blocks the secure network from the insecure Internet, with or without attachments. But SCEN users must first open the attachment and inspect it, verifying the classification

level of the message, before the system will allow it to be sent. To facilitate this exchange, all e-mail users must now indicate the classification level of each e-mail message.

The SCEN will accept incoming messages with attachments via the SBU LAN, but only if the message has been digitally signed using what's known as Fortezza technology. "This technology simply helps ensure user authenticity," Davis said. Purchased from the National Security Agency (NSA), the Fortezza cards allow users to send mail with attachments to themselves or others on the SCEN.

The Fortezza card, Davis said, "authenticates the attachment and enables it to be sent to those on the classified network." Users also can choose to save the attachment to a disk and physically save it to their SCEN desktops. The only caveat, she added, is that any external media, whether floppy disk or Zip disk, becomes classified the instant it's inserted into an SCEN drive.

Internet and Hard Drives

Because of the secure nature of the SCEN workstation, access to the Internet is currently curtailed.

"The firewall between the SBU and the SCEN will pre-

vent surfing on all but the Secret Internet Protocol Router Network (SIPRNet), the Intelligence Community Internet," Davis said, "which means no web browser capability on the nonclassified environment from the SCEN.

As a possible solution, a product called CYBERSHIELD is under review. In May, Davis sent a team of two engineers to the NSA to begin integration testing. If successful, CYBERSHIELD will allow SCEN users to surf the Internet in a secure mode. "We are working on this with great expectations for success," Davis said. "We're the first in the Department of Defense to ask for Internet access from the secret domain—154 other DoD organizations are lining up to do this as well, so NIMA is the test case." The NSA evaluation should be complete by this January.

Another technical feature of the SCEN is that users have limited access to storage space on the servers. Users can store data on floppy or Zip disks and their workstation's C-drive, but the only data backup is done for data on the server. According to DoD regulations, backups and archives must be maintained for five years.

"Each user," Davis said, "will be responsible for backing up their data to the servers. If you do not save files on the server, you should back up the workstation C-drive and removable media data."

The standardization attained by these changes will provide a host of benefits, not the least of which is unprecedented support. Operations support on the SCEN will be enhanced by use



Debbie Davis

(Photo by John Ivey)

of the Computer Association Unicenter Network Enterprise Management System (NEMS), which was built along with the SCEN.

"If you can't connect to the server," she said, "NEMS will tell us, we'll know it before you do and will be working on a fix." By taking over the support functions of a number of independent offices, efficiency will be significantly enhanced and at substantial cost savings.

"The bottom line is that our customers have to have our products, and we have to meet deadlines. Our job from the start was to bring all the dissimilar predecessor organizations into a common network. And I think it's coming together very well."

And Loving It...

But what of the Apple Macintosh computers, which are still in use in some offices throughout NIMA on the other networks? Individual offices can continue using them if they wish, but they will receive limited software and hardware support. No Macintoshes will be on the SCEN. "Even NIMA's Deputy Director, Leo Hazlewood—a dedicated Mac user—is now on a PC and loving it!" Davis said.

In fact, since the command staff and deputy directors were converted to the SCEN, "the requests for SCEN connectivity have been overwhelming." And, she added, "The network has been performing above our expectations for availability—over 96 percent." ❖

Who You Gonna Call?



Help for NIMA's Legacy Help Desks

When NIMA was established in 1996, it inherited more than 20 trouble or help desks and call centers from its predecessor organizations. Most supported a single production system or function, were individually staffed and had their own customized tools for entering, tracking and routing trouble ticket calls from customers.

Since late 1998, however, a team of government and contractor personnel has worked to consolidate these help desks into a single Virtual Service Center with locations in the Washington, D.C., and St. Louis areas.

"Studies completed both prior to and after the formation of NIMA all agreed that the number of NIMA Help Desks could and should be reduced," said team leader John Reiter. Another factor adding weight to the decision was a NIMA study conducted last year recommending such reductions and standardized service operations agency-wide.

"The vision identifies the creation of a NIMA Service Center to serve as the single point of contact for anyone needing assistance with NIMA networks, systems and products," Reiter said. "The objective is to use standardized processes and tools to provide a consistently higher level of service to both NIMA employees and external NIMA users." This, he added, will help boost productivity and reduce the level of resources NIMA expends on help desk services.

The team is finalizing preparations to deploy initial "ST pilot" Service Centers in St. Louis and Reston this fall. The pilot will support Information Technology (IT) functions, not only in office automation operations on the Sensitive But Unclassified (SBU) and Secret Collateral Enterprise Network (SCEN) environments, but with legacy Digital Production System operations and the Geospatial Information Management Data Environment 2000 (GIMDE 2000) program (the last only at Reston).

Three-Tier Support

The service centers will provide three tiers of support.

Tier 1 will be staffed with IT personnel who have knowledge bases to aid in problem diagnosis and responding to customer phone queries. Personnel also will be able to remotely access a caller's workstation to diagnose problems. "The goal of the pilot," said Reiter, "is to resolve at least 40 percent of calls received during the initial contact. In instances when a caller's problem cannot be quickly resolved, the trouble call will be escalated to Tier 2."

Tier 2 support will be administered by experts in NIMA production applications or IT-specific systems (e.g., Windows NT capabilities) and will also have remote access to callers' workstations. For problems that cannot be resolved over the phone or remotely, Tier 2 support personnel will personally visit customers to resolve problems.

Tier 3 support will consist of engineering developmental contractors and/or COTS vendors.

When users and NIMA leadership conclude that the "pilot" service center consolidation activity is a success, it will become the first completed phase of the NIMA Service Center. The goal, Reiter said, is January 2000.

"We also have additional future services in mind," he added, "including a NIMA Service Center website available for NIMA-wide use. This will allow customers to use a web browser to either enter a trouble ticket directly into the service center database or to review the status of existing trouble tickets from their workstations." Those who want to learn more about IT-related applications will be able to access tutorials, computer-based training (CBT) and Frequently Asked Questions (FAQ) from the website as well.

Seeking Outside Help

Reiter is pleased with the progress towards the standup of the pilot and said the team is trying to accelerate the schedule. Team members visited four private sector help desks earlier this year—at Nations Bank, Texas Instruments, Microsoft and BMC. The team also contacted industry leader NCI Inc. and Ziff-Davis, the company that oversees the Help Desk Institute.

"Ziff-Davis provides a variety of hands-on and computer-based training for help desk personnel in both people skills and technical areas," he said. "Giving our help desk people the right kinds of training will reap big dividends in the form of improved customer satisfaction and a more standard approach to service than currently exists."

Chuck McClay, engineering team lead for the project, said exemplary customer service results from a blend of experience, training and accessibility.

"One of the keys to the success of the pilot is making sure our customers receive prompt attention," he said. In May, the team activated a single phone number (1-800-582-8931) for all NIMA IT or SCEN Help Desk services.

Y2K

One problem with many of NIMA's legacy help desks was the lack of preparedness for the mil-

lennium rollover. Not only were many computer systems ill-prepared to handle a four-digit year field, there were a surprising number of software applications that were not Y2K compliant. This issue, alone, said Reiter, demanded a concerted approach.

The consolidation team is responsible for Y2K remediation and has already made significant inroads to repairing and replacing systems throughout NIMA. The team also is replacing the Automated Configuration Management System (ACMS), the discrepancy report tracking system for legacy geospatial production systems.

NIMA personnel interested in keeping up to date with the latest developments of this project are invited to attend the monthly Help Desk Forum VTC meetings, held the third Wednesday of every month from 11 a.m. to noon (eastern time) at the following NIMA VTC locations:

- BET1 - 213AB
- RES1 - T503
- STL1 - 15B41
- WNY - 4N40

The first Program Management Review was held in the Washington, D.C., area in late April. Follow-on reviews are planned for St. Louis as well. Requirement interviews with future U.S. Imagery and Geospatial Information System users of a consolidated service center are underway.

Reiter emphasized that, despite the progress, there is still a lot of work to be done. "We've had excellent cooperation from other offices in NIMA. With their continued help, plus the hard work of all the team members, we can field a NIMA Service Center that significantly improves the support provided to agency customers when they have a problem and need assistance."

Editor's note: Due to the nature of the support provided, NIMA's Requirements Management System and Marine Navigation Safety Center Help Desks were not included in initial consolidation planning activities. ❖

NTA Seeks Best of All Worlds

... a unique partnership between government, industry and academia ...

by Patrick Williams
Deputy Program Manager

Created in 1992 and first managed by the National Reconnaissance Office (NRO), the National Technology Alliance (NTA) seeks to bring together the best in government, industry and academia for the purpose of identifying, applying, accelerating and developing commercial information technologies that meet the critical needs of government users.

NTA was declassified in 1995 and now is managed by NIMA's Systems and Technology Directorate's Office of Technology.

According to Program Manager Jim Kwolek, NTA's mission requires identifying the limitations of current systems and exploring adaptable technologies, feasible applications and solutions for users across the government spectrum.

"NTA departs from the controlled world of government-directed research and development towards one that embraces the dynamic, but often volatile and unpredictable, world of the commercial marketplace," he said. "It's a program that entails risk, but whose demonstrated rewards have more than justified the government's investment."

NTA was established to gain the support of the world leaders in crucial technologies in the commercial marketplace,

where technological developments were rapid and significant.

"The objective," said Kwolek, "was to take advantage of emerging technologies in commercial markets and replace the former government acquisition paradigm that was too slow, commercially incompatible and increasingly too expensive and redundant."

"NTA departs from the controlled world of government-directed research and development towards one that embraces the dynamic, but often volatile and unpredictable, world of the commercial marketplace."

In fact, he added, the mission statement of the NTA is to "empower government users to effectively and efficiently capitalize on technology emerging from commercial and consumer industry by influencing development efforts, leveraging advances, implementing standards, delivering operational solutions, providing corporate courage and promoting passion."

Kwolek said NTA's intrinsic value is that it's connected with commercial business units in companies that traditionally do not work with government. Operating under a unique contract arrangement

called "Section 845, Other Transaction Agreement," leading national commercial companies and universities are attracted that might otherwise shy away from the sometimes bureaucratic government contracting procedures.

The Centers

The first of the three labs to compose the NTA—the National Media Laboratory (NML)—was founded in 1987 to serve as an industry resource supporting the government in the evaluation, development and deployment of advanced storage and recording technology.

Current NML Alliance capabilities include printing and imaging technology, consumer communication appliances and technology and advanced materials for media, fiber optics, lasers, networks, batteries and other components used in the manufacture of thousands of consumer-based products. The 3M Company, headquartered in St. Paul, Minn., was selected to host the NML. Through its commercial ties, NML already has influenced technology developments to better meet government needs.

Recognizing the need to process and extract meaning from the growing flood of multimedia information, the

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Navigation Safety System Docks at NIMA

by Howard Cohen
Marine Navigation Department

A ribbon cutting ceremony of NIMA's new Navigation Safety System (NSS) was held on July 26. The new system supports all maritime safety information database maintenance, produces all of the agency's navigation publications and provides worldwide remote query access to databases and navigation publications via the Marine Navigation Department website and the Navigation Information Network Service (NAVINFONET).

NIMA Director Lt. Gen. James C. King; Bobbie Lenczowski, director of Operations (DO); Bill Allder Jr., director of Systems and Technology (ST); Curt Ward, director of Geospatial Information and Services (GI); and Steven C. Hall, chief, Marine Navigation Department (GIMM) all took part in the ceremony. King led the ribbon cutting before a standing room only crowd recognizing NSS has achieved operational readiness and full production.

"Your tremendous efforts in establishing the Navigation Safety System," said King, "will be able to ensure the protection of life, the protection of property at sea, and, the accomplishment of our national security objectives. ...Today, we leap into the 21st century. We no longer talk about the future of navigation



NIMA's NSS Cadre Team (l-r): Steven Debrecht, Paul McMullen, Randy White, Chris Janus, Keith Alexander, Kathy Chance, Peter Doherty, Frank Chamberlain, Tim Doherty and Scott Lippy. Not shown are Joe Grzymkowski, Kathleen Foley, Gary Rogan, Kay Fox and Michaela Duffy.

safety, we will be providing the future to the people—now."

After the ceremony, Tim Doherty, NSS lead technical engineer, demonstrated the new system for Gen. King. "This system is exactly what our customers have been waiting for," he told King.

NSS is moving full speed ahead to fulfill customer needs. It transitions NIMA's maritime safety program from a hardcopy environment to one using a digital nautical database. It also will extend into the next millennium the production capability to satisfy NIMA's statutory responsibility, under U.S. Code Titles 10 and 44, to provide maritime safety information, products and services.

The United States, as a signatory to the International Convention for the Safety of Life at Sea (SOLAS), requires

ships under its flag to carry current and accurate charts and related products for the waters in which they operate.

"NSS takes NIMA forward into the digital world of disseminating critical information to mariners throughout the world," said Chris Andreasen, NIMA's chief hydrographer. "It's a great step forward for NIMA's vision to the digital age in the 21st century, and it's going to be an essential component for updating the Digital Nautical Chart that we are now producing and sending to ships worldwide."

Users with Internet access may reach the new NSS website via the NIMA homepage www.nima.mil by clicking on the "Maps & Geodata" button and then the Marine Navigation Home Page hotlink. ❖

Agreement Helps NIMA Prepare for 21st Century

by Muridith Winder



NIMA Director Lt. Gen. James C. King and ERDAS President Lawrie E. Jordan sign off on a Cooperative Research and Development Agreement (CRADA) between the two agencies.

A Cooperative Research and Development Agreement (CRADA) between NIMA and ERDAS, Inc., will help NIMA meet the challenges of the new millennium's civil and military operational needs, according to agency officials.

NIMA Director Lt. Gen. James C. King and ERDAS president Lawrie E. Jordan III signed the 59-month agreement. ERDAS is a leading provider of geographic imaging products and related services.

"The CRADA will serve as a mechanism for enhancing and integrating emerging and rapidly evolving geospatial and imaging technologies into responsive commercial applications and tools," said Ken Loudon, NIMA principal point

of contact. He added that the CRADA signing emphasized the significance NIMA and ERDAS put on this unique partnership.

"Together they approach the new millennium with the view of meeting the challenges in the imagery and geospatial community and commercial marketplace," he said.

According to Loudon, four outcomes are expected from the CRADA:

- Enhancement of the ERDAS tool *Imagizer* to meet some specific functional needs of the government for the display and manipulation of geospatial imagery in products like the CD Photo Map.
- Integration of NIMA-accepted Automated Feature

Extraction tools into ERDAS commercial products and, potentially, the commercialization of some of those tools.

- Incorporation of National Technical Means (NTM) information into ERDAS software, which will enable the imagery and geospatial national and civil communities to better work with NTM data using ERDAS commercial products.
- Development of the next generation of geospatial imaging tools that support advanced imaging sensors such as hyperspectral and radar imagery.

CRADAs were originally authorized by Congress as a means to encourage the transfer of technology between the government and private sector, enhancing U.S. competitiveness. It's a "win-win" situation for government and industry. NIMA gets hands-on access to leading edge commercial-off-the-shelf (COTS) tools and technologies.

The CRADA partner, in return, gains direct insight into NIMA's requirements, data, data standards and processes and is able to work with technical experts using advanced tools and technologies in a production environment. ❖

'Surf's Up' for Imagery Analysts on Gulf Coast

by Kenny Hebert
IACB, NAVOCEANO
Stennis Space Center, Miss

What's this? NIMA imagery analysts (IAs) working on their tans on government time and braving surf killer waves all day?

Well, not exactly, but close.

Eight imagery analysts from the Imagery Analysis Corporate Integration (IACB) division are assisting in the analysis and production of imagery products on the oceanographic environment. They are assigned to the Naval Oceanographic Office (NAVOCEANO), Stennis Space Center in southern Mississippi, home to the National Aeronautics and Space Administration's lead center for rocket propulsion testing and remote sensing within its Earth Science Enterprise.

The NIMA imagery analysts began arriving in early 1998, learning new methods of imagery analysis and production for oceanographic environments. Often referred to "The NIMA-8," they are part of the

114 imagery analysts providing on-site imagery expertise at the various military commands. Since the analysts arrived, they have become an integral part of NAVOCEANO's Warfighting Support Center (WSC), providing NIMA's customer support.

Working alongside oceanographers, meteorologists and physical scientists, the NIMA-8 analyze various types of commercial and government imagery to extract critical information relating to the littoral, or coastal, environment.

The NIMA-8 are not only developing unique skills from their NAVOCEANO counterparts, they also contribute to the planning and execution of military operations in the littoral environment. The identification of specific local water features such as currents, tides, bathymetry, bottom composition and many others provide military commanders, their staffs and the warfighters with accurate and up-to-date information on their operating area.

The analysts' jobs provide an exceptional example of NIMA's expanding role in imagery analysis. The innovative and sophisticated technologies emerging from the commercial remote sensing industry are requiring NIMA's imagery analysts to explore new analytical methodologies and master complex computer systems to maintain the cutting edge.

"It's been quite a challenge and experience to modify and use our IA skills to identify slightly different targets," said Joelyn Goodrick, a retired Marine Corps imagery analyst now a NIMA analyst. "Rather than analyzing traditional hard targets, such as facilities and equipment, we're identifying factors such as hazardous beach approaches or dangerous surf conditions that could affect military operations."

In fact, while the eight imagery analysts at NAVOCEANO relied heavily upon the traditional techniques of imagery analysis, they also required an entirely new set of skills for processing and analyzing spectral and spatial data.

Working primarily in a digital environment, the analysts had to develop skills to manipulate and enhance spectral signatures from commercial imagery and merge data from entirely different sensors to highlight the oceanographic phenomena to be extracted.

Because of the subtle oceanographic features they usually try and locate, the imagery must be processed through various filters and algorithms before those features can be identified. In the past, such techniques were usually associated with state-of-the-art scientific research. However, modern technologies in imagery-processing systems now provide the IA with new tools

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Supporting Task Force Hawk

by Paul Hurlburt

"It was tough but worth it," said NIMA geospatial analyst Dave Montgomery, who was recently deployed to Albania to support Army helicopter operations during Operation Allied Force. Although the Apache helicopters never saw combat in Kosovo, they did gather valuable intelligence that was passed on to the Air Force operating out of Italy.

Montgomery was one of seven NIMA personnel on the National Intelligence Support Team (NIST), which provided intelligence support to the Army's Task Force Hawk at an airfield outside Tirana, Albania. Two imagery analysts and four members of NIMA's Army Customer Support Team supporting remote replication operations also were deployed.

The two imagery analysts were Chief Warrant Officer 4 Jerry Prewitt and Van Miller. Army Reserves Lt. Col. Craig Pearson, Kevin Coffey, Paul Burkett and Louis Halbert (all from NIMA's Customer Support Response Team) composed the NIMA NIST element.

"Six team members were deployed to Tirana with a Quick Response System and other imagery and geospatial processing hardware and software," said Air Force Capt. Mike Masters, Customer Support Response Team chief of operations. As members rotated out, he added, others would rotate in. "The NIMA NIST members produced custom imagery and geospatial products, including photomaps of ingoing and outgoing routes and imagery of planned zones of engagement."

The environment was less than ideal. Torrential rains often made conditions almost unbearable.

"It rained for about two weeks before we got there," Montgomery said, "so the ground was pretty well saturated. The Army had brought in heavy equipment, which tore up the ground. We had to walk in a lot of mud, and there were no showers."



(Photos by Navy CT2 Scott Texelto)

An AH-64A Apache attack helicopter, fully loaded with armaments, provides an appropriate backdrop for NIMA's Dave Montgomery.

As spring turned to summer, the mud turned to dust. Fortunately, by then showers had been installed. Montgomery also got his first hot meal after weeks of living on MREs (Meals Ready to Eat). But he still had to wear battle gear—flack vest, helmet and boots.

"We heard sporadic gunfire and explosions in the distance," Montgomery said. "And though we weren't within firing distance of Serbian mortar, we could have come under fire from Serbian sympathizers from the surrounding hills in Albania." Officials considered it too dangerous to leave the area, he said, so he never left the airfield.

The monotony of "60 days in the same place" notwithstanding, Montgomery had little time to be bored. Work took 12 to 16 hours a day, and more than one night he was roused from bed to work a hot tasking.

"It was hard duty," he said, grinning. "I wouldn't recommend it for sightseeing!"

But Montgomery would recommend the duty for its value in connecting with customers.

Thanks to the team's corporate knowledge and NIMA "reach-back capability," via telephone and the Internet, Montgomery was successful in gathering a wealth of data for his customers, usually within 24 hours of a request. He also

helped the soldiers build products with the data and put them to use.

A hardcopy 3D terrain model of Kosovo, control points for offensive activities and strips of imaged-based maps covering strategic routes into the province were among the products the NIMA NIST element helped provide.

Before leaving Albania, the element helped plan the Army's entry into Kosovo.

"The helicopters were flying 50 feet off the ground—basically at treetop level—so I got them information on vertical obstructions," Montgomery said. Searching on the NIMA Gateway Digital Vertical Obstruction File (DVOF) home page, he found the phone number of Bob Brueckmann, a team chief in the Dissemination Division (ISD), and called him. After a short chat, Montgomery downloaded the needed data and, with other members of the Customer Support Response Team, helped the mission planners plot the obstructions.

Another project involved control point development for artillery operations.

"I knew somebody in Geodesy and Geophysics (GIMG) could help with that," Montgomery said. "On a Saturday, he located some geodesists in St. Louis who 'came in and popped out a control point ASAP.'"

The Army uses control points in its mobile fire control systems, Montgomery explained.



Getting around in the mud was difficult, even for vehicles.

When a "Humvee" stops on a control point, the system on board is calibrated to ensure accurate artillery fire.

Three-D terrain models of Kosovo continue to be used for mission planning and ground operations. Unlike raised relief models of the past, the Kosovo models were produced in a short time frame through computer simulation using digital terrain elevation data. The 1:250,000-scale 3-by-3 foot models, built in Washington under contract and through an agreement with NRO, give "a better feel for the terrain" than paper maps or computer-simulated fly-throughs, Montgomery said.

"Three-D models show all the possibilities for planning routes into and through an area." The commanding general of Task Force Hawk, Lt. Gen. John W. Hendrix, personally called Montgomery to express his thanks for the models, Montgomery said.

Before leaving Albania, Montgomery helped plan the Army's entry into Kosovo.

"That was a huge project," he said. With imagery and vector data downloaded from the NIMA Gateway and the Defense Intelligence Agency, Montgomery and the soldiers developed unique lines of communication maps and cross-country movement charts for air and ground operations.

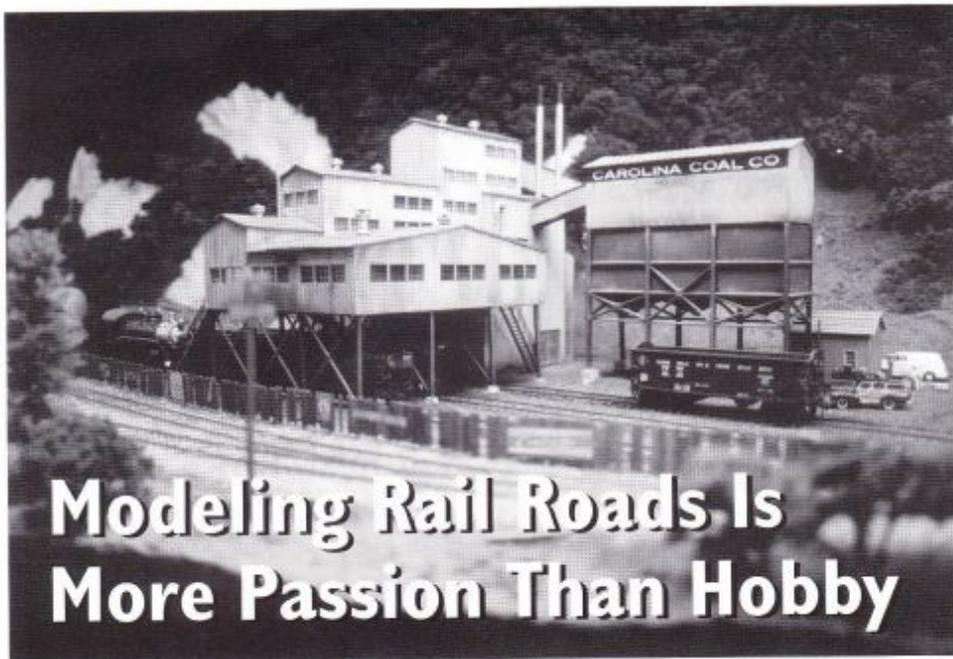
On land, bridges were important to move tanks and heavy armor, so Montgomery downloaded the latest intelligence, including the condition of a bridge, its load-bearing capacity, surface, width and so on.

He also provided anaglyphic photos of the bridges, which the soldiers incorporated into the maps as insets. The finished product combined imagery and map data into an overview of a route at a scale of 1:25,000.

Teaching the soldiers how to use NIMA information and systems was "a consistent factor on the deployment," Montgomery said.

"We were the experts, always teaching them how to fuse different types of data into custom products and perform geospatial analysis," he said. "Heightening their awareness of the possi-

Continued on next page



Modeling Rail Roads Is More Passion Than Hobby

By Sharon Alexander and
Muridith Winder

Ronald Hale calls it a passion. His wife thinks it's more of an obsession. But after one look at the intricate detail of his model railroad, it's easy to see this is no mere hobby.

An imagery analyst, Ron has been "working on the railroad"—his own unique creation—since 1991. His interest in trains dates back to childhood, but was rekindled when he and his wife, Laura, purchased their home. With plenty of room downstairs, he made "tracks" to the basement and began building an elaborate landscape of wooden buildings and plastic people interspersed with trees and roads. Built to scale, he says it depicts the countryside between the Blue Ridge and Allegheny Mountains from western North Carolina to western Maryland. Features such as terrain, businesses, billboards, streets and supporting structures are intricate—exact replicas of that stretch of territory, circa 1952.

"I tried to capture the flavor of that era in my model," Ron said. "I looked at books, photographs and collected memorabilia."

He selected the early 50s, he said, "because during that time railroads were still an important part of American life. They were the major

mode of travel before major highways, and industry was served by railroads." Ron also is constructing a large city around his railroad that includes 10-to-15-story buildings and spacious factories. He expects it will be years before his model will be complete.

Although most of the towns and buildings are faithfully depicted, Ron did come up with a few fictitious companies—and a diner—named after some friends.

Despite the nostalgic appearance of yesterday's trains and cars, the electronics at the heart of the railroad are the latest. Flashing signals are synchronized and there are even hand-held throttle controls for each locomotive, allowing Ron to run them by remote control. Even the sound system is digital.

In fact, he views the project as the perfect "training" opportunity. "I've learned to do a lot of things I thought I'd never do," Ron said. Modeling has permitted him to pursue his love of history and to learn other hobbies, such as electronics, photography, woodworking and painting.

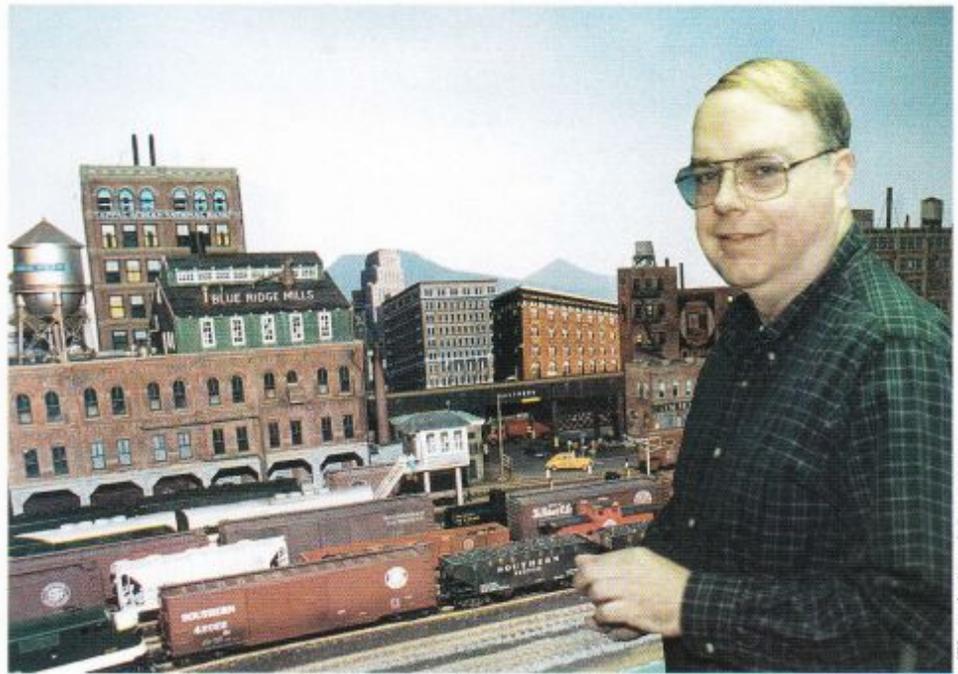
The first step to becoming a model railroader, Ron said, is to select the time frame and geographical region the setting will depict, then design a layout. After that, lay the foundation, also putting down the substructure for the third step, building the roadbed. Once the bed has been laid, the actual tracks can be placed. From there, it's a matter of making countless improvements and building up the surrounding scenery.

Ron often travels to rural areas in North Carolina, so he gets plenty of inspiration for scenes. In his railroad at home, his layout features a bottling plant for Cheerwine, a cherry-favored soft drink bottled in North Carolina. "I sometime borrow what I see around the country, but what I add always is representative of

western Maryland," he said. He also gleans ideas from bookstores, as well as antiques and collectible items, such as old advertisements, that he can recreate for use in his railroad.

In constructing the elaborate "countryside," he uses model kits, but he also creates landscapes based on photographs. "I always travel with two cameras, and by train when possible," he said. "One camera is for slides; the other is for photographs representative of my model."

Ron and his wife even travel to distant locations to see the work of modelers the two have met at conventions, trade shows and other gatherings. Just last year, the group traveled to Boston to see a famous railroad layout that has received national attention. Of course, they traveled by train.



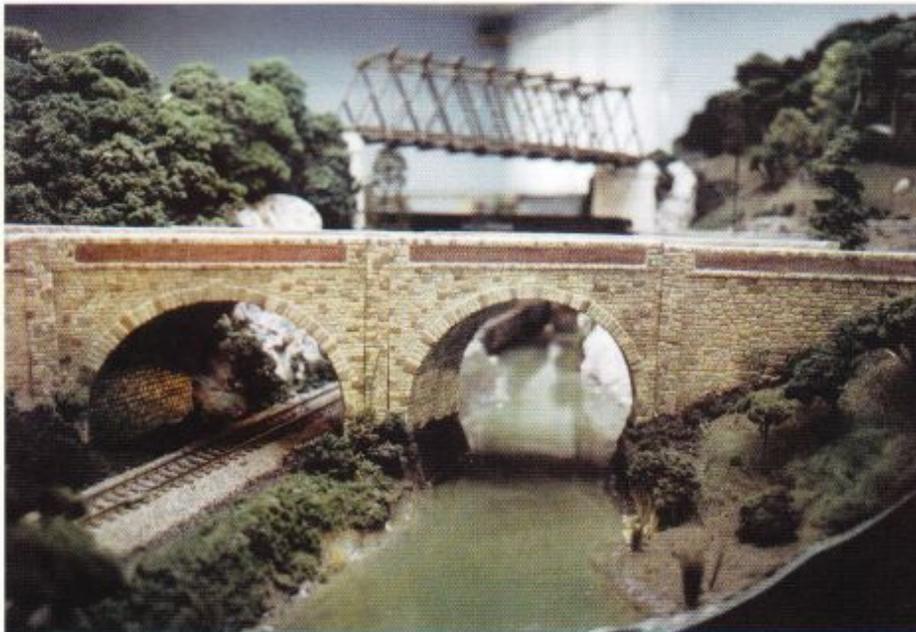
Photos by Murielith Winder

Ronald Hale looms over his creation, a carefully constructed rail yard with scenes representative of locations between western North Carolina and western Maryland.

Besides working on his model, Ron also enjoys keeping company with other railroaders. In fact, he said, it's one of his favorite parts of the hobby. "We share information, give demonstrations, discuss the hobby, share techniques and offer possible solutions to problems we may be

encountering with our models," he said. He's part of a group of about seven enthusiasts who meet monthly, rotating from home to home.

The group meetings also give Laura an opportunity to spend time with the wives of the other modelers. "In fact," she said, "becoming close friends with them is the best part of Ron's obsession." ❖

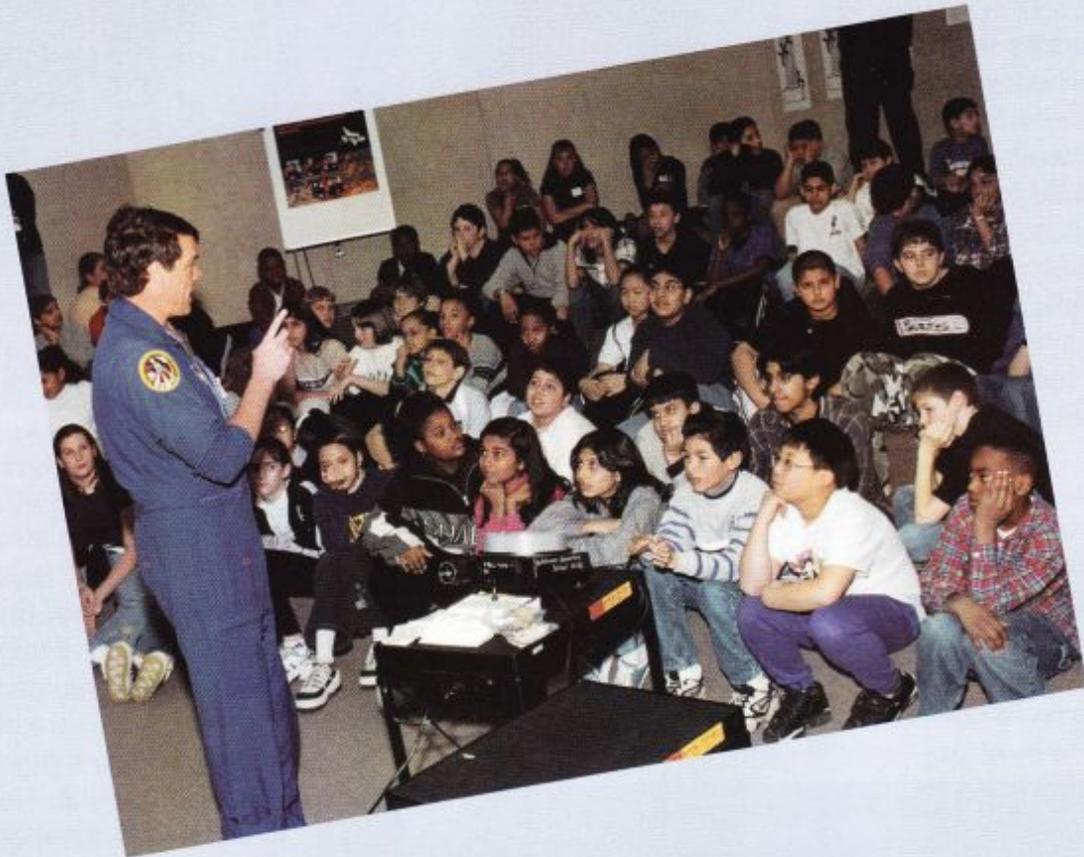


A river runs under it, but in this case the stream is nothing more than translucent green epoxy. Note the reflections on the "water" and the detail in the shoreline.

BACK TO SCHOOL!

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or Sharon Smith at 314-263-4142.*