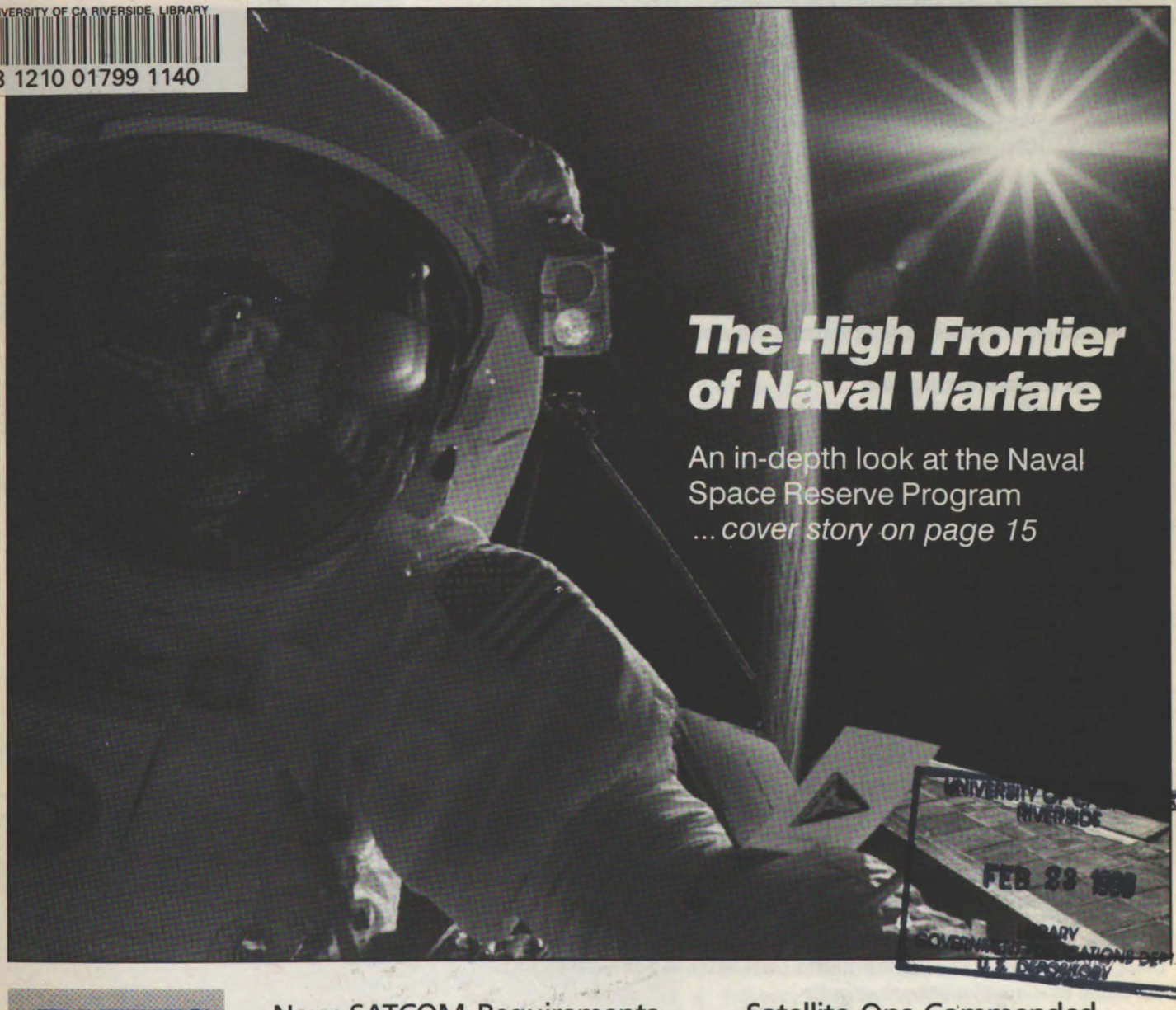
Naval Space Command

SPACE TRACKS

A BULLETIN ON NAVAL SPACE ISSUES AND INITIATIVES January/February 1998



The High Frontier of Naval Warfare

An in-depth look at the Naval Space Reserve Program
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Directory of Services

Naval Space Command provides direct space support to Fleet and Fleet Marine Force operational units around the world, whether for routine deployments, exercises, or actions in response to a crisis situation. We take very seriously our duty of ensuring that our Sailors and Marines understand what products are available from space, how to access them, and finally, how to exploit those products in the waging of war and peace.

O Operational Status/Exercise Support Summaries
Naval Space Command maintains a home page on the Global Command and Control System (GCCS) accessible to operational U.S. military forces worldwide at <http://navspac1.navspace.navy.smil.mil> or <http://206.36.197.10>.

O Naval Spece Operations Center (540) 653-6500
Call Toll-Free at 1-888-404-6557. Source of space-related operational intelligence. Space reports and analyses are activated on request and are tailored to a deploying unit's operations and geographic area of movement. Tactical assessments of space system capabilities and vulnerabilities to potentially hostile space sensors are also available.

O Naval Space Support (540) 653-6160
Naval Space Support Teams provide tailored information and training at all operational levels to include on-site training, exercise support and staff augmentation.

O Multi-Spectral Imagery (MSI) Cell (540) 653-6520
Naval Space Command employs imagery from remote Earth sensing satellites to support intelligence, planning and operations. Naval Space Command's MSI cell processes LANDSAT and SPOT data in support of Fleet and Fleet Marine Force units. Hardcopy and softcopy MSI products specifically tailored to user needs are produced by the cell and distributed to support naval participation in both real-world and exercise operations. MSI products can be produced to support any of the following applications:

Planning	Target Area Analysis
Intelligence Prep of the Battlefield	Disaster Assessment
Mission Rehearsal	Order of Battle Disposition
Amphibious Support	Change Detection
Supplement MC&G Products	Broad Area Coverage
Combat Search and Rescue	Bathymetry Predictions

Product requests may be submitted via message to: COMNAVSPACECOM DAHLGREN VA//N312, via facsimile to DSN 249-6167 or (540) 653-6167, or via email to <msi@manta.nosc.mil>.

O Internet On-Line Access
Naval Space Command maintains a home page on the World Wide Web at URL <http://www.navspace.navy.mil>. Comments or requests for information may be forwarded to the Public Affairs Office via email to <gwagner@nsc.navy.mil>.

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Arlington, Va.

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SPACE TRACKS is published five times a year as an official communications medium for Naval Space Command. Its purpose is to discuss naval space issues and initiatives, and promote a broader awareness of space support available to the naval warfighter. Information contained in Space Tracks does not necessarily reflect the official views of the U.S. Government, the Department of Defense or the Department of the Navy. The editorial content is prepared by the Public Affairs Office of the Commander, Naval Space Command.

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Forward Deployed Presence is Key to International Influence

By Stephen J. Trachtenberg

The United States must continue to remain engaged with the world, diplomatically, economically and militarily," said Secretary of Defense William Cohen in the Report of the Quadrennial Defense Review.

Why? Our nation has become increasingly interdependent with the rest of the world through foreign trade, investment and alliances. The United States must protect our vital overseas economic and security interests and maintain an international environment of peace and stability.

How do we do this? Forward presence by U.S. Navy aircraft carrier battle groups and amphibious ready groups. As Secretary Cohen stated in a press conference May 15 last year, "If you don't have that forward deployed presence, you have less of a voice, less of an influence."

Just as international businesses cannot operate effectively without overseas offices, the Department of Defense cannot fulfill its mission without the physical presence offered by forward-deployed naval forces. Land and air forces based in the United States may be able to deploy overseas in the event of conflict, but their use is limited to regions where we have sufficient military infrastructure to support them, and their operations will be subject to disapproval or restriction by the host nation.

"When word of crisis breaks out in Washington, the first question that comes to everyone's lips is, 'Where is the nearest carrier?'"

The United States can no longer rely on our friends in strategic locations to agree to deployment of U.S. forces to their bases. Even a NATO ally such as Italy drew the line in 1995 and indicated it did not want the United States to deploy Air Force F-117 stealth aircraft to Aviano Air Base to participate in Operation Deny Flight in Bosnia. No such restrictions were imposed on Navy aircraft aboard the aircraft carrier USS *George Washington* operating free of political constraint in the Adriatic Sea. Aircraft carriers are sovereign U.S. territory that can be strategically placed wherever and whenever U.S. interests dictate, without straining relations or imposing on our allies.

We cannot gamble on the assumption that we will have the necessary bases and infrastructure, as well as the political approval of our allies, to conduct military operations with deployable "garrison forces" from the United States in the event of crises. The U.S. has too great an economic and political stake in the peace and stability of key regions throughout the world to risk investing solely in forces dependent on foreign powers for their employment.

If you examine the political crises to which the United States has responded with military forces in recent years — Somalia, Bosnia, Korea, Haiti, Taiwan, Iraq, and others — you will notice a common theme: the repeated use of aircraft carriers and the relative absence of land-based forces. Only sea-based forces allow the United States to operate unilaterally, without restriction, when our actions defend interests that are solely our own or may be controversial with our allies.

Only naval forces can promote our values of democracy and market economics, deter crises, and provide stability in regions of vital U.S. interest throughout the world.

President Bill Clinton, who said during a visit to the aircraft carrier USS *Theodore Roosevelt*, "When word of crisis breaks out in Washington, it's no accident the first question that comes to everyone's lips is, 'Where is the nearest carrier?'"

Author Stephen J. Trachtenberg is president and professor of public administration at George Washington University in Washington, D.C. He is a member of the Advisory Committee to the Chief of Naval Operations.

Communications Requirements Outlined for Industry

COMMERCIAL SATCOM FOR NAVAL SUPPORT

By Thomas B. Sanford

Naval Space Command hosted a day-long conference on Oct. 22, 1997, to highlight naval requirements for satellite communications (SATCOM). The meeting in Dahlgren, Va., was attended by representatives of more than 70 commercial companies and 25 government agencies.

The purpose of the conference was to provide interested industry and military representatives with details on naval SATCOM requirements for narrowband, wideband, and protected satellite communications, building a close partnership between Navy and industry for meeting the warfighting needs of the next century.

Cmdr. Austin Boyd, director of NAVSPACECOM's Space Plans Division and coordinator of the conference, emphasized, "Before industry can hope to provide solutions to Navy SATCOM problems, they must understand the most critical naval requirements and naval warfighting doctrine."

The conference provided a detailed understanding of the naval use for, and platform requirements for, satellite communications. The conference was structured to lay out Navy's broad vision for network centric warfare and focus down to specific platform needs for various SATCOM media.

"This was an expansive and informational presentation on naval communication needs, and provided the opportunity to educate industry on naval SATCOM requirements," emphasized Cmdr. Boyd. "This was one of the first steps in establishing a joint dialogue with industry on SATCOM needs and vision."

Rear Admiral Patrick D. Moneymaker, commander for Naval Space Command, provided an overview of the command's SATCOM mission. He described how the command links with the Fleet on satellite communications issues as a system operational manager and acts as an advocate for Fleet C4I requirements.

He stressed that Navy, with its unique basing requirements, is heavily dependent on SATCOM to meet its communications needs. Naval forces are the only joint forces without access to fiber connectivity. Naval Space Command, as the naval component of U.S. Space Command, uses the medium of space and its potential to provide essential information and capabilities to naval forces.

Vice Admiral Cebrowski addresses the capacity audience during the SATCOM industry day on the topic of network centric warfare.

Naval Space Command determines Fleet satellite communications requirements, and interfaces with Navy and Marine Corps systems commands and agencies to ensure that emerging needs are coordinated and funded.

NAVSPACECOM is also the system operational manager (SOM) for several existing military SATCOM systems. In this role, NAVSPACECOM assesses operational performance, diagnoses satellite problems and resolves satellite failures.

Key to Connectivity for Joint Warfighter

The bottom line, emphasized Rear Adm. Moneymaker, is that SATCOM is the key to C4I connectivity for the joint warfighter. Only SATCOM will satisfy the over-the-horizon capacity and mobility requirements for naval forces.

As naval forces seek to fulfill the Joint Vision 2010 doctrine, operations must be based on a foundation of "information superiority." This information superiority yields important battlespace awareness and speed of command. As proof of this information need, SATCOM ranked at the top of the Fleet top five concerns related to space support for maritime operations.

Naval forces are critically dependent on SATCOM to achieve information dominance in future conflicts. Without an aggressive embrace of satellite communications, naval forces will not have a proactive role in future joint task force operations. NAVSPACECOM acts as the leverage agent for satellite communications support to naval forces in the joint arena.

Vice Admiral Arthur Cebrowski, director for Space, Information Warfare, Command and Control on the staff of the Chief of Naval Operations (N6), provided the keynote address for the conference, speaking on the subject of "network centric warfare."

He noted that naval warfare could formerly be characterized as "platform centric," relying on the attrition of enemy forces, and centralized command and control, to win a battle. VADM Cebrowski stated that naval warfare of the future should be "network centric," focusing instead on "speed of command" to win battles, by:

- Applying an overwhelming early effort
- Learning by gaining knowledge and experience faster
- Using early victories to offset technology inferiorities
- Locking out enemy solutions

Vice Admiral Cebrowski stated that network centric warfare will produce higher sustained situational awareness, which will enhance speed of command, lower ambiguity, reduce questions and enhance clarity of mission and intent.

Cmdr. Boyd presented an overview of naval satellite communication system requirements. A series of technical challenges was presented to industry representatives, as a means of opening dialogue with various companies, to determine the types of assistance they may be able to provide.

Each of the SATCOM media has unique advantages and disadvantages, emphasized Cmdr. Boyd, meaning that no single SATCOM system can fulfill all of the naval communications needs on its own. Therefore, an integrated architecture of all six media is the best approach, utilizing the best of each system.

Lt. Michael P. Finnegan of the SATCOM and Policy Branch at Naval Space Command gave a presentation on naval SATCOM user requirements, explaining how naval communications requirements can be supported by SATCOM systems.

He stressed that the Navy's need for SATCOM will grow rapidly over the next few years, requiring full use of both DoD and commercial SATCOM systems to fully meet Navy requirements. Even though commercial SATCOM systems are not protected, they can provide a valuable surge capability, as naval forces seek to meet a need for 1.5 to 2.0 gigabits per second of data connectivity in a major regional conflict.

Cmdr. Boyd also presented the results of the Mobile User Study (MUS), a joint-service effort directed by the Deputy Undersecretary of Defense for Space. The Navy was designated as the lead service for this study, which looked at how to provide SATCOM service to mobile users after the Ultra-High Frequency (UHF) Follow-On (UFO) communications system reaches end-of-life.

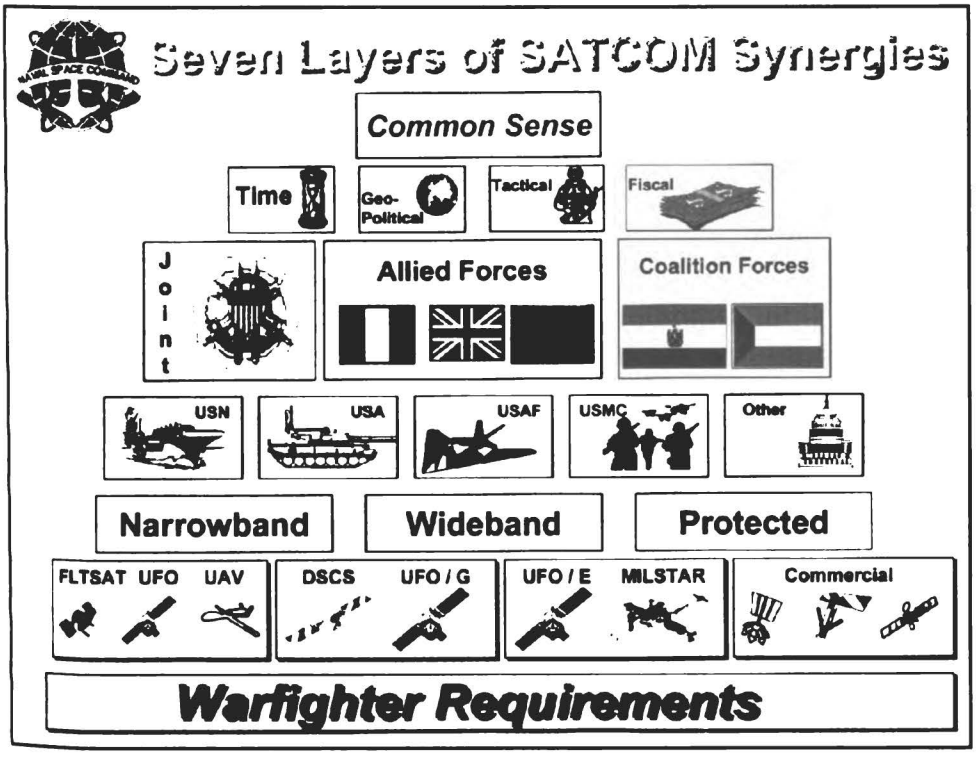
Cmdr. Boyd pointed out that the leading requirements for joint warfighters in support of Joint Vision 2010 are assured access and communications to highly mobile platforms.

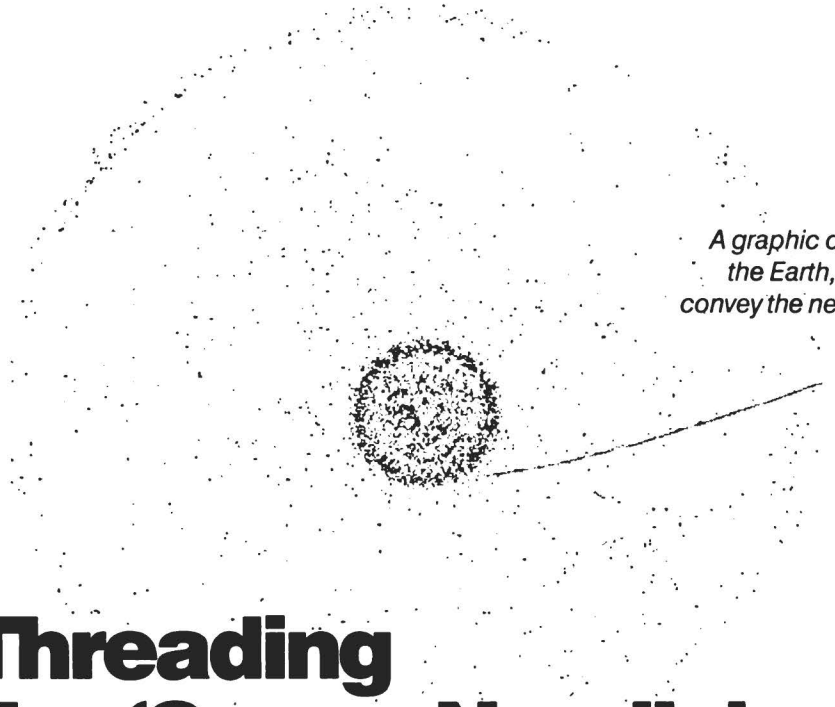
In addition, Cmdr. Boyd presented a summary of naval SATCOM requirements and resources. He outlined many of Navy's goals for improved communications in the future, including:

- Improved SATCOM to ground warriors (e.g., vehicles, manpacks)
- Improved use of network management
- Reduction in costs and timelines
- Improved capabilities for voice and data
- Better use of existing bandwidth and power
- Commercial solutions to military requirements
- Improve the joint dialogue between DoD and industry on SATCOM needs and solutions
- Better means of predicting future SATCOM requirements

Individuals interested in the information presented at the Industry Day may request conference materials, or the Naval Space Command SATCOM Functional Requirements Document, from the command's homepage at <www.navspace.com>. Videotapes of the conference are also available.

Author Thomas B. Sanford is a commercial SATCOM action officer in Naval Space Command's SATCOM and Policy Branch.





A graphic depiction (left) of space objects in orbit around the Earth, and the projected flight path of Cassini, helps convey the need for carefully selecting launch opportunities.

Threading the 'Space Needle'

CASSINI MISSION LAUNCH SUPPORT

By Jonathan P. Boers

On Oct. 15, 1997, NASA launched its last planned grand voyager deep space probe. The Cassini satellite will travel past the planets Venus, Earth and Jupiter on its way to Saturn and will arrive on July 10, 2004.

Upon arrival near Saturn, Cassini will release the Hyugens Probe to the moon Titan. It will use the moon for repeated gravity assists to perform detailed scientific exploration of the Saturnian system over a four-year period.

Naval Space Command assisted NASA in launching the Titan IV/B rocket safely by helping them choose safe launch times that would avoid known space objects.

The Risks

Due to the large cost (~$3.3 Billion) and the 72 pounds of plutonium that provide electrical power for the spacecraft, NASA made a special effort to improve launch safety to standards even greater than for manned space flights.

Each phase of the launch has different dangers. While under powered flight in the atmosphere, the greatest danger is catastrophic booster failure. Once it is clear of the Earth's atmosphere the danger comes from collision with one of almost 10,000 known resident space objects (RSOs) traveling at 5 kilometers per second in orbit around the Earth.

Depending on the exact time of launch, Cassini was programmed to "coast" from 10 to 30 minutes in low Earth orbit to align itself with Venus. During this phase it was particularly vulnerable to the considerable space debris in orbit. If Cassini were struck by a piece of debris at this time, not only would it end a very expensive mission, it could possibly shower the Earth with plutonium over a considerable area.

The risk of such an event was about 1 in 10,000. By calculating safe launch times that attempt to avoid known space objects, the figurative "space needle" is threaded and chances of a collision decrease to about 1 in 1,000,000.

The Solution

To provide this level of safety, NASA asked U.S. Space Command to provide collision avoidance (COLA) calculations. Until this launch, COLA support consisted of taking the predicted final orbit, rectifying it for each possible launch time, and comparing it to the catalog for possible conjunctions.

This process, known as launch window screening (LWS), assumes a final orbit will be around the Earth, but does not account for the time a satellite would be under powered flight. Since Cassini would experience a combination of powered flight and coast phases while in proximity to the Earth, historic LWS would not protect Cassini until it was past the majority of the danger.

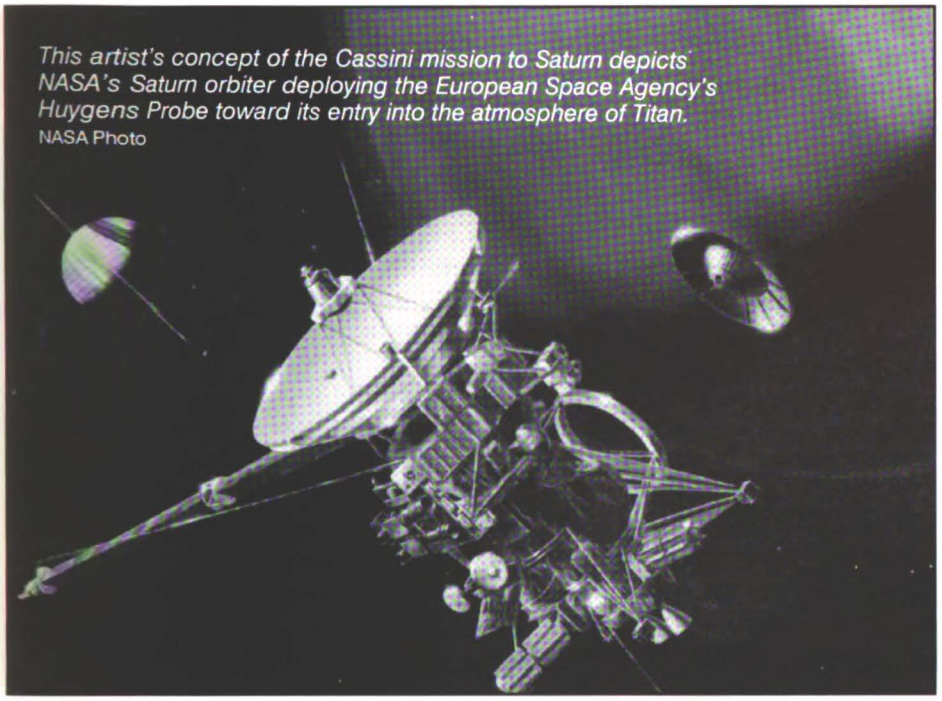
NASA's Lewis Research Center, USSPACECOM and NAVSPACECOM studied the problem and identified a solution.

The launch opportunities for the Cassini mission consisted of 140 minutes and two launch azimuths each day for up to 86 days. With the speeds of RSOs and Cassini, the exact second of launch was critical to the calculations. This meant that 10,800 launch times would need to be considered each day. This put COLA support in the realm of supercomputing.

Fortunately, the Titan IV/B booster that Cassini was riding is the only booster in the inventory that can guarantee the launch time to within 1 second of the start of a minute. This reduced the launch windows to just 180 per day, allowing calculations to be done with existing computing resources.

USSPACECOM contracted Kaman Sciences Corporation to write a software application to calculate these safe launch windows. The software (Caliper) was hosted at both USSPACECOM and Naval Space Command. Both centers would make the runs with their respective RSO catalogs and the two outputs would be merged before being delivered to NASA.

The Caliper software was written to take input from a trajectory file that closely modeled the exact flight path to the



This artist's concept of the Cassini mission to Saturn depicts NASA's Saturn orbiter deploying the European Space Agency's Huygens Probe toward its entry into the atmosphere of Titan.
NASA Photo

booster and satellite. This feature makes the software not exclusive to Cassini and will soon become the way we support all Titan launches.

NASA requested that runs be made at the 48-hour, 24-hour, and 4-hour points before each possible launch day. This allowed for refinement in the orbits of the possible conjunction satellites through increased sensor tasking and manual differential correction of the element sets.

How It Went

Due to some minor pre-launch damage to the Hyugens Probe, the first attempt to launch Cassini was delayed to Oct. 13. Starting on Oct. 11, both centers started running Caliper, merging the results and posting them to their unclassified bulletin board systems.

By launch day, each center was producing three runs per day: a 4-hour run for that day's launch, a 24-hour run for the next day's launch, and a 48-hour run for the day after that.

Due to several technical glitches, such as trouble fueling the Centaur upper stage and the wind blowing the wrong direction, the launch was delayed 48 hours until Oct. 15. On the 15th, of the 180 launch opportunities, 16 were closed to conjunctions with known satellites. NASA took these windows and launched Cassini on the very first safe launch opportunity for that day.

The Titan IV/B booster performed well and placed the Centaur/Cassini package safely into the parking orbit. Within minutes of achieving this orbit, the Centaur fired and within two hours propelled Cassini past the geosynchronous belt and on its way to Saturn at nearly 20 kilometers per second.

The Future

On the day Cassini was launched, 16 of 180 launch opportunities were closed. For this minor inconvenience, the probability of a successful launch was increased by 10 to 100 times. In the near future, the Caliper software will be improved and procedures will be in place to support all Titan launches by early 1998.

As the catalog of space objects continues to grow, COLA processing like this will become even more important for reducing the great risks taken launching satellites and people into Earth orbit and beyond.

Author Jonathan P. Boers is a mission analyst with Naval Space Command at Dahlgren, Va., in charge of the Sensor Operations Section.

Defending the Korean Peninsula

ULCHI FOCUS LENS EXERCISE REPORT

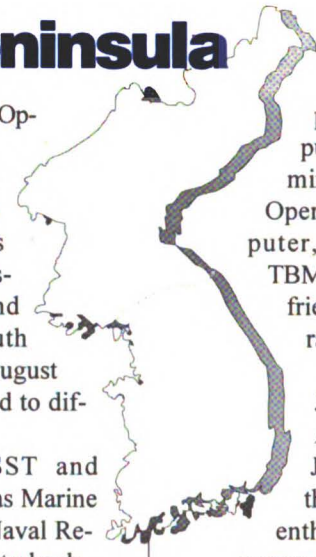
By LT Clifton Phillips

North Korean forces begin what appears to be war preparations. As tension increases, U.S. troops and ships rush to the aid of our South Korean allies. Finally after several cross-border incidents the North Korean invasion of the South begins with a volley of Scuds and other surface-to-surface missiles, some with chemical warheads. Thousands of troops pour across the border as South Korean and United Nation forces counterattack, both at the front and deep into North Korea with airstrikes and Tomahawk cruise missile attacks.

This scenario was played out last Aug. 17-29 in the 22nd annual South Korean exercise known as Ulchi Focus Lens (UFL). Sponsored by the Commander in Chief United Nations Command/Combined Forces Command (CINCUNC/CFC), this computer-generated "war" involved all military branches, including U.S. Space Command and components, which includes Naval Space Command.

Concurrent with UFL, U.S. Space Command sponsored an exercise called Apollo Lens designed to exercise space contingency procedures throughout all component commands. As a force enhancement, U.S. Space Command directed the Joint Space Support Team (JSST) and Naval Space Command's Naval Space Support Team (NSST) to deploy to South Korea for additional space knowledge, space procedures and space training to in-theater commands.

In addition to these Korean deployments, the Naval Space Operations Center (NAVSPOC) went to higher manning levels and sent two representatives to Peterson Air Force Base in order to support USSPACECOM's Space Operations Center (SPOC).



As the focal point for space expertise in Korea, the Naval Space Support Teams performed a variety of missions, both operational and training. Arriving in South Korea the second week of August the NSST members dispersed to different commands in-theater.

Working with the JSST and CINCUNC/CFC in Seoul was Marine Maj. Mike McDonald and Naval Reserve Lt.Cmdr. Tom Spriesterbach. This direct contact with the JSST prevented duplication of space efforts while providing training to command post personnel on their Tactical Receive Equipment (TRE) and the Standard TRE Display (S-TRED) computer in support of tactical ballistic missile warning (TBMW).

Several hundred miles south in Pohang, South Korea, Marine Reserve Maj. Mike O'Leary and Marine Capt. Mark Flannery were assigned to the Third Marine Air Wing (3rd MAW). Equipped with the portable TRE/S-TRED computer known as a "Hail" terminal and the Theater Space Operations Cell (TSOC) computer, the emphasis was on TBMW, satellite vulnerability to friendly forces, and GPS accuracy predictions.

Underway in the Sea of Japan on board USS *Blue Ridge* (LCC 19) was Lt.Cmdr. Julia Petritsch working with the staff of Commander Seventh Fleet. As a liaison and augmentee to Seventh Fleet's Space Cell, the emphasis was on training Navy watchstanders on space applications and products as well as ensuring proper ship-based TRE/S-TRED performance.

In addition to the normal 24-hour watch maintained at Naval Space Command's operations center, a NAVSPOC Watch Officer (NWO) and intelligence analyst were added to support all NAVSPOC functions. The NWO's liaison to U.S. Space Command's Crisis Action Team (CAT),

Naval Space Support Team members deployed to the Korean theater of operations to provide a wide range of products and training for Exercise Ulchi Focus Lens, including a team aboard Seventh Fleet's flagship USS Blue Ridge (above).

Naval Reserve Lt.Cmdr. Mike Udell and Lt. Jim Sauers, traveled to Peterson Air Force Base to augment the CAT.

Connectivity to the CAT, as well as deployed personnel, was maintained via the Global Command and Control System (GCCS) which uses a classified Internet-like communications path called the SIPRNET. Outstanding contact was maintained with overseas personnel via GCCS, even to afloat units. Daily situation reports and requests for information were sent from deployed personnel to the NWO for immediate action and response.

One example of the outstanding connectivity was a request from the 101st Airborne Division (via the Combined Marine Forces Command) to the NSST in Seoul for satellite multi-spectral imagery (MSI) of a planned parachute drop zone. Using GCCS e-mail, the NSST member forwarded the request and coordinates to the NAVSPOC where the NWO saw the incoming message and immediately forwarded it to Naval Space Command's MSI Cell.

Within 12 hours, over 300 megabytes of imagery data was loaded onto a CD-ROM and made available via the GCCS server. The Combined Marine Forces and 101st Airborne were able to chose from a list the images they needed, in the resolution they required, for download in time to support operations planning. This method of letting the customer "pull" the required information vice the sender "pushing" out information saved transmission time and valuable bandwidth.

As a way of testing established procedures, U.S. Space Command's Exercise Division developed a Master Scenario Events List (MSEL) which scripted space-related incidents within USSPACECOM's component commands for Exercise Apollo Lens. The MSEL development process began shortly after completion of UFL '96 to ensure a smooth and rational flow of events.

Naval Space Command developed one major and three minor MSEL injects for the exercise, ranging from a communications satellite jamming event, to a ground attack event, to the Alternate Space Control Center responding to a "fire" in the Space Control Center located at Cheyenne Mountain Air Force Base.

The yearly exercise to defend South Korea enabled Naval Space Command to display our customer support capabilities and to employ some of our best services and warfighter support. Concluding over 10 months of planning, coordination and execution, the command's Intelligence/Operations Division developed lessons learned for submission to U.S. Space Command, as well as to pass on to next year's coordinators to build on the standards set during Ulchi Focus Lens 97.

Author Lt. Clifton Phillips is a fleet support officer in Naval Space Command's Intelligence/Operations Division.

30 Plus Years of Satellite Operations Recognized

NAVSOC Earns Meritorious Unit Commendation

The Secretary of the Navy has awarded the Meritorious Unit Commendation to the Naval Satellite Opeations Center (NAVSOC).

Rear Admiral Patrick D. Moneymaker, commander for Naval Space Command, presented the award at NAVSOC headquarters in Point Mugu, Calif., at an informal ceremony on Oct. 10.

The award citation highlighted NAVSOC's operation and maintenance of the Navy Navigation Satellite System (or TRANSIT). NAVSOC, originally commissioned as the Navy Astronautics Group, operated TRANSIT from the time the satellite system first became operational in 1962.

In the 34 years that TRANSIT was operational, NAVSOC performed 107,000 satellite injections and 581,000 tracking passes. During that period, the command operated and maintained a 100-percent satellite system reliability.

Rear Admiral Patrick Moneymaker (left) presents the Meritorious Unit Commendation to Capt. M. M. Herbert, commanding officer for NAVSOC.

As a direct result of the daily care provided by NAVSOC personnel, several TRANSIT satellites extended their on-orbit life, passing 15 years of operational service, far exceeding their original four-year design life. TRANSIT fully supported every war, armed conflict and mission of importance to the defense and national security of the United States. Operational military use of the system ended in December 1996.

The SECNAV commendation also lauded NAVSOC's development of the Integrated Satellite Control System (ISCS) from April 1987 to December 1996. During that nine-year period, NAVSOC refined its TRANSIT operations, which resulted in a cost saving of $19 million, and at the same time increased operational efficiency and decreased manpower requirements. The implementation of ISCS was completely transparent to over 100,000 military and commercial TRANSIT users.

In addition to maintaining 100 percent availability of the TRANSIT system to the Fleet, NAVSOC flawlessly developed a viable ISCS used for commanding, tracking, and acquisition of telemetry for four different satellite constellations. ISCS provides worldwide connectivity, coupled with refined contingency plans, for a low-cost and robust Satellite Control System.

SPACE BILLETS

The following is a partial listing of officer billets with space missions, whose incumbents are scheduled to transfer between August 1998 and March 1999. For specific billet information and actual availability dates, contact your detailer.

Billets With Subspecialty Code XX75 (Space Systems - General)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
OPNAV N632F	TENCAP NATL SYS	1610	CDR	0075P		9808
SPAWAR SPTECH	DPF SUP/SPACE PJ TECH	1610	CDR	0075P		9809
NAVSOC PT MUGU	STF PLN/DIV OFFICER	1700	LT	0075S		9810
OSD	SA FOR SPACE POLICY	1000	CAPT	0075P		9811
NWARCOL NPT	ADV C&S INST/OPS PROF	1300	CDR	0075R		9902
DOD SPACE ARCH	STAFF ANALYST	1000	CDR	0075R		9902
OPNAV N2K2	ASST AGENCY COORD	1000	LT	0075S		9903

Billets With Subspecialty Code XX76 (Space Systems - Operations)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
CNSG FT MEADE	36 NSG SPEC OPS	1610	CDR	0076P		9808
NSGA W HARBOR	58 CLASSIC WIZ OPS	1610	LT	0076P		9808
USNELMDODPRJOF	EXERCISE AGENT	1050	LCDR	0046B	0076B	9808
USSPAC CB OPST	DEP CMDR	1700	LCDR	0076R		9808
COMNAVSPACECOM	POM/BUDGET	1700	LCDR	0031P	0076S	9809
USSPAC CB OPST	CMBT ANAL	1050	LT	0076S		9809
HQ NIMA	INTEL RQ ANL	1110	CDR	0076B		9809
COMANVSPACECOM	FLAG LT	1000	LT	0076S		9810
CNSC DT COL	AF LIAISON OFF	1000	LCDR	0076P		9810
CINCUSNAVEUR	INTEL SUPP	1630	CDR	0061P	0076S	9811
COM6THFLT	OPINTEL ANAL	1630	LT	0076S		9811
NAVSPACECOM	OPINTEL/ASCC DIV OFF	1050	LCDR	0076S		9811
NAVSPACECOM	OPINTEL/ASCC	1000	LTJG	0076S		9811
NAVSPACECOM	OPINTEL/NSST	1050	LT	0076S		9811
USSPAC CB OPST	SPACE CTL	1000	LTJG	0076S		9811
USSPACECOM	CH OPS READ	1050	CDR	0076P		9811
COMNAVSPACECOM	OPS/INTEL/ASCC	1700	LT	0076S		9811
USSPACECOM	COMM-COMP 6421	1700	LT	0076P		9811
USSPACECOM	MRP/IPL OFF	1050	LCDR	0076P		9812
USNELDODOF ACO	NATL SYS LIAIS	1050	LCDR	0076B	0046B	9812
DOD SP ARCH	SPACE REQ OFF	1050	CDR	0076P		9812
SPAWAR SPTECH	SPACERMT ANAL	1610	LT	0076P		9812
SPAWAR SPTECH	SPACE PJ TECH	1610	LCDR	0076P		9901
SPAWAR SPTECH	SPACERQMT ANAL	1000	LCDR	0076P		9901
USSPACECOM	TST OPS OFF	1000	CDR	0076P		9901
OPNAV N60C	COMM PLN&OPS	1000	LCDR	0089R	0076S	9901
USSPACECOM	INT TNG STF	1050	LCDR	0076S		9901
USNELMDODPRJOF	NTL SYS CUST REP	1050	LT	0076B		9902
DEFINTEL AGEN	IO/COLL MGT	1630	LCDR	0076S		9903

Billets With Subspecialty Code XX77 (Space Systems - Engineering)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
SPAWAR SPTECH	SPACE RQMT ANAL	1000	LT	0077P		9808
SPAWAR SPTECH	SPACE AQD	1510	LT	0077P		9809
NCCOSC RDTE DV	SPACE ACQ/RSCH	1510	CDR	0077P		9809
SPAWAR SPTECH	DEP DES PJ MGR	1510	CAPT	0077P		9810
SPAWAR SPTECH	DPJ SUP	1512	LCDR	0077P		9810
SPAWAR SPTECH	SPACE PJ TECH	1050	LT	0077B		9810
NAVSOC PT MUGU	ELX ENG/SAT MGR	1000	LT	0077S		9810
NAVSPACECOM	NSST	1700	LCDR	0077P		9811
DOD SP ARCH	CHIEF CAPAB DIV	1510	CAPT	0077P		9812
SPAWAR PMOSDGO	DPJ SUP/ASST PT	1050	LT	0077B		9903
SPAWAR SPTECH	HD, MEASURE DIV	1000	LCDR	0077P		9903

NAVSPACECOM Enlisted Billets at Dahlgren, Virginia

Following is the allowance for enlisted personnel at Naval Space Command, Naval Surface Warfare Center Dahlgren Detachment, Dahlgren,, Virginia. Dahlgren is located approximately 50 minutes from Washington, D.C., and three hours away from Norfolk, Va. The base is also home to the Aegis Training Center and the Navy's only active gun testing range. You will also find a small Navy exchange, commissary, gymnasium, auto and wood hobby shops, year-round pool, library, chapel, theater, and numerous outdoor recreation facilities. If you would like more information about one of the Navy's "best kept secret" duty stations, or would like a welcome aboard package, feel free to contact LCDR J. Hoffman at DSN 249-6143 (e-mail address: jhoffman@nsc.navy.mil) or the Command Master Chief, ETCM Kinder. Master Chief Kinder can be reached at DSN 249- 6115 or commercial (540) 653-6115 (e-mail address: akinder@nsc.navy.mil). If you are interested in receiving orders to Naval Space Command, contact your detailer.

CTA:	E7:1		E5:2	E4:1
CTR:		E6:1	E5:2	
CTT:		E6:2		
DP:			E5:1	
DS:		E6:1	E5:1	
EA:	E7:1			
ET:	E7:1	E6:1	E5:3	E4:2
EW:	E7:1		E5:2	E4:2
IS:	E7:1	E6:2	E5:4	E4:3
NC:	E7:1			
OS:	E7:3	E6:5	E5:3	E4:13
RM:	E7:2	E6:3	E5:8	E4:1
SK:			E5:1	
YN:		E6:1	E5:2*	

*One YN2 billet is TAR.

BATHYMETRY FROM SPACE

Initiative Reveals Details of the Littoral Battlespace

By Lt. Bobby Pullin

Information regarding currents, water depth, water clarity, natural and manmade obstacles either onshore or offshore, beach exits, and onshore/offshore beach conditions are paramount to successful amphibious planning and operations. In some cases the most current bathymetric information is years old, and in others it may date back to British Admiralty surveys.

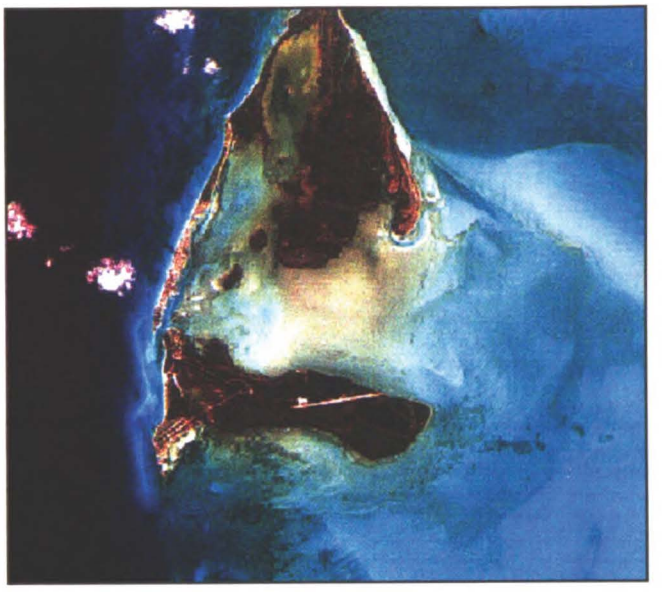
Naval Space Command has been working on a program called quantitative shoreline characterization (QSC) since 1995. The main goal of this program is the characterization of the near shore/littoral region of the battlespace.

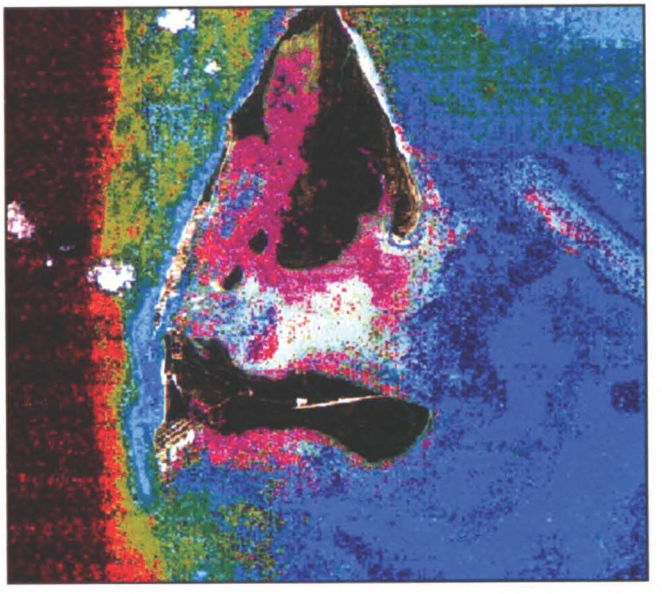
Since current bathymetry data is often not available in deployment or denied areas, spectral imagery offers a means of supplementing available data for warfare and amphibious planning. Bathymetry charts prepared from spectral imagery provide information on depth of near-shore channels, reefs, and underwater obstacles/obstructions to a depth of about 40 meters.

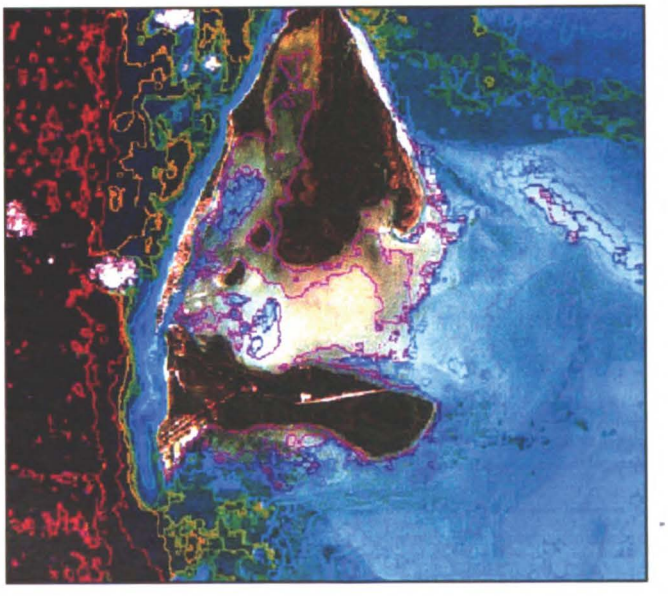
The accuracy of extracted depths is significantly degraded in areas of turbid water or areas with submerged vegetation. Still, extraction of bathymetric information from spectral imagery does provide tangible and useful information even if it provides only an 80 percent solution.

Bathymetry is defined as the measurement of water depths in oceans, lakes, and streams. Substantial efforts in the past have been aimed at extracting bathymetric information from airborne and spaceborne multispectral sensors with varying degrees of success. Many factors affect the ability to accurately extract bathymetric information including variations in atmospheric conditions, illumination/viewing geometries, variations in bottom surface composi-

*(Please see **Bathymetry** on page 12)*







The images shown here are initial BETA products provided by the QSC software. The top figure is a true-color Landsat image of Bimini Island in the Bahamas, the intitial testing site. Bimini Island was selected as a test site due to the quantity and accuracy of ground truth information. The middle figure is the initial output of the QSC software providing color-coded depths. The colors can be changed to any desired by the operator. In this case, stark contrasting colors were used to display the ability of QSC to discern the varying depths in the image and land mass. The magenta represents very shallow depths of 0-0.6 meters, red 0.6-1.3, blue shades 1.3-5.8, green shades 5.8-12.2, tan shades 12.2-25, and brown greater than 25 meters. The bottom figure represents the next stage of automatically assigning depth contours to the image and using colors to represent the different depth contours.

Bathymetry

(Continued from page 11)

tion, water column characteristics, and the synergistic effects of different depths, bottom surface material, and water column properties interacting within a single pixel.

Naval Space Command's initial bathymetry capability was very command line intensive and required significant keyboarding to run the various file format conversions, extract pixel radiance, and analyze linear regression. In an effort to make the entire process more "user friendly," NAVSPACECOM contracted to have the capability refined and integrated into the ERDAS "Imagine" image processing application.

In addition to the bathymetric depth extraction features, functionality to determine pixel constituents at the subpixel level were added. Additional functionality includes the evaluation of water column turbidity and the extraction of suspended mineral, dissolved organic carbon, and chlorophyl concentrations. From the water column turbidity, estimations of the vertical and horizontal subsurface sighting range can be made which help to determine visibility.

The current functionality is being expanded to utilize hyperspectral imagery in additional broadband multispectral imagery such as Landsat. It is expected that the incorporation of hyperspectral imagery will provide more accurate prediction, characterization, and identification of depths, turbidity, and bottom surface materials.

Beta products produced using the new QSC software are very promising and appear to correlate very well with ground truth. As the QSC development comes to completion, the final step is to perform a validation to ensure that the algorithm produces accurate and reliable information.

Discussions are currently underway between Naval Space Command and the Naval Oceanographic Office (NAVOCEANO) to determine the feasibility of NAVOCEANO performing a validation and taking possession of the entire QSC project/program. This would enable QSC to reside at the location which best serves the warfighter. The thought is that once QSC is verified and accepted, it will transition into the Warfighter Support Center where it can be used to support real-world operations. It has also been mentioned that QSC may be a candidate for incorporation into the Common Spectral MASINT Exploitation Capability. If this happens, the whole effort will be a successful migration from a research and development effort to a prototype module and finally into an operational and useful tool.

In follow-on products, an actual depth scale can be provided using colors and listing the depth scales for each color to allow easy interpretation of the depth. The timelines required to produce products using QSC vary depending on data availability, quality, and whether the signatures on hand are sufficient.

The main goal for QSC is not to have to develop training sets and signatures for each area, but rather to have a set of high confidence signatures or a signature library that adequately represents a broad range of water types, depths, and bottom surface materials. This library can then be applied, within reason, to any geographic area for which bathymetric analysis is required.

Author Lt. Bobby Pullin heads Naval Space Command's Multi-Spectral Imagery Cell at Dahlgren, Va.

SPACE TRAINING

ISIOC (Interservice Space Intelligence Operations Course)
The ISIOC is offered to military and civilian personnel (0-4 and below) at the SI/TK level, in all the armed services who work as space system operators. This course is also excellent for those involved in Command and Control Warfare (C2W) activities. Classes remaining for FY98 are:

2-13 FEB 98	15-26 JUN 98
23 FEB - 6 MAR 98	20-31 JUL 98
30 MAR - 10 APR 98	17-28 AUG 98
20 APR - 1 MAY 98	14-25 SEP 98

11-22 MAY 98 (MOBILE TRAINING TEAM AT DAHLGREN)

ISIOSC (Interservice Space Intelligence Operations Senior Course)
A condensed version of ISIOC, the ISIOSC is offered for senior officers, O-5 and above, also at the SI/TK level. Classes remaining for FY98 are:

17-20 MAR 98
2-5 JUN 98
1-4 SEP 98

ISFC (Interservice Space Fundamentals Course)
The ISFC is offered to Army, Air Force, Navy and Marine Corps officers, enlisted personnel, and civilian employees entering nonoperator staff positions who need to be knowledgeable of space operations, activities and environment. This course covers a fundamental presentation of the physical environments of space and the potential effects on manned and unmanned space systems. ISFC is offered at the SECRET clearance level. Classes remaining for FY98 are:

2-13 MAR 98	27 JUL - 7 AUG 98
6-17 APR 98	17-28 AUG 98
4-15 MAY 98	14-25 SEP 98
1-12 JUN 98	

All courses are conducted at the Air Education and Training Center, Colorado Springs, Colo., unless otherwise indicated. To obtain a quota, or for further information, contact B. Watson at commercial (540) 653-5151: DSN 249-5151 or e-mail bwatson@nsc.navy.mil. The following information is needed to obtain a quota: NAME; RANK/RATE/DESIG; SSN; UIC; BILLET TITLE; and PHONE/FAX#.

Commercial Satellite Communications in Navy ... Transitioning from Challenge Athena to "ATS"

AFLOAT TELECOMMUNICATIONS

Operations Desert Storm and Desert Shield identified many tactical deficiencies and joint interoperability problems due to the Navy's inability to receive or transmit large-volume information in a timely manner at sea. The fact that Air Tasking Orders had to be flown from shore to afloat platforms, and then transferred to smaller ships in the task force via helicopter, was one well-publicized example of this information dissemination handicap.

Navy's Special Project Challenge Athena was conceived to use commercial communication satellites and facilities to provide high-data-rate communications to ships. Current military communication satellites do not have the bandwidth expansion needed for naval ships with increasing high-data-rate requirements. The use of commercial satellite communications parallels and augments the connectivity available through the Defense Satellite Communications System (DSCS). DSCS provides a "core" communications capability which is relatively secure and reliable. Project Challenge Athena, now in its third phase (CA III), has successfully demonstrated the ability to handle naval high-data-rate needs, providing a "non-core" communications pathway not otherwise available on DSCS.

The basic concept of Challenge Athena is to demonstrate in three phases that commercial satellite communications capabilities can be used to meet burgeoning naval requirements. The Challenge Athena concept was born in the thesis work of Cmdr. John Hearing, a space systems operations student at the Naval Postgraduate School, now assigned at Strike University, NAS Fallon, Nev. Challenge Athena I was the first phase of a program funded to test this concept of commercial SATCOM in Navy and consisted of a 4-Ghz receive only (simplex) terminal installed on USS *George Washington* (CVN-73). The receive-only capability of high-quality transmission to the ship at data rates of 750 kilobits per second (kbps) to 1.5 megabits per second (Mbps) was a stunning success during a month-long, at-sea, test period.

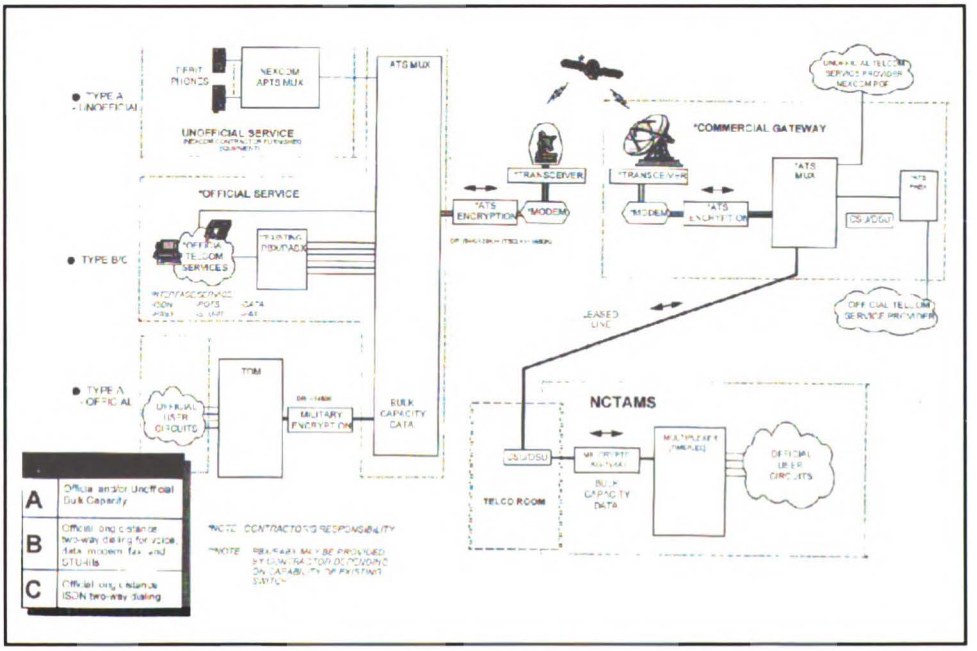
Challenge Athena II, the second phase of the program, was planned to emphasize full duplex (transmit and receive) operations. During this phase, commercial SATCOM supported *George Washington* and the staff of President Clinton during a data-intensive 50th anniversary remembrance of the Normandy invasion.

Challenge Athena is now in its third and final phase, involving USS *Carl Vinson* (CVN-70), USS *Blue Ridge* (LCC-19) and USS *Belleau Wood* (LHA -3), and has been remarkably successful in providing high-data-rate communications to afloat vessels. The inclusion of a "Sailor phone" capability has made a dramatic improvement in quality of life for our forces at sea.

The Challenge Athena program has ably demonstrated that high-data-rate telecommunications are possible in a tactical environment using the commercial satellite communication infrastructure. Challenge Athena allows global connectivity at high data rates virtually worldwide. The tactical value of this capability is remarkable, and it has revolutionized the employment of information in naval operations.

The genesis of Challenge Athena was the need to disseminate national primary imagery for support of tactical air operations, Tomahawk mission planning, and battle damage assessment. Challenge Athena now allows near-real-time imaging data to be transmitted to the theater of operations during normal and surge conditions. Improving national imagery service to afloat forces clearly proved the tactical advantage of high-resolution imagery in planning strike operations. This decisive edge in battle planning could not have been enabled without the information dissemination capability of Challenge Athena.

*(Please see **ATS** on page 14)*



A conceptual architecture for the Navy's Afloat Telecommunications System is depicted in this illustration.

ATS

(Continued from page 13)

A second capability new to the sea services, brought through the value added of commercial SATCOM, is live two-way video. Video teleconferencing allows ship and shore staffs to conduct "virtual" meetings with other naval commanders, while separated by thousands of miles. This conferencing capability has saved hundreds of man-hours and volumes of message traffic. Yet, its greatest value is in the improvement of personal communication between naval commanders, enabling a direct sharing of opinions, inflections, and goals in ways that message traffic can never quite convey.

Video tele-training has brought classroom-style training on board the ship with video teaching aids, showing hands-on instruction and significantly expanding Navy's at-sea education offerings.

Telemedicine and medical imagery services allow deployed naval forces to interface directly with hospitals to obtain complex medical information and instruction (in real time) during normal or life-threatening situations. The telemedicine service has demonstrated huge dividends in enhancing the health and welfare of an entire battle group. Shipboard physicians scan and digitize sailors' X-rays and transmit them to the National Naval Medical Center in Bethesda, Md., for review by specialists ashore. Many medical problems have been diagnosed and treated at sea without the need for medical evacuations and changes to ship steaming plans.

Dial-up telephone service has also come as a benefit of Challenge Athena. This capability allows secure or personal telephone service from the ship to anywhere in the world. Previously, deploying aircraft carriers would normally have had available four to eight telephone lines provided via INMARSAT or DSCS connections. Challenge Athena can now provide 24 telephone lines for official use, to be shared by the battle group staff, air wing, and the ship's company.

The intent of the Challenge Athena program has been to demonstrate the limited conceptual feasibility of using commercial satellite communications systems to support military requirements during surge operations, at high data rates. The goal is to now progress to a totally commercial venture for all naval vessels. The rapidly expanding need for additional bandwidth to supplement DSCS at sea has led to a program known as the "Afloat Telecommunications System" (ATS) to provide a robust mix of commercial SATCOM services to all naval vessels.

During the 1994 Challenge Athena deployment of *George Washington*, the system demonstrated full duplex T-1 (1.54 Mbps) operation with an additional 64 kbps of excess bandwidth that was used for personal telephone calls by the ship's crew.

Also in 1994, and in a departure from traditional strategy, the Navy Exchange Service Command (NEXCOM) used non-appropriated fund license agreements to outfit 35 naval vessels with vendor-capitalized equipment and services, supporting off-ship personal telephone calling for the ship's crew.

More Bandwidth at Competitive Rates

In response to the success of the NEXCOM Sailor phone capability, and the innovations in acquisition strategy needed to procure commercial SATCOM, Navy has developed a plan for the Afloat Telecommunications Service, or ATS. This radical new approach to contracting will enable Navy to provide a significant bandwidth capability to most ships, and at highly competitive rates.

Several studies have been conducted by the Space and Naval Warfare Systems Command (SPAWAR), the Defense Information Service Agency (DISA), and the Chief of Naval Operations to define the needs for ATS. ATS represents an innovative, non-traditional acquisition strategy for telecommunications services that encourages the inclusion of increased communication capability, with performance and reliability improvements as they become available.

ATS will accommodate various ship requirements through four types of telecommunications service. All four types of telecommunication service are not compatible with all ships. Therefore, ships that are to be serviced under the ATS program are divided into three categories. Category 1 is specified for large-ship, high-capacity users typically requiring dedicated bulk capacity of at least T-1 (1.54 Mbps) service. Category 2 is specified for ships with medium-capacity users typically requiring on-call or per-use services. Category 3 is specified for ships with medium-capacity users typically requiring on-call or per-use services, and with mission restrictions that require topside shipboard systems to incorporate low-radar-signature attributes.

INMARSAT and C-band SATCOM will be used to provide multi-line, personal-use, off-ship-dialing phone service to a variety of ships. Future Mobile Subscriber Service (MSS) SATCOM systems, implemented through large constellations of low- and mid-Earth-orbiting satellites, may also be capable of providing telecommunication services to seagoing vessels.

In FY98, Navy will distribute 1,500 Iridium phones to ships for the first wave of this MSS revolution in satellite-based telephone service. ATS will also provide the Navy with a contractual vehicle through which ships will obtain long-distance phone, ISDN, and bulk capacity service through commercial SATCOM.

In FY98, SPAWAR will compete the ATS contract, and a contract will be issued in early calendar year 1998. A single service provider will oversee all elements of the Navy commercial SATCOM program. Contracting for transponders, establishing billing, commissioning terminals, purchasing and installation of terminals, terminal maintenance, and future planning will all be the responsibility of the contractor.

Much like the use of cellular telephones for which the phone company gives away a phone but charges for service, the ATS contractor will eventually build the cost of terminal equipment and maintenance into the service fee for the bandwidth used by the ship. Navy anticipates significant savings through this contracting approach, with a "bulk buy" through one contractor.

The Naval Space Reserve Program

The High Frontier of Naval Warfare

By Lt.Cmdr. Harold Moffitt

Across all aspects of modern air, surface, and undersea warfare, there's not one facet of modern naval warfighting operations, from the ocean depths to outer space, that is not significantly enhanced by space technology. And nowhere else in the Fleet are there so few men and women having such a significant impact on the supremacy of current and future naval warfare operations as the select reservists of the Naval Space Reserve Program (NSRP).

Space-enhanced military capabilities for all military services today include the mission critical functions of command, control, communications, computer and intelligence (C4I), navigation, environmental/weather, surveillance and warning, and science and technology. The Navy in particular, has long been the largest DoD user of space-derived products that are essential to tactical, strategic, intelligence, and battleforce management.

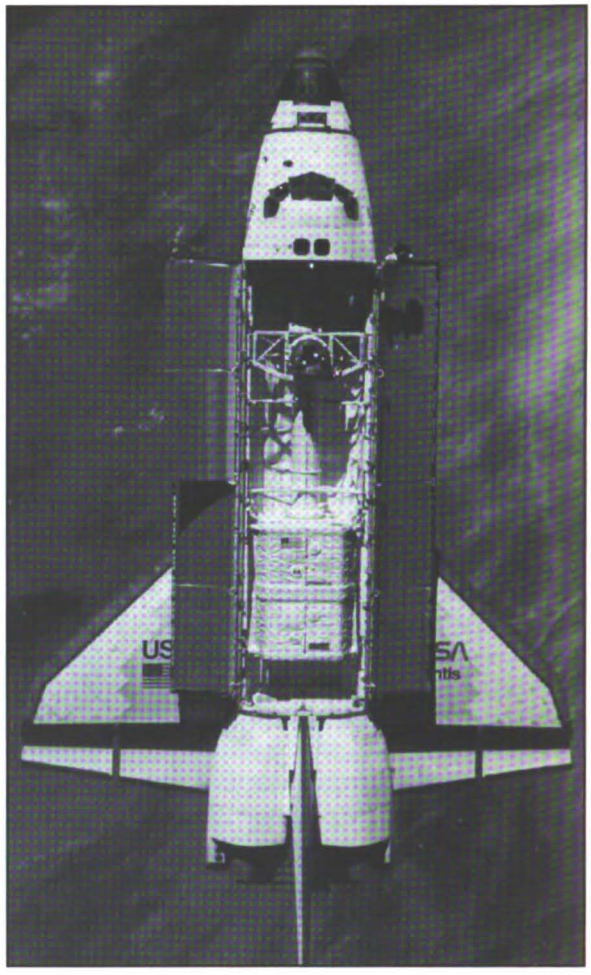
After the extraordinary ten-fold growth since the "launch" of the first Naval Space Reserve unit, NR NAVSPACECOM 0166, in 1984, the Naval Air Reserve Force (COMNAVAIRESFOR) formalized the seven individual reserve space units into the NSRP in March 1995 with the mission to "provide the gaining commands of U.S. Space Command, Naval Space Command, the Space and Naval Warfare Systems Command, and other national agencies with highly trained, skilled, and technically qualified military personnel to augment the peacetime staffing allowance and during times of crisis or national emergency."

Successfully executing this highly challenging mission with today's eight NSRP units and the Office of Naval Research (ONR) program affiliate includes continuing state-of-the-art professional development, training, and exercise and operations support via drills, annual active duty for training (ADT), and active duty for special work (ADSW), to constantly maintain and improve the Navy and Marine Corps' decisive command and control warfare (C2W) technology advantage over any potentially hostile force. The space warfare professionals of the NSRP support a broad spectrum of DoD and naval missions including concept development, systems engineering and integration, operations, warfare integration, tactical applications, professional education and training, exercise support, and space policy development.

Naval Reserve Capt. Steve Oswald, director of the Naval Space Reserve Program, pilots the landing of Space Shuttle Discovery *during mission STS-42.* NASA Photo

Naval Space Reserve command emphasis on "seamless integration," "contributory support," and drilling "during the week" alongside active-duty counterparts

*(Please see **Reserves** on page 16)*



Naval Reserve Capt. Bill Readdy (top), manager for NASA's Space Shuttle Program Office in Houston, commands Space Shuttle Atlantis *(right) toward a historic docking with the Russian* Mir *space station during* mission STS-79. NASA Photos

Space Professionals Enhance Military Operations

Reserves

(Continued from page 15)

at the gaining commands has been a key hallmark of NSRP units since 1984. NSRP members performed nearly 1,200 days of contributory support in FY96.

In addition to performing monthly drills providing contributory support at the gaining command locations, many NSRP Reservists today regularly spend more than 30 days a year on fast-paced active-duty assignments around the globe. With the continuing downsizing of the active-duty forces, and the expanding role of the U.S. military in regional operations, the NSRP provides gaining commands and national agencies with a critical array of space technical and operational expertise, and long-term continuity. Today's NSRP Reservists provide an outstanding model of the fully integrated Total Force concept in daily action.

NSRP Organization

The majority of NSRP units are centered around Washington, D.C. Under Rear Admiral Stephan Keith (COMNAVAIRESFOR) and Capt. Earl Perry at NAF Washington, the NSRP has over 250 officers and enlisted billets filled by representatives from the aviation, surface, submarine, intelligence, cryptology, engineering, oceanography, and Fleet Support communities.

NSRP units also include "joint" billets filled by reservists from the Army, Air Force and Marine Corps. In their "day jobs," NSRP Reservists are space professionals from government and industry with extraordinary expertise in aviation, surface, subsurface, space and electronic warfare, intelligence, engineering, crypto-logy, and command, control, and communications (C3), and manned space flight.

In addition to the core NSRP units, a memorandum of understanding was signed for mutual support between the NSRP and the Naval Science and Technology Reserve Program (NSTRP) — Naval Surface Reserve Force (COMNAVSURRESFOR) Program 38 — sponsored by the Office of Naval Research (ONR) and the Naval Research Laboratory (NRL).

For the individual unit descriptions that follow, it is important to note that the majority of the projects and programs described are routinely supported by members from across NSRP and NSTRP.

NR DIR SPAEW HQ 0666

The headquarters unit, under the command of the NSRP Director, Naval Reserve Capt. Steve Oswald, augments the crisis support requirements of the staff of the Chief of Naval Operations in the areas of communications, surveillance, environmental, and Navy Tactical Exploitation of National Capabilities (TENCAP). Members of the 0666 unit support the Naval Space Systems Division (N63), the office responsible for developing the Navy's composite program of space system utilization to perform surveillance, communications, navigation, command and control, environmental remote sensing, targeting, and warning functions. N63 is also the principle office responsible for command and control space matters, policy and planning for space exploitation, and the defense of critical space systems. Collateral duties for the NR DIR SPAEW HQ 0666 commanding officer include serving as the director of the NSRP.

NR NAVSPACECOM 0166

The first Naval Reserve space unit was "launched" in October 1984, just one year after the establishment of the Naval Space Command (NAVSPACECOM) to consolidate the Navy's extensive space efforts in support of the national maritime strategy. As the naval component of the U.S. Space Command, NAVSPACECOM is responsible for organizing, training, equipping and administering Navy and Marine forces.

Under the leadership of the late astronaut, Naval Reserve Rear Admiral David Griggs, the 0166 unit quickly integrated with the gaining command located in Dahlgren, Va. Reserve unit structure paralleled the gaining command in the key functional areas of space operations, space surveillance, satellite communications, space plans and requirements, environmental remote sensing, and Fleet education and training.

Today, there are two Reserve units assigned to Naval Space Command to provide contributory and crisis response support: NR NAVSPACECOM 0166 and NR NAVSPACECOM 0266. Under the command of Naval Reserve Capt. Randy Nees, the 0166 unit provides the gaining command support in the areas of space support, information systems, space plans, and management support.

Space support includes direct tactical support to the Fleet for real-world operations (e.g. Exercise Joint Endeavor), exercise support such as Roving Sands and the Joint Warrior Interoperability Demonstration (JWID), and the execution of TENCAP demonstration projects such as RADIANT ELM for strike mission planning, and RADIANT GOLD for theater ballistic missile defense.

Information systems support includes augmenting the NAVSPACECOM active-duty communications and data processing infrastructures. Space plans determines the requirements for future space systems, and actively supports space-related wargames at the service war colleges.

Members of 0166 have actively supported numerous "Military Man in Space" (MMIS) experiments while assigned to the joint-service DoD Space Test Program (STP) office at NASA's Johnson Space Center in Houston, Texas, since 1986. In addition to providing pre-flight mission critical engineering and operations development to the DoD's highest priority Space Shuttle payloads, 0166 Reservists have provided real-time mission support from NASA's Shuttle Mission Control Center for numerous DoD Shuttle experiments.

0166 personnel also have supported the DoD Manned Space Support Office, a USSPACECOM chartered organization, to provide worldwide support and coordination of DoD assets in the event of a shuttle contingency requiring crew rescue. After extensive training, Reservists stand round-the-clock watches as support operations controllers at Cape Canaveral Air Force Station during all shuttle missions.

Early Fleet educational support by 0166 Reservists to the U.S. Naval Academy has resulted in an operational satellite control ground station and Spacecraft Artificial Intelligence Laboratory (SAIL). A joint Navy/NASA project, SAIL is used to support USNA classes with real-world spacecraft data and provides an advanced engineering testbed to evaluate automation and machine intelligence technologies for the command and control of space systems.

The continuing efforts of 0166 Reservists in advancing space education continues to pay significant benefits of providing "space savvy" officers and enlisted personnel to the Fleet. 0166 members have proactively participated in regular academic reviews at the USNA Aerospace Engineering Department, Naval Postgraduate School (NPS) space operations and space systems engineering programs, and the Interservice Space Intelligence and the Interservice Space Fundamentals courses. Additional Fleet educational support by 0166 members included writing the "Navy Space Correspondence Course," a self-paced training tool for both enlisted and officer personnel. In cooperation with NASA, the unit produced the award-winning "Fundamentals of Space Flight" training videotape.

NR NAVSPACECOM 0266

With Naval Reserve Cmdr. Bob Wright at the helm, the members of 0266 focus on naval space operations support, multispectral imagery (MSI) production, and the NAVSPACECOM Operations Center (NAVSPOC). 0266 Reservists augment the NAVSPOC and supporting activities during crisis periods and provide watch position contributory support during inactive and active periods. Located in Dahlgren, Va., the key roles of the 24-hour "space watch" in this critical naval space command center include supporting the Fleet and Fleet Marine Forces with access to and tactical utilization of space-derived data, and serves as the USSPACECOM's Alternate Space Control Center (ASCC).

As the ASCC, the NAVSPOC provides operational direction to the Naval Space Surveillance System portion of the national Space Surveillance Network (SSN), and provides a complete operational backup to the USSPACECOM Space Control Center (SSC) located at Cheyenne Mountain Air Force Base in Colorado Springs Colo. The ASCC missions include operational direction of the entire global SSN for CINCSPACE. ASCC provides data that includes detection of new space launches and maintenance of the "space satellite catalog" of over 8,000 objects that are tracked in Earth orbit, much of which is "space debris." Positions of these space objects are routinely compared to positions of the Space Shuttle and Russian space station *Mir* to determine if orbital "obstacle avoidance" maneuvers may be required to protect U.S. astronauts and Russian cosmonauts.

0266 members provide complete end-to-end production of MSI using imagery from the LANDSAT and SPOT environmental satellites. During the past year, over 300 image products were provided in support of deployed naval forces in Haiti, Bosnia, Korea, and the Middle East. As a result of increased emphasis on joint lit-

*(Please see **Reserves** on page 18)*

Reserves

(Continued from page 17)

toral warfare, MSI imagery processed by 0266 Reservists provides many critical tactical applications including mission rehearsal, amphibious landing support, combat search and rescue, and target area analysis.

New initiatives for the 0266 unit include supporting the deployment of the Joint Tactical Ground Station (JTAGS) and an advanced Navy version (JTAGS-N) to provide rapid in-theater reporting of tactical events detected by the Defense Support Program (DSP) satellite system.

NR SPAWAR HQ 0366

Under the command of Naval Reserve Capt. Scott Granger, 0366 provides crisis response and mission contributory support as a component of the naval space and national space infrastructures for the management, development, acquisition, tactical integration, and operations of classified space systems and their ground segments. 0366 is a "joint" reserve unit with Army, Air Force and Marine members serving in operational billets.

Since 0366's formation in 1989, NSRP Reservists have supported the Navy and national agency customers in providing optimum use of national systems data to worldwide, theater-level and individual unit forces in both exercise and real-world operations.

In 1995 and 1996, 0366 Reservists were instrumental in the startup of the Joint Broadcast System (JBS) which provides time-critical intelligence data to front-line naval, joint, and allied forces in supporting Joint Endeavor. In 1996, SPAWAR 0366 became the first military reserve unit to be awarded the prestigious National Intelligence Meritorious Unit Citation in recognition of support of 27 different JCS-directed, joint-service, and naval exercises.

NR SPAWAR HQ 0466

Under the command of Naval Reserve Capt. Rick Ryan, SPAWAR 0466 provides contributory support and mobilization qualified personnel to augment critical acquisition support functions of the Program Executive Officer for Space Communications, and Sensors (PEO-SCS); the Space and Naval Warfare Systems Command (SPAWARSYSCOM) Chief Engineer; and the Intelligence, Surveillance, and Reconnaissance Directorate (PD18). The 0466 also supports the Deputy Assistant Secretary of the Navy (DASN) for C4I/Space as the principle advisor to the Assistant SECNAV (ASN) (RD&A) for C4I, EW, and Space.

Located in Crystal City, Va., 0466 NSRP Reservists play key roles in the development and initial operations of mission critical satellite programs including the Ultra-High Frequency Follow-On (UFO) and the Geodetic/Geophysical Follow-on (GFO) satellites. The UFO satellite program is a critical link in providing global tactical communications for naval forces worldwide. As the operational replacement for the Fleet Satellite Communications System (FLTSATCOM), UFO provides the Fleet with significantly enhanced bandwidth and data communications capability. Members of the 0466 unit and other units have been active in supporting pre-launch preparations, launch countdown, and initial orbital checkout of the UFO spacecraft since the launch of the first satellite in 1993, and will also support launches in 1998 and 1999. Reservists are also actively supporting ongoing advanced studies to define future military satellite communication architectures for the 21st century to maintain the Navy's battlespace dominance.

In addition to satellite communications programs, Reservists of the 0466 unit provide engineering, flight assurance, and mission operations support to the SPAWAR PMW-185 Meteorological System Program Office in the development of GFO as the replacement for the GEOSAT global geodetic survey satellite, which provided tactical oceanographic data from 1985 to 1990. In addition to supporting military users, environmental data from the GFO will be made available to scientific and commercial users. 0466 support to the DASN/C4I, EW and Space is oriented to providing policy and technical assessment support to a myriad of wide-ranging C4I issues.

NR SPACE VTU 0566

Under the command of Naval Reserve Cmdr. Bob Knight, the 0566 unit provides a unique cadre of highly qualified senior officer space warfare professionals to augment the NSRP units as required.

NR USSPACECOM 0188

Naval Reserve Capt. Jim Bowlin is the commanding officer of the Navy Service Element of the first DoD Joint Aerospace Reserve Program (JARP) unit. This Reserve component of the "Rocky Mountain Navy" provides Reserve personnel to satisfy USSPACECOM and North American Aerospace Defense (NORAD) command mission requirements, to provide timely and effective air and space

support to the warfighters aligned with the USSPACECOM mission areas.

0188 Reservists support the four mission areas of USSPACE-COM: space control, space support, space force enhancement, and space force applications. Located at Cheyenne Mountain Air Force Base, deep inside a hollowed-out, 100-million-year-old mountain near Colorado Springs, 0188 personnel support mobilization billets in the Space Surveillance Center (SSC), Missile Warning Center (MWC), and the Joint Space Intelligence Center (JSIC).

The USSPACE-COM mission also includes operations of key DoD space systems including the Defense Support Program (DSP), Defense Satellite Communications System (DSCS), Global Positioning System (GPS), and Air Force Satellite Communications (AFSAT-COM) System payloads, as well as the Defense Meteorological Satellite Program (DMSP). The DSP satellite system is an integral part of the Theater Event System (TES), a theater ballistic missile warning system, which also includes the Attack and Launch Early Reporting to Theater (ALERT), and the Joint Tactical Ground Station (JTAGS). Both ALERT and JTAGS are also supported by members of NR NAVSPACECOM 0266.

NR SPAWAR 40 0788

The latest addition to the NSRP community is NR SPAWAR 40 0788 under the command of Naval Reserve Cmdr. Dan Beary. Located in Denver, Colo., the classified mission of the 0788 unit is to provide tactical operations support to a local gaining joint command by standing operational watches and supporting deployments as requested. SPAWAR 0788 unit personnel represent all naval warfare and intelligence communities.

NSRP Associate Member — Naval Science & Technology Reserve Program

The NSTRP consists of nearly 250 billets distributed across 16 Office of Naval Research (ONR), Naval Research Laboratory (NRL), and N-091 units across the country under the command of Naval Reserve Capt. Steve O'Brien as program director. NSTRP Reservists provide support to classified space-related projects at NRL, national agencies, and other military science and technology activities.

NSRP and NSTRP personnel routinely join forces to support projects such as ONR's Joint Countermine Advanced Concept Technology Demonstration (JCM-ACTD), the Joint Warfare Analysis Center (JWAC), and the Joint Warfare Interoperability Demonstration (JWID).

Naval Reserve Capt. Kenneth Cockrell (left photo) prepares for firing of Space Shuttle Columbia's reaction control engines aboard mission STS-80 in 1996. He is wearing a liquid-cooled biological garment (NASA Photo). *Marine Reservist Lt. Col. Robert McGinnis (left, right photo), drilling with HQMC Plans, Policies and Operations Reserve Detachment, reviews deployment of Reserve and active-duty Naval Space Support Teams during Roving Sands 97.*

Naval Reserve Astronauts

Naval Reservists with out-of-this-world "day jobs" include eight NASA astronauts and astronaut candidates. Naval Reserve Capt. Steve Oswald, director of the NSRP, has flown three shuttle missions, commanding STS-67 and piloting missions STS-42 and STS-56. He is currently the deputy associate administrator for the Space Shuttle program at NASA headquarters in Washington, D.C.

Naval Reserve Capt. Bill Readdy is a veteran of three shuttle missions, most recently commanding STS-79 on a historic mission to dock with the Russian space station *Mir*. His previous flights include piloting STS-51 and serving as flight engineer and on-orbit pilot of STS-42. Capt. Readdy currently manages the Space Shuttle Program Office at NASA's Lyndon B. Johnson Space Center in Houston, Texas.

Naval Reserve Capt. Ken Cockrell is also a three-shuttle flight veteran, having commanded STS-80, piloted mission STS-56, and flown as flight engineer and on-orbit pilot of STS-56. Capt. Cockrell is chief of the Astronaut Office at NASA's Johnson Space Center. Naval Reserve Lt.Cmdr. Kay Hire was the first woman to be assigned to a combat aircrew while assigned to VP-62. She is currently in training for her first shuttle flight in early 1998 on STS-90. NASA mission specialist and Naval Reserve Cmdr. Kathy Sullivan is a three-shuttle flight veteran, and was the first American woman to conduct a space walk.

Retired Naval Reserve Cmdr. Joe Tanner is a two-shuttle flight veteran. His first flight was as a mission specialist on STS-66, and his most recent flight was the historic second servicing mission to upgrade NASA's Hubble Space Telescope (HST). During the flight of STS-82, Cmdr. Tanner performed two space walks as part of restoring the HST to near perfect working order.

NASA astronaut candidates Capt. John Phillips and Lt. Paul Richards are currently in their second of two years of astronaut training and evaluation at the Johnson Space Center. When they complete their training, they will be eligible for future space flight assignments aboard both the Space Shuttle and International Space Station.

NSRP space activities can be divided into four basic arenas of exercises, games,

*(Please see **Reserves** on page 20)*

NSRP FY97 Space Support

EXERCISES	Bulwark Bronze	Keen Edge
	Cobra Gold	Roving Sands 97
	Internal Look	Tandem Thrust
	JTFX 97 1/3	Tempo Brave
	JWID 97	Ulchi Focus Lens
	Atlantic Resolve	Ultimate Resolve
	Kernal Blitz 97	
GAMES	Global War Game 97	
	Table Top War Game	
PROJECTS	Communications	Ops Ctr Support
	Watches	PQS Development
	Legal Support	RFI/GFO
	JTAGS	SWPO
	MSI	
OPERATIONS/ DEMOS	Radiant White	JBS/GBS
	Radiant Tin	Radiant Cirrus
	Radiant Clear	ASN-C3I
	Radiant Topaz	Radiant Jade
	Radiant Coal	IR/RF Site Surveys
	SABER	Space Shuttle Ops
	DDMS Support	VISTA
	GALE	Tactical Event Ops
	Precision Strike	Assessment
	Joint Mine Countermeasures (JCM)	

Reserves

(Continued from page 19)

projects, and operations/demos as shown in the accompanying table. While many aspects of the complex space technologies and infrastructure of military space are highly classified, some facets of recent and current NSRP activities that can be openly discussed include the Navy TENCAP program and the JBS program.

NSRP TENCAP Support

The overall TENCAP program supports the mission areas of joint surveillance and joint intelligence/ space and electronic warfare. NSRP Reservists serve key roles in the Navy's TENCAP efforts including serving as technical liaison, data collectors, and special evaluators, who use their extensive operational Fleet experience to devise and demonstrate innovative ways that national systems can directly support the warfighter.

NSRP members also serve as forward deployed battlestaff augmentees to provide space expertise and rapidly facilitate the delivery of operational real-time information to the "shooter" in both exercises and real-world operations. Successful TENCAP demonstration projects typically evolve into operational programs. NSRP Reservists continue to make key contributions to many TENCAP programs.

Joint Broadcast Service

The NSRP is providing direct support to Joint Endeavor's Bosnian operations in the implementation of the Joint Broadcast Service (JBS). A multi-source, high-data capacity, direct-to-user system, JBS builds on the initial success of TENCAP Project Radiant Storm, and provides U.S. and NATO commands with both classified and unclassified video and data.

NSRP support to the JBS project has concentrated in two key system segments: augmentation of the CONUS-based Broadcast Management Center (BMC) and support of the overseas JBS receive sites.

As the lead NSRP unit for JBS support, NR SPAWAR HQ 0366 provided coordination of BMC watch teams including Army, Air Force and Marine reservists. The most challenging aspect of the NSRP's support of JBS was meeting the rapid deployment requirements for personnel to support the installation of overseas receive sites. NSRP personnel on 30-day ATs reported to Tuzla and Sarajevo in Bosnia-Hercogovina; the Joint Analysis Center (JAC) at Molesworth, United Kingdom; Vicenza, Italy; and aboard USS *LaSalle* to operate and train active-duty personnel on JBS equipment. Prior to deployment, all personnel going in-country had to meet EUCOM's requirements for small-arms qualifications, cold weather survival and mine awareness training.

At last report, NSRP Reservists had provided over 880 days of JBS support. The JBS capability is planned to evolve into the Global Broadcast System (GBS) which will fly on the last three UFO satellites.

Force Multipliers

The NSRP Space Warfare Professionals fully understand the complexities of space and how to effectively apply space systems as the ultimate force multiplier to maintain and advance the superiority of naval forces worldwide. From tactical space applications in the ocean depths to the far reaches of outer space, today's NSRP Reservists provide an outstanding model of the fully integrated Total Force concept in daily action around the world.

"Ready to Beam Up?"

Successful execution of NSRP missions requires a diverse mix of enlisted and officer skills, knowledge, and professional experience. The fast-paced nature of today's Reserve space support to the Fleet demands that personnel assigned to NSRP billets report aboard with the basic skills, knowledge and security accesses to immediately contribute to mission success.

Because of the complex and often highly classified nature of both the technology and infrastructure that supports the technology, there is not yet a Space Warfare designator, nor a clear progression path for naval space professionals, either Reserve or active duty. O-5 and above billets are competitively selected in accordance with NRF and community selection boards. O-1 through O-4 billets are filled by a selection board convened by the NSRP director.

For further information about "beaming up" to the "high frontier of space warfare," contact Naval Reserve Capt. Steve Kaltneckar at (703) 689-2849 or via E-mail at <103152.547@compuserve.com>. Additional information on the NSRP may be accessed at its global web site: <http://eng.usna.navy.mil/~seftas/>.

Author and Naval Reserve Lt.Cmdr. Harold Moffitt, PE, is a NASA space shuttle engineer and flight controller, and a naval oceanography officer. He served as a member of NR NAVSPACECOM 0166 from 1986 to 1995. His article originally appeared in Naval Reserve Association News.

Naval Space Command Honors People of the Quarter


Mary Ahearn


DS1 Quackenbush


RM2 Delaney


James Taylor

Civilian and military personnel at Naval Space Command were recently selected for quarterly awards for July through September 1997.

Mary P. Ahearn is Civilian of the Quarter. Her citation was based on her work as a training specialist for Naval Space Command. During the award period, she took on added responsibilities as an advisor and principal point of contact for coordinating enrollment in joint space training courses, as well as schedules for other training classes.

Originally from Arlington, Va., Ahearn joined the Naval Space Surveillance Center at Dahlgren in 1988 and transferred to Naval Space Command in 1993 when the organizations were consolidated. Prior to transferring to Dahlgren, she was employed by Fairfax County Public Schools.

Ahearn resides in Colonial Beach, Va.

Petty Officer 1st Class Thomas Quackenbush is Sailor of the Quarter. His award recognizes his work as leading petty officer for the Information System Branch. He was cited for his effort to install a key backup component for the command's information management system, along with the development of procedures to reduce system backup time by 50 percent. He has also managed the installation of new network software, as well as an upgraded secure mail guard for the command's Internet connection.

A data systems technician, Quackenbush has been assigned to Naval Space Command since January 1995. Originally from Albany, N.Y., he enlisted in 1979. His other Navy assignments have included sea tours aboard the cruiser USS *Reeves* and the oiler USNS *Truckee*. He also served at the Naval Air Facility in Adak, Alaska, with the Naval Environmental Prediction Research Facility in Monterey, Calif., and as an instructor at a Navy electronics technician school. Quackenbush currently resides in King George, Va.

Petty Officer 2nd Class Terry Delaney was selected as Junior Sailor of the Quarter for his efforts as a communications center officer and, in particular, his work to coordinate EHF operations and procedures in the command's Joint Information Processing Center (JIPC).

Delaney, a radioman, joined the Navy in 1990. In his Navy career he has sailed aboard ballistic missile submarines USS *Francis Scott Key* and USS *Ohio* and aboard the guided-missile destroyer USS *Mitscher*. He has also served on the staff of Commander Submarine Group 9 in Bangor, Wash. He reported to Naval Space Command in February 1997.

Originally from Baltimore, Md., he currently resides in Fredericksburg, Va., with his wife, Patricia, and their daughter.

James F. Taylor was named ADP Watchstander of the Quarter. His award cited his analysis of a data circuit malfunction, which prevented an outage in the Navy's space surveillance network.

Taylor retired in October, completing over 36 years of federal employment. He was first employed at the former Naval Weapons Laboratory in Dahlgren in 1961 where he worked four years as an engineering technician. He transferred to the former Naval Space Surveillance Center in 1965 as a computer operator. He rejoined the Naval Surface Warfare Center for two years in 1972 as a computer technician in the conical shock tube facility before finally returning to NAVSPASUR's computer operations center in 1974. He resides in Woodford, Va.

Medals & Special Awards

Defense Meritorious Service Medal

Rear Admiral Patrick D. Moneymaker, for service as deputy commander for Joint Task Force-Southwest Asia in Riyadh, Saudi Arabia, in support of Operation Southern Watch from May to August 1997.

Navy & Marine Corps Commendation Medals

RMC Steven Sweet, as UHF operations scheduler and leading chief petty officer for the Joint Information Processing Center; he coordinated the shutdown and relocation of the GENSER message center and technical control facility and consolidated the general service and special intelligence message centers into the first JIPC within the Department of Defense; he worked directly with the Joint Staff to manage 11 UHF satellite channels for VIP travel worldwide, coordinating with the White House Communications Agency and unified CINC staffs.

LCDR Barbara S. Kanewske, as force enhancement officer and chief of plans for special

*(Please see **Awards** on page 22)*

Awards

(Continued from page 21)

technical operations; she ensured uninterrupted delivery of reconnaissance satellite data, resolutions of communications interference, and orbit calculations for manned space missions. Her efforts to upgrade equipment in the Special Technical Operations cell enabled NAVSPACECOM to fully participate in worldwide integrated space exercises and support units engaged in contingency operations.

OS2 Marcus Marquez, as NAVSPOC training petty officer, helped update and standardize procedures for resolving radio frequency interference affecting Fleet satellite communications; as a member of the command's Training Team, he developed invaluable training materials to help new personnel qualify as NAVSPOC watchstanders.

OSC Michael Adams, as leading chief petty officer in the command's Multi-Spectral Imagery Cell, as a support team member for the Situational Awareness Beacon with Reply (SABER), and as Naval Space Operations Center crew training leading petty officer.

Lt. Mark A. Prokopius, as UHF spacecraft operations officer; he took an active role in advocating future requirements as a critical member of the Mobile Users Study to help prevent a three-satellite shortfall in the future UHF constellation.

Lt. Ronald E. Foudray, as the space electronic warfare and navigation systems officer, assistant Naval Space Operations Center Officer, and Alternate Space Control Center crew commander; he devised a master plan to develop and implement a capability to identify sources of satellite communications interference, reducing resolution time by 50 percent. He led a crisis action team to support the 22nd Marine Expeditionary Unit participating in non-combatant evacuation operations in Liberia.

Lt.Cmdr. Tammy M. Baker, as the training and schedules officer for the Naval Space Support Team Branch; she developed and implemented the Navy's first Space Support Team training plan, blending divergent disciplines of command and control, space, and exercise support into a single training track. She was also responsible for scheduling space support for five fleet CINCs, 17 battle groups and amphibious readiness groups, all Marine Expeditionary Force commands and Marine Expeditionary Units in a two-year period.

Lt. Scott A. Johnson, as the ultra-high-frequency (UHF) satellite communications (SATCOM) systems operational manager; his efforts resulted in optimal support to warfighting CINC's communications requirements that include emergent tasking for U.S. Forces Korea and support of Operations Uphold Democracy and Southern Watch/ Vigilant Warrior.

Lt. Cmdr. Julia Petritsch, as exercise coordinator for Ulchi Focus Lens from April to August 1997, providing tactically focused space support to the Naval Forces Component Commander, Marine Forces Component Commander, Joint Task Force Commander, and Commander 7th Fleet.

YN1 Bruce E. McCants, as leading petty officer for the Administration and Training Branch; he provided superior support to over 200 personnel, coordinated quality of life issues, and orchestrated and conducted over 30 command indoctrinations, General Navy Training and Navy Rights and Responsibilities workshops.

Joint Service Achievement Medal

Lt. Lawrence A. Pemberton, Jr., as flag aide and personal security officer on the command staff for Joint Task Force-Southwest Asia in support of Operation Southern Watch from May to August 1997.

Navy & Marine Corps Achievement Medals

OS2 Lejon Starks, as a space control mission watchstander; he was responsible for the research, design, implementation and evaluation of lesson plans, instructional media and testing criteria to help ensure proper and timely qualification for other enlisted personnel.

Lt. Julie M. LaPoint, as Atlantic Fleet Space Support Team Leader during Exercise Unified Endeavor 97-1; she orchestrated team deployments to three geographically dispersed locations and helped to establish and evaluate the first ever functional integration of the theater and component Space Support Teams using Theater Space Operations Cell concepts.

OS2 Alberto Guadalupe Jr., as space warning petty officer and force enhancement petty officer in the Naval Space Operations Center; he monitored more than 75,000 space activities in support of U.S. Space Command during activation of the Alternate Space Control Center, monitored Space Shuttle flight parameters to predict potential collisions with other space objects, and was a key watchstander in processing and disseminating information on reconnaissance satellite summaries and satellite vulnerability reports to operational forces.

NATO Medals

NCC Frank Demmers, Jr.
OS1 Ricky Fortner
OS2 Lejon Starks
IS2 Chuck Taylor
ET2 Brian Malone

Good Conduct Awards

RMC Michael Brady, 5th
CTO1 Brian Cantleberry, 3rd
RM1 Preston H. Summers, 3rd
OS2 Marcus Marquez, 2nd
CTR2 Lisa A. Munro, 2nd
SK2 Misty A. McLeod, 2nd
RM2 Terry D. Delaney, 2nd

U.S. Navy Marksman Ribbons

RM1 Darren Johnson
OS2 Bruce Roberts

Special Achievement Award

Harold ("Buddy") Meyers, Jr., received a Special Achievement Award for service from August 1996 to July 1997. During that time, he served as head of the Space Systems Branch, as well as acting head of the Space Plans Division. His award cited his effort to review the division's mission and organization and refocus the division to establish a clear role in the command's strategic planning process. He was also commended for his initiative to revitalize the division's relationship with the larger Navy through interaction with Fleet CINCs to identify top Navy issues related to space.

Letters of Commendation

IS2 John Fritz
Marine Capt. Mark S. Flannery
RM2 Walter J. Swieder
OS2 Kenneth W. Boyd
OS2(SW) Sedrick J. Bailey

Letters of Appreciation

Lt.Cmdr. Julia Petritsch
Lt.Cmdr. Mark Rodgers
Marine Maj. Mike McDonald
Lt. Sara Ostrom
Lt. Tracy Vincent
Lt.j.g. Gerald Oliver
ETCM(SW) Alan G. Kinder
EAC Virgilio G. Peredo
CTR1 Randy Otis
CTA2 Rosenette Tipton
IS2 Larnell V. Smith
IS2 Charles J. Taylor
IS3 Gary F. Barile
OS2 Lee Keyzer
OS2 Bruce Roberts
RM3 Carl Smith
Larry Gallup
Burdetta ("Jinx") Messick
Dr. Paul Schumacher
Norma ("Rusty") Thoemke
Bonnie Watson

FROM THE MASTER CHIEF

Advancement ... Now or Never?

By ETCM Alan G. Kinder

The September advancement examinations have long passed. The results have been promulgated, and those who were selected for advancement are already used to being called by their new rank. The congratulations have long passed into memory, and our Sailors who advanced are already looking forward to their next career milestone.

ETCM Kinder

But what about the Sailors who failed to advance? What is our responsibility, what is our challenge, as senior enlisted leaders to those who didn't do well on the examination? I think it is two-fold.

First, we must ensure that we have put in place a robust, dynamic training program. This training must include all material from the advancement bibliography. The training should include hands-on if available, but must include properly prepared and presented lectures at a minimum. The training cycle should be such that all of the high points from the bibliography are covered, especially those areas where our Sailors traditionally do poorly.

This means that we must do our homework before we can help our junior Sailors. We should have a copy of the examination sheet which lists the topics from the previous examination for each paygrade. We should have a copy of the examination profile sheets so we can analyze where to focus the training. We should know our Sailor's strengths and weaknesses.

You may say that this places a tremendous burden on the chain of command, making it our responsibility for our Sailors' advancement. I don't think so. What it does is remind us of our job as senior enlisted leaders.

We should make every effort to see our Sailors advance. To fail to do so is to abdicate our leadership responsibility. Too often the cry of, "It's not my job" is heard, but it shouldn't be from the mouth of a senior enlisted person. If we don't care, who will?

Secondly, we must set the example. I believe this to be the foundation of all leadership. So, how do you set the example in preparing for advancement? Well, when was the last time you completed a correspondence course that related to your duties? When was the last time you did the I&C course for your rate? When was the last time you completed reading a book on naval history or heritage and used the lessons learned to improve your own leadership potential?

These questions get hard to ask ourselves. Even as a Master Chief I have to look in the mirror and answer honestly. It isn't easy, but the really important things in life rarely are.

Finally, remember to instill in your Sailors the fact that advancement isn't the responsibility of the chain of command. It is their responsibility. The chain of command is there to provide the necessary tools, leadership, and experience. The advancement itself rests squarely on the shoulders of the individual Sailor. Good Luck to all of them in March!

Advancements

CTR1 William T. Clark
CTA2 Bradley J. Long
IS2 Larnell V. Smith
OS2 Tarris Randolph

Civilian Length of Service Awards

15 Years
Sayna Jones
John Trammell
Susan Wright

10 Years
Kelly Layman

CALENDAR

Meetings & Symposia

Space Technology & Applications International Forum, Jan. 25-29, 1998, Albuquerque, N.M. Sponsors: NASA, Dept. of Energy, and Air Force in cooperation with major professional societies. Call (505) 277-0446 or email alaburda@unm.edu or access the internet at <http://www-chne.unm.edu/isnps/isnps.htm> for details and complete "Call for Papers."

Virtual Government '98, Feb. 10-12, College Park, Md. Sponsor: Armed Forces Communications and Electronics Association (AFCEA). Call (703) 631-6238 for more information.

Joint C4ISR Symposium, April 28-30, San Diego, Calif. Sponsor: AFCEA. Call Debbie Matzek at (619) 691-9299.

Global Air & Space, May 4-6, Arlington, Va. Sponsor: American Institute of Aeronautics and Astronautics. Call (800) 739-4424 or (703) 264-7535.

Spring Intelligence Symposium, May 6-7, Langley, Va. Classified: Top Secret SI/TK). Sponsor: AFCEA. Call (703) 631-6250 for information.

TechNet '98, June 9-11, Washington, D.C. Sponsor: AFCEA. Call (703) 631-6125 for information.

Courses & Seminars

- Space Mission Operations, March 2-3 at Cape Canaveral, Fla., and March 26-27 at Washington, D.C.
- Satellite Communications Systems Engineering: LEO, MEO, GEO, March 4-6 at Cape Canaveral, Fla., and March 23-25 at Washington, D.C.
- Satellite Communications, Tracking and Control, May 11-13 at Washington, D.C.
- Fundamentals of Synthetic Aperture Radar, June 15-16, Washington, D.C.
- Advanced Synthetic Aperture Radar (Processing & Applications), June 17-19 at Washington, D.C.
- Small Remote Sensing Satellites, April 7-9, Washington, D.C.
- Mobile Communication Satellites, April 2-3, Washington, D.C.
- Spacecraft Thermal Control, Feb. 3-4, Beltsville, Md.
- GPS Technology (for Scientists, Engineers & Technicians), Feb. 18-20, Dayton, Ohio.
- Spacecraft Power Systems, March 16, Beltsville, Md.
- Fundamentals of Orbital Mechanics, March 17, Beltsville, Md.
- Spacecraft Quality Assurance, Integration & Test, March 18, Beltsville, Md.
- Cost Assessment for Aerospace & Military Systems, March 24-26, Arlington, Va.
- Ground Station Design & Operation, March 26-27, Chevy Chase, Md.
- Launch Vehicle Selection, Performance & Use, May 18-20, Huntsville, Ala.
- Advanced Earth-to-Orbit Vehicles, May 21-22, Huntsville, Ala.

All courses are sponsored by the Applied Technology Institute. Call (410) 531-6034; email <atiinfo@aol.com>. Course outlines are available on the Internet at <http://catalog.com/hitekweb/>.

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