

# The Army's use of space

*Space offers the Army the opportunity to do the things it has always done, but to do them better and faster.*

by Capt.(P) Lynn Weber and Capt. Rick Manson

The Army Space Initiatives Study (ASIS) group recently wrote the proposed Army Space Master Plan, the Army's roadmap for space well into the 21st century. The group consisted of 30 officers technically qualified in space-related subjects. They convened for six months at Ft. Leavenworth, Kansas, under the direction of Brig. Gen. William J. Fiorentino.

How the Army can use space to carry out its mission was the basic subject addressed by the study group. To find the answer, they reviewed the history of the Army in space, attempted to identify the current and projected space technology, and then developed a comprehensive plan to adapt that technology to the Army's needs.

The Army has been in space since 1958 when it put the first United States satellite in orbit. Also, the first U.S. Communications Satellite (COMSAT) belonged to the Army Signal Corps. Although much of our national space effort has since been transferred to NASA, the Army still maintains the U.S. technology base in Ballistic Missile Defense. The Army has historically been at the forefront of our nation's frontiers, and space should not be an exception.

New opportunities will continue to open up as we explore space further.

The space shuttle program, despite the recent tragedy, is still a phenomenal national asset. A second shuttle launch facility, recently completed at Vandenberg AFB, will increase this vital program's capabilities. Army astronauts, like Col. Bob Stewart and Col. Sherwood Spring, are doing more and more exciting things, such as "flying" with the maneuver pack and performing space construction. The Army will continue to support the astronaut program. The United States is also about to embark on a new, perhaps even more exciting, space project—the construction of a space station. We could have a space station operational as early as the mid-1990s.

The role of space in Army missions was emphasized by the Army Space Policy, signed on 5 June 1985 by Secretary of the Army John O. Marsh and Gen. John A. Wickham, the Army chief of staff. Using its guidance, an interim Army Operational Concept for space was developed, with input from each of the TRADOC schools. The Operational Concept was a basis for the proposed Army Space Master Plan.

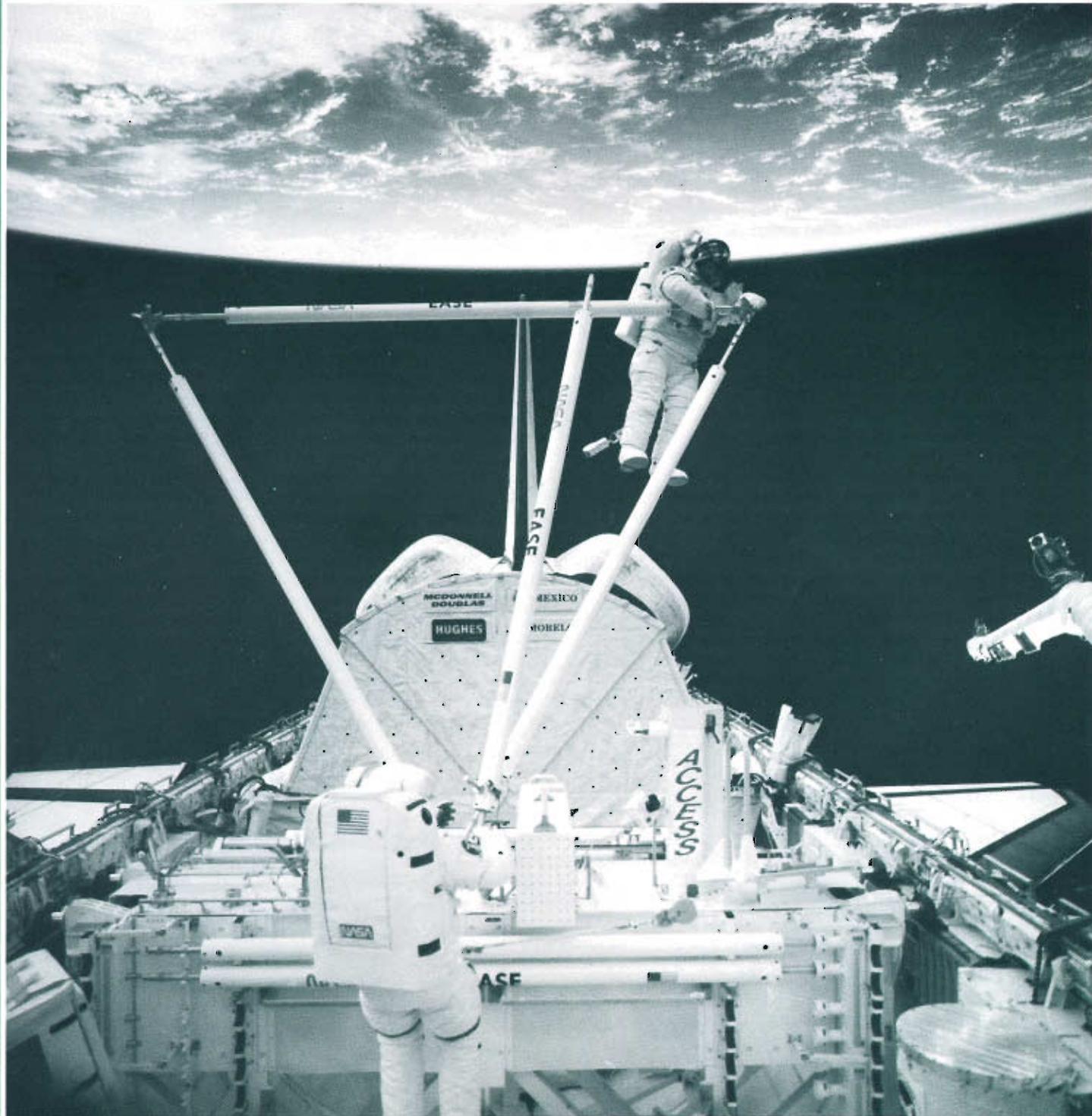
As mentioned above, the ASIS group attempted to identify Army needs that space technology might be



1946



1960



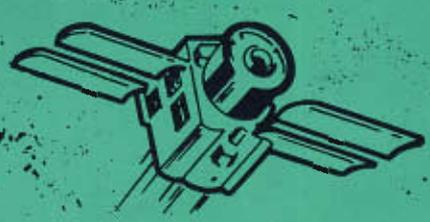
Astronauts Jerry L. Ross (bottom) and Sherwood C. Spring (top) captured on 70mm film with a handheld camera inside of the Atlantis's cabin. (NASA photo)



1965



1972



1980

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able to help fill. The Mission Area Analysis (MAA) and the Battlefield Development Plan (BDP) process provided basic information on many of the Army's deficiencies. In addition, ASIS group members made numerous visits worldwide to verify these needs and to identify others. The group then tried to formulate ways in which current and foreseeable space technology might answer the Army's needs.

For example, they noted that the Army must be able to communicate over long distances. And these long distance communications systems must not only be as resistant as possible to jamming and physical destruction, but they must remain light and mobile enough to keep up with the fighting forces. Line-of-sight terrestrial systems simply do not satisfy all of the Army's needs under current doctrine; in many cases, space-based communications systems offer a superior alternative. Because satellite communications have virtually no line-of-sight restrictions, they can provide direct communications over greatly extended distances, normally without relays.

The Army is currently fielding several satellite ground terminal systems. The AN/PSC-3 is a manpackable, single-channel UHF satellite terminal which will provide troops with an extremely mobile long distance communications capability. The Army is also fielding the AN/TSC-85A and AN/TSC-93A mobile satellite terminals which are deployed in tactical S-280/S-250 shelters and provide a multichannel SHF capability. (These systems will soon have a spread spectrum anti-

jam/control modem (AJ/CM), which, together with their higher SHF frequencies, will give them greater resistance to enemy jamming.) These multichannel satellite terminals can be used in conjunction with the Mobile Subscriber Equipment (MSE) system to extend the range of the area communications system.

Another satellite ground terminal that is currently being designed is the Single Channel Objective Tactical Terminal (SCOTT). The SCOTT is a mobile satellite terminal which will operate in the EHF frequency range, providing a high degree of ECCM protection and increased protection from nuclear effects. SCOTT will provide survivable C2 communications at theater through division level.

The proposed Army Space Master Plan includes a detailed investment strategy; education, training, and personnel management plans; a recommendation for Army space organization; and detailed plans for all mission areas. The study report recommends a total of 53 space related investment initiatives, which are to be implemented in three phases: near-term, 1986-1992, covered by the Program Objective Memorandum (POM); mid-term, 1993-2002, covered by the Extended Planning Annex; and far-term, 2003-2025. The study also ranks the initiatives according to three levels of importance.

Near-term recommendations will provide the Commander-in-Chief (CINC) with improved C3 and an enhanced technology base with which to fight the AirLand Battle. Satellite communications (SATCOM) will be

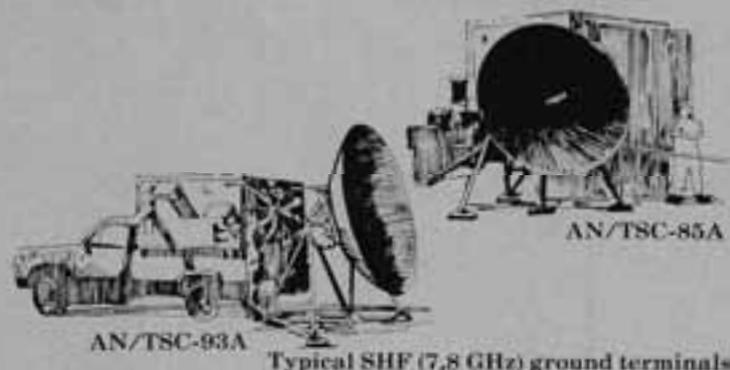
leased to light forces in order to provide them with assured UHF access. Near-term initiatives will also support advanced computer technology research and the SCOTT/MILSTAR program, as well as other space related research. One of the initiatives examined by the ASIS was a possible Army involvement in the NASA Advanced Communications Technology Satellite (ACTS) program the on-orbit test system for a new generation of satellite communications technology. Employing frequencies in the EHF range, ACTS will offer high data throughput rates (approximately 1 gigabit per second). Technology which will be tested under ACTS includes flexible trucking, mobile communications, and the reuse of frequencies over comparatively small areas. Such sharing of technology and research efforts among government agencies and civilian institutions can lead to more rapid advances in communications and less duplication of effort.

Mid-term recommendations support the transition to Army 21 doctrine (the way the Army will fight in the 21st century). This transition includes improved space-based communications, which will provide increased support to the tactical commander.

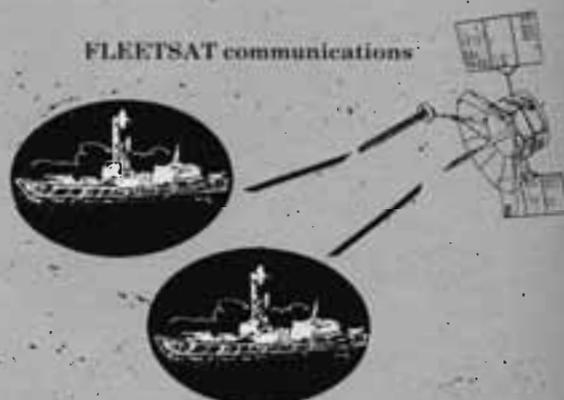
Far-term recommendations provide total support to Army 21 by improving the integration/synchronization of key operational capabilities. For example, the report proposes an Army communications satellite to augment shared DOD satellites. Such a satellite would provide Army users with assured access and sufficient capacity both during wartime and during peacetime training.

If the Army is to take full advantage of space, it must have

## Military satellite communications



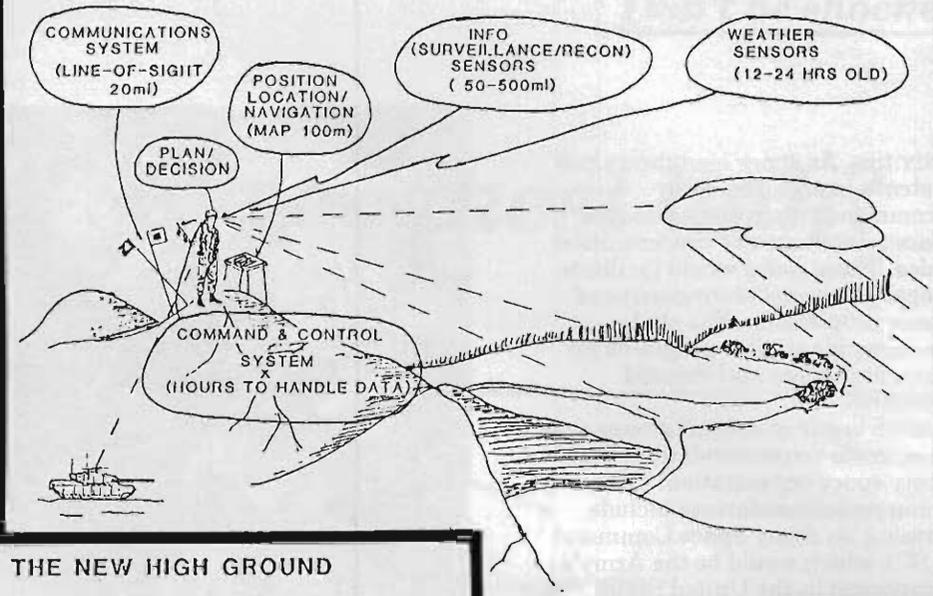
## FLEETSAT communications



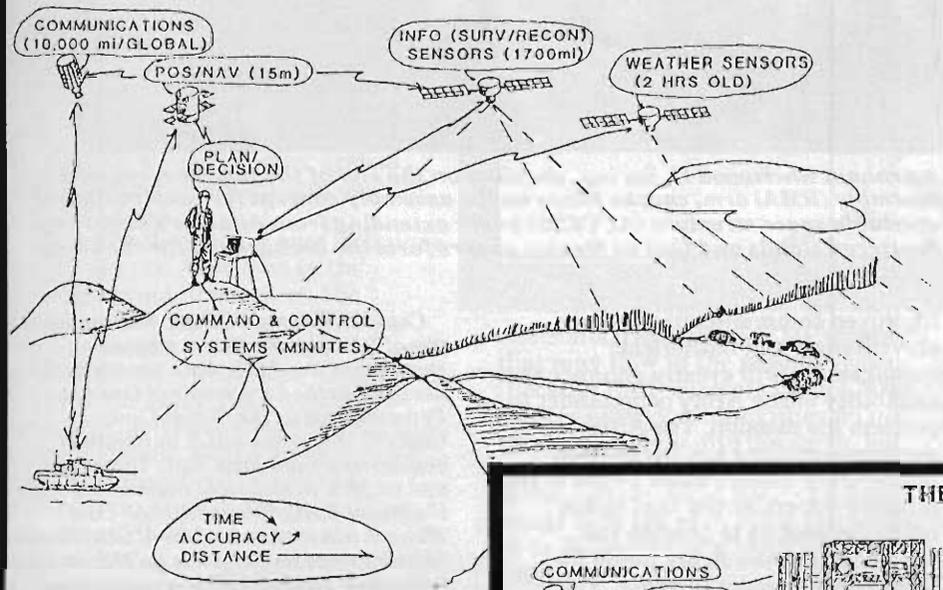
people who can understand space technology and apply it to Army missions. The study recommends education in space related disciplines throughout the professional military education system, as well as programs to ensure that DA civilians are trained in such disciplines in order to provide continuity. The study also recommends that more people be sent to obtain graduate degrees in technical fields and that the Training With Industry (TWI) program be expanded.

The Army has recently established a 3Y skill code to identify officers trained and educated in space

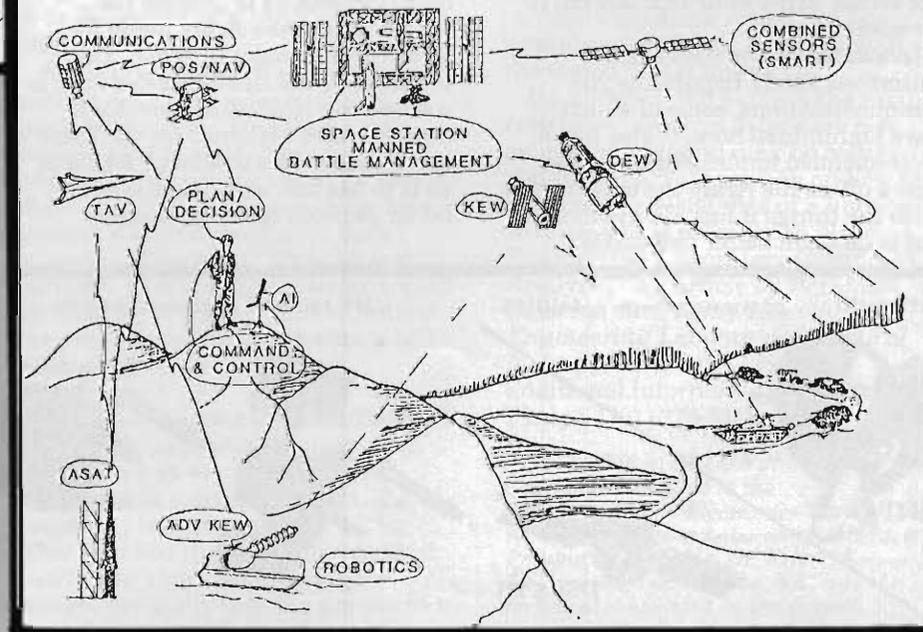
### BEFORE SPACE - THE TRADITIONAL HIGH GROUND



### WITH SPACE - THE NEW HIGH GROUND



### THE FUTURE WITH SPACE

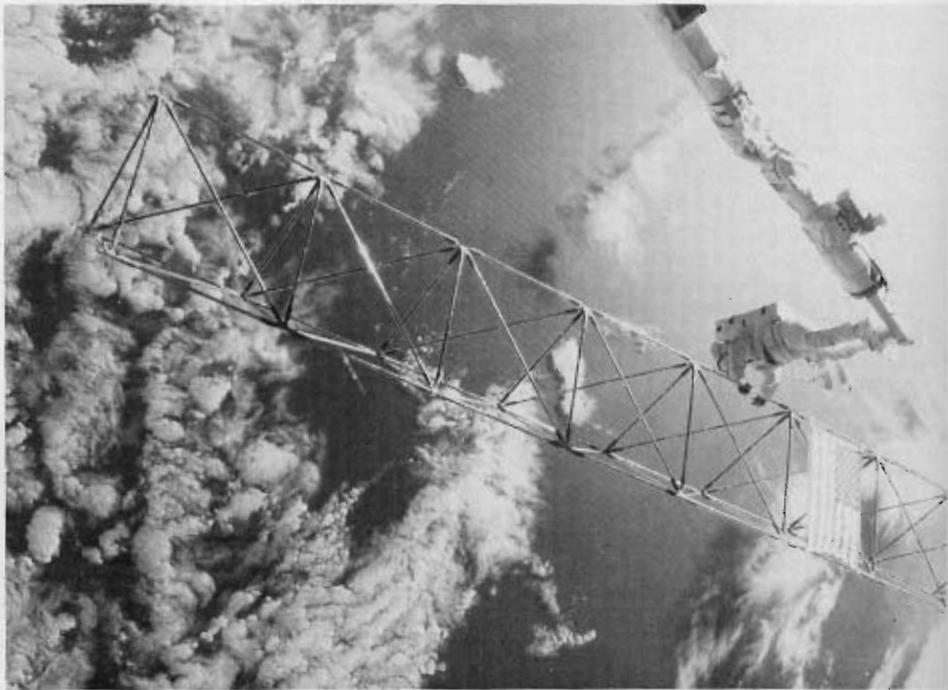


EHF (20,40 GHz) single channel TACSAT terminal

activities. As space operations and systems emerge, the study recommends an evolution to new space-related area of concentration codes. These codes would facilitate proper personnel management of career progression. The study recommends similar programs for warrant officers and enlisted personnel.

ASIS is one of several groups that have made recommendations for an Army space organization. The study group recommendations include forming an Army Space Command (ASC), which would be the Army's component in the United States Space Command at Colorado Springs. The ASC, commanded by a brigadier general, would give the appropriate focus and emphasis to space-related activities within the Army. One of the most unique functions of this organization would be to co-locate the combat developer, operator, and material developer. TRADOC and AMC would both have space directorates co-located with the Army Space Command. The 235th Signal Detachment, currently located at Fort Monmouth, New Jersey, would become the first operational unit under the ASC. Within the Department of the Army, the assistant secretary for RD&A would designate a deputy assistant secretary responsible for space activities, and the DCSOPS would be designated as the senior Army staff representative for space.

In summary, the Army Space Initiatives Study Report has 203 recommendations, some of which were highlighted here. It also has a recommended implementation plan. Space offers the Army the opportunity to do the things it has always done, but to do them better and faster.

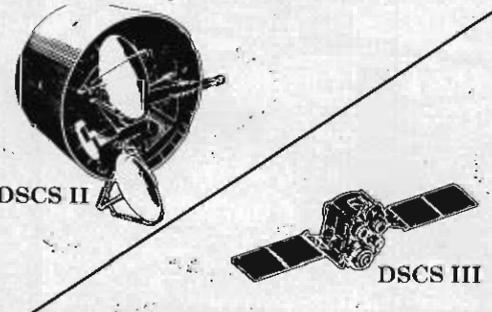


*Astronaut Sherwood C. Spring, standing on the end of the remote manipulator assembly (RMA) arm, checks joints on the assembly concept for construction of erectable space structure (ACCESS) tower extending from Atlantis's cargo bay. Scattered clouds and Gulf of Mexico waters form the background for the scene. (NASA photo)*

Improved communications, space surveillance, and battlefield management will greatly enhance the capability of the Army commander to perform his mission. The ASIS recommendations are designed to make Army leaders more aware of the military opportunities that space offers, as well as to provide the roadmap that the Army needs for future development in space. The proposed Army Space Master Plan is a milestone effort that provides a direction and blueprint for the Army's use of space. The challenge for all of us is to use this new dimension to better perform Army missions.

*Capt.(P) Weber and Capt. Manson were two of four Signal officers who were members of the ASIS. Both are currently assigned to the Directorate of Combat Developments at the Signal Center. Capt.(P) Weber has a B.S. in electrical engineering from Iowa State University and an M.S. in electrical engineering from the Naval Postgraduate School. Capt. Manson is a graduate of the United States Military Academy and has an M.S. in joint command, control, and communications from the Naval Postgraduate School.*

### SHF military communications satellites



### UHF tactical communications

