Past, Present, Future

Satellites become "high ground of Space" over last 30 years

By Bill Furr

Over the past three decades, satellite systems have been developed into vital combat enablers of the Army's warfighting capability. Occupying the "high ground of Space," satellites now provide unprecedented "battlespace awareness" that helps reduce the "fog, friction, and uncertainty of warfare." Space has, indeed, changed the way military force is applied and created opportunities to redefine the Army's role in developing its uses.

Space capabilities are a cornerstone of the Army's Transformation Force. Critical operations such as communications, imagery, reconnaissance, navigation, and warning have migrated from a total dependence on terrestrial systems to an integrated architecture of ground-, air-, and Space-based technologies that are systems unencumbered by the terrestrial limitations of topography and distance. To achieve the Objective Force requirement for information superiority for advanced full spectrum operations, Space must be seamlessly integrated into land-force operations. Seamless integration is not about improvements to individual platforms, weapons, sensors, or decision tools, but about the complete integration of land- and Space-based capabilities across the full battlespace. Achieving information superiority requires the Army to define what it wants from Space and position itself to get it.

A Historical Perspective of the Army's Role in Space

From a historical perspective, the Army has had an important role in the development and use of Space systems. In the early stages of the U.S. Space program, the Army was instrumental in the development of rockets and satellites. The first U.S. satellite was launched into orbit by an Army Redstone rocket. Subsequently, presidential decisions in 1958 transferred Army rockets and missiles to NASA.

The Sixties

In 1961, DoD assigned the mission of managing and operating U.S. military Space launch vehicles and satellites to the Air Force. In the early 1960s, the Defense Communications Agency was formed and assumed the role as the developer of communications payloads in satellite systems. In 1962, the U.S. Army Satellite Communications Agency was created with the responsibility for ground terminal and ground support development of satellite systems. The Army continues to perform this mission today, most prominently in ground mobile force terminals for the Defense Satellite Communications System and military strategic and tactical relay system.

The Seventies

In the early 1970s, national satellite systems were providing essential strategic, national-level capabilities. At the operational and tactical level, however, users were not receiving products and services from these systems in a timely manner. In 1973, the Army took the lead in DoD by establishing the Army Space Program Office to execute the Army Tactical Exploitation of National Capabilities Program (TENCAP), serve as the unique technical and fiscal interface with the national program offices, and manage the TENCAP materiel acquisition. The TENCAP program is based on exploiting current and future tactical potential of national capabilities and integrating those capabilities into the tactical decision-making process as rapidly as possible. This approach was so successful that Congress ordered all services to establish a TENCAP program based on the Army's model in 1977.

The Eighties

In the mid-1980s, the Army continued to solidify and exploit Space within the Army. In 1983, the Army

The Theater Missile Warning Company fields and supports the operation of Joint Tactical Ground Stations that provide early warning of missile launches to our deployed forces wherever the threat of ballistic missiles exists. The JTAGS systems provide direct down-linked, in-theater, early warning of missile launches. The five existing JTAGS systems are operated by joint Army/Navy crews and are a part of the U.S. Strategic Command's Tactical Event System (TES).

Army's role in developing Space systems critical

Army responsibilities among Department of Defense roles and missions must include active investment in and development of Space for Army purposes. As the Army contributes to joint warfighting and maintains dominance in land warfare, it may not be able to depend solely on Space capabilities developed by other services. Space systems, especially Space force enhancement user equipment and terrestrial-based Space control systems, will need to provide capabilities specifically for soldiers to continue land dominance. The Army role in developing Space systems must be active.

Space Council was formed and consisted of designated general officers who had the responsibility to coordinate actions, approve proposals and provide guidance on Army involvement in and use of Space. In 1985, the Army Training and Doctrine Command (TRADOC) established a Space Directorate at the Combined Arms Combat Developments Activity with the responsibility for the development of concepts, doctrine, and operational requirements for Space. The Space Directorate published the initial operational concept for Space, "Army Space Operations," in 1985. In August 1986, the Army Space Planning Group, the Army element assigned to the newly formed U.S. Space Command, was redesignated as the Army Space Agency. The agency was the Army component to the U.S. Space Command and a field-operating agency of Headquarters, Department of the Army. On April 7, 1988, the U.S. Army Space Command was activated and organized to support the field Army. It absorbed the planning and support functions of the Army Space Agency and assumed operational Space missions.

In the early to mid-1980s, our national Space policies began to reflect a transition from peaceful use of Space for science, technology, and commercial activities, to policies reflecting Space systems as force enablers critical to national survival. Policies reflecting Space as a warfighting medium began to take shape. By dovetailing national and DoD Space policies, the Army published an Army Space Policy in 1985 that established Space capabilities as a priority for integration into future Army operational doctrine and warfighter requirements. The 1985 Army Space Policy embodied tenets that were underscored through subsequent Army Space policies (1994, 2003):

- Support to the warfighter.
- Contribute to successful execution of Army missions.
- Contribute to Army modernization objectives.
- Enhance Army Space expertise.
- Exploit and use Space capabilities.

The Nineties

In August 1992, the U.S. Army Space Command became a major subordinate element of the newly formed U.S. Army Space and Strategic Defense Command (SSDC). In March 1998, SSDC was redesignated U.S. Army Space and Missile Defense Command (SMDC) to act as the specified proponent for Space and as the principal adviser to the Army Staff for all matters pertaining to the research and development of Space.

2000

It was the Desert Shield/Desert Storm conflict that brought Space into the spotlight. Kuwait and Iraq operations presented a different scenario than the traditional Cold War European scenario. Our forces were faced with limited national infrastructures, great expanses of desert to command and control, and limited knowledge of the terrain or obstacles in which the Iraqi

(See Army's Role, page 48)

forces would deploy. Space systems that traditionally supported strategic missions were realigned to support operational and tactical level missions. Military satellite communications (MILSATCOM) systems were soon overtaxed, requiring repositioning of satellites and reallocation of channels and bandwidth from strategic to tactical use. Imagery, both national and commercial, became critical for the development of maps, terrain analysis, and intelligence. Processing facilities often were halfway around the world — yet our troops required near-real-time dissemination. The vast desert expanses with no key terrain features presented a problem of precise navigation that was solved by using the newly orbited global positioning system (GPS) constellation and rushing demonstration small lightweight GPS receivers into theater. The Iraqi SCUD missile presented a formidable threat not only to coalition forces but also to Saudi Arabia and Israel. Detection of missile launches was accomplished by altering the strategic missile warning system and emplacing ad hoc warning to theater from the continental United States. Clearly, the need for satellite systems to support tactical operations surged in importance during this conflict.

Service Roles and Responsibilities

Decisions on Space responsibilities forged throughout the last three decades have charted lanes in the road for the Services that still exist today. Each military Service has the responsibility to train, equip and provide forces for unique Service Space operations and for joint operations. This recognizes both the unique requirements of each Service and the joint responsibilities established by Title 10, United States Code. DoD Directive (DODD) 5100.1 further delineates the responsibility of the military Services to coordinate the development of doctrine, procedures, and equipment employed in the conduct of Space operations. Space control is included in the intent of this directive. The Army and Navy develop and train forces to conduct Space control missions from the surface of the Earth. The Air Force functions specifically call for defense of the United States against Space attack, Space supremacy and defeat of Space forces. Launch and Space support for DoD is assigned to the Air Force. These Space control Service responsibilities originate from the Service roles and responsibilities established throughout the development of military Space. The emphasis over the years has changed from solely single Service missions to joint development and cooperation in Space and Space-associated missions.

The Air Force was assigned responsibility for development, production, and deployment of Space systems for warning and surveillance, military satellite communications, navigation, and launch vehicles, including launch and orbital support operations. As a result of DSCS, the Army was assigned responsibility for ground terminal development and acquisition and payload control. In the TENCAP program, each of the Services was responsible for the development of its own TENCAP capabilities. The Navy was designated the responsible Service for sea-launch capability and for Service-unique capability that supports its operational needs, such as ultra high frequency communications. When a Space capability crosses multiservice requirements, a joint program office is usually established (e.g., NAVSTAR GPS, global broadcast and joint tactical ground stations) to represent the multiservice requirements and interests.

The Changing Road

The roles, missions, and relationships for current Space capabilities are firmly and clearly established. There are a number of factors, however, that may influence or change the present missions and relationships.

First, the Commission to Assess United States National Security Space Management and Organization presented a number of recommendations to the Secretary of Defense, many of which are in the process of being implemented (amplification of Service functions have been incorporated in DoDD 5100.1). The recommendations satisfied the Secretary of Defense's intent to consolidate management of Space programs and to gain visibility for programming and budgeting of Space capabilities. The accepted recommendations of the Space Commission are considered to be extremely positive to the organization and management of Space at this time. There are three recommendations, however, that could have an effect on how the Army approaches and influences Space in the future: (1) The designation of the Department of the Air Force as the Executive Agent for Space with planning, programming, and acquisition of Space systems; (2) the establishment of a "virtual" major force program for Space to increase the visibility into the resources allocated for Space activities; and (3) the assignment of the National Security Space Architect (NSSA) to the Under Secretary of the Air Force. The NSSA will report on the consistency of the implementation of the defense and intelligence Space programs with policy, planning guidance, and architectural decisions. Most importantly, from an Army perspective, the NSSA will assess trades between Space and non-Space solutions and integration of Space with land, sea, and air forces. These changes place a great deal of authority and power over the future of Space and the budgetary means for the development of future Space with the Air Force.

The second major factor is the merger of U.S. Space Command (USSPACECOM) and U.S. Strategic Command (USSTRATCOM) as USSTRATCOM and the assignment of new missions in the Unified Command Plan (UCP). Since Desert Shield/Desert Storm, the importance of Space to military operations has been recognized. Far-sighted leadership at USSPACECOM pushed the envelope in highlighting the importance of Space to national security and warfighting success. USSPACECOM's showcase planning document, the Long-range Plan, provided a comprehensive Joint plan for Space that integrated Service capabilities and requirements through participation and support of its components. USSPACECOM sup-

ported and advocated the roles of the Services in support of Space operations through integration of its Joint Space Forces in military operations. USSPACECOM clearly saw the role and contributions each Service provided to Joint Space operations and accordingly advocated for or directly assigned missions. The success of Army support was evident in Space support teams, missile warning, payload control, and Space-based Blue Force Tracking. Now with the merger of the two commands and the revision of the UCP that assigned the new missions of global strike and command, control, communications, computers, intelligence, surveillance, and reconnaissance, along with the original missions of Space and integrated missile defense, USSTRATCOM will face a strategic challenge in maintaining the focus and advocacy for the Service roles in Space. Faced with an immense portfolio of missions, USSTRATCOM may look to its primary Service component command for Space, Air Force Space Command, to be the voice and advocate for Space and Space programs.

The third factor is the proposed change from the Requirements Generation System (RGS) (CJCSI 3170.01A) to Joint Capabilities Integration and Development System (JCIDS) (CJCSI 3170.01C), which is in draft. The JCIDS is a new and different concept that establishes the structure and defines how new capabilities will be developed and validated within DoD. The major difference between the old RGS and JCIDS is that JCIDS is top-down driven based on "national defense policy and centered in the common Joint warfighting construct." From the beginning, future capabilities will be developed in an integrated fashion and will be "born Joint." Capabilities will be developed to support an overarching Joint concept of operations through Joint operating concepts and Joint functional concepts. Supporting the concepts will be integrated architectures that develop operational, system and technical views for a functional area. Within the JCIDS structure, the focal point for organization, analysis and prioritization of warfighting capabilities is the Functional Capabilities Board (FCB). The FCB is a body that would be permanently established by the Joint Requirements Oversight Council. The current concept is for FCBs to align to functional areas such as "gathering information, producing information, preventing effects, causing effects, and focused logistics." We might expect that Space, as a whole, or subsets of Space (e.g., Space control, MILSATCOM, etc.) would be considered in the FCBs, but there would not be a specific FCB for Space. The FCB is responsible for the development and maintenance of functional concepts and integrated architectures, and the coordination, integration, and deconfliction of DoD component efforts within the functional area. FCB efforts are focused on the development of the entire range of doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) solutions. JCIDS documentation will be forwarded to the Joint Requirements Oversight Council for decision after evaluation and analysis by the FCB to ensure concept and architectural compliance. The FCB is the clearinghouse for warfighting requirements and the proponent of ultimate solutions.

The Army Path

With the acceptance of the Space Commission Report in 2001, the ongoing changes to the management and organization of Space including the merger of USSPACECOM and USSTRATCOM, and the pending publication of JCIDS, the centers of gravity have changed for Space and the Army must change with them. It is expected that these roles will continue into the near future; however, it is the evolving future of Space the Army needs to be concerned about. The designation of the Air Force as the Executive Agent for Space could allow the Air Force to prosecute its role in Space over those of the other Services. The challenge faced by the Executive Agent for Space will be to balance the strategic, operational, and tactical needs of all users and lessen the concern that the Air Force will dominate certain Space programs to the exclusion of the other Services. Although the Air Force may not intentionally exclude the other Services, the cultural differences between the Air Force Space Forces and the ground warfighter may make the understanding of warfighter needs and the priority of those needs open to different interpretations. To overcome the cultural differences, the Army needs to work with the Air Force in organizations such as NSS and the Air Force Space Command to develop their understanding of the ground warfighter perspective for Space support. This will require more active Army solicitation and participation at all levels of future development of Space capabilities within the Air Force Space structure.

The results of the merger of USSPACECOM and USSTRATCOM roles and missions under USSTRATCOM should be of some concern to the Army Space community. The broad roles and missions now assigned to USSTRATCOM lead to the certainty that Space will no longer have the pre-eminent hold it enjoyed under USSPACECOM. As the USSPACECOM Army component, Army Space advocated the Army warfighter needs — and USSPACECOM listened. The Army must work closely with the USSTRATCOM staff in advocating the Army's role in Space, solidifying Army missions and emphasizing a ground warfighter focus. As a uni-

The Army has had a prominent historical role in the development and use of Space capabilities. Many changes to Space organization and management have been proposed over the past few years, some of which are now being implemented.

fied command, USSTRATCOM's cultural focus is on current capabilities and operations, leaving future planning for Space to other organizations within DoD.

The proposed change from the current Requirements Generation System to the Joint Capabilities Integration and Development System may be the greatest opportunity for the Army to solidify its future roles and missions in Space. The Army's transformation development to the Objective Force should be a leading precept in the development of the Joint operating concept that describes how the Joint Force commander deploys, employs, and sustains a Joint Force.

Correspondingly, a Joint functional concept should, in part, reflect the objectives of TRADOC Pamphlet 525-60, Concept for Space Operations in Support of the Objective Force. The issue then becomes: are the Army concepts, as written now, relevant to the Joint concept of operations to be developed, given the change in current military operations over the past two years? To maintain relevancy, the Army will have to adapt its transformational and Space concepts to the national requirements. To be able to influence future Space, the Army will have to develop a stronger comprehensive concept for Space operations in support of the Objective Force along with a supporting architecture. That architecture must be forward looking with operational, system and technical perspectives that truly support the ground warfighter. In the past, the Army has had limited success in telling a convincing story that led to development of future Space capabilities. Current efforts within the Force Development and Integration Center of SMDC to establish a Space Planning Process to augment and structure the current Space Integrated Concept Team will provide the rigor and analysis necessary to build the Army concepts and architecture across all functional Space mission areas. Through this effort the Army should be able to present a comprehensive road map for Space, embodied in the Army Space Master Plan, that can be used to develop Joint concepts and architectures. The Army's participation in and support of the FCBs may prove crucial to its future influence over Space. Defining needed Army Space capabilities in support of the Objective Force and applying them to the FCBs may be the only way future Army Space capabilities will be recognized. This will require that the Army "cadre of Space experts" participate in the development of Joint functional concepts and integrated architectures by identifying supporting Space capabilities to the warfighter.

Conclusion

The Army has had a prominent historical role in the development and use of Space capabilities. Many changes to Space organization and management have been proposed over the past few years, some of which are now being implemented. While these changes, for the most part, are beneficial, they are not without challenges and should be closely watched through their implementation. It can be expected that as the nature of warfare continues to change as it has in the last couple of years, we can expect that the reliance on Space capabilities will significantly rise. As this occurs we will see changing emphasis, new operational concepts, and differing organizational structures that will be needed to meet the changes of the future. The Army has not only a vested interest in the future of Space and Space management, but also a moral obligation to its warfighters to ensure that Space continues to evolve and meet its operational needs. To meet this obligation, the Army must know where it wants to go in Space, develop the road ahead, and advocate its concepts in every Space forum. This will require "out-of-the-box thinking" on the part of our Space cadre and acceptance of new ideas and concepts in the various elements of our Space community. The most important aspect to successfully meet the challenges of the future is to have a holistic approach to Space throughout the Army. The challenge now facing the Army is to not regress into the development of stove-piped capabilities, but to support and participate in all facets of Space development to ensure future capabilities are relevant to warfighter needs. Army concepts and architectures must be integrated and reflect the relevance that the Army brings to the Space mission area.

Bill Furr serves as the plans director, G3, SMDC-West. His professional experience includes a degree in Geography and Environmental Science and an extensive background in Tactical and Strategic level Intelligence. He served on active duty (Army) for seven years before being assigned to Director of Intelligence, Cheyenne Mountain Air Station, where he served as the chief of Analysis. He still holds a Reserve Commission and supports the NORAD and NORTHCOM J2, Deliberate Plans Division.