

ARMY SPACE MASTER PLAN

By Ron Dickerman

The United States is the unquestioned leader in Space activities and is developing Space capabilities that will help transform the military. The United States Army is undergoing its own transformation from a heavy-oriented force to a light and agile force that will radically change how it conducts ground operations. The nation's Space capabilities have the potential to support all aspects of the ground maneuver force's operations and will be an integral component supporting the Army's transformation. Therefore, the Army needs a plan for how best to incorporate Space capabilities into its current and future forces, and a set of guidelines to develop Service positions on the design, acquisition, and employment of Space capabilities.

The Senior Army Space Council, chaired by the Deputy Chief of Staff, Operations (Department of Army G3), tasked U.S. Army Space and Missile Defense Command to lead an Army-wide effort to develop an Army Space Master Plan that can guide development of Space capabilities in support of ground maneuver force operations. There are two versions of the Army Space Master Plan; an unclassified, high-level extract and a classified (SECRET) version containing the specific details. This article describes the material found in the Plan and the process used to develop the document.

The Army Space Master Plan identifies roles and capabilities to guide development of Space capabilities as key enablers in support of ground maneuver force operations. And, it can be used as the basis for developing official Army positions on Space issues and for synchronizing Army efforts to leverage Space capabilities, as well as to develop Space-related input to Program Objective Memorandum decisions, The Army Plan, DOTMLPF (Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities) development

activities, the Army Campaign Plan, and the next Capability Needs Analysis. The assessment also supports the Space Operations Concept Capability Plan and can guide Army Science and Technology development efforts.

The U.S. Army Training and Doctrine Command Capability Needs Analysis 08-13 identified 61 capabilities required for success in future ground maneuver force operations. The Army Space Master Plan assessment team used the Capability Needs Analysis to derive Space capabilities that bridge operational capability gaps and to link potential Space solutions to Capability Needs Analysis-identified capability needs. The assessment team also prioritized gaps in the identified Army Space-required capabilities.

The assessment and prioritization was based on the following objectives: 1) the need to influence the development and design of future Space systems and their operational concepts to support the full range of joint ground force operations; 2) the Army's need to improve its ability to exploit Space systems in support of the current and future forces; and 3) the need to facilitate delivery of Space capabilities that address Army requirements.

The following conclusions about the role of Space emerged from the Space assessment and staffing process:

- An Army Combat Developer community that can understand, substantiate, articulate and defend Space requirements that support the ground maneuver force in the Joint Capabilities Integration and Development System process is critical to influencing future Space capabilities to support operational missions.
- A complementary mix of highly-trained and motivated Army Space cadre and traditional functional area experts is necessary for the Army to effectively exploit Space assets in support of ground maneuver force operations. Specific Space

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- Enhanced Satellite Communications
 - Early Missile Warning
 - Assured Access and Asset Protection
 - Persistent Surveillance
 - Position, Navigation, Timing
 - Weather, Terrain and Environmental Monitoring

Support to Army formations must be responsive, timely and assured.

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cadre positions, tasks and functions need to be identified as soon as possible.

- Satellite Communications (SATCOM) is critical to current and future force success. SATCOM service to theater operations is an amalgamation of multiple government programs with a heavy reliance on commercial providers to meet operational requirements, making vulnerability a potential problem area.
- Space-based Intelligence, Surveillance and Reconnaissance (ISR) systems are crucial to Entry/Shaping phases and non-contiguous operations, and Theater Downlink/Direct Downlink and Dynamic Tasking from theater are fundamental to timely, assured and responsive support to the ground maneuver force.
- Historically, Space capabilities were focused on global/strategic missions, with tactical applications piggy-backed on strategic and National assets. The Army must continue to influence the development, design and deployment of National assets to incorporate responsive, assured and timely support to ground maneuver operations in the initial design phases.
- Space-related Research and Development efforts need to be better linked to future capability gaps.
- Space Control will become an increasing area of emphasis as potential adversaries gain the technology to reduce our asymmetrical advantage in Space.

The following positions and actions support the Army's land dominance objectives:

- Emphasize the importance and utility of Space capabilities' timeliness, assuredness, and responsiveness to ground operations at the Joint and National levels and ensure those attributes are appropriately emphasized in Space system design and concept development.
- Articulate Army requirements in Space-related Joint Capabilities Integration and Development System documentation and other Department of Defense, National, and intelligence community forum to ensure Army needs are adequately considered in new and emerging

overhead systems and support architectures.

- Ensure new Space systems are designed for compatibility with Army information architectures to the maximum extent feasible, and that Army user equipment acquisition is synchronized with Space programs.
- Maintain flexibility to take advantage of technology developments that enable Space assets to meet the Army's maneuver capability gaps and develop new tactics, techniques, procedures and doctrine to enable those capabilities.
- Emphasize developing the personnel, training and tools to exploit Space capabilities.

The assessment supporting the Army Space Master Plan determined that the largest gaps in Space capabilities, and the greatest potential risk to ground operations, are a lack of high throughput, protected military satellite communications. Additionally, the assessment identified critical concerns over the continued availability of theater missile warning. Other gaps include lack of tactically responsive Space sensors, limited tactical responsiveness in Space control, and limited Space situation understanding. The gaps articulated in the Army Space Master Plan can be used as the basis for developing Army positions on Space programs as they move through the Joint Capabilities Integration and Development System process and can provide supporting rationale for advocating specific Space capabilities.

The Army Space Master Plan is built around the five Joint Functional Concepts, and shows how Space assets support those concepts and articulates the Army role relative to Space.

1) Joint Command and Control encompasses a commander's need to continually address changing situations and missions by dynamically linking functions within and across the Joint Operating environment. The cornerstone of Joint command and control for the Future Force is a ubiquitous, multi-layered command and con-

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trol network extending the essential command and control processes from the strategic to the tactical level. Satellite Communications networks enable extended range connectivity (even to forces on the move) that integrates all echelons in the Joint operational area. Space-based position, velocity, navigation and timing capabilities enable commanders at all echelons to shape the battlespace out of contact by enabling control and accuracy of extended range munitions and coordinated maneuver. Army elements will engage at all levels of Space planning and operations and synchronize collection and support activities supporting Joint command and control to achieve desired effects. The most consistent gap in this functional area is a shortage of Military Satellite Communication access.

2) Battlespace awareness contributes to battlespace success by enabling commanders to make better decisions more efficiently by providing actual and predictive cognizance. Battlespace awareness is enabled by seamless integration of a highly responsive overhead, airborne and terrestrial sensors across disciplines with a Flat Network (see the Army Intelligence Campaign Plan). Data derived from Space-based, and other, sensors will be inserted into a net-centric environment that produces information that supports operational time lines for both maneuver operations and missile defense; the intent is to provide unprecedented access to data from across sensors, systems, databases and networks in order to approach total situational awareness. Satellite communications links are necessary to integrate disparate systems and networks into a united network that enables successful joint operations from pre-deployment through decisive operations. Space-based position, velocity, navigation and timing capabilities will enable current and future forces to maneuver to contact at the maneuver commander's discretion. Army elements will fuse Space sensor products into usable information, integrate Space into a common operating picture, operate select SAT-

COM and high-altitude/sensor payloads and operate ground-based Space and missile defense radars. The most consistent gap is a shortage of tactically responsive sensors and the difficulty in providing data gathered within operational time lines.

3) Force Application synchronizes maneuver and engagement against an adversary to create the effects necessary to achieve assigned mission objectives. Space-based force enhancement capabilities provide intelligence, surveillance, reconnaissance and position, velocity, navigation and timing data, communications connectivity, and weather information that enable extended range engagements, precision weapon control, target tracking, actionable targeting and damage assessment. It also includes aspects of Space control. Space-based intelligence, surveillance and reconnaissance sensors will collect data to support an integrated operational picture of the battlespace at all echelons to quickly generate and synchronize maneuver and engagement for desired effects at decisive points, and satellite communications will be the primary data delivery mechanism. Operational and tactical success will depend on the ability to coordinate, direct, control and integrate Force Application activities in time, Space and purpose across the battlefield. Therefore, Space control activities will be necessary to protect critical Space assets and to protect Army forces from hostile Space capabilities. Army elements will fuse Space sensor products with data from other sources into effects-based planning, targeting and fire direction processes; provide remotely-delivered wide-area Global Positioning System (GPS) enhancement capabilities to urban and mountainous regions; and operate or control responsive, tactically relevant offensive Space negation capabilities. There are consistent shortfalls in military satellite communications interfaces, throughput to support Space-based intelligence, surveillance and reconnaissance sensors, and limited Space control capabilities.

4) Focused logistics provides end-

to-end control over the supply pipeline to ensure that forces, equipment, and sustaining support arrive where needed and on time. Space-based position, velocity, navigation and timing, Intelligence, surveillance and reconnaissance, Satellite Communication and Weather, Terrain and Environmental Monitoring systems facilitate focused logistics by supplying information used in traffic ability estimates, supply system visibility, precise tactical re-supply and maneuver. Satellite communications will be critical to a theater and global network-centric architecture enabling logistics decision superiority and the ability to integrate logistics with operations. Army elements will integrate satellite communications capabilities and Space sensor data products into logistics planning, control and operations. The capability gaps associated with focused logistics are related to shortfalls in military satellite communications, sensor coverage and position/navigation assets.

5) Joint Force Protection enables continuous operation in supporting the Joint Force Commander's intent. Space capabilities will provide missile launch detection, Military Satellite Communication networks, position, velocity, navigation and timing information and Space-based intelligence, surveillance and reconnaissance data for an asynchronous advantage over our adversaries which must be protected during employment, sustaining activities and redeployment. The goal is to prevent an adversary from employing capabilities that would restrict or prevent the joint force from achieving decisive results at the time and place of the U.S. leadership's choosing. Protection also includes actions necessary to protect the Joint Task Force from tactical missiles and release of chemical, biological, radiological, nuclear or environmental materials, as well as their effects. Army elements will integrate Space situational awareness into a common operating picture; plan, coordinate, integrate and synchronize employment of Joint Space control capabilities; exploit Space control capabilities in theater; and oper-

ate Space-based missile warning capabilities in theater. The most persistent gaps are the delay in replacing existing missile warning satellites and the lack of inherent interoperability in Blue Force Situational Awareness devices.

The Space assessment supporting Army Space Master Plan development identified a number of issues and questions that need proactive decisions by the Army leadership. Therefore, the plan recommends studies and assessments on the following questions and issues to enable Senior Leaders to make prudent decisions,

1. The Army must seek innovative solutions, to include partnering with commercial providers, to overcome military SATCOM shortfalls in capacity, user access and delays in capability improvements.

2. Where should the Army invest in near- Space and high-altitude, long-endurance platforms as a lower cost, more responsive alternative to Space platforms if they prove technically feasible?

3. Establish Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities development proponents (where they do not currently exist), and assign responsibilities for potential Army involvement in tactical satellite and near- Space and high-altitude, long-endurance capabilities and operations.

4. Assess the utility in pursuing a more efficient commercial imagery policy and process in order to better support time-sensitive tactical use.

5. Plan for the prioritized migration from using Commercial Satellite Communication to using Military Satellite Communication as the primary means of transmitting mission-critical data.

6. Determine and execute a course of action to bridge the two-year capability gap (2010-2012) between Joint Tactical Ground Station (JTAGS)/Defense Support Program and JTAGS follow-on/Space-Based Infra-Red Satellite to maintain an organic theater missile warning capability.

7. Army-operated elements of the Missile Defense Agency-developed Ballistic Missile Defense System must be supported in accordance with the Ballistic Missile Defense System transition and transfer plan to defeat Space transiting ballistic missiles

launched against the U.S. Homeland, allies, deployed forces, and other national interests, and to provide enhanced missile detection and assured warning for the U.S. Homeland and regional Combatant Commanders

8. Assess the utility of using directed energy as a weapons system within the Future Force. Consider mission areas, applications and constraints as part of the assessment.

The Space assessment of the Capability Needs Analysis identified Space capabilities that are critical to the Future Forces' ability to achieve mission success. Therefore, the Army Space Master Plan recommends that the Army carry the following positions into Space acquisition and Space operation discussions at every level:

- Military Satellite Communication programs will provide critical capabilities for Joint Command and Control; they must stay on schedule and meet performance levels. Joint Blue Force Situational Awareness, Combat Identification, and other blue force tracking activities need to migrate to Military Satellite Communication with the desire for further migration to protected Military Satellite Communication.

- The Army needs to continue to influence intelligence community and Department of Defense for tactically responsive sensors supporting Battlespace Awareness; this includes the capability for dynamic retasking and theater, en route and beyond line-of-sight downlink capabilities as part of the Space Radar design, without going back to the Continental United States. This means the Army should support Global Information Grid and Intel Enterprise capabilities that include theater/direct downlinks. Battlespace Awareness also needs better local weather support and timely, high-fidelity weather data. Satellite providers for Department of Defense operations need on-board standards for detecting and responding to attack, enabling a quality of assurance for support to ground operations. A "quick time to first fix" capability for GPS III and robust, anti-jam GPS signals are necessary to support Joint Blue Force Situational Awareness.

- Advocate an assessment of the utility of a Space sensor direct-to-shooter capability on future Department of Defense and National systems as support to Force Application.

Joint Space Control efforts should include an offensive focus, aimed at creating tactical effects. Those efforts need to be synchronized and integrated with other Joint Space control activities. Determine the need for Joint development of a tactical single integrated Space picture capability embedded in Joint Battle Command systems.

- There can be no compromise on the need for a direct downlink capability from Overhead Non-Imaging InfraRed sensors to the theater as part of the protection concept. Also, Army Combat Developers must ensure that U.S. Strategic Command's Functional Solution Analysis for Space control fully addresses the impact of Space control capability gaps on the ground maneuver force.

- Joint Space doctrine needs updating to provide needed depth and clarity for command and control of Space forces as part of the effort to integrate Space into the Future Force. In addition, Space impacts on ground operations must be integrated across the Joint virtual and live training complex.

The Army Space Master Plan with annexes provides guidelines for developing Army positions relative to Space questions and issues. It ties needed Space capabilities to Army operational capabilities in support of the five Joint Functional Concepts — Joint Command and Control, Battlespace Awareness, Force Application, Focused Logistics, and Protection. It also identifies potential gaps in needed Space capabilities, and recommends some doctrine, organization, training, material, leadership, personnel and facilities solutions to bridge (at least partially) those gaps. The experience and insight gained from implementing the recommendations and resolving the identified issues, and the analysis conducted to support those activities, will make the Army a better-educated consumer of Space products.

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