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AUSA's Institute of Land Warfare Attn: Defense Report 2425
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Space and Missile Defense Challenges:

The Army's Interest in Space Control

(Third in a series of three Background Briefs based on information obtained from U.S. Army Space and Missile Defense Command)

Dominance in space is integral to enhanced full-spectrum operations. To the Army, space is a vertical extension of the battlespace. It is key terrain with a unique view of the battlespace and high-capacity data streams conveying operational advantages through highly capable terminals and ground stations. Space systems support intelligence, surveillance and reconnaissance; weather, terrain and environmental monitoring; communications; missile warning; and positioning, navigation and timing. In operational terms, space provides a virtual forward presence, extends operational reach, enhances connectivity among operational elements, enables advanced logistics concepts and split-based operations, and more. It also provides a universal reference grid and timing system, which lets us operate with precision, speed and comprehensive situational awareness. Space systems, in fact, are essential to achieving the multidimensional situational awareness required for strategic deployability and enhanced full-spectrum operations at home and abroad. Space dominance is integral to achieving the information dominance necessary to execute the enhanced joint operational concepts of Joint Vision 2010.

However, U.S. dominance in the dimension of space is not guaranteed. Adversaries understand the advantages of operating from space. Some forty nations have space programs, and the array of commercial systems is growing steadily. Many of those systems have military applications such as targeting, intelligence, and communications. Adversaries will probe our space systems for vulnerabilities, or they might alter the space environment to disrupt or deny our space operations. They might gain access to our systems and tamper with data or exploit it for hostile purposes, or they might turn to third parties to buy services and products of military significance without making the huge investment of resources to develop their own space program. Each of these approaches has unacceptable implications for our land forces. Consequently, the Army, in conjunction with the Department of Defense (DoD), is implementing a broad-front campaign to protect its vested interest in space by contributing to the U.S. capability for control.

The Army's approach to engaging in space control activities. Space control is a joint mission. Its operational elements include *surveillance* of the region of space, *protection* of friendly-force space systems, *prevention* of enemy use of friendly or third-party systems and, if necessary, forceful *negation* of an enemy's space capabilities. The Army participates in development of these operational elements, directing its limited space resources to initiatives addressing specific land force needs or leveraging the Army's traditional competencies in ground-based operations to support joint needs. A two-pronged approach to space control has emerged:

- Army investments in selected multiagency or joint space control initiatives.
- Development of Army capabilities into space control-capable systems.

Army investments in selected multiagency or joint space control initiatives. The Army makes precisely targeted, modest investments in joint, commercial and multiagency initiatives that will meet specific land force needs. This is not unlike the Army's approach to tactical exploitation of national capabilities, or TENCAP. Investments may take the form of funding, exercise participation, personnel, analytical capability or other means to contribute to the shaping of the initiative. One example is the Army's participation in navigation warfare studies and the Global Positioning System (GPS) modernization effort. This interagency initiative is developing measures to allow a joint force commander to selectively deny an adversary's use of GPS signals, while preserving our own access to the system. Operational solutions will likely take numerous forms. Under consideration are jamming and antijam techniques, modifications to user terminals, and navigation warfare measures incorporated into signals emitted by GPS satellites.

The Army is implementing another significant investment contributing to space support to Army operations and space control—the establishment of a functional area for space operations officers. The numerous stakeholders in the Army space and user community are refining the duties and TOA (Table of Allowance) positioning of these officers. It is clear, however, that they will play a prominent role in space control. Their tasks will include space-focused intelligence preparation of the battlefield, coordination of multiagency space control measures, and the translation of the space situation into terms relevant to land forces.

Development of Army capabilities into space control-capable systems. The Army is well along in its development of space negation capabilities. For example, the kinetic energy antisatellite program (KE-ASAT), managed from the Missile Defense and Space Technology Center at Huntsville, Alabama, leverages the Army's work in exoatmospheric interceptors, seekers and kill vehicles. Within a few years, KE-ASAT could provide the nation a limited satellite intercept capability. The Army is also leading the effort to understand the effects of directed energy on satellite systems, having conducted a data collection exercise at the High Energy Laser Systems Test Facility at White Sands, New Mexico, lasing an on-orbit satellite to determine vulnerabilities of U.S. satellites to this type of threat. Additionally, in recent months the Army has rejuvenated its Big Crow system, the free world's premier nonlethal space control capability. Big Crow is a uniquely capable collection of reconfigurable electronic warfare capabilities, including jamming, detection, interception and deception features. Currently, the Army is developing an operational concept for its employment in support of the geographic commanders in chief (CINCs).

The Army's role in space surveillance is also expanding. The Army's high-power radars at the Kwajalein Missile Range (in the Pacific's Marshall Islands) continue to serve as a mainstay of the space surveillance network. The radars at the Kiernan Reentry Measurements System complex on Kwajalein Atoll provide the only precision deep-space tracking capability in the Eastern Hemisphere. Also, they track missiles launched from space ports and test ranges in western Asia, and conduct detailed imaging of designated space objects passing over the vicinity of Kwajalein. An ongoing modernization and remoting program is ensuring the efficiency and serviceability of these radars well into the next century.

The Army is applying other areas of expertise to the space surveillance challenge. For example, the Army has recently authorized research under a science and technology objective to investigate the use of Army tactical systems as theater-level space surveillance capabilities. This capability would augment the worldwide space surveillance network operated in support of U.S. Space Command. Theater-level

space surveillance would let a joint force commander see the region of space as he needs to see it, when he needs to see it, and in a way that responds specifically to his priority information requirements.

Bottom line: Space control is Army business. The Army has a vested interest in space dominance, just as it has in other areas critical to the mission. Battles for space supremacy will be intertwined with information warfare and often fought from the ground. Consequently, the Army's contributions to space control are numerous—and growing. Based on this assessment of the space control environment, the Army is pushing hard to help secure and maintain U.S. dominance on the vertical extension of the battlefield.

