

Leveraging Space:

An Examination of the Ultimate High Ground at Echelons Brigade and Below

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Describing the space domain as “the ultimate high ground” may seem a bit cliché, but there are some underlying truths in the statement the U.S. Army has taken for granted since the advent of the space-enabled force in the late 1980s. Imagine a day without space assets providing intelligence, surveillance, and reconnaissance (ISR) of denied areas; Global Positioning System (GPS) providing position, navigation, and timing (PNT) for joint friendly force tracking, precision-guided munitions, etc.; satellite communications (SATCOM); missile warning (MW) systems; or environmental monitoring (EM) providing terrestrial weather enabling land operations; and you quickly recognize the U.S. Army’s reliance on the capabilities afforded by the ultimate high ground of space. Over the course of the previous three decades, the U.S. Army has shifted from being space-enabled to space-dependent — a condition our potential adversaries understand and likely intend to exploit in future conflicts.

Space provides multiple capabilities that enable movement and maneuver, but our adversaries will increasingly put these at risk to neutralize our long-held technological advantage and challenge conventional assumptions of domain superiority. Therefore, units must be adept at operating in a denied, degraded, or disrupted space-operating environment (D3SOE). This article addresses how formations can best prepare for this reality to ensure mission accomplishment regardless of the level of space domain degradation. Commanders must be aware of the threat, understand the role of space capabilities within the U.S. Army, and exercise future space support within the emerging conceptual frameworks of multi-domain battle (MDB) and the Army Functional Concept for Movement and Maneuver (AFC-MM).

The Threat

Any adversary can be space-capable with access to many of the same capabilities the U.S. Army enjoys if they can afford the commercial rate for provided services.¹ Space-faring nations — nations that possess their own space capabilities — have a wider range of options. Some possess the ability to develop their own space systems and function in the space domain as near-peer competitors with the U.S. These capabilities generally provide ISR, PNT, SATCOM, MW, and EM for their forces. Some of these near-peer competitors have also developed counter-space abilities or the ability to threaten others’ space assets and means.² Some nations employ a mix of national and commercial capabilities while others depend upon commercial only.

Considering a typical U.S. Army brigade combat team (BCT) has more than 2,500 pieces of PNT-enabled equipment and 250 pieces of SATCOM-enabled equipment, assured access to space is tremendously important.³ The recent conflict in the Ukraine highlighted issues the U.S. Army could face in the future. Russian separatists were highly successful executing electronic attacks, GPS jamming/spoofing, and signals interceptions and targeting.⁴ Carl von Clausewitz opined that “[h]istorical examples clarify everything and also provide the best kind of proof” if properly

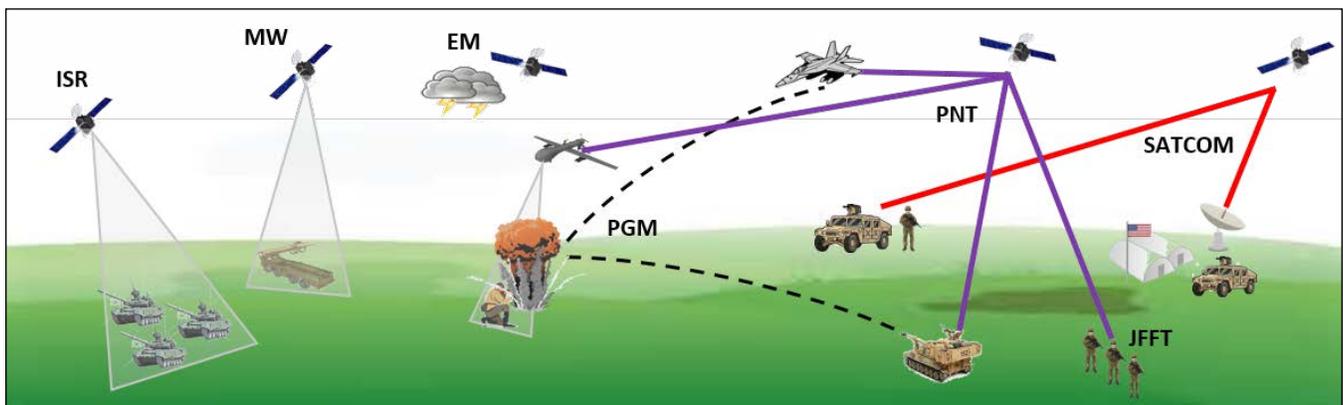


Figure 1 — Illustration of Space Support to Operations

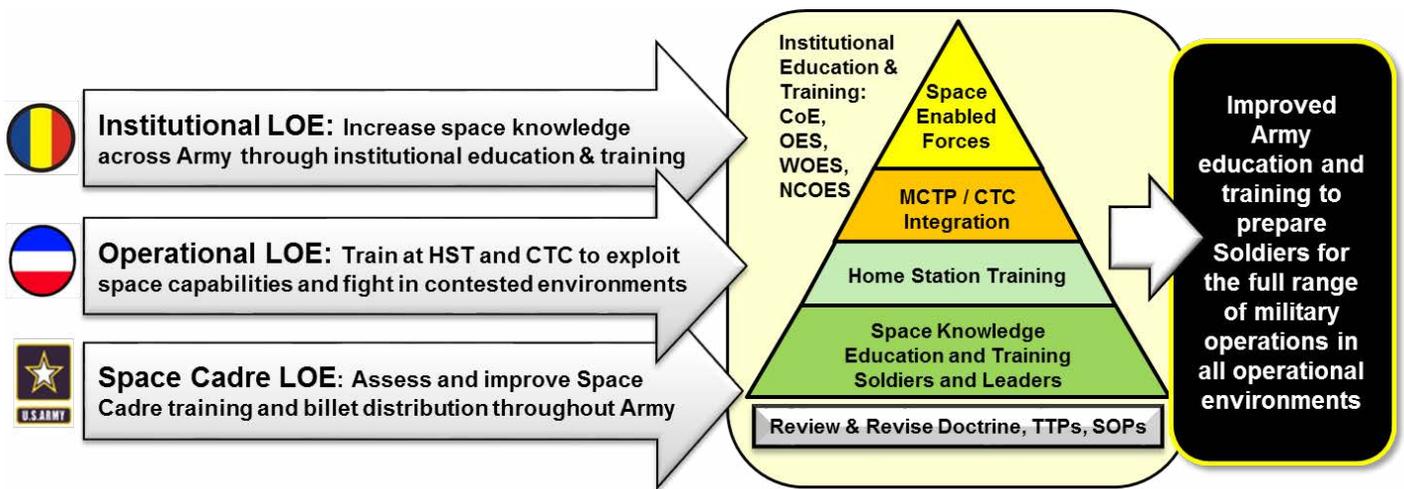


Figure 2 — The Army Space Training Strategy¹¹

used through explanation, application, supporting facts, and deduction of doctrine.⁵ Sun Tzu also counseled that “one who knows the enemy and knows himself will not be endangered in a hundred engagements. One who does not know the enemy but knows himself will be sometimes victorious, sometimes meet with defeat. One who knows neither the enemy nor himself will invariably be defeated in every engagement.”⁶

If we heed this advice, then understanding how the space domain can affect the U.S. Army (in light of potential threats) and how it is structured to leverage the ultimate high ground is very instructive for a “space savvy” future force.

Role of Space

Recent observations, trends, and insights reveal that most units are ill-prepared for a D3SOE, and there is much room for improvement. The 2015 Gypsy Kilo exercise was a Joint Navigation Warfare Center (JNWC)-facilitated contested PNT and Navigation Warfare (NAVWAR — deliberate defensive and offensive action to assure friendly use and prevent adversary use of PNT) event. JNWC simulated these conditions for company-sized elements and concluded units experienced significant issues navigating and maintaining situational awareness of force orientation in degraded environments.⁷

National Training Center (NTC) rotation after action reviews routinely reveal:

- 1) Underutilization of GPS encryption;
- 2) Deficiencies in spectrum management operations (SMO)/joint restricted frequency list (JRFL);
- 3) Poor SATCOM terminal operations;
- 4) Insufficient contested space techniques [e.g., primary-alternate-contingency-emergency (PACE) plans, tactical standard operating procedures (TACSOPs), battle drills]; and
- 5) Inadequate unmanned aerial system (UAS)/counter-UAS operations.⁸

U.S. Army senior leaders believe the old adage, “The more you sweat in peace, the less you bleed in war.” In December 2015, the Chief of Staff of the Army (CSA) challenged the Combat Training Centers (CTCs) for “increased exposure to electronic warfare... as close to combat as you can get without actual death. Ratchet up the intensity... to make the experience a leader and Soldier crucible.”⁹

The commanding general of the Combined Arms Center (CAC) published a directive mandating the inclusion of D3SOE training into all professional military education courses. The commander’s intent is to “ensure the Army Space Training Strategy (ASTS) is fully implemented within professional military education in order to improve the Army’s understanding and utilization of space capabilities, improve operations in contested operational environments, and create a continuum of career-long space education throughout the professional development system.”¹⁰

The U.S. Army Space and Missile Defense Command (SMDC) is working hard to reverse these trends by fully

implementing the Headquarters, Department of the Army (HQDA) G3-directed ASTS in preparation for the future and providing D3SOE home-station training to better prepare units for training rotations.

SMDC supports U.S. Army space training and professional development and education through three lines of effort (LOEs): **institutional**, **operational**, and **space cadre** (see Figure 2). The **institutional** LOE aims to increase knowledge and awareness of space capabilities through education and training at U.S. Army Training and Doctrine Command (TRADOC) centers of excellence and schools. Currently at the Maneuver Center of Excellence (MCoE) at Fort Benning, GA, SMDC teaches blocks of space instruction to the Maneuver Pre-Command Course (MPCC), Infantry/Armor Basic Officer Leader Courses (I/ABOLC), and is making progress toward implementing instruction for the Maneuver Captains Career Course (MCCC).

Through the **operational** LOE, SMDC trains units at home station and the CTCs to better leverage space capabilities and better prepare them to fight in a D3SOE. Units can coordinate directly with the Army Space Training Integration (ASTI) Branch to integrate space training into the unit training cycle.

Lastly, the U.S. Army has a core of **space cadre** to offer subject matter expertise within the operating force. Army Space Support Elements (SSEs) are small cells of space cadre trained and experienced in space operations organic to army, corps, division, and special forces group staffs. The SSE understands planning and operational considerations of employed space capabilities and has a firm knowledge of the threats to those systems by an adversary. An Army Space Support Team (ARSST) can augment an SSE for product development and employment of unique capabilities during deployments, exercises, or increased operational tempo situations. The ARSST is also tailorable in size and expertise (rank and/or military occupational specialty [MOS]) based upon the needs of the supported organization.

Armed with knowledge of the threat and self-awareness of space domain operations (function and structure), the U.S. Army can better prepare the force for future conflicts. Space cadre members resident within the force structure offer units a myriad of support. Examples include reverse intelligence preparation of the battlefield (IPB)-red space, electromagnetic interference (EMI) resolution, NAVWAR and special technical operations (STO) support, missile warning system status, additional imagery/overhead persistent infrared (OPIR) requests, space systems constellation health status, and GPS accuracy reports.

Future Space Support

Just as the second offset strategy of the 1980s connected the U.S. Army to space-based capabilities, the third offset strategy must maintain the U.S. military's advantage over its adversaries in space. The CSA/Commandant of the Marine Corps (CMC)-approved white paper on MDB is informing the U.S. Army on how current and future forces will operate and protect capabilities within the space domain in light of the emerging near-peer threat. The U.S. Army cannot allow current and planned space dependencies to hinder operations in future conflicts. Concept-to-

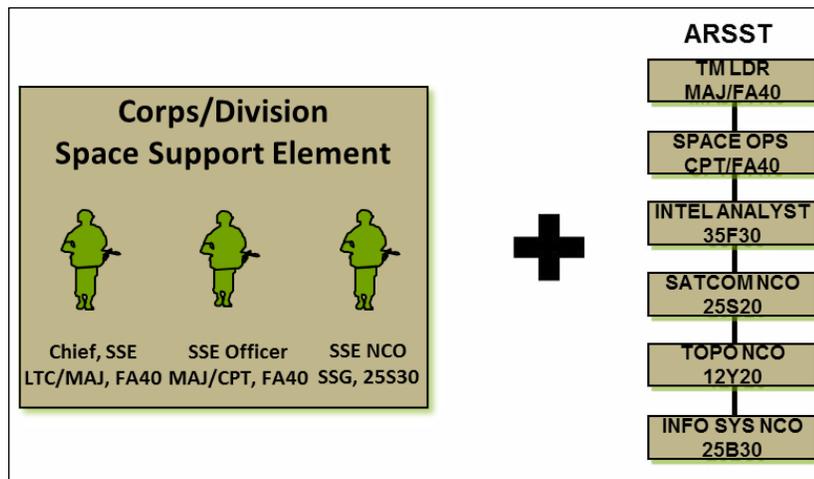


Figure 3 — Army Space Cadre at Echelons Above Brigade

*ARSST structure as example only; it is tailorable to fit mission requirements

capability activities orchestrated by TRADOC aim to address these dependencies and better protect and employ current and future technologies to retain a continuing advantage. How the U.S. Army plans to leverage space in the future to execute MDB and the AFC-MM is a considerable question to be addressed in the Force 2025 Maneuver's Campaign of Learning. There is no doubt that space capabilities are integral to the Department of Defense (DoD) MDB concept or that they will enable the four components of the AFC-MM solution: cross-domain maneuver, semi-independent operations, integrated reconnaissance and security, and realized mission command. Future threats, coupled with new-found self-awareness, require the U.S. Army to make changes.

The ASTS guides these efforts through training, and SMDC is also actively engaged in concept-to-capability development of potential capabilities across the doctrine, organization, training, materiel, leadership, personnel, facilities, and policy (DOTMLPF-P) for the force as well. In the past, the Army was primarily a receiver of space capabilities owned and operated by other services. Emerging doctrine in MDB is an opportunity for the U.S. Army to become more of a provider of effects. Imagine a BCT commander being able to plan, coordinate, and employ space effects from a space battalion in the same fashion as they would employ a fires battalion in direct support (DS) with priority of fires (POF). This formation hypothetically could have high-altitude airships (HAAs) with interchangeable ISR, SATCOM, PNT, MW, or fires payloads capable of providing real-time, responsive effects for the maneuver commander. Or perhaps, this unit is equipped with retrievable payload-carrying balloons or small satellites to provide diverse capabilities dedicated to tactical formations without reliance on national assets.

The possibilities are extensive, and options exist even in a fiscally constrained environment. Maneuver leaders owe it to their profession and their Soldiers to create the demand signal for the space community on how best to support. Leveraging space at the brigade and below echelons is in a crucial stage of development. The MCoE Capability Development Division (CDD) is pushing the envelope on space integration with the multi-domain task force (MDTF) to execute cross-domain maneuver and employ cross-domain fires as well as gaps in obscurity across the entire electromagnetic spectrum (EMS) with the U.S. Army Cross Domain Obscurity Strategy. The nature of warfare is changing and the question is does the U.S. Army take the initiative and shape the change or just hold on for the ride?

Notes

¹ SMDC Directorate of Training and Doctrine (DoTD), Space Update, MCoE Pre-Command Course (PCC) Brief (2016).

² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Carl von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 170-171.

⁶ Sun Tzu, *The Art of War*, trans. Ralph D. Sawyer (NY: Basic Books, 1994), 179.

⁷ SMDC DoTD.

⁸ Ibid.

⁹ SMDC G31 Training, Readiness, and Exercises, "Army Space Training and Integration (ASTI) Branch," 2.

¹⁰ CAC, D3SOE Tasking Order, 2017, 1.

¹¹ SMDC DoTD.

¹² TRADOC, The U.S. Army Functional Concept for Movement and Maneuver 2020-2040, February 2017, 22.

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