

Leveraging Space: an Examination of the Ultimate High Ground at Echelons Brigade and Below

by LTC Coley D. Tyler

Describing the space domain as “the ultimate high ground” may seem cliché, but there are some underlying truths in the statement that 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;
- The Global Positioning System (GPS) providing position, navigation and timing (PNT) for joint friendly-force tracking;
- Precision-guided munitions;
- Satellite communications (SATCOM); or
- Missile warning (MW) or environmental monitoring (EM) providing terrestrial weather, enabling land operations ...

... and you quickly recognize the Army’s reliance on the capabilities afforded by the ultimate high ground of space.

Over the course of the previous three decades, the Army has shifted from being space-enabled to space-dependent, a condition our potential adversaries understand and intend to exploit in future conflict.

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 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).

Threat

Any adversary can be space-capable with access to many of the same capabilities the U.S. Army enjoys if it 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 United States. 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 on commercial only.

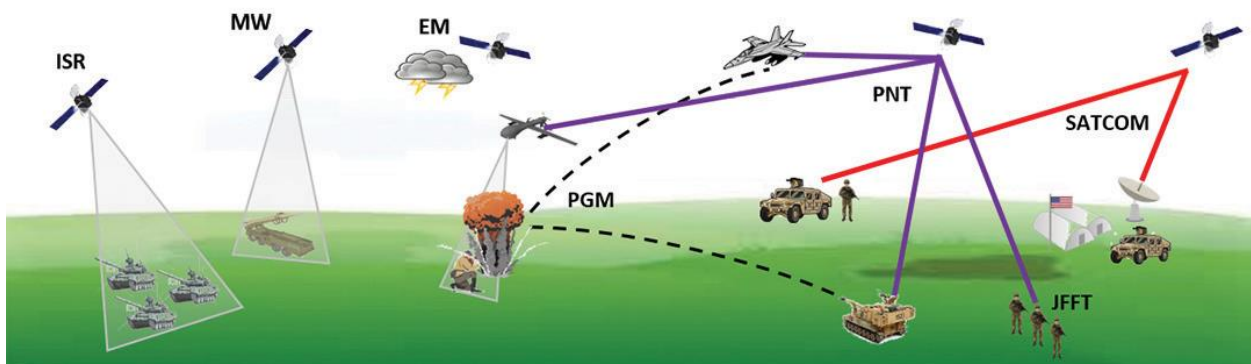


Figure 1. Illustration of space support to operations. (Graphic by LTC Coley D. Tyler)

Considering that 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 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 opines that “[h]istorical examples clarify everything and also provide the best kind of proof” if properly 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 and sometimes will meet with defeat. One who knows neither the enemy nor himself will invariably be defeated in every engagement.⁶

If we heed their 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 saavy” future force.

Space’s role

Recent observations, trends and insights reveal that most units are ill-prepared for a D3SOE and there is much room for improvement. For example, in the 2015 Gypsy Kilo exercise – a Joint Navigation Warfare Center (JNWC)-facilitated contested PNT and navigation-warfare (navwar) event – JNWC simulated D3SOE conditions for company-sized elements and concluded that units experienced significant issues navigating and maintaining situational awareness of force orientation in degraded environments.⁷

National Training Center rotation after-action reviews routinely reveal:

- Underuse of GPS encryption;
- Deficiencies in spectrum-management operations/Joint Restricted Frequency List;
- Poor SATCOM terminal operations;
- Insufficient contested-space techniques (for example, primary-alternate-contingency-emergency plans, tactical standard operating procedures and battle drills); and
- Inadequate unmanned aerial systems (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 Combined Arms Center (CAC)’s commanding general published a directive mandating the inclusion of D3SOE training into all professional-military-education (PME) courses. The commander’s intent is “[t]o ensure the Army Space Training Strategy is fully implemented within [PME] to improve the Army’s understanding and [use] 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 Army Space Training Strategy (ASTS) that the Army G-3 directed in preparation for the future and by providing D3SOE home-station training to better prepare units for training rotations.

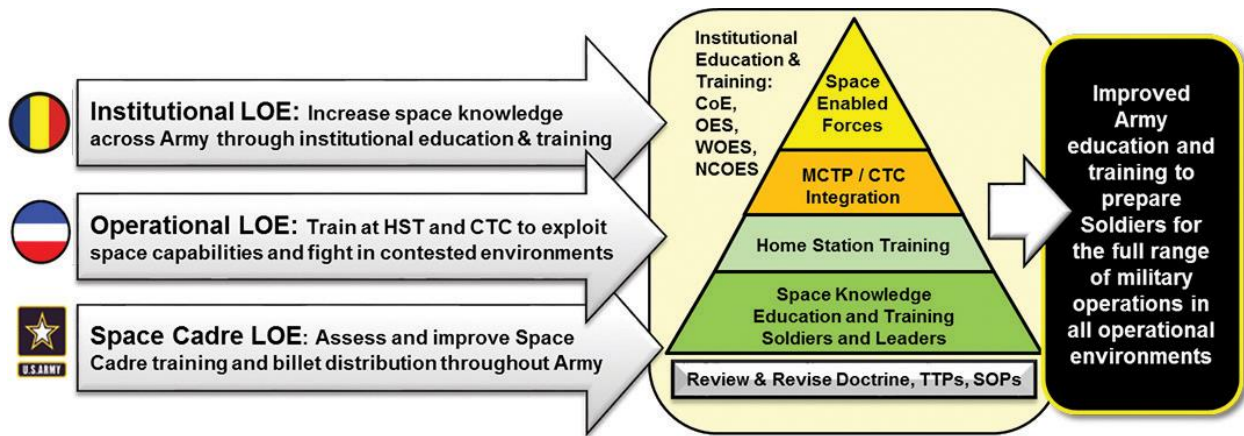


Figure 2. ASTS. (Graphic source: *Space Update*, MCoE Pre-Command Course brief)

SMDC supports U.S. Army space training and professional development and education through three lines of effort (LoEs): institutional, operational and space cadre:

- The **institutional LoE** aims to increase knowledge and awareness of space capabilities through education and training at Training and Doctrine Command (TRADOC) centers of excellence and schools. Currently at the Maneuver Center of Excellence (MCoE) on Fort Benning, GA, SMDC teaches blocks of space instruction to the Maneuver Pre-Command Course and Infantry/Armor Basic Officer Leader Courses. SMDC is also making progress toward implementing instruction for the Maneuver Captain's Career Course.
- 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 with the Army Space Training Integration (ASTI) Branch directly 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 (SSE) are small cells of space cadre trained and experienced in space operations organic to army, corps, division and Special Forces Group staffs. SSE understand planning and operational considerations of employed space capabilities and have 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. An ARSST is also tailorable in size and expertise (rank and/or military-occupation specialty) based on the supported organization's needs.

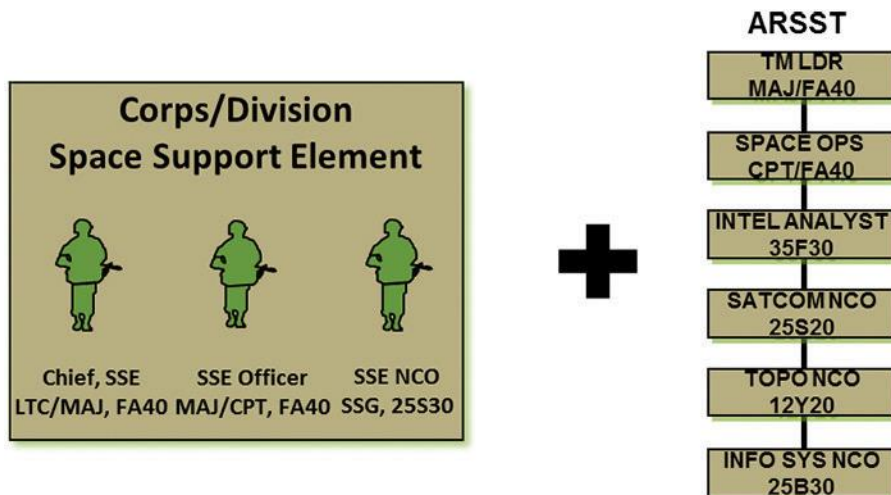


Figure 3. Army space cadre at echelons above brigade. The ARSST structure is diagrammed as an example only, as it is tailorable to fit mission requirements. (Graphic by LTC Coley D. Tyler)

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/Red space; electromagnetic-interference resolution; navwar and special technical operations support; MW system status; additional imagery/overhead persistent infrared 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 and commandant of the Marine Corps recently signed off on an MDB whitepaper that will serve to inform 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-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 Campaign of Learning. There is no doubt that space capabilities are integral to the Defense Department's MDB concept or that the Defense Department will enable the four components of the AFC-MM solution: cross-domain maneuver, semi-independent operations, integrated reconnaissance and security and realized mission command.¹¹ Future threats, coupled with newfound 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 doctrine, organization, training, materiel, leadership, personnel, facilities and policy 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 he/she would employ a fires battalion in direct support with priority of fires. This formation hypothetically could have high-altitude airships 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 brigade-and-below echelons is in a crucial stage of development. MCoE's Capability Development Division is pushing the envelope on space integration with the multi-domain task force to execute cross-domain maneuver and employ cross-domain fires, as well as to fill gaps in obscuration across the entire electromagnetic spectrum with the U.S. Army cross-domain obscuration 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?"

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Notes

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

⁶ Sun Tzu, *The Art of War*, trans. Ralph D. Sawyer, New York: Basic Books, 1994.

⁷ Navwar is a deliberate defensive and offensive action to assure friendly use and prevent adversary use of PNT, per DoTD.

⁸ *Space Update*.

⁹ SMDC G-31 Training and Exercise, ASTI Branch, 2017.

¹⁰ CAC, D3SOE task order, 2017.

¹¹ TRADOC, *The U.S. Army Functional Concept for Movement and Maneuver 2020-2040*, February 2017.

Acronym Quick-Scan

AFC-MM – Army Functional Concept for Movement and Maneuver

ARSST – Army space-support team

ASTI – Army Space Training Integration

ASTS – Army Space Training Strategy

BCT – brigade combat team

CAC – Combined Arms Center

CSA – Chief of Staff of the Army

CTC – combat-training center

D3SOE – denied, degraded or disrupted space operating environment

DoTD – Directorate of Training and Doctrine

EM – environmental monitoring

GPS – Global Positioning System

ISR – intelligence, surveillance and reconnaissance

JNWC – Joint Navigation Warfare Center

LoE – line of effort

MCoE – Maneuver Center of Excellence

MDB – multi-domain battle

MW – missile warning

Navwar – navigation warfare

PME – professional military education

PNT – position, navigation and timing

SAMS – School of Advanced Military Studies

SATCOM – satellite communications

SMDC – Space and Missile Defense Command

SSE – space-support element

TRADOC – (U.S. Army) Training and Doctrine Command

UAS – unmanned aerial system

USMA – U.S. Military Academy