

Maneuvering in Space

By Donald E. Messmer Jr.

For Your Consideration

“Talking Army” helps soldiers understand what space operations bring to the fight.

- Does using the term “space operations maneuver” help communicate the importance of military space capabilities?
- What are the physical and doctrinal aspects of space operations maneuver?

Lessons learned over the past decade have taught us space operations are critical to unified land operations and the way the Army fights. Soldiers of all ranks and from all branches have stated repeatedly the dependency Army forces have on space operations. This reliance is well codified in doctrine. Just as new lessons are constantly being learned, however, they also must be constantly integrated into doctrine.

The 2012 Defense Strategic Guidance places “Operate Effectively in Cyberspace and Space”¹ as one of the top defense mission areas. It recognizes space capabilities as a critical component of an agile, responsive and tailorable force capable of responding to any mission, anywhere, any time. Effective space operations only can occur with a force adept in current practices and doctrine.

Experience has proven Army space operations are effective but not well understood by soldiers, including many senior leaders, largely due to abstract terminology. Space operators use terms of the art such as space force enhancement, space support and space control without understanding the communications gap this causes with the rest of the Army. These terms do a poor job of describing the capabilities and effects space operations deliver and how they help soldiers in unified land operations. Recognizable, self-descriptive terminology is needed to communicate to soldiers the capabilities and effects provided by space operations.

To illustrate this point, Army soldiers know how to navigate using handheld devices that harness the power of GPS but may not recognize degraded conditions or realize that their mission may be impacted when someone announces position, navigation and timing (PNT) is degraded. Many soldiers cannot recognize their handheld GPS device is being jammed and may simply believe the device is malfunctioning because they don’t understand “space-jargon” or the impact when they are told there is electromagnetic interference affecting PNT.

Make the Abstract Recognizable

To be effective, the capabilities and effects of space-based operations such as PNT; intelligence, surveillance and reconnaissance (ISR); satellite communications (SATCOM); environmental monitoring/weather; and missile warning must be available to the warfighter whenever needed. Space operations must be responsive to commanders’ needs, remain flexible to each situation and be agile in response to operating in a denied, degraded and disrupted space operational environment (D3SOE)—the space operations focus of operating within a contested electromagnetic spectrum (EMS) environment.

In his book *On Becoming a Leader*, Warren Bennis, a pioneer of the contemporary field of leadership studies, writes, “You have to be able to make the abstract recognizable, because

only then can people accept or reject it.”² Space operations widely are acknowledged as abstract, most likely because they are not easily observed, recognized or understood, aside from the well-known use of SATCOM and GPS.

One of the things that makes space operations so critical for the Army is they give fighting forces a distinct advantage during fires, movement and maneuver. As Lt. Gen. David L. Mann, then-commander of U.S. Army Space and Missile Defense Command/Army Forces Strategic Command, said to the Senate Armed Services Committee in March 2014, “Army space forces contribute to the Joint Force and the Army’s ability to be adaptive, versatile and agile to meet tomorrow’s security challenges. Simply put, space capabilities are critical elements to the Army’s ability to see, shoot, move and communicate.”³

According to Joint Publication 3-0, the first of four definitions of maneuver is “a movement to place ships, aircraft or land forces in a position of advantage over the enemy.” The absolute necessity for space operations to enhance ground operations drives both the Army’s and space operations adaptivity, versatility and agility. It is this same necessity coupled with recent lessons learned that drives doctrine to adopt the framework of space operations maneuver.

Space operations maneuver should be a subset of a newly recognized but unnamed electronic maneuver used to place forces into a position of advantage. Electronic maneuver includes those operations dependent upon the EMS such as space, cyberspace, signal, electronic warfare and information operations. This article’s focus is on space operations maneuver, but the discussion is just as applicable to the umbrella definition and understanding of electronic maneuver, although specific examples will differ.

The definition of maneuver is largely limited to ground, sea and air. The codified joint definitions given for maneuver talk about “ships, aircraft, or land forces . . .,” “at sea, in the air, on the ground or on a map . . .” or “operation of a ship, aircraft or vehicle . . .”⁴ Only the latter can remotely be applied to space operations, and only if one considers a satellite as the “vehicle” mentioned. But even this application does not address the virtual aspect of electronic maneuver or space operations maneuver, wherein both deliver a position of advantage over the enemy without physically moving resources.

While the codified definitions of maneuver fail to recognize how maneuver applies to those operations dependent upon EMS, practitioners should not be bound by a conventional definition that prevents them from providing a thorough and proper explanation of space operations maneuver. Failure to update doctrinal language when operational environments change relegates the doctrine to a position of dogma. The long pole in the tent is whether to create new language, which even fewer soldiers will understand, or expand upon—or corrupt, depending on one’s perspective—an existing definition.

At the October 2016 meeting of the Association of the United States Army, then-Deputy Secretary of Defense Robert O. Work gave a special address opening a seven-member panel discussion titled “Multi-Domain Battle: Ensuring Joint Force Freedom of Action in Future War.” He said, “Multi-domain battle envisions a future where you synchronize cross-domain fires and maneuver in all the domains to achieve physical, temporal and positional advantages.”⁵

Space operations are critical in providing cross-domain fires, whether supporting targeting information for conventional fires or providing the capability and effects for electronic fires. Space operations maneuver is a cornerstone of space operations and must be recognized as part of the lexicon. Work said exactly that: “synchronize cross-domain maneuver in all the domains,” which explicitly implies space operators manipulating space resources in the space domain—or simply space operations maneuver.

Space Operations Maneuver as a Framework

The Army uses the warfighting functions as an operational framework to assist commanders and staffs in describing the application of combat power. An operational framework is a cognitive tool used to assist commands and staffs to clearly visualize and describe the application of combat power in time, space, purpose and resource.⁶ An operational framework that uses the most recognizable of Army terms and highlights space operations' responsiveness, flexibility and agility makes space operations easier to recognize and understand.

Space operations maneuver is a framework borne from the lessons of more than a decade of war which has helped mature Army space operations. It is a cohesive term used to pull together multiple space capabilities and effects used together to achieve a desired result. Space operations maneuver recognizes space operations must be conducted in a collaborative manner, and it does so using a term all soldiers readily recognize and understand.

Space operations maneuver is not an Army warfighting function, nor does it attempt to modify the movement and maneuver warfighting function. Space operations maneuver is not a new space mission area, function, process or concept, nor does it attempt to modify the existing space mission areas. It is a doctrinal framework used to describe and codify the responsive, flexible and agile actions space operations always have undertaken to ensure mission success.

As a doctrinal framework, the term space operations maneuver improves communication. It conveys far more than abstract operations. Space operations maneuver tells soldiers Army space operations are responsive, flexible and agile. It indicates space operations provide capabilities and effects to place Army forces in a position of advantage over the adversary. It tells soldiers Army space operations will adjust to overcome operating in a D3SOE and that space operations are more than static PNT and SATCOM.

Space operations maneuver requires a high level of competency and coordination by a variety of personnel across all military services. Arguably, conducting space operations maneuver is a quintessential core competency sought by space operations personnel from all services; without it, space operations become stagnant and unable to react in a D3SOE.

Using Space Operations Maneuver to Conceptualize Operations

According to Army Doctrine Publication 3-0, "Doctrine often describes an idealized situation and then contrasts the ideal with the reality Army leaders expect. Doctrine provides a means of conceptualizing campaigns and operations, as well as the detailed understanding of conditions."⁷

For the non-space soldier, conceptualizing how space operations support a specific operation or campaign is difficult when the space terminology is a language unique unto itself and totally different from the rest of the Army. This difference should drive leaders in the space operations community to use common, existing terminology soldiers already recognize and understand to effectively describe the capabilities and effects space operations can deliver.

Army operations are dependent on the integration of space functions, but too many commanders cannot conceptualize, visualize or understand how space operations support their operations or contribute mission success. Much of the lack of understanding can be directly linked to obscure and ambiguous space terminology and unseen effects. The Army wins when commanders and staffs have a clear understanding that space operations provide capabilities and effects simply from the term used.

The space operations maneuver doctrinal framework is used as a cognitive tool which gives soldiers a simple way to understand and conceptualize space operations. It provides an intellectual organization of space capabilities and effects used to assist commanders and staffs. When they conceptualize space operations in terms of space operations maneuver, Army commanders and staffs are better able to visualize and understand integrated space operations and how they collectively contribute to Army and joint mission success.

The space operations maneuver framework extends the well-established, well-understood term maneuver to space operations to help soldiers recognize and understand space capabilities and effects. Soldiers no longer see space operations as static GPS signals or satellite communications. They may not understand exactly how space operations maneuver occurs, but they will recognize and understand it can overcome D3SOE and place friendly forces in a relative position of advantage.

Where Does Space Operations Maneuver Occur?

Now that you know what space operations maneuver is not, what exactly is space operations maneuver? Space operations maneuver is a physical or virtual movement of space resources to obtain a desired result that provides ground forces a position of relative advantage over the enemy.

Space operations maneuver occurs in both the physical and electronic realms and is implemented in all three space segments: space/on-orbit, control/link and ground segments. It is used to support optimization of space-based capabilities and effects. It also supports active and passive protection from environmental hazards and adversarial threats.

The physical aspect of space operations maneuver includes but is not limited to launching newer satellites, moving on-orbit satellites to another position, deploying space-related assets and forces into an operational area, moving ground terminals/receivers to maximize reception, resilience measures (such as resource distribution, redundancy and protection), bent-pipe operations and distributed architectures/disaggregation of space resources.

Some examples of EMS maneuver include but are not limited to boosting power/gain, changing channels, changing frequencies, frequency hopping, shifting users to other satellites (both commercial and military), moving spot beams, altering beam shape, changing modulation schemes, crosslinking (transmissions from one satellite to another), cross-banding (crossing from one frequency band to another), connectivity through multiple access points, re-routing communications in near-real time and the tactics, techniques and procedures designed to overcome threats and hazards to ensure mission success.

Direct fire and close combat are inherent in ground maneuver. Given the perpetual state of congested and contested space operations, it is easy to understand how electronic fires and close combat in the EMS are the reasons D3SOE exists.

Space superiority permits the conduct of operations at a given time and place without prohibitive interference. Achieving and maintaining space superiority during D3SOE may only occur during small windows of opportunity opened using space operations maneuver techniques. Space operations maneuver is what gives space operations the ability to succeed at a given time and place by out-maneuvering prohibitive interference.

It's Already Used in Doctrine

To be clear, space operations maneuver is not new; it has been part of Army space operations since its inception. Space operations maneuver is inherently codified in Field Manual 3-14. Readers of FM 3-14 know it discusses maximizing connectivity, enhancing accuracy,

avoiding situations negatively impacting operations, enabling forces to take advantage of adverse environmental conditions and maneuvering to positions of advantage.

Space operations maneuver requires a high level of competencies by space warfighters across all space functions. Arguably, conducting space operations maneuver is a quintessential core competency sought by space operations personnel from all services. Without it, space operations become stagnant and unable to react in a D3SOE.

Situational understanding generates space operations maneuver opportunities before and during operations across the range of military operations with unified action partners. Situational understanding is the product of applying analysis and judgment to relevant information to determine the relationship among operational and mission variables to facilitate decision making. Situational understanding is a necessity to be able to implement the space operations maneuver framework.

Traditional ground maneuver forces shape the security environment through the conduct of security cooperation. They do this through Department of Defense interactions with foreign governments to build defense relationships that promote common security interests and help allied and friendly militaries develop capabilities for self-defense and multinational operations.

Space operations maneuver also has a role to play in shaping the security environment. Shared space-based missile warning data builds defense capacity; missile defense develops capabilities for self-defense and common security interests, and both foster defense relationships. Satellite communications and space control operations enable increased multinational cooperative mission. PNT, space environmental monitoring and shared space-based surveillance and reconnaissance all enable multinational operations.

New Frameworks and Terms

Space operations has always conducted space operations maneuver. The problem is we have never labeled it as such and have disguised it with obscure terminology. Consequently, the Army does not recognize or understand it. It's time we finally give the cat a recognizable and understandable name, then let it out of the bag. It needs to be out of the bag so the operating force can gain a better understanding and appreciation for space operations.

The Army operates in an environment of changing threats and hazards, resources, technology and doctrine. Doctrine is what we do and how best to do it. Doctrine is not static; it is dynamic in nature and must evolve to keep pace as warfare evolves. As a result, the Army must update its doctrine as changes occur. Such updates draw heavily from warfighter experiences in the field. Only then does doctrine maintain relevance to soldiers.

As we look at the past with new perspectives, new frameworks and terms must be codified to capture the evolving nature of operations, or we risk our doctrine becoming stagnant, ineffective dogma. Space operations maneuver is a great place to start.

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¹ U.S. Department of Defense, *Sustaining Global Leadership: Priorities for 21st Century Defense* (Washington: January 2012), pg. 5.

² Warren Bennis, *On Becoming a Leader* (New York: Addison-Wesley, 1989), pg. 107.

³ U.S. Senate, Committee on Armed Services, "Statement by Lieutenant General David L. Mann, USA, Commanding General, U.S. Army Space and Missile Defense Command and Army Forces

Strategic Command, Before the Committee on Armed Services, Strategic Forces Subcommittee, United States Senate on Space Programs,” March 12, 2014, https://www.armed-services.senate.gov/imo/media/doc/Mann_03-12-14.pdf, pg. 3.

⁴ Joint Chiefs of Staff, Joint Publication 3-0, *Joint Operations* (Washington: January 17, 2017), pg. GL-12.

⁵ Association of the United States Army, Contemporary Military Forum, “Multi-Domain Battle: Ensuring Joint Force Freedom of Action in Future War,” 19:54, Oct. 4, 2016, <https://www.ausa.org/events/ausa-annual-meeting-exposition/sessions/cmf-multi-domain-battle-ensuring-joint-force-freedom>.

⁶ Headquarters, Department of the Army, Army Doctrine Publication No. 1-01, *Doctrine Primer* (Washington: September 2014), paras. 4-27 and 4-40.

⁷ Headquarters, Department of the Army, Army Doctrine Publication No. 3-0, *Unified Land Operations* (Washington: October 2011), para. 5.