Maritime Space Operations

The Marine Corps' role in the space domain

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The 2016 *Marine Corps Operating Concept* stated, "The Marine Corps is currently not organized, trained, and equipped to meet the demands of a future operating environment characterized by complex terrain, technology proliferation, information warfare, the need to shield and exploit signatures, and an increasingly non-permissive maritime domain."[1] Nowhere within the Marine Corps is this problem statement more apparent than within Marine Corps Space Operations and associated capabilities. What the *Marine Corps Operating Concept* previously defined as the future operating environment was, in retrospect, an acknowledgement of the current operating environment against peer-level competitors, distinguished by increasing threats to the space domain as it becomes more congested, contested, and competitive. Peer-level competitors have identified space as one of the United States' critical vulnerabilities and have developed counterspace capabilities to degrade the Nation's technological advantages.

To meet the aims of the Commandant of the Marine Corps' (CMC) *Force Design 2030*, the Marine Corps must examine its capabilities and revise its methods to function effectively on the battlefield of the future.[2] To this end, the institution must address the competing interests between the Marine Corps Concept for Space Operations and the needs of the naval force. The 2030 Marine Corps must utilize space to enable maritime maneuver in contested environments against adversaries that will have regional domain superiority.

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The goal of operating from within the weapons engagement zone (WEZ) of our most capable adversaries offers significant challenges to the current force, but it also offers unique opportunities should the institution address current shortfalls in space-related equipment, organization, and training. To fulfill its mandate to support the fleet, the Marine Corps must be prepared to integrate into space.

Space Domain and Force Design

The *2019 Commandant's Planning Guidance* (*CPG*) establishes the end state that, "The Marine Corps will be trained and equipped as a naval expeditionary force-in-readiness and prepared to operate inside actively contested maritime spaces in support of fleet operations."[3] To accomplish this, the institution must take an honest assessment of resource shortfalls across the warfighting functions and establish recommended courses of action to address critical vulnerabilities to enable the force of the future. Specific to the space domain, the Marine Corps must develop concepts for high-leverage space technologies and systems that will best support forces operating forward within the enemy's WEZ, in austere conditions, and distributed across large distances. The Marine Corps must take full advantage of space solutions and be prepared to operate in a denied, degraded, and disrupted space operational environment (D3SOE).

The vision of the Marine Corps' future force, as outlined by the CMC, is one of Marines operating forward as an inside force armed with advanced sensors and strike capabilities distributed within the threat ring of the Nation's most capable adversaries. From the inside, Marines will fight, persist, and set conditions for follow-on forces to strike decisive blows against an opponent. The force is being tailored to such a vision, particularly as the Marine Corps divests itself from legacy systems, explores the possibility of restructuring the force for austere and distributed operations, and develops a C2 construct alongside the fires capabilities necessary to conduct and coordinate sea denial.[4] Now, as the organization looks to move back to its naval roots, it is imperative to analyze the efficacy of the *CPG* in the context of a future battlefield reliant on resilient space-enabled capabilities. His stance on the future of Marine capabilities in maritime environments should be a driving force in bolstering research and support of space-enabled operational capabilities.

The institution needs innovative proposals that are responsive, feasible, and achievable to transform space-enabled operational capabilities and address critical gaps. A threat-based approach to building Marine Corps space-enabled operations and associated capabilities that support the composite warfare commander will provide evolutionary concepts that can drive operational requirements across the combined naval

force. This will introduce and field capabilities that can provide a mutually beneficial competitive advantage for the future fight. As identified in a recent national intelligence study, "The most powerful actors of the future will be [those] who can leverage material capabilities, relationships, and information in a more rapid, integrated, and adaptive mode than in generations past."[5] The Marine Corps must seek new and creative solutions to build a force capable of integrating space capabilities for use within composite warfare to increase naval force lethality and resiliency within the enemy's WEZ.

Operations inside the Enemy's WEZ

The Marine Corps of the future will aggressively consume the services offered by the space domain, despite current limitations, to compete against adversary counterspace threats. To conduct expeditionary advanced base operations, the Marine Corps will be reliant on space-based capabilities to sense, communicate, and coordinate maneuver and fires. Although it has been asserted that the Marine Corps does not own a single space asset, it must be clarified that this applies to on-orbit assets and does not reflect the space-enabled capabilities of command and control, communications, computers, cyber, intelligence, surveillance, reconnaissance, and targeting resident within the force. Marine Corps space operations and associated capabilities span across the warfighting functions. They are a critical enabler of not only traditional command and control, communications, computers, intelligence, surveillance, and reconnaissance solutions within the communications and intelligence communities but also facilitate distributed and disaggregated movement, maneuver, fires, sustainment, and protection—all essential to operating within an anti-access/area denial (A2/AD) environment and critical to winning the counter-C2, communications, computers, cyber, intelligence, surveillance, reconnaissance, and targeting challenge.

A2/AD is more than just denial in two dimensions. Marines are working to solve the challenges associated with long-range precision fires and maneuver, but few are addressing A2/AD in other domains. If Marines only solve the terrestrial kinetic threats to maritime maneuver but fail to address the threat in space, they will find themselves effectively isolated while operating inside the WEZ of the United States' most capable adversaries. Isolation through space denial will render forces operating as an inside force ineffective. Intentional jamming degrades satellite communication; degrades positioning, navigation, and timing; and disrupts command and control of forces in distributed austere environments.

The 2017 *Marine Corps Concept for Space Operations* identified numerous enabling capabilities Marines may one day have to source in order to increase the resiliency and operability of the U.S. space enterprise architecture; however, many of those programs have not yet materialized. The joint force will be fighting to maintain superiority in the space domain, but the unique placement of Marines fighting inside the denied environment requires educated space professionals forward. This will increase the Marine Corps' ability to leverage space solutions in the conduct of naval and joint force operations. The institution is diligently striving to address the problems that immediately threaten U.S. warships, but it must also assist in the battle for space primacy to truly succeed as an inside force. Specifically, the Marine Corps must invest more heavily in high-leverage space technologies and systems that will best support forces operating forward. These systems include high-altitude platforms capable of relaying critical information in the event of localized space denial and leveraging proliferated low earth orbit commercial assets to maintain satellite communication in a D3SOE environment. However, investments in these technologies will be moot if the institution does not continue to organize to support them.

Future Fight Organization

Two years after the publication of the *CPG,* the Marine Corps is making strides to organize, train, and equip its force for the future fight against adversary counterspace threats. Effective 1 October 2020, the CMC established Marine Corps Forces Space Command (MARFORSPACE), creating a Marine Corps Service component command to U.S. Space Command (USSPACECOM), focused on providing space operational support to the FMF "while building a convergence capability to increase warfighter lethality."[6] MARFORSPACE enables USSPACECOM to deliver timely space capabilities to the FMF in the conduct of naval and joint force operations. Additionally, MARFORSPACE will support space-based command and control systems; space-based intelligence, surveillance, and reconnaissance; positioning, navigation, and timing; space-control operations; and space intelligence and targeting operations in support of USSPACECOM. This strategic adaptation will streamline and stimulate organizational changes while providing the Marine Corps a command concentrated on the space domain. Further, the command will focus on which concepts and technologies offer the greatest promise of increasing Marine Corps operational effectiveness ensuring resiliency and lethality of its systems.

Additionally, the Marine Corps has created the Marine Space Support Team (MSST) to plan, integrate, and coordinate space-based capabilities and mission areas, across all warfighting functions, in support of the FMF commander's requirements. The task organized MSSTs have reachback capability to MARFORSPACE and other space support organizations to provide the Marine Corps with critical space-enabled capabilities in support of mission requirements. Further, MSSTs provide the force organic and scalable space support operations across the FMF in support of training and operations for a D3SOE peer-level, advanced-threat operating environment.[7]

Although the recent establishment of MARFORSPACE and the MSSTs are critically important steps in addressing organizational change, the Marine Corps must adjust its approach to space occupational specialties. The Corps is developing a professional space cadre, but it requires a reevaluation of current talent management models to realize an

effective return on investment for these critical personnel. The current model for training, retaining, and utilizing these key enablers is failing. The future operating environment is increasing the demands for space professionals, and existing personnel models are not able to meet that demand by producing the right kind of professionals at the scale needed.

The Corps is currently producing two space-focused MOSs: 8866 Space Operations Officer and 0540 Space Operations Staff Officer, which have a vast disparity in formal training. 8866s undergo two years of graduate-level education at the Naval Postgraduate School, while 0540s receive their MOS after only two weeks of training. Experts have previously argued that this structure is not conducive to building an effective space cadre. The primary issue with the 0540 MOS is that their two weeks of training is insufficient to create space advisors capable of supporting operations of an inside force. Conversely, given the length of time they take to produce, the institution must employ 8866s almost exclusively at the strategic level, building concepts, doctrine, and policy for acquisition and integration of space systems while 0540s serve as space integration advisors at the tactical and operational level.

Therefore, the solution is to incorporate force design changes to introduce an additional MOS that fills the current training gap between the current 0540 and 8866 MOSs, utilizing an existent framework within the joint force consistent with the Army's FA-40, which requires eleven weeks of training. Evolving the current talent management model to generate a competitive force structure will increase the competence of the Marine Corps' tactical and operational space professionals. It will also allow for the best possible utilization of the 8866 cadre and will bridge the current capability gap between the two space-related MOSs. This new MOS and the 8866 MOS would become primary MOSs while the 0540s would stay a secondary MOS, creating space professionalization and retaining critical personnel within the occupational field. Further, the Marine Corps must also reassess the way it addresses space integration and education across the force, advancing space fundamental-level training and the general

Future Training Focus

As the Marine Corps grapples with the challenges associated with distributed operations against a peer-level adversary, it is imperative that the force embraces emerging technologies critical to success on the battlefield. The focus has traditionally been on training in "the basics," requiring even general officers to test on squad tactics and radio programming until the institution finally dropped basic skills test requirements in 2020.[8] While fundamentals should always have their place in the Marine Corps, the current operating environment demands a reevaluation of what it is the force deems essential.

The institution's future employment as the inside force demands an understanding and effective utilization of space to be successful.

The institution's future employment as the inside force demands an understanding and effective utilization of space to be successful. By itself, a distributed Marine Corps operating within the enemy's WEZ will not have sufficient intelligence, fires, or C2 capacity to conduct sea denial against a peer-level adversary. Instead, the inside force will be most effective as an enabler and integrator of the joint force. Therefore, as an inside force it will have to utilize space-enabled capabilities, or it will have significant challenges performing its role. The naval application of space power must become fundamental knowledge for any force operating inside the WEZ.

The Marine Corps has not yet optimized its current training and readiness to operate and win in a D3SOE environment. The *CPG* emphasizes that, "If we will be required to persist inside an adversary's WEZ, then we must train to do so."[9] However, the Marine Corps has not aligned its training and readiness manuals to the current threat. Master scenario event lists within exercises do not provide the realistic threat environment that the Nation's peer-level competitors pose to the Marine Corps' current tactics, techniques, and procedures. If it is to provide a ready, relevant, and responsive force that meets tomorrow's challenges in the contested maritime domain, the Marine Corps must acknowledge shortfalls, adjust its approach, and reinvigorate innovation within not only the space cadre but also the institution at large. It must adjust training and readiness manuals across the force to incorporate and effectively integrate space capabilities into mission planning, training, and mitigation strategies for operations in a D3SOE.

The *2018 National Defense Strategy* challenges the Marine Corps to deliver performance at the speed of relevance.[10] Further, it describes a "more lethal and disruptive battlefield, combined across domains, and conducted at increasing speed and reach—from close combat, throughout overseas theaters, and reaching to our homeland." The Marine Corps must move beyond foundational-level training into space threat-based core competency-level training, understanding enemy capabilities and developing tactics, techniques, and procedures to maintain resiliency in a high threat environment. Space operations and associated capabilities are a critical enabler of maritime operations and an essential element for achieving the CMC's end state. Integrating space solutions into operational concepts, planning and training will best enable the FMF to operate successfully in a D3SOE while effectively understanding and countering adversary capabilities and threats.

Conclusion

As the character of war changes and the domains in which the Nation fights expand, the requirement for U.S. forces to successfully deter and defeat peer and near-peer level enemies will persist. The *CPG* and *Force Design 2030* have provided a framework for the retooling of the Marine Corps with a renewed emphasis on expeditionary operations, but the reality of distributed operations is one of space reliance. To meet the needs of the future fight, the organization must address current shortfalls in equipment, organization, and training related to the space domain. As the Marine Corps continues to refine its position within the joint force, it must expand beyond its historic consumption-only approach to space and be prepared to fight and win in a D3SOE environment in order to enable naval and joint force operations.

Notes

1. Headquarters Marine Corps, *Marine Corps Operating Concept: How an Expeditionary Force Operates in the 21st Century,* (Washington, DC: 2016).

2. Gen David H. Berger, *Force Design 2030,* (Washington, DC: March 2020).

3. Gen David H. Berger, *38th Commandant's Planning Guidance,* (Washington, DC: July 2019).

4. Ibid.

5. National Intelligence Council, "Global Trends: Paradox of Progress," (Washington, DC: January 2017).

6. Marine Corps Forces Space Command Communication Strategies and Operations, "Marine Corps Commandant Directs Activation of Space Service Component," Marine Corps Forces Space Command, (November 2020), available at https://www.spacecom.mil.

7. Joseph Horvath, Erika Teichert, and James Connolly, "The Marine Space Support Team Concept," Marine Corps Association, (August 2019), available at https://mca-marines.org.

8. Headquarters Marine Corps, *MARADMIN 694/20*, (Washington, DC: November 2020).

9. *38th Commandant's Planning Guidance.*

10. Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018), available at https://dod.defense.gov.