

Much of today's innovation in warfare involves space-enabled technologies, such as precision weapons using global positioning system information, missile defense systems designed to engage enemy missiles in the lowest regions of outer space, and information operations utilizing orbiting satellites. Indeed, space-enabled technologies play a pivotal role within U.S. national security strategy, which has led some to conclude that the United States is more dependent on space than any other nation.¹

As executive agent for space issues within the Department of Defense, the U.S. Air Force is responsible for overseeing military space operations and requirements.² Choosing the Air Force for this role seems reasonable; for decades, space systems have been declared "high-flying air forces."³ Unfortunately, many professionals within the Navy, Marine Corps, and Coast Guard have long assumed that the sea Services have little to contribute regarding the formulation of space strategy. Yet nothing could be further from the truth.

The sea Services already support the warfighter through space-enabled technologies. This support includes the activities and

Space Strategy: A Call to Arms for the Sea Services

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NASA launching Spitzer Space Telescope

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organizations of the Space and Naval Warfare Systems Command, Naval Network and Space Operations Command, Naval Center for Space Technology, Space Research and Design Center at the Naval Postgraduate School, and Coast Guard Navigation Center.⁴ While these contributions are noteworthy, the sea Services' contribution toward the development of military space strategy has been scant to date.

This situation is understandable. Maritime and space operations seem to have little in common at the tactical level of war, while the similarities between air and space operations are readily apparent to even the novice military tactician. Air and space are adjoining environments, and, consequently, they share many of the same required technologies for operation. These similarities in technologies are especially apparent between very high, fast-flying aircraft and current spacecraft. The environment of operations and available technology shape military tactics; therefore, air and space operations are comparable at the tactical level of war. But the story is different when it comes to the strategic level.

As with tactics, military strategy is influenced by the environment in which operations are conducted, yet it is also shaped by those national interests within the operational environment.⁵ Therefore, to formulate space strategy properly, it is necessary to understand both the environment of operations and the national interests within it. The environment of outer space encompasses distant "bases," or hubs of operations, separated along lines of communication, as exemplified by satellites in orbit and communication relay stations on Earth continually passing data and information back and forth. The list of national interests for a space-faring nation includes using space for economic gain; promoting peace and security; ensuring access to lines of communication that may be shared with a potential adversary; impacting an enemy's economic, commercial, or military interests; maintaining forward presence; projecting power; deterring an aggressor through offensive or defensive means; and working with all the military Services to achieve common national objectives.

To those in the sea Services, this list of strategy-shaping national interests should look familiar, for they are also the list of strategic interests pertaining to the maritime domain. Broadly considered, even the operational environments of space and the sea have similarities, since both deal with bases and

hubs along dispersed lines of communication. Because the national interests within the maritime and space domains are strikingly similar, the strategic-level considerations for operating at sea and in space will be similar too. As a result, the sea Services have centuries of maritime experience for considering and shaping future space strategy.

Lessons from the Sea Services

Although the national interests within the maritime and space domains are remarkably similar, space is not the sea. These radically different environments—along with the required technology to operate within them—dictate that the tactics, techniques, and procedures in each medium of warfare will be distinctly different. Therefore, a maritime-inspired space strategy merely serves as a strategic springboard for considering those military operations enabled by space technologies or those from, into, and through space. Nevertheless, maritime strategy can provide specific insights into topics such as the value of space, a balanced approach to space strategy, and the nature of space warfare.

Value of Space. Space-based assets are inextricably linked to today's global economy. International conglomerates provide worldwide telecommunication services, and orbiting satellites are used extensively for commercial transactions between financial institutions and small businesses. Because space is used for economic gain, many countries view such space-reliant commerce as a means of enhancing national power. Toward this end, various space powers have employed international agreements and diplomatic haranguing to advocate their own agendas for using and accessing space. These advocating efforts have ranged from altruistically ensuring the equitable use of space by all nations to selfishly gaining the most advantageous orbital locations or operating frequencies. Since space affects national power, space strategy must correctly discern the value of space and the preferred methods of protecting one's interests in it.

Based on the precedent of maritime strategy, the inherent value of space is a means of communication.⁶ Space communications include the movement of personnel, spacecraft, equipment, military effects, data, and information, and maintaining such access and use is paramount.⁷ If a potential adversary is able to deny one's access to space, economic or military disaster could result. Consequently,

space-reliant nations may protect and defend their interests in space, and this may include the use of force.

Furthermore, one's access to and use of space are enabled by celestial lines of communication.⁸ Generally stated, celestial lines of communication are those from, into, and through space. Since a space-faring nation's access to and use of space are vital, the primary objective of space strategy is to protect and defend one's own lines, while limiting the enemy's ability to use his. As with maritime communications, lines of communication in space often run parallel to an adversary's and may at times even be shared with him. Because of this, an adversary's space communications frequently cannot be attacked without affecting one's own. By ensuring access to "lines of passage and communication" in space, a nation can better protect its various diplomatic, informational, military, and economic endeavors.⁹

A Balanced Space Strategy. Since force is a legitimate option for protecting national interests in space, space strategy must help determine the proper method of using it. As with maritime strategy, space strategy must always directly support a nation's overall military strategy. Consequently, space systems and assets must operate in concert with other military forces on land, at sea, and in the air. While space systems may engage a hostile enemy to achieve solely military ends, they can also achieve economic ends that impact an adversary's long-term warfighting capability. Such economic actions can negatively impact those revenues gained through space-reliant commerce and trade, which otherwise might have been used to fund future military operations. Contrary to the popular sentiment of some "space power" advocates—yet based on centuries of naval warfare experience—military space operations alone can seldom determine a war's outcome.¹⁰ Thus, most successful military strategies require the combined and effective employment of land, sea, air, and space assets.

When the use of force is warranted and decisive action is called for, space strategy must address the best method of achieving either political or military ends, while also ensuring one's access to celestial lines of communication. To achieve these goals, a proper space strategy demands a balanced approach to both offensive and defensive strategies. From the time-honored strategies of land and naval warfare, it is recognized that

offensive strategy is the more “effective” form of warfare and defensive strategy is the “stronger” form.¹¹ Since both offensive and defensive strategies have inherent strengths and weaknesses, the strategic planner must effectively and efficiently integrate these two strategies into an overall war plan.

Offensive space strategy is called for when political or military objectives necessitate wresting or acquiring something from the adversary. This may include gaining access to contested lines of communication or achieving a strategic advantage. Since offensive strategy is the more effective form of warfare, it should usually be attempted by a stronger space power against a less capable one. A force executing an offensive strategy and looking for a decisive victory, however, will likely not find it because an adversary will usually move assets or take defensive measures when attack is imminent. A purely offensive strategy does not guarantee eventual success, and a haphazard application of offensive strategy often leads to military disaster.¹²

On the other hand, defensive strategy is called for when objectives necessitate preventing the enemy from acquiring something and often enables an inferior force to achieve notable results. If this same inferior force undertook offensive operations against a superior foe, it would likely meet its own destruction. For this reason, the sophomoric adage “the best defense is a good offense” is in fact the strategy of the foolhardy.

Defensive strategy incorporates an attitude of alert expectation and does so from a position with strategic advantage. For less capable space powers, adopting a defensive strategy will help protect national interests, ensure access to vital celestial lines of communication, and achieve modest political objectives.

Ultimately, however, offensive and defensive strategies mutually support one another. Offensive operations are frequently needed to make positive gains and bring about the enemy’s eventual capitulation. Yet defensive operations protect the very lines of communication that make offensive operations possible. Furthermore, defensive strategies frequently require fewer forces and assets when compared to offensive strategy, so defensive operations in some regions facilitate the concentration of forces or effects to support offensive operations in other regions. The goal of space strategy is not only to defeat a hostile enemy through offensive means but

also to protect vulnerable and potentially shared lines of communication at the same time. Therefore, both offensive and defensive strategies are necessary ingredients in any sound space strategy.

Nature of Space Warfare. Centuries of maritime experience provide lessons regarding modern warfare using space technologies. Since the primary purpose of space strategy is to ensure one’s access to the celestial lines of communication most vital to national interests, those nations that can ensure access are able to exercise command of space. For those less capable nations who are denied access to lines of communication in space or whose technological capability is insufficient to launch space vehicles into orbit, outer space effectively becomes an obstacle. A historical understanding of maritime strategy reveals that by making space a barrier to an adversary, a nation can better control the escalation of hostilities and minimize the most devastating enemy counterattacks from, into, or through space.

Moreover, the experience of the sea Services hints at the true nature of space warfare. Some advocates have claimed that employing space-based systems in modern warfare obviates the need for those defensive strategies

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meant to handle friction and uncertainty. This view, however, is incorrect. History has shown that ambiguity, miscalculation, incompetence, and chance are all ingredients during hostilities. It should not be expected that warfare employing space-based technologies would be any different in this regard. Despite the many advantages of space-based systems and assets, such technology will not eliminate friction and uncertainty, but may at times only reduce it. With the technological advancement of one belligerent, the other belligerent is likely to find a counter to such advancement. This is the natural progression of warfare.

Implications

A maritime-inspired space strategy has lessons for both warfighters and policymakers. As indicated, the primary purpose of space strategy is to ensure one’s access to celestial lines of communication during times of peace or war. Therefore, strategies and measures

that provide self-defense against offensive attack, harden space systems against electromagnetic damage, or incorporate redundant systems are all suitable methods of supporting this strategy of ensuring access to and use of space. Unlike the common interpretation of current space power strategy, defensive strategy is just as effective as offensive strategy in protecting one’s ability to use space, and, in some instances, defensive methods may be even more effective. The lesson learned is that defensive strategy can confer a similar degree of space superiority, as compared to that degree normally attained through offensive means. As a result, any purported space strategy having an inordinate focus on the application of force or the role of weapons is an unbalanced and ill-considered strategy.

Since space strategy is intended to ensure access to and use of celestial lines of communication, a means of doing so is needed. In maritime strategy, this is the job of the naval cruiser, which in the classical sense is a vessel of sufficient range and endurance to protect distant and dispersed sea lines of communication. Because maritime and space operations share similar strategic interests, a functional equivalent to the naval cruiser is needed to protect and defend one’s interests

in space. As in the maritime domain, vital lines of communication in space are dispersed in some locations but are concentrated in others. Consequently, space strategy demands the protection of the most expansive celestial lines of communication and also the most congested, such as those at chokepoints.¹³

The key to properly understanding space strategy is realizing that celestial lines of communication include users and systems on land, at sea, and in the air. For this reason, a sound space strategy must also incorporate land, sea, and air assets to protect a nation’s access to space. Both space-based and terrestrial-based assets should, therefore, be employed when executing either offensive or defensive space strategies. Since space strategy must address protecting and defending access to and use of space, space-based weapons systems that perform purely offensive missions, while failing to protect one’s access to space, are only of secondary importance.

Perhaps the most immediate need is for naval professionals to appreciate the fact that their Services’ maritime experience provides insight into warfare employing space technologies. What was old is new again. Therefore,



U.S. Navy (Lay Mcintosh)

341st Communications Squadron (Roger M. Day)

Far Left: **ADM James D. Watkins, Chief of Naval Operations, speaks at commissioning of U.S. Naval Space Command, 1983**

Left: **Gen James Cartwright, USMC, Commander, USSTRATCOM, addressing 341st Space Wing at Malmstrom AFB**

those in the sea Services must embrace and study naval history to learn practical lessons for the future and make valuable contributions in formulating today's military strategy.¹⁴ This necessitates a general appreciation of formal education opportunities, such as those provided at the war colleges. While naval professionals do in fact learn through operational deployments, when it comes to formulating strategy and discerning the principles of war, only careful study and thoughtful deliberations bring strategic enlightenment.

Because the U.S. Navy has the largest proportional share of personnel among the sea Services, it needs to be more proactive in defining and shaping space strategy. In particular, the Navy should stand up a dedicated center at its Naval War College to study, develop, and debate future U.S. space strategy. While the Navy provides valuable input into space system requirements, its role in formulating space strategy has been minimal so far. Thus, the sea Services need a dedicated center of study for thinking about our nation's naval history and discerning the implications for the future of space-enabled warfare.

Call to Arms

It should never be assumed that since space strategy is a relatively new concept, the rules and lessons of the past do not apply. Space is just another medium to be exploited for military advantage, not a panacea for achieving a quick and easy victory. Because space strategy has striking similarities to maritime strategy, it can glean lessons from hundreds of years of Navy, Marine Corps, and Coast Guard experience to apply to activities from, into, and through space. Based on a rich heritage of defending those same strategic interests that we currently have in space, the sea Services are eminently qualified both to consider and develop space strategy.

This is not to diminish the contributions of the Air Force to date. The United States is currently the premier space power, mostly due to the efforts of that Service. Yet the designation of the Air Force as executive agent for space issues within the Department of Defense does not preclude the sea Services from participating in the space strategy debate. In fact, the same policy designating the Air Force as executive agent also directs each of the Services to make valuable contributions in formulating space strategy.

There is plenty of room at the space strategy table for the sea Services. It is time that they own up to their naval heritage and realize that they have a duty to help shape future space strategy. For those in the sea Services, now is the time to speak up and be heard. **JFQ**

NOTES

¹ U.S. Commission to Assess United States National Security Space Management and Organization, *Report of the Commission to Assess United States National Security Space Management and Organization* (Washington, DC: January 11, 2001), 18.

² Paul D. Wolfowitz, Deputy Secretary of Defense, Department of Defense (DOD) Directive 5101.2, "DOD Executive Agent for Space" (Washington, DC: DOD, June 3, 2003).

³ Thomas D. White, "Air and Space are Indivisible," *Air Force* 4, no. 3 (March 1958), 40–41.

⁴ The Department of the Navy, however, has been repeatedly criticized for not providing ample resources—both manpower and funding—to ensure its space requirements are adequately determined, articulated, and addressed. Committee on the Navy's Needs in Space for Providing Future Capabilities, *The Navy's Needs in Space for Providing Future Capabilities* (Washington, DC: National Academies Press, 2005), 4–12; Panel to Review Naval Space, *Report of the Panel to Review Naval Space: Assured Space Capabilities for Critical*

Mission Support (Alexandria, VA: Center for Naval Analyses, March 19, 2002).

⁵ A proper strategy necessitates balancing ends with means. The environment of operations—including the strategic positions within it—affects means. See Wolfgang Wegener, *The Naval Strategy of the World War* (Berlin: E.S. Mittler and Sohn, 1929; reprint, Annapolis, MD: Naval Institute Press, 1989), 36, 82, 129.

⁶ Julian S. Corbett, *Some Principles of Maritime Strategy* (London: Longmans, Green, 1911; reprint, Annapolis, MD: Naval Institute Press, 1988), 91–93.

⁷ Alfred T. Mahan, *The Problem of Asia and Its Effect Upon International Policies* (Boston: Little, Brown, 1900), 125.

⁸ Colonel Peter Zwack, USA, first defined the term *celestial lines of communication* while conducting research as a Mahan Scholar at the Naval War College in 2003.

⁹ The term *lines of passage and communication* is used by Corbett to describe lines of communications at sea. See Corbett, 316.

¹⁰ "Space power" was adapted from the "air power" strategy of air warfare, whose early dogma claimed the nation that wins the opening air war is "practically certain to win the whole war." See William "Billy" Mitchell, *Our Air Force: The Keystone of National Defense* (New York: Dutton, 1921), xix. See also S.W. Roskill, *The Strategy of Sea Power: Its Development and Application* (London: Collins, 1962), 20: "[R]arely, if ever, have [wars] been decided by sea power alone."

¹¹ Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1989), 97, 358; Corbett, 31–33, 310–311.

¹² Corbett writes that caution must be used when deciding in favor of offensive operations; otherwise, naval assets may be thrown away on "ill-considered offensives." Corbett, xxviii.

¹³ Chokepoints pertaining to space communications include those hubs or systems used as uplinks, downlinks, and crosslinks.

¹⁴ J.K. Laughton, "The Scientific Study of Naval History," *Journal of the Royal United Service Institution*, vol. 18 (1875), 508–509.