

# THE UNITED STATES NAVAL WAR COLLEGE

## JOINT MILITARY OPERATIONS DEPARTMENT



VISION FOR NAVAL SPACE STRATEGY

by Colin S. Gray

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# Vision for Naval Space Strategy

By Colin S. Gray



*Space is the fourth environment of warfare . . . after the land, sea, and air. As we enter the 21st century, we in the Navy need to focus on charting a course for warfare in this fourth exciting environment and learn to dominate the fifth space and electronic warfare dimension, the electromagnetic spectra.*

*As former Secretary of the Navy, Sean O'Keefe, states in ". . . From the Sea," "Our surveillance efforts will continue to emphasize exploitation of space and electronic warfare*

*systems to provide commanders with immediate information, while denying and/or managing the data available to our enemies."*

*In this era of technological explosions, we must have a clear vision of where we must go and ensure that we do not steam into a technology cul-de-sac. The following article by Dr. Gray, a noted military strategist, develops this vision.*

Vice Admiral Jerry O. Tuttle, U.S. Navy (Retired)

The United States has long been in the space age, but only recently did it wage a war in which space made a recognized contribution. We have achieved space-power status, and the addition of space power already has formidably enhanced the capabilities of U.S. sea, air, and land forces. The present challenge is less to understand space power than it is to secure a firm conceptual grip upon its meaning for terrestrial forces in the prevention or prosecution of war, and to achieve this in the "joint" perspective which alone makes strategic sense. We cannot assess intelligently space power's strategic value as a "supporting capability" for the naval service without first understanding the strategic value of the naval service to the nation in this new era.<sup>1</sup> It is similarly important to realize the synergism of a naval-space relationship as it contributes to overall U.S. national space power.

### *New Challenges*

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In 1900 the world of the defense planner was geostrategically two-dimensional. Land and sea (surface), army and navy, embraced everything of interest. The defense planner of the 1990s, however, must make sense of possible warfare in five dimensions, plus a "wild card": land, sea, air, and space, plus the fifth dimension of the electromagnetic spectrum. Overshadowing the five geophysical dimensions is the "wild card" of nuclear weapons, which requires distinctive treatment in strategic thinking and military planning.<sup>2</sup> At the very least, the relevant geostrategic world for today's naval professional includes subsurface, surface, land, air, space, and electromagnetic aspects—with a nuclear complication in the background.

The challenge of understanding what space means for the naval service corresponds to the challenge posed in the first half of this century by the novelty of air power. A naval service capable of thinking through the implications of air power for the maritime environment and naval missions is well equipped to perform similar analysis for space power. The arrival of the space age means a huge increase in the total battlespace that the naval service needs to dominate in order to secure a decisive advantage. The maturing of space systems carries the promise of enhancing dramatically the potency of U.S. naval power, but we must approach space in the full realization that the logic of strategy applies to all environments and all players, friendly and otherwise.

### *Time for Deeds*

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The Navy never has formally decided that it would accommodate space capabilities. Consequently, it has not fully appreciated its massive dependency on space and has lacked the necessary service infrastructure (institutions, space-trained people, space-educated naval consumers, suitable concepts for the guidance of doctrine from which force requirements can be derived). Space systems will remain a supporting function for naval forces, but the naval forces place primary (not sole) reliance on space capabilities for long-haul communications, navigation (for friendly forces and for some of their ordnance), surveillance and reconnaissance, meteorology, and geodesy. Space is not an optional extra for naval war fighters. That

is why we need to develop and execute a coherent, forward-looking naval space strategy—now.

### *The New Security Environment and the Naval Service*

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As the international security environment evolves into some semblance of a post-Cold War order, and then presumably into a post-post-Cold War order, the specific duties of the Navy and Marine Corps will change with circumstances, foreign and domestic. The constant will be the irreversible trend toward ever greater reliance upon space support for naval operations of all kinds.

It is not yet clear how power will be distributed in the post-Cold War world; nor is it certain how much effort the United States will need to exert on behalf of an emerging world order. What is certain, however, is that major disturbances to international order and security will occur, that to intervene in them decisively the United States will need transoceanic reach, and that the naval service will play a critical role in support of whatever policy choices U.S. presidents make.

Geostrategically, the United States is obliged to be a maritime state. Although targets can be bombarded by long-range air and, eventually perhaps, space vehicles (including some sea-based ones), the projection of power in heavy, bulky, or sustained form requires a maritime "enabler." How much—and what kind—of a fighting navy is required will vary with time, adversary, issue, and technology. Whether a U.S. enemy is a global, a regional, or even just a local power, the securing of decisive advantage at sea has strategic meaning for war as a whole.

Fleet design, size, deployments, operations, and tactics all must reflect changing guidelines of high policy and an evolving strategic concept of the naval service. But the characteristics of naval power and the strategic functions of the Navy are constant over time and during different contingencies, and it is to this constancy that the future role of naval space operations is linked.

### *The Space Environment*

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Desert Storm was a *space* war. It highlighted both how far we have come in our ability to exploit space wisely and how far we have yet to go. The military value of space systems to the United States and its allies in the Gulf War is as well appreciated by our potential enemies—spurred on by the evidence of defeat by a space-competent power—as by ourselves. It will not necessarily be the case that a future enemy will have an interest of identical scope and intensity to that of the United States in the military exploitation of space, but it must be true that the strength of *our* interest is the measure of *his* need to deny.

Future naval task forces and Marine expeditionary forces (and lodgments ashore) will need protection against the damage that enemy counterspace operations could inflict on U.S. space operations in their role of force multiplier. Ultimately, potential enemies can be expected to build space capabilities parallel to our own and space control may become an active mission area. In the long run, a multifaceted space-assistance story is fundamental to the ability of the naval forces to perform their missions.

Space systems provide combat support for force enhancement, and one day *may* provide fire support from orbit by way of force application to assist terrestrial war-fighting elements in their search for decisive military advantage. In the words of the *National Military Strategy, 1992*, "more than ever before, space is the 'High Ground' that we must occupy."<sup>4</sup> In common with transportation, reconstitution, and research and development, space was designated one of the "four supporting capabilities" for the entire Base Force concept. The Clinton administration's "bottom-up" defense review of 1993 is no less supportive of space activity. Improved C4I—largely space-based—is identified as a "critical force enhancement," while space launch capability is among the handful of specified necessary areas for modernization.<sup>5</sup>

### *Joint Strategic Effectiveness*

Military advantage in any of the geophysical environments is going to benefit forces in the other environments, sometimes importantly in synergistic ways that a narrowly one- or two-environment focus might fail to appreciate. For example, a very powerful air arm—sea-based and perhaps long-range shore-based—does not merely enhance the ability of a navy to perform traditional naval missions, it also enables a navy to wage campaigns that would be wholly impracticable without that air support. Similarly, maritime superiority is not merely useful to an army or air force, it is literally the *enabler* of sustained action by those forces far from the homeland overseas. Across all three levels of war—strategic, operational, and tactical—the addition of a maturing space power to excellence in now-traditional forms of conflict on land, at sea, and in the air, will have a distinctive effect upon the character and quality of the military tasks attempted.

"Thinking joint" with space systems in the conceptual loop has four significant thrusts:

- ▶ Assistance from space works as a force enhancer or multiplier (or combat supporter) for the Navy and Marine Corps to perform the tasks they would have performed, or attempted, anyway.
- ▶ Assistance from space will enable the Navy and Marine Corps to undertake tasks that would be too risky, were such assistance not available.
- ▶ Space capabilities will allow naval forces to accomplish more with less, as the defense budget declines. The qual-

ity of the meteorological, intelligence, navigation, targeting, and communications data flows from orbit means that shrinking naval forces will find some compensation for their loss of numbers.

- ▶ Space systems will be able to provide some critical compensation for known or suspected limitations in particular elements of national or coalition terrestrial forces.

### *The Utility of Space Systems: The Trend*

Historical precedents abound from the maritime and the air environments—of too much too soon and too little too late being asked of new military instruments. New kinds of capabilities are resisted in varying measures typically for good and bad reasons. Also, exciting new ways of performing military duties attract exaggerated claims. Technological enthusiasm needs to be tempered with strategic, operational, and tactical realism. For example, radios, submarines, aircraft, nuclear weapons, and ballistic missiles are wonderful inventions, but their strategic promise is a net standoff because our enemies acquire these "engines" also. So it must be with space systems. The fighting maritime services of the United States have to be concerned not only with the undoubted value to us of space capabilities, but also of the eventual value to them (whoever "them" will be over the next several decades) of comparable prowess in orbit.

Several defining points drive naval concepts and planning for the space medium, specifically:

- ▶ The utility of space systems for the Navy and Marine Corps currently is high and is continuing to grow.
- ▶ Whether or not there is a superpower-scale

enemy in the U.S. future for the next 10 to 20 years, our armed forces will be operating on a global basis and increasingly will be critically dependent upon data flows from orbiting platforms.

- ▶ Enemies of the United States, be they local, regional, or super states (or coalitions), will notice the great strategic utility derived by U.S. forces of all kinds from space systems, and therefore they will be motivated to try to reduce, offset, or emulate that U.S. space prowess.
- ▶ Superiority in space has offensive and defensive implications—remember the vital distinction between sea control and sea denial. It may prove easier to deny reliable access to orbit than to achieve or protect it.
- ▶ Inferior sea, or space, powers can harass a superior foe



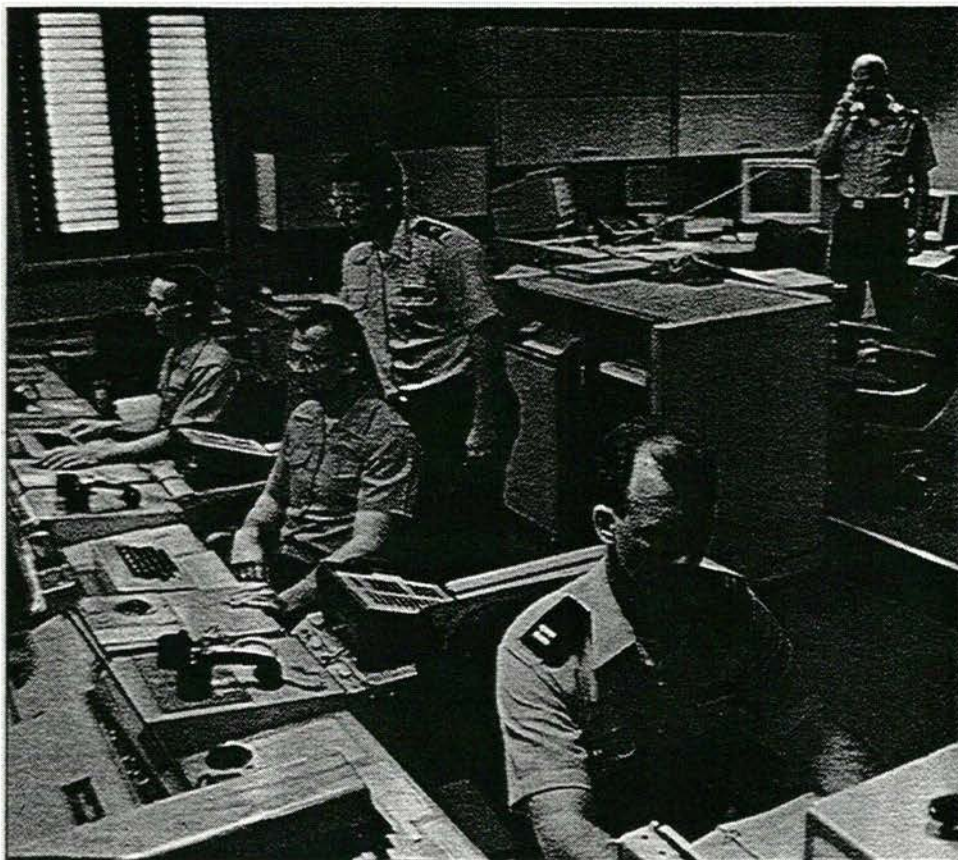
Charles Vest (left), head of the NASA Advisory Committee on the redesign of the space station; John Gibbons, Science Advisor to the White House; and Daniel S. Goldin, NASA Administrator, talk with congressmen of the House Committee on Appropriations. Space capabilities—framed in a comprehensive strategy—will allow naval forces to accomplish more with less as the defense budget declines.

to significant effect. In our justifiable pride in space (and sea and air) superiority, we must not neglect to worry about the damage that hostile small-scale, fugitive space capabilities might wreak.

► Foreign space systems are proliferating rapidly for both military and commercial purposes. The dual-use potential of those systems is a fact. Also, the increasing number of U.S. commercial satellite networks offers dual-use options, to which our space planners need to be alert.

ing the same against us. Potential enemies learned about our space prowess from Desert Storm; we cannot assume that U.S. space operations will enjoy a free ride in the future.

► The third reflects the ultimate probability that space control will become an active mission area. As more and more countries develop space capabilities, their ranks will unavoidably include competitors likely to become future enemies. They will be drawn to use their space capabilities against us, and we ours against them.



U.S. SPACE COMMAND

U.S. Army, Navy, Marine Corps, and Air Force personnel work a shift in the U.S. Space Command's Space Surveillance Center in Cheyenne Mountain Air Force Base. Space systems are inherently "joint," functioning in battlespace that surrounds land, sea, and air. A naval space strategy will strengthen the Navy and Marine Corps position on the team.

It is commonplace to say that the devil is in the details. It is more important to recognize the terror that may lie in the trends, if the trends are not recognized fully and exploited intelligently. These trend observations require that our naval space strategy accommodate three phases in the naval service's interaction with space:

► The first is to intensify the integration of space operations support into the naval services' performance of their terrestrial missions. Convergence between burgeoning technological possibilities and ever more restrictive defense resources means that the United States cannot long anticipate sustaining maritime superiority without making better use of space systems.

► The second is to be ready to counter the potential efforts of others to interfere with U.S. space operations. We accomplish defensive counterspace operations today; others, even with limited resources, are capable of attempt-

The timing of these three phases cannot be foretold with precision. The integration of space support is being pursued energetically now, in spite of the tide of retrenchment in military spending. Development of counterspace techniques and disciplines are also proceeding, albeit at a more measured pace. They will both continue through the next two decades. Active space-control undertakings lie further in the future. A successful naval strategy, however, needs to accommodate all three, for strategy guides operations today and the planning and concept development for the future.

The trends show us that the course of the space age is beyond effective control by U.S. policy and strategy alone. The United States currently has a significant lead in the exploitation of space, but we must recognize about spacecraft that "now everybody is doing it." If the Navy and Marine Corps choose to be slow to integrate the value of space systems into operational plans, the loss eventually will come to haunt us.

#### *The Need for Naval Space Strategy*

A great deal is known about space as an operating medium, and particularly about the near-earth space envelope from 93 out to 22,300 nautical miles. The science of astrodynamics is nearly three-and-a-half centuries old, while extensive experience with the design and operation of space vehicles has been gathered over the last 50 years. We do not understand as well the strategic meaning—or even the utility at the operational level of war—of space as an operating medium.

It is easier to design a new class of vehicles than it is to employ it correctly. The large ideas of defense plans,

strategy, and operations must shape the tactical choices that are made in each operating medium. Nonetheless, if the actual forces cannot do what strategy directs, then the strategy—as well as the forces—is at fault. The relationship between strategy and tactics, between higher direction and capabilities, is two-way in character.

System-by-system appreciation of the naval value of space assets is growing rapidly, but much remains to be done with regard to understanding the total impact of space operations upon naval excellence. The naval services could be asking too little by way of support from space, unless we better comprehend the ways in which a nearly full-service space architecture could improve combat performance across the board.<sup>6</sup> That idea, properly formed, can come only from an explicit naval space strategy. The naval services must help shape the total U.S. military space program if they are to do their maritime job properly in the future. However, if we lack a vision of what naval power and space power can mean for each other, the agenda of U.S. military space development will be set by people and organizations not oriented primarily toward the advancement of maritime excellence. The U.S. military's space power is certain to grow, but it will not grow in ways most responsive to naval requirements unless we ourselves set those requirements: to do that, we need a vision at the core of that strategy.

### *The Vision*

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*Our goal is to achieve the same quality of integration of support from space systems that we have achieved for aircraft.*

The aircraft analogy is important because it renders more easily comprehensible what is—and no less important, what is not—meant by naval space strategy. In the broadest of terms, the way ahead will require the Navy and Marine Corps:

- ▶ To “think space” for all levels of war—strategic, operational, and tactical—to the point where an absence of the space dimension would be literally unthinkable
- ▶ To plan and conduct strategic, operational, and tactical activity with an institutionalized space dimension effectively built-in
- ▶ To think, plan, and operate “joint” as a critical part of a combined arms team making systematic use of national military (and probably some commercial) space systems.

If these three points seem to be radical as well as visionary, it shows just how urgent it is for the naval service to come to grips with the rapidly changing terms of war fighting in this decade. The vision is not that space systems will replace rival capabilities that operate on land, at sea, or in the air, but rather that the naval services will allow space systems to assist in ways they can do best.

We recognize that even if space systems offer the superior capability, say, for reconnaissance in support of a Marine expedition, there are still likely to be targets whose precise locations are obscure to space-based sensors or are not trackable in near enough to real time for Marine air ground task force needs. In those cases, SEALs (Sea Air Land team) and other approaches to intelligence gather-

ing will have to supplement collection from orbit. Space systems join the team; they do not replace it.

The trend of the U.S. defense effort over the next decade and more is that the Navy and Marine Corps will be required to perform with fewer forces; therefore, it is appropriate for us to think of naval space strategy as a vital force multiplier. The genuinely precise navigation, the globally reliable communications, the real-time detailed awareness of the physical environment, and the full-spectrum intelligence gathering—all from space—combine to enhance critically the potency and economy of force of naval forces declining in size. Fewer naval assets can continue to project power globally at tolerable risk when enemy and friendly forces can be located with certainty and precision. In addition, targeting assistance from space vehicles will enable a few good men, women, ships, aircraft, and missiles to go and succeed when previously a crowd would have been necessary.

### *The Strategy*

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The top-down vision of space-conscious naval forces thinking space at all levels of war is the first essential step toward implementation of a naval space strategy. This vision is the core of a naval space strategy capable of achieving, in the near term, the level of integration of support from space operations into maritime operations that has come to be the case with aviation. This vision must remain broad enough to cope with the efforts of potential enemies to interfere with U.S. use of space. And it must be sufficiently forward looking to accommodate the probability of the eventual growth of space control as an active mission area.

Enhanced institutionalization within the naval service of its commitment to the full-scale use of space must be a focus of the effective development of space thinking in its relation to the needs of maritime duties. The naval service's present institutional structures for space are but a beginning. Whether an evolutionary growth of today's naval space organization or a bold new departure aimed at bringing together now dispersed functions, the naval service's future space operating institution will require the broad charter to bring the Navy and the Marine Corps systematically and genuinely into the space age. For example, the naval space organization should:

- ▶ Guide space training throughout the naval educational system
- ▶ Provide space training itself
- ▶ Operate space systems as a component of the U.S. Space Command
- ▶ Develop concepts and doctrine for the naval exploitation of space capabilities
- ▶ Lead the requirements process for maritime needs in the space arena
- ▶ Represent both the Navy and Marine Corps in joint space undertakings

First among the goals of the naval service's institutional center for space is the establishment of a corps of naval operators with real expertise in space operations. These trained people are essential to inform commanders about what space operations can do for or to them, orient the rest of the naval service to the maritime utility of space

operations, develop the concepts and doctrine required to guide the naval service in employing space assets, and build the basis for advocacy of appropriate naval space systems and programs.

These trained naval space experts will educate the "customer" sailors and Marines across the rest of the naval service to be space-minded clients. In the implementation of our naval space strategy it is at least as important for space-minded people to think war-fighting naval forces, as it is for the war-fighting Navy and Marine Corps to learn to think space. Good space-oriented ideas can only be useful if they are practicable for all our naval forces.

People still matter most, notwithstanding the prominence of technology in space operations. If we provide an institution that can train people to "think space" for naval tasks in a joint arena, sound concepts and doctrine will follow. Through its history the naval service has built a robust conceptual foundation to which motivated space-minded planners confidently can add the significance of space operations. Similarly, the richness and depth of Navy-Marine Corps doctrine should accommodate the newness of space capabilities, both as we can project their value now and later as experience reveals their full potential.

Logically derived force requirements grow out of a clear vision, cultivated by effective institutions, by trained personnel, supporting a space-minded naval service, that assembles sound concepts and doctrine for naval operations in the space age.

The transmission belt of strategy, which turns vision into execution by naval forces, depends upon trained people who in their turn can depend upon the commitment of the naval service. Doctrine and force requirements are important, but they are only details compared logically with the need to "get the vision right," to institutionalize that vision, and to train the people to make a truly space-minded naval service a reality.

### *The Navy and Marine Corps Role*

The gravity-governed laws of motion in orbit render space systems inherently "joint" in nature, functioning in

potential battlespace that literally surrounds land, sea, and air. No one service "owns" space. Because so much of the earth's surface is water, and so much of that water is continuous for maritime access by the superior navy, and ships inherently are agile vehicles (unlike satellites pursuing prescribed orbits), naval power can provide major assistance to the country's national space capabilities. Space vehicles can be launched from ships, antisatellite weapons can be deployed at sea, and space surveillance can be conducted by ships, and so forth. In addition, naval forces can threaten or assault the ground segment of an enemy's space-system architecture.

The Navy and Marine Corps role in space thus is plain to see. First, we have to exploit space capabilities for maximum useful maritime effect, while second we must function as a team player placing the comparative advantages of our maritime excellence at the service of the development and operation of national space capabilities. In order to perform these demanding tasks, to execute this role, we require the guidance of naval space strategy. The 21st century beckons. We were granted a glimpse of the future by the Gulf War of 1991. There is time to do the job right—and that time begins now.

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<sup>1</sup>Gen. Colin L. Powell, USA (Ret.), *National Military Strategy, 1992* (Washington, D.C.: Joint Chiefs of Staff, Department of Defense, 1992), pp. 24-5.

<sup>2</sup>With the conclusion of the Cold War, President Bush ordered the removal of nuclear weapons from U.S. naval vessels. Henceforth, as a general rule in peacetime, the U.S. Navy will not be nuclear-armed at sea.

<sup>3</sup>A theme developed extensively with historical case studies in Colin S. Gray, *The Leverage of Sea Power: The Strategic Advantage of Navies in War* (New York: Free Press, 1992).

<sup>4</sup>Powell, *National Military Strategy, 1992*, p. 25.

<sup>5</sup>Les Aspin and Gen. Colin Powell, USA (Ret.) "Bottom-up Review," Washington, DC, Department of Defense (September 1993).

<sup>6</sup>"Full-service" is qualified here ("nearly") because we recognize that the subject of terrestrial bombardment or fire support from orbit raises political and legal issues of unusual sensitivity. Discussion of what *could* be done from orbit has to include space-to-earth fire support, but that possibility, no matter how technically or economically feasible, is many years away from serious consideration for system acquisition. Certainly, there is no requirement for such a capability today.

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