

A Sea of Peace or a Theater of War: Dealing with the Inevitable Conflict in Space

by

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Space science, like nuclear science and all technology, has no conscience of its own. Whether it will become a force for good or ill depends on man, and only if the United States occupies a position of pre-eminence can we help decide whether this new ocean will *be a sea of peace or a new terrifying theater of war.*

President John F. Kennedy
Address to Rice University
September 12, 1962¹

President Kennedy had just finished touring the new Manned Spaceflight Center in Houston, Texas when he spoke these words. In his speech he addressed a broad vision for the future of the United States and the world in space. Kennedy perceived and understood the great potential that space has to offer for all mankind. He hoped and believed that space would be used to promote progress and peace for all the people of the world, but he also understood that there were risks and dangers that could not be ignored. His next words that day were perhaps even more enlightening as to his vision and priorities. He said,

I do not say that we should or will go unprotected against the hostile misuse of space any more than we go unprotected against the hostile use of land or sea, but I do say that space can be explored and mastered without feeding the fires of war, without repeating the mistakes that man has made in extending his writ around this globe of ours.²

President Kennedy understood the delicate balance between peace and war. He had a clear vision of the future of the United States in space. He understood that this country could not go undefended into this new frontier. He believed that only through strength could the United States ensure such a future.

Today, nearly four decades later, the United States is proceeding into the frontier of space in ways that not even President Kennedy had foreseen. Our civil space program has made manned travel to space almost routine, and the first elements of an International Space Station were launched by our Russian partners. The U.S. military has become absolutely dependent on the use of space systems for conducting military operations—from peacekeeping to major theater wars. And perhaps even more impressively, U.S. and international business interests are moving into space in record numbers. By the turn of the century, the commercial space industry is expected to generate over \$122 billion in revenue in the United States alone.³

The United States is, however, in spite of the warnings of President Kennedy and many others, proceeding "unprotected" into the future. Should any adversary on any level—national,

commercial, or even individual—choose to interfere with our space systems, the United States has no coherent policy or means to deal with such a threat.

Opponents of an expanded military space program (beyond the current capability to support terrestrial forces) charge that, with the fall of the Soviet Union and the end of the cold war, there no longer exists any threat of the hostile misuse of space. They argue that space has indeed become the "sea of peace" that President Kennedy dreamed of, where space is being mastered and explored without threat of warfare or conflict.

In fact, in spite of indications to the contrary, conflict in space is inevitable—and on a limited basis, has already occurred. Nations have already interfered with the space systems of other nations—through jamming and interference—solely for commercial advantage.⁴ All the nations of the world have learned from the Persian Gulf War how critically dependent the United States is on the use of space assets to successfully operate in a theater of war. No nation would dare to challenge the United States in conventional military operations without attempting to somewhat level the information dominant battlefield that the U.S. currently enjoys; and this dominance, in great part, comes from space.

The future of the United States is, in many ways, tied to the future development of space. One would think that, given the serious issues facing this development and the potential for conflict, the debate over this future would be widespread and vigorous. This is not the case. Even though a debate is occurring within limited political and military circles, it is not being addressed in any real depth on a national level.

In the 1970s and 1980s, in the midst of an active Soviet space threat, the debate was loud, vigorous, and involved not only leading military officers, presidents, and congressmen, but many from the scientific and academic community as well. Significantly, it was also extremely well covered by the mainstream national media. The debate today lacks this national attention and committed involvement as evidenced by the lack of response to a major speech given at the Fletcher School of Diplomacy in November of 1998 by Senator Bob Smith, Chairman of the Strategic Forces Subcommittee of the Senate Armed Services Committee. In this speech, he proposed, in very strong terms, the need for space weapons and perhaps even the need for a separate space force to develop and operate these weapons. Media response to these radical and bold proposals was almost non-existent. For many weeks, the only media coverage to be found was in primarily defense-related periodicals such as *Inside the Air Force*.⁵ The first mainstream American newspaper to even mention this speech was the *Washington Times* when it published an editorial by James Hackett on January 11, 1999 (nearly two months after the speech).⁶ Even though Congress subsequently passed legislation, included in the Fiscal Year 2000 Defense Authorization Bill, which established a special commission⁷ to evaluate these proposals, the national media has still largely ignored the issue.

But at least the debate is beginning. Unfortunately, the discourse thus far seems to focus on two very strong, opposing positions: the need for space weapons vs. the need to maintain space as a sanctuary. This should not be the focus. The focus should be on choices—choices that can help define the future of this nation, and the world, in space.

Many aspects of conflict, certainly in the near term, can be assuaged without requiring the controversial development and use of space weapons—without military intervention in space. To do so, however, requires the aggressive implementation of other instruments of national power, specifically economic and political. This also has not occurred.

General Richard B. Myers, Commander in Chief of the United States Space Command (CINCSPACE), said in a speech in early 1999, "Just as we can't expect to successfully fight the next war with the equipment of the last war, we surely won't see victory in the next war using the policies of the last war. To best prepare for the future, we have to energize our thinking too. We need that national debate on the existing policies and open questions affecting future military capabilities and possibilities in space. And we need resolution of that debate sooner rather than later."⁸

**We are at the dawn of a new century. Now is the moment to be farsighted
as we chart a path into the new millennium.**

President Bill Clinton

"A National Security Strategy for a New Century," 1997⁹

In order for this debate to take place, the nation's leaders must step out front and define a "farsighted" vision of the future. In the last year, some steps forward have occurred. The Department of Defense has published a new Defense Space Policy, and, in the new National Security Strategy (December 1999), President Clinton declared for the first time that unimpeded access to and use of space is a vital national interest of the United States.¹⁰ Unfortunately, these are only small steps. With regards to the nation's future in space, the United States currently lacks any coherent, long term national vision.

Again, the brief Presidency of John Kennedy provides some interesting insights. Shortly after taking office, the Kennedy Administration recognized the need for integrating all the aspects of national space policy in order to develop an effective space program. President Kennedy provided the overall vision and direction. Senior officials in his administration implemented the specifics.

In May 1961, Secretary of Defense Robert McNamara and NASA administrator James Webb delivered a memorandum to the President articulating both the need for and the specifics of a coherent national space program integrating all the elements of national power.¹¹ This national space program was clearly developed in response to the activities of the Soviet Union and the overall strategy stayed quite consistent throughout the Cold War. The space initiatives in the various segments of government—military, civil, and commercial—varied greatly over these three decades, but their goals remained consistent. National security and national prestige were the primary forces driving much of the space program. Numerous other forces impacted the program, ranging from science to economics, but they were minor factors when compared to the focus on national security, prestige, and relative standing with the Soviet Union.

The collapse of the Soviet Union changed this focus. Without a rival providing an immediate threat to the United States, the need for an integrated space program lessened. The result has been the development of separate military, civil, and commercial space programs driven by

different priorities. The military space program has continued to be driven by national security concerns. The civil space program, NASA, has focused increasingly on science—on research and development. Exploration and discovery have again become the primary forces behind NASA initiatives. Most significantly, the commercial space sector has begun to flourish. Competition and profit are clearly the driving factors behind the commercial space industry.

The results of these separate programs have been positive in many ways. NASA has moved forward in a number of important areas by concentrating more of their energies on discovery and exploration rather than on operations orchestrated by a massive government bureaucracy. The success of the commercial space sector has not been driven by government direction, but by the enormous potential to generate income and make a profit. The military has developed remarkable capabilities to support terrestrial operations by maintaining a clear focus on national security. The problem is, however, that as each of these segments moved out into the future, they did so in response to different visions—different directions. Without a threat like the Soviet Union, United States policy encouraged these different directions.

The current National Space Policy (1996) provides top-level guidance for each of the nation's space sectors—civil, commercial, and military. It does not fully integrate the nation's space program or provide a long term vision for the future. If conflict in space were not inevitable, such an approach would be not only acceptable, but appropriate. These divergent approaches, however, make it difficult to deal with the inevitable conflicts of the future.

The pressures on space are enormous—from both an economic and a military perspective. Looked at in isolation, each of these pressures is severe enough to create conflict. In combination, they create the risk that future space conflicts could result in war—either on earth, in space, or both.

On the economic front, conflict has already occurred due to crowding in geostationary (GEO) orbits and through saturation of the available radio spectrum.¹² On the military front, conflict has been avoided because the United States, in recent years, has retained an effective monopoly on the use of space during conflict.

Conflicts involving the commercial use of space will continue to increase as crowding increases. There are limited unoccupied slots at GEO and limited spectrum remaining to be allocated. On the military side, one cannot imagine the United States allowing an enemy to either threaten U.S. space capabilities or use space systems to their advantage, putting Americans at risk. Conflict involving space systems could be a significant part of any future military conflict involving the United States.

Space is such a diverse environment that predicting how conflict will occur is a challenge of infinite possibilities. What is clear, however, is that future conflict will likely be derived from these two interests so heavily dependent on space—the commercial sector and the military.

The military leadership is fully convinced that weapons will be needed to deal with such a conflict.¹³ Other nations and many Americans see such a plan as disastrous and are calling for the United States to negotiate treaties, bilateral and multilateral, to prevent this from taking

place. Despite requests from numerous nations around the world, new space treaties are not currently being considered. The Clinton Administration has determined that the current limits on placing weapons of mass destruction in space are all that are needed at the moment. Negotiations regarding the peaceful uses of outer space are not considered in the best interest of the nation.¹⁴ Although the administration sees space as a vital national interest, it does not see the need for either developing a full spectrum of weapons that could influence space systems, or negotiating with the international community in an attempt to preserve the U.S. advantage. Current national space policy is disjointed and confusing. Even on the issue of anti-satellite (ASAT) weapons, the administration has sent mixed signals.

In the fall of 1997, the Clinton Administration allowed the testing of the U.S. Army's Mid-Infrared Advanced Chemical Laser (MIRACL) against an orbiting Air Force satellite. The objective of the test was as follows; "to collect data that will help us improve computer models used in planning protection measures for U.S. satellite systems." The decision to test a high powered laser against an object in space was viewed by many as an ASAT test. It came under heavy criticism from Russian President Yeltsin, many members of Congress, and many in the scientific community as well—but the test was allowed to proceed. The satellite was indeed illuminated by the laser.¹⁵ Almost at the same time, President Clinton used the line item veto to implement policy for the first time (an action since ruled unconstitutional) when he vetoed three programs with the potential for exploring technology for space weapons—the Clementine II micro-satellite program, the Army's kinetic energy ASAT system, and the Military Space Plane. The administration argued that the MIRACL test was not an ASAT demonstration, that space control¹⁶ could be performed without weapons, and that the three programs in question were not needed for our future defense. The resultant perception in the media and in much of the world was that the administration did not have a clear policy for space control.¹⁷

In dealing with the commercial aspects of space, neither Congress nor the administration has been able to effectively deal with the growth of the space business and its impact on national security. Even though the Congress finally passed the Commercial Space Act in 1998, the critical issue of remote sensing (imagery) was not fully resolved. Issues regarding the commercial imagery satellite (Space Imaging's Ikonos) with one meter resolution remain confusing at best.¹⁸ The true impact of global satellite communications from satellite constellations like Iridium and Globalstar, likewise, has not been fully addressed. Again, the commercial sector has a tremendous potential for impacting national security—not only the U.S. sector but the international as well. Every new step that is taken in exploiting the benefits of space has tremendous impact throughout society. Decisions regarding commercial, civil, and military space systems cannot be effectively made without considering the full impact across the sectors.

In looking at the current U.S. space strategy and policy, it is interesting to compare them with Chinese efforts for planning their future in space. The Chinese have consistently pursued a relatively balanced strategy that integrates all their instruments of national power. This coherent strategy has allowed them to improve their ability to pursue their national interests while the United States seems to struggle with basic questions of policy, vision, and the future.

As they have for many centuries now, through the rise and fall of different dynasties and now as the last great communist power on earth, the Chinese have worked hard to strike a balance

between peaceful solutions and economic prosperity (wen) and the use of military power (wu). Development of the frontier of space for China has been pursued by a balanced application of these two basic principles. They realize that they remain significantly behind much of the world, particularly the United States, when it comes to taking advantage of space—for both military and commercial pursuits. They also realize that they must aggressively develop their interests in space in order to effectively compete in the global information age of the 21st century. A world without any threats to space systems would make their development efforts much easier. It would enable them to expand their military and commercial space industry without having to counter threats from other nations. They would gladly give up any benefits they could achieve from future space weapons to be allowed to freely develop the information potential of space (navigation, reconnaissance, communications, etc.) They also realize that they cannot afford to get into an arms race in space with the United States. Therefore, their diplomats have been working aggressively in pursuit of treaties that would ban space weapons.

Mindful of over a thousand years of history, the Chinese have attempted to avoid a total emphasis on wen without wu. Current events indicate they are also, apparently, pursuing the development of advanced technology space weapon systems. In late 1998, shortly after the Chinese Ambassador to the UN Conference on Disarmament had, in an impassioned address, pleaded with the nations of the world to begin pursuit of treaties to prevent the weaponization of space,¹⁹ newspapers in both Asia and the United States, citing Pentagon and other sources, reported that China was developing a high power laser ASAT capability to allow them to effectively conduct "information warfare."²⁰ China, in the past year, has also been accused of obtaining critical ballistic missile and nuclear weapons technology from American companies and from national laboratories. It is interesting to note that the Chinese government has vehemently denied the news reports accusing them of spying, but has made no visible public statement on the reports of their laser ASAT development.

It seems clear that the Chinese are attempting to pursue a national strategy with regard to space that will allow them to both expand economically and improve their own national security. Such a strategy is being pursued within the constraints of their overall defense and economic programs. The United States, even with a vastly superior economy and enormous resources, is not pursuing such a coherent approach.

Space has been described as both a frontier and a fuel – a frontier for exploration and exploitation and a fuel for the economy. Even though still early in its overall development as a frontier, significant military and economic pressures are already beginning to generate conflicts that require responses from the nations of the world. As a fuel, space is growing at an enormous rate, helping to drive the information age, and has already reached a point where it can be described as a vital national interest. These two analogies, frontier and fuel, provide useful insights into two different aspects of the development of space, but they still fail to provide a comprehensive description of the environment of space from a national and international perspective. Such a description is necessary in order to determine the need for and the specifics of a coherent U.S. strategy for space.

The environment of space has reached the point where it can be referred to as a "commons." Commons is defined as an area that can be used by the community as a whole, or more

specifically, as a legal term, an area where one nation has the right to use the same area as another nation without interference.²¹ As a frontier, space is a commons because it is available for exploration to any nation with the desire and wherewithal. As a fuel, it is a commons because there are no national restrictions limiting how space can be exploited. The only restrictions on space as both a frontier and a fuel are international in scope—applicable to the community of nations as a whole, not any single nation. Therefore, areas of conflict, such as geostationary spacing or spectrum allocations, must be dealt with from the viewpoint of the commons, as well as from the viewpoint of individual nations.

The international nature of space as a commons is what makes the problem of dealing with conflict so difficult. The U.S. military, as a minority player in space and in the absence of a coherent national strategy, is finding it increasingly difficult to develop the means to deal with conflict in space in the next century. Therefore, it is impossible for the military alone to effectively plan for and deal with all the elements of space as it relates to national security. It is a national problem and must be dealt with in a coherent manner by the executive branch—integrating all the elements of national power into a coherent policy.

As a commons, space will demand continued engagement in the international arena for the foreseeable future. With regards to commercial and economic expansion, laws, treaties, and agreements must continue to be explored and updated in order to allow for effective growth while minimizing conflict. The United Nation's International Telecommunications Union (ITU) is well positioned to deal with many of these multinational issues, through peaceful negotiations. Similar to the commons of the sea, however, disagreements and conflicts will continue to occur whenever one nation achieves a distinct advantage over others, and the others want to challenge this advantage. As the nations of the world explored the sea, new international laws were developed, treaties among nations for fishing rights and defense were established, and a new legal framework was developed to resolve conflict. However, these did not always work, and nations had to remain prepared to defend their rights to the seas with military power.

With regard to the commons of the sea, strategic military advantages and economic advantages are easily discernable. Ships of war and ships of commerce are, for the most part, quite different. In space, particularly in the future, satellites of war and satellites of commerce may be one and the same. The national response to a threat from a ship of war is clear. The national response to a satellite that has a military and commercial "dual-use" is not so clear. The 21st century in space will be driven by dual-use technologies, and these technologies will greatly impact future conflict. If the military desires to maintain an advantage in space, the nation must pursue ways to effectively deal with these technologies. Again, the military cannot do it alone.

The U.N. again offers opportunities to advance U.S. national interests in dealing with dual use technologies. The Conference on Disarmament (CD) and other U.N. committees looking at commerce and outer space offer excellent forums for raising issues among nations. Possibilities exist for exploring negotiated agreements for the controls of these kinds of systems and technologies. By engaging other nations within the structure of the United Nations, progress is possible in at least defining some of the additional laws and agreements necessary to operate in the commons of space.

The United Nations, and other arenas for peaceful negotiations should not be looked at as a panacea. The United States has the opportunity, due to its current competitive advantage, to continue to commercially develop the commons of space and continue to be the leading provider of space services around the world—from telecommunications, to navigation, to remote sensing, to whatever space industry arises in the coming years. It is essential that the U.S. government not take any action or implement regulations that would encourage other nations to develop a particular space market instead of U.S. industry. This raises continuing conflicts with national security interests and again stresses the need for an integrated approach from the U.S. government.

With regard to national security, each nation, the United States included, has certain national interests that are unique to that nation in space. At the moment, the U.S. is probably the most heavily dependent nation in the world on space. The U.S. must, therefore, be prepared to respond to threats to these national interests if negotiations cannot achieve their objectives. Threats to these national interests in the next century may come from a variety of sources. These sources could develop the capability to directly or indirectly threaten U.S. space systems, develop the ability to deny commercial space capabilities to the U.S., develop indigenous space capabilities to threaten U.S. forces or American citizens, or take advantage of international space capabilities to provide their own strategic advantage. Each of these threats is significantly different, and each must be considered by the nation in developing a strategy for the next century. Some threats may be effectively controlled via political and economic means, others may require military intervention. Military intervention may consist of non-lethal action (e.g., jamming), lethal action confined to terrestrial targets, or ultimately, lethal action against targets in space. A response to a purely commercial conflict would most likely be handled through non-lethal means while the only time lethal space weapons would be required would be when American lives or property was threatened by space systems.

The United States is indeed in a unique position in history—a lone superpower with no aspirations for further conquest and expansion. The lack of any immediate threat allows the country a period of "strategic pause" in which the nation can take the time to develop not only the technologies, but also the policies that will allow the nation to prosper in a period of relative security. Space is a critical element of the future. It will play an essential role in allowing for economic growth and enhancing national security. In order to take full advantage of this future, however, the United States must integrate all the elements of national power into an effective, integrated national strategy. The following recommendations are formulated to help develop such a strategy and to respond to these challenges—to respond to the complicated environment of space in the 21st century.

Recommendation #1: The Administration should reconstitute the National Space Council.

The National Science and Technology Council (NSTC) is currently "the principle forum" for resolving issues related to national space policy.²² Unfortunately, very few of the critical decisions regarding the future of space are issues of science and technology. They are issues that cross the boundaries of many agencies in government and impact everything from national security to economic prosperity. Addressing these issues in the context of science and technology gives them the wrong focus. The result has been the development of disparate visions and plans

(in Commerce, Defense, State, NASA, etc.) for dealing with the future of space without an integrated assessment of their impact on the other instruments of national power. Science and technology plans are integrated, but the overall national policy is unclear.

What is clear is that the problem must be handled in the executive branch of government. Congress is beginning to legislate different elements of the problem, but by its very nature, Congress will have a difficult time attempting to integrate the different elements of foreign and economic policy that mostly lie within the executive branch.

The original National Space Council (disbanded in 1992) effectively integrated the different elements of the executive branch and allowed the development of coherent strategies. Having the council chaired by the Vice President gave it the authority needed to make the tough decisions. Having a new National Space Council chaired by the Vice President may be politically obsolete, but a similar body needs to be chartered with the power and authority to make critical policy recommendations to the President. It should include senior representatives from all the impacted segments of the government—state, defense, commerce, CIA, NASA, the National Security Council, to name but a few. Its first order of business should be to define the overarching space policy of the nation that must contain a clear vision for the next century. This vision must be more than simply being committed to "the exploration and use of outer space by all nations for peaceful purposes."

Recommendation #2: The United States should develop and publish a new National Space Policy which clearly delineates a common vision for the future of the nation in space.

The current National Space Policy is out of date. The issues that need to be addressed are so complicated that only a national body within the executive branch, such as a National Space Council, could possibly consolidate the various positions and integrate the policy. The new policy must effectively encompass all the instruments of national power—allowing continued economic expansion, pursuit of vigorous research and exploration, while at the same time protecting U.S national security.

All of the instruments of national power must be effectively utilized and this requires new direction. The remaining recommendations will address the political aspects of the problem, followed by the military, and finally the economic.

Recommendation #3: The United States should enter into bilateral negotiations with other nations and multinational negotiations within the U.N. concerning the broad issue of space in the future.

This does not mean the United States should immediately support or sign a blanket treaty to "preserve space for peaceful purposes" or eliminate all future weapons in space. At this time, such an action is clearly not in the best interest of the United States. Other nations need to understand that the United States does not claim any sovereign right to space, rejects any nation's claim to such sovereignty, and desires space be available for use by all humanity—but at the same time, the U.S. considers the use of space to be a vital national interest—an interest Americans will be willing to protect if called upon. The United States currently achieves such a

tremendous strategic advantage from the use of space, that signing such a treaty would effectively result in a unilateral decision to level the playing field. The United States would not want to take such a step unless other nations could ensure some maintenance of the status quo (a U.S. strategic advantage) into the future. Preserving this strategic advantage should be a guiding principle behind any future U.S. initiatives.

Space has long been militarized, but in order to keep it from being weaponized, other nations would have to give up some of their own potential to use space for military purposes. Other nations need to understand that if they use space systems to target, exploit, or attack U.S. citizens or resources, these systems will be attacked in return. Such a response could occur through an attack on the ground segment or the communication links, but could if necessary, require the use of space weapons. A negotiating position for the United States could be: if the world desires the U.S. not to develop space weapons, other nations must make concessions that will allow for the status quo in the current use of military space systems to support terrestrial operations. Without maintaining the status quo, United States military forces will become increasingly vulnerable around the globe from the indirect military use of space systems.

It is not clear or even likely that other nations would desire to agree to such a construct, but U.S. refusal to negotiate ignores the possibility for mutually beneficial, peaceful solutions to conflict. The current Administration's foreign policy is based on a concept of international engagement. By engaging around the world, it is often possible to find common ground and mutual interests that can improve the situation for both (or many) countries. The same opportunity to engage is available in space. The nation needs to take advantage of this opportunity.

Recommendation #4: The U.S. military must be prepared, across the spectrum of conflict, to take all prudent actions necessary to achieve space superiority.

Just as all operational plans today consist of military campaigns to achieve air superiority, each of these plans must also include campaigns to achieve space superiority. Unless space superiority is achieved, the nation's political and military leaders need to be cognizant of the fact that American forces would operate under greater risk if committed into such a theater of operations. Space superiority plans should consist of the appropriate application of non-lethal and lethal force applied in the appropriate medium to ensure the availability of space for U.S. and allied forces and the denial of the use of space for enemy forces.

Space superiority, like that of air superiority or maritime superiority, is not something that exists all the time. Rather, it is something that must be achieved only when dealing with a specific conflict, and then must be maintained for the duration of that conflict only. Space differs from air and maritime superiority because of its unique physical characteristics. In conflict, air and maritime superiority can be achieved over the limited geographic area involved in the conflict (e.g., air superiority over the Persian Gulf, or maritime superiority in the Mediterranean Sea). Space presents a more complicated problem. Orbiting space systems have the potential to impact an enormous portion of the globe, and therefore, space superiority must be evaluated from the perspective of all of space, not just a limited theater of operations.

In its efforts to achieve space superiority, even for the limited duration of some future conflict, the United States must, therefore, consider the overall impact of its actions on the overall commons of space. If the U.S. impedes on the commons, establishing superiority for the duration of a conflict, part of the exit strategy for that conflict must be the return of space to a commons allowing all nations full access. This requires two approaches: (1) the development of a complete spectrum of military options (non-lethal to lethal), and (2) the development of doctrine and concepts of operation that will employ the military option least threatening to the commons—thus allowing a better peace following the conflict.

Recommendation #5: The United States should begin an aggressive development and test program for a spectrum of capabilities necessary for space control.

As history has demonstrated, a concentration on political means without the proper preparation to use military force will almost certainly result in failure. It should therefore be the goal of the United States to aggressively pursue development and test programs for space weapons that will allow future decision makers options to deny, disrupt, degrade, and, if necessary, destroy space systems that could threaten U.S. interests in the 21st century. Space superiority can, at least for some time, be achieved without the use of space weapons. There is currently no specific threat demanding the deployment of such weapons. Therefore, the United States need not make a decision on the need to deploy such weapons at this time. It is possible that through negotiations, peaceful solutions to future threats may be achieved. It is also possible that through the use of terrestrial and air-breathing forces, space superiority can be achieved well into the future. The future threat in space may be handled in a progressive pattern of response that focuses on denial and disruption without having to degrade or destroy. However, at some time in the future, if peaceful negotiations fail, and military planners cannot develop terrestrial means to ensure space superiority, the only alternative may be the deployment of some type of space weapons. If this scenario occurs, the United States must be ready to respond.

A full spectrum of capabilities is needed to allow decision makers options for resolving conflict at the lowest level possible. The only way to be fully prepared is to have developed and tested the critical systems and technologies necessary to field such capabilities.

Failure to fully develop and test such capabilities and such weapons could make the United States vulnerable to surprises from other nations in the future. Gen. John L. Piotrowski, former commander of the United States Space Command said, on many occasions, that when it came to space weapons the one thing the United States couldn't afford to be was second.²³

A robust program developing capabilities for space control should be laid out to explore new technologies, integrate them into new weapons systems, and fully test them both in laboratory and field demonstrations. Since the goal would be not to deploy such weapons until absolutely required (and when that time would come is unknown), an urgent "crash" program is not needed. However, unless aggressive programs (in terms of funding and schedules) are developed, little progress will be made. In this time of strategic pause, programs can be implemented that are aggressive but take the necessary time—time to fully explore different technologies and thoroughly test and check out systems when developed. If the systems actually reach maturity,

and there is still no pressing need for deployment, they can be set aside until such a situation arises.

At the same time, the military needs to more fully develop the doctrine necessary to operate and use space control capabilities. The concept of space superiority is still relatively new for military planners. Significant work still needs to be done on how to effectively and efficiently achieve space superiority for today's military. Otherwise, when and if the day arrives where space weapons are needed, the transition will be confused at best. Understanding concepts and doctrine will allow military leaders to give political leaders sound advice on how to achieve space control as well as when space weapons need to be deployed and used.

This same approach should be applied for the development and use of space weapons for missions other than space control—specifically missile defense and force application. Again, when a threat emerges in the world that cannot be handled through either peaceful means or with traditional military methods, and a space weapon can respond to such a threat, the time will have arrived to deploy such weapons.

Methods for better characterizing potential attacks and defending current space assets also need to be pursued. Improved space surveillance capabilities are needed to ensure better knowledge of future activities in space. Improvements are needed on future satellites to better indicate when and if they are being jammed or attacked. An anomalous event on a satellite can be caused by many reasons: the impact of the space environment, system anomalies on board the spacecraft, or by the intentional efforts of an enemy. Distinguishing between these events is difficult, but the correct response depends on knowing the specific cause. Satellites today have a poor capability to identify these causes, and this capability needs to be improved to better identify problems and conflict.

The deployment of space weapons should be treated as a last resort by this nation—but not as an unthinkable option. American leaders have long believed in the concept of employing force only as a last resort, but have used military force when the situation demanded. The same should be true of space weapons. The United States should make every effort, political and otherwise, to create a future in space where weapons are not required. The deployment of such weapons will create the need on the part of future enemies to attempt to respond in some way to such a step—and how they respond is difficult to predict. It would be better to control the future through peaceful agreements that are in the mutual interests of all parties involved. At the same time, the United States should be prepared to deal with conflict in space if these other means fail. This means developing and testing a broad spectrum of space weapons.

Recommendation #6: The military services, particularly the Air Force, must continue to meet the responsibilities for funding the military space program.

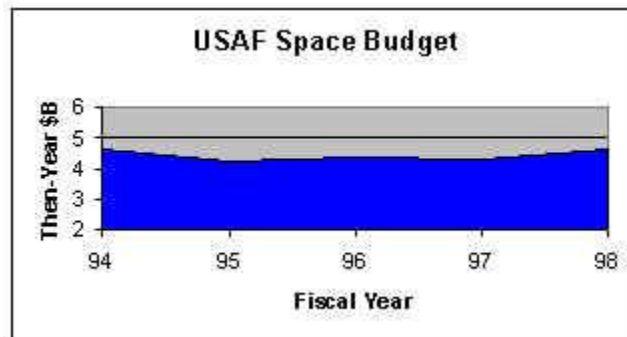
The current space missions do not require a separate service to execute them. The three services today (Army, Navy, and Air Force) are effectively integrating space into their warfighting capabilities. The military services should retain the responsibility to organize, train, and equip these forces.

However, the perception that the services have not fully supported the development of space over the last few years is real and must be addressed. Faced with severe budget pressures the services have all sacrificed future space programs to help pay other critical funding requirements. Congress has taken note and has been severely critical.

In their rhetoric, both the Department of Defense and the Air Force have acknowledged the importance and promise of spacepower. In his 1998 report to Congress, Secretary [of Defense] Cohen stated that "spacepower has become as important to the nation as land, sea, and air power." In 1995, the Air Force made clear in Global Engagement that: "The medium of space is one which cannot be ceded to our nation's adversaries. The Air Force must plan to prevail in the use of space." ...Compared to the magnitude of the technical challenges involved—and these programs' potential military value—the investments being made by the Air Force in these areas are paltry.²⁴

Senator Bob Smith (R-NH), November 1998

This criticism is based on Senator Smith's perception of Air Force budget decisions on space over the last five years. Senator Smith and other critics in Congress believe that the space threat in the future is growing and they feel the Department of Defense should be responding accordingly. A recent study by the AF Scientific Advisory Board (SAB) report explained, indirectly, the very reasons why this perception has developed. In this study, the SAB proposed the need for an aggressive increase in Air Force space funding in the coming decade. Interestingly, it also showed the actual Air Force space budget for the previous five years. These data are shown in the following chart.



Air Force Space Budget for the Fiscal Years 1994 through 1998²⁵

The chart shows that the actual Air Force expenditures on space have declined slightly or stayed fairly level over the last five years. These are the data that Senator Smith refers to when criticizing the Air Force's investment in space. The senator believes that the Air Force has had ample opportunity to step up to the future for the last five years and has failed to meet this obligation.

At the program level, the Air Force is also coming under fire for decisions made in early 1999 to delay both the high and low portions of the Space Based Infrared System (SBIRS), the new

missile warning satellite programs. For a number of reasons (technical, programmatic, and funding), the Air Force decided to delay these programs for about two years. This decision was seen by many in Congress as further failure by the Air Force to support space. The publication *Inside the Air Force* reported that key members of Congress were "concerned about the Air Force's practice of using the SBIRS program... to pay its bills."²⁶ Senator John Warner (R-VA), Chairman of the Senate Armed Services Committee, called on Defense Secretary William Cohen to cease making any changes to the SBIRS programs until Congress has an opportunity to decide on them.²⁷

Delaying the Space Based Infrared System (SBIRS), the highest priority military space program, for two years is viewed by space proponents as a decision equivalent to the Army delaying deployment of the M-1 tank because the M-60 could last a couple more years; or the Air Force delaying the development of the F-22 fighter because the F-15 could last a couple more years; or the Navy delaying their newest carrier because their oldest could last a couple more years. It is not just about how long a system lasts, but the need to update out-of-date technology and take advantage of new capabilities. Failure to treat space systems with equal importance to other military programs sends the wrong message.

There may be a day in the future when the United States determines a need to deploy space weapons. At that time, warfare will be conducted in the actual medium of space, and there may be a need for a separate space service. That would be a logical point to make such a decision. Making that decision now would be a mistake. Space does not currently require such oversight and nurturing—if the Air Force and the other services can meet the actual and perceived need to be good stewards of military space. If the current military services fail to step up to this challenge, a decision for a space service could result well before its time and well before many of the critical policy and doctrine questions have even been addressed.

Recommendation #7: The United States should structure its laws and regulations governing the commercial use of space to ensure U.S. companies remain or become the leaders in the global marketplace.

All space industries are global in nature. Navigation, weather, imagery, and communications from space—all were developed in the United States. The U.S. space industry, once a free world monopoly, now faces increasing competition from around the world. Complicating matters even further, every one of these commercial developments inherently has significant military capability within. Commercial navigation, commercial weather, commercial imagery, and commercial communications can all be used to help a potential enemy close the gap with the information dominant United States.

Any action that the U.S. government takes that prevents U.S. companies from competing in international markets is a threat to national security. If U.S. companies are the leaders of the industry, and the world comes to them for a particular space service, the U.S. as a nation at least maintains some insight and control over this service in times of conflict or crisis.

At the same time, any action that U.S. companies take to transfer critical technologies overseas is also a threat to national security. Even if the technology is "only" for communications satellites,

that technology still advances the state of the art overseas and allows international companies to provide improved capabilities in competition with the United States.

In a global economy, however, it is impossible for a nation to isolate itself and still be able to compete. The United States must trade overseas with space services, and therefore, industry must be allowed some leeway in the exchange of technical information.

In March 1999, the State Department, in order to comply with the 1999 National Defense Authorization Act, assumed responsibility for satellite export controls. However, according to John Holum, acting Undersecretary of State for Arms Control and International Affairs, they had extreme difficulty in staffing this critical function. Shortly after assuming responsibility for this function, he stated, "Congress mandated new staff... but there wasn't any money provided for that."²⁸ International customers responded negatively. In its April 5, 1999 issue, *Space News* reported that "three large satellite operators from Canada, Europe, and Asia said new U.S. technology-transfer regulations will make it difficult, and perhaps impossible, for them to purchase U.S. satellites."²⁹ It was clearly implied that these operators, previous American customers, would go to other international markets to obtain these services.

Given these sets of circumstances, the national space policy should direct the following: remove restrictions that prevent U.S. industry from maintaining a leadership role in the space marketplace, enter into agreements with industry to allow some control over international services in times of international crises, and allow industry to enter into export agreements when it can be demonstrated that no threat to national security will be created. The State Department, fully funded and properly organized is the best place to coordinate these export licenses. The United States cannot afford to miss out on international opportunities because of government bureaucracies. If these actions can be implemented, the issues concerning difficult and controversial subjects like remote sensing and imagery resolution should be easier to resolve, and the United States should be able to capture the majority of the space business in the 21st century—good for business, good for national security.

The United States has an amazing opportunity to implement a vision that will help shape the world in the 21st century. Space is only one of many places where this opportunity presents itself, but space is unique in many ways. Space envelops the earth and reaches to the stars. Space has the ability to effect, in some way, every person's life on this planet. Without a peer competitor, the United States has the opportunity now to take advantage of the unique attributes of space, but the nation has not yet stepped up to the challenge.

Conflict in space is inevitable. No frontier exploited or occupied by humans has ever been free from conflict, but the United States has a remarkable chance to mold and shape how these conflicts will be resolved in the future.

There is no threat right now that demands the deployment of space weapons. Opportunities exist in the Conference on Disarmament and through bilateral negotiations to make progress in eliminating the future need for such weapons. At the same time the United States cannot afford to be caught off guard in the future—the nation cannot afford to be second in the deployment of space weapons. The only way to ensure this happens is through a robust development program

for an entire spectrum of space control capabilities—deferring the decision to deploy space weapons until a clear requirement exists.

If the United States remains strong, if space truly is a clear vital national interest, if we negotiate openly with the nations of the world, if we allow our industry to fully exploit space and become the unquestioned leader of the information age, and if we develop the means and methods to effectively deal with the inevitable conflicts that will occur in space in the next century, perhaps President Kennedy's new ocean could remain primarily a "sea of peace."

If, however, the United States continues without an integrated national strategy, if we fail to define a vision of space for the future, if we decide to develop space weapons in a vacuum apart from the rest of the space community, if we refuse to negotiate with other nations, or if we fail to fully establish a comprehensive commercial space policy, then the ocean will undoubtedly become "a terrifying new theater of war."

The opportunity exists now, but it won't last forever. It requires vision, and it requires decisions. It requires a national debate on the issues and a national effort—it cannot be dealt with by the Air Force or the military alone. It requires a desire to eliminate space weapons in the future, while at the same time developing the very same weapons. It requires an understanding that, if a threat does appear in the future, the United States may very well have to deploy these weapons. It requires an understanding of a wide variety of very complex issues, but most importantly, it requires an integrated national strategy.

In his first annual address to Congress, the first state of the union address, President George Washington addressed Congress about its most important duties. The date was January 8, 1790 and President Washington said:

Fellow Citizens of the Senate and House of Representatives.....
Among the many interesting objects, which will engage your attention,
that of providing for the common defense will merit particular regard.

To be prepared for War is one of the most effectual means of preserving peace.³⁰

In the 210 years since these words were spoken, little has changed. If the United States desires to preserve peace in space in the 21st century, the nation must be prepared for war. Such preparations do not demand the deployment of space weapons, but they do demand their development. In order to fully exploit the tremendous riches and opportunities in space, the United States must be willing to effectively combine all the instruments of national power in a concerted effort towards the realization of a future vision. If the nation prepares now, the vision has no limits. If we fail to prepare, that vision will be defined by others—and not likely in a way the United States would prefer.

Notes

1. John F. Kennedy, *The Burden and the Glory* (New York: Harper and Row, 1964), p. 243.
2. *Ibid.*

3. The White House, A National Security Strategy for a New Century, October 1998, p. 25-26.
4. One example: During January 1996, the United Nations (UN) International Telecommunications Union (ITU) supported the Pacific Telecommunications Conference to address both GEO crowding and frequency allocations and developed a number of suggestions to alleviate these problems. Only a few months later, as reported by the UN themselves, severe crowding in the geostationary orbital slots over Asia "led to the jamming of a communication satellite by PT Pasifik Satellite Nusantara (PSN) of Jakarta, Indonesia, in defence of an orbital position claimed by Indonesia. This incident focused global attention on a worsening problem of orbital crowding and caused the matter to be brought before the October-November 1997 World Radiocommunication Conference (WRC) of the 187 member-nation ITU in Geneva." (The United Nations, Highlights in Space: Progress in Space Science, Technology, Applications, International Cooperation and Space Law, 1996 (Vienna: United Nations, 1997) p. 38., and 1997 (Vienna: United Nations, 1998) p. 51. The conference, after nearly six weeks, made only minor modifications to the procedures for reserving orbital slots and came to no resolution as to the Indonesian jamming incident. When contacted in September of 1998 about the incident, Rhea McGraw, a spokesperson for PSN provided the following amplifying information, "There was (and continues to be) some confusion over 'ownership' of the slot at 134 degrees East... both PSN and APSTAR IA [China] both claim ownership of that position. PSN did carry out testing that may have resulted in the temporary suspension of broadcasting for APSTAR, however, this was in no way intentional, was halted immediately, and has not occurred since. The ITU did not get involved in the dispute settlement process, claiming bilateral negotiations were appropriate. The discussions are ongoing, with no clear resolution in sight." She later indicated that the PSN (Indonesian) satellite project was halted due to the monetary crisis in Asia. Indonesia, therefore, felt no immediate urgency to resolve the dilemma.
5. In addition to a survey of major newspapers, magazines, and the INTERNET performed during the course of this research, the Air Force Space Command Office of the Legislative Liaison, HQ AFSPC/XPPL, Peterson AFB, CO, performs an ongoing, detailed search for anything of interest to military space. They publish these articles every week in their Legislative Update. Their survey found no media response by the mainstream press either.
6. James Hackett, "Space Control Horizon," Washington Times, opinion editorial, January 11, 1999.
7. HRPT 106-301, The Conference Report to Accompany S. 1059, the FY00 Defense Authorization Bill, Sec. 1621-1630, Commission to Assess United States National Security Space Management and Organization, Aug 1999.
8. General Richard B. Myers, USAF, Commander in Chief, United States Space Command, Address to the United States Air Force Warfighting Symposium, Orlando, FL, February 4, 1999.
9. The White House, A National Security Strategy for a New Century, May 1997.
10. The White House, A National Security Strategy for a New Century, Dec 1999.
11. Robert McNamara and James Webb, Memorandum to the President, May 8, 1961. A copy of this memo was presented at a conference at the Woodrow Wilson Institute,

Washington D.C. on March 25, 1999, by Professor John Logsdon, Space Policy Institute, George Washington University.

12. The frequency crowding problem is so severe that the United States Government has had to take critical frequencies, originally reserved for military operations, and consider methods for sharing these frequencies. The government has done this with both the military navigation satellite, the Global Positioning System (GPS) and the military weather satellite, the Defense Meteorological Satellite Program (DMSP). For more information see. Office of Spectrum Management, National Telecommunications and Information Administration, A Preliminary Analysis to Determine Interference Effects to GPS from Other Radio Services (<http://www.ntia.doc.gov/osmhome/osmhome.html>). A report on the GPS issues with frequency sharing with Inmarsat can be found at <http://www.laafb.af.mil/SMC/CZ/homepage/future/report.htm>. The DMSP problem is described in In the matter of the Application of LEO ONE USA CORPORATION, Federal Communications Commission (FCC), Washington D.C., File No. 57-DDS-P/LA-94(48), , February 13, 1998.
13. For example, see United States Space Command, Long Range Plan, March 1998, and USAF Scientific Advisory Board, Report on A Space Roadmap for the 21st Century Aerospace Force, November 1998.
14. Ambassador Robert T. Grey, Jr., U.S. Permanent Representative to the U.N. Conference on Disarmament, in "U.S. Interests and Priorities at the CD: An Interview with U.S. Ambassador Robert T. Grey," Arms Control Today, October, 1998, p. 3-8. In this interview, he states, among other things: "We've got an agreement that bans the emplacement of weapons of mass destruction in outer space. We think that's enough; we don't anticipate any other problems." October 1998
15. Kenneth Bacon, Pentagon spokesman, regular Thursday briefing to the media, October 24, 1997.
16. See United States Space Command, Long Range Plan, March 1998, "Control of Space is the ability to assure access to space, freedom of operations within the space medium, and an ability to deny others the use of space, if required."
17. See transcripts of Kenneth Bacon's Thursday briefings to the media September and October 1997, press release by Senator Tom Harkin (D-Iowa) criticizing administration ASAT policy and the MIRACL test in particular, October 10, 1997 and numerous criticisms from arms control organizations published on the Internet. See <http://www.armscontrol.org/ACT/oct97/miraclact.htm> or numerous citations at <http://www.fas.org>.
18. Bob Drogin, "Sale To Public Of Satellite Photos Debated," Los Angeles Times, page 1, 15 Jan 00.
19. Li Changhe, Ambassador for Disarmament Affairs of China, Prevention of an Arms Race in Outer Space, Address to the Plenary Meeting of the Conference on Disarmament, Geneva, Switzerland, 13 Aug 1998.
20. "China Building Laser, A Key Weapon," Hindustan Times, New Delhi, India, November 4, 1998. See <http://www.hindustantimes.com/nonfram/041198/detFOR05.htm>. Also see Los Angeles Time and Washington Post reports, located at http://www.wichitaeagle.com/news/military/docs/laser1129_txt.htm
21. The American Heritage Dictionary of the English Language. American Heritage: New York, 1969, p. 268. Commons: n. A tract of land belonging to or used by a community as

a whole, or the right of a person to use the lands or waters of another, as for fishing or grazing cattle.

22. The White House, National Science and Technology Council, Fact Sheet: National Space Policy, September 19, 1996, p. 2. A copy can be found at <http://www.hq.nasa.gov/office/oss/spacepol.htm>.
23. The author heard General Piotrowski make these kinds of remarks on numerous occasions in the 1990s. In most instances, General Piotrowski was specifically referring to a Space Based Laser (SBL) when he stated that "the one thing the United States could not afford to be was second."
24. Senator Bob Smith, "The Challenge of Spacepower," Address to the Fletcher School/Institute for Foreign Policy Analysis Annual Conference, Cambridge, Massachusetts, November 18, 1998.
25. Derived from data provided in United States Air Force Scientific Advisory Board, Report on A Space Roadmap for the 21st Century Aerospace Force, p. 35-36.
26. "Congress Critical of Air Force's Decision to Put Off SBIRS High Launch," Inside the Air Force, January 29, 1999, p. 8-9.
27. Senator John Warner, Letter to Secretary of Defense William Cohen, February 4, 1999.
28. Warren Ferster, "Satellite Export Licensing Caught in Budget Dispute," Space News, March 29, 1999, p. 1.
29. Peter B. de Selding, "Satellite Buyers Blast U.S. Rules: American Firms Face Irate Customers," Space News, April 5, 1999, p. 1.
30. George Washington, The Writings of George Washington, ed. John C. Fitzpatrick, Volume 30 (Washington D.C.: U.S. Government Printing Office, 1939) p. 491.

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