STRATEGY RESEARCH PROJECT

SPACE CONTROL STRATEGY FOR A DYNAMIC, MULTIPOLAR WORLD

BY

LIEUTENANT COLONEL MATTHEW F. MARTORANO
United States Air Force

USAWC CLASS OF 1997

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

USAWC STRATEGY RESEARCH PROJECT

SPACE CONTROL STRATEGY FOR A DYNAMIC, MULTIPOLAR WORLD

by

LTC Matthew F. Martorano

Colonel Sanford D. Mangold
Project Advisor

U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

ABSTRACT

AUTHOR: Matthew F. Martorano (LTC), USAF

TITLE: Space Control Strategy for a Dynamic, Multipolar World

FORMAT: Strategy Research Project

DATE: 15 April 1996 PAGES: 28 CLASSIFICATION: Unclassified

The US military is increasingly reliant on space assets to accomplish its mission. In a multipolar world, where we do not know where and when the military will deploy, space systems are needed to augment and provide critical support to our forces. In the future, space systems will be an even more dynamic force multiplier. Additionally, our future opponents will have access to space information that could threaten US forces. This paper will analyze US space control strategy in light of our increased reliance on space systems and propose a space control strategy for a multipolar world. First, it will show how critical space assets are to the US military focusing on Desert Storm and proposed future uses of space. Next, the history of space control strategy will be explored from the first satellite launch to the present administration. In addition, current space control strategy and doctrine will be examined focusing on ends, ways, and means. Furthermore, a risk assessment of US strategy will evaluate whether there is a disconnect between strategy and resources. Finally, the paper will propose a future space control strategy for a multipolar world.

TABLE OF CONTENTS

INTRODUCTION

The US military is increasingly reliant on space assets to accomplish its mission. General Colin Powell said, "The United States learned from Operation Desert Storm that it had to achieve total control of space if it is to succeed on the modern battlefield."[1] In a multipolar world, where we do not know where and when the military will deploy, space systems are needed to augment and provide critical support to our forces. In the future, space systems will be an even more dynamic force multiplier. Additionally, our future opponents will have access to space information that could threaten US forces. Space control strategy must continue to evolve from a focus on a single threat, the former Soviet Union, to a consideration of many threats using not only country possessed assets, but allied assets either leased or passively acquired. This paper will analyze US space control strategy in light of our increased reliance on space systems and propose a space control strategy for a multipolar world. First, it will show how critical space assets are to the US military focusing on Desert Storm and proposed future uses of space. Next, the history of space control strategy will be explored from the first satellite launch to the present administration. In addition, current space control strategy and doctrine will be examined focusing on ends, ways, and means. Furthermore, a risk assessment of US strategy will evaluate whether there is a disconnect between strategy and resources. Finally, the paper will propose a future space control strategy for a multipolar world.

SPACE ASSETS ARE CRITICAL TO NATIONAL DEFENSE

Before US space control strategy can be evaluated, we must first understand the importance of space systems. Space assets are critical to US military forces as shown in Desert Storm and proposed future uses of space. During the Persian Gulf war, space systems provided weather information, communications, target intelligence, and navigation for both ground and air

forces. Weather information from satellites has been a core force multiplier since the Vietnam war and was critical during Desert Storm.[2] Military operations depend on accurate weather information to determine weapon effectiveness, timing, and direction of maneuver. Weather information played a key role determining the timing and direction of General Schwarzkopf's "left hook" operation in Desert Storm. Weather was also critical in the air war as coalition forces used laser targeting devices and air refueling, operations dependent on accurate weather information for mission accomplishment.[3]

In order to take advantage of weather information, US forces must have responsive command and control systems. According to General Donald J. Kutyna, former USCINCSPACE, "Effective command and control of US and coalition forces simply would have been impossible without military satellite communication systems. Over ninety percent of communications to and from the area of operations were carried over satellite systems..."[4] Furthermore, due to the lack of communication infrastructure in Saudi Arabia and Kuwait, a majority of communication within theater was conducted using satellites.[5] In addition, an effective SCUD warning system was established between USSPACECOM and the theater using satellite missile launch information to conduct warning and targeting of Iraqi missile launchers.[6]

Targeting and navigation were probably the biggest contributions provided by space systems in the Gulf war. "Navstar GPS became a legend as it fed navigation signals to aircraft, tanks, and trucks."[7] Coalition forces used GPS extensively to navigate the featureless terrain of the Iraq and Kuwait desert. They also used accurate GPS information to direct precise artillery support, bombing coordinates, and to supply forces in the field. Navigation information was essential for precision weapons used by the US on air defense, communication, command and

control facilities, and limiting collateral damage in Iraq. Based on their success during the Gulf war, GPS receivers are being further reduced, by Army Space Command, in size and weight to get them in the hands of more individual soldiers.[8] In addition, the Air Force has added $400 million to equip combat aircraft more quickly with GPS.[9] Increasing GPS is only a small step in how the US military plans to use space assets in the future.

US forces reliance on space assets will increase as space becomes an integral part of all future operations. According to Global Reach, Global Power, "Space forces are today where airpower was before World War II. The mission of space forces, long considered support for combat or mobility "customers" is now an integral part of combat operations."[10] For example, the lack of infrastructure as we deploy to more remote locations versus the European theater will require communications, navigation, surveillance, and reconnaissance capability from space.[11] In addition, one of the main predictions from Air Force 2025 is that, "the medium for Air Force operations will move from the air and space toward space and air."[12]

Many of the concepts described in Joint Vision 2010 require the use and protection of space assets to conduct dominant maneuver, precision engagement, and full-dimension protection operations.[13] For example, Global Engagement, A Vision for the 21st Century Air Force states, "Full Spectrum Dominance depends on the inherent strengths of modern air and space power-speed, global range, stealth, flexibility, precision, lethality, global/theater situation awareness and strategic perspective."[14] In addition, according to Global Engagement, space and air superiority is the precursor for Dominant Maneuver and is also the basis of Full-Dimensional Protection. Finally, the document asserts that, "The bottom line, is everything on the battlefield is at risk without Air and Space Superiority."[15] Now let's examine the development of space control

strategy to understand how current US strategy evolved and to see if past strategies could be relevant in a multipolar world.

EVOLUTION OF SPACE CONTROL STRATEGY

The US has been developing space control strategy since the end of World War II when the military first examined the possibility of satellites and their potential capabilities. After the war, there was a competition between the Army Air Force, Navy, and eventually the separated Air Force to see which service would control the development and deployment of space assets. Initially, the Navy began research efforts in 1945 to determine the usefulness of satellites to military operations and asked the Army Air Force to contribute.[16] The Army Air Force decided not to participate in the Navy study because it wanted to control space system development.

The first formal statement by the Commanding General of the Army Air Forces was that space was an extension of the air medium and therefore the responsibility of the Air Force.[17] In 1948 each service was studying military satellite utilization and their efforts were neither focused or coordinated. Finally, in late 1948, the Air Force through Project RAND eventually became, "the only service authorized to spend defense department funds on studies of satellite vehicles."[18] In 1954, RAND and the Technologies Capabilities Panel submitted definitive recommendations to the Air Force to pursue advanced research into satellite reconnaissance.[19]

As the Air Force pursued ownership of space, NSC 5520 was signed on 26 May 1955 and proved critical to the development of space strategy. It was the first document that represented the Eisenhower administration's attitudes and guidelines to the exploration of space. In fact, some of the guidelines of the document such as "freedom of access" have proved enduring and are still relevant to today's strategy:

- Satellites would constitute no active military offensive threat to any country over which it might pass
- Although a satellite might be able to launch a missile at ground targets, it will always be a poor choice for that purpose
- The US preserves the concept of "Freedom of Space," a nation does not have to get permission to fly a satellite over another country.[20]

These guidelines anticipated the US would be the first nation to launch a satellite into orbit and laid the groundwork for US satellites to have free access above the Soviet Union and other countries throughout the world. However, much to the dismay of US policy makers, the Soviet Union beat the US into space.

The launch of Sputnik I in Oct 1957 was a terrible shock to the American public and resulted in the US committing tremendous resources for missile and space programs. The Eisenhower administration had known for some time the Soviet Union was on the verge of launching an artificial satellite.[21] However, they underestimated the US public outrage and fear of the Soviet launch. On 31 Jan 58, Explorer I was launched by the Army, further highlighting the unresolved question of which agency or service would have responsibility for the space program.[22] In fact, the Eisenhower administration did not care at the time which service or agency launched the first satellite, they allowed the organization that was ready to launch the first opportunity.

To consolidate and coordinate space programs throughout the defense department, a new organization called Advanced Research Projects Agency (ARPA) was given responsibility in 1959 for all space projects. This organization was opposed by the Air Force, who continued to pursue development rights based on the premise that space represented an extension of the air medium.

The Air Force Chief of Staff in a speech on 29 Nov 1957, stated the definitive position on space control the Air Force holds true even today:

> Whoever has the capability to control the air is in a position to exert control over the land and seas beneath. I feel that in the future whoever has the capability to control space will likewise possess the capability to exert control of the surface of the earth...In speaking of the control of air and the control of space, I want to stress that there is no division, per se, between air and space. Air and space are indivisible fields of operations...[23]

In Aug of 1959, the Eisenhower administration transferred space programs back to the individual services and ARPA focused on basic research to advance military technology.[24]

Early antisatellite (ASAT) development was initiated by the Navy, Army, and Air Force and by 1958 all three were given authorization to pursue research in antisatellite programs. The discovery of an unknown Soviet satellite by US tracking facilities spurred the development of a capability to inspect and destroy enemy satellites.[25] The Air Force had been working on a program to intercept, identify, and then destroy a satellite called Satellite Interceptor (SAINT). However, the Eisenhower administration did not permit at any time the advanced development of an antisatellite system. Nonetheless, it did allow the Air Force to proceed with development of the inspection variant of SAINT in Nov 1960.[26] Eisenhower rejected advanced development of antisatellite weapons because he realized the critical importance of US reconnaissance satellites and did not want to encourage the Soviets to further develop an ASAT capability.[27]

The first US reconnaissance satellites were launched in 1959 and their importance was emphasized in NSC 5814/1, "Reconnaissance satellites are of critical importance to US national security."[28] In addition to emphasizing their early warning and intelligence gathering capabilities, the directive also foresaw the importance of satellites for arms control verification.[29] In order to

reduce the anticipated international opposition to US satellite reconnaissance, the Eisenhower administration increasingly emphasized that reconnaissance was a "peaceful" use of space and therefore legitimate. His goal was to avoid projecting an aggressive image and stimulating Soviet countermeasures. In fact, the space control policy of minimum ASAT research to guard against a Soviet space breakthrough, while supporting freedom of space access, became the main rationale for US ASAT research and development from 1957 to 1981.[30] The Eisenhower administration developed a significant space program and laid the foundations of space defense strategy that would be the cornerstone of US space policy.

The Kennedy years were a period of uncertainty due to Soviet space "firsts," fears that the Soviets would deploy orbital bombs in space, and a diplomatic offensive by the Soviets to prohibit space reconnaissance. Again, as in the Eisenhower administration, there was a debate on which service or agency should have sole responsibility for space development. A report by the "Ad hoc Committee on Space" concluded the US was lagging the Soviet Union in space due to inadequate management of national space programs.[31] The result was McNamara, the new Secretary of Defense, gave the Air Force primary responsibility for space but not sole responsibility allowing the Army and Navy to continue their space programs.[32] To guarantee space access and not antagonize the Soviet Union, the US began to keep DOD launches secret until after liftoff. Also, the US kept secret any reference to reconnaissance from space. Aviation week reported, "Defense officials are justifying the secrecy on the grounds that it will lessen the chances of provoking attacks on the US space program by Russia and other foreign countries."[33] Eventually as the Soviets became reliant on reconnaissance satellites they accepted US overflight.

In Oct 1960, Kennedy stated, "We are in a strategic space race with the Russians and we have been losing...control of space will be decided in the next decade. If the Soviets control space they can control earth, as in the past centuries the nations that controlled the seas dominated the continents"[34] During this period, Krushchev threatened weapons in space, "We placed Gagarin and Titov in space and we can replace them with other loads that can be directed to any place on earth"[35] Based on these threats, McNamara instructed the Army in 1962 to proceed with the development of the first ASAT, a modified Nike Zeus system.[36] The Air Force was also told in 1963, to prepare for an operational standby capability after it had completed initial testing of the Thor ASAT missile. By Feb 1964 the first test had been successfully completed on Johnston Island in the Pacific. According to Stare,

> The Administration was trying to maintain space for the passive use of military systems by example and diplomatic action. Yet if it failed, they wanted to be in a position to react with developed capability. Thus in many respects the Kennedy administration was implicitly following a "twin track" policy before that term became fashionable during the Carter administration.[37]

By 1963, the Kennedy administration had thwarted the Soviet attempt to prohibit reconnaissance satellites and also reached an agreement with the Soviet Union to ban nuclear weapons from space.

The Johnson administration generally followed the same guidance that was handed down from the Kennedy administration. The consolidation of Space Policy was summed up in a report on US space policy saying:

> We should continue to stand on general principle of freedom of space; actively seek arms control arrangements which enhance national security; pursue vigorously the development and use of appropriate and necessary military activities in space; and seek to prevent extension of the arms race into space.[38]

In 1964, Johnson was the first president to admit publicly the US had an ASAT program. Then, in 1967, the US signed the Outer Space Treaty. However, the Johnson administration deliberately avoided widening provisions beyond the 1963 treaty so the US could retain freedom of action in space and to eliminate the possibility of reopening the debate about the legitimacy of military use of space. During this period, the US began to dismantle its ASAT capability due to cost and the issue that the kill mechanism was nuclear limiting its usefulness so that by 1975 the system was completely deactivated.

Presidents Nixon and Ford saw the development of more complex and reliable space systems, and the deployment of a Soviet ASAT. US satellite lifetimes were increasing and they were becoming more complicated. Unfortunately, there was a definite drawback for space defense because the US was dependent on fewer, more capable satellites. By 1972 the Soviet Union was credited with having an ASAT capability.[39] The administration discussed whether to revitalize a US ASAT program to deter the Soviets and decided the US had much more to lose. In this situation, deterrence would not work because of dissimilarities in value between US and Soviet space systems.

Watergate, better relations with the Soviet Union, and SALT talks limited concern and reaction to the Soviet ASAT threat. Also, the ABM treaty put some constraints on use of ASAT systems. For example, the treaty states that, "Each Party undertakes not to interfere with the national technical means of verification of the other party..." and, "Each Party undertakes not to use deliberate measures which impede verification by national means of compliance."[40] Unfortunately, Soviet ASAT testing in 1976 challenged the administration's belief that the Soviet

Union was willing to reduce the space threat and was the catalyst in the US decision to develop an ASAT.[41] Ford and his immediate national security advisors considered it essential for the US to match the Soviet ASAT capability regardless of its limited effectiveness and poor testing record.

The Carter administration was the first to publicly announce a "two-track" policy of ASAT research and development in parallel with arms control efforts. However, as we have already discussed, other administrations have used this strategy. In parallel with arms control efforts, the Carter administration continued the ASAT research and development program authorized by Ford. Despite the contradiction, the ASAT program was justified on the grounds that it would support the US bargaining position.

The major reason the US ASAT program survived was the increasing pace of Soviet military space activities and continued tests of the Soviet ASAT.[42] The Carter administration was very interested in negotiating an ASAT agreement with Soviet Union. The prospect of a US ASAT capability would hopefully provide the Soviet Union with an incentive to negotiate and give the US bargaining leverage. Furthermore, in the event that an acceptable arms limitation agreement proved unattainable, the US could still have the capability to deal with space threats. The "two-track" policy of ASAT arms control with ASAT R&D gave both the DOD and Department of State what they wanted.[43] Unfortunately, the Soviet invasion of Afghanistan in December of 1979 brought to a halt all further progress on ASAT arms control during the Carter administration.

The election of Ronald Reagan brought new emphasis on the ASAT program and space defense strategy.[44] The requirement for effective and survivable early warning, communication,

and attack assessment systems was considered essential to the administration's declared policy of being able to fight and "prevail" in a nuclear war.[45] The rational for the US ASAT was:

> The United States will proceed with development of an ASAT, with operational deployment as a goal. The primary purposes of a US ASAT capability are to deter threats to space systems of the US and its allies and, within such limits imposed by international law, and to deny any adversary the use of space-based systems that provide support to hostile military forces.[46]

This was the first time the US justified the belief that we could deter the Soviets with an ASAT. When Reagan submitted the FY 1990 defense budget, Secretary of Defense Carlucci included a statement asserting that the lack of a US ASAT system was the single most vulnerable point in the country's defense.[47]

To give the ASAT program a better chance of service and congressional support, the DOD now emphasized the tactical role for ASATs. The new DOD position was that ASAT's principal role was in a conventional war, striking threatening satellites to prevent their observation of tactical level maneuvers by friendly forces.[48] This represented a departure from the past strategy of the need for ASAT as a deterrent to Soviet ASAT strikes on our space systems. Gen Piotrowski and the DOD now thought ASAT was needed not just for its qualities as an element of the overall deterrent posture, but as a warfighting tool itself if deterrence should fail.[49] ASAT research and development was canceled in 1988 by the Reagan administration based on the continuing Congressional ban on ASAT testing.[50]

The Bush administration's space control policy remained similar to Reagan's at the end of his presidential term. Space Control strategy continued to emphasis freedom of access and denying the enemy the use of space. However, there was no development of a US ASAT. There

was a distinct impression the threat from space had disappeared with the fall of the Soviet Union. Also, the preoccupation with the fall of the Berlin wall, Desert Shield/Storm, and military force reductions left little time or energy to focus on new space control strategies.

CURRENT SPACE CONTROL STRATEGY

Without doubt, as demonstrated in Desert Storm, space operations is rapidly becoming an integral part of military operations. Also, the history of space control strategy and ASAT development shows how US strategy has evolved since military use of satellites was first explored. Now let's examine the US's current space strategy focusing on ends, ways, and means. According to A National Security Strategy of Engagement and Enlargement, US space objectives include:

> Continued freedom of access to and use of space; maintaining the US position as the major power in space; deterring threats to US interests in space and defeating aggressive or hostile acts against US space assets if deterrence fails; preventing the spread of weapons of mass destruction to space; and enhancing global partnerships with other spacefaring nations.[51]

In contrast, US military objectives in space as defined in National Military Strategy of the United States of America, are less ambitious and focus more on the information and support available from space and less on protection of space assets and ensuring US space dominance.[52]

Air Force space objectives for future operations as presented in, "New World Vistas: Air and Space Power for the 21st Century," an Air Force Scientific Advisory Board study, focuses more on space control, "The US should plan to exploit space as a battle arena, as the high ground to be controlled, from which and in which it will fight."[53] In addition, Global Reach, Global Power predicts, "At the dawn of the new century, space forces' superiority of speed and position over surface and air forces points to control of space as a prerequisite for victory."[54] Also, Global

Engagement: A vision for the 21st Century Air Force states, "The control of air and space is a critical enabler for the Joint Force because it allows all US forces freedom *from* attack and freedom *to* attack."[55] Furthermore, as previously stated, Joint Vision 2010 relies extensively on space control and integrated information from space to execute military missions. The Air Force's approach to space control strategy seams to be more in line with national security strategy. However, as we shall see, the ways and means for space control do not completely match national security strategy or Air Force strategy, and are more closely aligned with the national military strategy of exploiting space information rather than space control.

US concepts for space control rely on deterrence through conventional ground attack and negotiation. The only current deterrence capability is to threaten attacks against an enemies ground based portion of a space system.[56] The US has the capability to destroy the ground segment with high precision smart bombs or cruise missiles since present satellite command and control facilities are soft, fixed based targets. However, there is a risk of further escalation if the only way the US can deny the enemy space information is by attacking his territory.

Negotiation through space treaties may not be able to mitigate the potential threat from ASAT weapons against US systems. In fact, Boris Yeltsin called for the elimination of ASAT systems in future arms control reductions.[57] Unfortunately, placing controls on ASATs would not eliminate the threat to US systems. "Antisatellite arms control measures are flawed by problems of definition, commonality between civilian and military technologies, information disclosure, verification and enforcement."[58] In addition, as more nations gain the ability to exploit space, the US may need to deny their access to space information, or be threatened from a country that has not agreed to eliminate ASATs. Also, with the growing trend to lease both satellites and space

derived information, the US must recognize the possibility it may have to negotiate with an ally or a neutral to "turn off" space information to an adversary who is using the information to threaten US forces.

US concepts for space control include, in the national security strategy and Air Force's future vision, the ability to deter threats to US interests in space and defeat aggressive or hostile acts against US space assets if deterrence fails. However, the US has not committed the means to achieve this portion of space control. The last ASAT the US tested was canceled in February 1988 by Secretary of Defense Carlucci citing the negative impact of the congressional ban on ASAT testing.[59] Currently, there is no dedicated ASAT testing occurring in DOD; however, spin-offs from BMD efforts could definitely have ASAT implications. Also, the effort to produce laser weapons to counter theater ballistic missiles in the boost phase could be applied as a potential ASAT. The reason an ASAT may become so important is the technology risk the US faces if it does not have the capability to protect its satellites or deny an enemy access to space information.

JOINT AND AIR FORCE SPACE CONTROL DOCTRINE

US space control doctrine also recognizes the increased reliance on US space systems, the future vulnerability of US forces to other countries space assets, and the need for space control. According to Joint Pub 1, space control is a key supporting capability necessary to the success of the Joint Campaign.[60] Air Force Manual 1-1 states, "Aerospace control normally should be the first priority of aerospace forces."[61] Additionally, Joint Publication 3-14 asserts, "US forces have not conducted war against an adversary that can duplicate our tremendous space capabilities, nor have we been denied the ability to exploit our space capabilities."[62] US joint space doctrine anticipates both hostile actions against US space capabilities and the proliferation and increasing

sophistication of enemy space capabilities.[63] For example, the need and value of space assets is expressed by the following statement, "Overhead, space based capabilities affect all terrestrial forces, with a potential we have only begun to grasp"[64]

Joint Publication 3 recognizes the operational importance of space systems to the Joint Force Commander (JFC) by suggesting the JFC needs to exploit the advantage space control provides throughout prebattle operations.[65] Air Force Manual 1-1 asserts, "...air and now space reconnaissance and surveillance systems have become the backbone of intelligence operations in both peace and war."[66] Also, the JFC needs to be able to request the maneuver or activation of intelligence and communication space systems to rapidly respond to operational requirements.[67] Joint Doctrine recognizes that superiority battles are no longer limited to the air, land, and maritime arenas. The JFC now needs to also achieve superiority in command, control, communications, computers, and intelligence (C4I) and space control is the key to achieving superiority in these areas.[68]

Space systems significantly reduce the friction and uncertainty of warfare. The JFC has become an integral part of the space effort, and now must participate in making space part of the joint operation or campaign plan.[69] Space control allows the US to determine enemy intentions, capabilities, and actions while simultaneously having freedom of action by depriving the enemy of similar information about our forces.[70] Normally USCINCSPACE is supporting commander; however, the supported JFC may be asked to support the space force commander by attacking enemy or defending friendly ground-based facilities.[71]

According to both Joint and Air Force doctrine, space control includes military space capabilities that will ensure freedom of action in space for friendly forces while limiting or denying

enemy freedom of action. According to Joint Publication 3-14, "Counterspace Operations (CSO) includes offensive and defensive operations by friendly forces to gain and maintain control of activities conducted in or through the space environment."[72] Additionally, Air Force Manual 1-1 states, "Aerospace control assures the friendly use of the environment while denying its use to an enemy...The objective of counterspace missions is control of space."[73] Defensive CSO is used to confuse, nullify, or deceive enemy space systems. It's goal is to let the JFC know when to conceal plans or forces. This type of defensive operation can be difficult if the launch or maneuver of enemy satellites goes undetected. However, with current capabilities in launch detection and space surveillance, the US can be relatively assured enemy reconnaissance satellites will be detected.

Offensive CSO can also be used to deny an enemy use of space systems. According to Joint Publication 3-14, "Offensive CSO is the lethal and nonlethal offensive actions taken to disrupt, degrade, deny, or destroy an enemy's ability to exploit military space operations."[74] These can include actions against the space system, space link, and ground elements. To deny an adversary the use of third-party or commercial space systems, the US can jam the space system, or take diplomatic and economic actions.[75] Presently, the US is able to conduct operations against the entire space system except for the satellite.

EXPANDING TECHNOLOGY

In future conflicts, the rapid growth of technology could place our space systems at risk and force the US to attack an enemy's space systems to maintain the battlefield edge our current satellites provide. According to "New World Vistas," rapid technology developments are likely to move the battle out into space because of our reliance on those systems.[76] Additionally, fast

development of commercial and foreign satellites means access to space will be widespread and will lead to an enemy's using space for their own purposes.[77] General S. Bogdanov, chief of the former Soviet general staff's operational research center observed, "Iraq did not have the necessary countermeasures, US space means functioned under test bed conditions."[78] Certainly an enemy looking at our reliance on space assets and the example of Desert Storm will attack those systems if he has the capability. As technology expands and transfers between nations the ability to threaten US satellites will increase. "In thirty years: US military and commercial satellites will constitute perhaps the highest-value target an adversary could destroy."[79] However, generally the ASAT threat to our satellites in a multipolar world seems longer term than perhaps the near term threat of an enemy using their own space systems against US forces.

Expanding technology may, in the shorter term, allow an enemy to exploit space systems against the US. Certainly there are already nations that have the capability to use reconnaissance satellites against US forces.[80] As access to space becomes available to more nations, our potential enemies may have the capability to threaten our forces. General Kutyna, explained the dilemma of a future enemy having reconnaissance capability of our forces, "During Desert Storm, the allied coalition was able to covertly reposition forces immediately before the ground combat phase began only because the Iraqis did not have an aerial surveillance capability."[81] General Kutyna added, "it's not enough just to provide satellites for our use; one must acquire and maintain control of the space environment."[82] If the US does not have the capability for space control, it may not be able to stop an adversary from conducting space-supported operations on US forces. The importance of space control is reemphasized in Global Reach, Global Power:

> During the Persian Gulf War, America's *de facto* control of space allowed us to keep continuos watch on the enemy...Extending this kind of

> control into the future means both ensuring access to space--one of the fundamental national interests of the United States-- and ensuring our exploitation of space in situations even when an adversary challenges us there.[83]

Denying an enemy's access to space information may soon become necessary to ensure US dominance of space and the ability to achieve our national security objectives.

The ultimate decision on whether to deploy an ASAT in the multipolar world will depend on the US's perception of the threat from enemy space systems. However, the discussion over ASAT use will likely reflect the same arguments over space control strategy that have been debated in the past. For example, let's suppose Iraq had an indigenous space reconnaissance capability during the Gulf war. The US would probably want to negate Iraq's capability prior to Desert Storm to ensure Iraq did not have the capability to know the size and position of coalition forces and to protect the left hook's element of surprise. Similar to the bipolar era, the US would face a difficult choice deciding when to use its ASAT.

Negotiations were continuing constantly until just prior to the start of the conflict. It is doubtful the coalition would have allowed the US to use its ASAT while it was negotiating. Therefore, Iraq would have been able to observe all coalition movements prior to hostilities. If the US destroyed the Iraqi satellite just prior to the attack, it could have escalated the conflict before the US was ready or allowed Iraq to anticipate when the US would attack. However, if the US relied on defensive CSO, it would have limited the coalition ability to position forces or its surprise maneuver could have been discovered. These arguments are similar to the ones used during the debate in the Reagan administration on whether to deploy an ASAT.

Once the decision to negate the reconnaissance satellite was made, the coalition would have to decide how to attack the capability. A non-destructive CSO like jamming may be less

likely to escalate the conflict but may be difficult to execute. The timing and feasibility of an attack against the ground segment would have to be evaluated based on hardness, maneuverability, and weapon systems available. An attack on the satellite would also have to be evaluated on timing and the effectiveness of the US ASAT. The timing of the attack and negation option would be a very difficult decision for the NCA and JFC. Unfortunately, the possibility exists that Iraq may risk a preemptive strike against the coalition if it perceives its intelligence source, reconnaissance satellite, is no longer available or at risk to a US ASAT. However, it may prove even more difficult to deny space information to an adversary if they are purchasing information from a third party.

To further complicate the above scenario, let's suppose Iraq is purchasing surveillance information from a third party, like Russia. Also, in this situation, Russia is neutral or even providing some support to the Iraq cause. Obviously, it would be very difficult for the coalition to attack a neutral's satellite or ground stations, especially Russia, before or after hostilities had started. More than likely, negotiation and diplomacy with the third party would be used to deny Iraq space surveillance information. The US may even have to "buy" the information from the Russians to ensure Iraq does not get it. This type of diplomacy would be just as effective as negating the space system and may be the US's best option in the future as more nations secure space capability from third parties.

Space control strategy in a multipolar world and therefore the ASAT debate will continue to revisit when, and how an ASAT should be used against an enemy's reconnaissance capability. Making the case in the bipolar world with the Soviet threat and capability seamed obvious based on deterrence and warfighting necessity. The Soviet Union recognized the value of space systems

and deployed an ASAT to counter the US's increasing reliance on space systems. In response to the Soviet threat, the Eisenhower, Kennedy, and Carter administrations chose a "two-track" space control strategy of research and development of an ASAT while pursuing ASAT arms control. The Reagan administration chose to deploy an ASAT but was thwarted by congressional restrictions on testing and funding based on a fear of arms escalation and ASAT doctrine. The decision to deploy an ASAT in a multipolar world will hinge on the perceived threat to US forces from enemy satellites and how effective other means like negotiation, and attacking ground or link components of the space system, are to achieving national security objectives.

THE US SHOULD BEGIN RESEARCH AND DEVELOPMENT OF AN ASAT

Based on US national security objectives, the increasing reliance on space systems, and the emerging threat from technology, our national military space control strategy needs to commit the resources to match capability with our stated objectives and doctrine. The US should begin a research and development program to test an ASAT using emerging technologies from the BMD effort. Based on an evaluation of future threats and potential enemies, the system should be fielded if advancing technology allows potential enemies the capability to exploit space systems against our forces. This approach would be similar to the "two-track" space control strategies of the Eisenhower, Kennedy, and Carter administrations. If another nation deploys an ASAT capability, the US must be ready to immediately deploy an ASAT similar to the Reagan strategy. US space systems are already critical to national defense, our "center of gravity," and they must be protected from enemy attack.

Negotiation should also continue with other space nations to ensure there are controls on the information third party nations can receive from space systems. These controls are critical to

ensure access to space information is not used by unfriendly nations through lease agreements or by passive exploitation. Also, the US should emphasize its position of no technology transfer of knowledge that would enable a nation to quickly develop the capability to conduct space reconnaissance or surveillance of military forces. Economic and political pressures should be applied to nations that violate technology transfer agreements or provide critical space information. Additionally, future arms control agreements should not prohibit research and development of an ASAT. Funding ASAT research and development in the current budget environment will be difficult; however, the need is so critical all programs throughout the Department of Defense should be considered to offset the effort.

CONCLUSION

Military space control strategy must continue to evolve and more adequately reflect our national security strategy. Space assets are critical to US operations and will become even more important as our military relies on communication, command and control, navigation, weather, and surveillance information from space. Past space control strategies are relevant today and can be used as a basis for future strategies in a multipolar word. Current US objectives in national security strategy, Joint and Air Force Doctrine, and Air Force vision, is more focused on space control than the national military strategy which focuses on exploiting space information. In fact, the resources necessary to execute national security strategy are not available because the US is not developing an ASAT. Technology advancements may increase future risk to space systems as enemies gain the ability to threaten our satellites or exploit their own satellites to gain vital information on US forces. Furthermore, a space control strategy for a multipolar world should include research and development of an ASAT with possible deployment if an enemy develops an

ASAT or if potential enemies gain the technology to threaten our forces from space. Finally, economic and political means should be used to prevent technology transfer and to ensure controls are kept on space information to prevent unauthorized use. Global Reach, Global Power said it best, "Space superiority is joining air superiority as a *sine qua non* of global reach and power."[84]

ENDNOTES

[1] Dr Colin S. Gray, "Space Power Survivability," Air Power Journal (Winter 1993): 27.

[2] Roger C. Hunter, A United States Antisatellite Policy for a Multipolar World (Maxwell Air Force Base, Alabama: Air University Press, 1995), 6.

[3] James W. Canan, "Space Support for the Shooting Wars." Air Force Magazine (April 1993): 31.

[4] General Donald J. Kutyna, "The Military Space Program and Desert Storm." Space Times (September-October 1991): 4.

[5] "The Air Campaign," Reprinted from, *"Conduct of the Persian Gulf War"*, April 1992, pp. 87-181, Final Report to Congress, Department of Defense, Chapter VI, in Air War College Associate Programs, Vol 1, LSN. 11, 4th Ed., 222.

[6] Ibid., 266.

[7] John T. Correll, "The Command of Space." Air Force Magazine (October 1996): 3.

[8] Canan, 33.

[9] Ibid.

[10] Donald B. Rice, Global Reach, Global Power: the Evolving Air Force Contribution to National Security (Washington D.C.: Department of the Air Force, 1992), 8.

[11] Strategic Assessment 1996: Instruments of U.S. Power (Washington D.C.: National Defense University Press, Institute for National Security Studies, 1996), 180.

[12] Correll, 3.

[13] Joint Vision 2010 (Washington D.C.: Chairman of the Joint Chiefs of Staff, 1996), 19-23.

[14] Department of the Air Force, Global Engagement: A vision for the 21st Century Air Force, (Washington: Department of the Air Force. November, 1996), 3.

[15] Ibid, 4.

[16] Paul B. Stares, The Militarization of Space: US Policy, 1945-84 (Ithaca, New York: Cornell University Press, 1985), 25.

[17] Ibid, 26.

[18] Ibid, 29.

[19] William J. Durch, National Interests and the Military Use of Space (Cambridge, Massachusetts: Harper and Row, 1984), 36.

[20] Stares, 35.

[21] James R. Killian, Sputnik, Scientists and Eisenhower (Cambridge, Massachusetts: MIT Press, 1977), 7.

[22] Stares, 41.

[23] Ibid, 48.

[24] Ibid, 43.

[25] Herbert F. York, Race to Oblivion (New York: Simon and Schuster, 1970), 131.

[26] Ibid.

[27] Stares, 58.

[28] Ibid, 51.

[29] Ibid.

[30] Ibid, 58.

[31] John M. Lodgson, The Decision to Go to the Moon: Project Apollo and the National Interest (Cambridge, Massachusetts: MIT Press, 1970), 73.

[32] Stares, 61.

[33] "Space Secrecy Rule Stirs Fear, Confusion," Aviation Week and Space Technology, no. 21 (21 May 1962): 27.

[34] Robert F. Futrell, Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964 (Maxwell AFB, Alabama: Air University Press, 1971), 430.

[35] Phillip J. Klass, Secret Sentries in Space (New York: Random House, 1971), 62.

[36] Stares, 76.

[37] Ibid, 82.

[38] Ibid, 93.

[39] Ibid, 162.

[40] Durch, 179.

[41] Stares, 179.

[42] Ibid, 181.

[43] Ibid, 183.

[44] Colin S. Gray, American Military Space Policy (Cambridge, Massachusetts: Abt Books, 1982), 23.

[45] Ibid, 14.

[46] The White House Fact Sheet on National Space Policy, July 4, 1982, "Weekly Compilation of Presidential Documents," (12 Jul 1982), pp. 872.

[47] Marcia S. Smith, CRS Issue Brief: ASATs--Antisatellite Weapon Systems (Library of Congress: Congressional Research Service, 7 December 1989), 8.

[48] Ibid.

[49] Hunter, 27.

[50] Ibid, 24.

[51] A National Security Strategy of Engagement and Enlargement (Washington, D.C.: The White House, February 1996), 17-18.

[52] National Military Strategy of the United States of America. (Washington D.C.: U.S. Government Printing Office, 1995), 14.

[53] Peter Grier, "The Arena of Space." Air Force Magazine (September 1996): 44.

[54] Rice, 8.

[55] Global Engagement, 4

[56] Grier, 47.

[57] Mark J. Berkowitz, "Future U.S. Security Hinges on Dominant Role in Space." Signal (May 1992): 73.

[58] Ibid.

[59] Hunter, 24.

[60] Department of the Joint Staff, Joint Warfare of the Armed Forces of the United States, Joint Pub 1 (Washington: US Government Printing Office, 10 January 1995), X.

[61] Department of the Air Force, Basic Aerospace Doctrine of the United States Air Force, Air Force Manual 1-1, Vol I (Washington: Department of the Air Force, March 1992), 10.

[62] Department of the Joint Staff, Joint Doctrine; Tactics, Techniques, and Procedures for Space Operations, Proposed Joint Pub 3-14 (Washington: US Government Printing Office, 1 September 1994), I-3.

[63] Ibid, I-4.

[64] Joint Warfare of the Armed Forces of the United States , I-2.

[65] Department of the Joint Staff, Doctrine for Joint Operations, Joint Pub 3 (Washington: US Government Printing Office, 1 February 1995), IV-3.

[66] Department of the Air Force, Basic Aerospace Doctrine of the United States Air Force, Air Force Manual 1-1, Vol II (Washington: Department of the Air Force, March 1992), 192.

[67] Doctrine for Joint Operations, IV-3.

[68] Ibid, IV-5.

[69] Joint Doctrine; Tactics, Techniques, and Procedures for Space Operations, III-4.

[70] Doctrine for Joint Operations, IV-5.

[71] Joint Doctrine; Tactics, Techniques, and Procedures for Space Operations, I-8.

[72] Ibid, III-5.

[73] Basic Aerospace Doctrine of the United States Air Force, Air Force Manual 1-1, Vol I, 6.

[74] Joint Doctrine; Tactics, Techniques, and Procedures for Space Operations, III-6.

[75] Ibid.

[76] Grier, 44.

[77] Ibid.

[78] Berkowitz, 73.

[79] Grier, 46.

[80] Hunter, 32.

[81] Kutyna, 5.

[82] Ibid.

[83] Rice, 8.

[84] Ibid.

BIBLIOGRAPHY

1. "The Air Campaign," Reprinted from, *"Conduct of the Persian Gulf War"*, April 1992, pp. 87-181, Final Report to Congress, Department of Defense, Chapter VI, in Air War College Associate Programs, Vol 1, LSN. 11, 4th Ed., pp. 213-269.

2. Berkowitz, Marc J. "Future U.S. Security Hinges on Dominant Role in Space." Signal (May 1992): 71-73.

3. Canan, James W. "Space Support for the Shooting Wars." Air Force Magazine (April 1993): 30-34.

4. Correll, John T. "The Command of Space." Air Force Magazine (October 1996): 3.

5. Department of the Air Force. Basic Aerospace Doctrine of the United States Air Force. Air Force Manual 1-1, Vol I. Washington: Department of the Air Force, March 1992.

6. Department of the Air Force. Basic Aerospace Doctrine of the United States Air Force. Air Force Manual 1-1, Vol II. Washington: Department of the Air Force, March 1992.

7. Department of the Air Force. Global Engagement: A vision for the 21st Century Air Force. Washington: Department of the Air Force, November, 1996.

8. Department of the Joint Staff. Doctrine for Joint Operations. Joint Pub 3. Washington: US Government Printing Office, 1 February 1995.

9. Department of the Joint Staff. Joint Doctrine; Tactics, Techniques, and Procedures for Space Operations. Proposed Joint Pub 3-14. Washington: US Government Printing Office, 1 September 1994.

10. Department of the Joint Staff. Joint Warfare of the Armed Forces of the United States. Joint Pub 1. Washington: US Government Printing Office, 10 January 1995.

11. Durch, William J. National Interests and the Military Use of Space. Cambridge, Massachusetts: Harper and Row, 1984.

12. Futrell, Robert F. Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964. Maxwell AFB, Alabama: Air University Press, 1971.

13. Gray, Dr Colin S. American Military Space Policy. Cambridge, Massachusetts: Abt Books, 1982.

14. _____. "Space Power Survivability." Air Power Journal (Winter 1993): 27-42.

15. Grier, Peter. "The Arena of Space." Air Force Magazine (September 1996): 44-47.

16. Hunter, Roger C. A United States Antisatellite Policy for a Multipolar World. Maxwell Air Force Base, Alabama: Air University Press, 1995.

17. Joint Chiefs of Staff. Joint Vision 2010. Washington D.C.: Chairman of the Joint Chiefs of Staff, 1996.

18. Killian, James R. Sputnik, Scientists and Eisenhower. Cambridge, Massachusetts: MIT Press, 1977.

19. Klass, Phillip J. Secret Sentries in Space. New York: Random House, 1970.

20. Kutyna, Donald J., Gen, USAF. "The Military Space Program and Desert Storm." Space Times (September-October, 1991): 4-5.

21. Lodgson, John M. The Decision to Go to the Moon: Project Apollo and the National Interest. Cambridge, Massachusetts: MIT Press, 1970.

22. National Military Strategy of the United States of America. Washington D.C.: U.S. Government Printing Office, 1995.

23. A National Security Strategy of Engagement and Enlargement. Washington, D.C.: The White House, February 1996.

24. Rice, Donald B. Global Reach Global Power: the Evolving Air Force Contribution to National Security. Washington D.C.: Department of the Air Force, 1992.

25. Smith, Marcia S. CRS Issue Brief: ASATs--Antisatellite Weapon Systems. Library of Congress: Congressional Research Service, 7 December 1989.

26. "Space Secrecy Rule Stirs Fear, Confusion," Aviation Week and Space Technology, no. 21 (21 May 1962): 27.

27. Stares, Paul B. The Militarization of Space: US Policy, 1945-84. Ithaca, New York: Cornell University Press, 1985.

28. Strategic Assessment 1996: Instruments of U.S. Power. Washington D.C.: National Defense University Press, Institute for National Security Studies, 1996.

29. The White House Fact Sheet on National Space Policy, July 4, 1982, "Weekly Compilation of Presidential Documents," (12 Jul 1982): 872.

30. York, Herbert F. Race to Oblivion. New York: Simon and Schuster, 1970.