STRATEGY RESEARCH PROJECT

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SPACE POWER, *THE* REVOLUTION IN MILITARY AFFAIRS

BY

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Space Power, *The* Revolution in Military Affairs

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ABSTRACT

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Space power is the true revolution in military affairs. With the United States undisputed as the world leader in space, it is the responsibility of America's military to ensure we retain space superiority. Just as space has matured into an essential venue for military operations, to include communications and intelligence, it is inevitable that space will become a future battle ground though weaponization, due to increased competition for limited satellite orbits and the ability to place weapons in space to strike terrestrial targets. In light of this, three things must occur for the United States to maintain its position as the world's preeminent space power: the idea of weapons in space should be recognized as inevitable; secondly, space should be recognized as a distinct and legitimate Area of Responsibility in the Unified Command Plan; and lastly, the Defense Department should create a separate Space Corps under the auspices of the Air Force.

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SPACE POWER, *THE* REVOLUTION IN MILITARY AFFAIRS

INTRODUCTION

"We are committed to maintaining US preeminence in space. Unimpeded access to space is a vital national interest – essential for protecting US national security, promoting our prosperity and ensuring our well-being. Consistent with our international obligations, we will deter threats to our interests in space, counter hostile forces against access to and use of space, and maintain the ability to counter space systems that could be used for hostile purposes against our military forces."[1] These timely words may sound familiar, as they are found in the latest version of the National Security Strategy, in recognition of the indispensable interest the US has in space.

In light of that revelation, the US military stands on the cusp of a revolution in military affairs (RMA) like no other in history, even above and beyond the RMA so highly touted just a few years ago that witnessed the advent of precision guided munitions and burgeoning stealth technology. When the term RMA first came into vogue in the early 1990's, it meant different things to different individuals. Words like streamlined and agile forces, just in time logistics, increased munitions' lethality, and highly sophisticated automation were all catch phrases of the RMA.

One of the indisputable pillars of this RMA is information superiority, or the ability to communicate nearly instantaneously with forces anywhere in the world, and see emerging battlefields in three dimensions with perfect resolution. One of the greatest assumptions of the RMA is that modern US forces will have unobstructed access to space – not air supremacy or maritime totality – but access to space. This assumption is both dangerous and potentially lethal. For without *unobstructed* space control, US forces could be crippled to the point where the revolution in military affairs, including supremacy in space, could be the unexpected Achilles' Heel of our forces in the conflicts we will fight during this millennium. The US must now prepare for a new era of the space age, and master a field in which this nation should have no peer, for space power is the true revolution in military affairs.

The thesis of this article is to show that space is becoming such an indispensable force in warfare that the following three courses of action must be undertaken: first, the services need to embrace the concept of, and prepare for, the inevitable weaponization of space; secondly, the Unified Command Plan (UCP) must recognize space as its own Area of Responsibility (AOR); and finally, because space is a such unique environment, the DoD should establish a distinct space corps within the Air Force.

This paper is prepared in five sections. The first section will serve as a basis for the three recommendations by examining what space power has accomplished for the nation, and more specifically the DoD, in recent history. Using this portion as a foundation, the second, third, and fourth sections will discuss the imminent weaponization of space, the need for a space AOR, and the necessity of a space corps, respectively. The final section will serve as the paper's conclusion.

WHAT HAS SPACE DONE FOR US LATELY?

> From Desert Storm to every use of force since, we have come to know that all military operations depend on space-based capabilities. Space will become even more important in the future. For the needs envisioned in the next decade, our smaller military force will be much more effective because of the space-based information available to it.
>
> – General Richard Meyers, USAF CINCSPACE, 1998. [2]

Desert Storm was arguably the first space war the US fought, and yet space power appeared as an only ancillary to the air war that defeated Hussein's forces with breathtaking rapidity. The term "space war" does not mean our forces were using lasers from above to destroy terrestrial targets, or satellite mines to disrupt enemy communications. Rather, it means space forces were such a vital asset during that crisis that the coalition team would have been hard pressed to defeat Iraq in such a laconic manner. Thanks to space systems, the coalition not only could posture effectively for defense, feint, and maneuver, but could strike more accurately thanks to detailed knowledge of target and launcher locations and weather. Additional improvements in space technology paid further dividends in better logistics because more efficient force operations reduced tonnage demands, and supplies could be delivered to precise locations at exactly the right times.[3]

Space platforms ranging from the Global Positioning System (GPS) to the Defense Meteorological Satellite Program (DMSP) were critical to the outcome of the crisis. Without these high-tech eyes, essential weather forecasting would have been almost non-existent, munitions zeroed in by GPS would not have had their bull's-eye accuracy, and pertinent communications between planning cells in Washington, Tampa, and Riyadh would have been at worst non-existent, and at best painfully slow. In fact, "satellites carried 90 percent of the communications in and out of the Persian Gulf region during the war."[4]

Not only was space power essential to successfully waging Desert Storm's air campaign, ground forces received enormous, although often unrecognized, assistance from space. "The Land Component Commander depended on satellite communications to control the rapid movements of very large and dispersed armor forces comprised of tanks and armored personnel carriers. Defense against ballistic missile attacks became an necessity, and that

defense was thoroughly reliant on space sensors and communications links used for force protection."[5] Without space sensors, coalition forces in rear areas would have been held hostage to SCUD missile attacks, batteries of Patriot air defense missiles notwithstanding.

Even before Desert Storm, the DoD was realizing just how valuable space power was, and not merely as a force multiplier. "During Operation Just Cause in Panama in 1989, tactical applications of space included the first combat use of many widely dispersed single-channel tactical satellites as the only means of secure communications available. Satellites were also used to transmit images of ground targets, while the Army's CONUS-based intelligence production centers transmitted intelligence overlays directly to Panama, portraying targets for use in the commander's preparation of the battlefield."[6]

In 1994, US Space Command supported US Southern Command during the US occupation of Haiti by gathering critical intelligence for deployed forces and providing vital communication nodes, timely intelligence reports, and high resolution maps; all of which would have been unavailable had it not been for space assets.[7] For the 15,000 troops that were expected to occupy Haiti during Operation Restore Democracy, this information was an indispensable asset in restoring peace to the island nation.

More recently, the conflicts in Bosnia, Kosovo, and Serbia were also important venues for space power. Difficult terrain and restricted lines of operations restrained logistical flows. Airpower, again relying on precise targeting via space platforms, was forced to carry a preponderance of the combat as land forces were slow to get to the fight. During operations in Kosovo, the Defense Satellite Communications System, the main provider of data and communication between the CONUS and the theater, used an unprecedented amount of bandwidth – five times the size used in the Gulf War[8] – proving once again the indispensable nature of space.

General Myers highlighted the consequences of space superiority during Kosovo:

> "We brought space to the fight in Kosovo—pushed it to the theater and achieved some monumental firsts. Take the use of the Multiple Source Tactical System on our bombers. This space-enabled system used communication satellites, threat information from space-based sensors and GPS navigation data to provide exceptional situational awareness directly into the cockpit. This included near-real-time position and status of both friendly and adversary forces and upgraded targeting information. The Defense Support Program constellation filled a dramatic role, providing real-time battle management indications to commanders. The

result: faster crisis-response times, reduced lift requirements and fewer friendly forces in harm's way."[9]

In the Balkans, as with other venues of modern conflict, space power became much more than a force enhancer, and as in Iraq, it became a force to be reckoned with.

As evidenced by Operations Just Cause and Desert Storm, Haiti, Bosnia, and Kosovo, and a host of other conflicts, space power is *the* true revolution in military affairs. In the near future, space will become a more important theater of military operations than the air, land, and maritime theaters armed forces are so well-versed in. As the size of our forces have decreased and our world-wide commitments have increased, space forces have filled in the gaps.

It is a well proven axiom throughout military history that the faction who holds the "high ground" has a distinct advantage in the execution of military affairs. Our forces need to recognize, understand, and exploit space as a battle arena – the ultimate high ground of control and domination.

THE INEVITABLE WEAPONIZATION OF SPACE

> Its going to happen. Some people don't want to hear this, and it sure isn't in vogue...but, absolutely, we're going to fight in space.
> – General Joseph W. Ashy, CINCSPACE, 1996. [10]

The evolution of land armies predates history. As nation-states acquired more resources to protect, societies created armies to protect them. Similarly, ancient navies sailed the oceans to protect commerce as piracy was common and often times, state-sponsored. By 1500, it was apparent that European powers would depend on the dominance of the seas for their prosperous future; similarly in 2001, the American experience of power will rest on the domination of space.

Space, like land masses and waterways, is also a finite resource, a view not commonly understood. Similar to the history of airpower, the role of military operations in space has shifted from scientific interest, through intelligence collection and a communication medium, to combat support, and will inevitably shift towards conflict. The "view" space provides, and the capability to instantly pass information around the globe, makes limited satellite orbits much more valuable than others. This will inevitably lead to choke points in space, and as in the case of the sea, this will lead to competition. This competition in turn, will lead to conflict, first with defensive measures to protect satellites, and ultimately with offensive weaponry to deny adversarial use of the same.

There are those who believe space is not militarized as there currently are no weapons in space. Such an argument can be specious. This paper is calling for an acceptance of the idea of space weaponization, not militarization, as space is in fact, already militarized, and has been

since the first DoD messages were transmitted via satellite decades ago. Currently, about 75 percent of satellites have some military application.[11] What is inevitable, is the placement of weapons in space, with some of them aimed at the heart of the US.

Currently, the US does not have a peer competitor in the space arena; however, with the recognition of space as being vital to many nations' well being, that will change. The US needs to consider that our commercial and military satellites, combined with their ground stations, may aggregate the highest value target an adversary could destroy in future conflicts. In the last 20 years, the total number of US satellites in orbit has more than doubled to over 940 (See Figure 1)[12].

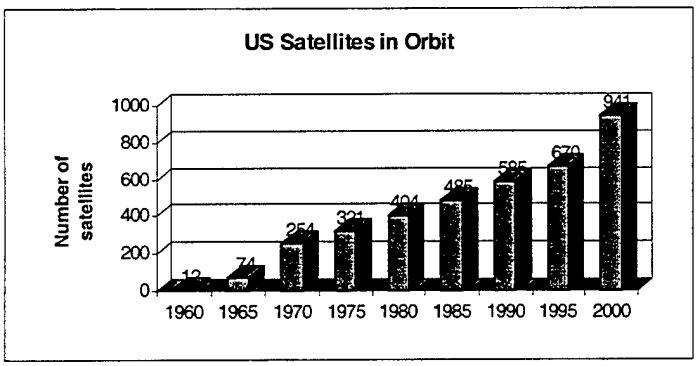

FIGURE 1

World wide, the explosion of space technology has fueled an economic "space rush," the likes of which have not been seen since the gold rush coinciding with the opening of the American frontier. The amount of global funding of space systems has increased fourteen fold in the last 15 years to over $57 billion (See Figure 2).[13] Other nation-states, recognizing the role of space in communications, commerce, and military potential, have obviously contributed to the "explosion" in space. The list of actors in space runs wide.

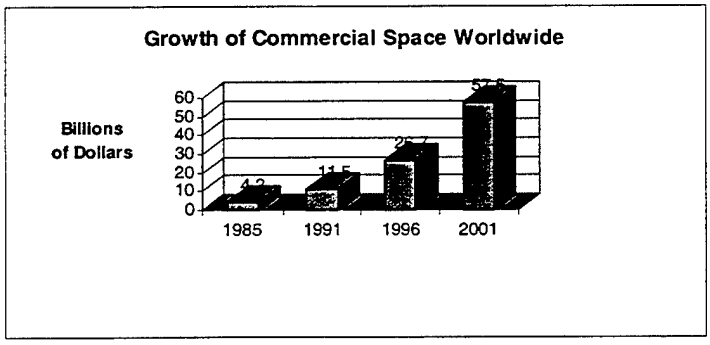

FIGURE 2

European nations are developing space programs at a feverish pace. France has launched more than half the world's commercial satellites over the last 30 years, and continues to reap enormous revenues from its Ariane space lift program, selling lift to nations as diverse as Brazil, Turkey, and Indonesia.[14] Businesses in Germany, England, and Denmark each have hired paid-for-launch companies to deploy telecommunication satellites in orbit just as quickly as they are built.[15]

But perhaps the largest emerging threat to space dominance is found in China. China's successful unmanned test flight of a human-carrying spacecraft in 1999, indicates that China intends to be a major force in space, intending to expand their role with advanced space programs serviceable by space crews in orbit. Many in the US are not taking these advances lightly. Marcia Smith, a respected space analyst for the Congressional Research Service states, "this is more than just a project to make them 'feel good,' rather, some in China view this as a step in the evolution of Chinese military space capability."[16]

Intelligence analysts also believe China is developing technologies to assist Chinese ballistic missile warheads avoid interception by US missile defense systems. Additionally, China is also stepping up its fielding of ICBMs, furthering its threats to the US. The CIA report titled Global Trends 2015 notes "by 2015 China will have deployed tens of missiles with nuclear warheads targeted against the US. It will also have hundreds of shorter-range missiles for use in regional conflicts,"[17] armed with both conventional and nuclear payloads. While not a symmetrical threat to our space systems, these advances in Chinese missile technology do not bode well if our nation falls short in the necessary advances in space.

The CIA's report goes on to say that international "sales of ICBMs or space launch vehicles, which have ICBM capabilities, could further increase the number of countries that will threaten the US with a missile strike or an attack through space."[18]

China may also be in the process of developing advanced anti-satellite weapons. A 1998 Pentagon report says China may have lasers that can blind satellites' optical sensors.[19] Another DoD report found the Chinese are purchasing "frequency jammers, satellite trackers, and high-energy lasers. Further reports indicate China is working on a microwave warhead assembly that can produce an electro-magnetic pulse designed to disable a satellite's electronics, and that China recently conducted a laser test against a satellite's sensors."[20]

The Chinese may also be developing weapons to destroy satellites from earth. A recently declassified DoD report indicates the Chinese may be constructing an earth-based anti-satellite laser for specific use against communication satellites.[21] Some are going so far as to say the

recent outage of cellular phones on the west coast in 1999 may have been the first test of such a laser. [22]

China is not the only nation embracing space weapons. The CIA predicts that by 2015 several nations will have counterspace weapons such as signal jammers, directed energy weapons, and low-powered lasers.[23] Space mines might also prove troublesome. These mines, which are very hard to spot from orbiting satellites and virtually undetectable from the ground, could be devastating. Inexpensive, and launched for the right price, these mines could have damaging effects upon the US by shutting down communications and disabling GPS.

Russia also has a keen interest in anti-satellite (ASAT) weaponry. The first Soviet ASAT test was conducted in 1968, although initial research is believed to have started as early as 1963.[24] Soviet testing has included every conceivable platform ranging from "ramming" satellites launched on modified SS-9 ICBMs, to satellites with destruction packages consisting of advanced optical/infra-red technology designed to blind US satellites.[25]

In light of these dangerous advances, the US military is not doing enough to develop defensive or offensive space-control capability. The authors of New World Vistas: Air and Space Power for the 21st Century complain of a "growing gap" between current DoD policy and the likely course of events beyond the atmosphere.[26] There is empirical evidence that indicates multiple international actors will challenge the US's space superiority. This nation must take proper steps, and finance as necessary, to prepare for the inevitable military challenges that will confront us in space. It is time to clearly articulate a policy of space superiority that does not cower from the use of space weapons to deter conflict, or should deterrence fail, win handily with the same.

WHY SPACE NEEDS AN AOR

> If you're going to have a warfighting mission, and I believe we will, you have to have an *area* in which you're going to fight.
>
> –General Howell M. Estes III, CINCSPACE, 1997.

Of the areas critical to national security, space is undoubtedly the least understood, yet is undoubtedly one of the most important. The satellites that are launched for intelligence gathering, arms control, and navigation, contribute in irreplaceable ways to America's defense. Space power provides our forces with increasingly essential capabilities and will soon be a venue from which wars are fought – yet the Unified Command Plan does not designate a single commander to oversee these operations.

Military history has shown that successful unity of effort is achieved through unified command under a single commander. During World War II, the military services recognized the importance of joint military operations and unity of command; however, attempts to

establish a unified command for the Pacific theater seemed impossible due to service parochialism. In 1946, following the war, the DoD was able to cut through perceived service inequities and established a unified command plan to address the Navy's dissatisfaction with the command and control structure in the Pacific.[27] The UCP has served the military well since its inception, and has been modified numerous times since, not always without growing pains, but always for the betterment of the Armed Forces. Now is the time to modify the UCP to create an AOR for space.

Recognizing the importance of military space missions, then-President Reagan approved a space policy in 1989 that affirmed US goals in space.[28] This policy clarified what the US hoped to achieve in space, both militarily, and commercially.[29] This policy, now undertaken by the National Space Council, provides a broad framework to guide future space activities. Today, defense planners get high-level guidance from the National Space Policy document. The most recent version, dated 1998, directs the DoD to perform four basic missions in support of national space interests.[30] Those missions are: space support, meaning those activities related to launching and operating satellites; space control, or maintaining access to space; force enhancement, which means supporting forces with intelligence, weather, and missile warning information; and force application, the most controversial mission, means engaging adversaries from space. Soon, being able to engage enemy targets from space will be vital to national defense. Whether these targets are inbound warheads fired from rogue states, or terrestrial targets unobtainable from ground-based forces, space weaponry is a sure thing.[31]

USSPACECOM's vision statement makes this assertion; "space represents a new and better way to apply military force – by promptly striking an adversary's center of gravity, or bypassing high-risk conflicts. We may need to incorporate space-based systems to support our efforts to defeat ballistic and cruise missiles that threaten our homeland if we cannot rely exclusively on terrestrial systems."[32]

The pending mission of force application in, and through, space will not necessarily happen with lasers or kinetic weaponry. One of the most recent changes to the UCP has been the transfer of the computer network defense (CND) and computer network attack missions (CNA) to USSPACECOM.[33] "This change to the UCP was designed to solve a problem that occurred in the 1997 Eligible Receiver exercise, an element of which was an attack [via satellite] on the defense computer network. In the simulation, the JCS was forced to take charge [of the attack] by default, which it could not legally do in actual conflict, because such an attack was not covered by any of the regional combatant commanders, in which the nation's powers to fight are vested by law."[34]

These responsibilities of CND and CNA further define USSPACECOM as a warfighting command, charged with the obligation of handling information as a weapon. The role of information in society has grown so much that military doctrine is now adding information as a fourth lever of national power adjoining it to the standing tenants of political, economic, and military influences. The addition of the CNA mission to USSPACECOM's tool kit confirms the CINC is truly in charge of a combatant command, albeit currently one with no AOR. Now, in addition to its long-standing role of enhancing force application across the spectrum of warfare, USSPACECOM can also apply force through high-speed data cables and modem ports. It may be years before the military capability exists to employ lasers from space, but it is inescapable that space will become increasingly important to the projection of power by the virulent use of information.

Just as space has matured into an essential venue for military operations, it is inevitable that space will become a future battle ground due to increased competition for limited satellite orbits, emerging centers of gravity, and the ability of adversaries to strike terrestrial targets from space. In light of this, USSPACECOM has assigned warfighting missions, but unlike other regional CINCs, it has no AOR in which to carry out these missions – this must change.

Today our forces rely on space systems to provide real-time intelligence and communication relays in such places like Bosnia, Kosovo, and the Middle East. Sending a brigade to one of the world's hot spots today without space systems like SATCOM and GPS is akin to sending forces into harm's way 25 years ago without radios and compasses.

Soon, technology will allow the US and our adversaries to accurately mark and destroy targets on Earth from space without sending a single soldier into harm's way. Establishing an AOR, controlled by CINCSPACE, for these finite orbits and future conflicts, will create more effective space operations as our multi-service space forces continue to mature as a warfighting team.

Due to the increased role of space in military operations, USSPACECOM's responsibilities have recently increased to match those of a regional CINC. Services organize, train, and equip forces, who are provided to a warfighting CINC, who in turn use these forces to conduct warfighting missions in their respective AOR. The UCP clearly defines the AORs where each regional CINC has the authority over these forces – all except USSPACECOM. It is only a matter of time before the area above where routine manned flight takes place, now controlled by no one, becomes mired in conflict. A space AOR aligns the necessary authority to a CINC with appropriate warfigthing forces. Space will no longer be an area from which combat is supported, but rather an area from which combat is *conducted.*

Under the existing UCP, USSPACECOM is in the unenviable position of preparing for threats that top-level policy makers would rather not debate. Until recently, these threats have not been discussed simply because the US has not been faced with such threats in the past, but they are coming. The current UCP assigns CINCSPACE the responsibility of launching military satellites and operating them, and providing space support to unified and theater commanders.[35] However, as previously mentioned, USSPACECOM has two other missions, space control and force application, also assigned by the UCP, though there has not been a need to exercise these two missions – yet.

Space, as a military mission, is still in many ways undefined. But as proven by empirical data supporting the relevance of space in tomorrow's conflicts, there is little doubt that it is becoming an increasingly essential operating area.[36] Until recently, space was not considered a vital region for the US. Now, with the hundreds of US satellites in orbit, costing the Air Force alone over $7 billion a year[37], space now makes up a center of gravity that an adversary will likely seek to minimize in future conflicts. This threat, joined with the ever-growing web of dependence on such systems for civil and military operations, suggest that now is the time to establish a space AOR, with a single military focal point for all space assets, to properly support vital national interests.[38] A space AOR will move USSPACECOM from being a supporting CINC, to one that is fully vested in preparing for conflict above the atmosphere.

WHY SPACE NEEDS A SPACE CORPS

> In 1919, Robert Goddard, known as the father of rocketry, published "A Method of Attaining Extreme Altitude" while studying for his doctorate. The article laid many foundations for rocket development, and mentioned that a rocket could, in theory, be flown to the moon. He was dismissed as a "crackpot."[39]

The concept of a separate space corps is seen by many in a similar light in which Goddard's concepts were proposed – heresy. The growth of space technology, computers, and the innovative use of satellites, have created new roles for space, but one element is missing – the vision, passion, and outright enthusiasm to further develop space to its fullest potential.[40]

From a national perspective, the US must overcome significant political and legal hurdles to make the shift toward military operations in space. Those operations are coming, but not without a fair deal of resistance. Perhaps the largest impediment may be the inability of the armed services to understand that the traditional means of employing air power are rapidly becoming obsolete. And therein lies perhaps the largest argument for the establishment of a separate space corps. Just as proponents of the Army's Air Corps knew that the merits of airpower could only be properly espoused and employed by airmen, it will take a collection of

uniquely trained space operators to correctly employ space assets.

What is missing from the Air Force's equation is how space should be brought to the fight, as the service still relegates space power to a supporting role. The Air Force space budget is dedicated almost entirely to the maintenance of information systems and to the means of increasing the effectiveness of terrestrial forces. Even the Space Warfare Center and Space Battle Lab are focused on how to use space systems to put information in the cockpit in order to more accurately drop bombs from aircraft.[41] This certainly is not befitting a service who tries to understand the future of space in conflict.

Airpower has become almost routine, and its attributes are well understood by a dedicated group of professionals who are well versed in its employment. As Lieutenant General Kelly stated:

> "We're familiar with airways; we fly them all the time. We feel safe in them. They are controlled and deconflicted. But who's working the space ways, who's in charge of operations? It's insufficient to know what is in orbit and where orbiting objects are. If there is an increase in orbital objects in the future, and there most assuredly will be, some entity must be responsible for this. Thus, just as airways arose to handle increased traffic, space ways are overdue."[42]

Currently, the Air Force holds the preponderance of responsibility in executing the use of space. The Air Force provides 90 percent of the people and dollars for all US space defense activities.[43] However, the venue of space is rapidly becoming such a unique operating environment, that aviators (who currently populate key leadership roles in USSPACECOM), may be unable to think outside the aviation boxes they were raised in, and create a space vision that is needed. What is needed is a separate space corps, aligned to the Air Force much in the same way the Marine Corps is to the Navy.

The strategic context in which many existing space systems were first developed, acquired and justified, have been supplanted with an evolving and dynamic international landscape that poses new challenges for the military. Consequently, space forces must now compete with other systems in a declining budgetary and force structure environment, and it is not certain that a clear understanding of the attributes of space assets exist amongst key decision makers in the military.[44]

Even though the Air Force's space budget has remained stable, while other budget lines have declined, there still are instances where funding for emerging space technology is deprived to supplement existing platforms. For instance, after allocating capital for science and

technology expenditures in space research, DoD officials have taken funds back and earmarked it for turbine engine technology,[45] in essence robbing a new Peter to pay for and old Paul. A few high-level policy makers are going farther and saying its becoming painfully obvious that the Air Force is dragging its heels on the advancement of space power. Senator Bob Smith (R-N.H.), one of the more vocal proponents of a military space posture, told a Washington space symposium that the Air Force only sees space as "supporting non-space forms of power projection," and that funding for space programs have been paltry.[46] Senator Smith went on to say that "if the Air Force won't embrace space power, then Congress will have to drag them there kicking and screaming."[47]

The Air Force has always been, and always will be, a pilot dominated culture. The scarf and goggles mentality dies hard, and satellite and missile driving are rarely fast track careers. The space career field is led by a assemblage of generals of which none are career space officers. Of the 11 Air Force general officers in AF Space Command, five are pilots, five are missileers, and one has a command-and-control background.[48] To put this into perspective, one can only imagine how many general officers at Air Combat Command are *not* pilots.

Most of what the Air Force does in space supports the other services; as would be expected from aviators when it comes to the employment of space power. Yet, this supporting role is what fails to posture the space arena for future tactics and doctrine. This does not bode well for a service who will one day be expected to fight and win our nation's wars in space. A separate and distinct corps of individuals, raised, trained, and educated in the space environment, is what is needed to properly implement space into the defense architecture.

Satellite technology is advancing more rapidly than any technology supporting fixed-wing aircraft. The venerable GPS is already on its third iteration, and a request for proposals is being readied for release this year to provide GPS follow-on satellites beyond 2001. Missile launch detection capabilities are making enormous technological strides. The Space Based Infra-red System will soon replace the aging Defense Support Program, and Milstar communication satellites are being replaced by an advanced system that dramatically expands bandwidth capacity.

Space forces are fundamental to modern military operations and play a central role in the evolution of warfare because of their matchless capabilities. In particular, space systems provide forces that are increasingly important for sustaining an effective level of US defense capability as force structures are downsized.[49]

But what is missing is a cadre of individuals dedicated to taking space into the new millennium, much in the way Trenchard, Mitchell, and Eaker brought airpower out from under

the silhouette of land warriors. Today, military doctrine for the use of existing and emerging space systems is at the same stage that aviation strategies and tactics were at the beginning of World War I. This means that space is primarily a medium for scouts and messengers, not warfighters.[50] The US military, and the Air Force in particular, are not doing enough to develop defensive space-control capability, to include the formation of a space corps.

Perhaps Senator Smith best articulates the need for a space corps when he says:

> "a space force would put the same bureaucratic muscle behind space missions that the Army, Navy, and Air Force currently flex in theirs. [This] would allow spacepower to compete for funding within the defense budget, lessening the unfair pressure on the Air Force to make cost trade-offs, and protecting spacepower initiatives from being raided by more well-established programs. A separate service would create an incentive or people to develop new skills to operate in space and a promotion pathway to retain those people."[51]

Senator Smith goes on to say that a space force may presently be too dramatic a step, but a space corps would be sufficient, used as a step in developing a fully independent space force.

Future warfighting will be joint, and space will be critical to successful conclusions. The effective use of space requires a space-knowledgeable cadre of motivated personnel. During the next century, military operations to defeat an enemy's exploitation of space will become one of the highest priorities in warfare. In the future, space forces will be able to change the course of events on Earth in hours, perhaps even seconds,[52] much the way the airplane did during is combat premier. Being able to do so will require a high level of understanding space forces, to include the development of professionals unencumbered by service rivalries or depleted budgets.

The time is right for a space corps.

CONCLUSION

A revolution in military affairs above the atmosphere is upon us. The future of the US lies in space. Former USCINCSPACE General Estes called space a rapidly emerging center of gravity, "equal in importance to oil in the Persian Gulf, if not more so."[53] In ancient times military leaders learned the advantage of sending scouts forward of advancing troops and taking the high ground. Space is the new high ground – the true revolution in military affairs.

A program to ensure space supremacy in the next conflict must begin in peacetime with proper diplomacy, funding for advanced technology, and the recognition that space is more

than a venue of data transmission and intelligence gathering.

Many people, both civilian and military alike, simply are not cognizant of the role space plays in our modern society. Every day business, from cellular phones to international commerce, are dependent upon space assets. In 1998, over 40 million pagers lost service, ATM and credit card machines failed, news bureaus could not transmit, and many areas lost television service – all because of the loss of *one* satellite.[54] Now consider that by 2010, over 3,000 satellites will orbit the earth, almost four times more than today, and the global economy will contribute about a half of a trillion dollars of investment to accomplish this feat.[55]

Today, the US is the world's preeminent space power, the leader in this once-exclusive club. But unless we recognize space as the true revolution in military affairs, this advantage will disappear and may even be used against us. The space age has been with us now for some time, but a vision for the employment of space as a vested national interest is lacking. We need a vision for space to exploit our mastery of the technological advances made in the last two decades. A vision for space is needed to recognize the pending placement of weapons in space. A vision for space is needed to create an AOR for a CINC who will inevitably be a supported CINC in future warfare. And a vision for space is needed that recognizes the unique attributes of space that needs leaders well-versed in this critical arena, unencumbered by service inequities or competition for resources.

A vision for space is needed to keep the US ahead of any competitor who may challenge us. If the US does not take the lead in space others will. Clearly, it is vital to defend US interests in space, and it would be advantageous to deny the use of space to adversaries during times of conflict, much as we deny the use of airpower by achieving air superiority during the opening chapters of conflict.

The civilian and military leadership within the DoD can ignore this rapid transition, or they can embrace it by developing a long-term strategy that recognizes the importance of space in future conflicts and as one of our nation's vital interests. By charting the proper course in space, there is no reason why this nation, the world's first space power, cannot remain the leader in space, where the revolution in military affairs is quickly unfolding.

(Word Count: 5,958)

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