

# **Why Space Should Be a Separate Service**

**Norman W. Barber, Major, USAF**  
**Richard J. Douglass, Major, USAF**  
**John D. DuMond, Major, USA**

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## Biographies

Major Norman W. Barber, U.S. Air Force, an Air Battle Manager, is currently serving as the Air Operations Officer for the Air Force Mission, United States Embassy, Bogotá, Colombia. Major Barber entered the Air Force in 1987 and has served extensively in the Pacific region as well as South and Central America. He has also served one- and three-year tours respectively with the U.S. Marine Corps as a student at the Command and Control Systems School, Quantico, Virginia, and with the U.S. Navy as the PACAF Liaison to Amphibious Group 3, San Diego, California. His military education includes U.S. Air Force Squadron Officer's School, Air Operations Staff Officers Course, Air Command and Staff College, and Defense Language Institute. He holds a BS in Petroleum Geology from Wichita State University, Kansas, and an MA in Information Systems from Webster University, St. Louis, Missouri.

Major Richard J. Douglas, U.S. Air Force, is an F-16C Instructor Pilot and Mission Commander on his way to the J-5 Plans at NORAD, Peterson AFB, Colorado. Major Douglass entered the Air Force in 1990 and has served at duty locations worldwide. His operational experience includes assignments culminating with appointment as Chief of Weapons and Tactics, 63<sup>rd</sup> Fighter Squadron, Luke AFB, Arizona. His education includes completion of U.S. Army Airborne School, U.S. Army Air Assault School, U.S. Air Force Squadron Officer's School, U.S. Air Force Safety School, Joint Employment Tactics School, Electronic Combat Pilots School, and Air Command and Staff College. He holds a BA in English Literature from UCLA, California, an MA in English Literature from Midwestern State University, Texas, and an MA in Military Occupational Art from Air University, Montgomery, Alabama. Major Douglass is presently a PhD candidate in English Literature at the University of Colorado, Boulder.

Major John D. DuMond is a U.S. Army Foreign Area Officer serving as a policy staff officer at Supreme Headquarters Allied Powers Europe (SHAPE), Belgium. Major DuMond entered the Army as a Field Artillery Officer in 1989, and has since served in a number of duty positions and locations in the United States and Europe. His operational experience includes command of Headquarters and Headquarters Battery, 2<sup>nd</sup> Battalion 3<sup>rd</sup> Field Artillery Regiment, in Bosnia-Herzegovina, as part of Operation JOINT ENDEAVOR. His military education includes completion of the Field Artillery Officer's Basic and Advance Courses, the Combined Arms and Services Staff School, the Defense Language Institute, the Czech Army's Brno Military Academy, and the Command and General Staff College. He holds a BA in Political Science from Colorado State University, and an MA in International Security from the University of Denver's Graduate School of International Studies.

## **INTRODUCTION**

Technological change has continually transformed the way mankind fights its wars. Bronze and steel brought the defeat of barbarians and the ascendance of Greece and Rome. The stirrup allowed the development of the mounted knight, who was in turn brought down by the development of the English longbow. Gunpowder came next, forever changing the battlefield, and the dramatic alterations brought along with the tank, and then the airplane, further matured it. Nuclear weapons and terrorism are the latest technological transformations. Next is the weaponization of space, which will likewise have a dramatic effect on the defining principles of warfare. In parallel to the argument for the separation of the Air Force from the Army in the early 1900s, the debate over a separate Space Service has come to the forefront of military discussion. Space Vision 2020 is clear: “During the early portion of the 21<sup>st</sup> century, space power will evolve into a separate and equal medium of warfare.”<sup>1</sup> Key doctrinal, technological, and organizational reforms indicate the United States needs to establish a separate Space Service in order to completely and economically introduce space-generated effects into the joint fight.

## **DOCTRINE**

Space needs to be its own separate Service because it is fundamentally different from the existing Services. Joint Doctrine for Space Operations states:

Space has several unique characteristics that differentiate it from the other services. Accepted international conventions do not extend a nation’s geographical boundaries into Earth orbit. Therefore, nations enjoy unimpeded satellite overflight of other nations through space. Spacecraft movement is not significantly impeded by any of Earth’s surface features such as terrain, but instead is governed by orbital mechanics.... The space environment affects the performance of both terrestrial and space systems...[and] the difficulty in gaining access to [space] presents unique planning and operational considerations that affect both friendly, adversary and neutral space forces alike.<sup>2</sup>

These differences are so fundamental that it would be difficult at best for a terrestrial commander to employ space assets efficiently. To “think out of the box,” a commander needs to know what the box (and the physical laws governing its use) looks like. The fabric of space is not the only significant difference between it and the environments of the present Services.

The lumping of air and space into one medium of warfare is not supportable; subsequently, space should be separated from the other Services as the Air Force was from the Army in 1947. U.S. Air Force leadership first used the term “aerospace” to indicate a seamless air and space medium: That is not accurate. Many experts believe that the lowest altitude at which a satellite can maintain an orbit defines the lower limit of “space.” The highest limit of “air” is the highest altitude that aircraft use lift to maintain flight.<sup>3</sup> One is left wondering how to define the area between these two limits and the resultant seam between them. In addition, airpower is subject to the laws of gravity and fluid mechanics while space assets are subject to the laws of orbital mechanics. Just as land warfare differs significantly from sea warfare due to their different environments, the operating environments of air and space are similarly diverse. Seamlessness between air and space does not exist, and the main similarity between them is that both are not constrained to the surface of the earth.

Space requires a Space Service professional to globally prioritize assets. The Army, Navy, and Air Force are geographically oriented to the specific combatant command theaters established by the *Unified Command Plan*. Space, on the other hand, has a global focus. The different combatant commands compete for scarce space power enhancement effects. Subsequently, the requirements for space’s low-density, high-demand (LD/HD) assets need to be organized by someone with objectivity and global situational awareness (SA). This concept

directly parallels the argument that airpower needs to be controlled by an airman and applied with a theater perspective in order to properly apportion airpower effects.

With the establishment of a separate Space Service, the joint task force of the future should include a Space Force Component Commander in addition to the joint land, maritime, and air component commanders. That would give the JTF commander a single source for space effects requirements and support the notion that space assets are being used in a manner that maximizes their potential and supports unity of effort.

Space, Information Warfare, and USSTRATCOM all share a global orientation and, subsequently, should be combined under the separate Space Service. Space and USSTRATCOM assets share the same operating medium, and USSTRATCOM missions obviously have global effects. In fact, the merger between USSTRATCOM and USSPACECOM is already under way and should have been a fait accompli by 1 October 2002. The globalization of satellite communication for information transfer has in turn permanently linked Information Warfare to space systems. In addition, Information Warfare, like its LD/HD space sister, has competing requests from numerous combatant commands for global support. Priority with a global perspective would be an integral, cultural characteristic of a separate Space Service.

A separate Space Service is also needed to oversee and develop the Force Application mission area of space, as it generally takes the United States 10 to 20 years to field a new space system. While “the role of space in attacking an enemy’s ability to make war is not yet fully developed,”<sup>4</sup> the technology is available. Accordingly, it is time now to establish a separate Space Service. A separate Space Service would throw off its sister services’ strict relegation of effects to Space Enhancement. Unfortunately, Space Enhancement is a “capabilities-based” concept and violates the present emphasis on effects-based operations. Force Application is

important, because as “space systems become more lucrative targets there will be a critical need to control the space medium to ensure US dominance on the battlefield.”<sup>5</sup> The effect of Information Superiority requires Space Control. Information Superiority—a pre-requisite for Joint Vision 2020’s “Full Spectrum Dominance”—also needs its own unfettered R&D that focuses on achieving its effects rather than simply enhancing the effects of the present Services.

A separate Space Service would also evenly balance the concerns of each of its terrestrial, sister services. The U.S. Air Force, with its appointed responsibility for space, owns a preponderance of the space budget and subsequently focuses on Air Force enhancement. For example, the FY02 budget allocates \$87.3 million to USSPACECOM, \$101.4 million to Naval Space Command, \$59.0 million to Army Space Command and \$8.0 billion to Air Force Space Command.<sup>6</sup> It seems the budget is quite lop-sided in the Air Force’s favor, and “no amount of directive authority-budgetary or otherwise-will overcome the capacity of Service staffs to commit mischief should that be their bent.”<sup>7</sup> The DOD itself has seemingly shorted space development as well when one considers that space accounts for less than \$9 billion of the \$310 billion DOD budget. A Space Service would be able to compete for funding and objectively budget for systems that would evenly represent space effects required by the joint forces. It would also be able to force the sister Services to link their space-supported assets to one interoperable system. The budget would emphasize space potential and serve to establish a more economical way to do business.

Space Superiority, “an essential element of battlefield success and future warfare,” begs for the eventual weaponization of space.<sup>8</sup> Once space is weaponized, it will become a decisive force and thereby establish the equality of Space with the Army, Navy, and Air Force. Moreover, Force Application will have dramatic effects on major theater conflict. Imagine space-based

lasers wiping out massed troop formations, tanks, ships or aircraft. Has the Air Force been dragging its feet on developing weapons for space because of its Icarus Syndrome? The answer is clear: Space Force Application does not make the sister Services irrelevant. As present military conflicts get smaller and targets are more widely dispersed in the differing forms of MOOTW, the sister Services will always be required to handle small conflicts.

A separate Space Service will also be necessary as the U.S. responsibilities in space morph into policing roles. Space Vision 2020 states the “US may evolve into the guardian of space commerce—similar to the historical example of navies protecting sea commerce.”<sup>9</sup> The United States is the only nation that has the economic power to support development of space-based Force Application platforms, and U.S. superpower influence will eventually grow to include the Space Control medium. A separate Space Service would manage and prioritize U.S. involvement in space with qualified professionals and appropriate resources.

A separate Space Service would make possible the development of numerous senior officers and would offer equivalent career opportunities for space professional advancement. To develop the art needed for its proper realization will require space professionals. As presented previously, one can’t “think out of the box” if one doesn’t know what the box looks like. Space professionals, in the present system, are career isolated in their Services and must branch out to other fields to progress and get promoted. For example, until the most recent UCP of 2002, the USSPACECOM commander (the four-star space position) has been triple-hatted, acting also as the Air Force Space Command and NORAD commander. Unfortunately the link to NORAD mandated a fighter pilot for this position in order to supervise the air inceptor mission of air defense. Now for the first time Air Force Space Command is separated from NORAD, and a space officer can now rise to the O-10 level.

The necessary assets for a separate Space Service are available today. The DOD could quickly and efficiently establish a separate Space Service by staffing it with the present USSPACECOM, USSTRATCOM, Air Force, Navy, and Army Space Command personnel and budget. It seems reasonable that NASA should also be integrated into the Space Service in a manner similar to the way the Coast Guard and Marine Corps are part of the Department of Transportation and the Navy respectively. A separate Space Service would be responsible for supporting and defending national military objectives and civilian assets just as the Navy and Coast Guard operate today in their maritime medium. Space Force Application will develop economically, Enhancement for the entire joint force will increase, Space Lift will finally be supported by an economical platform, and a staff, led by foundationally solid leadership, will provide the vision for the Space Service of the future.

## **TECHNOLOGIES AND APPLICATIONS**

Today, USSPACECOM is responsible for development of space capabilities. A separate Space Service, taking the lead in all future enhancements to space-based enabling technologies and applications, should control that responsibility. Space related hardware generally falls into two broad categories. The first is systems dedicated to Space Control and the other is systems used in Space Support.

According to General Ralph E. Eberhardt, commander of USSPACECOM, “Space control involves ensuring the United States’ use of space while denying its use to the enemy.”<sup>10</sup> From his perspective, the growing reliance of the military, intelligence agencies, and commercial interests on space-based systems makes it imperative that the United States place more emphasis and resources on ensuring positive control of space. A separate Space Service would enjoy

organizational parity with the other Services, thereby ensuring that it received the attention and funding it deserves.

The 1967 Outer Space Treaty is an important influence on the types of systems a separate Space Service could deploy. That agreement prohibits the deployment of space-based weapons of mass destruction, be they nuclear, biological or chemical. However, it does not restrict the use of conventional weapons.<sup>11</sup> In compliance with the treaty provisions, the United States is developing antisatellite systems using either kinetic energy (KE-ASAT), or directed energy.<sup>12</sup> KE-ASAT capability relies on a “killer satellite” that maneuvers to hit a target satellite, or detonates itself in the path of a satellite, destroying the target as it flies through the resultant debris field. A directed energy antisatellite system, using laser or microwave energy, could be deployed aboard a satellite, an aircraft, or ground station. Such a weapon would render target satellites inoperative by damaging critical command, communication, or navigation components. Whether kinetic or directed energy, such Force Application weapons would play an important role in Space Control by negating an adversary’s use of space systems.

A separate Space Service also is needed to develop other negation assets. Other ways to accomplish negation are to jam the signal links between satellites and their ground stations, or to “spoof” the satellites, causing them to transmit erroneous information. Yet another method is to employ a laser dazzler to temporarily blind a satellite. The United States is currently working to develop these capabilities through both space- and ground-based systems.<sup>13</sup> While negation is an important element of space control as it relates to enemy systems, protection is an equally important function for U.S. systems.

A separate Space Service will need to develop and deploy advanced military communication satellites with the necessary “bandwidth, protection, survivability, and

interoperability” to support future joint warfighting.<sup>14</sup> Much of the U.S. military’s space-based communications is carried over commercial systems as the need for greater bandwidth has far outpaced the military’s ability to fund and deploy its own systems to meet capacity requirements.<sup>15</sup> The complicating element is that the military as one customer among many, lacks both the funding and the authority to ensure that its commercial providers incorporate defensive measures into the design and deployment of their satellite systems. The lack of civilian asset self-protection is forecast to continue and will remain a key vulnerability for U.S. forces. Presently MILSTAR is the only communication satellite that has shielding against electromagnetic pulses and other space environment threats.

A separate Space Service could better develop countermeasures to the growing availability and low cost of jamming technologies. Developments in miniaturization are enabling the creation of micro- and nano-satellites capable of “bird-dogging,” disrupting or destroying U.S. space systems. Because they are so small, such satellites are very difficult to detect and defeat.<sup>16</sup> In a similar fashion, miniaturization has enabled the development of low-cost Global Positioning System (GPS) jammers that could seriously impair the capabilities of U.S. forces that rely on GPS for navigation and weapons delivery.<sup>17</sup>

A separate Space Service is also needed to coordinate and deconflict the growing and diverse requirements of the GPS contribution to the Force Enhancement mission. Worldwide navigation and timing is currently provided by a constellation of 24 GPS satellites. That system gives U.S. military forces precision navigation and weapon system guidance capability with a reliable accuracy of less than 15 meters. The next generation of GPS will deliver 30-centimeter position resolution, decreased vulnerability to jamming, and timing signals of 1-nanosecond accuracy.<sup>18</sup> Today, commercial off-the-shelf GPS receivers are inexpensive and widely available

to anyone. Thus military planners are acutely aware that GPS capabilities may not only enable U.S. forces, but also greatly benefit an adversary. The next generation GPS will partially solve that dilemma by offering service blackout areas, thereby denying an adversary the use of GPS in targeted regions during critical times.<sup>19</sup>

The complexity and scope of maintaining “global” SA also points to a separate Space Service to support the geographic sister services. The ISR functions currently provided by space-based systems enable the United States to quickly and accurately identify activities that pose strategic threats to national interests as well as operational and tactical forces. These include such things as the deployment of offensive ballistic missiles, the movement of air or land forces in a crisis area, or the construction of a terrorist training camp. Simply put, the goal of exploiting space-based ISR systems is to maintain a constant “global” situational awareness of militarily significant events.<sup>20</sup>

Plans to employ a number of innovative space systems in the future require a separate Space Service to integrate targeting priorities with a global perspective. U.S. planners are also working on a distributed surveillance satellite constellation carrying weather, radar, optical, and hyperspectral sensors. A key element of such enhanced surveillance capability may involve space-based synthetic aperture radars (SAR). Planners foresee deploying a small constellation of SAR satellites in low earth orbit with an imaging capability refined to 1-centimeter resolution.<sup>21</sup> The development of Force Application assets like the “micro-munitions” using “coordinate targeting”<sup>22</sup> would give the United States a truly revolutionary over-the-horizon weapon system. These barely detectable weapons would combine the precision navigation capability of the next generation GPS with the superhigh-resolution imagery of a space-based SAR system. Thus instead of relying on a 2,000-pound bomb to eliminate an adversary’s command and control

center, the United States could launch a baseball-sized munition to destroy its antenna array, achieving the same effect at a fraction of the cost.

Another reason for a separate Space Service is the need to develop the piloted single-stage-to-orbit space-plane that has consistently been placed on the back burner by the Air Force. The space-plane would support Space Control, Space Support, and the Force Application missions. The key factor in the deployment of both Space Control and Space Support systems is the enormous cost of putting satellites into orbit. The United States relies primarily on expensive single-use rockets to fulfill that task and developed the Space Shuttle program as an economical, reusable space lift capability. Unfortunately, the savings promised by the shuttle program were never realized. The space-plane would fulfill the original goal of the space shuttle program by providing a more cost effective way to deliver space systems into orbit. Force Application and the goals of Rapid Decisive Operations would also benefit from a space-plane and its ability to project small, lethal “strike teams” to crisis areas anywhere in the world, in hours rather than days. Overall, the space-plane contributions are a logical and necessary addition, which only a separate Space Service could guide to maturity.

For all the advances the United States has realized in the development of space-based technologies, many experts are coming to realize that the continued management of space control and space support is outside the ability of the U.S. military’s current organizational structure. Furthermore, to maintain dominance in space, the United States must anticipate future threats and exploit the capabilities of commercial industries. Only a separate Space Service can adequately perform that critical function while harnessing new technologies and the revolutionary capabilities they offer.

## **STRUCTURE AND ORGANIZATION OF U.S. SPACE AGENCIES**

U.S. space agencies were conceived in the aftermath of World War II as U.S. Air Force and civilian researchers were tasked to research and develop nuclear weapons delivery systems incorporating rocket technology acquired from Germany. The Air Force also wanted to explore the application of rocket technology for powering aircraft. Those two applications were mutually complementary, and the first mission for the exploitation of space was given to the Air Force. Recently, the Air Force was given the formalized responsibility to organize, train and equip for air and space operations, and subsequently is the lead agency for military space operations. The second major U.S. space agency is the National Aeronautical and Space Administration (NASA), which was first conceived by the Eisenhower Administration in 1957. No one is certain of the rationale behind Eisenhower's decision to create another government bureaucracy, but some have postulated that he believed the military Services would use space to further their own agendas.<sup>23</sup> In addition, the Air Force was still in its infancy, having been created only ten years earlier, and it is believed that Eisenhower did not fully embrace the creation of the U.S. Air Force separate from the U.S. Army.<sup>24</sup> Congress funded NASA in 1958 for the purpose of leading the U.S. space race with the Soviet Union. The third major space agency is the National Reconnaissance Office (NRO), recently declassified, but little information has been released about how it has affected space operations. Its budgets are classified, and currently the NRO is deeply involved with the military, receiving substantial manpower and funding augmentation from the Air Force.

These space organizations will soon be changing due to the report of the Space Commission chaired by the current Secretary of Defense, Donald Rumsfeld. The report was released in early 2001, two weeks before Rumsfeld's appointment as Secretary of Defense. The

commission looked closely at U.S. security strategy that has become increasingly more dependent on space operations. It recommended placing a higher priority on space capabilities and suggested that the National Security Council create a focal point for space.<sup>25</sup> The report includes recommendations to foster “greater cooperation” between the military and intelligence communities. It also recommends the creation of an Under Secretary of Defense (USD) for space, intelligence and information. The USD Space would be a Pentagon official and would be the advocate for funding research and space systems development.

The commission report also pointed out that the current military components do not foster a space-oriented culture and look at space only as a means to enhance their own component’s inherent combat power. The commission recommended ending the appointment of general officers to key space leadership positions with very little or no previous space experience.<sup>26</sup> That practice is detrimental to cultivating a space-oriented culture because the establishment of a core group from which to grow military space professionals is vital. They would have a positive impact on space doctrine, systems development and space operations by building cultural and organizational foundations of a Space Service dedicated to Space Power.

Some of the findings of the commission have already been taken for action. The Air Force was formally assigned responsibility as the executive agency for military space programs and is now required to submit a Joint Space Program Plan to the office of the Secretary of Defense. In addition, Secretary Rumsfeld announced on 26 June 2002 that USSPACECOM and USSTRATCOM will merge. That is the first step of the initiative to transform space operations into a more streamlined organization. The merger should have taken effect on 1 October 2002. The new command is responsible for military space operations, control of the nation’s nuclear forces, computer network operations, strategic warning and global planning missions. The

command will improve warfighting capabilities and accelerate information collection. Secretary Rumsfeld said, “The missions of Space-Com and Strat-Comm have evolved to a point where merging the two into a single entity will eliminate redundancies in the command structure and streamline the decision making process.”<sup>27</sup> Since space is the newest exploitable environment, organizations are in a constant state of evolution.

Another proposal to restructure U.S. space organizations is to create a Major Force Program (MFP) similar to the one that created USSOCCOM in the 1980s. Former Secretary of the Air Force Whitten Peters is against the establishment of a new space force in this manner. He argues that current bureaucracies are adequate, the military space programs need a higher funding prioritization, and “Establishing a new force...would be far from cost-free. Creation of a new headquarters operation would be expensive.”<sup>28</sup> According to former Secretary Peters, “Space operations, under at present conditions, do not warrant this type of action.” His view contrasts with the opinion of former Air Force Chief of Staff and space commission panelist General Ronald Fogelman. General Fogelman sees striking parallels between the Army’s reluctance in the 1920s to recognize the uniqueness of airpower as a distinct medium of warfare and the actions of today’s Air Force with respect to space power. He believes the successful MFP that established USSOCCOM should be used as a template to establish a space force.<sup>29</sup> Establishing a separate Space Service would provide space operation the visibility it needs for the “higher funding priority” recommended by former Secretary Peters. In addition, the other Services could concentrate on their core competencies and would no longer be accused of Service parochialism if a separate space Service were established.

## CONCLUSION

Congressman Dan Daniel's comments with regard to creating a Special Operations Service echo the call to create a separate Space Service. He notes, "At one time or another, the tank, the airplane and many other ways of war were viewed with skepticism and distaste before they were absorbed into the military's philosophical core."<sup>30</sup> Space-based weapons are meeting these same challenges today, but the precedent of the Air Force's secession from the Army should facilitate a Space Service's establishment. Doctrinal, technological and organizational issues call for space's equality with the sister Services in order to support the military instrument of power. One can only hope the nation's leadership will overcome Service rivalry and do what is required to exploit space force effects globally in the most economic manner. Overall, Space Vision 2020 makes it clear: "During the early portion of the 21<sup>st</sup> Century, space power will also evolve into a separate and equal medium of warfare." The question is now left in the leadership's hands to decide when the separate Space Service will begin.

## ENDNOTES

- <sup>1</sup> United States Space Command, "Space Vision for 2020," p.4.
- <sup>2</sup> Joint Pub 3-14, "Joint Doctrine for Space Operations," Washington, GPO, 2002, p. vii.
- <sup>3</sup> Shawn P. Rife, "On Space Power Separatism," *Air Power Journal*, Spring 1999, p.22.
- <sup>4</sup> Dr. David F. Fautua, JFCOM J-9 Millennium Challenge 02 Presentation, 7 August 02.
- <sup>5</sup> Space Vision 2020, p.7.
- <sup>6</sup> Timothy A. Mehuron, 2002 Space Almanac, *Air Force Magazine*, August 2002, p.31.
- <sup>7</sup> Dan Daniel, "The Case for a Sixth Service," *Armed Forces Journal International*, August 1985, p. 74.
- <sup>8</sup> "Space Vision for 2020," p.6.
- <sup>9</sup> *Ibid*, p.10.
- <sup>10</sup> Edward G. Anderson, "U.S. Space Command: Warfighters Supporting Warfighters in the 21<sup>st</sup> Century," *Military Review*, vol. 81, no.6, Nov./Dec. 2001, p.16.
- <sup>11</sup> Sandra I. Irwin, "U.S. Space Command Chief Warns about Technological Complacency," *National Defense*, vol. 85 no. 570, May 2001, p.14.
- <sup>12</sup> *Ibid*.
- <sup>13</sup> Brad Baehr, et. al, "Space Control Operations and the U.S. Army," *Military Review*, vol. 81, no. 6, Nov./Dec. 2001, p.37.
- <sup>14</sup> Edward G. Anderson, "U.S. Space Command: Warfighters Supporting Warfighters," p.15.
- <sup>15</sup> "U.S. Space Command Chief Warns....," p.14.
- <sup>16</sup> Brad Baehr, et. al, "Space Control Operations and the U.S. Army," p.40.
- <sup>17</sup> *Ibid*, p.41.
- <sup>18</sup> William B. Scott, "New USAF Roadmaps Spotlight Space Warfare Technologies," *Aviation Week & Space Technology*, vol.146, no. 1, Jan. 6, 1997, p.62.
- <sup>19</sup> Edward G. Anderson, "U.S. Space Command: Warfighters Supporting Warfighters....," p.15.
- <sup>20</sup> William B. Scott, "New USAF Roadmaps Spotlight Space Warfare Technologies," p.59.

- <sup>21</sup> William B. Scott, “New USAF Roadmaps Spotlight Space Warfare Technologies,” p.63.
- <sup>22</sup> Ibid.
- <sup>23</sup> PBS Video, “Space Flight: Thunder in the Skies,” PBS Home Video, 1997.
- <sup>24</sup> Ibid.
- <sup>25</sup> John A. Tirpak, “The Space Commission Reports,” *Air Force Magazine*, March 2001, pp.31-33.
- <sup>26</sup> Ibid.
- <sup>27</sup> DOD News Release, “DOD Announces Merger of US Space and Strategic Commands,” *Defenselink Online*, at: [http://defenselink.mil/news/jun2002/b06262002\\_bt331-02.html](http://defenselink.mil/news/jun2002/b06262002_bt331-02.html).
- <sup>28</sup> Peter Grier, “The Force and Space,” *Air Force Magazine*, February 2001, p.51.
- <sup>29</sup> Ibid.
- <sup>30</sup> Dan Daniel, “The Case for a Sixth Service,” *Armed Forces Journal International*, August 1985, pp 71.