

## CHAPTER 8

# **An Air Force Vision for the Military Space Mission: A Roadmap to the 21st Century**

**I**n the aftermath of Desert Storm Air Force leaders took significant steps to establish the Air Force as the “lead” service for space. Their motivation stemmed from multiple sources. It reflected the pride of having been the principal steward of military space capabilities for over thirty years. As important, the Air Force space community recognized the crucial turning point represented by space accomplishments in the Gulf War and anxiously sought to apply the operational “lessons learned.” Finally, Air Force leaders saw that in a post-Cold War world, Air Force leadership in the space arena remained not only critical for the future of space within the service, but essential to support the new demands of “global power and global presence.”

### **A Generation of Leadership in Military Space Activities**

In promoting its leadership role in military space for the 21st century, Air Force leaders relied on the institutional memory and experience acquired over more than a generation, dating back to the second Eisenhower administration. The Air Force role in space proceeded along two broad levels: one involved a number of “campaigns” to convince national leaders that the imperative of national security required assigning the Air Force sole responsibility for military space activities that included development and deployment of weapons in outer space; the other centered on continuation of the effort to institutionalize space within the Air Force and throughout the armed forces by transferring responsibility for Air Force space

activities from the realm of research and development to the operational side of the service. Space advocates believed that “normalizing” and “operationalizing” space within the Air Force would also buttress the service’s claim to be designated executive agent for space and to lead the national military space program. Air Force space pioneers never achieved the lofty goals they established for the service. Like their aviation counterparts after World War I, ambitious Air Force space agendas did not always receive sufficient support from within the service, or from national leaders who remained opposed to an expanded military space program. Nevertheless, the Air Force achieved a remarkable record as the service preeminently involved in initiating, developing, and applying the technology of space-based systems in support of the nation’s security.

The foundation for Air Force space leadership was established before the Eisenhower era, at the close of the Second World War. At that time, the Army Air Forces took two important steps to set the stage for an Air Force future in space. With the publication of *Toward New Horizons* in late 1945, Commanding General of the Army Air Forces Henry H. “Hap” Arnold and his close friend and Chairman of the Scientific Advisory Board Theodore von Kármán provided the service a sound research and development focus and an agenda for the future. Shortly thereafter, in early 1946, the service-sponsored Rand Corporation issued its prescient report on satellite feasibility, *Preliminary Design of an Experimental World Circling Spaceship*, which predicted that an artificial Earth-observation satellite could be launched within five years. Neither *Toward New Horizons* nor the Rand report produced a rush to develop space capabilities in light of Cold War tensions during the late 1940s, tight budgets, and focus on the strategic bomber as the first line of national defense. Even so, if the newly designated United States Air Force proved unwilling to seriously pursue satellite development itself, it was determined to prevent the other services from capturing what it termed the “space mission.”

The Air Force renewed its interest in satellites in the early 1950s, when technological progress affirmed the promise of long-range ballistic missiles carrying thermonuclear devices, and the new Eisenhower administration took measures to defend the nation from a surprise attack. Development of an American ICBM represented one means of strengthening national defense; at the same time, development of a reconnaissance satellite, launched into orbit by rocket boosters, offered the prospect of obtaining vital strategic intelligence data on the Soviet Union. In 1954, Rand’s landmark Project Feed Back report affirmed the technical feasibility of artificial satellites and recommended the Air Force develop an electro-optical reconnaissance satellite to meet President Eisenhower’s requirements.

The administration initially supported the missile and satellite efforts of all three services. The Air Force redesigned and intensified its development of an earlier Convair ICBM proposal, which it renamed Atlas and placed under the direction of the hard-charging Brigadier General Bernard A. Schriever. By 1957 the crash

program led by Schriever and his cohorts at the newly-established Western Development Division encompassed not only the Atlas ICBM, but the Thor IRBM and, in conjunction with Lockheed's Missile Systems Division, the military reconnaissance satellite project. The latter would lead to the Agena upper-stage booster, the Defense Support Program's early warning infrared satellite, and the reconnaissance satellites managed as a national program by the National Reconnaissance Office.

At the same time, the Eisenhower administration established a "freedom of space" policy that promoted unrestricted overflight to allow the free passage of military reconnaissance satellites. This meant emphasizing civil spaceflight and prohibiting the deployment of space-based weapons. Air Force leaders believed otherwise. They preferred to guard against potential threats, and viewed the self-limiting "space for peaceful purposes" policy dangerous and self-defeating. Space-based weapons would remain restricted to studies only. Consequently, Air Force space efforts centered on what came to be called defense support functions—reconnaissance and surveillance, early warning, navigation, communications, and meteorology. These activities, and the Eisenhower space policy that framed them, would endure largely unaltered for the next 30 years.

The launch of the Sputnik satellites in late 1957 intensified an already heated contest for leadership of the national space program among the Army, Navy, and Air Force. Air Force leaders coined the term "aerospace" to justify their claims, first to lead the national space effort and, when that failed, to be designated the executive agent for all of military space. The Air Force confronted a host of competitors in its bid for space primacy. The creation of NASA in 1958 proved a mixed blessing for the Air Force. On the one hand, NASA acquired its most important space assets from the Army and Navy which, by 1960, left the Air Force the dominant military space service and NASA dependent on the Air Force for support. On the other hand, NASA now would chart the nation's civil spaceflight future and compete for space funding. Moreover, in the military sphere, the Air Force found itself subordinated to the Pentagon's Advanced Research Projects Agency and, later, to the Director of Defense Research and Engineering. A new competitor appeared in 1960 when the administration created the National Reconnaissance Office (NRO) to manage Project CORONA, the sensitive reconnaissance satellite program. Although directed by the Under Secretary of the Air Force, this Central Intelligence Agency-Air Force program would remain outside the control of Air Force headquarters. Finally, for defense support missions, the Air Force often had to share responsibilities with other services and agencies.

By the end of the Eisenhower presidency, the Air Force clearly had not achieved the "independent" leadership position claimed by its most ardent spokesmen. Even so, it could point to an impressive list of achievements that included providing the bulk of space booster and infrastructure support and managing the early warning

satellite and the ground-based space surveillance network. Air Force leaders also thwarted two attempts by their Army and Navy rivals to create a unified command for military space activities. Responsible for nearly 80 percent of the military space budget, it clearly found itself the leading service for military space.

In the spring of 1961, Secretary of Defense Robert McNamara designated the Air Force the military service for space research and development. As part of the arrangement, the Air Force reorganized to create a more centralized focus for space by establishing Air Force Systems Command with General Schriever as its first commander. The previous year the Air Force had created the nonprofit Aerospace Corporation to provide needed technical expertise. The beginning of the Kennedy administration was a period of high expectations for Air Force space leaders, who believed they had a “green light” to promote an expanded military space program and gain recognition as “executive agent for military space.” The Air Force agenda included making permanent NASA’s early dependence on the service. As executive agent for NASA support, the Air Force sought an equal partnership with NASA in the decade ahead. The service also attempted to convince Defense Department officials that the military had a legitimate requirement for a manned space mission apart from NASA’s program. Manned spaceflight was also seen as the best means of generating support for space within the Air Force. Finally, despite established national space policy, the Air Force strongly lobbied for permission to develop space-based antisatellite weapons.

Well before the end of the decade, the Air Force campaign had failed all across the board. NASA basked in the glow of the unprecedented Project Apollo moon landing. Meanwhile, Air Force efforts to make military manned spaceflight the focal point of a space-oriented service ended when President Nixon in 1969 canceled its remaining human spaceflight project, the Manned Orbiting Laboratory. The Air Force could never convince the Defense Department that the military had a legitimate requirement for a man-in-space “mission.” Likewise, Air Force attempts to move space-based weapons projects beyond the drawing board proved fruitless. Air Force pretensions to lead an expanded space program received further setbacks under the Defense Department’s policy of tri-service management and military-civil cooperative efforts designed to reduce costs and service bickering. With the larger Air Force space agenda unrealized, the service’s research and development organizations, by default, assumed operational responsibility for space programs and systems. This set the stage for the future contest between R&D and operational elements for control of Air Force space. Meanwhile, by the end of the 1960s, Air Force leaders downplayed space issues and spoke instead of taking care of traditional Air Force aviation needs.

At this juncture, two developments reinvigorated the Air Force space program. One proved to be the rapid growth of unmanned, instrumented spacecraft and their potential importance for military operations. Communications (DSCS) and weather

(DMSP) satellites provided crucial data to commanders in Vietnam, while by the early 1970s, the Air Force had launched its first early warning satellites (DSP) and readied for development the nation's first three-dimensional satellite navigation system (GPS). The National Reconnaissance Office also prepared to launch the successors to Project CORONA reconnaissance satellites. Artificial earth satellites were coming of age.

The other important development was the advent of the Space Shuttle, the NASA-Defense Department project for a reusable launch vehicle that NASA predicted would provide more inexpensive and more frequent access to space. Under pressure to use the Shuttle in place of expendable boosters, the Air Force agreed to assist with development costs, produce an upper-stage vehicle, and construct a West Coast launch facility. In return, NASA accepted an enlarged cargo bay to accommodate military satellite requirements and resolved to give Defense Department missions operational priority. Air Force space enthusiasts could also argue that involvement with the Shuttle preserved a military manned spaceflight mission.

The coming of the Shuttle and artificial satellites compelled Air Force leaders in the 1970s to seriously address organizational issues. Because satellites increasingly provided operational support to a variety of users, the practice of assigning operational responsibility to one particular Air Force command seemed inappropriate. Likewise, by the mid-1970s four Air Force commands promoted themselves as best qualified to manage Shuttle operations. The potential operational impact of space systems prompted Air Force leaders to assess the importance of space for operational commanders and the service's institutional commitment to a space future. The growing debate focused on whether the research and development community should continue to launch and control space systems or relinquish those responsibilities to the operational side of the Air Force. If the latter, should the Air Force create a new, major command for space operations? The decade of the 1970s witnessed a plethora of studies, conferences, and symposia that helped to build consensus for an operational space focus within the Air Force. At the same time, the contributions of the space systems themselves showed that they had moved beyond the experimental stage and could no longer be confined to the research and development realm. By the early 1980s, the Reagan administration's interest in an expanded defense space program provided important momentum for organizational changes already underway within the Air Force. By late summer 1982 the Air Force had an operational Space Command—for the price of a unified space command to follow three years later.

During the 1980s, Air Force Space Command needed to acquire systems, gain the necessary experience, and convince the wider Air Force of the operational importance of space for traditional missions. Becoming operational proved to be a long and difficult process. Not until 1993, for example, did the research and development community relinquish complete responsibility for satellite control and space launch.

Along the way, the new Air Force Space Command had to establish effective relationships with the unified command and deal with the launch crisis following the *Challenger* tragedy. The latter precipitated not only a return to expendable boosters but, also, a reexamination of the Air Force commitment to space. By the end of the 1980s, Air Force leaders referred to the responsibility of the Air Force as the “lead service for military space” to “normalize” and “operationalize” space within and outside the Air Force—in short, to institutionalize space to the point where space systems furnished support essential to the warfighter.

Desert Storm provided the needed catalyst in the “operationalization” of military space systems. In the Persian Gulf conflict, space systems that had traditionally performed a strategic function proved sufficiently flexible in a tactical environment to provide critical support to the warfighters. Space systems helped achieve victory, which served as the springboard for Air Force leaders to assert their vision for the nation’s space program and the Air Force’s leadership role in achieving it.

### **An Air Force Vision for Another Generation of Space Leadership**

In order to chart the course for the Air Force space program into the next century, Chief of Staff General Merrill McPeak in the fall of 1992 established another Blue Ribbon Panel on space. Led by Lieutenant General Thomas S. Moorman, Jr., vice commander of Air Force Space Command, it included nearly 30 officers and civilians from Air Force headquarters and the major commands. Like the Blue Ribbon Panel of four years earlier, the Moorman Panel addressed space roles and missions issues that affected the Air Force internally. But the new panel, in the aftermath of space contributions to Desert Shield and Desert Storm, expanded its analysis to emphasize the role of the Air Force in the wider military and national arena. Meeting at Maxwell Air Force Base, Alabama, from early September to early November, the panel reviewed existing Air Force space policy, organization and infrastructure, charted the service’s future role in space, developed a strategy to achieve that objective, and outlined an action plan for Air Force leaders to follow. The Moorman Panel issued its report in early January 1993 during the closing days of the Bush administration.<sup>1</sup>

The panel envisioned the future Air Force as a thoroughly integrated air and space force that reflected General McPeak’s unprecedented mission statement of June 1992, which declared air and space coequal. Moreover, in the world of the next century, the Air Force would be the linchpin in the nation’s strategy of projecting military power rapidly and decisively with expeditionary forces. Space would provide the “global eyes and ears” that would ensure “global reach and global power.” In short, space represented the decisive edge for the warfighter. General McPeak’s mission statement also flatly asserted that “the Air Force will lead the Defense Department in the acquisition, operation and application of space capabilities to preserve the peace and win in war.” The Moorman Panel focused on these three

areas in its assessment of the Air Force's future leadership role. In the area of acquisition, the panel examined ways to reduce the costs of acquiring and maintaining space systems, of making operational requirements the driving force in the acquisition process, and of ensuring U.S. space superiority through innovative, sophisticated technological solutions. Operational objectives included establishing space control capabilities equivalent to the air superiority mission, providing responsive space launch and on-orbit control, and leading the armed forces in providing "an integrated aerospace control system—air, missile, and space defense—for combatant commanders." Finally, for space applications, the panel examined how the Air Force could become the "preeminent service for the exploitation of space capabilities" and produce a "space applications mindset" throughout the Air Force.<sup>2</sup>

The Moorman Panel also incorporated the results of a number of space studies that emerged in late 1992 during the closing months of the Bush administration. Three task group reports of the National Space Council addressed America's future in space: "The Future of the U.S. Space Launch Capability," by Edward C. Aldridge, Jr., (November 1992); "The Future of the U.S. Space Industrial Base," by Daniel J. Fink (November 1992); and "A Post Cold War Assessment of U.S. Space Policy," by Laurel Wilkening (December 1992). The Aldridge report, as noted above, called for replacement of the National Launch System with the "Spacelifter." Following publication of the report, Congress directed cancellation of the National Launch System. Senior leaders of the Air Force responded by agreeing among themselves that the Air Force would lead the national effort to develop a responsive launch system. In early 1994 they directed a comprehensive "Space Launch Modernization Study" by a distinguished committee of forty experts from all space sectors and chaired by General Moorman. The Moorman Committee was charged with developing an extensive requirements data base, synthesizing the needs of space launch for the commercial, civil, and national security sectors, then compiling options and "roadmaps." It promised to be the most credible effort to date to solve the launch problem.<sup>3</sup>

The Blue Ribbon Panel also took into account the Fink report, which stressed the importance of coordinated Defense Department-NASA measures to achieve more efficient procurement and lower operating costs while maintaining vital space technologies and facilities within a reduced space industrial base. The Wilkening report advocated more centralization and efficiency across the military and civilian space sectors, as well as increased cooperation among civil, military and commercial space elements to better confront international space competition. Finally, the panel remained well aware of the February 1993 *Triennial Report to Congress on Service Roles, Missions and Functions* by the Chairman of the Joint Chiefs of Staff. The controversial report proposed to eliminate U.S. Space Command and make U.S. Strategic Command responsible for the space mission. Doing so would likely mean the end of the Army and Navy space commands. In the final report, the panel

considered their recommendations consistent with the decisions and findings of the space studies that occurred during their deliberations.

In its critique of the acquisition area, the panel found widespread “fragmentation and duplication of effort” that resulted in expensive, inefficient, “stove-piped” systems, whereby each agency pursued its own agenda without attempting to support multiple requirements and systems. In a world of declining space budgets, the Defense Department and the Air Force no longer could afford costly duplication and many one-of-a-kind satellite systems. Moreover, operational users continued to lack sufficient voice in the requirements process, which stemmed in large part from ignorance of space capabilities. On one level, the panel called for a “summit” process to spread space knowledge throughout the Air Force. On another, more visible level, it called on the Air Force to “seek designation as the single manager for DoD space acquisition.” Although the other services would participate, the Air Force would become the focal point for acquisition.<sup>4</sup>

In the operational area, the panel declared that the “Air Force should be designated as the single manager for DoD space operations.” Taking its lead from the January 1993 Joint Chiefs of Staff study on roles and missions, the panel called for an end to the Army and Navy space commands. After all, it argued, the Air Force performed 90 percent of Defense Department space operations, and eliminating the other services’ space commands would encourage an end to “stove-piping” and duplication. The panel also recommended development of a new launch capability to replace the unresponsive Eisenhower-era fleet of expendable boosters, production of a space-based antisatellite system to counter the growing space capabilities among potential enemies, and a commitment to producing an effective ballistic missile defense. Finally, the panel called on the Air Force to enhance space support through improved arrangements with allies and commercial space companies, as well as providing the doctrine and capabilities to win the emerging space “information war.”<sup>5</sup>

In the third area, applications, the panel found the Air Force woefully behind the Navy and Army in integrating and applying space capabilities on the battlefield. It cited the examples that only five percent of the service’s aircraft had Global Positioning System receivers installed, and that little Air Force commitment existed to programs such as Tactical Exploitation of National Capabilities (TENCAP). To right the situation, the panel recommended establishment of a Space Warfare Center devoted to developing new applications for space systems and to educating and training operators on space capabilities and tactical applications. In fact, Air Force Space Command already had begun planning for a Space Warfare Center, which it hoped could attract other service operations personnel as well. Furthermore, the Moorman Panel believed that theater arrangements should find the Air Force component commander formally designated as the focal point for space support. The Air Force also should reexamine all training, education, and personnel policies

in order to promote a better understanding of space among the aviation community, as well as of aviation needs among the space community.<sup>6</sup>

The panel also advocated establishing a stronger operational space presence at Air Force headquarters—and throughout the Air Force—one that could provide an operational imperative in place of the budget-and-policy focus that traditionally dominated decisions on space issues. The July 1993 activation of Headquarters Fourteenth Air Force at Vandenberg Air Force Base, California, to manage the nation's military space assets, was one response to this recommendation. The new headquarters became the operational focus under Air Force Space Command with responsibility for “providing ballistic missile warning, space control, space lift, and satellite command and control.”<sup>7</sup> Finally, the Moorman report addressed the sensitive issue of the “national” reconnaissance space community's role. Because requirements for national systems were identified in intelligence councils outside the normal defense process, it said, defense needs had to conform to intelligence requirements. It recommended the creation of a more formal system to ensure adequate consideration of service needs in the design of national systems.<sup>8</sup>

The panel concluded by observing that in a world of declining resources, improving support to the warfighter would demand major changes in space acquisition, operations, and application. The Air Force, it declared, found itself “uniquely positioned” to ensure the achievement of these goals. “The Air Force's ability to provide Global Reach and Global Power for America allows us to be the leading edge of military force.”<sup>9</sup>

By the spring of 1993, General McPeak had endorsed the Blue Ribbon Panel's findings, had designated various Air Force organizations responsible for implementing the panel's recommendations, and had prepared an implementation plan for Air Force Secretary Sheila Widnall's review. The Blue Ribbon Panel set the stage for a major Air Force effort to maintain its leadership of military space. If this theme seemed overly familiar, Air Force leaders believed that the post-Cold War reality of readiness and power projection amid budget austerity provided an unprecedented opportunity for Air Force action.

The reinvigorated Air Force's assertion of leadership took several forms. One involved proposing to Defense Department officials and congressional members the designation of the Air Force as the executive agent for space research and development and for acquisition. By the summer of 1994, reports indicated that Deputy Defense Secretary John Deutch had agreed to support the Air Force plan and to argue the case before House and Senate conferees who were preparing to negotiate the fiscal year 1995 defense appropriations bill. At the same time, it became clear that Air Force assertiveness had raised old fears of an Air Force space “takeover.” Army and Navy leaders could hardly be expected to stand idly by after the Chairman of the Joint Chiefs of Staff had recommended the elimination of their space

commands and the Air Force's Blue Ribbon Panel had endorsed this proposal. The always contentious roles and missions debate among the services seemed about to take center stage once again.<sup>10</sup>

The Air Force proposal drew opposition beyond Army and Navy circles. A General Accounting Office report in the summer of 1994 criticized previous Air Force attempts to become the Defense Department's executive agent for space. The GAO recommended that military space acquisition decisions be centralized within the Office of the Secretary of Defense rather than consolidated under Air Force direction. A House Appropriations Committee report in August noted that "the Air Force dominates the military space budget, yet generates little of the requirement. Nevertheless, its space budget competes with other service-specific Air Force requirements such as aircraft and missiles." The House report questioned the Air Force's ability to handle the varied space needs of the military space community.<sup>11</sup>

Air Force leaders like Chief of Staff General Merrill A. McPeak and Air Force Secretary Sheila E. Widnall sought by means of policy statements and public addresses to allay fears, overcome skepticism, and generate support both within and outside the service. In a speech before the "Spacetalk 94" conference on 16 September 1994, General McPeak squarely faced the controversial issue. Referring to the crucial role of space in the Gulf War, he noted that all the services now worked to make space important to warfighters by ensuring that their requirements for space support were met. Unfortunately, he said, this legitimate concern had become embroiled in the "current Washington debate over the proper allocation of roles and missions among the services." He referred to one headline that asserted the "USAF Aggressively Guns for Roles" and was seeking to completely remove the other services from space operations.<sup>12</sup>

The chief of staff sought to "set the record straight." The Air Force, indeed, should be the lead service for space, he reasoned, because this would be good for the Defense Department and the taxpayer. In an era of steadily declining defense budgets, the military was especially challenged to realize the great potential of space. Cutting costs by reducing overhead and "streamlining" organizations represented one solution. He cited the restructured post-Cold War Air Force as an example of successful adjustment to the new realities. In fact, two days earlier, the chief of staff had given a major address on "reinventing the Air Force" at the Air Force Association Convention in Washington, D.C.<sup>13</sup>

General McPeak proposed a similar consolidated, streamlined approach to the development and acquisition of military space systems. He restated the argument made by the Blue Ribbon Panel that fragmentation in the requirements process too often resulted in one-of-a-kind satellites that drove up costs and produced excessive delays in the space launch schedule. Austere times demanded better management. The Defense Department, he noted, had asked the Air Force to examine ways to improve the development and acquisition process. This made good sense. The Air

Force, after all, managed almost 85 percent of the military space budget, employed more than 90 percent of military space personnel, and owned most of the space infrastructure. He assured his audience that the Air Force proposal was not an attempt to usurp the responsibility of the other services to establish their own space requirements. All requirements would be evaluated by the Joint Requirements Oversight Council, comprised of the service vice chiefs of staff and by a Joint Space Management Board directed by senior officials from the Defense Department and intelligence community. This process would ensure “jointness” and, for the first time, effectively integrate intelligence requirements into the larger military space arena. Hence, the Air Force would not determine the space requirements of others; it would act only as the Defense Department’s executive agent with responsibility for developing and acquiring space systems. The Air Force proposal would help lower costs by promoting commonality and standardization and serve to end the barrier between classified and unclassified programs. “If the Air Force becomes the lead service for space development and acquisition,” the general asserted, “the other services will come to trust us to meet their requirements in space.”<sup>14</sup>

Secretary Widnall also took up the theme of Air Force leadership and tried to alleviate the concerns of critics. Referring to the current roles and missions debate in an October 1994 policy letter, she declared that the chief of staff had been misunderstood when he remarked that “the Army works on the land, the Navy at sea, and the Air Force in the air, and the Air Force accomplishes the majority of space activities.” She flatly stated: “let me state clearly that we are not trying to make the Air Force stronger at the expense of the other services.” It simply made good sense financially and organizationally to make the service with the largest space role and the most experience responsible for managing the acquisition of space systems. Consequently, the Air Force had proposed that the Secretary of the Air Force be designated the executive agent for space.<sup>15</sup>

Air Force leaders relied on more than official statements and speeches to spread the word on Air Force space leadership. In the spring of 1993, after the Blue Ribbon Panel had completed its deliberations, General McPeak initiated a comprehensive evaluation of space capabilities and “high-leverage” space technologies for the year 2020 and beyond. *SPACECAST 2020* appeared in the spring of 1994, following a year of analysis by scientists, industrialists, and members of all service space commands under the auspices of Air University. In the tradition of Theodore von Kármán’s *Toward New Horizons* and subsequent studies, *SPACECAST 2020* produced eighteen white papers that assessed emerging technologies and described creative space applications that would support the security of the country in the next century. Particularly interesting was the closing address delivered by retired Air Force General Michael P. C. Carns on 10 November 1994 to the National Security Industrial Association, which had provided the forum for the first major *SPACECAST 2020* briefing to industry.<sup>16</sup>

The former vice chief of staff declared that space for thirty years had been shaped not by operators but by functionalists from the national intelligence and the surveillance and warning communities. This prevented widespread appreciation for the opportunities space offered military forces. Only Desert Storm, he asserted, had finally opened the door for the warfighter. But the “operationalization” of space would not occur on its own, because the domain of the specialist continued to promote a testing mindset in the Air Force. After all, despite Air Force Space Command’s assumption of the operational space launch mission, “space operations are in the hands of the research, development, test, and evaluation...communities.” In Carn’s opinion, this had to end. At the same time, he argued, the military should encourage the commercial sector to perform all specialized tasks that did not require particular military involvement. He, too, favored standardization and commonality among the military, civil, and commercial space sectors to promote increased efficiency at lower costs. Above all, General Carns focused on the importance of space operations for the Air Force. He agreed that *SPACECAST 2020* represented a good effort to link space technology, capability, and military operations. Now the Air Force needed to assume the “operational sponsorship of space, a formal commitment...mainstreaming space with all of its aspects into the line Air Force.” In short, Air Force leaders would need to institutionalize space operations within the Air Force and the wider military community.<sup>17</sup>

Complementing *SPACECAST 2020* was another important study of Air Force space challenges for the future. At the behest of Secretary of the Air Force Widnall and new Chief of Staff General Ronald R. Fogleman, the Scientific Advisory Board convened a group of experts to address the technological requirements and capabilities facing the Air Force into the 21st century. Titling its study *New World Vistas*, the board pointedly linked its study to its predecessor, *Toward New Horizons*, produced by Theodore von Kármán 50 years earlier. Board chairman Gene H. McCall also noted that his team of specialists worked closely with the *SPACECAST 2020* panel and the Rand Corporation, as well as the Air Force Academy and Air University, in preparing the 15-volume study that appeared late in 1995.<sup>18</sup>

*New World Vistas* focused on integrated, capability-based technology requirements for long-range planning—more specifically for the next 30 years into the new century. The objective was to apply new technologies to produce affordable capabilities. The board asserted that the emphasis of Air Force technology needed to change given the absence of a known “enemy,” the reality of high costs, and the military applicability of commercial technologies. In its assessment of space operations, the board recommended the use of distributed satellite constellations relying on single or dual-purpose satellites. With technologies improving significantly at close to a two-year cycle, the study argued that “time from design to launch should be reduced substantially. A goal of two years is reasonable.” Commercial vehicles should be used to launch most military satellites, which could be made compatible

with available launchers if the satellites were commercially-produced for distributed systems. Consequently, the Air Force needed to reassess dedicated military satellite communications systems like Milstar and to examine different ways to protect satellite systems in the future. The study proceeded to describe a number of specific technical and procedural measures that would result in cheaper, equally effective satellites and a more responsive launch capability that eliminated the current “cast of thousands” approach to management and operations. Throughout their analysis, the authors emphasized taking advantage of new technologies and the proficiency of the commercial sector. *New World Vistas* declared that unless the Air Force asserted itself to perform its unique mission for the nation, there perhaps should not be a separate air force in the next century. Although the service should expect opposition from the Army and Navy, the Air Force should plan immediately for all air and space activities. *New World Vistas*, the authors argued, would help provide the long-range technology and capability-linked plans to support a clear vision for the Air Force into the 21st century.<sup>19</sup>

An equally forthright call for action appeared in early 1995 in the report prepared by the Air Force Association Advisory Group on Military Roles and Missions. That report attacked the fragmentation, absence of leadership, and divided authority that continued to characterize the nation’s space community. Space launch represented the most serious example. After many years and millions of dollars, the lack of consensus on requirements had produced little more than a string of “program corpses”—the Advanced Launch System, the National Launch System, and, most recently, Spacelifter. Similar difficulties had led to elimination of FEWS and, now, threatened the Milstar program. Echoing General McPeak and other Air Force leaders, the report warned that the country would lose its technological advantage and fail to achieve operational space capabilities in the future if it did not confront the organizational dilemma. Large space budgets would not solve the problem; reorganization would.<sup>20</sup>

In order to eliminate duplication, reduce costs, and achieve the great advantages offered by space, the Advisory Group stated, defense leaders needed to turn to the service with the space expertise, capability, and commitment—the only service that included space in its mission statement and operated throughout the full spectrum of space functions. The Air Force should be responsible for research, development, and acquisition of space systems to meet the requirements of all the services. Such restructuring would not represent an Air Force power play but, rather, the most logical solution to an intractable problem. To be effective, however, the Air Force needed to end the perception that the space system requirements of operational commanders-in-chief and the other services could not compete successfully against Air Force demands for new aircraft. One way of minimizing the problem would be to have a more equitable distribution of space costs. While the space portion of the Air Force budget supported all the services as well as the joint forces, the Defense

Department did not recognize the need for balanced apportionment to help the Air Force defray the large investment costs it made on behalf of the entire military space community. Above all, the report declared that space needed to finally become institutionalized in the Air Force, and that the Air Force demonstrate “an unequivocal commitment to exploiting space for all forces.”<sup>221</sup>

Would the Air Force’s quest for military space leadership prove unequivocally successful? At mid-decade, success seemed doubtful in light of initially strong opposition from Navy and Army leaders. Furthermore, the Defense Department had centered space acquisition in a new Space Architect office within the Pentagon. Many roadblocks from earlier years continued to obstruct the Air Force’s progress. Fragmentation and lack of consensus, the very problems identified by Air Force critics, worked against the service’s efforts. Responsible for preventing more unified, centralized approaches to space management, a fragmented space community contributed to interservice rivalry over roles and missions and to traditional bureaucratic turf battles.

On the other hand, the world of the 1990s presented a landscape that had been significantly altered. For one thing, cooperative efforts had now become more acceptable to all. Multiuser programs and systems increasingly reflected interest in promoting commonality and “convergence” to end duplication and cut costs. Although few would doubt the continued need for dedicated military space systems like DSCS and DMSP, Air Force leaders had joined the chorus to extol the virtues of cooperative ventures among the military, civil, and commercial sectors. Desert Storm had made them believers, and shrinking budgets for space would continue to foster cooperative efforts.

But what about space launch, the most fundamental element of the space program and the one that stubbornly defied efforts to create a responsive, cost-effective means to reach space? Placing responsibility in the hands of Air Force Space Command had begun the process of making space launch “operational,” but much work remained. At mid-decade Air Force leaders looked to the Moorman study on space launch to chart the proper course for the nation. Although space launch represented a national concern, the Air Force provided the leadership to solve the problem. The Achilles heel of the space program might well reinforce the Air Force’s argument for space leadership.

Above all, the new world of the 1990s reflected the end of the Cold War and the impact of Desert Storm. Superpower rivalry had given way to regional conflict. The United States needed to be ready to field lean, mobile, highly-trained expeditionary forces capable of decisive action in theater-level contingency operations. This first modern war in which space systems played a vital role confirmed the shift to tactical warfighting, and space systems had shown their ability to apply strategic assets to tactical contingencies. In “reinventing” the Air Force, General McPeak had made

space a top priority. He believed that Air Force space systems would provide the critical advantage for the “power projection” strategy of the future.

The altered conditions of the 1990s offered the Air Force a golden opportunity to display its space leadership—in the name of greater operational efficiency and the national interest. The postwar Air Force initiative reflected important institutional thinking about space requirements for the post-Cold War era. It also revealed Air Force thinking about the technical and political means necessary to implement this vision. Air Force reviews represented an impressive, comprehensive internal look at the state of military space, future needs, and integration issues. Unfortunately, the weakness of the effort came from attempting to convert ideas into a roadmap for the whole Defense Department without a full, public review of military space. Alternative proposals focused on Defense Department management and encompassed plans for better integration of “black” and “white” space communities, as well as the evolving “jointness” of military space.

Air Force success in the larger arena, however, had to begin from within. From his vantage point as commander-in-chief of U.S. Space Command, General Charles A. Horner noted that when he assumed command of United States air forces during Desert Storm, “most of us over there were ignorant of the contributions of space assets.” A major command-post exercise shortly before the conflict did not integrate space forces into the operation.<sup>22</sup> Although Horner quickly realized the importance of space contributions, his experience suggests the central dilemma facing Air Force space leaders at the dawn of the new century. Much of the Air Force continued to view space as more the province of the technocrats, as something beyond the realm of aviators. To be sure, much had been accomplished over the past decade to “operationalize” space in the Air Force. But much remained to be done before space would become a thoroughly integrated element of all Air Force operations and before air and space would become equal in fact as well as name. Above all, Air Force leaders needed to demonstrate greater commitment to space within the service and institutionalize space as a fundamental element of the Air Force’s future. Only by establishing the foundation for space within the service could the Air Force demonstrate its commitment to support the warfighter and maintain its space leadership. As the Air Force approached its 50th anniversary as an independent service, it could look back on a half century of leadership in meeting the challenges of military space. Its space vision aimed to perpetuate that leadership and successfully meet the military space challenges of the new century.