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2001: A U.S. Space Force

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In military history, land conflicts progressed to use of the sea and then of the air as requisite technology became available. We are now at another frontier for the application of military power—space. But as the authors here point out, space is a place, not a mission. They call for an American space policy that requires new vision, an appropriate organizational structure, and adequate program funding. Alternative approaches are recognized and discussed and positive recommendations are made.

2001: A U.S. SPACE FORCE

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Introduction. By the year 2001, space activity for both peaceful and military purposes will increase significantly, with signal importance for continued international stability. As U.S. and Soviet activities in space continue to increase, the possibility for competition and conflict will almost certainly arise. Although we would prefer to shape the world into a place of mutual cooperation and good will, the present international environment continues to be dominated by superpower rivalry and suspicion; "détente" has been expunged from the lexicon of official policymakers on both sides. Competition is an inevitable outgrowth of the incompatible political, moral and economic values espoused by the United States and the Soviet Union. The scope and intensity of this antagonistic rivalry has ebbed and flowed for more than three decades, but it would appear that for the foreseeable future the prospects for alleviating the competitiveness of the relationship are not particularly optimistic. This competition is likely to intensify in many areas and to be extended into new areas, with direct and serious military and political consequences.

Nowhere are the prospects for conflict so intrinsically dangerous to future global security than in Soviet initiatives in space. Assistant Secretary of the Air Force Robert J. Hermann recently remarked that, "the 1980s are surely going to be characterized by continued intense competition and confrontation between ourselves and the Soviet Union. That competition and confrontation is likely to be more open, more visible and potentially more reckless."[1] This competition has already begun in space, and the United States must decide now what its space policy will be in face of a clear and present danger. Because the Soviets have assuredly decided to compete in a determined way, we

cannot afford the consequences of muddling through in a struggle that could spell disaster.

As a result of the prospects for continued competition between the superpowers, particularly in the military sphere, the United States must decide what should be its military role in space. This article examines this issue from the following perspectives: What policy options are open to the United States? What factors should be addressed in considering these options? And finally, what course of action will best serve the long-range security interests of the United States?

Relevant Factors. U.S. National Objectives. The security and well-being of the United States in the next century will depend increasingly on the uninhibited use of space for the collection of environmental data, communications relay, weather monitoring, safe navigation and transportation, and the efficient use of resources and energy. In addition, the surveillance, detection, and warning of impending attacks on our homeland require the use of space-based systems. According to former Secretary of the Air Force, Hans M. Mark, "There is no question whatsoever in my mind that space operations will take on an ever-increasing importance in maintaining our national security. Communications, surveillance, indications and warning and weather observations will depend more on space operations than they do now."[2] The denial of our ability to operate freely in space could threaten our continued growth and advancement, and indeed, our very survival as a nation.

In addressing this critical national issue, *Air Force Military Space Doctrine* (AFM 1-6) states: "As national use of space increases, protection of our resources will become more important. This growing importance of space operations introduces the possibility of space-to-space and space-to-earth warfare."[3] An interpretation of this reference to "space-to-space and space-to-earth warfare" is not provided, nor is there any indication of how it might be conducted. Instead, the *Space Doctrine Manual* goes on to say that "the United States intends *to deter the introduction* of offensive military capabilities into space by whatever means are appropriate. *To hedge* against failure, it is in our national interests to develop the means to conclude any military conflict in or from space on favorable terms." This statement leaves considerable room for interpretation, ranging from negotiated international agreements to the pursuit of U.S. military superiority in space.

The Soviet Challenge. For the past 20 years the Soviet Union has pursued an unrelenting effort to surpass the United States in every area of military capability. The Soviets have outproduced the United States in land and air forces. They now have 173 active army divisions to our 16; they have over 50,000 tanks to our 10,900; they have some 5,000 Air Force tactical aircraft to our 3,700.[4] While increasing the numerical gap, the Soviet Union has also significantly improved the quality of its weapons to the point that "they are a bit behind us in some areas, but are moving fast in every area."[5]

The Soviets have 289 major combat surface ships to our 173.[6] They have moved from a coastal defense force in 1960 to a blue-water navy having global strike capabilities in 1980. Only in the key category of aircraft carriers does the United States remain superior. In Theater Nuclear Forces, the Soviets have a 3.1 to 1 overall advantage in arriving warheads if *Poseidon* warheads are not included on the U.S. side.[7]

In Strategic Nuclear Forces the Soviets now have 1,398 ICBMs, 1,003 SLBMs and 156 long-range bombers to the United States' 1,054 ICBMs, 656 SLBMs and 338 bombers.[8] Whether the

Soviet Union now has or will soon achieve nuclear superiority over the United States is the subject of current debate, but the trend is patently clear—the Soviets have continued to increase both the quantity and quality of their weapons after the United States remained relatively constant.

In space systems, although less noticed and discussed, the Soviets have also pursued an aggressive development effort. Last year alone they launched ten times more payloads into orbit than did the United States. Many of these were military satellites, including a number of manned flights. Although the United States has had some spectacular successes with unmanned planetary probes, including the recent *Voyager* flyby of Saturn, no American has flown in space since 1975.[9] Clearly, the Soviets are not ignoring this new arena for military competition.

There are at least two reasons to believe that the Soviet space programs have direct military application. The first, and certainly the most important reason, is that the Soviet policymakers have no other option in pursuing a space program. There is only one agency within the Soviet Union that has the requisite human and organizational structure to exploit the space medium—the Strategic Rocket Force. It has a monopoly on all the human and technical resources required to support Soviet activities in space.

This situation is the result of at least two decades of Politburo policies to make available to the Soviet Armed Forces the men, material and money needed to build a military power that could favorably compete with the United States. Therefore, it is Defense Minister Ustinov and Marshal Ogarkov who are primarily responsible for Soviet space efforts. The Politburo has neither the flexibility nor the desire to change this fact of Soviet bureaucratic life. It follows that the Soviet Military Establishment can hardly be expected to undertake major Soviet space initiatives of a wholly scientific nature out of a spirit of altruism. To believe that the Soviet General Staff would not seek to maximize military applications of space technology is dangerously naive. They will do so as a matter of policy; indeed, it is an inherent result of their organizational process and single-minded focus on a superior military capability. This fact cannot be overstated; it is a critical factor for American policymakers to consider whenever they review Soviet space initiatives.

The second reason the Soviet activities in space should be a cause for grave military concern is the scope and intensity of Soviet research and development; operational testing; and the deployment of space support, defense and force enhancement systems. The character of these Soviet initiatives presents a major challenge to U.S. leadership in space. In fact, unless the U.S. military space program is substantially energized it is likely that the dynamics of ongoing Soviet investment will consign the United States to a position of second place that will be difficult to reverse.

No one in the West knows for certain just how much the Soviet Union is willing to spend for space exploration. If defense spending trends for the last decade are extended for space, Soviet spending will be significantly greater than U.S. investment. Current Soviet defense spending exceeds that of the United States by more than 50 percent and is growing by 3 percent each year.[10] In the field of high-energy lasers, the Soviets outspend the United States by three to five times.[11]

The Soviet Union relies heavily on space systems for many of the same purposes that the United States does. They have weather, navigation, communications, early warning and reconnaissance satellites in both near earth and geosynchronous orbit. These systems play important reconnaissance roles and greatly assist Soviet military

commanders for near real-time surveillance as well as for providing over-the-horizon targeting data.

The Soviets also have experimented with offensive strategic systems in space.[12] One such example was their experiment with fractional orbital bombardment systems that was terminated after ratification of the 1967 Outer Space Treaty. However, the Soviets have actively pursued other space programs that could promote a strategic advantage. They have an operational antisatellite program (ASAT) that threatens U.S. satellites upon which we depend for surveillance and attack warning.[13] Although the Soviet ASATs are presently restricted to near earth orbit capabilities, our own ASAT system is still on the drawing board and even under the most optimistic circumstances will not be operational before 1985.[14] It is expected that the Soviet ASAT system will have appreciably matured by that time.

Although it is extremely difficult to assess Soviet intentions based on rudimentary evidence of their space development activities, such an assessment is indeed necessary if we are to avoid a technological surprise. By the time Soviet intentions become convincingly obvious to U.S. observers, it will be too late to recover strategic parity. The Soviet Union is likely to exploit the situation to achieve long-sought political and military advantages over the United States. In assessing military intentions, *Air Force Magazine* suggests that "The Soviet Union, unencumbered by moralistic views about the peaceful and humanitarian character of the cosmos, treats space as a predominantly military high ground that needs to be seized and exploited by its armed forces."[15]

One possible high payoff area for the Soviets to pursue is the development of a large space-based laser system that could destroy ballistic missiles and strategic bombers on their way toward enemy targets. Such a system, if operationally deployed, could dramatically upset the delicate strategic balance of offensive nuclear weapons that has characterized the U.S.-Soviet military relationship for the past two decades. According to Senator Malcolm Wallop, the placement of a single high-energy laser in space would permit the Soviet Union to disable U.S. space satellites without warning. With only four laser battle stations in space, the Soviets could "shoot down our entire fleet of high altitude bombers—B-52s, FB-111s and most KC-135 tankers."[16] Senator Wallop suggests that Russian space-based lasers could prevent U.S. flight tests of any missile, or the placing of U.S. payloads in orbit.[17] Thus, the Soviets could permanently freeze the United States out of space and prevent us from reestablishing the strategic nuclear balance.

Evidence of Soviet intentions to exploit operationally the strategic advantage of space-based weapons is contained in several seemingly unrelated Soviet developmental activities. These activities include Soviet experimentation with directed energy weapons, their extensive manned space station activities, their development of large space boosters and reusable orbiting vehicle, and their concentration on improving space power generation capabilities.

Soviet experimentation with directed energy weapons, both high-energy lasers and charged particle beams, has been suspected for some time. According to retired Maj. Gen. George J. Keegan, former head of U.S. Air Force intelligence activities, the Soviet Union has conducted intensive and costly research for at least 10 years to develop an operational charged particle beam capable of destroying enemy missile warheads and orbiting satellites.[18] In July 1980 *Aviation Week* reported, "From a variety of sources the U.S. has discovered a massive Soviet effort to

develop and deploy directed-energy weapons—both high-energy lasers and charged particle beams. There is evidence the Soviets already may have issued orders to design bureaus to begin prototyping the electron-beam device at Saryshagan."[19] In addition, "U.S. intelligence estimates have concluded that the U.S.S.R. is moving at a pace that could permit it to place high-energy lasers in space between 1984 and 1986."[20] The United States is more than 10 years away from having a similar capability if current development schedules and funding levels are adhered to.[21]

Another area of active Soviet military space activity is the development of manned space platforms. In 1971 the Soviets launched an experimental manned space station called *Salyut-1*, 3 years prior to the first U.S. experimental *Skylab* spacecraft.[22] Since that time, they have had over 25 manned orbital missions, one of which set a new 185-day endurance record. This is contrasted with the U.S. endurance record of 84 days set in 1974.[23] Thus, the Soviets continue to make steady progress toward establishing a permanently manned space station in orbit.

According to *Aviation Week* there is srrong evidence to suggest that the "Soviet Union is developing a 220,000-lb. military/scientific space station to be manned permanently in earth orbit by about 12 cosmonauts." "Military objectives are expected to dominate the multidisciplinary station and could include . . . the first large-scale development of space-based, directed-energy weapons."[24]

In order to launch their large space platforms into orbit, the Soviets have been working on a 10-14 million lb. thrust booster.[25] This huge spacecraft booster can be compared with the 7.5 million lb. lift-off thrust of the U.S. *Saturn 5* vehicle that propelled U.S. astronauts to the moon. Current work on the giant new Soviet booster could result in a launch attempt as early as 1983. A space station launch could occur in 1985 if all goes well for the Russians. Although the U.S. Space Shuttle will provide easier and less expensive access to space, nothing approaching the scale of Soviet space activity is planned for the United States. The large booster developments will permit the Russians to maintain their important lead in long duration manned space flight.[26]

At the same time that Soviet booster development is dramatically improving, so is Soviet space electrical power generation capabilities primarily as a result of continued nuclear reactor progress. "Loss of the Cosmos 954 reactor-powered spacecraft over Canada . . . has not slowed the Soviet reactor program."[27] Soviet nuclear reactor developments in space could have important consequences for the advancement of spaceborne high-energy laser devices that employ nuclear power sources.

The implementation of large booster payloads, leading to manned space stations with large intrinsic electrical power capabilities, leads us full circle to the laser battle station concept alluded to earlier. While we cannot be certain of Soviet intentions, and one might be guilty of ascribing to them goals that are not in their farsighted policies, Soviet developments, capabilities and centrally directed programs suggest that to ignore these possibilities would abrogate our responsibility to insure adequately the security of the United States and our allies.

Technology. An awareness of intensified Soviet efforts to develop and deploy a directed-energy weapon in space that could alter the strategic nuclear equation has not been lost on U.S. policymakers. Despite the controversy surrounding the development of directed-energy weapons, Department of Defense and Congressional officials have stated that high-energy

laser weapons will become a reality. Current debate centers around how soon such a system could be placed in space and at what cost.[28]

There is some sentiment suggesting that the Defense Department is studying the concept to death and that a firm commitment should be made to accelerate the U.S. effort to head off the possibility of a Soviet surprise. In addition to the immense political implications the Soviet announcement of an operational space-based laser platform would have, proliferation of the system could force the United States into making unfavorable military concessions.

Because of the greatly increased size and complexity of today's strategic systems, moving a new concept from the laboratory to the field takes increasingly more time and effort. Given the experience, the momentum, the technical work force, and the military production capability of the Soviet space effort, it will be extremely difficult for the United States to match the Soviet accomplishment even if a "crash effort" program is begun now.

A typical U.S. weapon system development program, such as the MX missile, B-1 bomber, or *Trident* submarine, takes about 15 years from concept formulation to production. Little is known about how much the time could be reduced if a crash effort is initiated that reduces red tape, provides unlimited funds and proceeds concurrently with all segments. The atomic bomb's Manhattan Project and the *Polaris* ballistic missile submarine, which were both considerably simpler systems than a space-based laser system, took approximately 4 years to develop. The United States has not succeeded in matching those schedules for a major weapon system for the last 20 years. Thus, the size, cost, complexity, and technological difficulties militate against a sudden reversal of the development trends that have already been set in the United States and the U.S.S.R.

Agreements. America's military activities in space are partially circumscribed by a myriad of international agreements and treaties. The three that have the most immediate influence on military space programs are the Limited Test Ban Treaty, the Anti-Ballistic Missile (ABM) Treaty and the Outer Space Treaty. Several other international conventions impinge on space activities, but are very specific or highly technical in nature and do not inhibit the military role of space to the same degree as the three major treaties cited.

The Limited Test Ban Treaty does not appear to influence the military space initiatives of the two superpowers to any great degree. Its major provision enjoined the signatories from carrying out nuclear weapons test explosions, or any other nuclear explosion in the atmosphere, under water or in outer space.[29] The phrase "any other nuclear explosion" includes explosions for peaceful purposes.[30] The provisions of this program would foreclose, however, an antisatellite system that used nuclear explosions. It would also foreclose an exoatmospheric or atmospheric ballistic missile defense system that used a nuclear explosion as a kill device. This injunction might pose a restriction on superpower space plans; however, these plans are more restricted by the provisions of the ABM Treaty.

The ABM Treaty permits both the United States and the U.S.S.R. to have one limited ABM System to prorect its capital and another to protect an ICBM launch area. There are precise limits imposed on the number of interceptors and launchers that may be deployed, and the characteristics of radars permitted. In addition, to avert the strategic consequence of a technological breakthrough, the ABM treaty prohibits the development, testing, or deployment of ABM systems or components that are sea-

based, air-based, space-based, or mobile land-based.[31] The majot intent of the ABM Treaty was to promote strategic stability by making both superpowers inherently vulnerable to a ballistic missile attack by each other.

At the time of its signing there were few who saw the likelihood of effective national ballistic missile defense. However, there is growing evidence that this one time certainty is becoming increasingly suspect.[32] In fact, Soviet and U.S. ABM research and development funding has continued to grow, with Soviet initiatives exceeding those of the United States. Presently the U.S. Army has the responsibility for the ballistic missile defense efforts for America. The Army is working on both a low-altitude system that could use a nuclear warhead detonation as the kill mechanism as well as an exoatmospheric system still in the concept definition stage.[33]

General Keegan and others point to Soviet initiatives in particle beam research and lasers to suggest that our primary adversary is considering using the exoatmosphere for ballistic missile defense.[34] The deployment of any ABM system with national defense capabilities would be in violation of the 1972 ABM Treaty. However, there is a strong likelihood that the most efficient environment to use these types of systems might be in space. Indeed, this is a major reason to suggest that this will eventually take place.

The Outer Space Treaty, signed by mote than 100 nations, contains two provisions that significantly restrict military activities in space. First, it enjoins the contracting parties from placing in orbit around the earth, or installing on the moon or any other celestial body, or otherwise stationing in outer space *nuclear* or any other *weapons of mass destruction.* Second, it limits the use of the moon and other celestial bodies to peaceful purposes and forbids the establishment of military bases, installations, fortifications, and weapons testing on celestial bodies.[35] It makes no provision for verification, and any party to the treaty may withdraw 1 year after giving written notification.

The implication of these Outer Space Treaty provisions for the possible enlargement of either U.S. or Soviet military space activities is obvious if the terms of this agreement are to be complied with. The interpretation of exactly what constitutes a *weapon of mass destruction* will certainly come to dominate the future military space debate. High-energy lasers or other directed-energy weapons could be construed as such systems. However, the potential for selective and controlled use of high-energy laser weapons suggests that they cannot be easily included in any definition of indiscriminate weapons of mass destruction, such as nuclear, chemical, or bacteriological. In his analysis of the coercive capabilities of high-energy lasers, Beane observes that "It is a clean, discriminating weapon, not one of mass destruction. . . . Because the laser is unique, it can be used in unique ways."[36] In his comprehensive look at the legal implications of directed-energy weapons, Fessler says, "There is little consensus in either academic or political circles as to precisely what is meant in the use of the language *any other kinds of weapons of mass destruction.*"[37]

The suggestion that international space treaties can serve as an effective impediment to the introduction of strategic defensive weapons in space is contradicted by the following arguments. First, included within each of the three major treaties that most directly affect military applications in space are articles for either amendment or termination. Article IV of the Limited Test Ban Treaty permits any of the signatories to withdraw after 3 months' advance notice.[38] The ABM Treaty between the United States and the Soviet Union provides for amendments and allows each party to withdraw after 6 months' advance notice if it decides its

supreme interests are jeopardized.[39] Article XVI of the Outer Space Treaty provides for unilateral withdrawal from its provisions 1 year after notification of intent.[40] Thus, space treaty provisions give the United States no more than 1 year to recover from the announcement of Soviet intentions to deploy military systems in space that fall outside the confines of international agreements.

Second, as evidenced by recent Soviet actions, they may choose to violate the provisions of the space treaties without notification or explanation. Clarence Robinson points out the following Soviet record: (1) The Soviets have tested an air defense system in an antiballistic missile mode that is a clear violation of the ABM Treaty; (2) During recent war games, the Soviets exercised a 2-5 day reload procedure for the SS-18 heavy ICBM in violation of the SALT accord; (3) Tests of a new submarine-launched ballistic missile used encrypted telemetry that is also a violation of SALT provisions; (4) A new Soviet air-launched cruise missile was tested from the *Backfire* bomber with a missile range greater than 600 km, the maximum distance permitted by the unratified SALT 2 agreement; (5) the SS-18 is clearly designed to carry 12-14 reentry vehicles, not the 10 limited by SALT 2.[41] One arms control expert concluded, "With the deployment of the flat twin movable ABM radar system, the new missiles tested against RVs (reentry vehicles) and the battle management radar around Moscow, the Soviets are building toward a capability to break out of the ABM agreement with a clear-cut capability and leave the U.S. behind."[42] There appears to be little doubt that the Russians do not feel obliged or constrained by the provisions of military arms agreements when they can see distinct advantages accruing from their violation or abrogation.

Space Policy Alternatives. There are at least four major space policy alternatives that the United States could pursue in meeting the Soviet challenge. First, we could choose to ignore Soviet space activities and conserve defense resources for other priorities. Second, we could seek to dampen the pace of Soviet military developments in space through treaties. Third, we could focus our efforts on research and development programs as a hedge against a Soviet technological surprise. Finally, we could choose to exploit the medium of space to our own advantage, thus seizing the high ground before the Soviets do. The following discussion examines the implications of these space policy alternatives for U.S. security interests.

Option 1: Do Nothing. The option to do nothing in space does not have strong or broadly based support in the United States. However, there is a vocal minority that advocates the reduction or elimination of our military activites in space. This opposition is a byproduct of the political activism of a host of single issue pressure groups whose programs cut across environmental, arms control and minority rights issues. Those who argue for no U.S. involvement in space are concerned primarily about the possible fouling of another environmental medium, or that the space resource investments could be better spent on earth, ministering to societal ills. Counterarguments based on the needs of national security fail to impress these "true believers" because of the zealousness of their convictions and disbelief of a Soviet threat. Although sincere in their beliefs, antispace lobbies often display an unfortunate naiveté about the factual aspects of space exploration, the false simplicity of transferring funds from the space program to cures for societal ills, and the nature of Communist purpose.

Fortunately, there are very few who argue for absolutely no U.S. activities in space. However, whenever military space applications are considered, this

small coterie of negativists are often joined by peace groups and arms control spokesmen who insist that the United States must demonstrate unilateral restraint.[43] Many liberal political leaders suggest that if the United States would only demonstrate unilateral military restraint, then surely our major adversary will see the wisdom in that policy and follow suit. Unfortunately, the Soviet record does not support this view.[44] The evidence is diametrically opposed and the dangers of following such a program would constitute an abrogation of our obligation to provide for the common defense.

The general strategy of the "do nothing" school of thought is one of delaying, stretching out, continually questioning and carping, in order to stall critical programs. *Air Force Magazine* referred to the advocates of this policy as "fuzzy thinkers."[45] While this criticism of their intellectual capability appears harsh, it certainly could be ascribed to their policy recommendations.

Option 2: Negotiate. For the two decades that the United States has been actively involved in the space age, administrations have attempted to define U.S. military space objectives and to develop strategies to attain them. Unfortunately, the clarity of our stated policies and the emphasis placed on reaching our objectives have ebbed and flowed with successive administrations. Some have tackled the issue with vision and ambition, witness the *Apollo* program; others have tended to founder in indecision, witness the *Dyna Soar,* MOL and Space Shuttle programs. A common thread throughout the two decades, however, has been the determination to resolve diplomatically, through international conventions and agreements, the problems associated with extending military conflict into space. In fact, there are at least seven major multilateral treaties and numerous U.N. documents that govern everything from the exploration of celestial bodies to the rescue of astronauts in distress.[46]

The Carter administration was deeply committed to a continuation of these efforts. The desire to negotiate agreements on the peaceful use of space was the linchpin of the Carter space policy.[47] The risks and costs of this approach in terms of Soviet advances and lagging U.S. efforts are profoundly disadvantageous to American security. Examples of this approach include the Moon Treaty, a relatively innocuous document governing the exploration of outer space, but one that could have adverse implications for American access to the resources of space.[48]

While pursuing this diplomatic approach to defense, the last administration favored an agreement to preclude antisatellite and other offensive military weapons in space. This initiative continues the mind set of being permanently on the defensive. Endemic to our conventional and strategic nuclear policy, this defensive approach also underlies our space programs. It is still too early to determine which direction the Reagan administration will take as far as negotiating a solution to space defense is concerned.

The New York Times has characterized our current space program as being dominated by the single goal of developing the Space Shuttle.[49] Even that goal appears to be hampered now by "NASA's putative nonchalance about schedules and operational aspects, (which) threatens to turn this program into a management nightmare."[50] Another expression of this malaise was expressed in a 1978 policy statement that spoke of space as a place to work, and of a space program that should be modest and balanced. According to the White House, "It is neither feasible nor necessary at this time to commit the United States to a high challenge space engineering initiative comparable to Apollo."[51]

An even clearer appreciation of the Carter policy can be gained from former Secretary Brown's Annual Report for FY 81. Our security interest in space is covered by the single statement: "More generally, our economic well-being and security depend on expanding world trade, freedom of the arteries of commerce at sea and in the air, and increasingly on the peaceful and unhindered uses of space."[52] As far as directed energy technology (lasers and particle beams) is concerned, our stated policy is "to concentrate our efforts on identifying the scientific and engineering uncertainties associated with this technology, determining means for their resolution, and determining the feasiblity and utility of directed energy weapons."[53] This can hardly be interpreted as a policy for achieving a U.S. technological lead in this potentially revolutionary scientific area. At best, it is a risky, moderate hedge against a Soviet technological surprise.

Present national space policy is governed by the National Aeronautics and Space Act of 1958. This act established the National Aeronautics and Space Administration (NASA) as the responsible agency to direct aeronautics and space research and development. The act also designated the Department of Defense as responsible for "those activities peculiar to or primarily associated with the development of weapons systems, military operations, or the defense of the United States (including the research and development necessary to make effective provisions for the defense of the United States)."[54]

There is a growing concern that this dual responsibility has become detrimental to the national security interests of the Unired States. This is because of NASA's lead on the Space Shuttle program which has primarily military payloads, and the diverging civilian-military influence on setting space goals in general. A sobering analysis of just how deeply divided the separate communities within our space program have become was offered by *Air Force Magazine*. It indicated that the division is both one of a bureaucratic nature, which is probably resolvable, and also one of seeking different goals, which might continue to fester.[55] In fact, senior editor Ulsamer suggests that, "Two decades into the Space Age, in the absence of a clear national space program, the Air Force and NASA have yet to sort out precisely how the national defense possibilities in space should be managed."[56] Some officials contend that because the national security mission of the shuttle is its reason for being, the Pentagon ought to be in charge of the program.[57]

Revised responsibilities and goals for space are not entirely a NASA responsibility, given both Congressional and Administration guidance. Dr. Mark stated "that the objective of rhe firsr decade of American activities in space was to establish the *U.S. leadership* in space activities by placing men on the moon and returning them safely to earth" [emphasis added].[58] He suggested that in the 1970s we concentrate on developing a space transportation system that would preserve and enhance that leadership. In light of numerous manned and unmanned Soviet space missions, many responsible commentarors are not nearly so satisfied that this conclusion is warranted.

Option 3: Prepare. The third U.S. space policy option argues for an increased military role in space, but solely to deny the Soviets any strategic advantage. This position is probably most compatible with thinking within the Air Force. It requires an aggressive research and development program to promote defensive space-based systems, with the Air Force taking the lead and managing its own destiny, but consrrained by past treaties and future conventions.

It is neither possible nor desirable to identify an Air Force space policy different from that of an incumbent administration, because of the primacy of civilian control that is rightly the cornerstone of our political-military relationship. However, this does not mean that a Service cannot advocate a greater role for a particular weapon system or even for a greater use of a particular medium. For more than two decades the U.S. Air Force has been a leading advocate of a significantly increased military use of space. It presently has a separate Space Division, Space Defense Operarions Center and is creating a Consolidated Space Operations Center to be operational in the near future.[59] "In Planning long-term exploitation of space for national security purposes, the Air Force System Command's Space Division at Los Angeles, California, is coming up with blueprints for a comprehensive space strategy and even an orbital force structure," according to a recent *Air Force Magazine* report.[60]

The Air Force position was clearly articulated by recently retired Maj. Gen. William Yost whose last assignment as the Director of Space Systems ar Headquarters Air Force offered an excellent vantage point. He said, "Space systems are crucial to the expansion of our territorial force capabilities. It provides that force multiplier effort which is so critical in a period of limited resource and diverse national priorities for those resources."[61] General Yost's conclusion about the military role and use of space is much more far reaching than that of the Carter administration, but it also suggests that space must compete for its share of limited defense resources. In this competition it runs into a stiff battle because it is still viewed by many as somewhat esoteric, having little to do with operations, maintenance and force readiness.

There are Air Force advocates for a greater military role in space, but their opinions are organizationally fragmented without a definitive sponsor at the Air Staff level. An Air Force staff officer charged with long-range planning acknowledged that space was important, but it had to be balanced with other competing requirements.[62] Certainly the Air Force is interested in the greater military application of space, but it is bound both by Administration and Congressional interest and by its own bureaucratic/organizational makeup. This condition will prevail as long as the Air Force manages the space functions.

The U.S. Air Force is charged with the mission of organizing, training, equipping and sustaining forces for conducting space operations for (1) space support, (2) force enhancement and (3) space defense.[63] Each of these missions entails a series of tasks that could be very far reaching and have the growth potential for a much wider application. As currently proposed the missions are all passive. This probably results from the requirement to be supportive of past policies, such as the several treaties, conventions and arms negotiations in which the United States has participated. Certainly this is understandable; however, the stakes are getting higher and reactive shifts in national policies waste valuable time and resources.

In a recent speech General Yost commented "that perhaps the most exciting and promising view of the future is given by the idea of *total battlefield management* made possible by space assets" (emphasis added).[64] Certainly this is a likely phenomenon in the year 2001; however, it does not go far enough. It reveals the continued view that the most likely scenario for future conflict is of a terrestrial nature. After all, that is where the overwhelming bulk of the present balancing of requirements is taking place. However, what is just as probable is that *space itself will be the battlefield of the future!*

The authors see this likelihood, for good or ill, as being the more credible. Defensively oriented, organizationally fragmented, and internally "balanced" programs may leave us singularly unprepared to control our destiny against a Soviet supremacy in space, unless we act dramatically to change our present course.

The problem of bureaucratic infighting and extended political debate was foreseen by Gen. Thomas D. White more than 20 years ago.

> Once we attain the space capability, a lack of centralized authority would certainly hamper our peaceful use of space and could be disastrous in time of war. Failure to properly coordinate peaceful space activities under common direction could cause confusion. . . . In war, when time is of the essence and quick reaction so necessary, centralized military authority will surely be mandatory.[65]

Certainly the Air Force Manned Orbiting Laboratory (MOL) was a victim of this confusion seen by General White. The MOL cancellation along with the retarded entry into directed-energy weapon projects can be laid at the doorstep of bureaucratic failings.

> The question can again be asked, What appears to be a logical future program? The answer is not easy. It is very difficult to make a firm prognosis on military need during a twenty-year period for something as new and revolutionary as ballistic missiles, with satellites, and space vehicles. We are somewhat in the same position today as were military planners at the close of the First World War when they were trying to anticipate the employment of aircraft in future wars.[66]

This eloquent view was expressed by Gen. Bernard Schreiver in 1959 and the question is just as germane now as then. However, the answer was also partially provided in the same year by General White,

> Airmen throughout the world have learned that the capability to control the air above the earth's surface permits freedom of movement on the land and seas beneath. As we progress into space, I feel sure that our capability to *control space* [emphasis added] will assure freedom of movement on the surface of the earth and through the earth's atmosphere.[67]

The three space policy options just discussed fall far short of the goal suggested by General White. Therefore, a fourth oprion aimed at providing the United States an unmistakable military advantage, is suggested as both reasonable and attainable by the year 2001.

Option 4: Compete. Beyond the prospect of trying to stay even with the Soviets and hedging against a technological surprise in space, another policy option is to pursue an aggressive space program aimed at achieving U.S. space superiority. Although contrary to current policy preferences, space superiority is eventually certain to follow such well-articulated U.S. military doctrines as air superiority, naval superiority and technological superiority. However, this change in thinking is not apt to occur until after the first military confrontation in space has taken place. Because of the strategic consequences of spaceborne combat to our national survival, the apparent concentration of Soviet resources in this area, and the technological leadtime required to deploy an offensive space capability, waiting until the first shots are fired may prove to be too late. As stated by Air Marshall Giulio Douhet many years ago, "Victory smiles on those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur."[68]

Whereas critics of this policy of seeking space superiority might suggest that it would engender an arms race, we are persuaded that we might otherwise have the making of a Soviet unilateral arms race. General Graham confirmed this opinion when he said, "In my view, there is an arms race going on, and the Soviets are running almost as hard as they can. So the idea that they would suddenly take off if we did something about the balance is really not in the cards."[69]

From the lessons of history it might be well to note that while arms races might have been a contributing cause of an armed conflict, the importance of a real or perceived power imbalance between rival powers has been of paramount importance as a cause of war. In fact, it was just such an imbalance that Thucydides posited in his *History of the Peloponnesian War* as the reason for the strife that destroyed the Greek city states civilization.[70] The great paradox for today's world is the juxtaposition of the Athenian's (United States) becoming the descendant power, whereas Sparta (U.S.S.R.) is the ascendant power.

In 1974 Secretary of Defense Schlesinger pointed out that essential equivalence did not require that opposing forces be absolutely equal or a mirror image, but he did suggest that neither side could have all the force posture advantages.[71] Because of the tremendous costs associated with the maintenance of large standing conventional forces and its requisite manpower intensiveness, it is unreasonable to believe that the United States can reverse the present conventional or general-purpose force imbalance. This is especially difficult not only because of Soviet production quantities, but also because of Soviet technological advances that have eroded the West's once huge advantage in this area.

The momentum of Soviet strategic initiatives also has allowed them to surpass the United States in almost all of the static, and most of the dynamic indicators of strategic capabilities.[72] The "window of vulnerability" of U.S. land-based ICBMs will extend at least into the late 1980s. Unless Soviet efforts are constrained appreciably, the "window" will open even wider.[73] Many national security analysts have suggested that the United States can never expect to regain strategic superiority because of the cost of such an effort, ongoing Soviet programs, and the ephemeral nature of the concept itself.[74]

If we are to gain any military leverage over the Soviet Union and the traditional avenues of gaining military power are foreclosed, are we to throw up our hands and accept "essential inequivalence"? The authors contend that the United States does not have to be frozen into inequality. We should restore the initiative to the Department of Defense to exploit space for both *active defense of the United States* and for *strategic offensive missions* using manned space platforms and directed energy weapons as necessary. The primary candidate for such a program would be a space-based laser system that is entirely within our capability. According to General Graham, "the curious thing is that we could get a space-borne defense quicker than we can deploy the 200 MX missiles in the way the Carter administration wants. As a matter of fact, getting a space-borne defense deployed would carry less technological risk than our decision years ago to deploy the Polaris submarine."[75] Although this appears to be a highly optimistic assessment, it is indicative of what might be done if we act decisively now. If essential equivalence is to be restored to the power equation, then it is time for the United States to seize the high ground of space and to exploit its military potential.

The basic motivation for pursuing this policy of aggressive competition can be summarized by the startlingly clairvoyant premonition of James H.

Doolittle when he said in *1959*, "We, the United States of America, can be *first* [emphasis added]. If we do not expend the thought, the effort, and the money required, then another and more progressive nation will. It will dominate space, and it will dominate the world."[76] In 1974, Gen. Jacob E. Smart gave us the same message with these words, "Today and henceforth the United States must be prepared to defend itself against aggression *in* space and *from* space. We cannot surrender the 'high ground' without contest. We must be in space to acquire knowledge of what others are doing there and to prepare to counter that which threatens us."[77] We are concerned that we have foresworn the progressive nature that Generals Doolittle and Smart presaged, and we now find ourselves in the position posed by Paul Fitzgerald of NASA, "We can't sit here on earth when we can go to the moon and the planets with all our instruments and our people, anymore than our forefathers could sit on Plymouth Rock with the whole continent before them. *There is just too much to learn to be complacent.*"[78] This call to action is even more urgent with respect to our complacency in preserving and promoting the security of our nation.

What Should Be Done? The authors recommend that the U.S. strategy in space should be closely aligned with Option 4 for many of the reasons already mentioned. First, it is in our national interest to preserve and defend the uninhibited access to space for our growth and survival. Second, the Soviets have set forth the challenge; their activities in space and their programs under development reveal their intentions and capability to exploit the regions of space for their own strategic military advantage. Only a credible counter-challenge by the United States can temper Soviet plans. Third, the size, complexity and cost of future military space systems rule against a successful U.S. crash effort to overcome the crippling effect of a Soviet technological surprise. Finally, negotiated treaties and agreements may lure us into a false sense of complacency allowing the Soviets to advance unnoticed their long-range plan for global dominance.

In order to set a new course for American space policy, three actions must be taken. These actions involve setting a new vision for the future, creating a suitable organizational structure, and providing adequate funding. In our democratic society, organizational interests and bureaucratic politics have a way of impeding our progress toward countering what now appears to be a clear and present danger. If these immediate barriers are to be overcome, then a concerted effort by the Congress and the new Administration is required.

A New Vision: During the course of the recent national elections there was an underlying current of thought that suggested America's concern with military superiority was at best a reactionary policy that could lead to superpower confrontation. Indeed it was viewed by many defense pundits as an attempt to recreate the halcyon days of U.S. nuclear superiority of the 1950s. While this view was treated as a retreat to the past, it actually deserves to be cloaked in the mantle of a new vision for America. Exploitation of space is attainable, but only if we have a vision and the leadership willing to undertake the task.

The decade of the 1980s could be analogous to the 1960s, when America had the vision of President John F. Kennedy leading us into a New Frontier, including the advancement of American initiatives in space. It is scarcely believable that President Kennedy's prophecy that we would put an American on the moon within the decade would come to fruition in the summer of 1969.[79] We are on the precipice of a revolutionary capability in

terms of the military role in space for the decade of the 1980s. If we are to reach that goal, it will require all of the elements that underwrote the Man on the Moon program of the 1960s. The risk this time, however, is greater because of the dynamics associated with the ongoing Soviet programs. The question, "Can it be done?" while germane, should be better phrased "Can we afford not to undertake it?"

It can be done, because it is in the area of highly complex space technology that we still have the clear advantage. The comments of Lt. Gen. Richard C. Henry are particularly pertinent. From his vantage point as the Commander of the Air Force Space Division he stated, "I will argue that our largest technological advantage lies in the sophisticated machinery that we put into space. If we can but properly exploit that advantage, we may compensate in military efficiency for what we lack in men and material."[80] He goes on to suggest what may be a reality by the year 2001. "By taking advantage of space, the expression Iron Curtain and all that it implies, can disappear from our vocabulary."[81]

Organizational Structure. To bring the new vision set for America to fruition, we need to create an organizational structure with the direction, leadership and funding to see it through. First and foremost is to separate the military activities in space from the civilian uses. There is a real, overriding and critical requirement to create a separate and distinct military organization to focus our efforts and to make operational the military applications of space. This organization would have to be assimilated from the presently diverse interservice and civilian agencies that are presently involved in space.

By 2001 the eventual goal of our proposal is the creation of the U.S. Space Force, independent of the other military services. The rationale developed for the U.S. Air Force as a separate entity from the Army can now be applied to space. In a remarkably prescient work Brig. Gen. Perry Smith captured the very heart of this argument in his assessment of the Army Air Corps leadership from 1943-1945. As he states, "The argument put forward in the plans, in the press, and before Congress was that autonomy was necessary since the air was a separate environment from the land or the sea, and that . . . equality with the Army and the Navy was thus . . . necessary."[82]

Space is a place; it is not a mission. It is an environment as distinct from air, as air was from land or sea. Interestingly, however, the Air Force argument for autonomy in 1945 did not simply stop at this point. Air Force leaders argued that the strategic importance of technological improvements in aeronautics strongly suggested that airpower would have the paramount role in providing for national defense.[83] While there is still a requirement for the three traditional military forces for the foreseeable future, there is also the stark realization that in the not too distant future, space will be the dominant medium for the maintenance of national security.

A particularly salient issue discussed by General Smith as a reason for a separate autonomous Air Force and one that is also true for the suggested Space Force, is that it would be a major claimant in the budgetary process. Whereas the Air Force planners openly asserted a desire for an equal share of the national defense budget, they inwardly felt that an even larger share was attainable because of their predominant mission. They were proven to be right, much to the chagrin of their sister services.[84] A separate U.S. Space Force would be in a much better position to increase and certainly to consolidate the military space budget.

Besides consolidating and increasing the space budget, a separate space force

should also provide the much needed organizational cohesiveness that is now lacking in the military space program. This cohesiveness would promote an element of reinforcement and consistency in the space initiatives to be undertaken in the next two decades. These psychological concerns are essential for providing the motivation required to promote activities that will often be of necessity on the forefront of technology. In fact, it is entirely likely that there will be a significant number of failures or near misses, and without pioneers continuously reinforcing one another, the process could not be sustained. If these events occurred in an organization that had pressing terrestrial concerns, one could easily see where the lack of reinforcement, indeed even ridicule, could doom the program.

The last major benefit that better organizational cohesiveness would have is the establishment of a well thought out doctrine for both the employment of and need for space systems. Often doctrine has been an afterthought or the stepchild of military forces. The primary function of a separate space force would be to equate space doctrine with the requisite space force structure. In fact, the doctrine should be addressed as a matter of principle long before space weapons systems are operationally fielded. A separate organization unfettered by diverse bureaucratic balancing acts would be better able to promote this critical function than several space divisions, branches and agencies each trying to justify its separate existence within one of the three major services or within the Office of the Secretary of Defense. The experience of a separate U.S. Air Force has demonstrably proven many of the points made in support of the organizational model suggested.

As an example of how a separate organizational structure can be effectively used to fulfill a new military vision, we can take a page from the Soviet Strategic Rocket Forces. The idea of the "Revolution in military affairs" dominated the lexicon of Soviet military doctrine during the 1960s and 1970s. The Soviet Strategic Rocket Forces were made the preeminent and elite arm of the Soviet Armed Forces.[85] They have fostered that role ever since their creation, with the result that in two decades they surpassed the United States in nuclear delivery potential as well as carved out a major role in the space program of the Soviet Union.[86] The decision to make a fifth service in the Soviet Union was strongly resisted, but Khrushchev and Malinovsksy persevered and the results have borne out their desire.

Funding: Our commitment to a new vision of expanding our role in space must also be matched with a commitment of adequate and sustained funding. The space budget in the present Five-Year Defense Program is deemed totally inadequate to support the space program on which we should be embarked.[87] A separate space organization with only a space mission to concern itself with would almost certainly be able to increase the funds necessary to pursue its diverse tasks. As a minimum it would consolidate the budgetary process and reduce organizational duplication.

Given a sagging economy, and orher social and defense spending priorities, allocating funds for a massive new space effort will be a difficult proposition at best. It becomes a matter of priorities. The choice is easy if the immediacy of the Soviet challenge is perceived and the threat to our freedom and national survival is evident. It may be necessary to abandon our conservative approach of trying to match the Russians tank for tank and missile for missile, and take the high risk/high payoff approach of achieving space superiority to negate the military and political potency of Soviet conventional and strategic

nuclear forces. With the likely prospect of deploying the major elements of a spaceborne laser antiballistic missile defense system within the same time as the deployment of the planned MX system, it may be prudent to forego the latter, thus releasing substantial funds for a military space system.

What is sought here is not a sideline event that could be achieved without a national commitment, sacrifice, and sense of purpose. It goes to the very heart of what we stand for as a nation and the hostile forces that are present in the world today. We can decide to act now while there is still time to recover, or we can wait until we are confronted with another *Sputnik*-like event that will shake us out of our lethargy.

Conclusion. In tracing our interests in space and the Soviet challenge confronting us today, we have suggested that the United States is presently delinquent in fulfilling its obligation under the Constitution of "providing for the common defense." The technological feasibility of placing in space a directed-energy weapon, such as a high-energy laser with the potential to destroy a long-range bomber or a ballistic missile in flight, is currently available for either the United States or the Soviet Union to exploit. To stand by and allow the Russians to freeze us into strategic nuclear impotence is tantamount to national suicide. To be lulled into complacency by the lure of negotiating against the military use of space is unforgivably naive for a great superpower. To strive for "essential equivalence" in space by attempting to match Soviet initiatives is to allow them the edge in all areas—general purpose, theater nuclear, strategic nuclear, and space—and the political leverage that accompanies that perception of military power. Our only acceptable recourse is to recognize the inevitable danger now, and to engage the Soviets aggressively in a race for the high ground of space in order to secure for ourselves a position of space superiority that can provide the bedrock for our future security doctrine.

BIOGRAPHIC SUMMARY

Lieutenant Colonel Dino A. Lorenzini, an Air Force Academy graduate, holds advanced degrees in Business Administration and Management from Auburn University and Astronautical Engineering from MIT, receiving his Doctorate of Science degree from the latter. He has served in several Air Force engineering, research, and program management positions. His articles, "How Much is Not Enough? The Non-nuclear Air Battle in NATO's Central Region" and "A Framework for Choosing Defense Forces" have been published in recent issues of this journal. He is a member of the Management Department faculty of the Naval War College.

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