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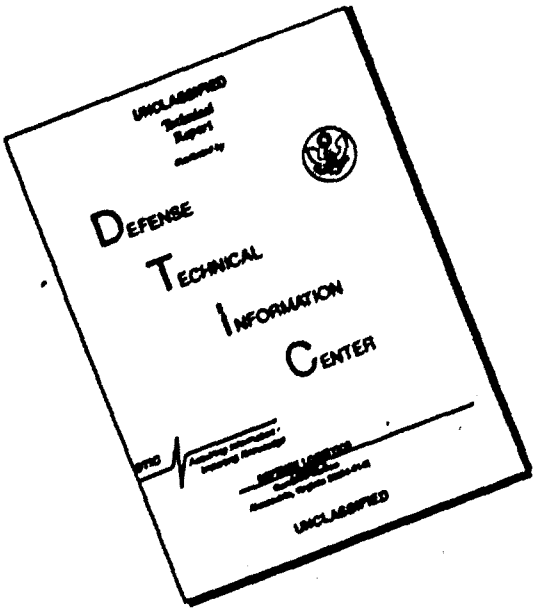

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ABSTRACT

This thesis examines the legal issues and implications surrounding the potential military use of the permanently manned international space station. In order to accurately analyze and predict possible military missions for the station, knowledge of the evolution of the manned military role in outer space, the development of United States' policy regarding the military use of the medium, and the characteristics and capabilities of the space station itself, are all essential. Chapters I and II address these subjects. The provisions of the specific legal instruments governing the space station are reviewed and discussed in Chapters III and IV. The final chapter examines what role international space law will play in governing the military use of the station. A brief conclusion assesses the likelihood of certain military uses in light of practical, legal, and political constraints.

RESUME

Cette thèse examine les issues et les implications légales concernant la possibilité d'usage militaire d'une station interstellaire internationale avec équipage permanent.

Afin d'analyser avec précision et prédire la possibilité de missions militaires pour la station, la connaissance de l'évolution du rôle militaire de l'équipage dans l'espace interstellaire, le dévelopement de la politique des États -Unis regardant l'emploi militaire du milieu et les caractéristiques et les capacités de la station elle-même, sont des plus essentielles.

Les chapitres I et II touchent à ses sujets. Les clauses legales des instruments précis gouvernant la station interstellaire, sont révisées et discutées aux chapitres III et IV.

Le chapitre final profile quel rôle sera joué, s'il y en a un, d'une loi internationale interstellaire, déterminant l'usage militaire de la station.

Une conclusion brere, etablissant la probabilité de certains usages militaires, considérant les contraintes pratiques, légales et politiques, suivent.

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INTRODUCTION

In his State of the Union address on the 25th of January, 1984, President Ronald Reagan announced that he was "directing NASA to develop a permanently manned space station, and to do it within a decade ...."[1] Far from a new idea, the National Aeronautics and Space Administration had attempted to attract public and Congressional support for such a project for over 25 years. The agency viewed a manned space station as an integral and necessary component of its charter to explore and exploit outer space. In each attempt however, NASA was rebuffed by successive administrations with differing economic and space priorities. The enormous cost of a permanent presence in space invariably figured into the death of each proposal, a fact not lost on NASA managers. Thus, when the President went on to add that "We want our friends to help meet these challenges and share in the benefits ...." his motives were not purely altruistic.[2] Participation would, of course, require a financial contribution from those wishing to join in the endeavor.

The decision by the United States to encourage a significant degree of international participation in the space station program has had far-reaching effects. While international involvement may have been seen by the U.S. as a necessary means of ensuring the viability of the program, it has not come without a price. Potential partners demanded a meaningful role in the design, development and management of the space station, one commensurate with their sizeable investments. Previous

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[1] President's State of the Union Address, 20 Weekly Comp. Pres. Doc. 87 (Jan. 27, 1984).

[2] Id.

international projects involving NASA tended to be lopsided affairs, with NASA as the dominant partner. Consequently, talks between the parties were difficult and protracted. There were a number of contentious issues raised and dealt with in the negotiations only recently concluded,[3] but none more intractable than that of the U.S.' insistence on using the space station for national security purposes. Raised at the eleventh hour by the United States, the issue was nearly the straw that broke the camel's back. After repeated assurances spanning a four year period that the U.S. Department of Defense (DoD) had no use for the proposed station, the U.S. abruptly reversed course in late 1986. A variety of motives were suggested for this unwelcome turnaround, most prominent among them the belief that the U.S. wished to ensure the station would be available for SDI[4] research. For the U.S.' space station partners--Canada, Japan, and a number of the member nations of the European Space Agency (ESA)--the possibility of DoD involvement had troublesome political and legal implications. The project had been touted, and sold at home, as a civil space station dedicated to peaceful pursuits. DoD's demands for access to the station threatened to dissolve support for the expensive program that had been so meticulously cultivated. Eventually language was agreed upon, and the issue resolved for the moment. DoD use of the station is permitted, subject to the provisions of the governing multilateral and bilateral instruments.

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[3]The inter-governmental agreement between the United States, Japan, Canada, and participating ESA members, governing the detailed design and operation of the space station, was signed in Washington D.C. on Sept. 29, 1988.

[4]SDI stands for Strategic Defense Initiative, a largely space-based ballistic missile defense program under development in the United States.

In arriving at a solution to the military use issue, the potential existed for the parties to do something that has eluded all others; define in an international, multilateral instrument precisely what, at least among the parties, constitutes an acceptable level of military involvement in outer space. Granted, the agreement would be binding only among the signatories and even then be limited in application to the space station. Nevertheless, placing in writing the views of virtually all of the Western space-faring nations on the subject would have carried considerable precedental value. The world has been struggling for over thirty years with the question of the scope of permissible military activity in outer space. The opportunity present in the space station negotiations was that of being able to begin the process of establishing concrete rules and guidelines.

The purpose of this paper is to examine the solution reached and assess its impact on space station operations. In an extensive and detailed preliminary section, the evolution of the manned military role in outer space is examined. This serves two purposes. First, it provides background information on various manned military space systems proposed over the years and how they fared in the developing political and legal environment. Second, the information gives the reader a sound basis, in conjunction with the technical details regarding the station contained in Chapter II, for predicting the most likely military uses of the station. The remainder of the paper concentrates on the legal regime that will govern operations on-board the space station. This regime has been established by a multilateral inter-governmental agreement signed between the U.S. and its partner nations, and bilateral memoranda of understanding concluded on an agency-to-agency level. In the final chapter, a review

of selected provisions of international legal instruments that will affect space station activities is conducted. Finally, in a brief conclusion section, the practical, legal and political constraints are tied together to provide an assessment of what the future may hold for the space station.

CHAPTER I: EVOLUTION OF THE MANNED MILITARY ROLE IN OUTER SPACE

Chapter I.1: Pre-Sputnik Ideas and Policy Development

A. Early Concepts. The thought of man travelling through space has captured the imagination of writers and philosophers for centuries. From Lucian's second century account of a sailing ship being swept by winds to the moon[1] to Jules Verne's De la Terre a La Lune (From the Earth to the Moon)[2] published in 1865, voyages to the moon and the stars appeared in dozens of fictional accounts. Somewhat less prevalent in popular literature were stories focusing on earth-orbiting spaceships or satellites. The first known proposal for a manned satellite appeared in serialized form in 1869, in a story entitled "The Brick Moon."[3] Constructed of brick for its strength and resistance to heat, the primary purpose of the author's artificial moon was to serve as a navigation aid to ships. Other uses mentioned or implied in the text included relaying messages between two points on earth, and serving as an observation platform. While none of the imagined activities were carried out for military reasons, all could easily have been adapted to that end. Decades later more serious proposals for placing a man in orbit appeared in scientific journals, and began to emphasize the military potential of manned satellites. A German scientist, Hermann Oberth, was the first to offer a technically detailed plan for a space station, a term he coined, in his Die Rakete zu den Planetenraumen (The Rocket into Planetary

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[1] Recounted in W. von Braun and F. Ordway, History of Rocketry and Space Travel, at 9 (rev. ed. 1969).

[2] J. Verne, From the Earth to the Moon (1970 ed.).

[3] Hall, The Brick Moon, Atl. Monthly, Oct. 1869, at 451; Nov. 1869, at 603; Dec. 1869, at 679.

Space), published in 1923.[4] A short time later, he was quoted as having said that from a space station "one can observe and photograph inaccessible countries" by using a large mirror.[5] When he revised his station design in 1929, Oberth was more direct, listing "military defense" as a use, along with: 1) a greater understanding of the cosmos through celestial observation; 2) meteorological observations and global communications; 3) interplanetary exploration (the station serving as a jumping off point); and, 4) scientific research.[6] Oberth's list of possible uses has been a feature of virtually every space station proposed since World War II.[7] The military potential inherent in manned space stations was thus evident in the earliest concepts, and recognized decades before the practical problems associated with spaceflight were solved.

The fictional accounts of space travel employed a wide variety of power sources and devices to escape the Earth's gravitational pull.[8] Interestingly enough, few envisioned the use of rockets, a device that had

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[4]H. Oberth, Die Rakete zu den Planetenraumen, (1923). This book started as Oberth's thesis at Heidelberg University. The faculty rejected it. A summary of the book may be found at W. Ley, Rockets, Missiles, and Men in Space 100-104 (1968).

[5]Staff of Senate Committee on Aeronautical and Space Sciences, 87th Cong., 2nd Sess., Soviet Space Programs: Organization, Plans, Goals, and International Implications 56 (Comm. Print 1962).

[6]Space Station Task Force, National Aeronautics and Space Administration, Space Station Program Description, Applications, and Opportunities 10 (1985).

[7]Id.

[8]Including: wind (Lucien); horsepower (Furiso, 16th century); demons (Firdausi, 10th Century, and Kepler, 1634); geese (Godwin, 1630); steam heat (Cyrano de Bergerac, 1652); a giant spring (Russen, 1703); a ladder (Wilson, 18th century); balloon (Edgar Allan Poe, 1835); projectile (Jules Verne, 1865, and others); or, when all else failed, anti-gravity machines, paint, or water. W. von Braun and F. Ordway, History of Rocketry and Space Travel 8-21 (rev. ed. 1969).

been around in primitive form for centuries. It took the burst of development in rocketry during World War II to firmly marry the idea of spacecraft powered by rockets as a means of getting into outer space. Rocket pioneers in Russia (Tsiolkovsky and Korolev), the United States (Goddard), and Germany (Oberth and later, von Braun), had tinkered with small rockets for years without a great deal of success. With the advent of World War II, this interest was directed towards refining the rocket as a weapon. Most successful in this regard was the German V-2 program, which heralded the dawn of the ballistic missile age. Those involved in the V-2 project, including Wernher von Braun, were keenly aware of the missile's combined weapons and man-carrying potential. After the first successful V-2 launch in 1942, one project director told his chief assistants:

> The following points may be deemed of decisive significance in the history of technology: we have invaded space with our rocket and for the first time we have used space as a bridge between two points on earth .... To land, sea, and air may now be added infinite empty space as an area of future intercontinental traffic, thereby acquiring political importance .... So long as the war lasts, our most urgent tasks can only be the rapid perfection of the rocket as a weapon. The development of possibilities we cannot yet envisage will be a peacetime task.[9]

In fact, in 1944 von Braun's fascination with space travel led to his arrest and brief detention by the German S.S. for "over-concentration" on, among other things, manned space ships.[10] The seeds of the intimate

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[9] W. Dornberger, V-2 (1954) as cited in Brandt, Military Uses for Space, Air U. Rev., Nov.-Dec. 1985, at 40, 41-42.

[10] House Comm. on Science and Astronautics, A Chronology of Missile and Astronautic Events, H.R. Rep. No. 67, 87th Cong., 1st Sess. 7 (1961) [hereinafter cited as Chronology].

relationship between space travel and the military exploitation of space took firm root under von Braun's tutelage.

B. Post-World War II and into the 1950s. After the war, both the United States and the U.S.S.R. employed their recently acquired German scientists to further develop the V-2's ballistic missile technology.[11] In the United States, with its nuclear monopoly and vast armadas of aircraft and ships, von Braun's work for the Army was not accorded a high priority. While all military services engaged in rocket and satellite studies in 1945-46, research and development was not funded by the War Department.[12] In 1946 the Navy proposed a joint-service scientific research satellite project to the Army Air Force (AAF). The AAF responded by coming up with a similar satellite proposal of its own, thus extending long-standing inter-service rivalries to the outer space arena for the first time.[13] The AAF viewed space as an extension of the air medium, and therefore its just domain, just as the sea was the Navy's. The Navy felt that space was simply an empty void, available to any service able to use it to enhance its primary missions. A third approach was added to this philosophical debate after the Army and Air Force were split apart in 1947, the Army stating that missiles were really nothing more than a fancy form of artillery. This rivalry and difference of opinions had a

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[11] For a fascinating and very critical account of the Allies' race to acquire and employ the German Peenemunde rocket scientists, see T. Bower, The Paperclip Conspiracy, The Battle for the Spoils and Secrets of Nazi Germany (1987).

[12] In 1947 the name was changed to the National Military Establishment, then to the current Department of Defense.

[13] The Air Force's proposal was drawn up by Project RAND, the Air Force's new think tank carved out of Douglas Aircraft. The detailed, 321 page report, entitled "Preliminary Design of an Experimental Earth Circling Spaceship" was produced in less than three weeks.

profound, long-term effect on the development of U.S. space programs, the reverberations of which are still felt today. In any event, neither service's satellite proposal was funded beyond the study phase, and ballistic missile and satellite development languished. Project RAND, a government controlled think tank, continued to churn out Air Force-funded studies. Industry, meanwhile, continued low-level research and development activities. A 1946 RAND study warned that the quickest way to mount a challenge to the U.S.' military superiority would be through rocket technology--an area the U.S. was paying little attention to. The same study alluded to the political, psychological and deterrent value of being the first nation to launch a satellite.[14] Without a defined military requirement however, funding was hard to get. Most of the money available for space-related research was funneled into the nascent ballistic missile programs, which themselves were viewed with considerable skepticism by the Department of Defense (DoD) rank and file. Although RAND studies in the 1940s and early 1950s frequently cited the potential reconnaissance and communications value of satellites, the usual response was that these functions were being adequately performed by existing means.[15] Other military uses for satellites, mentioned in the Project RAND study of 1946, included use as a weapons carrier to overcome air

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[14]Lipp, The Time Factor in the Satellite Program, RAND, Oct. 18, 1946.

[15]One of these studies, RM-120, a report on a RAND-sponsored conference in 1949 on the Utility of Satellites, also discussed the use of satellites to "open up" the Iron Curtain by "destabilizing" the communist countries through the use of satellite intelligence. It also noted the potential legal implications of satellite overflight, and resolved the "problem" by noting that "a satellite in polar orbit can not be accountable for the Earth's rotation beneath it which carries every country sweeping by." Hall, Early U.S. Satellite Proposals, in The History of Rocket Technology 88-91 (E. Emme ed. 1964).

defenses, for spotting targets, for assessing weather conditions over enemy territory, and for serving as a communications relay from a geostationary orbit. All were viewed as nothing more than science fiction.[16] The fact that the Soviet Union was developing a missile program of its own apparently disturbed few people. As the former head of the Army Ballistic Missile Agency (ABMA) stated in 1960:

> During all this time, the Russians were known to be working on rocket development, but it was fashionable to think of them as retarded folk who depended mainly on a few captured German scientists for their achievements, if any. And since the cream of the German planners had surrendered to the Americans, so the argument ran, there was nothing to worry about.[17]

The Soviet Union repeatedly criticized the U.S.' interest in satellites, directing most of its ire towards the reconnaissance satellites that would be used to "peep in other countries as through a keyhole."[18] Nevertheless, studies of the military value of space continued unabated. According to some, only cost--not technical feasibility--prevented the U.S.' early entry into space.[19] In a 1950 RAND report labelled the "birth certificate of American space policy," the foundation of the U.S.' official attitude towards space was set.[20] Soviet criticism, the study noted, made it advisable to limit comment on the military potential of

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[16]Douglas Aircraft Co. Inc., Preliminary Design of an Experimental Earth Circling Spaceship 9-14 (1946).

[17]J. Medaris, Countdown for Decision 45 (1960).

[18]Staff of the Senate Committee on Aeronautical and Space Sciences, 87th Cong., 2nd Sess., Soviet Space Programs: Organization, Plans, Goals, and International Implications 59 (Comm. Print 1962).

[19]See W. McDougall, The Heavens and the Earth, A Political History of the Space Age 107-108 (1985).

[20]Kecskemet: The Satellite Rocket Vehicle: Political and Psychological Problems, RAND, Oct. 4, 1950.

satellites, and stress the peaceful aspect of "this remarkable technological advance." Furthermore, it was believed that satellites would not in and of themselves be used as weapons or weapons platforms, instead becoming an important component of the national security apparatus in the areas of strategic and meteorological reconnaissance. Thus, according to the study, they carried inherent political connotations. The report dwelled on the expected response of the Soviet Union to a U.S. satellite overflight, as well as such an overflight's implications in international law. Legally, it concluded, it was an open question. The Soviet Union however, was certain to condemn such an act. RAND proposed an effective method of sounding out the Soviet Union and limiting any adverse international response; launch an experimental, scientific satellite into an equatorial orbit, thereby establishing a precedent for later overflights under the most favorable of circumstances. Polar orbits and more explicitly military applications could come later. Since the U.S. only wanted to gain knowledge about a "closed" society--a peaceful, stabilizing intent—the Soviets would not need to respond in kind. The U.S. was an open society, and information that could be had by reconnaissance satellite was easily obtainable by other means. Less than five years later, the International Geophysical Year (IGY) provided just the cover story the study had recommended for the first U.S. satellite.

While the U.S. conducted studies and sorted out policy implications, the U.S.S.R. forged ahead in missile development, leaving the policy problems for later.[21] It took a series of events to force the U.S. out of its complacency, beginning with the end of its nuclear monopoly. The

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[21] W. McDougall, supra note 19, at 108.

U.S.S.R. exploded its first thermonuclear warhead in 1952, and tested its first deliverable hydrogen bomb in 1955. This, combined with increasingly concrete indications that the U.S.S.R. had developed the means to deliver the warhead by using an intercontinental ballistic missile (ICBM), prodded the U.S. military services and the Administration into action. The military's ICBM/IRBM programs were assigned the highest priority. Money began to flow, and concepts blossomed into hardware in the ballistic missile field. The appetite for intelligence information, always strong, became voracious. A joint RAND/industry study on reconnaissance, developed from the watershed 1950 report, evolved for several years. Slowly, it sketched in the details for a complete reconnaissance package. The concept, named "Project Feedback," was approved within Air Force channels in 1954 and ultimately given the weapons system designation of WS-117L. By March of 1955 the Air Force was quietly circulating among industry, plans for a large and sophisticated strategic reconnaissance satellite incorporating the most advanced technology. In 1956, Lockheed was awarded the contract.[22] It was America's first military satellite program to advance beyond the research and development stage. At the same time, the "dual-track" approach of emphasizing the peaceful intent of the U.S. while developing military space systems also made its debut. The promise of the U.S. to launch an earth-orbiting satellite during the IGY gave the Eisenhower Administration the political opening it wanted. In selecting the rocket to launch the IGY satellite, more than technical considerations were involved. All three military services submitted proposals, each

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[22]P. Stares, Space Weapons and U.S. Strategy 29-33 (1985).

employing hardware already under development. Ultimately, the Navy's proposal was selected even though the Army's "Project Orbiter" was more technically sound and could be ready for launch sooner. The Navy's Vanguard, a version of its Viking scientific sounding rocket, was seen as having a more civilian flavor and thus less subject to foreign criticism. Project Orbiter on the other hand, relied upon the Army's Redstone rocket, itself a direct descendant of the V-2. Officially, the Vanguard was selected in order to avoid diverting resources from the military's ballistic missile programs.[23] In fact, the National Security Council (NSC) had decided in May 1955 that the IGY launcher would not be derived from one intended for military use, making the later selection process meaningless.[24] At the same meeting, the NSC had also opined, as had RAND, that a "satellite would constitute no military offensive threat" and that "Although a large satellite might conceivably serve to launch a guided missile at a ground target, it will always be a poor choice for that purpose."[25] Continuing the dual-track approach in the wake of these decisions, the Administration proceeded with a series of public proposals directed at the Soviet Union. All were designed to take advantage of the brief "window of opportunity" existing before the first satellite launch, to preserve space for peaceful purposes. This included at one point, a proposal by the U.S. to preserve space solely for peaceful purposes and submit its space programs to international inspection and

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[23] Id. at 34.

[24] This decision was embodied in NSC Directive 5520, May 26, 1955. See P. Stares, supra note 22, at 34.

[25] P. Stares, supra note 22, at 35.

controls.[26] In light of the WS-117L program, these seemingly contradictory ends were in fact, according to one author, a carefully designed plan to lay the groundwork for the space reconnaissance program should it become necessary:

> ... no hope was more abiding than that of "opening up" the Soviet Union. If it could be done voluntarily in the context of arms control, Eisenhower was even willing to forego a purely national space program. But if that was not possible, then the Soviet Union must be "opened up" by other, clandestine means, and meanwhile a U.S. commitment to the peaceful uses of space and "open skies" was on the record to support the later claim that spaceborne reconnaissance was itself a peaceful activity.[27]

C. The Approach to Manned Spaceflight. Although little official attention was paid to manned spaceflight between World War II and the launch of Sputnik in 1957, decisions made throughout this era were of critical importance to the U.S.' future manned and unmanned efforts. It became clear that the utility of military space systems would be judged not only on the basis of their effectiveness, but on their political implications as well. International opinion was of paramount concern, as was the expected political and military response of the Soviet Union. Space systems that were in and of themselves weapons were not looked upon favorably in this atmosphere, marking the beginning of the aggressive--nonaggressive dichotomy seen today. In addition, military space systems were not to be high profile projects. Touting the attributes of any military system publicly hardly comported with the peaceful image the Administration was trying to cultivate internationally. While this secretive approach was relaxed for a few years after Sputnik--primarily to

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[26] W. McDougall, supra note 19, at 127-128.

[27] Id.

reassure Congress and the public that the U.S. was in fact doing something--it has remained a central tenet of U.S. policy.

The lack of official attention to manned spaceflight in the 1950s was not surprising. The technical challenges posed by launching unmanned satellites were formidable enough. Placing a man in space was infinitely more complex and expensive. In addition, although the military recognized the potential of ballistic missiles, it took repeated RAND studies to gain enough support to pry funds loose for satellite development. Without a defined need for a man in orbit, the necessary support was not there. Another factor affecting the development of manned space systems was the different approaches taken by the U.S. and the U.S.S.R. The Soviet Union perceived ballistic missiles as a way to neutralize the existing strategic imbalance and accorded them a high priority. Included in their development program were ever larger rockets, necessary to deliver the crude atomic warheads then being produced. Large boosters, of course, were also ideal for lofting objects into orbit. The United States' approach, however, reflected the intense inter-service rivalry and division of responsibilities. In the U.S., man first touched the fringes of space not perched on top of an ICBM, but in aircraft. Extending the medium available for manned military operations was of considerable interest to the Air Force. The best way to do this however, was not by using rockets, but by using the mainstay vehicle of the Air Force, the manned, winged, aircraft. The result in the 1950s was the "X" series of experimental aircraft designed to probe the high altitude, high speed regimes. This approach was technically far riskier than the relatively simple Russian method, but was more consistent with the manner in which the Air Force viewed its role in the air and space

medium. The Army, with its belief that rocketry was just an advanced form of artillery, had no use whatsoever for a manned program.

While most of DoD and the military services may have been less than enchanted with manned space vehicles, the public was not. In March 1952, Collier's magazine devoted most of an issue to a symposium entitled "Man Will Conquer Space Soon." Included was an article by Wernher von Braun in which he envisioned a space station that would serve to "not only preserve the peace but ... take a long step towards uniting mankind."[28] Later that year he described a manned Mars expedition before the International Astronautics Federation. Von Braun's views conformed to the times however, in that he believed peace could be maintained only through strength; in December of 1952 he stated that his aims for a space station included the ability to curb Soviet military adventurism. He predicted that "With powerful cameras and telescopes, a crew on the satellite could inspect any spot on the face of the earth at least once in twenty-four hours. The station could also be used as a launching platform, against which there could be no effective countermeasures ...." and that "The space fortress should be a nearly impregnable station for observation and for possible missile launching ... once in place, the first space station could prevent the establishment of any other station."[29] He was no less explicit in 1956, when the New York Times

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[28]Von Braun, Crossing the Last Frontier, Collier's, Mar. 22, 1952, at 25-29.

[29]Von Braun was employed by the U.S. Army at the time, and his comments were seen as a response to remarks made in the same forum by Lt. Gen. L. C. Craigie, Dep. Chief of Staff of the Air Force, who said that missiles and supersonic planes were important and that people should forget about space travel. Man Made Moon is Held Feasible, N.Y. Times, Dec. 6, 1952, at 23.

summarized a 1955 speech made before the U.S. Armed Forces Staff College. Among other things, von Braun said the Soviets were working hard on a space ship and that the U.S. had no time to lose. He described "the ultimate futuristic weapons, a space ship and a satellite platform 1075 miles above the earth. From the platform, guided missiles could be fired upon earth targets with greater accuracy than the weapon of the nearer future, the I.C.B.M.," and explained "how a guided missile could be fired backward from an orbiting space station that would be constructed in outer space by the crew after his space ship arrived there ...." pointing out that the space ship "offered the advantage of seeing the target and being able to make minute adjustments--something you couldn't do with I.C.B.M.s."[30] Of course, the Soviet Union did nothing to dispel rumors that a Russian conquest of space was imminent. Officials announced on Radio Moscow in 1954 that the Soviet Union had designed an interplanetary space ship. This was followed in 1955 by the announcement that it would carry out a lunar expedition within two years. It took a beeping basketball in 1957 to accomplish what von Braun and countless RAND and industry studies had not been able to do; create a groundswell of military and Congressional support for space programs of the manned and unmanned variety.

Chapter I.2: Formative Years--From Sputnik to Apollo

A. The Impact of Sputnik. The Soviet Union's successful launch of Sputnik I into orbit on 4 October 1957 shattered myths about that country and the state of its technology. That the event served to solve the

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[30] Soviet Pace Cited in Space Ship Bid, N.Y. Times, Mar. 4., 1956, at 1.

Administration's dilemma of how to establish the right of free passage in space was not lost on the architects of U.S. policy. It was however, forgotten in the deluge of recriminations, hearings, and media circuses that followed. Also lost in the maelstrom was the fact that neither Sputnik I nor the canine-carrying Sputnik II launched a few weeks later, served any genuine and useful function despite being technological marvels. As instruments of propaganda though, they were superb, and allowed the Soviet Union to dictate the terms of the new competition. A satellite in orbit? The U.S. will follow. A manned program? Again, a similar U.S. response. The possibility that the enormous cost of placing a man in space might not have been worth the tangible benefits to be derived was not a key consideration. Where prestige was at stake, price was no object--yet. Congressional criticism of Eisenhower's space policies was severe. The situation was only exacerbated by the launchpad failure of the U.S.' IGY satellite, the Vanguard. This forced the Administration to turn to the Army's Jupiter C rocket (part of the original Orbiter proposal) for a sorely needed success. Both chambers of Congress established committees and held hearings. Both chambers were ready to appropriate funds and did so, often more than was requested by either DoD or the Administration.

The crisis atmosphere also had an immediate impact on the military services. For a decade the feud between the services over which of them belonged in space had smoldered. In the scramble for money that Congress was no longer reluctant to part with, all services quickly came up with studies, proposals, and predictions. Less than two weeks after Sputnik I, the Air Force combined two separate concepts and came up with a rocket-launched space glider later designated the Dyna-Soar. The Army,

already poised to succeed where Vanguard had failed, proposed an anti-satellite system (ASAT) just six weeks after Sputnik I. The Navy and Air Force also weighed in with recommended ASAT programs. To deal with the apparent duplication of effort, the Secretary of Defense announced in November 1957 that a new DoD agency, the Advanced Research Projects Agency (ARPA) would be formed. ARPA was to oversee and coordinate all DoD space projects, although operational systems were to remain with the individual services. All services, particularly the Air Force, bitterly opposed the formation of ARPA, viewing the agency as an interloper that could only harm their individual efforts. Although Congress authorized and funded the agency, internal resistance continued.[31] In September of 1959 DoD reversed itself, and announced that responsibility for space projects assigned to ARPA was to be given back to the services. ARPA would be limited to advanced research. This emasculated the agency and did little to solve the rivalry; the Air Force was assigned early warning and reconnaissance systems, the Army was given communications satellites, and the Navy received navigation satellite programs.[32]

In bidding for Congressional and public support for their individual projects, the services' arguments were openly aired. For instance, the Chief of Staff of the Air Force said in November 1957 that "In speaking of

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[31]Supplemental Defense Appropriation Act, 1958, Pub. L. No. 85-322, 72 Stat. 6 (1958) (funds appropriated), and National Security--Military Installations and Facilities, Pub. L. No. 85-325, 72 Stat. 11 (1958) (authorized).

[32]DoD press release dated Sept. 18, 1959, and Memorandum for Chairman, JCS, from the Sec. of Defense. Both reprinted in Report of House Comm. on Science and Astronautics, 87th Cong., 1st Sess., Military Astronautics, 5-6 (Comm. Print 1961) [hereinafter cited as Military Astronautics].

the control of the air and the control of space, I want to stress that there is no division per se between air and space. Air and space are indivisible fields of operations." This expressed the Air Force justification for being the sole service in space, and later became the basis for its attempt to gain a manned military capability.[33] In fact, Air Force officials invented the term "aerospace" to suggest that air and space were an inseparable continuum.[34] The Army was not without its designs in this regard. General Gavin, the former head of the Army's research and development division, asserted that:

> ... if we are to control space we must undertake the exploration of the moon and the planetary system as a matter of the highest national priority. A preliminary step in such an undertaking is the establishment of a manned space station .... The military significance of being able to establish and maintain an inhabited space station is obvious.[35]

Brigadier General H. A. Boushey, the Air Force's Deputy Director of Research and Development, testified before a House committee in 1958 that an orbiting manned reconnaissance platform could be used to detect ICBM launches. He went on to list other possible functions, and in doing so alluded to an argument that was, and still is, the basic justification for placing a man in space; irreplaceable judgment:

> Another function which I believe only man can perform effectively is that of interception and midspace rendezvous. At first, such missions probably would be for the purpose of refueling, thus permitting a manned maneuvering space vehicle to receive fuel from an uninhabited tanker satellite .... Eventually the capability to control space would be augmented

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[33] General Thomas White, Air Force Chief of Staff, quoted in W. Futrell, Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964 at 280 (1971).

[34] Chronology, supra note 10, at 67.

[35] J. Gavin, War and Peace in the Space Age 225 (1959).

> by the ability of manned military space craft to make an interception or rendezvous in space.[36]

In a published footnote to General Boushey's testimony, the Committee inadvertently illustrated a fundamental problem with this justification:

> Over and above the specific military advantages of manned satellites, the entire problem of man in space has aroused more than its share of scientific debate. Among the expert fraternity, it is actually not at all clear that human agents would be necessary .... Some feel that almost any conceivable instrument--directing and navigational operation--could be carried on by means of what Dr. Fred Whipple calls "telepuppets," extraordinarily sensitive mechanical devices. In the weightlessness of space, man appears at his most fragile .... Yet the human spirit, always a bit more reckless than the wind, lives by challenge. In space we have created a new challenge and, all authorities agree, we must and will go on to master it. A world which has supported countless generations of pioneers and mountain climbers will doubtless not content itself with observing space through the agency of "telepuppets."[37]

In other words, it must be done because of the challenge, regardless of the ultimate usefulness of a man in space. Nevertheless, even before man's first trip into space, doubt over his role there existed. During the scramble by the services for support of their space projects, only the Air Force lobbied hard for a manned presence. By March of 1958, unnamed Pentagon sources were saying that the Army would be given a moon assignment while the Air Force would be given manned space vehicles.[38] In the aftermath of Sputnik the Air Force dusted off a number of

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[36] Report of the Select Comm. on Astronautics and Space Exploration, 85th Cong., 2nd Sess., The National Space Program 27 (Comm. Print 1958) [hereinafter cited as National Space Program].

[37] Id.

[38] Chronology, supra note 10, at 44. On March 27, 1958, ARPA authorized 5 lunar probes; 3 for the Air Force, 2 for the Army. National Space Program supra note 36, at 227.

studies.[39] One, Project 7696, or the "Manned Ballistic Rocket Research System", had the goal of recovering a man from orbital flight. Beginning in March 1956, the Air Force and the National Advisory Committee for Aeronautics (NACA)[40] studied spacecraft design, rocket booster combinations and life support systems. Eleven companies presented proposals and by early 1958, a basic design had been settled on. The Air Force preferred using "the X-series of rocket planes climbing higher and higher until they crossed the boundary into space ...." but, if competition with the Soviets "demanded a 'quick and dirty' manned space program--blasting astronauts into space inside nose cones ('Spam in a can') ...," --then the Air Force wanted to garner that mission for themselves.[41] Project 7696 eventually evolved into Project Mercury, the U.S.' first manned space program.[42]

B. The National Aeronautics and Space Act.[43] Following Sputnik, the need to give direction to the "anvil chorus"[44] of those demanding

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[39]In fact, the Air Force submitted a broad-based program to ARPA consisting of 21 major projects, including satellites, manned hypersonic vehicles, and a manned lunar base. A. Downey, The Emerging Role of the U.S. Army in Space 7 (1985).

[40]Dissolved in 1958 upon the creation of NASA, NACA was a small organization first formed in 1915, that acted as a clearing house for research information and performed basic research. Although not military controlled, 90% of its work was military-related. See National Space Program, supra note 36, at 3.

[41]W. McDougall, supra note 19, at 197.

[42]Bland, Project Mercury, in The History of Rocket Technology 213-214 (E. Emme ed. 1964).

[43]National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, 72 Stat. 426 (1958).

[44]Schoettle, The Establishment of NASA, in Knowledge and Power, Essays on Science and Government 187 (S. Lakoff ed. 1966).

recognition of their peculiar skills and programs became overwhelming. The result was a host of commissions, panels, and committees formed to explore how best to organize and use the capabilities available. Eisenhower created the President's Special Advisory Committee on Space (PSAC) to study space problems and policy. In its first report, the PSAC recognized the military importance of surveillance, meteorology, and communications while discounting the services' more extravagant "Buck Rogers" notions such as manned orbiting battle platforms.[45] More important, from the report came the genesis of a civilian space agency, carved out of the large and expanding military programs. In early April 1958, the Administration introduced legislation that would eventually establish the National Aeronautics and Space Administration, or NASA. Public opinion evinced a strong desire to preserve space for peaceful purposes, and sentiment in Congress reflected this concern.[46] At the same time, it was recognized that while one should work towards that noble goal, the country had to ensure it did not fall behind the Soviet Union in the military exploitation of space. In months of hearings on the NAS Act, a great deal of attention was paid to what the DoD-NASA relationship would look like. There was no doubt that DoD would retain a significant space role, even if not as extensive as the services were demanding. In the two to three years bracketing Sputnik, the Administration had searched for some way to prohibit the use of space for any military purpose, including ICBM passage. Pre-Sputnik NSC policy directives were explicit in this regard, as were a series of public

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[45] W. McDougall, supra note 19, at 170.

[46] See 104 Cong. Rec. 9912 (1958) (House resolution introduced), and 104 Cong. Rec. 14753 (1958) (Senate resolution).

letters from Eisenhower to Soviet Premier Nikolai Bulganin in early 1958.[47] All were in the context of general disarmament proposals however, an area in which the two sides were unable to find any middle ground. By the summer of 1958, U.S. policy had made some subtle adjustments in response to post-Sputnik realities. The dual-track approach congealed into the position that the "peaceful uses" of outer space would permit military uses that served peaceful ends. The best example of such a use was embodied in reconnaissance satellites, which were not considered by the U.S. to be an offensive threat. Nothing however, prohibited the services from researching more "aggressive" uses, and they continued to do so. Section 102 of the NAS Act established the dividing line between civilian and military programs, and in doing so acknowledged the change in policy:

> (a) The Congress hereby declares that it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of mankind.
> (b) ... The Congress ... declares that such activities shall be the responsibility of, and shall be directed by, a civilian agency exercising control over aeronautical and space activities sponsored by the United States, except that 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 provision for the defense of the United States) shall be the responsibility of, and shall be directed by, the Department of Defense; and that the determination as to which such agency has

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[47] NSC Action No. 1553, Nov. 21, 1956, stated "It is the purpose of the United States, as part of an armaments Control System, to seek to assure that the sending of objects into outer space shall be exclusively for peaceful and scientific purposes and that under effective control the production of objects designed for travel in, or projection through, outer space for military purposes shall be prohibited," as quoted in P. Stares, supra note 22, at 54. For a brief summary of the Eisenhower-Bulganin exchange, see P. Stares, supra note 22, at 55.

> responsibility for and direction of any such activity shall be made by the President ....[48]

The United States thus created two parallel space programs; a civilian one emphasizing exploratory and scientific applications, open for the world to see, and a closed program, for military uses.

To provide substance for the newly-created NASA form, Congress raided existing military programs and facilities. NASA also inherited NACA's research facilities. The Army program was decimated, accomplishing for the Air Force what that service had long sought--preeminence among the services. This was buttressed in 1959 with the DoD decision to reduce ARPA's role to research, a determination that was felt to be a move towards giving the Air Force primary responsibility for DoD's space programs.[49] The Air Force did not survive unscathed, however. In August 1958, before NASA officially opened for business, President Eisenhower transferred the Air Force's Project 7696 to NASA. The decision was strictly political. Such a high visibility program belonged in NASA, not in military hands where it would inevitably attract criticism. The fact that the project was more exploratory in nature than for a defined military purpose, also dictated its transfer to NASA. The upshot was that among the services, the only manned space project under development was the Dyna-Soar, a highly sophisticated project that was a long way from flying. In Mercury and the subsequent Gemini and Apollo programs, the military was relegated to a support role.

C. NASA and the Manned Programs. The DoD had been willing to sponsor pure space research on the theory that sooner or later, valid

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[48] 42 U.S.C.A. Sect. 2451 (West 1973).

[49] Military Astronautics, supra note 32, at 6.

military needs would emerge from programs such as the Dyna-Soar and Project 7696. Now, through NASA, the DoD would be privy to the information gleaned from the manned program without having to pay for it. For Mercury, with its modest goals, that subordinate position was satisfactory. However, the level of DoD logistical and technical support for Mercury was prodigious. The launch vehicles were derivatives of military ICBMs and IRBMs; the launch facilities were those of the Air Force, as were the search and rescue aircraft, maps, and astronaut training programs.[50] Every astronaut selected for Mercury and 19 of the 23 follow-on astronauts selected through 1963 for Gemini and Apollo, were military officers. Even the handful of civilians selected had military backgrounds.[51] Concern over NASA retaining its civilian flavor in light of the level of DoD support, was repeatedly raised in Congress and elsewhere.

Mercury was a reaction project; the Russians were known to be working towards placing a man in orbit. Beyond matching (or perhaps beating) the Soviet Union in this feat, it was an essentially purposeless program. Nagging questions remained over the cost/benefit relationship. Articulated rationales in support of the project were, as a result, usually vague:

> Man is destined to play a vital and direct role in the exploration of the moon and the planets. In this regard it is not easy to conceive that instruments can be devised that can effectively and reliably duplicate man's role as an explorer, a geologist, a surveyor, a photographer, a chemist, a biologist, a

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[50] This support is detailed in House Comm. on Science and Astronautics, Project Mercury, Second Interim Report, H.R. Rep. 671, 87th Cong., 1st Sess. 5-6 (1961) [hereinafter cited as Project Mercury].

[51] National Aeronautics and Space Admin., NASA Astronauts (NASA pamphlet EP-34, undated).

> physicist, or any of a host of other specialists whose talent would be needed. In all of these areas, man's judgment, his ability to observe and to reason, and his decisionmaking capabilities are required. Only man can cope with the unexpected; and the unexpected, of course, is the most interesting ... man's special abilities would be employed in manned orbiting space laboratories, or space stations. Man's observational, analytical, and functional capabilities can provide an advantage in the conduct of a range of meteorological, communication, broadcasting, mapping, and search activities in orbiting vehicles.[52]

The problem was that by the time this was printed in 1961, the military had already made significant progress in the reconnaissance, early warning, communications, and even ASAT fields, conducting successful launches in all categories--all without on-board manned assistance. Hugh Dryden, the former head of NACA, and a top NASA official, said that Mercury had about the same technical value as the circus stunt of "shooting a young lady from a cannon."[53] It took President Kennedy's announcement in May 1961 calling for America to send a man to the moon before the decade was out, to give the civilian space program the goal and direction it needed. The fact that the main reason for doing it was for prestige, didn't seem to matter much.[54]

D. The Kennedy Administration. The "space race" was an issue in the 1960 presidential election, with both candidates promising to beef up space programs across the board. This prompted the Air Force to develop a long-range space program, the thrust of which, naturally, was that the military space programs needed more emphasis and that the Air Force was the service to provide it. Included in this "major political offensive to

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[52] Project Mercury, supra note 50, at 7.

[53] F. Gibney & G. Feldman, The Reluctant Space Farers 80 (1965).

[54] For a summary of Kennedy's Moon speech, see W. McDougall, supra note 19, at 302-305.

bring about changes in national space policy and law...."[55], was a strong push for manned activity. The Air Force proposed manned space bombers, space stations, and manned satellites acting as command posts and logistics vehicles.[56] Within weeks of taking office, the Administration took action that seemed to come down on the side of the Air Force. In a directive designed to reduce the problem of overlapping programs and duplication of effort, DoD limited the services to conducting preliminary research on space projects. Once a project progressed beyond that stage, it had to be submitted to, and approved by, DoD. Once approved, further research, development and testing became the Air Force's responsibility, as DoD's executive agent. Programs in progress were not effected.[57] The directive caused an uproar among the services and industry. Congressional hearings on the matter found the Navy and Army favoring a joint space command as a way to counter growing Air Force domination.[58] The Air Force was not pleased either. The directive was not of the absolute character it had sought. In addition, it did not increase the emphasis on military space. It simply consolidated current programs. In May 1961 the Air Force commissioned a ten-year space plan which was completed in September of that year. The plan continued the pro-Air Force push. It

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[55] Booda, AF Outlines Broad Space Plans, Avia. Wk. & Space Tech., Dec. 5, 1960, at 26.

[56] Id. at 27.

[57] DoD Directive Number 5160.32, Mar. 6, 1961, reprinted in full, along with a related DoD press release, in Military Astronautics, supra, note 32, at 8-11. For the content of the hearings conducted, see Defense Space Interests, Hearings before the House Comm. on Science and Astronautics, 87th Cong., 1st Sess. (1961).

[58] Lewis, Services Vie for Larger Space Role, Avia. Wk. & Space Tech., Mar. 13, 1961, at 115.

advocated not only "passive" satellites, but also systems for satellite interception/inspection, space-based ballistic missile defenses, and space bombardment. The Air Force's intent was not necessarily to seek to develop and deploy such systems, but to change space policy and remove the politically motivated restrictions imposed by the NAS Act and the Administration.[59] A manned role beyond Dyna-Soar was viewed by the Air Force as critical to the overall plan, and to maintaining its dominance in the space arena. The rationale stated for needing a man in space was by now familiar. In Congressional testimony, Air Force officials stated that "Man has certain qualitative capabilities which machines cannot duplicate. He is unique in his ability to make on-the-spot judgments ....Thus by including man in military space systems, we significantly increase the flexibility of the systems, as well as increase the probability of mission success."[60] This was echoed in the press in what was becoming a very public debate between the Air Force and conservative congressmen on one side, and the Administration and DoD on the other. One journal, describing an Air Force contractor's proposal for a manned reconnaissance system, related that the system consisted of:

> ... a number of armed, multi-man, earth orbiting, maneuverable aerospace vehicles in orbit ... performing surveillance functions now provided or expected from aircraft and reconnaissance satellite systems .... North American considered the requirements of the system and is believed to have concluded that men are essential to the satisfactory performance of the system's missions. Man could add a discretionary and

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[59] Alexander, USAF Aims at Military Space Supremacy, Avia. Wk. & Space Tech., Oct. 2, 1961, at 28.

[60] W. Futrell, Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964 at 431 (1971).

human judgment capability not available to an unmanned system.[61]

The arguments over the need for a man in space were part of the larger debate over the military's role in space. Invariably it seemed, the manned military role was perceived as connected with the more "offensive" uses of space. This did nothing to assist in the Administration's efforts to emphasize the peaceful uses of space and "legitimize" reconnaissance satellites. Things began to come to a head in the spring of 1962 when the "ASAT wars" among the services heated up. The Air Force was reported to be considering a manned version of a planned ASAT system at a time when the existence of such systems was not officially acknowledged.[62] This disclosure by the Air Force, in an attempt to muster support for its program, came at a particularly awkward time, just before a scheduled COPUOS (Committee on the Peaceful Uses of Outer Space) meeting at the United Nations.[63] The response was an offensive by DoD directed at the Air Force. Aiming at the most central "want" of the Air Force, manned space systems, Dr. Harold Brown, Director of Defense Research and Engineering, testified before Congress that "I cannot define a military requirement for them. I think there may, in the end, turn out not to be any."[64] DoD also clamped down on the number of studies the Air Force was commissioning, prohibiting the study of

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[61] Manned Space Surveillance System Urged, Avia. Wk. & Space Tech., Jan. 29, 1962, at 33.

[62] USAF Starts Manned SAINT Studies, Avia. Wk. & Space Tech., June 4, 1962, at 34.

[63] P. Stares, supra note 22, at 67-71.

[64] NASA Authorization for Fiscal Year 1963, Hearings Before the Senate Comm. on Appropriations, 87th Cong., 2nd Sess. 348 (1962).

"offensive space warfare systems."[65] The struggle continued, but it was Secretary of Defense McNamara's overriding concern with cost-effectiveness as much as the Administration's desire to avoid attracting international criticism that finally put a lid on the issue. As one author has explained the impact of the fiscal approach: "The phrase describing McNamara's approach, oft repeated, was that space is not a mission, or a program, or a cause; it is just a place. Some things could be done better there, others not. The job was to identify the former, and do them only."[66] Absent a demonstrated military need, DoD would not support the Air Force's efforts to get a manned military capability. The thought of funding an expensive project solely to determine if a need existed in this atmosphere was unlikely. It was a "Catch-22" situation; no funding without a demonstrated need, and no demonstrated need without the research funding to determine if a need could be developed. A very pragmatic approach, it served to check the Air Force's tendency to generate proposals based on abstract doctrines about the military role in space that had little relationship to political or fiscal realities. Talk by the Air Force of offensive space systems, manned or unmanned, was unwelcome, and such proposals were left unfunded. Where research and development on arguably "offensive" or "destabilizing" systems was funded, such as with the ASAT, it was a low-key affair designed to counter an existing or imminent Soviet threat. Passive systems were good, offensive systems were bad, and it wasn't for the Air Force to decide any issues raised by the distinction. Faced with the dual hurdles of cost

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[65] Booda, Air Force Still Limited on Space Studies, Avia. Wk. & Space Tech., Jul. 30, 1962, at 16.

[66] W. McDougall, supra note 19, at 337.

and appearances, highly visible manned military systems simply weren't viable in the absence of a clear demonstration of need.

The Administration's skepticism concerning the Air Force's manned role in space began to take its toll in late 1962. The Air Force proposed in its fiscal year 1964 budget that it be allowed to purchase four or five off-the-shelf Gemini capsules in a program labelled "Blue Gemini." Such a program was viewed as the "cheapest, fastest way to develop a military competence in space."[67] Included in its concept statement was a declaration that Blue Gemini would "be designed to approach, capture and disable an uncooperative satellite."[68] In addition, the Air Force proposed a long-term space station development program called MODS--Military Orbital Development System--which was to explore potential military missions. In line with Administration policy, both programs were deleted by DoD prior to fiscal year 1964 budget hearings, ostensibly for cost-effectiveness reasons.[69] McNamara testified that "The question of manned operations in space for military purposes is a difficult one to discuss. We do not, today, see clearly a military requirement for men in space, in contrast to unmanned satellites in space utilized for military purposes."[70] McNamara did leave the door somewhat open, conceding that

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[67] Trainor, Air Force Space Program Gains, Missiles & Rockets, Nov. 19, 1962, at 18. See also B. Hacker & J. Grimwood, On the Shoulders of Titans, A History of Project Gemini 117-121 (1977).

[68] Kolcum, USAF Keys Space Plan to Three Programs, Avia. Wk. & Space Tech., Jan. 28, 1963, at 26.

[69] Military Space Requests Were Cut $607 Million to Avoid Duplication, Avia. Wk. & Space Tech., April 1, 1963, at 37.

[70] DoD Appropriations for FY 1964, Hearings before House Subcomm. of the Comm. on Appropriations Part I, 88th Cong., 1st Sess. 476 (1963) (statement of Sec. Def. Robert McNamara).

"it is conceivable that there will develop, and perhaps suddenly, a requirement for manned military operations in space. We must be prepared to meet that possibility."[71] This bespoke at least a willingness to support military man in space (MMIS) projects, but on a less visible and expensive level. As if to accentuate this point, almost simultaneously with McNamara's deletion of the proposed programs, DoD concluded an arrangement with NASA that permitted DoD involvement in the Gemini program in exchange for DoD funding. DoD, through the Air Force, was allowed to "piggyback" on scheduled Gemini flights. The aim of this participation was "to gather scientific information to aid in military missions and to gain experience for pilots who will fly the Dyna-Soar boost-glide orbital vehicle ..." as well as "to experiment with sensors such as radar and cameras in a manned vehicle ...." the results from which "would later be applied to unmanned inspection and intercept systems and ground surveillance systems."[72] McNamara also expressed doubt over the Dyna-Soar and ordered a review of the project to determine if DoD's Gemini participation would be an adequate substitute.[73] The "piggyback" notion caught on quickly. For NASA it was a way to get additional funds, particularly for research into areas not affected by the lunar landing program, where funds were hard to come by. For the Air Force, acquiescence was simply a reflection of realities. Although MODS was cancelled, just a few months later NASA unveiled plans for MOSS--Manned

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[71] Id.

[72] DoD, NASA Confirm USAF Gemini Role, Avia. Wk. &Space Tech., Jan 28, 1963, at 18.

[73] Military Missions for X-20, Gemini Under Study, Avia. Wk. & Space Tech., Mar. 25, 1963, at 12.

Orbiting Space Station--which would include "provision for defensive and offensive possibilities."[74]

E. Phyrrhic Victories. The Air Force lost its bid for a dedicated manned military system when Blue Gemini was cancelled, but still got on-board Gemini. Then, the DoD ordered reevaluation of Dyna-Soar found it to be duplicative of Gemini, and DoD cancelled it in December 1963.[75] While McNamara was reported to be considering letting the military explore man's usefulness in space without waiting for "hard military manned space requirements," he nevertheless systematically reduced the Air Force's role in Gemini.[76] Meanwhile, the Air Force and NASA pursued studies based on the MOSS concept. The Air Force, however, was demanding that DoD be manager of the program and that NASA would piggyback on what was, in essence, the cancelled MODS design. Part of this insistence was based on the services' dissatisfaction with the Air Force's role in Gemini. Arriving late in the process, DoD had little input into the design, reducing its potential military value considerably.[77] As these events transpired in 1963, the Air Force came to rely on MODS/MOSS as the centerpiece of its manned space program. Aviation Week reported that the MMIS concept was gaining adherents within DoD even though there was still no specific need seen, and that "the battle is being won by those who

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[74]Wilks, MOSS Plans Include Military, Missiles & Rockets, May 13, 1963, at 14. MOSS never got past the concept phase.

[75]Booda, Air Force Given Space Laboratory Mission, Avia. Wk. & Space Tech., Dec. 16, 1963, at 30.

[76]See, e.g., Air Force Will Have Small Role in Gemini, Avia. Wk. & Space Tech., Jul. 22, 1963, at 225.

[77]USAF Gives Space Station Top Priority, Avia. Wk. & Space Tech., Jul. 22, 1963, at 214.

insist that military man must at least go into space and find out whether he can perform military tasks that cannot be done by machines alone, or can be done better by man."[78] NASA became a strong advocate of the Air Force's proposal.[79] Finally, in December 1963, President Johnson gave his go-ahead to the Air Force's space station concept, now called the MOL, for Manned Orbiting Laboratory. The MOL was expected to be primarily a "proof of concept" vehicle to determine man's military usefulness in space, and represented the first real victory for the Air Force in its seven year struggle to attain a separate manned space capability. It did not come without cost, however, as the Dyna-Soar was cancelled by McNamara, who concluded its objectives were too limited.[80] President Johnson's MOL decision was a classic example of putting the cart before the horse, lending credence to the theory that MOL was a trade-off for cancellation of the Dyna-Soar, a more expensive and potentially more "offensive" system. Although the Air Force now had its manned role, it had difficulty figuring out what to do with it. In February 1964 the Air Force awarded MOL "definition" study contracts to several companies. A DoD official characterized the MOL as "insurance against the possibility that there is a military mission for man in space."[81]

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[78] Thinking Matures on Military's Space Role, Avia. Wk. & Space Tech., Jul. 22, 1963, at 209.

[79] The NASA-DoD interrelationship was, and is, complex and extensive. For an account of it during this era, see Report of the Senate Subcomm. on NASA Oversight of the Comm. on Science & Astronautics, 88th Cong., 2nd Sess., The NASA-DoD Relationship (Comm. Print 1964). [hereinafter cited as NASA-DoD Relationship].

[80] Booda, supra note 75.

[81] Dr. Robert C. Hall, quoted in MOL to Test Man's Space Role, Avia. Wk. & Space Tech., Feb. 24, 1964, at 33.

Shortly afterwards, another spokesman was quoted as saying that the military "needs man in space experience, but we don't yet know exactly how we're going to use it. We can't now prove the necessity of having a manned space program in the defense structure of this country."[82] The situation did not improve, despite continued examination. An early emphasis on the MOL's scientific and experimental value ran afoul of NASA's "extended earth-orbital Apollo," which itself was to be a step towards a civil space station, and forced the Air Force to concentrate on operational roles for the MOL. This operational orientation eventually resulted in modifications of the MOL to extend on-orbit time, provide rendezvous capability, and increase the overall size.[83] When President Johnson finally provided a development commitment in August 1965, the listed purposes of the MOL included the detection of ICBMs and other reconnaissance and surveillance objectives. Significantly, one of the most promising capabilities mentioned was MOL's ability "To perform simultaneous photographic and electromagnetic reconnaissance."[84] At the time, separate satellite systems were required to accomplish the same thing.

MOL was cancelled outright in June of 1969 by the Nixon Administration in what was widely seen as a cost-cutting measure. Other reasons were just as compelling. First, when Johnson had given the MOL a go-ahead, he stressed its peaceful purposes, pointing out that "we intend to live up to

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[82]Fink, Station Holds Key to USAF's Man-in-Space, Avia. Wk. & Space Tech., Mar. 14, 1964, at 112.

[83]Fink, Defense Dept. Expands Capability of MOL, Avia. Wk. & Space Tech., Feb. 15, 1965, at 16.

[84]Detection of ICBMs Key in MOL Approval, Avia. Wk. & Space Tech., Sept. 27, 1965, at 26.

our agreement not to orbit weapons of mass destruction."[85] This did little to deflect quick and virulent Soviet criticism of the MOL, which assailed it as designed for "direct combat tasks," espionage, command post duty, and a host of other unsavory functions. An article in Izvestia included a comment on the oft-heard justification that a man's judgment would be an invaluable commodity in space:

> The Astronaut, in the opinion of Pentagon leaders, is a light and rather sophisticated discreet computer mechanism possessing comprehensive information pickup units, a memory and a "self-programming" capability. This is why the completed Mercury program, the Gemini program now under way and the future Apollo program include a large number of assignments that have military objectives.[86]

As with all manned efforts, MOL was a magnet for publicity, leading to international criticism decrying the militarization of outer space. This at a time when negotiations on what would eventually become the Outer Space Treaty[87] were taking place. From a cost-benefit viewpoint--the cost being the purported loss of international prestige and goodwill for what was portrayed as a hypocritical space policy--MOL's expected benefits simply were not substantial enough. The MOL was a political liability. Another compelling reason for the MOL cancellation was its technical obsolescence. Limited by a political policy emphasizing the so-called passive uses of outer space, MOL's reconnaissance and

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[85] For $1.5 Billion ..... A New Air Force Eye in the Sky, Newsweek, Sept. 6, 1965, at 46.

[86] Article by Colonel M. Golyshev, transl. and condensed in Soviet Article Raps DoD Space Role, Missiles & Rockets, Nov. 22, 1965, at 17. See, also, Space: MOL to Give Military First Chance at Manned Flight: Soviet Reaction Unpredictable, Science, Sept. 17, 1965, at 1357.

[87] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 206 (effec. Oct. 10, 1967) [hereinafter cited as OST].

surveillance functions constituted the foundation upon which MOL support was built. Being merely equal to or slightly better than unmanned systems performing the same functions wasn't enough to justify the dramatically higher costs involved in a manned operation. As Newsweek magazine had noted in 1965, an unmanned system then under development stood to give MOL serious competition in the intelligence gathering field.[88] By 1969 this system, Lockheed's Big Bird, later the KH-9 or "keyhole" series, was under construction. The satellite's capabilities were reportedly much more extensive than MOL's and it could perform photo- and electromagnetic-reconnaissance at the same time, at a fraction of the cost.[89] "Big Bird" gutted the main operational rationale for the MOL, and its use could be kept secret and away from public scrutiny and criticism.

MOL's demise ended an era in the MMIS concept. As with manned civil programs, the need for a man on-orbit was constantly questioned. Unlike NASA, with its prestige-oriented lunar program, DoD did not have the luxury of being permitted to avoid a practical cost-benefit analysis. From a strictly mission effectiveness perspective, unmanned systems were much less expensive, more capable, and less subject to criticism. In short, MOL made no sense. Its place as the premier space service relatively secure, the Air Force no longer needed a highly visible manned program to garner Congressional and public support for its space programs. Following the MOL cancellation, the Air Force held a jaundiced view of manned systems, and the MMIS concept lay dormant for over 15 years.

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[88] Newsweek, supra note 85, at 47.

[89] C. Whelan, Guide to Military Space Programs 78-79 (1986).

Chapter I.3: Skylab and the Shuttle - A Change of Direction

The MOL debacle doused the Air Force's desire for any dedicated manned military system, and interest in future systems waned. Although the Air Force had been able to conduct a number of experiments on-board Gemini, they were consonant with the technology existing at the time, and were thus relatively primitive.[90] Their military character was by and large a matter of semantics and served to highlight the long recognized truism that it is difficult in most cases, if not impossible, to separate military research and development from that of a civil character. DoD's involvement in the Apollo program was even less pronounced. Early in its development program, Apollo's military potential had been considered.[91] Most uses however, would have required substantial modification of the space vehicles involved due to their lunar program outfitting. As a result, the only DoD interest in Apollo was as a direct beneficiary of the data and experience collected in pursuit of the program's moon landings. The military had finally tumbled to the fact that "In every case in which ends have been identified for spaceflight, means have been found to perform the operation more cheaply and sooner with unmanned space flights than with manned space flights."[92] The loss of interest in manned space activities paralleled that seen generally in the aftermath of Apollo 11. The result was a change of direction in U.S.

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[90] See infra Chap. I.4 B 1)-8).

[91] See e.g., Apollo's Military Potential Detailed, Missiles & Rockets, Nov. 4, 1964, at 15.

[92] Garwin, National Security and Space Policy, 11 Int'l Security, Spring 1987, at 165, 167.

policy, which now demanded some tangible, economic benefits of future manned endeavors.

While DoD put the MOL behind it, NASA searched for some worthy Apollo follow-on. In 1969 NASA floated a three-pronged concept, the centerpiece of which was a permanently manned space station. The station was to be serviced by a reusable space shuttle and would eventually act as a jumping off point for a manned Mars expedition. Descriptions of the station published by NASA omitted any reference to DoD or Air Force involvement.[93] This was understandable, since neither had shown any interest in a space station, let alone one in which DoD did not exercise control. When budget realities were considered, the Mars idea was dropped. It also became evident that Congress would not support both a shuttle and a space station. NASA selected the shuttle, pushing it as a way to make access to space routine. This would lower the cost of placing the growing number of satellites into orbit. The station idea was not dropped completely, simply scaled back. The once ambitious Apollo Earth Applications Program was revived. From it, NASA developed Skylab, an orbital "workshop" housed in a converted third stage of the Apollo's Saturn V launch vehicle. In 1973, three three-man relays of astronauts were launched to crew Skylab. Designed as a research laboratory, it was damaged during launch in a way that limited its power output. This, in turn, affected its research capabilities. Its low inclination equatorial orbit, combined with its curtailed power generating ability, rendered it largely useless for even "passive" DoD purposes. As a result, DoD occupied the same position it had with Apollo; a beneficiary of data and a

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[93] See, e.g., NASA, Space Station: Key to the Future (NASA pamphlet EP-75. Undated but believed to be late 1969-early 1970).

provider of logistical support. To have participated in a more meaningful way would have required DoD funding that the Department was unwilling to part with. To be sure, much of the research carried out on the Skylab could be applied in a military context. The Earth observation program for instance, involved "a man in orbit, trained to look for objects of interest and alert to unfamiliar features ...."[94] The reconnaissance implications are apparent. Despite the success of Skylab I, an already built Skylab II was never launched. Instead, it was donated to the Smithsonian Museum, allegedly because "NASA could not find work enough for its space crews to justify launching [it] and supporting it with astronaut-carrying flights."[95]

NASA pegged its future on the system originally designed to support the space station, the shuttle, or Space Transportation System (STS). NASA fought a difficult battle to get the program funded, and eventually won by touting the system as less expensive and more flexible than expendable launch vehicles (ELVs) in placing satellites on-orbit. Both DoD and the Air Force were ambivalent about the shuttle.[96] If, as promised, it could perform as an adequate substitute for DoD's stable of ELVs at a lower cost, then DoD was supportive. DoD support was critical, as DoD represented not only the largest potential customer for the shuttle, but gave NASA an ally for the inevitable budget battles. DoD's role as a partner, however, meant designing the shuttle so that it would

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[94]NASA, Space Station Program, Description, Applications, & Opportunities 17-18 (1985).

[95]Happenheimer, The Space Station Nobody Wants, Reason, Feb. 1988, at 22.

[96]For a concise summary of the bureaucratic battles, see Logsdon, The Decision to Develop the Space Shuttle, Space Policy, May 1986, at 103.

be able to accommodate the maximum possible number of DoD missions and payloads. This also meant the construction of ground facilities necessary for the shuttle to fulfill its intended role as the DoD's primary launch vehicle. Most important was a California launch complex that would enable the shuttle to be placed into the polar orbits often used by DoD low Earth orbit payloads. In order to ensure a monopoly in the satellite launch business for its shuttle, NASA also succeeded in suppressing further ELV development by any government agency. As development progressed in the 1970s, it became apparent that the shuttle was not going to be the cheap, reusable system originally envisioned. It also became clear that an extensive commercial and scientific payload business was not going to materialize. Faced with the prospect of owning a very expensive white elephant:

> NASA pointed out to President Carter late in 1979 that he would be the President to preside over the demise of the space shuttle program if he did not command all future defense launches to go onto the shuttle. President Carter did so, after a cursory exploration of defense needs and alternatives, committing the nation to what Albert Wheelon calls "a policy of national tragedy".[97]

In one of the ironies of the space age, DoD and the Air Force have been roundly criticized for taking over and "militarizing" a system that; 1) they were never thrilled with, 2) would not have gotten off the ground without their support and funds, and 3) was ultimately forced upon them against their better judgment. Had it not been for continued Air Force reluctance to dismantle its ELV capability completely, the U.S. would have had no operational satellite launch system available following the Challenger disaster in early 1986.

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[97] Garwin, supra note 92, at 171.

The perception of the shuttle as primarily a military vehicle rather than both military and civilian will probably be reduced now that shuttle flights have resumed. DoD and the Air Force have given up on the notion of having a shuttle polar orbit capability in the near future, and have aggressively expanded the once-dormant ELV development program. Reluctant to once again place all of their faith in a single system, the Air Force now views the STS as complementing the ELV families being created. According to the current Secretary of the Air Force, once the DoD payloads that have accumulated over the past two years are launched, "Department of Defense requirements for Shuttle flights [will] drop to probably only three or four a year, and those will be focused on R & D payloads and experimental payloads that require the presence of man along with them."[98]

In looking at the use of the STS for military purposes, it is important to keep in mind that its primary role is that of a launch vehicle. The vast majority of DoD use to date has involved delivering satellite payloads. In this context, the fact that man is present, military or civilian, is essentially meaningless. The character of the military's use of space has not changed in any significant way with the STS. Early, dire predictions of an orbiting battleship have not come to pass:

> It will be able to provide visual close-ups of suspect satellites in orbit and presumably can capture, disarm or destroy their functional capabilities. It can be used to refuel other space craft, rotate crews on long-range missions, and skim the air

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[98]Canan, Recovery in Space, Air Force Magazine, Aug. 1988, at 68, 72, quoting Sec. of the A.F. Edward Aldridge.

> space for close-in observations. Its versatility is virtually unlimited both defensively and offensively.[99]

Another author saw the Air Force developing a "spaceborne command post, providing better command, control, and communications, with less vulnerability to attack."[100] Continuing the parallel with the MOL era mission statement, the same author opined;

> Of course to have a military expert or team of experts aboard a spacecraft in earth orbit would offer enormous advantages. The time-honored military tradition of sending scouts out to see where the enemy is and what they are doing would reach its ultimate application, since an orbital vantage point would encompass the entire world below. Such experts could also verify and confirm the findings of surveillance satellites and other space instrumentation and act upon the data instantly, thereby reducing the hazard of responding to a false threat, such as a signal indicating a foreign missile launching or nuclear blast, which has in reality been caused by equipment malfunction .... A person aboard the shuttle could spot an enemy missile or satellite and aim a knockout weapon at it faster and with greater accuracy than a land-based individual. He or she could also direct sensors at likely reconnaissance targets and could sift out irrelevant data and relay only important information to earth.[101]

The fact that most of the missions mentioned are either impractical or impossible with the STS didn't seem to make much difference. Without a polar orbit capability for example, any ASAT and most reconnaissance functions would have little value. Most Soviet satellites are not in equatorial orbits. The maximum inclination orbit for the Shuttle is 57 degrees to the equator (62-63 degrees with a minimal payload), which prevents observation of a significant portion of the Soviet land mass. As a communications center, it would be similarly impractical. In low earth

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[99] Diederiks-Verschoor, The Legal Aspects of the Space Shuttle, I Annals of Air & Space Law 197 (1976), quoting a speech by Hamilton DeSaussure at the U.S. Naval War College, Jan. 21, 1976.

[100] L. Taylor, Space: Battleground of the Future? 56 (1983).

[101] Id.

orbit, all communications have to be relayed through other space systems or through ground stations. Geosynchronous orbits are ideal for the communications function, however, the STS is incapable of achieving such an orbit. In short, speculation and predictable Soviet criticism aside,[102] DoD use of the STS has been limited by some of the same factors effecting all manned military systems; a political policy that favors "passive" uses, and more important, the availability of unmanned systems capable of doing as good, if not better, a job at far less cost. Aside from satellite delivery, DoD use of the STS has been remarkably similar to the piggyback experiments conducted during the Gemini program.[103] Shuttle mission STS-4, launched on 27 June 1982, carried DoD experiments which included the testing of a new space sextant and the testing of an advanced early warning surveillance sensor.[104] During the first Spacelab mission, STS-9, launched on 28 November 1983, the crew used a newly developed "earth observation camera" to photograph the lower half of the Soviet Union, including a number of military sites.[105] This use of the camera was repeated in October 1984.[106] For the first few years of STS operation, DoD's use has been relatively modest, limited to scientific research and intelligence gathering. The Strategic Defense

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[102]The Soviets have consistently referred to the STS as a weapons system. See, e.g., Rudev, Space Shuttle Program: Political and Legal Problems, Moscow Sovetskoye Gosudarstvo Pravo, April 1981, at 86, (DoD translation).

[103]See infra Chap. I.4B for a description of the Gemini experiments.

[104]Avia. Wk. & Space Tech. Jul. 12, 1982, at 20.

[105]Shuttle Crew Photographs Soviet Sites, Avia. Wk. & Space Tech., Jan. 18, 1984, at 19, and Mission 9 Astronauts Photographed Submarine, Missile Bases at Petropavlovsk, Avia. Wk. & Space Tech., Mar. 19, 1984, at

[106]Shuttle Photographs Nuclear Accident Site, Avia. Wk. & Space Tech., Oct. 15, 1984, at 16.

progress and evolved accordingly, the manned role has remained unchanged for over 30 years. The litany of contemplated uses cited for any manned military system has sounded like a broken record from one proposal to the next.

Chapter I.4: Summary of Selected Manned Systems

The political context in which each proposed manned military system was conceived, and eventually killed, has already been mentioned. With the exception of the Gemini and STS piggyback experiments, no DoD manned system has ever flown. Consequently, the systems described below were eliminated while still in the developmental or conceptual stage. All services, and particularly the Air Force, engaged in a number of studies of manned systems. Those listed here are programs that got beyond the theoretical stage.

A. The X-20 Dyna-Soar. An Austrian engineer, Eugene Sanger, had developed the idea of a rocket-powered aircraft that would be boosted into space and return to Earth in the same manner as conventional vehicles. While in space, the vehicle would repeatedly ricochet off of the Earth's atmosphere in a series of increasingly smaller roller coaster-type oscillations. As part of the Peenemunde V-2 group, Sanger refined his idea, coming up with a space bomber that would travel 12,300 kilometers in less than two hours. While Sanger's 1944 proposal got nowhere with his masters, copies of his data fell into the hands of both

the U.S. and the Soviet Union.[111] In the 1950s, Sanger's Peenemunde boss, Walter Dornberger, joined Bell Aircraft in the U.S., and began to pester the Air Force with proposals for a Sanger-like craft that could be used in a bomber and reconnaissance mode. Called "Bomi," Bell received an Air Force research contract in 1955. When its primary role shifted to reconnaissance, it was re-labelled "Robo."[112] In October of 1957, the concept was altered to include an orbital and in-space maneuvering capability, significantly expanding its potential usefulness in almost any role. The moniker Dyna-Soar (for dynamic soaring) was also attached to the project, and it was given the developmental go-ahead in November of 1957. In May 1958, NACA's research capabilities were added to the Air Force project, a role NASA inherited upon its creation. This made the Dyna-Soar a joint military-civilian endeavor, with the Air Force as the dominant partner. Boeing and Martin Aircraft were selected in 1958 from among nine bidders to provide parallel one-year definition studies.[113] Both companies concluded that the vehicle should be a medium lift-drag space glider that should first be an orbiting hypersonic test vehicle which, if developed further, would provide an operational platform for reconnaissance and bombardment. The Air Force selected Boeing to construct the vehicle. After a three month design review, the DoD approved the project in April of 1960, mandating a phased development

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[111] Stalin himself was so intrigued by the idea that in 1947 he ordered two military rocket experts to find Sanger (he was in Paris) and bring him to Russia in a "voluntary-compulsory manner." Fortunately, they didn't look too hard. See W. Ley, Rockets, Missiles & Men in Space 445 (1968).

[112] W. McDougall, Supra note 19, at 339.

[113] Dyna-Soar's History Full of Reexaminations, Avia. Wk. & Space Tech., Jul. 22, 1963, at 233.

process. Extensive applications studies were made by Boeing in 1960-1961 under the aegis of the BOSS/WEDGE (tortuously constructed from "bomb orbital strategic system and weapon development glide entry") program, and concentrated on use as an offensive weapons carrier.[114] The DoD however, limited the Dyna-Soar to phase I only, suborbital research, finding no specific military mission for the vehicle and stressing the project's experimental nature as a hedge against unforeseen Soviet developments.[115] To underscore its scientific purpose, Dyna-Soar was renamed the X-20 ("X" for experimental) in the summer of 1962. Having extinguished the X-20's future as a weapons system, DoD officials then began questioning its scientific value as well. In January of 1963 the Secretary of Defense asked the Air Force to study the possibility of cutting back on the X-20 so as to become more involved in NASA's Gemini program. The Air Force argued in vain that the operational characteristics of the X-20, particularly its on-orbit and re-entry maneuverability, had important implications for both manned and unmanned systems. The Secretary of Defense had made up his mind however, and cancelled the program outright in December 1963, after an expenditure of $400 million.[116] NASA described the X-20 in 1962, after the design had been finalized, as a "one-man piloted glider weighing about 10,000 pounds capable of being launched into orbit by a powerful rocket booster [the Titan III then under development]....It is a delta planform, controllable, maneuverable winged vehicle." In operation the X-20 would:

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[114] Boeing Studying Space Bomber Concept, Avia. Wk. & Space Tech., Apr. 10, 1961, at 26.

[115] P. Stares, supra note 22, at 129-131.

[116] Id.

> ... use centrifugal force and aerodynamic lift. Centrifugal force will sustain the glider when it obtains orbital speed....The craft's wing will give it aerodynamic lift and maneuverability as it descends through the atmosphere. This combination of high speed, extreme altitude and maneuverability will permit the pilot to shorten or lengthen his range by hundreds of miles and to maneuver far to the left or right of his flight path to reach his landing site.[117]

B. Gemini and Blue Gemini: The Gemini program was initiated by NASA as the Project Mercury follow-on in fiscal year 1962, to "provide an early manned rendezvous capability ... and to provide the United States with long-duration manned flight experience ...."[118] Fulfillment of both objectives was necessary as a prelude to the Apollo lunar program. The Gemini two-man capsule was very similar in appearance to the Mercury capsule, but about 20% larger with 50% more volume. In addition, it had the capability to change its speed and orbit, whereas Mercury had only attitude control. The Gemini was launched atop a modified Titan II ICBM, and rendezvous targets were launched on Atlas ICBMs. NASA used the 10 Gemini missions, spanning the period from March 1965 to November 1966, to conduct a wide variety of rendezvous, extravehicular activity, navigation, maneuvering, and other experiments.[119] In the fiscal year 1964 budget and planning process taking place in the fall of 1962, the Air Force proposed a "foot in the door, minimum cost approach" called Blue Gemini. DoD officials again questioned the need for a dedicated manned military

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[117] Staff Report of the Senate Comm. on Aeronautical & Space Sciences, 87th Cong., 2nd Sess., Manned Space Flight Program of the National Aeronautics and Space Administration: Projects Mercury, Gemini, and Apollo 151 (Comm. Print 1962).

[118] Id., at 115.

[119] For details of the Gemini Missions, see W. von Braun & F. Ordway, History of Rocketry and Space Travel 210-216 (1969), and B. Hacker and J. Grimwood, supra note 67.

system, even of the off-the-shelf variety. In April 1963 budget hearings, Secretary of Defense McNamara testified that Blue Gemini was deleted from the budget submission due to the "duplication, to a substantial degree, of the Gemini and/or Dyna-Soar program" and because no clear need for a military man in space had been demonstrated.[120] Pursuant to an agreement worked out by DoD with NASA however, the Air Force was permitted to conduct experiments on-board Gemini flights manned by NASA crews.[121] A slate of DoD experiments was agreed upon with NASA, and integrated into the schedules of the planned Gemini missions. Sixteen DoD experiments--13 Air Force and 3 Navy—were performed. All were one of eight types:[122]

1) Photographic and visual observations: (4 experiments) This included observation of space and terrestial objects with both the naked eye and cameras. Particular emphasis was on the ability of man to acquire, track, and photograph terrestial objects. Astronaut observations were compared with photographs taken at the same time to determine if an astronaut's visual acuity was better, as several Mercury astronauts had claimed.[123] Also included was a Navy experiment where objects were laid out on the earth to test man's ability to acquire and identify them.

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[120] DoD Appropriations, supra note 70, at 477, 479.

[121] NASA-DoD relationship, supra note 79, at 4.

[122] List compiled from McKee, The Gemini Program, in The U.S. Air Force in Space 10-15 (E. Downs ed., 1966).

[123] Gordon Cooper on Faith 7 claimed to have observed moving trains. See DoD, NASA Agree on Gemini Experiments, Avia. Wk. & Space Tech., Jun. 1, 1964, at 38, 41.

2) Mass determination: (1 experiment) This experiment was designed to test the ability of man to determine the mass of an in-space object by coming into contact with it, docking and maneuvering, and comparing the force needed to move with and without the object.

3) Radiometric measurements: (2 experiments) Radio spectrum analysis of regions of interest, including space, planets, space objects, and the Earth.

4) Navigation: (3 experiments) Aimed at developing in-space navigation techniques in the event manual navigation was required due to communications or equipment problems.

5) Radiation: (1 experiment) Radiation dosage measurements conducted in conjunction with a similar NASA experiment.

6) Extravehicular activity: (2-4 experiments) These were also done in conjunction with NASA experiments. DoD concentrated on maneuvering in space, using tools to construct objects, and the impact of the weightless environment on motor skills.

7) Communications: (at least 1 experiment) UHF and VHF polarization studies.

8) Television: (1 experiment) Designed to assess television's ability to discern terrestial and space objects in low light conditions.

In addition, it was speculated that one classified experiment would involve the use of a laser/infrared sensor device.[124] The Air Force was also interested in conducting rendezvous and inspection maneuvers, activities that could easily contribute to a manned or unmanned ASAT system. This was said to have been the primary reason for the proposed

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[124] Id., at 43.

Blue Gemini program. In any event, a number of experiments were conducted that could have assisted in developing an ASAT system.[125]

C. The Manned Orbiting Laboratory (MOL). The genesis of the MOL was in the 1958 planning studies done by the Air Force and proposed as part of a comprehensive space plan. Studies continued for several years at a relatively low level, investigating various configurations and functions. The operational (weapons system) attributes of the MOL were progressively minimized, which in turn effected the support behind the project, both within the Air Force and Congress. As two Air Force writers noted: "The slow progress made toward initiation of such a program can be attributed primarily to the lack of a validated requirement for the presence of military man in space, particularly in view of the Nation's dedication to the peaceful use of space."[126] Although DoD stressed the experimental nature of the MOL from the program's initiation in December 1963, a number of possible operational uses were repeatedly listed by Air Force and industry sources. These included:

1) Surveillance: Particular emphasis was to be on detecting ICBM launches and tracking launched vehicles. Detection and tracking data was to be relayed to Earth for response. Infrared equipment from MIDAS, a missile early warning system, and optical devices from SAMOS, a surveillance satellite, would be used.

2) Ocean surveillance: The primary focus would be on the detection and tracking of submarines. In addition, use as a navigation aid for U.S. submarines was to be explored.

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[125] P. Stares, supra note 22, at 117.

[126] Coulter & Louret, Manned Orbiting Stations, in The U.S. Air Force in Space 33, 37 (E. Downs ed., 1966).

3) Reconnaissance: In peacetime, this would entail repeated coverage of selected targets. In wartime, the MOL would also conduct post-attack assessments. Both functions implied an ability for the MOL to maneuver.

4) Inspection and destruction of satellites: The ASAT function, with an unspecified means of destroying or disabling the target satellite.

5) Weapons delivery: This could have included offensive and defensive weapons in a space-to-space or space-to-Earth mode. This would also have included serving as a platform from which to intercept ICBMs in any phase of their trajectory.

6) Command & control: This could have been for either tactical or strategic situations.

7) Space logistics and maintenance: This would have required the construction of an auxiliary vehicle.

This fairly comprehensive list[127] was never approved by DoD, but it illustrated where the planners' interests lay. As originally planned, the MOL would have been launched on a Titan IIIC booster. It was to consist of a two-man Gemini capsule attached to a pressurized laboratory approximately the size of a "small house trailer," or about nine meters long with a three to four meter diameter. The capsule would have had a hatch cut in the heat shield, enabling crew members to enter the MOL without having to go outside the capsule. There was to be about 1500 cubic feet of useful space able to accommodate about 4500 pounds of experimental equipment. The crew would remain on board for up to 30 days,

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[127]Booda, supra note 75, at 30.

then return to earth by reentering the Gemini B capsule, separating from the MOL, and reentering the Earth's atmosphere in the conventional manner.[128] The basic configuration of the MOL never changed, although the Air Force considered expanding its capabilities as the officially recognized uses for the MOL changed to include operational missions. These included a re-use and re-supply capability requiring the associated rendezvous and docking systems not planned for on the original MOL, an ability to depart the MOL to perform EVAs, and the ability to support crews for up to 120 days.[129] The MOL would also have been launched into a polar orbit, vastly increasing its usefulness for reconnaissance and surveillance purposes. Although the MOL never got off the ground, an unmanned Gemini capsule, along with a "simulated MOL", was launched in 1966 in order to verify the integrity of the launcher/booster combination. The capsule was recovered after separating from the simulated MOL.[130]

Chapter I.5: The Military Man in Space Program Revisited

A. The Impact of the STS. The lack of progress in identifying and developing manned military roles in space over the past three decades can be attributed to two basic factors; the lack of a suitable platform in space, and the constraints imposed by political and policy considerations. Of the two, the lack of an appropriate platform has been the largest impediment. With the advent of the STS program, the focus has

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[128] News Release No. 1556-63, Office of Public Affairs, DoD, Dec. 10, 1963.

[129] See e.g., Fink, Defense Expands Capability of MOL, Avia. Wk. & Space Tech., Feb. 15, 1965, at 16.

[130] W. Ley, Rockets, Missiles & Men in Space 413 (1968).

shifted. In addition to its primary function as a satellite delivery vehicle, the STS possesses the ability to carry specially designed modules, such as Spacelab, into orbit for up to two weeks at a time. It also has a sizeable "secondary payload" capacity for experiments and operational military activities such as reconnaissance and ocean surveillance. By providing a relatively inexpensive platform, the STS has removed some of the practical barriers that have previously kept a number of concepts on the drawing board. The result is that the role of political and policy constraints is now similar in many respects to that with regard to unmanned systems.

With the STS, the Air Force recognized the opportunity existed to piggy back experiments on NASA flights in a manner reminiscent of the Gemini program. Aside from the much broader range of potential uses that the STS provided in comparison to Gemini, another difference was that DoD would have its own flights. This provided a degree of security and control, as well as secondary payload capacity, optimal for DoD programs. The only thing needed was a coherent, integrated plan to exploit the situation.

The infrastructure available when the STS became operational consisted of the Space Test Program (STP), in existence since 1966. This program "uses the Space Shuttle and expendable launch vehicles to perform military experiments in space. It includes free flying experimental spacecraft, Shuttle cargo bay experiments, and the use of the Shuttle cabin as a manned laboratory."[131] The STP is a DoD program administered by the Air Force System Command's Space Division. It has the objective of providing

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[131]Cook, Use of a Space Station for National Security Missions, in The Space Station, an Ideas Whose Time Has Come(?) 9, (Dec. 1983 pre-print).

"spaceflight opportunities for programs or payloads which are not authorized their own access to space."[132] As it pertains to the shuttle, the STP has a program in which it seeks to use the available secondary space on DoD shuttle missions.[133] STP receives proposed experiments, prioritizes them, and in conjunction with a variety of agencies--civilian and military--develops and integrates the experiments aboard scheduled shuttle flights. If a particular experiment cannot be performed by the shuttle crew, a payload specialist (a non-NASA civilian) or Military Spaceflight Engineer (MSE) is trained for the job. The MSE is a military officer with a science background and specialized training, assigned to work with a specific payload. Most of the military STS experiments to date, some of which have already been described, are products of the STP. The purpose of the program is not however, aimed at developing a manned military role in space, particularly one of an operational nature. Man accompanies the payload into space only when necessary.

B. Revival of the Military Man in Space (MMIS) Concept. Implicitly recognizing the STS's potential as an inexpensive way to test manned concepts, an U.S. Air Force space plan developed in 1983 tasked the newly-created Air Force Space Command to study the MMIS concept. After a year-long effort, a wide-ranging report was issued by a group of experts

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[132] Air Force Space Command, Military Man in Space (MMIS) Handbook 101 (1988).

[133] In an arrangement similar to previous DoD-NASA programs, DoD has designated the Air Force as DoD's shuttle manager and NASA contact point. See NASA/DoD Memorandum of Understanding on the Management and Operation of the Space Transportation System, Feb. 25, 1980. For a description of the STP program, see Cook, National Security Implications of a U.S. Space Station, in Space Station Policy, Planning and Utilization 146 (1983).

detailed to study the subject.[134] Although not adopted as representing the official Air Force or DoD position, the report nevertheless contained some revealing features. The goal of the study was to assess where the use of a trained military person in space might enhance capabilities in a variety of missions. This assessment identified strengths and weaknesses of both man and machine in given contexts. The group was unconstrained to a large extent by practical considerations such as the lack of a manned polar or geostationary orbit capability, or the cost to develop one. It was also able to analyze man's potential free of political and policy considerations. As a result, when the group identified "Military Space Functions" (called missions), it listed several, such as "strategic offense" and "space interdiction," that legal or policy considerations would be likely to render infeasible. Figure 1 depicts the identified missions. Man's potential in combination with machines in each of these functions was then quantified and compared to machine alone operations. Figure 2 shows how the group viewed each given area. An interesting point is that most of the missions the U.S. has always claimed served peaceful ends (passive, non-weapons, etc.) or are neutral in character, are those in which the group judged that a machine alone was sufficient. Man's abilities were considered more critical in what at least traditionally have been viewed as the more provocative or potentially "aggressive" uses of space - force application and space control. Unfettered by policy or legal concerns, one would logically expect that the research and development of specific manned roles would follow the paths where promise is highest. The conclusions of the study in this regard seem to be

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[134]Air Force Space Command, The Utility of Military Crews in Space--A report From the Military Crews in Space Study Group (1985).

MILITARY SPACE FUNCTIONS

SUPPORT		COMBAT	
FORCE ENHANCEMENT	SPACE SUPPORT	SPACE CONTROL	FORCE APPLICATION
Communications	Launch operations	Counterspace ops.	Strategic offense
Navigation	Orbit Transfer	Space interdiction	Strategic defense
Surveillance	On-orbit control		Close air support
- from space	Maintenance		Battlefield interdiction
- of space			Counter air operations

Figure 1
54-1

Source: AF Space Cmd., The Utility of Military Crews in Space (1985)

MAN - MACHINE COMPARISONS

Force Enhancement

- communication.....even
- navigation.....machine better
- reconnaissance.....man slightly better
- surveillance from space.....machine slightly better
- surveillance of space.....even

Space Support

- launch operations.....machine much better
- on orbit control.....man better
- orbit transfer.....even

traditional "passive" uses

Space Control

- counterspace operations.....man better
- space interdiction.....man slightly better

Force Application

- strategic offense.....man much better
- strategic defense.....man better
- close air support.....man much better
- battlefield interdiction.....man slightly better
- counter air.....man better

"offensive" or "weapons" uses

Figure 2
54-2

Source: AF Space Ch.1, [illegible]
Mil. Crews in Space [illegible].

supported by history. The Air Force found it extremely difficult to identify missions for the MOL, beyond purely scientific ones, within the parameters of what policy then allowed. Permissible uses then included, as they do now, reconnaissance, surveillance, communications, and intelligence gathering. All of these uses happened to be the same uses in which the group, as had DoD in 1969, felt that man could contribute least. The machine alone was deemed as capable as a man-machine combination, particularly when one considered the added expense and difficulty of including a man on the mission. In looking at the STS and space station, the same sort of analysis obtains. What functions will policy and other considerations permit? Can those functions be performed as well by a machine alone? If not, does the enhanced capability provided by man's presence justify the cost and inevitable penalty in mission length and orbital limitations?

Even as the study group was undertaking its analysis, another effort to explore the MMIS concept was being formulated. Then-Under Secretary of the Air Force Edward Aldridge directed that a plan be developed to study the feasibility of MMIS. This was to include experiments on STS flights designed to investigate potential uses such as; aiding in development of sensors for unmanned operational spacecraft; repair or refurbishment of unmanned spacecraft, and; a permanent manned presence for military command and control operations.[135] Secretary Aldridge later articulated the current Air Force policy on manned military space operations; "The Air Force policy is to ensure that the unique capabilities that can be derived from the p: nce of military man in

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[135]Memorandum from Under Sec. of the Air Force Aldridge to Vice Chief of Staff of the USAF (Apr. 5, 1985).

space shall be utilized to the extent feasible and practical to enhance existing and future missions in the interest of national security objectives."[136] In March of 1986, the MMIS plan developed was approved by the Air Force. It had as its primary goal to identify those areas where man does or does not enhance a military mission in space.[137] The Air Force then developed a process whereby proposed experiments are collected, screened, prioritized, and ultimately integrated onto STS flights. For the first time, a centralized DoD-wide process was created to efficiently and effectively test MMIS concepts. Figure 3 depicts how the process works.

In order to encourage well-conceived proposals, a MMIS handbook was published providing detailed information on the process, as well as STS capabilities and limitations.[138] The purpose of the program is "to explore the operational utility of applying man's unique powers of observation and decisionmaking in the space environment."[139] To date, two annual DoD Prioritization Boards have met, selected, and ranked 11 shuttle MMIS experiments. They include:[140]

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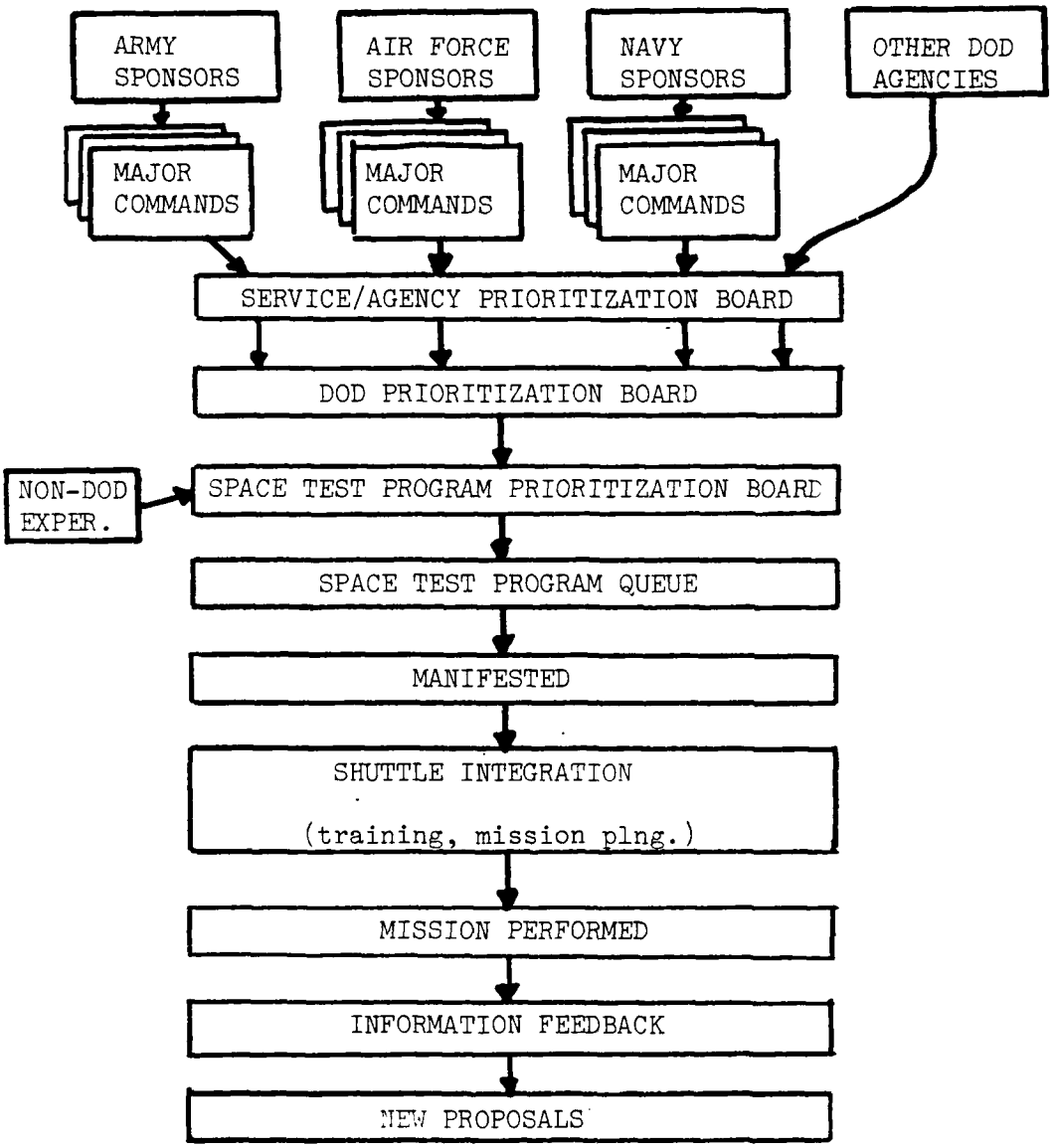
[136] Memorandum from Under Sec. of the Air Force Aldridge to Vice Chief of Staff of the USAF (Aug. 1, 1985) (stating AF MMIS policy).

[137] Wortham, Military Man in Space 5 (briefing guide 1987).

[138] Handbook, supra note 132.

[139] Id.

[140] DoD, List of Experiments approved by DoD MMIS Meeting 13-14 April 1988 (1988). Additional descriptive information on the listed experiments derived from Covault, USAF Plans Manned Military Exercises on Space Shuttle, Avia. Wk. & Space Tech., Jan. 4, 1988, at 38, and USAF, Final Report of the Air Force Military Man in Space (MMIS) Prioritization Board (1988) [hereinafter cited as MMIS Board].



MILITARY MAN IN SPACE (MMIS) EXPERIMENT PROCESSING

Figure 3
56-1

Source: AF Space Cmd.
MMIS Handbook (198

1. Navy latitude/longitude locator - a space sextant system being developed to determine the Earth surface location of features spotted from space to within 10 nautical miles;

2. Air Force - Direct View System - an optical system used by an astronaut to provide real-time enhanced observation of terrestial surface or airborne features of interest. It has target acquisition and tracking implications;

3. Air Force moving objects acquisition/tracking and tactics/exercise recording - an advanced optical system to search for and track various moving targets near the earth's surface;

4. Air Force - space debris experiment - the objective is to compare visual observations of space objects with imagery and tracking capabilities. The broader application of this exercise will be to determine whether man can assist general U.S. space surveillance activities and help identify Soviet space-based threats;

5. Navy maritime observations - the Navy will use existing intelligence resources in combination with instruments on the STS to assess whether an astronaut can discriminate ships and see phenomena such as "ocean memory" signatures left by submarines and surface ships;

6. Air Force - weather officer in space - the objective is to perform atmospheric and space environment observations on-orbit. "Will attempt to provide real-time forecasting for battle support. Will determine ability to detect/forecast dust, sea-state etc. This is meant to be a proof-of-concept, leading to long-term weather support from the Space Station" (emphasis added);[141]

7. Air Force - battle view - the objective is to assess man's capability to detect and identify targets and phenomena of value to battlefield commanders;

8. Air Force - space designation - designed to determine whether man, using a low power laser target designator, can acquire and track an instrumented target on the ground to evaluate if military astronauts could provide space-based laser target designation during war;

9. Army - Terra Scout - the Army will fly a payload specialist who will observe troop maneuvers from space using optical sensors to see if such reconnaissance could assist battlefield commanders;

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[141] MMIS Board, supra note 140, at iii.

10. Army - Terra Geode - designed to evaluate human ability to interpret geologic landforms from space and assist large vehicle and troop movements through rough terrain; and

11. Navy - "Night Mist" - a classified experiment for which no public information is available.

Other proposed, but not approved, experiments included several designed to detect submarines, camouflaged items, surface to air missile sites, radar sites, and other potential targets.[142] The MMIS emphasis on operational as opposed to purely scientific research is apparent. The MMIS program is important with regard to the space station for a number of reasons. First, it indicates that for the first time DoD has put together a centralized, focused, and operationally-oriented manned space program, albeit one that is at a proof-of-concept stage. Looking at the type of experiments that will be performed in the next few years on the STS, it is reasonable to assume that similar and refined versions will be proposed for the space station. Most are operationally-oriented, and one has the explicitly stated goal of developing a full-time military weather station on-board the space station.[143] It is also reasonable to assume that, based on the apparent ability of man to function more effectively in these operational roles, the MMIS agenda will enjoy some success. This may well cause future experiments, including those on the space station, to lean towards operational roles. Second, there is no doubt that DoD views the space station as another on-orbit platform from which to conduct MMIS research. This would account for DoD's sudden interest in 1986-1987 in preserving the military's access to the space station, after repeatedly denying DoD had any use for it. MMIS publications and officials state

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[142] Id., at 7-12.

[143] Id., at iii, 14-15.

that the space station is a part of the program's long-range plans.[144] In attempting to objectively predict likely military uses of the space station 10 or 15 years hence, the implications of the MMIS program cannot be ignored. While the program is just now getting underway with the resumption of shuttle flights, more than enough time remains to begin development of operational military uses of the space station. Absent practical, legal, or policy limitations on the military use of the station, all indications point towards a degree and variety of military involvement that may not have been fully foreseen by the international partners.

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[144] See e.g., Covault, USAF Plans Manned Military Exercises on Space Shuttle, Avia. Wk. & Space Tech., Jan. 4, 1988, at 30, and Handbook, supra note 132, at 1-1.

CHAPTER II: THE INTERNATIONAL SPACE STATION

Chapter II.1: The Space Station Concept

NASA has toyed with the idea of a permanently manned space station since 1958. In 1959, a NASA committee assigned space stations a higher development priority than a moon landing, an order that was reversed only by President Kennedy's lunar mandate in 1961.[1] More than any other single program, a space station seemed the most appropriate and enduring symbol of NASA's charter to explore and exploit space for peaceful and scientific purposes. Throughout the 1960s studies continued at a low level while the agency concentrated on carrying out the Gemini and Apollo manned programs.[2] As the design and development phase of those efforts wound down, NASA sought other programs for its cadre of engineers and scientists. The result was NASA's first major push for a space station, in conjunction with a servicing shuttle craft, proposed and lobbied for in 1969-1971. The drive was only partially successful, culminating in the truncated Skylab's launch in 1973. Once again, the emphasis shifted, this time to the STS. Space station studies were periodically revised and about a decade later, the pattern repeated itself. With the design and development of the STS substantially complete by 1981, NASA again turned its attention towards a space station. The seemingly endless design studies had served to refine the concept and keep it technologically

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[1] See, Space Station Task Force, National Aeronautics and Space Admin., Space Station Program Description, Applications and Opportunities 14 (1985). Table 1-3, at 21-22, lists major NASA space station developments 1959-1981. Table 1-2, at 13, lists seven pre-NASA space station studies from 1923-1958.

[2] Id., at 10-21.

current. With the new Administration and the budgetary climate in 1981, space station proponents were poised to make yet another attempt. NASA's new Administrator, James Beggs, stated at his confirmation hearing in June 1981--two months after the first STS flight--that a space station should be the next major NASA program.[3] This was followed by resolutions authored by NASA supporters in Congress, calling for a "national commitment to a manned, multi-purpose permanent space station."[4] In May 1982 NASA established a space station task force and lobbied the Administration for support, asking the President to announce a station go-ahead. President Reagan declined to indorse the idea wholeheartedly, but made reference in a July 4th, 1982, speech to "establishing a more permanent presence in space."[5] That proved to be enough encouragement for NASA. The next month it awarded "mission analysis" contracts of $800,000 each to eight aerospace companies for "military and civilian studies of station missions," with some of that money provided by DoD.[6] The emphasis of the studies "was on user communities and architecture, not on the actual configuration."[7] Mission areas studied included space science applications, commercial uses, and national security. Sources of input were canvassed to identify needs in each of these areas, and the station requirements constructed accordingly. The process reflected a

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[3] Id., at 20.

[4] Id.

[5] See A. Lawler & J. Vedda, Space Station Directory 1 (1987) [hereinafter cited as Space Station Directory].

[6] Id. This book contains an excellent 16 page summary of space station developments in 1981-1987.

[7] Id., at 2.

design philosophy of building the station around user needs rather than trying to accommodate proposed uses within already defined limits. At the same time, several foreign countries, including Canada, Japan, and ten member nations of the European Space Agency (ESA) conducted similar, parallel studies. Several working groups within NASA were established to develop the technical details, while externally NASA tried to build support for the program. Through most of 1983 the Administration debated the merits of a space station. Most critical of the idea was the Secretary of Defense, Casper Weinberger, who charged that NASA was under-estimating the station's total cost. He also refused to support the station because DoD had been unable to identify any specific military need for one.[8] As a result, DoD apparently contributed little in the way of input towards the design of the station, and NASA made no allowance for DoD use.[9]

On 25 January 1984 President Reagan endorsed a permanently manned space station "within a decade," and called for international involvement.[10] NASA proceeded at full speed. The "concept studies" phase continued. By 1985 the broad parameters of a design meeting the needs of the anticipated users emerged. A phased development approach was outlined:

Phase A - Concept studies

Phase B - Definition and preliminary design

Phase C - Detailed design

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[8] Id.

[9] P. Culbertson & R. Freitag, The Partnership: Space Shuttle, Space Science and Space Station 6 (NASA pub., undated).

[10] Text of speech reproduced in the N.Y. Times, Jan. 26, 1984, at 38.

Phase D - Development

Phase E - Operations[11]

First and foremost, the station was to be a research laboratory "for the conducting of science, the development of technologies, and the stimulation of commercial space enterprises."[12] The station design was still evolving, but basic features were established and included a laboratory in space, a permanent observatory, a satellite servicing facility, a storage depot, and a staging base.[13] Other basic elements of the overall architecture included a manned station consisting of several laboratory and habitation modules to accommodate a crew of six to eight persons in a low inclination, low earth orbit. Man-tended and unmanned polar and co-orbital platforms, an Orbital Maneuvering Vehicle (OMV) for servicing and transporting satellites once in space, and a reusable Orbital Transfer Vehicle (OTV) to boost satellites into geosynchronous orbit were also included.[14]

In March 1985, NASA awarded six companies contracts for Phase B, Definition and preliminary design, with an aggregate value of $122 million.[15] As this phase progressed, an overall design was settled on, the number of habitable modules was decided (four), and the degree of international participation detailed. Canada would build upon its

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[11] Space Station Directory, supra note 5, at 19.

[12] Stofan, Preparing for the Future, Aerospace America, Sept. 1987, at 16, 20.

[13] A. Stofan, Space Station: The Next Logical Step 3 (1986).

[14] See generally, Space Station Program, supra note 1, for detailed listings of functions and elements of the station. This multi-volume work represents the published result of the Phase A, Concept Studies.

[15] Space Station Directory, supra note 5, at 3.

expertise with robotics and provide a Mobile Servicing System (MSS) to be used for, among other things, assembling the station itself. Japan would provide one of the three laboratory modules, as would ESA. ESA would also provide one or more orbiting platforms. Each international participant funded their own work, designing the individual elements they would eventually provide. Memoranda of Understanding (MOUs) between NASA and the counterpart organization of each partner country addressed and formalized the arrangements, setting out specific roles and responsibilities.[16] As definition of the station progressed, it became apparent that the cost of the program was going to be much higher than originally estimated. This precipitated a domestic crisis that came close to killing the program. NASA Administrator James Fletcher estimated the total cost would probably amount to around $13 billion, some $5 billion more than initially predicted.[17] After months of debate within the Administration, a compromise between NASA, the Office of Management and Budget, Office of Science and Technology, and the National Security Advisor was reached on how to proceed. The decision was made in April 1987 to develop and launch a scaled-down version of the station, called the phase one or block one station, costing about $14.6 billion.[18] This would be followed by block two, the enhanced station, which would entail completing the station as originally planned. As Phase B came to a close,

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[16]The three Memoranda of Understanding (MOU) were between NASA-Canadian Ministry of State for Science and Technology (MOSST), Apr. 16, 1985; NASA-Science and Technology Agency (STA) of Japan, May 20, 1985, and; NASA-European Space Agency (ESA), Jun. 3, 1985, (formal titles omitted).

[17]Space Station Directory, supra note 5, at 9-11.

[18]Recent estimates place the total station cost nearer to $30 billion in current dollars.

NASA released Requests for Proposals (RFPs) to industry, soliciting contract bids for Phase C/D work. At the same time, negotiations between the partners on the legal instruments to govern Phase C/D/E got underway. Far more complex than the Phase B MOUs, the negotiations were not completed until mid-1988. Disputes over the protection of intellectual property, an arbitration mechanism, the relative authority of the partners, liability issues, and the military use of the station, all required resolution. In the meantime, never-ending budget battles in the U.S. continually threatened the program's existence.[19]

Construction of the "revised baseline" (block one) space station is currently scheduled to begin in March 1994 and require a mixture of 16 STS and ELV launches. The "man-tended" mode, where man will periodically visit and work aboard the station is targeted for March of 1995, after the sixth assembly launch. After the 11th flight, sometime in early 1996, the station will become permanently manned. The station will be completed by adding the ESA and Japanese modules, along with associated hardware, in launches 12 through 16. This is scheduled for late 1996.[20]

Chapter II.2: Space Station Configuration

Figure 4 depicts the block one, or baseline, station. It consists of a 110 meter long horizontal boom, to which four pressurized modules are attached in the middle. At each end of the boom are four photovoltaic arrays which will generate up to 75 kilowatts of electrical power. Two

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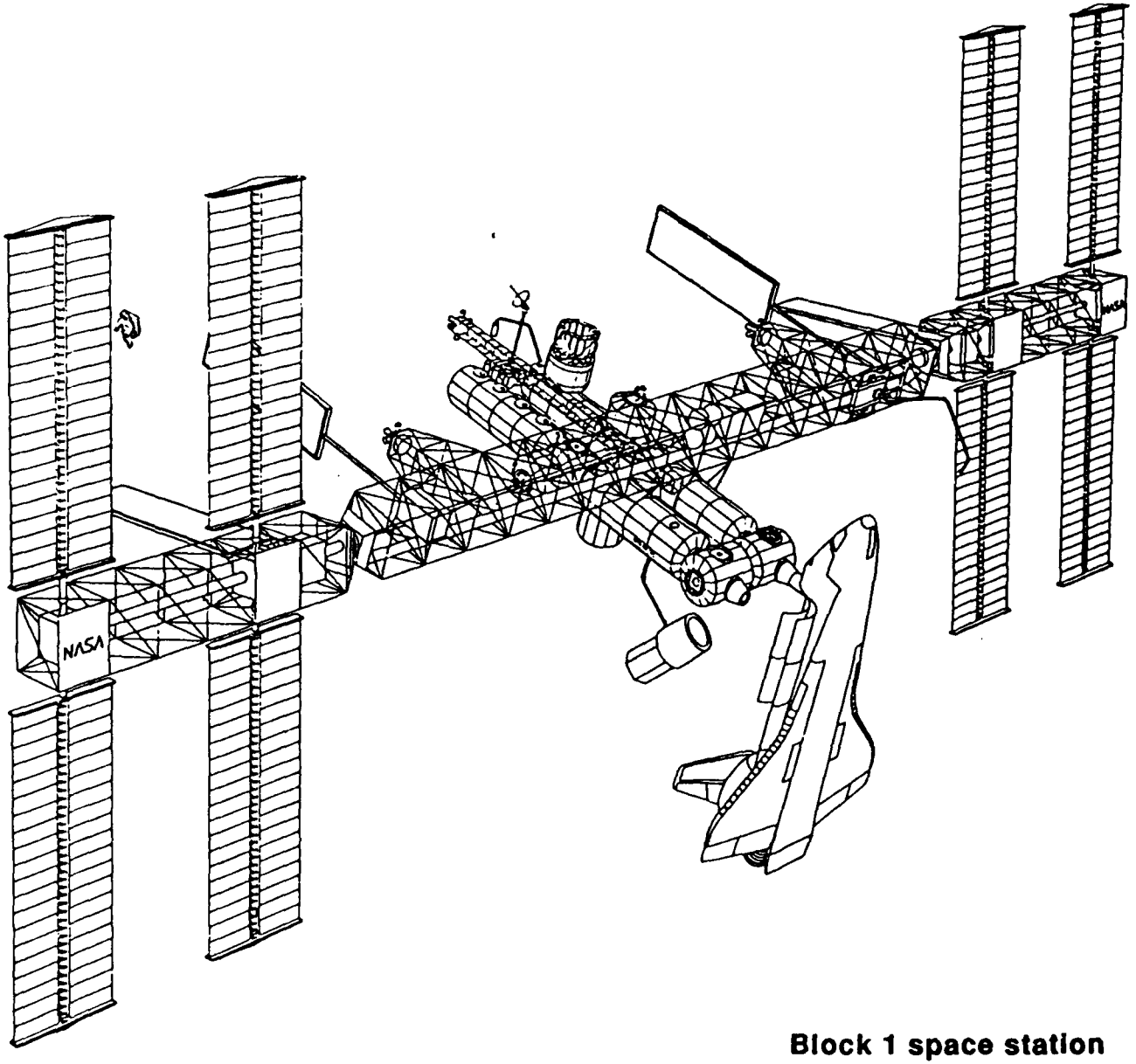
[19] See e.g., Space Station Directory, supra note 5, at 9-16; NASA Selects Station Contractors Despite Funding Uncertainties, Avia. Wk. & Space Tech., Dec. 7, 1987, at 18.

[20] A. Stofan, Revised Baseline Configuration Assembly Sequence (table), (from Space Station Presentation at the 1987 AIAA Annual Meeting 1987).

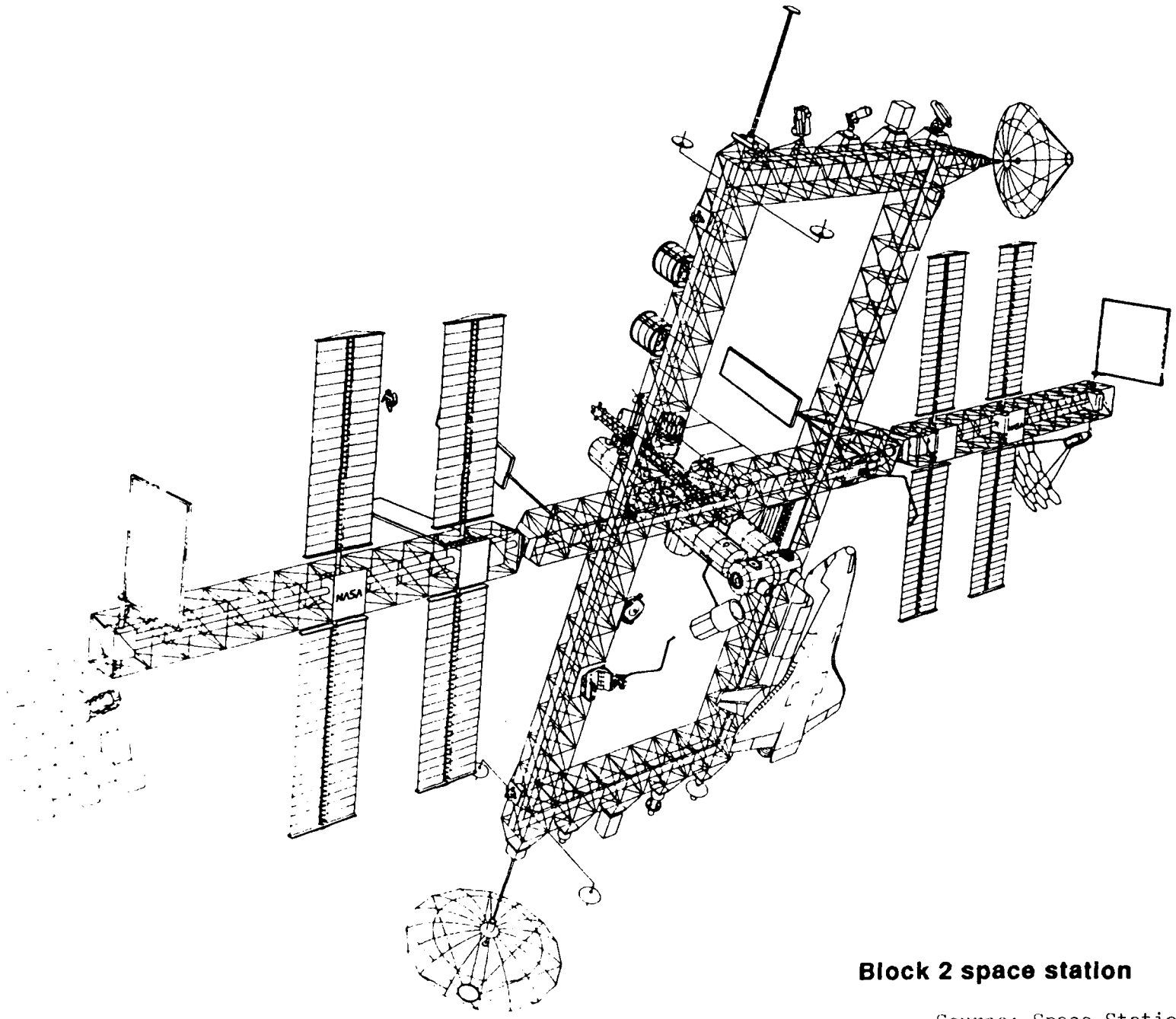


Block 1 space station

Source: Space Station Direc.(1987)

Figure 4
65-1

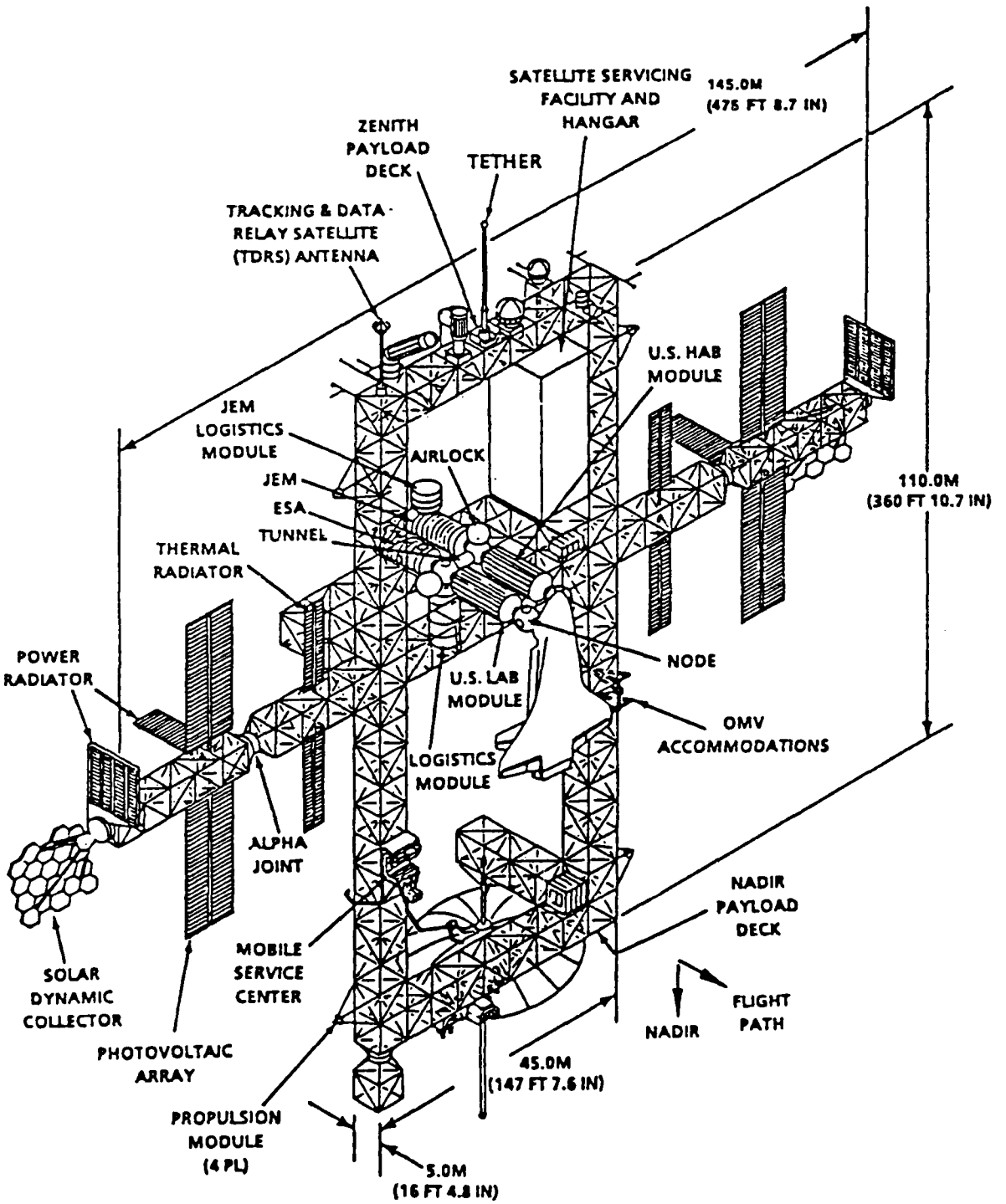
attachment points for external payloads are located on the boom, one on each side of the modules. The four pressurized, manned modules will consist of three laboratory and one habitation module. Each will be approximately 45 feet long and 15 feet in diameter. There will also be a smaller logistics module attached. The logistics unit will be removable after its stores are depleted. The modules are connected by nodes, which are pressurized passageways enlarged to provide room for storage, extra equipment, crew activity, command and control operations, systems support, airlocks, and docking ports. These nodes also provide for the station's evolutionary capability by functioning as the attachment points for all new modules. Glassed in cuppolas on some nodes will permit the crew to operate exterior equipment from within, reducing the amount of extravehicular activity (EVA) required. Located on the boom will be a U.S. developed flight telerobotic servicer, which will assist in assembling the station and servicing attached payloads. Also attached on the boom will be Canada's contribution to the station, the Mobile Servicing System (MSS). The block one MSS will consist of two remote manipulator arms and a mini-maintenance depot that will assist in the assembly and maintenance of both the station and external payloads. Associated with the station will be two unmanned polar platforms provided by the U.S. and ESA. These are satellites designed to accommodate a wide variety of scientific payloads that can be removed and replaced. ESA may also provide a man-tended free-flying co-orbital platform. Figures 5 & 6 depict the enhanced, or block two station configuration. The horizontal boom is extended on each end to accommodate a solar dynamic power system that would add 50 kilowatts of power to the station. Two vertical spines called "dual keels," each 105 meters long, will be constructed,



Block 2 space station

Source: Space Station Direc.(1987)

Figure 5
1-64



The space station

Figure 6
66-2

Source: Space Station Direc.(1987)

connected at the ends by upper and lower horizontal booms. One key advantage of adding this rectangle to the existing structure is to increase the number of external payload attachment points from two to five. Shown on the block two station are a number of unspecified payloads. The lower horizontal boom will face the Earth's surface and will permit the attachment of payloads such as remote sensors, meteorological systems and other Earth-oriented packages. The upper horizontal boom faces deep space and will be ideal for space tracking devices, communications relay equipment, and telescopes. A more complete MSS is also anticipated, and will include a satellite servicing structure similar to a small hanger. The block two station will require an additional 11 STS and ELV launches.

In addition to the configuration outlined above, two other station-related programs are contemplated. Both are critical to the station's ability to function as a satellite servicing center. The first of these is the Orbital Maneuvering Vehicle (OMV). This will be a remotely controlled, reusable "space tug" designed to deliver, retrieve, re-boost and de-orbit satellites and other hardware in low earth orbit. Basing will initially be on the STS beginning in 1991, transferring to the station when the station becomes operational. OMV capabilities may evolve to include the ability to refuel satellites on orbit and perform minor repairs. The second program is the Orbital Transfer Vehicle (OTV). The OTV is planned for the late 1990s. It will also be a remotely controlled, reusable vehicle designed to boost payloads from the STS or space station into semi-synchronous or geosynchronous orbits, or into deep space. It may also be capable of retrieving satellites from high orbital locations.

Chapter II.3: International Participation Breakdown[21]

A. U.S. Supplied Elements. U.S. supplied components will constitute a substantial majority of the stations hardware and sub-systems.

1) Habitation module: Designed and constructed by Boeing as the prime contractor, it will house up to eight crew members, contain a wardroom, galley, entertainment system and other crew-related features. No specific research abilities are intended for this module.[22]

2) Laboratory module: Also designed by Boeing, the module will be almost exclusively devoted to life sciences and microgravity research. To assist in the latter, a materials processing facility is planned, including a materials furnace.[23]

3) Logistics Module: These are primarily for storage and supplies. They will be docked to the station, one at a time, until supplies are depleted. The STS will then carry them back to earth for refurbishment, replacing them with a new module. They will also carry completed experiments, excess equipment, and waste back to earth.

4) Resource nodes: There will be at least four nodes included in the block one design. Given the desire to preserve the four main modules for their intended purposes, the nodes will contain most of the systems necessary to maintain and operate the station itself. They are considered part of the infrastructure. They will also contain airlocks

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[21] Information in this section is compiled from a variety of sources, including; Space Station Directory, supra note 5; Satellite News/Space Station News, User's Guide to the Space Station (1987); NASA, Briefing Guide to the Space Station (1987), and; Stofan, Preparing for the Future, Aerospace America, Sept. 1987.

[22] Boeing to Build Space Station Modules Under $750-Million Award, Avia. Wk. & Space Tech., Dec. 7, 1987, at 20.

[23] Id.

for EVAs, and docking ports for additional modules and the STS. Their most basic function is to provide the connecting structure between the four modules.

5) External structure: Two payload attachment points are planned for the block one station. Virtually any type of payload can be designed for use on the station. Payloads will be serviced by either the remote systems (the Canadian MSS or the U.S. Flight Telerobotic System (FTS)), by crew EVA.

6) Polar platform: This satellite will be launched by ELV into a polar orbit, and will be used for research, Earth and astronomical observation, and commercial endeavors. The polar orbit provides repeated, whole earth coverage, something the station does not. Unique aspects of the design include the ability to be serviced on-orbit, and to have payloads attached and removed as necessary.

7) OMV/OTV: As mentioned previously, both are critical to the station's ability to act as a service center for satellites. Neither will have a research or scientific purpose incorporated. Both, however, will have real-time cameras permitting the on-orbit inspection of satellites. The OMV will be designed to accommodate add-on features such as the ability to collect space debris, and to refuel satellites without having to move them from their location.[24]

B. ESA Supplied Elements.

1) Laboratory module: Called Columbus, the ESA laboratory was initially proposed as a system that could be detached from the space station complex and function as a man-tended free-flyer. NASA

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[24]NASA, Space Station (unpaginated briefing guide dated Mar. 1986).

resisted this, and ESA ultimately agreed to make the module a permanent part of the station. Columbus will be a general purpose laboratory with the ability to carry out materials processing, life sciences, and fluid physics research.

2) Polar platform: Launched from California, this platform is similar in concept to the U.S. platform. It will be used primarily for Earth observation experiments.

3) Man-tended free-flyer (MTFF): A proposed part of the enhanced station, the MTFF represents the compromise worked out between NASA and ESA over the Columbus' permanent attachment to the station. One ostensible reason ESA wanted the ability to detach Columbus was to achieve the very low microgravity levels unattainable when attached to the station complex. Aeritalia proposed a scaled down version of Columbus as a MTFF for this purpose.[25] As currently planned, the MTFF would be capable of supporting life, and would be visited periodically by astronauts residing on the space station. The MTFF would use the station's communications and data processing facilities. The MTFF would be co-orbital with the station, and have a resource module and solar arrays attached for orbital station keeping and power generation.

C. Japanese Supplied Elements. Japan's contribution consists of its single laboratory module, although interest exists in supplying an unmanned platform for the block two phase. The Japanese Experiment Module (JEM) will be used for materials processing, life sciences, and advanced technologies experiments. The National Space Development Agency is responsible for the JEM. Unique features include an exposed exterior work

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[25]Feazel, Aeritalia Asks that ESA Build Second Space Station Module, Avia. Wk. & Space Tech., Apr. 14, 1986, at 122.

deck, an airlock, and a remote manipulator arm, all of which will allow the crew to perform a wide variety of experiments outside the JEM.

D. Canadian Supplied Elements. Canada will supply an important part of the station's infrastructure in the form of the Mobile Servicing Center or System (MSS).[26] Block one includes two manipulator arms with "smart" front ends, and a small maintenance depot. The MSS will travel up and down the boom moving materials and replacing and servicing instruments and experiments. The enhanced block two MSS is much more comprehensive in ability, and will include several additional manipulator arms, an EVA astronaut workstation, and a hanger-like unpressurized five meter by five meter service bay.

E. A Note on the Station's Orbit. The manned space station structure outlined above will circle the Earth in a low earth orbit. The orbit of the station has a definite impact on its potential usefulness in certain areas. One of the few things that has not been altered since the beginning of the program has been the plan to launch the station into an orbit of 28.5 degrees inclined to the equator. According to NASA, the orbit was dictated by two factors; first, the equatorial orbit could accommodate most user's needs,[27] and second, 28.5 degrees is the inclination to which the maximum payload can be delivered by the shuttle launched from Cape Canaveral in Florida.[28] The station's altitude will be approximately 500 kilometers, or 315 miles. The actual orientation of

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[26] NASA calls this the MSS. For some unexplained reason, some commercial publications refer to it as the MSC.

[27] Space Station Program, supra note 1, at 35. DoD submitted no specific requirements and DoD needs were not considered in assessing what orbit would most meet user needs.

[28] Id.

the station on-orbit is dictated by a complex set of variables, including the need to accommodate solar power systems, heat rejection, and atmospheric drag.

Chapter II.4: Potential Military Uses of the Space Station

A. Initial Observations. The author of a monograph published by the U.S. National Defense University in 1985 predicted that "Probably before the end of the century we may see space based weapons deployed. If developed and deployed, space systems of the future could perform such tasks as surface attack, defense suppression, close support, battlefield interdiction and anti-naval and anti-submarine warfare."[29] All of these combat-type functions, along with existing operational "force enhancement" missions such as reconnaissance, early warning, and communications, are at least in theory potential military uses for a space station. In compiling a realistic list however, a wide variety of physical, legal, and political factors must be taken into account. As a practical matter, few of the operational military uses mentioned above could be effectively carried out aboard the space station as currently planned. First and foremost, there are physical limitations imposed by the design and location of the station. Although DoD was intimately involved in NASA's early conceptual work, its interest dissipated when it could find no valid military use for the station.[30] Prior to this time, NASA's emphasis on designing the station around user needs included DoD as one of the major station

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[29] A. Downey, The Emerging Role of the U.S. Army in Space 10 (1985).

[30] A lengthy review process included DoD-NASA and industry studies, analysis by a DoD Space Station Working Group, analysis by a committee of the Air Force Scientific Advisory Board, and inter-agency discussions.

customers. After DoD's decision to withdraw as an active participant in the definition and design phases, NASA concentrated on accommodating its other users, the scientific and commercial research communities.[31] While DoD was not entirely out of the picture, the current design reflects little or no DoD input. A second source of limiting factors are those imposed by policy and domestic and international law. Aside from the legal regime provided in the instruments concluded among the station partners, a wide variety of existing laws and policy considerations will shape the extent and form of DoD involvement. For example, if an unmanned alternative is more cost-effective for a given DoD space mission than the space station, there is little doubt that the former will be used. The same can be said of mission effectiveness. A long-lived reconnaissance satellite in polar orbit will be infinitely more effective than a man on the space station, with its time, maneuvering and orbital limitations.

In assessing potential military uses, the emphasis should be on operational missions of the type previously mentioned. They tend to be the uses that evoke the most debate, attract the most domestic and international attention and criticism, and bump up against the limits imposed by national policy. Most scientific research on the other hand, does not act as a publicity magnet whether performed by military or civilian astronauts. A considerable amount of the research potential of the space station will have military as well as civil applications. Both DoD and NASA have maintained for several years that the experimental

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[31] See, Space Station Program, supra note 1, for an explanation of the early design input process. NASA began to publicly state that DoD was not a participant but a potential user. See, Culbertson, Long Range Planning, Space Station Program 6 (briefing guide 1985).

capabilities of the station would probably be used by DoD personnel.[32] So long as the research performed was relatively innocuous, the issue of military use is not likely to attract much attention. The international partners, aware of this potential DoD involvement, apparently chose to ignore it.[33] This changed in late 1986, when DoD sought to assure its access to the station. It was not the idea of DoD-sponsored research that troubled the partners as much as it was the apparent impetus behind the DoD's renewed interest, the Strategic Defense Initiative (SDI).[34] raised the spectre of weapons research and development on the space station for a controversial program some viewed as "weaponizing" outer space. By design the station will be ideal for research, some of which will have military applications and be performed by military personnel. The limiting factors previously alluded to do not have near the impact in the research context as they do in an operational one.

B. Selected Design Limitations.

1) Orbital Parameters: Orbital inclination determines the amount of the earth's surface observable from space. A low earth orbit inclined 28.5 degrees to the equator provides coverage over a latitude roughly between 28.5 degrees to the north and 28.5 degrees to the south of the

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[32]See, e.g., DoD: Cook, Use of a Space Station for National Security Missions, in The Space Station, an Idea Whose Time Has Come(?) 15-17 (Dec. 1983 pre-print) (Cook was Dep. Ass't. Sec. for Space Plans & Policy, Headquarters Air Force); NASA: A. Stofan, supra note 13, at 1, and NASA, Space Station (unpaginated briefing book 1980).

[33]See infra Chap. III.2.

[34]Covault & Foley, Defense Decision to Use Space Station Will Delay International Negotiations, Avia. Wk. & Space Tech., Dec. 22, 1986, at 23.

equator.[35] This means the space station crew will be unable to surveil any part of the Soviet Union, Western Europe, and almost all of the United States. Only the lower one-quarter of the People's Republic of China will be visible. In the southern hemisphere, most of Africa, India, Australia and about two-thirds of South America will be within sight. This orbital inclination virtually eliminates the station's value as an operational reconnaissance, surveillance, or intelligence gathering platform. No major area of current strategic interest to the U.S. will fall beneath the space station's ground track. With the exception of some possible value for ocean surveillance and for covering certain third world areas that might be of tactical interest to the U.S., the station is so limited in these roles that it would hardly be worth the effort to use it all. The station would be a poor weapons platform and command center for the same reasons. Even functioning as a communications center, military or otherwise, is not entirely feasible. A low earth orbit would require relaying communications between either communications satellites, ground stations, or both, making the space station redundant and unnecessary in a communications role. Its low earth orbit would also make it vulnerable to a Soviet ASAT threat. Should the station eventually acquire a satellite servicing capability,overcoming numerous technological hurdles in the process,[36] the fact will remain that most military satellites reside in polar, not equatorial, orbits. DoD systems that aren't in low earth polar orbits, tend to be congregated in semi-synchronous or geo-synchronous

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[35]Air Force Space Command, Military Man In Space (MMIS) Handbook A-41 (1988).

[36]The technical questions are themselves daunting. An Air Force study for example, called for $100 million to be spent over seven years just to perfect the handling of fluids in space.

orbits. This will require the station's OMV to carry fuel and parts from its equatorial orbit into a polar one. Due to the widely disparate orbits involved, there is some question as to the cost-effectiveness of such an operation. To illustrate:

> It would cost vastly more to resupply a polar-orbiting satellite from an equatorial orbit that to resupply it by launch from the ground. The required speed that must be given to a supply package from the orbiting space station to allow it to dock with the polar satellite is some 11 kilometers per second, in comparison with some 8 kilometers per second if the satellite were supplied from the ground. With the rockets that we know how to build and that would be used for the space station, it is possible to put into space station orbit only some 5 percent of the initial launch weight. Only about 2 percent of that would then be deliverable to a polar-orbiting satellite. To be specific, if one wants to deliver a ton of payload to a polar-orbiting satellite (for resupply of fuel or the like), one could to that with something like 20 tons launched from the ground. One could do it with something like 60 tons launched from an equatorial space station, but to put the 60 tons on the equatorial space station to begin with would require the launch of some 1200 tons from the ground! (emphasis supplied)[37]

The single most important factor limiting DoD's use of the space station is the orbital inclination, a fact which has caused more than one expert to label it useless for military purposes.[38] While research into possible operational uses for MMIS might well be feasible, actual use in support of operational military missions is unlikely.

2) Station maneuverability: The station will have the ability to maintain its orbit by periodically re-boosting itself to compensate for orbital decay. This is not however, a real maneuvering capability such as that possessed by photo-reconnaissance satellites. The U.S. KH-11 for example, can maneuver and change its orbit and altitude to avoid a

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[37]Garwin, National Security and Space Policy, 11 Int'l Security, Spring 1987, at 165, 168.

[38]See, e.g., Winsor, U.S. Space Station Useless for Defence, Top Scientist Says, Toronto Globe & Mail, Apr. 28, 1987, at 4.

predictable orbit and ground path, as well as focus on specific targets.[39] The space station on the other hand, will have a stable, predictable orbit with little flexibility with regard to selecting what it is able to observe.

3) Power capacity: The block one station will be able to generate up to 75 kilowatts of electricity. This will be split between all elements of the station. Many experiments, military and civil, require far more power, particularly those SDI-related experiments involving exotic technologies such as particle beams and excimer (ultraviolet) lasers.[40]

4) Security considerations: Given the commercial research planned for the station, information protection provisions have been included in the design. DoD however, would require its own system. In addition, given the close confines of the station itself, physical security also enters into the picture. A study done by the Air Force warned of these security problems, and estimated that adequate security devices and plans would cost an estimated $1 billion.[41] An earlier, unofficial study noted that security on the NASA space station would be low, stating that "The best possible solution would be to have a separate laboratory DoD

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[39]Broad, U.S. Designs Spy Satellites To Be More Secret Than Ever, N.Y. Times, Nov. 3, 1987, at C3.

[40]An excimer laser, for example, would require 40,000 megawatts of power to deal with 1,000 boosters in 100 seconds (the output of 80 generating stations). F. Long, D. Hafner, & J. Boutwell, eds., Weapons in Space 327 (1986).

[41]This was a study conducted for the Air Force Space Tech. Center by the American Institute of Aeronautics and Astronautics (AIAA) in 1987. Excerpts are contained in Broad, Space Station Studied by Military, N.Y. Times, Apr. 7, 1987, at C3.

module on the station."[42] This, the study concluded, would cost about $7 billion over 20 years.[43] Furthermore, one aerospace manufacturer calculated that in light of the lengthy design, development, construction process, and lead times involved, the "window of opportunity" or commitment date for a turn-of-the-century initial operating capability for a DoD module would "close" in 1988.[44] For the foreseeable future then, DoD will probably be forced to use NASA facilities, something it may be reluctant to do.

5) Payload accommodation: The block one station will have only two external payload attachment points, and apparently DoD will have to compete with other station users for access to them. In addition, access to the attach points is temporary, since all users are to have the opportunity to use them. The Japanese module has an exterior workdeck and payload attachment capability. For a variety of reasons, including security concerns and the need to obtain Japan's permission, it is unlikely that DoD will be able to use the JEM.

C. The Impact of Legal and Policy Considerations. The extent to which international law restricts the military use of the station will be discussed at a later point. National law and policy however, also have a formidable impact. As demonstrated in Chapter I, national policy considerations have been an integral part of space operations from the beginning. While military sponsored studies and doctrine frequently

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[42] USAF, The Utility of Military Crews in Space--A Report From the Military Crews in Space Study Group 56 (1985).

[43] Id., at 59.

[44] Hayes & Casten, Space Station Potential Military Applications (1986) (unpaginated Rockwell Int'l Inc. briefing guide).

refer to a wide range of potential military uses of space, the final arbiter is the policy promulgated and refined by successive presidential administrations. This policy has served to keep the U.S. military space program a somewhat benign one, confined to the traditional "passive" roles of reconnaissance,surveillance and the like. On-again, off-again ASAT development constitutes the outer limit to which the military has been permitted to go in expanding this "passive envelope." The SDI program may mark the first time that this passive use definition has been significantly expanded since the Eisenhower Administration established it in the late 1950s. The program envisions the research, development, and deployment of a space based ballistic missile defense (BMD) which would include space-based weapons. The ultimate effect SDI will have on long established U.S. policy remains to be seen. The impact SDI and any attendant shifts in policy will have on the operation of the space station is even more unpredictable. What is certain however, is that as this passive or non-aggressive use envelope expands, the role of national policy as a factor limiting military operations in space decreases.

Domestic legislation currently in force consists of the NAS Act of 1958,[45] which does little to curtail DoD use of outer space. By design, the Act assigns to the Administration in power the responsibility of determining the direction and scope of the nation's space program. As a direct result of the controversy surrounding the DoD's insistence on using the space station, some members of Congress have attempted to place limits on the military's access to the station in the future. The methods used have included all those mentioned by Carl Christol:

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[45]National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, 72 Stat. 426 (1958).

> Members of Congress ... are able to influence presidential conduct in a number of ways including the provision or non-provision of funds for space activities, the adoption of resolutions calling for executive responses, the holding of hearings to give publicity to issues so that an informed public opinion will come into being, and direct appeals by individual Congressmen to the general public and to the world's authoritative decision makers.[46]

To date, only the exercise of Congress' power over appropriations has come close to placing real limits on DoD use of the station. In 1987 an effort was made to include language in the NASA Authorization Act of 1988 limiting the military use of the space station. In language directed at the SDI program, members of the House of Representatives introduced legislation that "prohibited the use of the Space Station by or on behalf of any department or agency for the conduct on the Space Station of the operational testing or deployment of any offensive or defensive weapon or weapons system or in contravention of United States laws or treaty obligations."[47] This was amended, pursuant to a committee recommendation, to change the phrase "or in contravention of ..." to "... if in contravention of ...,"[48] which severely restricted the scope of the limiting language. In response, the bill's sponsors moved to have the entire passage deleted, viewing it as having been rendered ineffectual by the amendment.[49] The legislation eventually enacted thus had none of

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[46]Christol, The Common Interest in the Exploration, Use and Exploitation of Outer Space for Peaceful Purposes: The Soviet-American Dilemma, in Proceedings of the 27th Colloquium on the Law of Outer Space 281, 288 (1984).

[47]Text at 133 Cong. Rec. H6133 (daily ed. Jul. 9, 1987).

[48]House Comm. on Science, Space, & Tech., Report on Nat'l Aeronautics and Space Admin. Authorization Act, FY 1988, H.R. Rep. 100-204, 100th Cong., 1st Sess. 10 (1987).

[49]133 Cong. Rec. H6134-6135 (daily ed. Jul. 9, 1987) (remarks of Mr. Mineta).

the language that would limit SDI testing,but did contain the following passage worked out between House and Senate negotiators:

> Sec. 105. No civil space station authorized under section 101(a)(1) of this title may be used to carry or place in orbit any nuclear weapon or any other weapon of mass destruction, to install any such weapon on any celestial body, or to station any such weapon in space in any other manner. This civil space station may be used only for peaceful purposes.[50]

The first sentence of the legislation simply repeats a prohibition already imposed by international law in the form of Article IV of the Outer Space Treaty, to which the U.S. is a party.[51] The second sentence suffers from a familiar problem, the lack of a definition of "peaceful purposes," which renders it as toothless as other such exhortations. Still, such legislative initiatives reflect sentiment within Congress that cannot be ignored. If the proponents of such initiatives ever achieve their goal, the legislation enacted may well be far more effective than international law in limiting military use of the station.

D. Department of Defense Proposed Uses. The 1987 Defense Authorization Act required DoD to file with Congress, by early 1988, a list of what DoD proposed to do with the space station.[52] The report, dated 1 March 1988, was submitted to both the Senate and House Armed Services Committees.[53] It states that DoD "intends to conduct research

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[50]National Aeronautics and Space Admin. Authorization Act of 1988, Pub. L. No. 100-147, 101 Stat. 860 (1987).

[51]OST, supra note 87 Chap. I.2.F, Art. IV.

[52]National Defense Authorization Act for Fiscal Years 1988 and 1989, Pub. L. No. 100-180, 101 Stat. 1019, Sect. 255 (1987).

[53]DoD, Potential Department of Defense Use of a Permanently Manned Space Station (report, 1988) [hereinafter cited as DoD Use Report].

and technology development" on-board what DoD considers "a national resource, dedicated primarily to civil space activities, but available to the DoD in accordance with national priorities and international commitments."[54] Before listing possible specific uses, the report also describes the level of DoD's interest in the station and where the DoD intends to focus its efforts. First, any attempt to influence the design or development of the station is denied. The focus of DoD will be "on low level, long duration research and development activities which require either extended manned involvement or take advantage of specific space station capabilities."[55] The report does not rule out eventual operational use of the station, noting that "possible roles for military man-in-space focused on unique or cost-effective contributions to valid operational missions and requirements ...."[56] are actively being explored. Should an operational military mission be identified though, the report states that "it may prove most effective and efficient to conduct certain of these activities on a DoD element or platform associated with the Space Station ...."[57] Although no weapons tests are planned, DoD does state that it may consider using the station for "certain test and development activities such as those approved in support of strategic defense research."[58] The report is couched in general terms and makes no reference in its seven pages to international law or

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[54] Id., at 1.

[55] Id., at 2.

[56] Id., at 1.

[57] Id.

[58] Id., at 3.

domestic legislation affecting its ability to use the station. If refers instead to the "international agreements related to the Space Station," saying that all DoD activities will be consistent with those agreements.[59] Finally, the DoD report mentions the potential operational uses it foresees, including the repair and refurbishing of spacecraft, and acting as a transportation way-station. To illustrate with greater specificity the kind of operational development activities it may conduct, 13 experiments are listed and described.[60] Eight of the 13 are virtually identical to currently approved MMIS shuttle experiments and were undoubtedly taken from the program.[61] An additional experiment, launch detection from space, was on an earlier MMIS program list. Only the last four experiments are unique to the space station. They include space system servicing and repair, on-orbit construction and power production research.[62]

E. Other Proposed Military Uses. In addition to the potential uses acknowledge by DoD, other possibilities have surfaced and been the subject of comment. Sources vary from military sponsored studies to the musings of journalists. The quality is similarly uneven, ranging from the relatively uninformed to the refined.[63] Most however, build upon

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[59] Id., at 2.

[60] The report emphasizes that they are for illustration purposes only; none are currently planned for the space station.

[61] See, supra Chap. I.5.B.

[62] DoD Use Report, supra note 53, at 6-7.

[63] Uninformed; see, e.g., B. O'Leary, Project Space Station 21-22 (1983), where the author dwells on the station's command post potential, ignoring the limitations imposed by the already decided low altitude and low inclination orbit. Informed; see, e.g., Broad, Space Station Studied by the Military, N.Y. Times, Aug. 7, 1987, at C1.

ideas discussed in military and industry circles for several years. The use of the station as some sort of military support facility has received quite a bit of attention and is usually a key feature of military and industry studies.[64] One possibility holding more promise than most, is the idea of using the station as a platform for space surveillance and tracking. The U.S. currently has sizeable gaps in its surveillance network, particularly in coverage of deep space and the geosynchronous orbits. Station mounted tracking radars would solve part of this problem.[65]

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[64] See, e.g., Contractors Tout Potential of DoD Station, Military Space, Mar. 30, 1987, at 1.

[65] See, e.g., Broad, Space Station Studied by the Military, N.Y. Times, Aug. 7, 1987, at C1.

CHAPTER III: THE INTERNATIONAL SPACE STATION AGREEMENTS: AN OVERVIEW

Chapter III.1: Format and Status

A. The Chosen Instruments. In its 30 years of existence, NASA has entered into over 1,000 agreements with approximately 135 countries and international organizations.[1] The subject of these agreements has ranged from the simple exchange of data, to laying out in intricate detail the development and operation of complex and expensive space hardware such as Spacelab. In each international collaborative effort, an agreement, memorandum of understanding, exchange of letters or notes, or some other form of written instrument has been used to document the arrangement. Over time, certain "rules" or guidelines evolved with regard to such international undertakings. Emphasizing substance over form, these guidelines were never codified and, as a former NASA Director of International Affairs has pointed out, several different versions can be found.[2] The underlying goal in their application, in any version, is two-fold; to maximize the benefits to be gained from the collaborative effort, and to control the risk to NASA.[3] One fairly recent

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[1] Kupperman, Reese & Thacher, Maintaining Outer Space for Peaceful Purposes Through International Cooperation 53 (AIAA pre-print 1987). The first international undertaking involved the launch of the United Kingdom's Ariel-1 satellite in 1962.

[2] Pedersen, The Changing Face of International Space Cooperation, Space Policy, May 1986, at 123. Aside from the version found in this article, see also E. Galloway and J. Galloway, United States National Space Legislation on the Exploration and Use of Outer Space for Peaceful Purposes, in Proceedings of the 30th Colloquium on the Law of Outer Space 32, 34 (1987), and International Space Activities 1979, Hearings Before the Subcomm. on Space Science and Applications of the House Comm. on Science and Tech., 96th Cong., 1st Sess. 197 (1979) (stmnt. of Kenneth S. Pedersen, NASA Dir. of Int'l Affairs) [hereinafter cited as International Space Hearings].

[3] Pederson, supra note 2, at 120.

articulation of these principles serves to illustrate characteristics of the type of agreement NASA prefers:

- Cooperation proceeds on a project-by-project basis, subject to written agreements which are focused in scope and limited in duration. "Umbrella agreements" containing only generalized commitments to partnership or embracing multiple projects, are discouraged. As one result, bilateral arrangements have predominated over multilateral ones.

- Agreements are signed with civilian government agencies, not with foreign private firms or military organizations.

- Each party ... provides ... hardware or clearly defined services using its own technology ....This simplifies management and limits technology transfer.

- Each party finances its own work and any exchange of funds is held to an absolute minimum.

- When it chooses to do so, NASA retains overall project management and operational control, especially where manned spaceflight systems are involved.[4]

NASA has a preference for bilateral, narrowly focused agreements in which it retains a high degree of managerial and operational control. This reflects the United States' historical dominance in space technology, experience, and funding. It has allowed NASA to dictate the terms of almost any international space endeavor. NASA's international partners have traditionally been quite subordinate, particularly in the area of operational control of space systems. The attitude associated with these principles, that the partner either agrees to NASA's terms or there will be no partnership, combined with a host of other factors to make the space station negotiations difficult and protracted.

The early development of the space station concept and program progressed quite smoothly and, for NASA, predictably. When the program received its formal go-ahead in 1984, NASA and its potential partners had

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[4] Id., at 121.

been engaged in conceptual studies for almost two years. The informal arrangement among the parties included periodic planning meetings and exchange of information--but no binding obligations. In 1985, as the program moved into Phase B, Detailed Definition and Preliminary Design,[5] a more detailed and concrete plan was necessary. NASA negotiated and concluded bilateral Memoranda of Understanding (MOU) with ESA, Canada's Ministry of State for Science and Technology (MOSST), and Japan's Science and Technology Agency (STA).[6] The conclusion of these MOUs was entirely consistent with past NASA practice, particularly the bilateral aspect. The Phase B MOUs did not bind the partners to proceed to the development phase, which was to be the subject of separate Phase C/D/E negotiations.

The advent of the Phase C/D/E negotiations in 1986 brought to the surface a number of problems that had been simmering for some time, both as to the form the agreements should take and the substance therein. There seemed to be a unanimous recognition among the participants that two types of legal instruments would be necessary to adequately address the remainder of the program. Bilateral MOUs on an agency-to-agency level were required to cover the complex technical details of the program, and in NASA's view, to outline the structures and procedures regarding the management and operation of the station. A government-to-government agreement of some sort was called for by the

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[5]The five development phases are listed at Chap. II.1, supra.

[6]Memoranda of Understanding: NASA-ESA, Jun. 3, 1985; NASA-MOSST, Apr. 16, 1985; NASA-STA, May 20, 1985 (formal titles omitted). ESA is viewed by the U.S. as a single entity with international legal personality pursuant to Exec. Order 11760, 39 Fed. Reg. 2343 (1974) (recognizing ESA's predecessor, ESRD).

sheer size and duration of the program, but in NASA's view would be limited to general platitudes and broad understandings. This was consistent with NASA's desire to maintain control over the content. The MOUs were primarily a NASA responsibility while government level agreements were open to an inter-agency formulation and review process that tended to be far more politicized and thus unpredictable. From the beginning however, the partners favored a formal treaty that would embody key elements of the relationship. There was a belief, particularly prevalent among the ESA member states, that an inter-governmental agreement would be more binding than the MOUs and would better serve to protect the partners' interests.[7] A formal treaty would ensure that the partners were accorded an equal status in the operation and management of the station, a status that would be difficult for NASA to dilute.[8] It was also thought that a treaty would somehow protect the partners' billion dollar investments from the vagaries of the United States' budget process and changing political winds.[9] Added to this tug of war were numerous problems involving the substance of the agreements. Issues such as the division of managerial authority, dispute resolution mechanisms, civil and criminal jurisdiction on-board the station, the protection of intellectual property, inter-party waivers of liability, access of partners and

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[7]This philosophical difference caused the negotiations to bog down almost as soon as they got started. See, Covault, U.S., Europe Deadlock Over Station Participation, Avia. Wk. & Space Tech., Nov. 24, 1986, at 16.

[8]ESA made this status a "fundamental objective" and a condition of its participation. See, Resolution on Participation in the Space Station Program, ESA Council meeting at Ministerial level (Jan. 31, 1985, ESA/C-M/LXVIII/Res. 2). Also known as "The Rome Resolution."

[9]Pedersen, supra note 2, at 134.

non-partners, crewing, and many others, needed to be addressed.[10] In addition, impacting on the entire process was a continuing philosophical debate over the scope of the agreements. Should they be all-encompassing in nature, in effect establishing a code of conduct for space? Or should they be designed to evolve incrementally, as needs were identified? Most authorities favored the latter option, and ultimately it prevailed.[11] The DoD use controversy, described in the next section, simply added fuel to the fire. After negotiations lasting over two years, the partners were able to agree on both the form and substance of the agreements. While the bilateral MOUs and the multilateral inter-governmental agreement (IGA) were negotiated during the same time frame, the language of the MOUs was the first to be agreed upon.[12] Tentative agreement on the MOUs with ESA and Canada's MOSST was reached in early 1988, followed shortly afterwards

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[10]The most stubborn problem proved to be the division of managerial/operational authority in case a consensus could not be obtained. This problem of integrating political and economic factors with scientific and technical factors wasn't new. Eilene Galloway, for example, recommended reference to INTELSAT-type arrangements, where dividing types of management among separate legal documents has proven to be an effective compromise. See Galloway, The Space Station: United States Proposal and Implementation, 14 J. Space L. 32 (1986).

[11]The basic approach taken was one of avoiding the creation of new bodies of law or procedural, adjudicatory systems solely for application in outer space. See, e.g., Office of Technology Assessment, Space Stations and the Law: Selected Legal Issues 55 (1986).

[12]The U.S. had initially insisted on a bilateral IGA with each partner as a means of enhancing its negotiating position. This "divide and conquer" strategy was changed in mid-1987 at the partners' insistence.

by the MOU with Japan's STA.[13] Agreement on the language however, did not constitute formal acceptance of the terms of the MOUs. As with the IGA, which received tentative approval close on the heels of the MOUs, acceptance was dependent upon individual government review and approval. This process preceded the late September 1988 signing of the IGA. While a single, multilateral instrument signed by all partners, the IGA has, as related but unattached instruments, letters exchanged between the United States and each partner elaborating on the scope of permissible military use of the station.[14]

B. The International Status of the Instruments. At a ceremony in Washington D.C. on the 29th of September 1988, the IGA was signed on behalf of the United States by Secretary of State George P. Schultz. His counterparts from the partner countries, including each participating ESA member, performed the same service for their nations. Following this, MOUs were signed by the NASA administrator and his counterparts from ESA and Canada's MOSST.[15] Given the partners' expressed desire for the "protection" of a formal treaty, discussion of the status of the IGA and MOUs is warranted.

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[13] NASA/ESA Clinch Agreement on Cooperation, Space Station News, Jan. 25, 1988, at 6. The ESA management council approved the MOU in Mar. 1988. ESA Approves Pact with NASA on Space Station, Avia. Wk. & Space Tech., Mar. 28, 1988, at 29. Canada and NASA reached a general agreement in the same time frame. See, U.S. Partners Cross Fingers on Agreement, Space Station News, Jan. 11, 1988, at 6. The Japanese had some internal problems over who would sign the MOU after agreeing on the language. See, White House Pressures Negotiators, Space Station News, May 30, 1988, at 7.

[14] For draft text of notes, see, Appendix A, infra.

[15] The NASA-STA (Japan) MOU, which is substantively identical to the NASA-ESA and NASA-MOSST MOUs should be signed within nine months. Letter from R.J. Wojtal, Senior Attorney, NASA, to author (Oct. 12, 1988).

In a generic sense, both types of instruments are recognized in international law as treaties. As such, they are legally binding between the parties involved. Article 2(a) of the Vienna Convention on the Law of Treaties defines a treaty as "an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation."[16] The definition provided is restrictive in a sense, as it applies only to written agreements concluded between states. It is generally accepted however, that oral agreements between states as well as those concluded between states and other subjects of international law possessing legal personality, may also be considered binding treaties under the right circumstances.[17] Thus ESA, while not falling within the scope of the Vienna Convention provision, may nevertheless be party to an international agreement under customary international law, providing its constitutional provisions so allow.[18] Another feature of the definition of a treaty, both under the convention and in customary international law, is the wide assortment of labels assigned to the term. A draft definition formulated by the International Law Commission

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[16]Vienna Convention on the Law of Treaties, opened for signature May 23, 1969 (entered into force Jan. 27, 1980). Text reproduced in 63 Am. J. Int'l L. 875 (1969). While the U.S. is not a party to this convention, the U.S. Dept. of State regularly invokes many of its terms as declarative of customary international law.

[17]See, e.g., J. Starke, Introduction to International Law 413-414 (9th ed. 1984). The Vienna Convention on the Law of Treaties itself recognizes, in Art. 3, that its definition is not meant to encompass all legally binding international agreements.

[18]The U.S. has recognized the international personality of ESA. See supra note 6.

illustrates the point, asserting that a treaty is "any international agreement in written form ... whatever its particular designation (treaty, convention, protocol, covenant, charter, statute, act, declaration, concordant, exchange of notes, agreed minute, memorandum of agreement, modus vivendi or any other appellation) ...."[19] The form in which the instruments are concluded in no way effects their binding character, as it is the content and substance that controls that determination. The IGA and MOUs, properly concluded, are legally cognizable and binding regardless of the labels attached.

The form selected however, may signify a "difference in procedure or a greater or lesser degree of formality."[20] The degree of formality desired is usually related to the importance of the agreement as well as the subject matter. As a general rule, the most formal instruments are those signed by heads of state, occasionally referred to as treaties between "high contracting parties." Further down the written agreement ladder are inter-agency instruments, such as the MOUs between NASA and the space station partners. While just as internationally binding on the parties as a treaty concluded among heads of state, they nevertheless suffer from an intangible loss of "weight" or prestige that accompanies the more formal arrangements. Between these two examples on the

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[19] Y. B. Int'l L. Comm'n, ii, 161 (1962), as excerpted in I. Brownlie, Principles of Public International Law 601 (3rd ed. 1979).

[20] J. Starke, supra note 17, at 417.

"formality (and perhaps importance) scale," lies the inter- governmental agreement, or IGA.[21] This has been defined as:

> ... an instrument less formal than a treaty or convention proper, and generally not in heads of state form. It is usually applied to agreements of more limited scope and with fewer parties than the ordinary convention. It is also employed for agreements of a technical or administrative character only, signed by the representatives of government departments, but not subject to ratification.[22]

The last point mentioned, ratification, has perhaps been the most instrumental in sparking a trend away from more formal instruments towards IGAs. For the United States in particular, the ability to avoid the lengthy and often politicized domestic treaty ratification process has provided more than enough incentive to favor the IGA format.[23] The desire to avoid the legislative approval process has not been limited to the United States. Most countries, including all space station partners, have increasingly turned to this form of agreement to conduct their

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[21] Id. According to Starke, the heirarchy, in descending order is; conventions, protocols, agreements, arrangements, proces verbal, statute, declaration, modus vivendi, exchange of notes, final act, and general act. Each of these can be concluded on several levels; between heads of state, between gov'ts., at the ministry or departmental level, between states, (e.g., the NATO Treaty of 1949) as parties, or between gov'ts. on an agency-to-agency level. Other authors have similar lists. See I. Brownlie, supra note 19, at 601.

[22] J. Starke, supra note 17, at 418.

[23] Under U.S. domestic law, international agreements fall into two categories; treaties (concluded pursuant to Art. II, Section 2 of the U.S. Constitution and requiring Senate ratification) and "executive agreements" (concluded by an authorized member of the executive branch based upon legal authority found in the Constitutional powers of the President, U.S. statutes, treaties, etc., and do not require Senate ratification). The IGA is considered an executive agreement.

international affairs.[24] The MOU also tends to avoid the legislative approval process, and differs from the IGA by being concluded at a lower level, usually agency-to-agency, and by being much more technical or detailed. The MOU's primary function seems to be one of dealing with the "nuts and bolts" issues encountered on a day-to-day basis. It may implement the broader terms of an IGA on the operational level, as it does with the space station, or stand on its own. When accomplished in conjunction with, or pursuant to, an IGA, it is usually clearly subordinate to the IGA signed at departmental level.

The problem with IGAs, and particularly MOUs, is that their very informality can degrade their international and domestic "status" in the eyes of the participants. As one author, worried about the lack of "respect" shown such instruments, cautioned almost 30 years ago:

> ... this practice must not be allowed to obscure the fact that the real contracting parties are States. It is necessary to insist upon this point, because any notion that an Agreement expressed to be made between Governments or Government Departments binds only those Governments might have a tendency to impair the binding character of such agreements by encouraging subsequent Governments, perhaps of a political complexion completely different from the Government which made the agreement, to repudiate them.[25]

In other words, the space station's IGA/MOU format does little to provide the sort of stability and protection sought by ESA and the other partners. While legally binding, they are nevertheless much more subject to alteration or repudiation since they simply are not viewed as having

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[24]For a comprehensive treatment of the IGA/MOU format in the space station context in each of the participating countries, see A. Young, Law and Policy in the Space Station's Era 140-184 (1987) (unpublished dissertation submitted to the Institute of Air & Space Law, McGill Univ., Montreal, CN.)

[25]L. McNair, The Law of Treaties 20 (1961).

the status or sanctity of a traditional, formal, treaty. The space station will remain at the mercy of the domestic political and budgetary processes of the United States. The status of the instruments involved in the "exchange of letters" is similar to that of an IGA or MOU. The terms and conditions contained therein constitute legal and binding obligations, the key issue being what "weight" they are to be given. If, as is the case of the space station letters, they purport to clarify or expand upon a point or provision of the IGA, then an argument can be made that their provisions should be accorded roughly the same status as the IGA itself. One argument to counter this assertion would be that by making the conscious choice to relegate the matter covered to a mere letter, the parties have implicitly commented upon its importance relative to the main instrument.

Chapter III.2: The Military Use Controversy

Judging by the uproar caused among the partners in December 1986 when the Secretary of Defense announced DoD's plans to use the space station for military research, it would have been easy to conclude that they had been misled by the U.S. regarding the civilian character of the station. Despite assertions to that effect, the partners had in fact been aware of the potential for DoD involvement for quite some time. When the U.S. and its partners conducted preliminary design studies in the 1982-1983 time frame, DoD was an active participant in the process. A limited amount of funding was provided by DoD and a formal liaison process was established for the program. By mid-1983 however, the DoD had concluded that it had no identifiable need for the proposed space station's capabilities and would thus provide no funding for the project. The partners were

nevertheless concerned about "militarization" of the station, fearful that as with the shuttle, DoD would become a dominant influence.[26] DoD's reluctance to become involved undoubtedly served to allay those concerns, as did frequent representations to Congress by NASA officials throughout the latter part of 1983 and into 1984 that DoD simply wasn't interested.[27] Most heartening however, were published reports at the time of the program's formal announcement in January 1984 that the station had been vehemently opposed by DoD.[28] Convinced that NASA had drastically under-estimated the total cost of the station, DoD's concern was that the station would divert scarce funding from the shuttle.[29]

On the surface then, the partners had little to fear in the form of DoD involvement. Closer examination reveals however, that their initial discomfort with the situation had a sound basis in fact. While NASA repeatedly portrayed the station as a civilian endeavor, neither NASA nor DoD ever said that the military would be precluded from jumping on-board should a need develop. Immediately after the program's announcement in 1984, NASA Administrator James Beggs visited the partners to outline the

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[26] International Space Hearings, supra note 2, at 44-45 (Statement of Kenneth S. Pedersen, NASA Dir. of Int'l Affairs).

[27] See, e.g., responses to questions asked of Mr. Hodge, NASA Director of the Space Station Task Force in NASA's Space Station Activities, Hearings Before the Subcomm. on Space Science and Applications of the House Comm. on Science and Tech., 98th Cong., 1st Sess. 85-88 (1983), and the testimony of Mr. Hodge, in Civil Space Station, Hearings Before the Subcomm. on Science, Technology and Space of the Senate Comm. on Commerce, Science and Transp., 98th Cong., 1st Sess. 47 (1983).

[28] Station Overrode Strong Opposition, Avia. Wk. & Space Tech., Jan. 30, 1984, at 16.

[29] DoD's fears in this regard have proven to be correct. NASA estimated a $4-$6 billion total cost in 1984. That figure has since risen to $18-$20 billion for the revised baseline station. See also, Grey, Space Station Careens Past All Obstacles, Aerospace America, Sept. 1987, at 24.

project. According to a 16 March 1984 letter from Beggs to Secretary of State Schultz, no military use of the station was contemplated, but that "the space station will be a national facility open to any paying customers--including DoD--for peaceful purposes ....," and that the partners understood and accepted this situation.[30] DoD reportedly told NASA that although it would not support the station, it would undoubtedly find uses for it if and when it came into being.[31] Such an approach was consistent with the adage that need often follows the demonstration of capability. It was widely felt that given the high technology involved, and NASA's proven track record of needing the infusion of DoD funds to make its major programs viable, some form of DoD involvement was inevitable.[32] NASA never denied this, but made an assiduous effort to minimize its significance.[33] The situation facing the partners was a murky one. DoD had not disavowed station operations and had in fact retained an active liaison with the NASA Space Station Office. Precedent favored a DoD interest at some point, and most observers felt it would manifest itself sooner or later. NASA however, citing the DoD's "no identifiable need" position, comforted the partners by basically inferring

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[30]A. Lawler & J. Vedda, Space Station Directory 3 (1987).

[31]McLucas, The Space Station is Not a Military Base, Aerospace America, Mar. 1987, at 4. (McLucas is a former Secretary of the Air Force).

[32]See, e.g., Anderson, NASA Finds the Way Toward Building a Station Fraught With Legal Hurdles, Commercial Space, Spring 1986, at 47, 61.

[33]For example, in 1985 a NASA official admitted that "national security objectives" would emerge to capitalize on station capabilities, but added that "I do not see these applications automatically coming aboard the space station," predicting that DoD would be more interested in their own stations, orbits and inclinations. Freitag, Space Station Planning, in Europe/United States Space Activities, 85, 87 (Baiman & Von Burn ed. 1985).

that DoD involvement would be much later, if ever. All parties realized that in any event, it wasn't an issue that needed to be resolved in the preliminary phases of development. Between 1984 and late 1986 there was little mention of the issue. The partners tended to view the somewhat ambiguous situation in the manner best suited to their circumstances.[34] NASA's representations that the station would be reserved for peaceful purposes, permitted each country to interpret the phrase as they saw fit.

The tone and timing of Secretary of Defense Weinberger's December 1986 statement probably served to cause more consternation among the partners than did its actual substance. The IGA/MOU negotiations had bogged down in November 1986, over issues unrelated to DoD use. One of the most contentious points was the partners' insistence on management by consensus, a system that would guarantee a degree of equality in the day-to-day operations of the station. NASA preferred to reserve for itself the right to veto any group decision that it disagreed with. There were also disagreements on everything from substantive issues of law (such as jurisdiction and intellectual property rights) to the form the agreements should take.[35] Because of the deadlock, the U.S.' Senior Inter-Agency Group on Space (SIG) composed of representatives from the NSC, DoD, State Department, and other agencies, became involved in the review of the drafts circulating at the time. It was the one thing NASA had sought to

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[34] See, e.g., Canadian Institute for Advanced Research, Canada and the Space Station, A Report to the Canadian Government 5 (1986), where it states that the station is not a military facility and has no connection whatever with the SDI program. While perhaps literally correct, it implies that SDI research will not be performed. No official assurances of this nature had been given to the partners by the U.S.

[35] Covault, U.S. Europe Deadlock Over Station Participation, and Fink, Space Cooperation Realities, both in Avia. Wk. & Space Tech. Nov. 24, 1986, at 16, 11 (respectively).

avoid, and with good reason. Within days DoD, afraid that NASA was about to somehow limit its future access to the station by agreeing to management processes that would give the partners an unacceptable level of influence, made public its concerns. Various motives have been ascribed to DoD's about-face on station use, but the primary reason seems to have been to ensure the station's availability for SDI-related research.[36] A renewed interest in the MMIS idea combined with decreased shuttle opportunities also seems to have played a part.[37] Regardless of the motive, the mention of SDI in the same breath as the space station created political havoc for the partners, particularly the neutral members of ESA. The U.S. had to delay further negotiations until it was able to resolve its own internal conflict. In January and February 1987 the U.S. sent each partner new draft bilateral IGA proposals. Article 2 of the text, addressing the object and scope of the agreement, stated that the station was to be used for peaceful purposes.[38] This was consistent with earlier drafts. Article 9, Utilization, contained new provisions however, that were the direct result of DoD's complaints. All partners, it was proposed, would have the right to use their allocated shares of space station resources for any purpose, including, in the case

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[36] Covault & Foley, Defense Decision to Use Space Station Will Delay International Negotiations, Avia. Wk. & Space Tech., Dec. 22, 1986, at 23.

[37] In the DoD Space Policy published shortly after Weinberger's Dec. 1986 announcement, the MMIS concept was made an integral part of a policy emphasizing research and development and the use of all available platforms to carry out this R&D. The space station was explicitly mentioned as a factor prompting the new policy. DoD, Fact Sheet on Space Policy (1987).

[38] See, e.g., Dept. of State, An Agreement Between the Government of the United States and the Government of Canada on Cooperation in the Detailed Design, Development, Operation and Utilization of the Permanently Manned Space Station (Draft, Feb. 3, 1987).

of the United States, national security.[39] A partner's use of its allocated share would not be subject to objection unless such use would affect the "foreign policy or national security interests of the party providing the element or of the United States."[40] In such an instance, the concurrence of the partner providing the element or the United States would be required. In essence, the U.S. had the right to use all elements of the station for national security purposes. If such use involved another partner's element, that partner could object and prevent the questioned activity. No one though, had the right to object to the U.S. using its own element for national security purposes. The U.S. however, had the right to veto a partner's use of its own element if the U.S. felt its national security or foreign policy interests were affected. Several aspects of this bothered the partners. First, the language was vague. "National security" for instance, was not limited to research and development. Second, the right of the U.S. to veto a country's activities in its own element was deemed unacceptable, particularly since there was no reciprocal privilege available to the partners. Since the U.S. was still insisting that NASA would make operational decisions when a consensus could not be reached, the ability of the partners to influence how the U.S. used its allocation was considerably reduced. In some respects the concern over DoD use was secondary to the management issue. No partner took the position that there could be no DoD involvement whatsoever. Even Japan, the partner most sensitive to being associated with military activities in space, had earlier indicated that "small" DoD

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[39] Id., Articles 9.4 & 9.5.

[40] Id., Art. 9.6.

research activities might be acceptable.[41] ESA was of the same opinion, and took the position that any problem in defining what would be acceptable could be taken care of by creating a management structure that gave the partners an equal say in the operation of the station. In this manner, a consensus mechanism could be used to classify a proposed use as peaceful or non-peaceful on a case-by-case basis.[42] The argument was not over whether any military activity was permissible, but over how the decision as to what would be allowed was to be made, and who would make it. The key to the partners' willingness to accept DoD involvement lay in their ability to exert some control over it. Absent a meaningful influence, they were reluctant to invest billions of dollars in a station that could be subject to unbridled military activity.

The idea of permitting a coalition of up to 14 countries to decide or even review what national security activities could be carried out on-board the station was pure anathema to DoD, so little progress was made. Negotiations again reached an impasse, and the partners threatened to wash their hands of the whole affair. NASA, desperately trying to save the program, brought things to a head in April 1987 after DoD publicly reiterated its demands.[43] Faced with the likelihood that the President would side with NASA, DoD agreed to some compromises. A new draft IGA was sent to the partners in late April. A major change was to defer the most controversial issues to the MOUs in order to make agreement on the IGA easier to achieve. This included the pertinent

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[41] Covault & Foley, supra note 36, at 23, 24.

[42] Foley, U.S. Proposal Would Restrict European, Japanese Station Use, Avia. Wk. & Space Tech., Feb. 16, 1987, at 23.

[43] Flash Point, Avia. Wk. & Space Tech., Apr. 13, 1987, at 21.

details of the management structure, which still retained a NASA veto ability. Article 2 became Article 1 and incorporated an important change in the language referring to the use of the station for peaceful purposes, by adding the words "in accordance with international law."[44] To the extent that international law limited the military use of outer space through its definition of peaceful uses, those limitations were now an explicit part of the station arrangements. No attempt was made to define "peaceful purposes." Article 9 deleted all references to national security, providing only that use would be in accordance with the IGA and other implementing arrangements.[45] Language dealing with the national security issue was relegated to a proposed agreed minute to be attached to the IGA. In it, the parties agreed that each participant would be the judge of what activities in their elements would meet the requirement that all uses be for peaceful purposes in accordance with international law. National security use was explicitly mentioned as a permissible activity. Finally, the minute allowed each partner to use their elements and the space station infrastructure in accordance with their interpretation of the above requirement.[46] This did not constitute much of a concession by the United States in terms of substance. The change in form however, was important as it removed the issue from the text of the IGA and supposedly out of the public's eye. For the moment, the partners accepted this and turned their attention to other more contentious issues. The

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[44] See, e.g., Dept. of State, An Agreement Between the Government of the United States of America and the Government of Japan on Cooperation in the Detailed Design, Development, Operation and Utilization of the Permanently Manned Space Station (Draft Apr. 17, 1987).

[45] Id., Articles 9.4 & 9.5.

[46] Id., Text of Agreed Minute.

ultimate acceptance of the provisions seemed to hinge on the outcome of the negotiations over the management structure.

After switching to a multilateral IGA format in late summer, further negotiating sessions were held in September 1987 and February 1988. While DoD use remained an open issue, it was no longer at the forefront. Some participants were still uncomfortable with the language, realizing that by having each party determine what constituted peaceful purposes in accordance with international law, the IGA could lead to a dozen different opinions in a given case.[47] More important, it allowed the proponent of a military use to be the judge of its propriety without providing for a more objective review or an appeals process for partners who disagreed with an interpretation. Nevertheless, as other issues were resolved, the military use language was fine-tuned and agreed upon, in substance ending up very much like the April 1987 proposal. Canada, concerned about DoD use of its contribution to the station--which as part of the infrastructure Canada could not prevent--negotiated a special provision in the IGA requiring NASA to buy Canada out should a disagreement on any issue prove to be insoluble and Canada wish to withdraw.[48] The final draft IGA, produced by the U.S. after the February meetings, retained clauses requiring that the station be operated

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[47] U.S., Europe Seek to Conclude Station Talks at Final Bilateral Meeting, Avia. Wk. & Space Tech., Sept. 7, 1987, at 28.

[48] U.S., Partners Cross Fingers in Agreement, Space Station News, Jan. 11, 1988, at 6.

in accordance with international law.[49] Article 9 reintroduced language referring to national security use, stating that the partner providing an element would have the right to determine if the anticipated use of that element complies with the peaceful purposes requirement.[50] In an Article dealing with evolution of the station, language requiring that the station remain a civil station operated for peaceful purposes was added.[51] The proposed agreed minute was deleted and an "exchange of letters" added. These consisted of an individual letter from the U.S. to each partner reiterating that the U.S. has the right to use its elements and the infrastructure for national security purposes so long as such use is for peaceful purposes and in accordance with international law. Replies from each partner to the United States varied slightly, but each confirmed that the U.S.'s letter correctly stated the U.S.' rights under the agreement.[52] Again, the changes were not so much of substance as they were of form. Where an agreed minute would probably have been considered a part of the IGA, the letters exchanged between the

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[49]The new draft also added, in Article 2, a provision requiring that the station would be "utilized in accordance with international law, including the Outer Space Treaty, the Rescue and Return Agreement, the Liability Convention, and the Registration Convention." Dept. of State, An Agreement Among the Government of the United States of America, Governments, Members of the European Space Agency, the Government of Japan, and the Government of Canada on Cooperation in the Detailed Design, Development, Operation, and Utilization of the Permanently Manned Space Station (Draft Feb. 9, 1988).

[50]Id., Article 9.8(b).

[51]Id., Article 14.

[52]Id., Texts of Exchange of Letters.

signatories are not.[53] Thus, they form a separate agreement of unknown weight in comparison to the IGA. The goal was to take a controversial issue and separate it from the IGA, leaving unobjectionable and vague language in the text as the only reference to peaceful use.

The provisions just discussed remained intact through the final negotiations and became part of the IGA and letters signed on 29 September 1988.[54] Significantly, the partners failed to sway the U.S. on the management issue, the result being that NASA has been given the final say when consensus cannot be reached on an issue. ESA, Japan and Canada have thus lost the structural ability to act as a check on a liberal interpretation of "peaceful purposes" by the U.S., should it be inclined to make one. The exchange of letters has all three partners at least acknowledging in effect, that the U.S.' long-standing position that the phrase "peaceful purposes" in international law, permits some military activity in space. While all may have acquiesced to that interpretation in practice by not raising the issue, some have never officially admitted that the American view is correct.

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[53]Article 3(a) of the signed inter-governmental agreement defines "this agreement" as meaning the agreement itself and the Annex thereto. The exchange of letters is not mentioned. Agreement Among the Government of the United States of America, Governments of Member States of the European Space Agency, The Government of Japan, and the Government of Canada on Cooperation in the Detailed Design, Development, Operations, and Utilization of the Permanently Manned Civil Space Station, opened for signature Sept. 29, 1988, [hereinafter cited as the Space Station IGA or IGA].

[54]Id. Between finalizing the IGA language in Mar.-Apr. 1988 and the IGA ceremony in Sept. 1988, three ESA members dropped out; Sweden, Austria and Switzerland. This was ostensibly for financial reasons, and not because of the national security issue.

Chapter III.3: A Summary of Selected Provisions of the IGA/MOUs

A. Registration, Ownership, Jurisdiction and Control. One theme that permeates most aspects of the IGA and MOUs is that of territoriality. The entire negotiating history of the agreements makes it clear that none of the participants ever really entertained the notion of a truly international space station, operated by an international organization created for that purpose. While this didn't deter those enchanted with the idea from fashioning proposed legal codes for outer space, the actual instruments are consistent with each partner doing its best to protect its national interests. The result is a system that may create more problems than it solves.

The basic principle underlying the specific provisions addressing jurisdiction, ownership and the like, is that each partner will own and operate the elements it provides. The station will not be considered a single entity for most purposes, but instead be seen as what Eilene Galloway has called a "flotilla" in space.[55] Essentially a cluster of related objects orbiting together, but for legal purposes, viewed as independent pieces of territory.

1) Registration. The IGA specifically recognizes the applicability of the Registration Convention[56] to the space station in Article 2.1. The Annex to the IGA lists the elements of the station each partner is to provide, and Article 5.1 requires each partner to register those elements

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[55]Galloway, supra note 10, at 17-18.

[56]Convention on the Registration of Objects Launched into Outer Space opened for signature Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. 8480 (entered into force Sept. 15, 1976).

in accordance with the Registration Convention. ESA will register elements under its name rather than those of its member states.

2) Ownership. In a similar vein, under Article 6, each partner will retain ownership of the elements it contributes. The only restriction placed on an owner's property rights is a provision prohibiting the transfer of any element or equipment therein to a non-partner, or private entity of a non-partner, without the prior concurrence of all partners [Art. 6.4].[57] The ownership of an element does not serve to indicate who owns material or data generated on-board the station [Art. 6.6].

3) Jurisdiction & Control. In keeping with the territorial concept, Article VIII of the Outer Space Treaty[58] is invoked as the basic rule [Art. 5.2]. Jurisdiction, both criminal and civil, is somewhat complex. Each partner has personal jurisdiction over its nationals anywhere on-board the station [Art. 5.2]. In addition, each partner has personal jurisdiction over all persons while they are in or on that partner's element(s). This scheme of concurrent personal jurisdiction extends to criminal acts as well. Article 22.1 of the IGA applies the same regime to criminal acts. Thus, a French individual committing a crime in the Japanese element would be subject to the criminal jurisdiction of both countries. No priority is specified as to the exercise of that jurisdiction. That is presumably to be decided through consultations. The one anomaly in this arrangement permits the U.S. to exercise criminal jurisdiction over any person anywhere on the station if the misconduct

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[57]References to Articles of the Space Station IGA, supra note 53, will occasionally be placed in brackets, as is the case here.

[58]The Outer Space Treaty, opened for signature Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. 6347 (entered into force Oct. 10, 1967) [hereinafter referred to as The Outer Space Treaty, or OST].

involved threatens the safety of the manned base or other crew members. Before exercising jurisdiction conferred under this provision however, the U.S. must consult with the perpetrator's owning country. In order to prosecute, the U.S. must either receive that country's permission or, if that permission is not granted, have failed to receive a promise from the owning country that it would prosecute the individual [Art. 22.2]. Theoretically then, a crewmember could be subject to prosecution by three separate partners. No mention is made of how ESA will handle the question of which ESA member's law will apply in a given situation. Subject matter jurisdiction is based on element ownership/registration by virtue of the incorporation of Article VIII of the Outer Space Treaty into the IGA. There are a few provisions that apply the rule in specific contexts. Article 21 of the IGA for instance, addressing intellectual property, states that the law governing an activity will be that of the country of registry of the element in which the activity takes place. On ESA-registered elements, "any European Partner State may deem the activity to have occurred within its territory' [Art. 21.2]. The partners may also apply national laws and regulations regarding information security, the exchange of data and goods, and technology transfer in carrying out their obligations under the IGA/MOUs.[59]

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[59]The two MOUs signed in Sept. 1988 between NASA-ESA and NASA-MOSST (Canada) are labelled as; Memorandum of Understanding Between the United States National Aeronautics and Space Administration and the European Space Agency [Ministry of State for Science and Technology of Canada] on Cooperation in the Detailed Design, Development, Operation and Utilization of the Permanently Manned Civil Space Station. [hereinafter cited and referred to as MOU(s)]. The text of both (as well as the yet unsigned NASA-STA MOU) is identical in all areas discussed herein.

B. Liability. Article 2.1 of the IGA, International Rights and Obligations, recognizes the applicability of the Liability Convention[60] to space station operations. However, a broad cross-waiver of liability provision contained in Article 16 of the IGA serves to limit the potential impact of the Liability Convention in cases involving two partners. With regard to any liability situation not covered by the waiver, Article 17 of the IGA provides for consultations among the partners to discuss the situation and apportion damages.

C. Communications and Information Protection. NASA's Tracking and Data Relay Satellite System (TDRSS) will be the primary communications carrier for the manned part of the space station [Art. 13.1]. The partners will reimburse NASA for their use of the system. As communications containing information and data are funneled through the on-board communications center, TDRSS, and ground stations, the opportunity exists for disclosure of information the partners would prefer to keep confidential. Several provisions address the problem. The IGA provides that each partner will "respect the proprietary rights in, and the confidentiality of, the utilization data passing through" the various communications systems [Art. 13.3]. The same type of protective provisions apply to data and goods being transported by another partner [Art 12.3]. Article 13 of the IGA, Communications, permits the implementation of measures to ensure the confidentiality of data. The MOUs reiterate this position, but do not expand on it.[61] It appears

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[60]Convention on International Liability for Damage Caused by Space Objects, opened for signature Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. 7762 (entered into force Oct. 9, 1973).

[61]See, e.g., NASA-ESA MOU, supra note 59, Art. 12.2.a & 12.2.d.

clear however, that the encryption of electronic data would be permitted under these provisions. Finally, Article 19 of the IGA deals at length with the conditions under which technical data will be transferred among partners. One subparagraph provides that the transfer of classified data or goods shall be only by agreement between the two parties involved. There is no requirement that one party reveal classified information to another absent such an agreement [Art. 19.4].

D. Operation and Utilization. Article 9 of the IGA, Utilization, spells out the basic division or allocation of space station capabilities. Precise allocation percentages and the formulas for determining them are contained in Article 8.3 of the MOUs. The allocations are based on a number of factors, and two types of allocations are made. One divides up access to hardware such as the laboratory modules. The second apportions station resources (crew time and power) for the station as a whole. For example, resources will be divided as follows (deducting first the amount of crew time and power required to perform house- and station-keeping functions); the U.S. is allocated 70% of the available resources, ESA and Japan 13% each, and Canada 3%. Use of the modules is another story; the U.S. will keep 97% of the time available for its laboratory module, with Canada getting the other 3%. Allocations of either type may be bartered or sold, subject only to prior notification to the other partners if the recipient is a non-partner.[62] If the allocation bartered or sold to a non-partner is for the manned station (as opposed to a polar platform for example), U.S. approval is required for the transaction. Article 9.9(b) of the IGA

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[62]IGA, supra note 53, Art. 9. See generally Art. 9 for basic utilization provisions and Art. 10 for basic operations provisions.

provides that the element owner shall decide if a use of that element is for peaceful purposes. The only exception to this is a case involving infrastructure. No party may prevent another partner's use of the infrastructure if that partner has determined that its use will be for peaceful purposes. All of Canada's on-orbit contribution is part of the infrastructure. Consequently, under this provision Canada may not refuse to permit the U.S. to use its element so long as the U.S. has determined that its use will be for a peaceful purpose. Through the exchange of letters, as previously mentioned, the partners have agreed that the U.S. may interpret peaceful purposes as including military uses.

E. Management Mechanisms. Article 7 of the IGA outlines a general division of responsibility. NASA for example, is responsible for its own program, as is every partner, as well as; overall program coordination and direction; overall system engineering and integration; establishment of safety requirements and plans, and; overall planning for direction of day-to-day operations on-board the station. ESA, Japan and Canada are given similar responsibilities, but are limited to their own elements. There is no doubt that overall program responsibility remains with NASA. The actual management apparatus and procedural details are left to the MOUs. Although Article 7 of the IGA mentions that consensus will be a goal in all of the management bodies, it fails to mention what will happen when a consensus cannot be reached. The question is instead passed to the MOUs. The MOUs divide the management bodies to be created into two categories. The first are those primarily concerned with detailed design and development. These are described in Article 7 of each MOU. The second category contains those bodies concerned with the actual operation of the station. These are described in detail in Article 8 of the MOUs. For ESA,

Canada and Japan, it was their input into the operational decisions that were of the most concern. The top managerial body will be the Multilateral Coordination Board (MCB) composed of NASA's Associate Administrator for Space Station, ESA's Director of Space Station and Platforms, the MOSST Director General, Space Policy Sector, and the STA Director-General of the Research and Development Bureau. Two features of the MCB are worth noting. While consensus is emphasized as the way decisions of the MCB should be made, in cases where consensus is not possible, the Chairman of the MCB (the NASA Associate Administrator) may make the decision.[63] There is no formal appeal procedure available. Second, after drawing up the charter and establishing two subordinate panels, the System Operations Panel (SOP) and the User Operations Panel (UOP), the primary function of the MCB will be to oversee the entire station program and to review and approve the Consolidated Operations and Utilization Plan (COUP). This plan, submitted annually by the UOP after consultation with the SOP, is in essence a five year projection or blueprint of what events will take place on the space station. All partners are represented and its decisions are taken by consensus. Where a consensus cannot be had, the dispute is elevated to the MCB for resolution. Using inputs from "tactical" level planning organizations, both multilateral and unilateral, the SOP puts together its five year projection, called the Composite Operations Plan (COP). This is done annually. Where the SOP handles the long-range planning for the

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[63] ESA may make the decision when a consensus cannot be reached and the question involves ESA elements which do not have an effect on the manned base.

day-to-day operations of the station, the UOP does the same for the day-to-day utilization. Each partner will annually develop and submit to the UOP a five year use plan called the Utilization Plan, or UP. If a partner's proposed activities fall completely within its allocation, does not interfere with other partners' activities, and causes no technical problems, then the partner's UP is automatically approved by the UOP. The UOP's main function is to take the UPs, combine them, and then produce the annual Composite Utilization Plan (CUP). As with the SOP, decisions are by consensus. Because the utilization of the station will drive the operational requirements, the UOP is charged with formulating the annual COUP for MCB approval. In addition to the planning structure just outlined, there will be a host of "execution" level organizations created. These will implement the COUP and lower level plans. Chief among these will be the Space Station Control Center (SSCC) which will be managed by NASA and located in the U.S. Working with it will be the Payload Operations Integration Center (POIC), also managed by NASA. Although all partners will provide personnel and resources to these organizations, the dominant force will undoubtedly be NASA. At the execution level of activities, each partner will be responsible for decisions regarding their elements. Beyond that, the MOUs give NASA an enormous amount of influence if not outright decision-making authority in most cases. While consensus is the goal on the planning side of station activities, the U.S. clearly is accorded the upper hand on the "button-pushing" side. In the planning process, where most important decisions will be made, only at the MCB level does the U.S. have the ability to override the consensus requirement. Even though this ability is present only at the end of the long planning process, it nevertheless makes the U.S. the ultimate

decision authority, precisely the situation the partners had sought to avoid.

F. Consultations and Dispute Settlement. Article 23 of the IGA asks the partners, through their agencies, to consult with one another and attempt to resolve any dispute by referring to the procedures provided in the MOUs. The MOU provision however, found in Article 18, says only that when the issue involves a question of interpretation or implementation of the MOU, the dispute will be referred to the concerned partners' representatives to the MCB. If they can't find a solution, then it may be turned over to the MCB itself. Although this is not explicitly stated, it would be the type of problem that would fall within the purview of the MCB's responsibilities. Should the MCB be unable to reach a consensus, then the NASA Associate Administrator would decide the issue. Once again, no appeal from his decision is provided for. IGA Article 23.2 permits any partner to request government-to-government consultations. There is no requirement to have first requested talks at a lower level. Should these consultations fail to produce a satisfactory result, no binding dispute mechanism is provided. Under Article 23.3 the concerned partners may submit the matter to an agreed form of dispute resolution, but there is no requirement that they do so. Should a partner disagree with a MCB decision, consultations are the only formal avenue available for appeal. It is entirely possible then, given the lack of a binding resolution procedure, that the partner may ultimately end up being forced to choose between abiding by the MCB decision or withdrawing from the program if it feels that it cannot live with the consequences of that decision. Problems rising to the consultation level are simply to be dealt with on an ad hoc basis, with no real recourse available should one of the

parties balk at submitting the issue to some binding dispute mechanism. As a result, not only does NASA have the authority to take decisions over the objection of other partners, it also has no obligation to permit the decision to be effectively appealed.

G. Station Evolution. The station is designed to accommodate growth over its 30 year life span. Because of the long lead times involved in designing, constructing, and integrating any expansion of the station into the overall program, the IGA and MOUs provide for a coordination process. Article 14 of the IGA reiterates the fundamentally civil character of the station and states that any additions will be for peaceful purposes. All additions to the station's capabilities must be coordinated with the partners. Additions effecting the manned base have to be subject to an agreement reached between the U.S. and the partner making the proposal. These basic requirements are expanded on in the corresponding Article 14 of the MOUs. Article 14.4 of the MOUs establishes an International Evolution Working Group, a multilateral body that will review and coordinate evolution studies and projects. The MCB will review the specific proposals of all partners. Following the MCB's assessment, notification of a partner's intent to proceed is required, as in the IGA. The proposal would then be subjected to the normal planning process.

H. Code of Conduct for Crewmembers. In what is perhaps the only major concession to the international character of the station, the partners have agreed to formulate a code of conduct that will apply to all crewmembers. Article 11 of the IGA makes acceptance of the code mandatory if a nation expects to have a crewmember permitted aboard the manned station. MOU Article 11.6 prescribes the parameters of the code:

> It will, inter alia: establish a clear chain of command; set forth standards for work and activities in space, and as appropriate, on the ground; establish responsibilities with respect to elements and equipment; set forth disciplinary regulations; establish physical and information security guidelines; and provide the Space Station Commander appropriate authority and responsibilities, on behalf of all the partners, to enforce safety procedures and physical and information security procedures in or on the Space Station.

I. Amendment, Entry into Force, and Withdrawal. The IGA and MOUs may be amended by the written agreement of the parties involved. Amendments will be subject to the same domestic approval processes as the original instruments [Art. 26]. Article 25 of the IGA addressing when the IGA will enter into force has some unique features. First, to enter into force, at least two partners must deposit instruments of ratification, approval, acceptance, or accession with the depositary, which is the U.S. One of those two partners must be the U.S. Second, if the other partner is ESA, at least four of the ESA member states must deposit the appropriate instrument and collectively, those four must contribute not less than 80% to ESA's Columbus development program. Columbus is the main ESA element of the station complex. Withdrawal of a partner is covered by Article 27. One year's written notice is required, and withdrawal from the IGA is deemed to also constitute withdrawal from the relevant MOU. Special provisions apply to Canada. Should Canada decide to withdraw, it is required to turn over to the U.S. the "drawings, documentation, software, spares, necessary tooling, special test equipment, and/or any other necessary items ...." pertaining to the elements Canada has contributed. In addition, Article 27.4 calls upon Canada and the U.S. to negotiate a withdrawal agreement. The language of the provision assumes that the U.S. will purchase Canada's infrastructure elements, although no price is specified.

CHAPTER IV: MILITARY USE OF THE SPACE STATION UNDER THE AGREEMENTS

Chapter IV.1: Provisions with a Direct Impact on Military Use

A. Reference to Peaceful Purposes. There are few provisions of the IGA and MOUs that even indirectly refer to the permissibility of military activities on the space station. All are couched in language that would lead an objective observer to conclude that such activities would be banned. The IGA preamble, for example, in explaining the U.S.' initiation of the program, states that its "friends" were invited to participate "in order to promote peace, prosperity and freedom ...." and goes on to recall the "long and fruitful cooperation in the peaceful use of outer space" by the U.S. and its partners. Turning to the present, the preamble then opines that the "permanently manned civil Space Station" will serve to "further promote cooperation in the exploration and peaceful use of outer space ...."[1] The language does little more than set the overall tone of the agreement. In describing the purpose of the agreement, the main text of the IGA begins to be slightly more specific, providing that "The object ... is to establish a long-term international cooperative framework ... for the detailed design, development, operation, and utilization of a permanently manned civil Space Station for peaceful purposes, in accordance with international law."[2] The applicability of international law to the entire agreement is also recognized in Article

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[1] Agreement Among the Government of the United States of America, Governments of Member States of the European Space Agency, The Government of Japan, and the Government of Canada on Cooperation in the Detailed Design, Development, Operation, and Utilization of the Permanently Manned Civil Space Station, opened for signature Sept. 29, 1988, ___ U.S.T. ___, T.I.A.S.___ [hereinafter cited as IGA], preamble.

[2] Id., Art. 1.1.

2.1, where the four currently in force space law treaties are incorporated by reference.[3] The list is not meant to be inclusive, and all relevant international law would be applicable to the space station's operation by virtue of this provision. Articles 9.8(b) and 14.1 of the IGA refer to peaceful purposes in the utilization context. Article 9 states that each partner will determine what the phrase means for its own activities, while the latter Article provides that future uses of the space station will be, again, "for peaceful purposes, in accordance with international law." On its face, the IGA[4] does little to answer two perennial questions posed by the undefined phrase "peaceful purposes"; does it preclude all military uses or are some limited military activities allowed? If allowed, at what point along a continuum from an innocuous military use such as weather observation, to an overtly hostile use such as serving as a weapons platform, will military involvement cross some imaginary line and no longer be considered peaceful? Since no other international space law instrument, doctrine or customary rule purports to authoritatively define peaceful purposes, the reference to international law by the IGA is of little help.

The content of the exchange of letters on the subject provides an interesting twist. Letters from the U.S. to each partner are designed

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[3]The Outer Space Treaty, opened for signature Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. 6347 (entered into force Oct. 10, 1967); Rescue and Return of Astronauts Agreement, opened for signature Apr. 22, 1968, 672 U.N.T.S. 120 (entered into force Dec. 3, 1968); Registration Convention, opened for signature Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. 8480 (entered into force Sept. 15, 1976), and; Liability Convention, opened for signature Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. 7762 (entered into force Oct. 9, 1973).

[4]To the extent provisions of the MOUs mention "peaceful purposes," the language mirrors that of the IGA.

> ... to confirm that pursuant to [the] Agreement, which provides that all utilization of the permanently manned civil Space Station will be for peaceful purposes, in accordance with international law, the United States has the right to use its elements ... for national security purposes. With respect to such uses of these elements and resources, the decision whether they may be carried out under the Agreement will be made by the United States.[5]

In other words, the United States, at a minimum, is putting the partners on notice that it considers national security uses to be permitted within its interpretation of peaceful purposes. Use of the word confirm prior to the key language goes further than mere notice however, and implies that the issue has been discussed and agreed upon. The letter is simply designed to embody and reiterate the common understanding. The wording of the responses by the partners to this "confirmation" is crucial. The U.S. has stated what its rights are, and the purpose of the letter is clearly to establish that national security use is permissible. The language regarding who will be the judge of what is a peaceful purpose is clearly surplusage, as Article 9.8(b) of the IGA already provides for this. Should the partner respond that it agrees with the U.S.' statement, then it will have in essence said that the U.S.' interpretation of peaceful purposes is correct. Some military use is permissible. However else the partners may conduct themselves in practice, all were loath for political reasons to go this far. Some disingenuous drafting resulted. While the text of the responses vary slightly from partner to partner, not one of them confirms what the U.S. wanted confirmed. The ESA response for example, states that its reply "is to confirm ... that your letter ... correctly states U.S. rights under the Agreement to decide whether contemplated uses of its elements and of

[5]Text of letter from U.S. to partners, 1st paragraph.

resources derived from the Space Station infrastructure may be carried out under the Agreement (emphasis added).[6] The partners don't agree or disagree with the U.S. position on national security use, they just state what the IGA already says and all parties know that it is the U.S.' right to decide. The real issue is sidestepped entirely. The end result is that these letters, which were supposed to "elaborate on the national security issue"[7] do no such thing. The two "perennial questions" mentioned previously are no closer to being answered, even as among the parties, by virtue of the letters or for that matter, the IGA. International law, to the extent that it is capable of doing so, has to provide the answers. This is not to say that the letters are of no effect. The partners are apparently content to apply the territorial approach to the issue of military use, letting each nation decide what is permissible on-board their own enclaves. While this may work as a legal fiction, the fact is that these enclaves are so closely related that it would be difficult for a partner to avoid a tendency towards "guilt by association." If the U.S. decides to establish a military command post in its part of the station (after determining that it was a peaceful purpose of course), ESA's territorial response to third party accusations of complicity will seem weak indeed. At best such a response would appear hypocritical. The situation would be even more precarious for Canada, since it has no enclave argument to make. The

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[6] Text of ESA letter in response.

[7] This is the way they were publicly characterized. See Foley, Space Station Partners to Sign Pact Starting 30 Year Agreement, Avia. Wk. & Space Tech., Sept. 12, 1988, at 30.

letters make such arguments even weaker, since they have put the partners on notice that military uses are possible, if not probable.

B. Determining Compliance with the Applicable Legal Regime, and Dispute Resolution: As made abundantly clear by the preceding discussion, each partner will determine what "peaceful purposes in accordance with international law" means. The process a partner will use in making the determination will be entirely of its choosing. Since the phrase is not defined in either the IGA, letters, or other international law sources with any degree of certainty, its safe to assume that each partner will apply the phrase as they have in the past. No mechanism is provided for the review of a partner's decision by the other partners. Using the command post again as an example, if ESA were to object to this use, its options would be extremely limited. If the command post has simply been proposed, ESA can make its displeasure known at any of the several levels of the planning process. Since utilization plans have to be submitted and approved by multilateral panels, ESA could refuse to assent to the proposed utilization. This is, of course, what ESA and the other partners had sought in the form of managerial authority. If a consensus were required, it would have been easy to prevent an objectionable activity. Ultimately however under existing provisions, when the dispute reaches the MCB level, the U.S. has the final say. In short, if the U.S. wants to proceed badly enough, there are no means available in the management structure for the partners to prevent it.[8] Given the probable level of concern if a dispute should arise over what

[8] If the situation is reversed, however, with the U.S. objecting to a proposed use, the result is not the same. Again, through its MCB authority, the U.S. can prevent any proposed use it deems objectionable.

constitutes a peaceful use, it is much more likely that the objecting partner will turn directly to the government level consultations permitted under Article 23 of the IGA. If those talks fail to produce a satisfactory result, and the U.S. is unwilling to submit the matter to binding arbitration or a similar procedure, then the partner's options are to either withdraw, or accept the situation. Once again, if the U.S. is adamant, no means are available to prevent it from proceeding as planned.

Chapter IV.2: Provisions Tending to Facilitate Military Use

Several features of the agreements indirectly act to make the potential for U.S. military use of the station more likely. They may be seen as collectively creating an atmosphere that does not discourage or impede military activities.

A. NASA's Degree of Managerial Control. The most important element of the management structure in this regard is NASA's ability to override the objections of the other partners. The consensus goal is just that--a goal. When a genuine disagreement arises between partners, the simple fact of the matter is that NASA has the final say. The only factor mitigating the potential impact of this is that NASA's ability to exercise this authority arises only at the highest managerial level.[9] All subordinate decision making bodies operate on a consensus basis. Nevertheless, the regime gives the U.S. the ability to use its allocated

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[9]Memoranda of Understanding between NASA-ESA and NASA-MOSST, signed Sept. 29, 1988, Art. 8.1.b (formal title omitted). This appears to have been a compromise between a NASA veto at all levels (preferred by NASA), and a consensus requirement at all levels (preferred by ESA). Its effect is to ensure that minor disputes, dealt with at lower levels, will be resolved by consensus. In a military use context, its doubtful the language will have even this effect, since disputes over military uses will probably be raised at the MCB level or higher from the beginning.

resources as it sees fit, so long as the various requirements unrelated to national security uses are met. Should any partner object to a proposed U.S. military use on any ground, technical or legal, the most it can hope to accomplish is to prevent the use of its own elements by the U.S. for the objectionable activity.[10] The U.S. can effectively suppress, through the exercise of its authority, any other objection. The U.S.' omnipotent position is substantially reinforced by the lack of any binding appeal mechanism.

B. Crew Requirements. Article 11.1 of the IGA places the responsibility for providing qualified crewmembers for the space station on each partner. The criteria crew members must meet however, are to be drawn up by NASA in consultation with the partners.[11] The MCB is also given the authority to specify additional criteria. No mention is made in either the IGA or MOUs, of the permissibility of using military personnel as crew members. Article 2.1 of the IGA specifically incorporates by reference the provisions of the Outer Space Treaty. In Article IV of that treaty, the only explicit reference to the use of military personnel in outer space, in any context, is made; "The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited."[12] This provision applies to the moon and other celestial bodies, where a number of military activities are prohibited, and is thus not directly applicable to station operations. Nevertheless, it serves to indicate that the use of military

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[10] IGA, supra note 1, Art. 9.8(b). Canada of course, does not have this option.

[11] MOU, supra note 9, Art. 11.3.

[12] Outer Space Treaty, supra note 3, Art. IV.

personnel in outer space is unrestricted in most cases. It is the character of the activity that determines whether or not it is permissible, not who the crew member may work for. As a result, there are no restrictions placed upon the use of military personnel as crew members for the space station.

C. Information Protection Provisions. As pointed out in Chapter III.3.C, supra, the communications arrangements permit the encryption of data transmitted from the space station. While designed primarily to protect commercial proprietary information and research data, the system would also be ideal for maintaining the level of secrecy DoD typically demands for its space activities. Even if DoD determines that NASA's system is not secure enough, a separate system would be possible. Since the space station will use NASA's TRDSS satellites as its main information conduit--a system DoD already uses--the cost of a separate DoD-unique subsystem on the station itself may not be prohibitively expensive.[13] Physical security arrangements are similarly provided for.[14] Since the STS will be the primary means of transporting goods, experiments, and untransmitted data to and from the station, DoD would again appear to be in a good position to maintain whatever level of confidentiality it desires.

D. The Definition and Meaning of Infrastructure. As far as the manned station is concerned, any partner may use the infrastructure for national

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[13]Although a previously cited study determined that DoD security arrangements could cost up to $1 billion (see supra note 41, Chap. II.4B1), it is unclear whether the use of TDRSS, a communications relay and downlink system DoD already uses and has the ground terminals for, was considered in arriving at this figure.

[14]IGA, supra note 1, Art. 12.3.

security purposes. No other partner may object to this use of infrastructure elements.[15] Infrastructure, as defined in the MOUs, basically includes everything but the three laboratory modules and the two external payload attachment points.[16] Thus, the command and control facilities, maintenance systems, resource nodes, and the Canadian servicing center are all part of the infrastructure. From the U.S.' point of view, the only elements of the manned station that DoD would be unable to use (unless given permission) would be the ESA Columbus laboratory and the JEM. Since the capabilities of both of those modules are largely redundant with the U.S.' laboratory module, the value of provisions requiring the U.S. to ask permission to use them for national security reasons is questionable. Having free run of the infrastructure and its own laboratory, it is unlikely that DoD would need or want access to the ESA or Japanese modules. A review of the list of DoD-proposed experiments for the space station reveals that most would take place in the infrastructure, not the laboratory.[17] Operational military activities such as reconnaissance, surveillance, intelligence gathering and the like, would be concentrated in the resource nodes. Under the current scheme, each partner will determine if their use of the infrastructure is

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[15] Id. Art. 9.8(b).

[16] The basic distinction is between the "accommodational elements" of the laboratories and payload attachment points, and the "infrastructural elements," which is essentially everything else. MOU, supra note 9, Art. 8.1.d.

[17] Most involve Earth or space observation which would probably be conducted from the resource nodes, which have viewing ports. Others, such as on-orbit construction or satellite servicing, and communications experiments, would use the resource nodes and the external structure of the station. DoD, A Report to the Comm. on Armed Services of the Senate and House of Representatives on Potential Dept. of Defense Use of the Permanently Manned Space Station, Mar. 1, 1988, at 3-7.

compatible with international law. In practice, this means that the U.S. will be free to apply its interpretation of peaceful purposes to any portion of the manned station that it will have any need or desire to use.

E. The Territoriality Theme. This effects virtually every aspect of station planning and operation. Each nation has its enclave, its rights of use for almost any purpose, its allocations, and most important, its right to apply national laws in a wide range of contexts. The more pervasive this theme, the less "international" the station actually is. This can only enhance the military's ability to carry out activities on the station. Whether a specific military activity will or will not be allowed, will be a domestic determination. In the case of the United States, it will be a decision not subject to veto by the other international partners. As a domestic matter, consensus on what is necessary for the nation's security will be much easier to obtain than in an international forum involving all partners, where national concerns are secondary to those of the group. Under the existing regime, the U.S. may legally decide, without the need or requirement to consult with its partners, what it wants to do, whether the activity comports with international law, and how it will carry out the activity, all without having to do so much as notify the other partners. They will be presented with a fait accompli.

Chapter IV.3: Provisions Tending to Inhibit Military Use

Features of the regime that can be viewed as facilitating the military use of the space station are to some extent balanced out by features that may inhibit military involvement. These are in addition to the variety

of practical considerations that make the station less than attractive to military planners.[18]

A. The Bureaucratic Structure. NASA may be accorded a final say in management decisions that rise to the level of the MCB, but the overall structure of the management bodies may operate to dilute the value of that authority in a military use context. As a whole, the structure imposes some conditions DoD would probably find unacceptable. The planning process for instance, requires that utilization plans (UPs) detailing proposed uses be submitted five years in advance.[19] These UPs are generated by each partner, and must be quite specific in order to allow for the complex process of integrating the various UPs and coming up with a common ground element, STS/ELV, and space station utilization plan. This integration is done by the User Operations Panel (UOP), which publishes the Composite Utilization Plan (CUP).[20] Any substantial use of station resources by DoD will require that it reveal, in intimate technical detail, the scope and nature of what it proposes to do. The mere incantation of the words "observations conducted for national security purposes" or some similar language in the UP submitted by the U.S., will not be sufficient. The amount of power, the number of individuals required, the supplies necessary, the computer and data support services needed, are just a few of the hundreds of variables that have to be taken into account in the planning process. While the U.S. will not necessarily need other partners' approval for what it proposes

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[18] See, e.g., Chap. II.4B & C, supra.

[19] MOU, supra note 9, Art. 8.3.f.1.

[20] Id., Art. 8.3.f.2.

to do with its allocated resources, it will not be able to keep the character of its uses secret.[21] For DoD, the process means revealing the nature of what it wants to do, five years in advance, to a series of international planning panels. Those panels may not have the option of objecting to the proposed use on policy or political grounds, but nothing prohibits their members from voicing their concerns, or finding technical fault with the proposal as a pretense. Even if the UOP has no objections to the proposed use, the DoD's plan will nevertheless be exposed to public scrutiny, national and international, for up to five years. If the DoD plans involve any form of operational research or uses, those plans will almost certainly attract attention and criticism. This is hardly the ideal environment for DoD activities, and given suitable alternatives, DoD would be unlikely to select this path. If DoD desires to maintain a cloak of secrecy around its research or activities, other platforms over which DoD and the U.S. have complete control would be far more appropriate.

The entire management process outlined in the MOUs belies the nature of the legal regime prescribed by the IGA for the station as a whole. Where the legal regime is very nationally oriented, the management process is just the opposite. Once a partner devises its own utilization plan, the processing of that plan, at all levels, becomes an international affair. The "execution" agencies such as the Space Station Control Center[22] are all international bodies, albeit created and largely staffed by NASA. Thus, while DoD and the U.S. could, under the terms of the IGA, legally

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[21] Id. Art. 8.3.f.3 provides for the automatic approval of UPs that fall entirely within one partner's allocation and do not conflict operationally or technically with other partners' UPs. In order to determine if such a conflict exists however, the UP still has to be detailed.

[22] Established under Art. 8.2.g. of the MOU(s).

conduct a wide assortment of national security activities on the station without paying too much attention to the partners' concerns, the management apparatus could make doing so politically unpalatable. In other words, while NASA could ram an objected-to DoD use through the management structure, the political cost would probably be too high. Five years of ignoring the consensus goal, the wishes of the other partners, and the adverse publicity and criticism that would certainly attend such a situation, would without a doubt extract too high a toll. While the regime may not require international cooperation, the agreements will not survive without it.

B. Provisions Governing the Evolution of the Station. One partial solution to many of the practical limitations imposed on DoD use of the station might be an attached DoD element. It could be made exempt from resource sharing requirements, have adequate security features, and perhaps even largely circumvent the lengthy international planning process. In fact, Article 14.3 of the IGA specifically states that most of the agreement will not apply to future additions to the station, although any derogation from the agreements affecting the rights and obligations of other partners must be agreed upon in advance.[23] DoD has certainly considered the possibility of adding an element.[24] The agreements do, however, make adding a DoD element more involved than one might suppose. All additions to the station must be submitted to a

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[23] Art. 14.3 of the MOU repeats this. Only Art. 14 and Art. 16 of the IGA & MOU(s) address future additions. Art. 14.1 of both the IGA & MOU(s) provide, however, that the station will remain a civil station and that its use and utilization will be for peaceful purposes in accordance with international law.

[24] [illegible], Air Force Space Command, The Utility of Military Crews in Space, [illegible], at 56-57.

multilateral coordination and review process. An International Evolution Working Group (IEWG) will review all evolution studies.[25] The MCB will review specific proposals by a partner, and assess a proposed addition's impact on the station operation as a whole. If a partner decides to go ahead with the addition, notification of all partners is required.[26] If the addition is to the manned station and is not proposed by the U.S., then the U.S.' permission is required.[27] Should the U.S. decide to add a DoD element, the permission of the other partners is not required. However, once given the go-ahead, the integration of the element into the station structure would be subject to the same five year planning process outlined in the preceding paragraph.[28] As with any proposed use, adding a DoD element would be subject to recurring and potentially intense national and international scrutiny. While perhaps not as onerous as the scrutiny for a proposed DoD use of the existing station, the level of public attention would still in all likelihood be considered unacceptably high. Combined with the practical limitations on the usefulness of the station that would not be alleviated by having a DoD element, such as those limitations associated with the station's orbit and altitude, adding a DoD element may simply not be seen as a viable option.

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[25] MOU, supra note 9, Art. 14.4.

[26] IGA, supra note 1, Art. 14.5; MOU, supra note 9, Art. 14.7.

[27] Id.

[28] Whether or not the utilization plans (UPs) for the new element, once operational, would fall under the same planning process is uncertain.

CHAPTER V: INTERNATIONAL LAW AND THE MILITARY USE OF THE SPACE STATION

Chapter V.1: Elements of the Current Legal Regime

A. Introduction. The opportunity existed for the space station participants to specify precisely what they meant by the phrase "peaceful purposes" in the military use context, and by doing so make a genuine contribution to the developing corpus of space law. This definition could have been couched in language banning all military activities, specific military activities, or simply listing criteria by which certain activities could be judged on a case-by-case basis. In what was perhaps the only politically acceptable solution, the parties chose instead to defer to international law for guidance on the matter.[1] To the extent that international law defines the phrase, the partners have agreed to apply that definition. The efficacy of this superficially attractive approach is considerably diluted when one realizes that there is no consensus of opinion in international law circles on how to interpret the phrase, nor is there likely to be one anytime soon. The result is simply that the partners, in attempting to avoid the issue entirely, shifted the problem from one forum to another. This unsettled state of affairs is only made worse by provisions in the IGA permitting each country to decide for itself whether or not its activities are in compliance with this

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[1] The IGA uses the phrase "peaceful purposes in accordance with international law" in Art. 1.1 (purpose) and Art. 14.1 (evolution). Space Station Inter-governmental Agreement, opened for signature Sept. 29, 1988, ___ U.S.T.___, T.I.A.S. ___. [hereinafter cited as IGA].

undefined standard.[2] It will be virtually impossible for a partner country to objectively assess the legality of its own activities when it acts as judge, prosecutor and defendant.

The lack of an agreed understanding of what "peaceful purposes" is supposed to mean is not for want of trying. For three decades the issue has been one of the central themes of emerging space law. None of the currently-in-force space law treaties purport to offer a definitive solution, and the matter remains unresolved. This has caused publicists to seek analogous situations and treaties, to engage in creative interpretive efforts, and in some instances, to ignore reality and the practice of states. The meaning of this particular phrase is crucial for one reason; there are only a handful of other restrictions on the military's use of outer space provided by international law. Most are contained in treaties that will impact on space station operations to some degree.[3] Combined, these scattered provisions establish some very broad parameters governing military operations in outer space.

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[2] IGA, supra note 1, Art. 9.8(b).

[3] There is no doubt that all existing, relevant, international law applies to the space station. Art. III of the 1967 Outer Space Treaty, to which all station participants are party, provides that "activities in the exploration and use of outer space, including the moon and other celestial bodies [shall be carried out] in accordance with international law, including the Charter of the United Nations," Art. 2 of the IGA also explicitly incorporates international law, and specifically lists the four in-force space treaties.

Of the constituents of international law, treaties are generally acknowledged to be the most authoritative.[4] Each relevant treaty, beginning with the Charter of the United Nations, will be reviewed, with an emphasis on those provisions affecting military operations on-board the space station.

B. Charter of the United Nations.[5] Drafted before the beginning of the space age, subsequent resolutions of the U.N. General Assembly and eventually, the entry into force of the Outer Space Treaty, have left no doubt that the Charter, and international law as a whole, are applicable to outer space.[6] The U.N. has, among its purposes stated in the Charter, "to maintain international peace and security ...." which may be done by taking "collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace,..."[7] The use of force, while not

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[4]Followed by; (b) international custom, as evidence of a general practice accepted as law; (c) the general principles of law recognized by civilized nations; and (d) judicial decisions and the teachings of the most highly qualified publicists of the various countries as subsidiary means for the determination of rules of law. (derived from Art. 38, para. 1 of the Statute, Int'l Ct. of Justice (reprinted in 59 Stat. 1055 (1945)), attached to the Charter of the United Nations.)

[5]Signed Jun. 26, 1945, reprinted at 59 Stat. 1031 (1945). [hereinafter cited as U.N. Charter].

[6]U.N.G.A. Res. 1721 (XVI), International Co-Operation in the Peaceful Uses of Outer Space (Dec. 20, 1961), "commended" to states the principle that "1(a) International law, including the Charter of the United Nations, applies to outer space and celestial bodies." This was followed by U.N.G.A. Res. 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (Dec. 13, 1963), which included substantially the same language, this time framed as a declaration of principle, in para. 4. The Outer Space Treaty of 1967, opened for signature, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. 6347, Art. III, (entered into force Oct. 10, 1967) made this a binding legal principle.

[7]Charter, supra note 5, Art. 1.1.

outlawed, is to be employed in a collective fashion to achieve common ends. The use of force by individual countries is frowned upon, the Charter requiring that "All members ... refrain ... from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations."[8] As a corollary to this, another part of the same article obligates states to "settle their international disputes by peaceful means ...."[9] Nevertheless, individual countries retain the right to act in self-defense. Article 51 states, in part, that "Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs ...."[10] A literal reading of this provision can permit the conclusion that a country must wait until an armed attack takes place before it may legitimately defend itself. Over the years, some commentators have adopted this view.[11] Others have disagreed, arguing that the traditional right of self-defense, which has customarily included the right to launch a preventive attack in the face of an imminent threat, has in no way been abridged by Article 51.

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[8] Id., Art 2.4.

[9] Id., Art 2.3.

[10] Id., Art. 51.

[11] See. e.g., the publicists cited in Cooper, Self-Defense in Outer Space and the U.N., in Explorations in Aerospace Law 418-419, footnotes 12-15 (I. Vlasic ed. 1968).

This seems to be the more widely accepted, if not better, view.[12] Carl Christol has commented:

> Although Article 51 ... uses the term "armed attack," it has not generally been thought that a state must actually have felt the force of an adversary's weapons before it may engage in legitimate self-defense. In looking at the customary principles of international law, it becomes clear that a state may engage legally in self-defense in provocative circumstances, particularly where it reasonably appears that the dangers being mounted against it may, if placed in motion, materially or substantially impair its way of life or prejudice its right to its own continued existence.[13]

This reading of the rights established (or affirmed) by Article 51 as, in essence, adding to existing customary international law, impacts on space operations in several ways. First, despite the obligations and exhortations contained in Article 2, a state may keep standing armed forces available for defense purposes. This has been the U.S.' position for decades:

> Nothing in the Charter prevents the maintenance of an efficient and modern military establishment or declares the mere ability to defend one's self inconsistent with positive obligations toward peaceful settlement of disputes. Article 51 is not an exhaustive statement of the rights of self defense ....There is,

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[12] The fallacies of the more restrictive interpretation is vividly illustrated in Cooper, supra note 11 at 420-421. Summarizing the opinions of several jurists, Cooper concludes that the "traditional right of preventive self-defense has not been limited by membership in the United Nations." See also, M. McDougal, H. Lasswell, and I. Vlasic, Law and Public Order in Outer Space 402 (1963); "Customary international law ... authorizes states to employ coercion even of the highest intensity, if necessary and proportional, to defend their territorial integrity and political independence against impermissible coercion. It is highly questionable whether the United Nations Charter, with its reference in Article 51 to "armed attack" in any way limits this competence.

[13] C. Christol, The International Law of Outer Space 326-327 (Int'l Law Studies Vol. LV, U.S. Naval War College, 1966). This view relies, in part, on the belief that "all powers which have not been expressly or by necessary implication transferred to the United Nations remain in the individual States. They hold these powers not by grant but by sovereign right." Cooper, supra note 11, at 419, quoting Prof. Arthur L. Goodhart.

> thus, no need to rely exclusively upon Article 51 to justify the capacity of the United States ... to defend [itself] against attack or even the threat of attack by maintaining a force in being.[14]

Second, since the right to defend one's self includes the right to strike in the face of an imminent threat, a state does not have to limit itself to waging war on its own territory. Even under a strict construction of Article 51, a country, once attacked, would be free to carry the battle to its foe. If an attack, or the imminent threat of one, were to be staged from or through outer space, the victim would be justified in responding through the same medium. As stated by Andrew Haley, an early space law jurist: "a nation is justified in protecting itself from attack no matter where the staging area of the attack may be, including on the high seas or in outer space, and a nation may carry its defensive forces to such areas."[15] Neither the Charter nor customary international law prohibit the use of the space medium for defensive purposes. The problem, as Haley saw it, was "so far as defensive measures in space are concerned, [how] to translate the general recognition of this right of self-defense into some workable criteria for distinguishing between the defensive and offensive uses of space."[16] In characterizing the medium of space, the U.S. has long analogized it to the high seas, where the mere presence of defensive forces violates no law. It is, as Haley alluded to, the purpose to which they are put that is crucial. A report to NASA concluded:

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[14] American Bar Foundation, The Law of Outer Space, Report to the National Aeronautics and Space Administration (1960), reprinted at S. Doc. No. 26, 87th Cong., 1st Sess. 807 (1961).

[15] A. Haley, Space Law and Governments 157 (1963).

[16] Id.

> Thus, any use of space which did not itself constitute an attack upon, or threat against, the territorial integrity and independence of another state would be permissible; the high seas, for example, can be used for the maintenance of a naval force-in-being without any violation of international law, and may be employed "peacefully" for maneuvers and testing of weapons.[17]

The Charter by itself, does little to limit the military use of outer space. It does not prohibit the possession of armed forces, and it does not prohibit the deployment of those forces in outer space so long as they are used solely for defensive or peaceful purposes. As applied by the U.S., "defensive purposes" is broadly interpreted as including any use that does not run afoul of Article 2.4. Peaceful, in this context, is used in contradistinction to aggression. Thus, non-aggressive military activities are allowed.[18]

C. Multilateral Treaties

1) The Partial Test Ban Treaty.[19] Article I of this treaty provides, in part, that:

> Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control:
> (a) in the atmosphere; beyond its limits, including outer space; or underwater, including territorial waters or high seas; or
> (b) in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted.

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[17] Amer. Bar Foundation, supra note 14, at 807.

[18] The meaning of "Peaceful purposes" in light of the Outer Space Treaty is discussed in Chap. V.2, infra. Even before the OST, the U.S. readily admitted that "peaceful purposes" meant different things in different contexts. See Amer. Bar. Found., supra note 14, at 807-808.

[19] The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water, opened for signature Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. 5433 (entered into force Oct. 10, 1963).

President John F. Kennedy had apparently stressed four reasons for negotiating the Partial Test Ban Treaty; to reduce fallout, limit proliferation, encourage detente, and slow the pace of the arms race.[20] It was just as likely however, that both the U.S. and the U.S.S.R. viewed the treaty as a means of ending certain types of testing they no longer viewed as necessary. The fact that one by-product of this decision was a favorable world response, was undoubtedly not lost on the parties either. The nuclear explosion testing programs of both the U.S. and U.S.S.R. simply moved underground. In the case of the U.S., the number of test explosions actually increased after the treaty entered into force.[21] Banning nuclear explosions in outer space was not a case of stopping something before it happened. The U.S. had in fact exploded nuclear weapons in space in 1958, essentially just to see what would happen. The program was abandoned for unspecified reasons after three explosions.[22]

The treaty's total prohibition of nuclear explosions in outer space has never been an issue. None of the signatories has displayed a desire to conduct such tests. This may change however, with the advent of the X-ray laser. A potential space-based component of the SDI architecture, the X-ray laser would most likely rely on a small nuclear explosion to

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[20] C. Blacker & G. Duffy, International Arms Control, Issues and Agreements 131 (1984).

[21] Id., at 132.

[22] The three explosions took place on Aug. 27 and 30, and Sept. 6, 1958. Each was at an altitude of 300 miles and had a yield of about 1 kiloton. Apparently, the goal was to gauge the effect the explosions had on communications. The tests took place in great secrecy, the rockets being launched from a Navy ship in the South Atlantic. The results of the project, reportedly called Project Argus, are still classified. See House Comm. on Science and Astronautics, A Chronology of Missile and Astronautic Events, H.R. Rep. No. 67, 87th Cong., 1st Sess. 71 (1961).

"pump," or excite, the lasant material. In the milliseconds before the device itself is destroyed by the explosion, the x-rays created are directed to the ICBM or SLBM (submarine launched ballistic missile) targets.[23] While there has been quibbling over whether or not such a device is a nuclear weapon for purposes of Article IV of the Outer Space Treaty,[24] the simple fact of the matter is that the Partial Test Ban Treaty would prohibit the testing of the x-ray laser in outer space. Without the ability to test the device, the U.S. would be unlikely to produce and deploy it.

2) The Outer Space Treaty of 1967.[25] This is perhaps the most important multilateral instrument in force addressing the military use of outer space. The fact that it actually accomplishes very little with regard to limiting such uses and nevertheless has this stature, is a good indication of the state of arms control in the outer space arena.

a) Article I. Article I, paragraph one, contains the following passage; "The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries ... and shall be the province of all mankind."

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[23]Office of Technology Assessment, Ballistic Missile Defense Technologies 152-153 (1985).

[24]Art. IV will be discussed in the next paragraph. The argument is that an x-ray laser is not a nuclear weapon because the actual destructive forces are the x-rays. The nuclear explosion simply powers the device. Since Art. IV only prohibits the orbiting of nuclear weapons, the argument goes, the x-ray laser does not violate the Outer Space Treaty. See Smith, Legal Implications of a Space-Based Ballistic Missile Defense, 15 Cal. W. Int'l L. J. 52, 70-71 1985).

[25]Formal name: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies, opened for signature Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. 6347 (entered into force Oct. 10, 1967) [hereinafter cited as the Outer Space Treaty].

This provision is consistent with the remainder of the article in that it is couched in general language of an exhortative nature. This first paragraph is the most general of the three comprising the article. Nevertheless, as part of the body of the treaty, there is no doubt that its terms are binding upon all parties.[26] In light of its binding nature, the vagueness of the provision was the source of some concern during U.S. Senate ratification hearings.[27] Ultimately this was resolved by determining that while binding, the provision was non-self-executing.[28] In other words, the U.S. decided that the provision did not require any positive act in the absence of implementing national legislation that would further define the obligations imposed. The ambiguous language has been used by at least one publicist to assert that the clause quoted above prohibits any military use of outer space.[29] Reasoning that no nation's military use of outer space could be "carried out for the benefit and in the interests of all countries," the author concludes that the only logical reading of the phrase is that all military uses are excluded. This view of Article I, paragraph 1, as an arms prohibition or disarmament provision has a very limited following.

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[26] See C. Christol, The Modern International Law of Outer Space 42-45 (1982) for a summary on the development and ramifications of Art. I, para. 1.

[27] Id., at 43.

[28] D. Smith, Space Stations--International Law and Policy 93 (1979). The Senate in fact, attached an "understanding" to its approval of treaty regarding Article I. See Christol, supra note 26, at 43.

[29] Markoff (also spelled Markov), Disarmament and Peaceful Purposes Provisions in the 1967 Outer Space Treaty, 4 J. Space L. 3 (1976).

None of the space powers share this interpretation, and in practice most have simply ignored the provision entirely.[30]

b) Article IV. Article IV of the treaty is the only section generally and widely characterized as being an arms limitation provision. It reads in part:

> States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The second paragraph addresses the scope of permissible activities on the moon and other celestial bodies. Although the cited paragraph has been the source of considerable controversy over the years, in conjunction with the remainder of the article and other language in the treaty, in practice the U.S. has consistently interpreted it in the same fashion.[31] In the U.S. view, the provision prohibits only the stationing or placing on-orbit of nuclear weapons and other weapons of mass destruction. Defensive or non-aggressive military systems that do not employ nuclear weapons or weapons of mass destruction, are perfectly legal. This approach is "based on the general proposition that what is not prohibited in a suitably clear expression of intent remains permissible, and, hence, lawful."[32] This, in turn, is rooted in the concept of sovereignty. A nation retains that which it does not

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[30]Christol, supra note 26 at 43. The U.S. has shared some data acquired in space, but its doubtful that it felt obliged to do so by virtue of Art. I.

[31]This refers to the "peaceful purposes" debate. See Chap. V.2, infra.

[32]Christol, supra note 26, at 26.

explicitly give up. The import of this approach in a military use sense is described thus:

> ... there is very little which is specifically prohibited in space ....While space is dedicated to peaceful uses, it does not follow that military uses are forbidden. In truth, space provides a vital extension of United States defensive forces. Defensive activities in space are all the more vital when one considers the fact that potential enemies of the United States are also unfettered by extensive prohibitions.[33]

Regarding military operations on the space station, the U.S. must refrain, under this provision, from placing nuclear weapons or any other weapon of mass destruction on-board the station. "Weapons of mass destruction" has been defined as: "includ[ing] atomic explosive weapons, radio-active material weapons, lethal chemical and biological weapons, and any weapons developed in the future which have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned ...."[34] In addition, according to Eilene Galloway, to comply with the language of Article IV, paragraph 2, "The space station could not be used to establish on the moon and other celestial bodies any military bases, installations and fortifications or to test any type of weapons or for the conduct of military maneuvers."[35] Presumably the last part of Ms. Galloway's statement is not meant to imply that the space station could not be used to conduct weapons tests or

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[33]Bridge, International Law and Military Activities in Outer Space, 3 Akron L. Rev. 649, 664 (1980).

[34]Galloway, Conditions Essential for Maintaining Outer Space for Peaceful Uses, in Proceedings of the 27th Colloquium on the Law of Outer Space, (1984), quoting a Resolution adopted by the U.N. Commission for Conventional Armaments on Aug. 12, 1948.

[35]Galloway, The Relevance of General Multilateral Space Conventions to Space Stations 14 (paper prepared for an Int'l Colloquium on Space Stations, Cologne FRG, Oct 3-4, 1984).

military ma[illegible]nly that such activities would be prohibited if carried out [illegible]urpose of one of the actions forbidden in Article IV, paragraph 2. [illegible]ing with the use of the verbis expressis doctrine as applied by th[illegible], the use of military personnel or equipment on-board the station will not be prohibited, so long as the purpose to which they are put is a peaceful one. The fact that the second paragraph of Article IV allows for this in the non-military regime established for the moon and other celestial bodies, by implication permits it in the less "demilitarized" outer space milieu. It is also worth noting that under this doctrine, research involving nuclear weapons or weapons of mass destruction would arguably be permissible, since Article IV seems to ban the orbiting or installation of the weapons themselves and does not address research activities. Any other military use of the space station, so long as it comports with the U.S.' view of the meaning of peaceful purposes, is acceptable. In short, Article IV, para. 1 does very little to prevent either scientific or operational military use of the station.

c) Article VIII. This article may conceivably act to limit DoD uses of the station. In part, the article states that "A State Party ...on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object ... while in outer space ....Ownership of objects launched into outer space ... is not affected by their presence in outer space ...." As recounted earlier, the Air Force has long sought the ability to rendezvous and inspect objects in orbit. The U.S. has also recently become quite interested in space debris, as evidenced by the Reagan Administration's National Space

Policy announced in early 1988.[36] About 95% of the 7,324 orbiting objects presently tracked by the U.S.' Space Surveillance Network[37] are derelict satellite systems, launch debris and other miscellaneous items of refuse. A number of these objects would be of considerable intelligence value to DoD, particularly if space station systems such as the Orbital Maneuvering Vehicle (OMV) could be used to bring them back to the station for inspection. Unlike the salvage rules obtaining on the high seas however, abandonment of an object in space cannot be construed as relinquishing the owner's rights in the item. Article VIII clearly establishes a regime that would prevent the DoD from legally retrieving other countries' space systems or debris for any purpose, without first gaining the owner's permission.

In addition, Article VIII's provisions can be construed as conferring on space systems, particularly manned systems, the status of flag ships similar to that of maritime vessels. This "quasi-territorial jurisdiction" may be equated with the "territorial integrity" of a state found in Article 2.4 of the U.N. Charter.[38] Thus, the seizure of, or interference with, the space system of another country could result in the invocation of that country's right of self-defense under Article 51 of the Charter. As a result, should the station turn out to be an ideal

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[36]White House Press Release, Fact Sheet--National Space Policy, Jan. 26, 1988, detailed the Jan. 1988 White House directive. Included was the establishment of an interagency working group charged with formulating a national policy on space debris. At the time of this writing a draft report is circulating among gov't. agencies for comment.

[37]The figure quoted is as of Oct. 18, 1988, and is from the Public Affairs Office, NORAD, Cheyenne Mountain Complex, Colorado.

[38]M. L. Stojak, Legally Permissible Scope of Current Military Activities in Space and Prospects for their Future Control 154 and citations therein (unpub. doctoral dissertation, McGill Univ. 1985).

platform for DoD to conduct research and intelligence gathering activities on space refuse, Article VIII may limit DoD's abilities in this regard.

d) Article IX. States party to the treaty conducting activities in outer space are required to conduct them "with due regard to the corresponding interests of all other States Parties ...." They must also be conducted "so as to avoid ... harmful contamination [of outer space, the moon, and other celestial bodies] and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestial matter ...." If a state believes that its activities could result in "harmful interference" with those of another state, it is required to consult with that state. DoD, as with any other user of the station, will have to ensure that its research, weapons testing, or operational uses do not cause harmful interference with the activities of other users of outer space. It will also be required to avoid altering the Earth's environment through the introduction of "extraterrestial matter." In 1961 and 1963 the U.S. conducted several communications experiments dubbed "Project Westford." One experiment, in 1963, succeeded in placing "a vast quantity of copper needles in a circular orbit around the Earth at an elevation of approximately 2,000 miles. The needles served to transmit radio signals ...."[39] This is precisely the type of experiment that has the potential to cause harmful interference of the type forbidden by Article IX.

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[39]C. Christol, supra note 26, at 131.

3) Environmental Modification Convention.[40] This convention was designed to prohibit the hostile use of environmental modification techniques. These are defined in Article II of the convention as "any technique for changing--through the deliberate manipulation of natural processes--the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space." Several qualifications to this definition are prescribed by the language of Article I.1: "Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party." As defined in an "Understanding relating to Article I," worked out by the Conference of the Committee on Disarmament during the negotiations,[41] widespread is considered as "encompassing an area on the scale of several hundred square kilometers." Long-lasting means "lasting for a period of months, or approximately a season." Severe is viewed as "involving serious or significant disruption or harm to human life, natural and economic resources or other assets." The use of environmental modification techniques for military or hostile purposes is not forbidden, just restricted. Unless the activity contemplated is either widespread, long-lasting or severe, nothing prevents a country from engaging in environmental modification activities. In addition, the "Understanding"

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[40]Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, opened for signature May 18, 1977, 31 U.S.T. 333, T.I.A.S. 9614 (entered into force Oct. 5, 1978) [hereinafter cited as ENMOD Convention].

[41]Conf. of the Comm. on Disarmament doc. CCD/520, Annex A (Geneva, 1976).

may not be considered legally binding, leaving each party some latitude to determine for itself what those three key terms mean.[42] Another limitation is contained in the language proscribing only military or "other hostile" use of such techniques. The peaceful use of such techniques is explicitly not restricted. Article III.1 states that "The provisions of this Convention shall not hinder the use of environmental modification techniques for peaceful purposes ...." As usual, the term peaceful purposes is not defined. Given the rather liberal and broad interpretation accorded the term in other space law contexts, it is not unreasonable to assume that if one of the space powers desired to conduct environmental modification activities that had military implications, it would do so, justifying them as a peaceful, non-aggressive use of outer space. In short, the Convention may not be worth the paper its written on. Hopefully its effectiveness will never need to be tested. The U.S.' propensity to conduct tests that at least appear to be of an environmental modification variety, just to gauge their effects, seems to have passed. Both Project Westford and Project Argus may well have violated the spirit, if not the letter, of the Convention, had it been in effect at the time.[43] In a space station context, certain types of environmental modification experiments with military overtones are imaginable, although by no means planned or probable. A space debris propagation experiment for instance, where debris is deliberately generated in specific militarily significant orbits in order to deny the enemy the safe use of that orbit, could be managed and observed from the space station.

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[42] See M. L. Stojak, supra note [illegible], at 175-176.

[43] See C. Christol, supra note 39 (Proj Westford), and supra note 22 (Proj. Argus).

D. Bilateral Agreements: The Anti-Ballistic Missile (ABM) Treaty.[44] According to some sources, DoD's change of heart in late 1986 regarding military use of the space station was directly attributable to the Strategic Defense Initiative (SDI) ballistic missile defense (BMD) program.[45] That this was the motive was inferentially confirmed in March of 1988, when DoD's report to Congress on the space station asserted that DoD "may consider the use of the Station for certain test and development activities ... in support of strategic defense research."[46] Of all the possible military uses suggested for the space station to date, SDI research and development activities appear to be among the most plausible. The question then becomes one of ascertaining how the current ABM treaty provisions would impact on the DoD's proposed SDI uses.

1) Treaty Provisions. The intent behind the ABM treaty was, and is, to prevent the establishment of a nationwide BMD. In the context of the Strategic Arms Limitation Talks (SALT), prohibiting a large scale BMD was to have then made it easier to agree on significant reductions in both sides' strategic offensive arsenals. Large-scale ABM systems were seen as destabilizing and the antithesis of the reduction goal, since the best method of overcoming an ABM defense is to simply increase the number of incoming warheads, overwhelming the defensive system. As history would

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[44]Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, signed May 26, 1972, 23 U.S.T. 3435, T.I.A.S. 7503 (entered into force Oct. 3, 1972) hereinafter cited as ABM Treaty].

[45]See Chap. III.2, supra.

[46]Dept. of Defense, A Report to the Committees on Armed Services of the Senate and House of Representatives on Potential Department of Defense Use of the Permanently Manned Space Station 3 (Mar. 1, 1988).

have it, the SALT process has not produced the reductions originally hoped for. Nevertheless, the ABM Treaty has at least limited the proliferation of BMDs and kept the door open for future cuts. The treaty limits each side to two geographically separated ABM sites. One may be around the national capital and the second system may protect an ICBM deployment area.[47] A subsequent protocol to the treaty limited this to just one site each.[48] Each location can have no more than 100 interceptor missiles and no more than 100 launchers for those missiles. The system deployed around the national capital was permitted to have six radars. The site around the ICBM field may have two large phased array radars (LPARs) and 18 smaller radars.[49] For purposes of applying the treaty's terms, Article II.1 defines an ABM system as:

> ... a system to counter strategic ballistic missiles or their elements in flight trajectory, currently consisting of:
> (a) ABM interceptor missiles, which are interceptor missiles constructed and deployed for an ABM role, or of a type tested in an ABM mode;
> (b) ABM launchers, which are launchers constructed and deployed for launching ABM interceptor missiles; and
> (c) ABM radars, which are radars constructed and deployed for an ABM role, or of a type tested in an ABM mode.[50]

The three elements of the system mentioned are considered ABM components. The testing and development of ABM systems or their

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[47] ABM Treaty, supra note 44, Art. III.

[48] Protocol to the Treaty Between the United States and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, signed Jul. 3, 1974, 27 U.S.T. 1645, T.I.A.S. 8276 (entered into force May 24, 1976).

[49] ABM Treaty, supra note 44, Art. III(a) & (b).

[50] ABM Treaty, supra note 44, Art. III(a) & (b).

components is allowed, but only at specified ABM test ranges.[51] Modernization of allowed ABM systems or their components is also permitted.[52] With relation to the systems in existence in 1972, the treaty's provisions are fairly straightforward and easy to apply. The terms addressing future systems however, have been the source of considerable controversy. In Article IX the parties agreed to not deploy ABM systems or their components outside their national territory. Future early warning radars are to be located on the periphery of one's national territory, and oriented outwards.[53] Of central importance for SDI development purposes is Article V.1, which simply states that "Each party undertakes not to develop, test, or deploy ABM systems or components which are sea-based, air-based, space-based, or mobile land-based. This language seems to clearly indicate that the development, testing, or deployment of a space-based SDI system would be prohibited. However, the language, scope, and intent of Article V.1 and Article III have all been called into question as a result of the SDI program. There is no doubt

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[51]Agreed Statement B to the ABM Treaty lists two sites for the U.S.; Kwajalein Atoll in the Pacific and White Sands Missile Range, New Mexico. The U.S.S.R. lists only one site; Sary Shagan, in Kazakhstan.

[52]ABM Treaty, supra note 44, Art. VII.

[53]ABM Treaty, supra note 44, Art. VI(b). Early warning radars have inherent ABM capabilities. By placing them on the edge of a country's territory facing outwards, their ABM value is significantly decreased. ABM radars are used for battle management. As such, they need to be located as far away from the incoming missile threat as possible. This allows the radar to track incoming warheads until just a few seconds before impact, and by doing so direct interceptor missiles to those warheads. Contrast this with an EW radar such as that the U.S. has at Clear, Alaska. Once ICBMs pass overhead en route to the main part of the U.S. from the U.S.S.R., that radar can no longer track them to target. It would thus be unable to provide guidance to interceptor missiles, or, if the ICBMs have multiple warheads that disperse after passing overhead, information on where the warheads should impact.

that SDI is an ABM system, but is it an ABM system of the type the treaty was intended to cover? Is research of any kind permitted, since it is not explicitly prohibited? What precisely does space-based mean, since its not defined in the treaty? However imperfect it may be, the ABM Treaty was designed to prevent precisely the type of comprehensive BMD system envisaged by SDI planners. The ABM Treaty is, in short, an impediment to development of the SDI system. Consequently, the treaty has received intense scrutiny and, as might be expected, flaws or perceived flaws have been found.

2) Issues. The most deleterious attack on the ABM Treaty has been that questioning the scope of the entire treaty. For over a decade, the terms of the ABM Treaty had been assumed to apply to all current and future ABM systems. In the so-called narrow or traditional view, Article II's definition of an ABM system was seen as being of a functional character. That is, any system designed to "counter strategic ballistic missiles or their elements in flight trajectory" fell within the scope of the treaty's prohibitions and limitations. The language "currently consisting of ..." followed by the definitions of ABM interceptors, launchers, and radars, was merely illustrative of an ABM system. Under this reading, a future ABM system that relied on lasers, particle beam weapons or other "exotic technology" would be covered by the treaty's provisions, even if none of the components were considered interceptors, launchers or radars as defined in Article II.1. The Article II.1 definition of ABM systems is crucial to the application of other terms of the treaty. For instance, in Article V.1 the parties have agreed to not develop, test or deploy ABM systems or components which are space-based. Article IX prohibits the deployment of ABM systems outside of a party's

national territory. As a result, the deployment of a satellite carrying ICBM interceptor rockets or a laser weapon with a similar purpose, would not be permissible. Other principal tenets of this traditional interpretation include:

> ... research on all ABMs, including those using exotic technologies, is permitted; testing and development of fixed, land-based systems or components which are based on "other physical principles (OPPs)" (i.e., "exotics") is permitted; testing and development of mobile/space-based exotics is prohibited; and the deployment of all exotics (whether fixed, land-based, or mobile/space-based) is prohibited unless the parties agree to amend the treaty.[54]

In October of 1985, the Reagan Administration announced that it was preparing to adopt a new interpretation of the ABM Treaty.[55] The architect of the new interpretation was the State Department's Legal Advisor, Abraham D. Sofaer. In essence, he argued that the definition of ABM systems contained in Article II.1, with its description of components, was inclusive. As such, any BMD system that did not consist of the listed components was not intended to be covered by the treaty. This meant that Article V.1's prohibition on space-based systems applied only to systems that were interceptors, launchers or radars as contemplated by Article II.1.[56] According to Sofaer, the parties did not intend to extend the treaty's coverage to systems based on future technologies, or OPPs. To buttress this key assertion, he pointed to the treaty's Agreed Statement D, which provides in part:

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[54]Nunn, The ABM Reinterpretation Issue, The Washington Quarterly, Autumn 1987, at 45, 46.

[55]Id. at 46.

[56]See Sofaer's written statement to a House subcomm. in Oct. 1985, reprinted in Sherr, Sound Legal Reasoning or Policy Expedient? The "New Interpretation" of the ABM Treaty, 11 Int'l Security 71, 86-91 (1986), for a detailed exposition of the basis for his re-interpretation.

> In order to insure fulfillment of the obligation not to deploy ABM systems and their components except as provided in Article III of the Treaty, the Parties agree that in the event ABM systems based on other physical principles and including components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars are created in the future, specific limitations on such systems and their components would be subject to discussion ....[57]

In Sofaer's view, Agreed Statement D would have been unnecessary had the parties intended the Article II.1 definition of ABM systems to apply to systems based on OPPs. Consequently, the treaty prohibited the deployment of fixed, land-based ABM systems based on current technologies except as permitted by Article III. Article V.1 was read as prohibiting the development, testing, and deployment of all mobile/space-based systems and components derived from current technological principles. The only real restrictions placed on systems based on OPPs were those of Agreed Statement D, which did nothing more than prohibit the deployment of such systems prior to discussing limitations.[58]

Sofaer's "restatement" would allow for considerably more latitude in testing the various exotic technologies associated with the SDI program.[59] If ABM systems were defined as Sofaer would have it, research, development and testing of BMD systems based on OPPs could proceed unhampered by anything in the ABM Treaty. Only before deployment took place would the U.S. be obliged to do anything. Due to the impact Sofaer's restatement would have in the SDI context, as well as some fundamental weaknesses in his legal analysis, his views came under

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[57] ABM Treaty, supra note 44, Agreed Stmnt. D.

[58] See Sofaer's statement, supra note 56, at 89.

[59] For a complete review of the BMD technologies, see the publication cited at supra note 23.

withering criticism from several quarters. Sofaer was forced to disavow his October 1985 legal analysis in early 1987, blaming it on "unnamed 'young lawyers' in his office."[60] According to Senator Sam Nunn, the restatement's chief antagonist in Congress, Sofaer has since conceded that the original or traditional interpretation is a "plausible" reading of the treaty.[61] Nevertheless, Sofaer believes, the treaty is more reasonably read as permitting the development and testing of exotics.[62] Now, according to Sofaer, the main difference between the two viewpoints boils down to this; under the traditional view a party can develop and test ABM systems based on OPPs that are capable of substituting for fixed, land-based ABM components. Under his view, a party may develop and test OPP ABM systems regardless of the basing mode. Under either interpretation an OPP ABM system may not be deployed in any basing mode without first discussing limitations on the system with the Soviet Union. For the moment, the debate over which interpretation is the better view has been put on hold. In the face of growing Congressional, public, and international pressure, the Reagan Administration agreed in 1987 to continue complying with the traditional interpretation.

With Sofaer's retreat from his initial approach of "ABM systems or their components" not applying to systems based on OPPs, attention and debate has shifted to other areas. All parties to the domestic debate, and apparently the Soviet Union as well, have at least implicitly agreed

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[60] Nunn, supra note 54, at 47.

[61] Id.

[62] For a statement of Sofaer's current views, see Sofaer, The ABM Treaty: Legal Analysis in The Political Cauldron, The Washington Quarterly, Autumn 1987, at 59.

that research on any type of ABM system, regardless of the technologies and basing mode involved, is allowed.[63] This has important implications for the space station, since it is ostensibly for research purposes that DoD made such an issue of ensuring its access. With research into ABM systems and their components based on OPPs allowed, but development, testing and deployment prohibited by Article V.1, the question naturally arises as to where the line between research and development is to be drawn. The U.S. has taken the position that development does not begin until field testing begins on a prototype. According to Ambassador Gerald Smith, the Chief of the U.S.' SALT delegation in 1972, both sides understood that "the prohibition on 'development' applies to activities involved after a component moves from the laboratory development and testing stage, wherever performed."[64] This usage implies that in-space testing of various technologies, as has been done by SDI, would be more than just research. The SDI organization has referred to some experiments as technology demonstrations of subsystems that could eventually evolve into complete BMD systems.[65] The distinction made is that the treaty prohibits the development and testing of ABM systems and their components, and that none of the SDI

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[63] See analysis, Smith, Legal Implications of a Space-Based Ballistic Missile Defense, 15 Cal. W. Int'l L. J. 52, 66-67 (1985). This conclusion is based on the practice of both parties, including their failure to object to the admitted BMD research activities of the other side.

[64] Military Implications of the Treaty on the Limitation of Anti-Ballistic Missile Systems and the Interim Agreement on Limitation of Strategic Offensive Arms, Hearings before the Senate Comm. on Armed Services, 92nd Cong., 2nd Sess. 377 (1972). See also M. L. Stojak, supra note 38, at 225-231, for a more complete review of the scope of research vs. development.

[65] See M. L. Stojak, supra note 38, at 230-231.

tests have involved a complete ABM system or a complete component of an ABM system. The Reagan Administration has decided to interpret the term "component" in such a manner as

> ... to include within its scope only those devices capable of performing 'the complete function of or substitute on a stand alone basis for an ABM component as defined in Article II of the Treaty. Such an interpretation would permit significant 'demonstrations' outside the laboratory of space-based BMD related technology which did not involve a 'component.'[66]

Thus the development and testing of any device that does not substitute for the function of one of the three ABM components, in its entirety, is permitted. Such a device would not fall within the scope of the prohibition of Article V.1. Another means of reducing the scope of the Article V.1 prohibition is by restrictively interpreting the "testing in an ABM mode" language of Article II. Even if the system can take the place of either an ABM interceptor missile or radar, it must still be constructed or deployed for an ABM role, or tested in an ABM mode.[67] For example, a space-based laser capable of destroying an ICBM warhead in flight might be considered a component under Article II.1 of the treaty, since it would be a complete functional substitute for an interceptor missile. If however, the laser were tested by having it illuminate and destroy a drone aircraft in the Earth's atmosphere, then the laser has not been tested in an ABM mode (i.e., against a dummy warhead launched in an ICBM-type trajectory). If the laser were constructed and deployed as part of a system designed to protect the U.S. from attack by aircraft,

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[66](Citations omitted) M. L. Stojak, supra note 38, at 234, and citations contained therein.

[67]The treaty offers no definition of "in an ABM mode." The U.S. has unilaterally defined it however. See Smith, supra note 63, at 60, footnote 47.

then it would likewise not fall within the definition of an ABM component. The fact that a device has an inherent ABM capability does not make it illegal. It is the purpose for which the device is constructed, deployed or tested that makes the difference.

By carefully designing its SDI experiments the U.S. can stay within even its "traditional" interpretation of the terms of the ABM Treaty. An important point to remember however, is that the deployment of a space-based BMD will violate the ABM Treaty, regardless of the interpretation applied. Should SDI progress to the point of deployment, the U.S. will either have to renounce the Treaty, seek to amend it, or ignore it. On the space station, under the current treaty, virtually all types of SDI research will be permissible. Furthermore, the development and testing of SDI-related systems on-board the station will be allowed, assuming the U.S. continues to interpret Article II.1 as it has in the past, and designs its experiments accordingly.

Chapter V.2: The "Peaceful Purposes" Debate

A. Introduction. Of the wide variety of space law issues that have cropped up over the years, none has been more enduring than the debate over the meaning of the phrase "peaceful purposes." The phrase appeared in a space context even before the launch of Sputnik in 1957,[68] and over the years has been seen in a number of domestic and international instruments. As the political winds changed, so did the meaning and

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[68] NSC Action No. 1553, Nov. 21, 1956, stated "It is the purpose of the United States, as part of an armaments control system, to seek to assure that the sending of objects into outer space shall be exclusively for peaceful and scientific purposes...." See P. Stares, Space Weapons and U.S. Strategy, Origins and Development 54 (1985).

intent attached to this otherwise innocuous terminology. Often, the employment of the words has been nothing more than a hollow exhortation, disguising by design an ulterior purpose or hypocritical policy. On a few occasions, such as in Article IV of the Outer Space Treaty,[69] use of the phrase "exclusively for peaceful purposes" has served to establish a widely recognized, legally binding obligation. In this instance, a commitment by the majority of the world's nations to refrain from "militarizing" the moon and other celestial bodies. The central issue has always been that of determining the scope of the phrase in relation to military activities in outer space. To what extent, if any, does "peaceful purposes" preclude or limit military involvement in outer space? If military activities are allowed, does the "peaceful purposes" concept draw a line somewhere? When does a peaceful, acceptable activity become an unpeaceful, and hence unacceptable one?

Peaceful purposes is not explicitly defined in international space law. For more than three decades each country has interpreted the phrase as it has seen fit. Furthermore, only a handful of in-force multilateral instruments contain the peaceful purposes language in the body of the document.[70] Of the four major space law treaties, only the Outer Space Treaty employs the term as part of a legally binding commitment. Consequently, the focus of the debate over how to interpret the undefined phrase has been on the events surrounding the drafting, negotiation, and implementation of that treaty as well as its text.

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[69] The Outer Space Treaty, supra note 25.

[70] See e.g., ENMOD Convention, supra note 40, Art. III.1.

The debate's relevance to space station operations is direct and unquestioned. The inter-governmental agreement (IGA) governing station activities incorporates by reference the provisions of the four space law treaties, as well as international law in general.[71] More important, the partners have agreed that the station will be used "for peaceful purposes, in accordance with international law."[72] Since the IGA does not define peaceful purposes, international law has to provide the answers to any questions resulting from use of the phrase. In recognition of the fact that no generally agreed upon international definition exists, the IGA reserves to the parties the right to determine whether or not their activities are permissible.[73] This last provision has some important ramifications, not least of which is that individual state practice takes on added significance. In predicting how the U.S. and its partners may use the station for military purposes, the manner in which those countries have interpreted and applied the phrase "peaceful purposes" is a crucial indicator. Presumably, as the judges of their own activities, they will assess their proposed conduct in light of past practice.

B. The Pre-1967 Background of the Peaceful Purposes Idea in Space Law. In the months before Sputnik, the Eisenhower Administration decided to

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[71] Agreement Among the Government of the United States of America, Governments of Member States of the European Space Agency, The Government of Japan, and the Government of Canada on Cooperation in the Detailed Design, Development, Operation and Utilization of the Permanently Manned Civil Space Station (signed Sept. 29, 1988) ___ U.S.T. ___, T.I.A.S. ___ (1988), Art. 2 (incorporating the specific treaties), Art. 1 (gen. international law) [hereinafter cited as the Space Station IGA].

[72] Space Station IGA, supra note 71, Arts. 1.1 and 14.1.

[73] Id., at Art. 9.8(b).

pursue a course of action designed to preserve outer space "exclusively for peaceful and scientific purposes." This policy decision, embodied in a National Security Council directive, explicitly sought to exclude the use of space for military purposes, including ICBM passage.[74] The impetus behind the initiative was the belief that the failure to subject atomic power to effective international control had been the result of not taking action soon enough. The same mistake, it was felt, ought not to be made with the medium of space.[75] Efforts at control continued after the launch of Sputnik, but with a rapidly diminishing potential for success. In the United Nations, the desire to preserve space for peaceful purposes found expression for the first time in General Assembly Resolution 1148 (XII) of November 14, 1957. A resolution urging the major powers to arrive at a general disarmament agreement, the document called for the study of an inspection system designed to ensure "that the sending of objects through outer space shall be exclusively for peaceful and scientific purposes."[76] In reality, this was part of the continuing U.S. - U.S.S.R. game played out in a multinational arena, each side vying for support of its positions. The wording of the part of the resolution just cited was identical to that contained in the NSC directive previously mentioned. In early 1958, Eisenhower renewed the U.S. offer regarding the peaceful use of space, this time directly to the Soviets in an exchange of

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[74] See, supra note 68.

[75] P. Stares, supra note 68, at 54-55.

[76] G.A. Res. 1148 (XII), "Regulation, limitation and balanced reduction of all armed forces and all armaments; conclusion of an international convention (treaty) on the reduction of armaments and the prohibition of atomic, hydrogen and other weapons of mass destruction" (Nov. 14, 1957) para. 1(f).

letters.[77] The theme caught on in the United Nations, resulting in General Assembly Resolution 1348 (XIII) of December 13, 1958, which stated in its first sentence: "Recognizing the common interest of mankind in outer space and recognizing that it is the common aim that outer space should be used for peaceful purposes only, ..."[78] The resolution established the U.N.'s ad hoc Committee on the Peaceful Uses of Outer Space (COPUOS), which would later become a permanent committee. Unfortunately, by the time of UNGA Resolution 1348, the brief "window of opportunity" available to preserve space for exclusively peaceful purposes had closed. Earlier that year, rebuffed by the U.S.S.R, the U.S. had made some subtle but important changes in policy regarding the way it viewed the "peaceful uses" of outer space. Recognizing the value of reconnaissance satellites in a still-armed world, the U.S. established its current policy of equating the term peaceful with non-aggressive rather than with non-military. This, it was said, was consistent with the meaning accorded peaceful in "classical international law."[79] Any doubt about the import or permanence of this shift was put to rest by enactment of the National Aeronautics and Space Act, which declared that space was to be "devoted to peaceful purposes," followed immediately by a provision dividing responsibilities for space between NASA and DoD.[80] UNGA

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[77] See P. Stares, supra note 68, at 55.

[78] G.A. Res. 1348 (XIII). "Question of the Peaceful Use of Outer Space" (Dec. 13, 1958).

[79] See, Meyer, Interpretation of the Term "Peaceful" In Light of the Space Treaty, in Proceedings of the 11th Colloquium on the Law of Outer Space 24, 27-28 (1968).

[80] National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, Section 102, 72 Stat. 426 (1958).

Resolution 1348 marked the last time the General Assembly gave formal approval to the widely phrased appeal.[81]

By the time the next major U.N. General Assembly Resolutions addressing the uses of outer space were promulgated, the atmosphere had changed completely. The U.S.' position regarding peaceful purposes had become well-entrenched, so much so that few ever thought it had been otherwise. Professor J. C. Cooper noted in 1965:

> While it may be true that the term "peaceful use of outer space" in some earlier public statements might have led to the erroneous conclusion that the United States was committed to a policy which banned all military use, it is quite certain that no such policy ever existed.[82]

Vastly changed circumstances also played a role. By 1962, the U.S. had operational satellites and a robust military space program, as did the Soviets, who were on the verge of launching their own reconnaissance satellites. This was in sharp contrast to late 1957 and early 1958. The strong language accompanying "peaceful purposes" in 1959's Antarctic Treaty[83] took advantage of the opportunity to prohibit military activities before such activities had become entrenched on the continent. The same may have been possible in space in 1957 or 1958. By 1962 however, the foothold had been established. Discussions between the two space powers no longer focused on banning a military presence in space,

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[81] C. Christol, supra note 26, at 23.

[82] Cooper, The Manned Orbiting Laboratory: A Major Legal & Political Decision, in Explorations in Aerospace Law 424 (I. Vlasic ed. 1968).

[83] The Antarctic Treaty, opened for signature Dec. 1, 1959, 12 U.S.T. 794, T.I.A.S. 4780 (entered into force Jun. 23, 1961), Art. I.1., provides "Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons."

but on limiting it. UNGA Resolution 1884 (XVIII) called upon states to refrain from placing nuclear weapons or weapons of mass destruction into orbit, and noted "with satisfaction" that both the U.S. and U.S.S.R. had pledged not to do so.[84] The resolution made no mention of peaceful purposes or uses, and was the direct result of a U.S. overture to the Soviet Union. The members of the U.N. had little role in drafting the resolution, essentially putting their stamp of approval on bilaterally negotiated language.[85] General Assembly Resolution 1962, which in conjunction with Resolution 1884 formed the basis for the Outer Space Treaty, was the product of a similar, largely bilateral process.[86] The peaceful purposes language was present in this resolution, but relegated to the preamble. Gone were words such as "exclusively," "only," or "solely" attached to peaceful purposes.

In June 1965 the U.S. State Department circulated a proposed treaty among other government agencies that addressed the exploration of celestial bodies. A few months later the U.S. proposed that the U.N. begin work on a comprehensive treaty to govern celestial bodies. By April of 1966, differences between U.S. government agencies over the substance of the draft to be presented by the U.S. had been ironed out. DoD concerns that the treaty should in no way operate to the prejudice of the

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[84] G. A. Res. 1884 (XVIII) "Question of general and complete disarmament" (Oct. 17, 1963).

[85] Mexico had previously submitted a draft treaty banning weapons of mass destruction from space. It re-tabled parts of it as a draft resolution after it had been approved by both the U.S. & U.S.S.R. For a detailed account of the development of UNGA Res. 1884, see P. Stares, supra note 68, at 81.

[86] G. A. Res. 1962 (XVIII) "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (Dec. 13, 1963).

military space program, particularly the intelligence-gathering aspect of it, were apparently met. President Johnson announced the basic elements of the treaty in May, 1966. This was followed by a Soviet proposal in June.[87] Both the U.S. and Soviet drafts used "peaceful purposes" restrictively, without the adverbs seen in 1957-1958. There was however, one exception made to this general rule by both countries. Article 9 of the U.S. draft provided that "celestial bodies shall be used for peaceful purposes only."[88] The Soviet draft called for the exploration and use of outer space to be for peaceful purposes, but in Article 4 said "the Moon and other celestial bodies shall be used exclusively for peaceful purposes."[89] The intent of both parties was obvious:

> ... the major space powers repudiated the views advanced in 1957 and in 1958 and which had gathered substantial support down to 1966. In doing so the space powers elected to reject the broad coverage contained in the Antarctica Treaty of December 1, 1959. This international agreement, which made no exceptions, provided in Article 1 that "Antarctica shall be used for peaceful purposes only.' (citations omitted)[90]

The distinction being made by the space powers was not lost on other members of COPUOS. When the U.S. and Soviets had agreed upon most of what

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[87]Details of this summary are extracted from P. Stares, supra note 68, 101-105.

[88]C. Christol, supra note 26, at 23-24.

[89]Id., at 24.

[90]Id.

is now Article IV of the Outer Space Treaty,[91] several delegations "questioned the propriety of excluding outer space from the coverage of the second paragraph, the implication being that outer space may be used for non-peaceful purposes."[92] The meaning of Article IV was apparent to others as well:

> ... one columnist took a jaundiced view: since national claims and nuclear bombs in space were already rejected as impractical, a space treaty could only be a facade to make the Cold War rivals look good without constraining them from doing anything they might really want to do. Indeed, Eilene Galloway, the leading congressional staffer on space law, thought a treaty might involve new restrictions only if a ban on all weapons tests and maneuvers (e.g. the planned MOL) were applied to all of outer space. (citations omitted)[93]

No one could have been ignorant of the true intent underlying Article IV as presented by the U.S. and the Soviet Union. If, in fact, as Goedhuis has suggested, the great majority of the delegations present equated peaceful with non-military uses of space, they nevertheless acquiesced in a different reading of the term by the space powers before the treaty was

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[91] Art. IV reads in part:
States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.
The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies shall be forbidden....

[92] Dembling, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies, in Manual on Space Law 1, 14 (N. Jasentuliyana and R. Lee, eds. 1979).

[93] W. McDougall, The Heavens and the Earth, A Political History of the Space Age 416 (1985).

ever submitted to the General Assembly.[94] To conclude that these delegations were somehow misled or genuinely believed that "peaceful purposes" absent an "exclusively," "only" or "solely" modifier, was intended to preclude any military involvement in space, would fly in the face of all logic and the evidence. Far more likely is the view stated by Paul Dembling and echoed by many others, that Article IV was the best that could be hoped for under the circumstances. Had a general prohibition against all military activities in space been sought, an agreement would never have been reached.[95]

The preamble of the Outer Space Treaty mentions peaceful purposes or some variation thereof, three times. In the body of the treaty it is mentioned twice, once in Article IV with the adverb "exclusively" attached, and later, in Article XI, where the treaty speaks of promoting international co-operation in the "peaceful exploration and use of outer space." It is a far cry from the center of attention the idea had received at the dawn of the space age. The important point to be made about the phrase as interpreted by the U.S. and several other space powers is this: however illogical it sounds, the phrase "peaceful purposes" (or uses) is seen as prohibiting only the "aggressive" use of space, thus allowing a wide range of "non-aggressive" military activities, while the same words accompanied by an adverb such as"exclusively" or "solely" has the effect of prohibiting all military uses.

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[94]See Matte, Space Stations: A Peaceful Use for Humanity, 10 Annals of Air & Space Law, 417, 440, note 104 (1985).

[95]Dembling, supra note 92, at 14., and McDougall, supra note 93, at 415-420.

C. "Peaceful Purposes" as Prohibiting All Military Activity in Space. There have been two related approaches to arriving at the conclusion that "peaceful purposes" prohibits all military activity in space. The first attempts to take other obligations imposed by the Outer Space Treaty and argues their precedence over Article IV, while the second relies more on the overall intent of the treaty. Professor Markoff has consistently argued the first, basing his thesis on the language of the first paragraph of Article I of the Outer Space Treaty, which provides that the use and exploration of outer space "shall be carried out for the benefit and in the interests of all countries."[96] Arguing that no military use of space could be in the interests of all countries, Markoff asserted that Article I had, in effect, provided a definition of "peaceful purposes." He admitted that the wording could have been "more precise and accurate," but nevertheless concluded that Article I contained a "newly created general international law rule of higher rank when putting forward the criterion of the interest of all States of the world."[97] Markoff's views, initially expressed shortly after the Outer Space Treaty was signed, were strongly criticized. In a 1976 article he responded to his critics, presenting a more refined iteration of his original views.[98] As he had earlier, he analogized the treaty's "peaceful purposes" provisions with those found in the Antarctic Treaty. In addressing the "non-aggressive" interpretation of the term, he rejected the often heard

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[96]See Markoff, supra note 29, and Markov (same) The Juridical Meaning of the Term "Peaceful in the 1967 Space Treaty, in Proc. of the 11th Colloquium on the Law of Outer Space 30 (1968).

[97]Markov, supra note 96, at 31-32.

[98]Markoff, supra note 29.

analogy to the NAS Act, dismissing the Act's declaration regarding peaceful uses as "a general statement of a goal, without binding force in international law."[99] To the charge that Article I's language was too vague to be reasonably construed as creating a binding obligation of the type he described, he responded that "its obligatory character and binding force remain quite unaffected by the specific dynamics of its application."[100] Article IV, Markoff concluded "constitutes but a limited, or partial application of the general principle contained in Article I(a)."[101] The most interesting aspect of Markoff's theory is revealed when he answers critics who say that he ignores the evidence of the intent and the practice of the space powers both before and after the treaty entered into force:

> In spite of the present practice of some States, the "common interests" provision of Article I(1) continues to keep its validity as a perfect treaty obligation, and not merely as a declaration of intent showing "prevailing consensus at a time." As already pointed out, by including that provision in the body of the Treaty, and not putting it in the preamble, the authors of the Treaty clearly manifested an intention to consider Article I paragraph 1 as a fixed contractual obligation and not solely as a statement of goals without legal binding force. With its entry into force, the "common interests'" rule achieved an independent significance and legal meaning, and any "reservato mentalis," or further unilateral interpretation of it, are irrelevant under general international law. (citations omitted)[102]

In other words, the common interest rule, as Markoff sees it, has attained a life of its own.

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[99] Id., at 8.

[100] Id., at 14.

[101] Id., at 16.

[102] Id., at 15.

A second approach has been labelled the Treaty "Intent and Purpose Override."[103] This school of thought admits that while

> Article 4 may, per se, allow for military activity, such a construction of the Article is not in keeping with the overall intent and purpose of the Treaty .... the inadequacies of Article 4, by the process of interpretation, must give way to the view that the Treaty in its larger sense obliges signatories to advance the peaceful and beneficial uses of the space environment so as to avoid in all areas all conduct that has a military or non-peaceful coloration.[104]

In effect, the defects of Article IV are "cured" by going beyond the Article and taking into account the object and intent behind the Treaty. Key elements used to construct an intent and object contrary to that implied by Article IV's literal construction, have included; the preamble;[105] Article I, with its "common interests" principle; Article III requiring parties to conduct their activities in space in accordance with international law and in the interest of maintaining peace; and Article IX, where the common interests principle appears again, in a slightly different context. Interpretation of these provisions has led Professor Vlasic to conclude that

> ... the cumulative effect of the directives contained in the preamble and in the operative part of the Treaty, more than any single specific stipulation in it, suggests convincingly that the present level of "defence" activities in space is contrary to the letter and spirit of the document.[106]

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[103] See e.g., M. L. Stojak, supra note 38, at 190.

[104] C. Christol, supra note 26, at 26-27.

[105] The preamble states in part "Recognizing the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes," and "Desiring to contribute to broad international co-operation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes."

[106] Vlasic, Disarmament Decade, Outer Space and International Law, 26 McGill L. J. 135, 174 (1981).

He also concludes that

> The preamble to the [Treaty] contains phrases which leave no doubt that the parties intended to create a legal regime to make the space environment serve, pre-eminently and perpetually, the cause of peace, international cooperation and general well-being. If during the negotiations of the Treaty, some of the parties harboured contrary ideas, their expectations are not reflected in the preamble.[107]

Unfortunately, this approach shares a weakness with that taken by Markoff. They both purport to interpret the intent behind the provisions of the Treaty without actually considering the evidence of intent that was available. Vlasic for instance, implies that "outer space" may have been inadvertently omitted from the language of paragraph 2 of Article IV providing that the Moon and other celestial bodies were to be used exclusively for peaceful purposes.[108] The evidence clearly demonstrates however, that the omission was quite deliberate.[109] In any event, the practice of states has rendered the non-military arguments an academic exercise, regardless of how valid they are. Neither the Soviet Union nor the United States is about to abandon their prodigious military space programs in the absence of comprehensive arms control agreements that require such a result.

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[107] Id., at 169.

[108] In Vlasic's view however, whether inadvertent or deliberate, the result is the same; the Article that was supposed to curb the "militarization" of outer space has had the opposite effect in practice. Id., at 170-171.

[109] The negotiating minutes prove this beyond any doubt. See e.g., Magno, How to Avoid Militarization of Outer Space? 7 (1983); Menter, Peaceful Uses of Outer Space and National Security, in Proc. of the 25 Colloquium on the Law of Outer Space 135, 136 (1982). Matte has accurately called these wording nuances "willful omissions." See N. Matte, Aerospace Law 298 (1969).

D. "Peaceful Purposes" as Permitting "Non-aggressive" Military Uses.

As stated in a previous section,[110] this concept is rooted in the idea that what has not been prohibited in a suitably clear expression of intent remains permissible, and hence, lawful. The Outer Space Treaty explicitly proscribes only the orbiting of nuclear weapons and weapons of mass destruction when speaking of outer space. The application of the verbis expressis rule, combined with the lack of a definition for "peaceful purposes" has resulted in the emasculation of the Treaty as a potential arms control instrument. Without a contrary definition in the Treaty, the U.S. has continued to equate "peaceful purposes" with non-aggressive purposes or uses. The beginning of this usage in a space law context can be traced back to the decision in 1958 to proceed with a military space program while at the same time trying to "legitimize" it. The architects of U.S. policy turned to the way in which "peaceful" was normally used in international law at the time, specifically the U.N. Charter. It was generally viewed in this context as being the opposite of "aggressive."[111] That being the case, any non-aggressive behavior not otherwise prohibited would be permissible.[112] An American Bar Association-generated report concluded that:

> For the time being it seems that the only uses of space that are prohibited are those that fall within the prohibition of the Charter, and that until a disarmament agreement dealing with space activities can be arrived at, the United States is justified in using space for non-aggressive military uses

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[110] Chap. V.1.C.2)b).

[111] See, supra note 14.

[112] See Chap. V.1.B., supra, for a review of the reasoning permitting non-aggressive uses of space in the context of the U.N. Charter.

> consistent with the terms of the Charter. Such use is clearly in accordance with existing international law, and the United States would have no embarrassment in asserting that it is "peaceful."[113]

These views are essentially unchanged today, since the usage of peaceful purposes in the Outer Space Treaty is not seen as having altered the U.S. interpretation. The Treaty does nothing more than prohibit certain types of armaments in specific environments. Quite a few commentators have decried the extent to which this "non-aggressive" interpretation has been used to justify almost any military space activity. At the same time however, most have conceded that the peaceful purposes language in the Outer Space Treaty and elsewhere does not ban all military activity in space.[114] The practice of states and the ambiguous nature of the language found in the Outer Space Treaty have combined to lend a great deal of credence to the non-aggressive approach. The prevailing, but not unanimous view is that only aggressive conduct violates the principal requiring the peaceful uses of outer space.[115]

One of the characteristics of the non-aggressive approach is that it "accepts the proposition that there is a continuum between peace and aggression, and that the critical issue is as to the amount of force that can be employed while still not crossing the line separating peaceful

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[113] Amer. Bar Found., supra note 14, at 807.

[114] See e.g., N. Natte, Aerospace Law 299 (1969), where he states that the second paragraph of Art. IV of the OST "practically represents a franchise, if not an invitation to use outer space for military purposes, such as reconnaissance and surveillance via satellites."

[115] Christol, The Common Interest in the Exploration, Use and Exploitation of Outer Space for Peaceful Purposes: The Soviet-American Dilemma, in Proc. of the 27th Colloquium on the Law of Outer Space 281, 283 (1984).

conduct from aggressive or unacceptable coercive conduct."[116] The problem of course, is determining just where the line should be drawn. After seven years of debate in a special committee, the U.N., defined aggression in a General Assembly resolution as "the use of armed force by a state against the sovereignty, territorial integrity or political independence of another state or in any other manner inconsistent with the Charter of the United Nations as set out in this definition."[117] Read in conjunction with the provisions of the U.N. Charter, including Article 2.4 containing similar language, this resolution has the effect of defining what is not aggression very broadly.[118] The use, or threat of use, of armed force without legal justification, such as in self-defense, constitutes aggression. Short of the threat or actual employment of armed force against the "territorial integrity or political independence of any state,"[119] almost any military activity in space is permissible assuming there are no other restrictions. Matte has summarized the situation thus:

> ..., the United States and its allies considered that each state had the right to use space for military purposes, as long as it was a question of national security, and that these maneuvers or activities were for self-defense and did not represent aggressive activities, such as threats or uses banned by the United Nations Charter. (citation omitted)[120]

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[116] Christol, Arms Control and Disarmament in Space: The Rough Road to Vienna 1984, Part 1, Space Policy, Feb. 1985, at 26, 33.

[117] G. A. Res. 3314 (XXIX), 29 U.N. CADR, Supp. 142, U.N. Dec. A/9631 (1975).

[118] U.N. Charter, supra note 5.

[119] Id., Article 2.4.

[120] N. Matte, supra note 114, at 270.

The actual use of armed force is fairly easy to detect, even in space, and has not presented a problem. The difficulty lies in determining at what point a defensive preparation or program crosses an imaginary line and becomes a threat to one's opponent. As a subjective determination made by each of the participants, this line is likely to be drawn at different points. It has been argued for instance, that a space-based ballistic missile defense system would be a peaceful use of outer space because it would be defensive, and hence inherently non-aggressive in character.[121] Despite the semantics however, the same space defense systems can be, and in the case of SDI have been, viewed by the opposing party as an offensive threat. In addressing the "true purpose" behind the SDI program, the Soviet Union has described SDI as a system designed to permit the U.S. to deliver a nuclear first strike against the U.S.S.R. without fear of effective retaliation.[122] From its inception, adherents of the non-aggressive school of thought have believed that defensive systems are perfectly permissible. This has provided the rationale for the existence of a number of weapons systems, labelled defensive in character, that would by their functions appear to be of the

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[121] Schwetje, Space Defense Systems: A Peaceful Use of Outer Space, in Proc. of the 29th Colloquium on the Law of Outer Space 72 (1986).

[122] See e.g., Mil. Pub. House, Star Wars, Delusions and Dangers 24-25 (Moscow 1985).

most offensive kind.[123] With regard to military space systems, the same sort of argument has been made for anti-satellite systems (ASATs). By equating non-aggressive with defensive uses of space, an ASAT system is currently permitted so long as it is used for defensive purposes.[124]

For years both space powers refrained from deploying systems that could objectively be viewed as potentially offensive. This mutual restraint was driven by policy and political, not legal, considerations. The effect in practice was to restrict the scope of the non-aggressive view of peaceful purposes. This gave rise to a "passive" or "non-offensive" characterization being ascribed to certain military uses of outer space. Generally included in this class of activities are reconnaissance, surveillance, intelligence gathering, targeting, mapping, communications, weather reporting, early warning and the like. The common thread running through these disparate uses is that none of the systems are, in and of themselves, weapons. All serve to enhance or support the war-fighting

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[123]For example, Martin Menter has described the U.S.' Strategic Air Command alert bomber force, where crews and aircraft loaded with nuclear weapons are prepared to take off minutes after being ordered aloft, as non-aggressive and consistent with the U.N. Charter. Menter, Peaceful Uses of Outer Space and National Security, in Proc. of the 25th Colloquium on the Law of Outer Space 135, 136 (1982). J. C. Cooper felt that ICBMs, "in the hands of the United States," were designed for peaceful purposes. Cooper, supra note 82, at 427.

[124]This reasoning is implicit in President Reagan's National Space Policy, approved on 5 Jan. 1988. In it, he called for a "robust and comprehensive ASAT capability ...." See White House Press Release, Fact Sheet National Space Policy (Jan. 26, 1988). That nothing in present int'l law forbids the development of an ASAT to be used for defensive purposes is acknowledged by attempts in the past decade to outlaw such systems. See Christol, supra note 115. The U.S.' position on ASATs is not new. Sec. of State Rusk, for instance, told a Senate Committee in 1967 that nothing in the Outer Space Treaty prevented the development of an ASAT. This was reiterated by Sec. of State Vance in 1978. See Hosenball, Present and Prospective Military Technologies and Space Law: Implications of the 1967 Outer Space Treaty, in Ra'anan & Pfaltzgraff, eds., International Security Dimensions of Space 213, 216 (1984).

capabilities of ground-based forces. Some systems, such as reconnaissance satellites, have been described as "peace-inducing" when used to verify arms control agreements or to just observe what the other side is doing.[125] Unfortunately, the satellite that can verify arms control agreements may also be used to select targets for ICBMs, and thus does not lose its military value. When both the U.S. and the Soviet Union began to move towards the deployment of ASATs beyond the limited systems they already possessed or had possessed in the past, proponents of this "passive" school of thought complained of the "militarization" of space. In reality, this was a misnomer. Militarization of space is, as a former Air Force official has stated, an accomplished fact. It has been for decades.[126] The real issue concerns what some have called the "weaponization" of space. This is

> ... meant to distinguish those military activities involving the actual deployment of weapons in space from other more benign military activities in space such as communications, early warning, surveillance and navigation ....The "weaponization" of space refers to the introduction of (1) weapons, wherever based, directed at space objects and (2) weapons, for whatever purpose, based in space.[127]

The prospect of the introduction of actual weapons into space, whether through the SDI, an ASAT or some other means, is viewed with alarm by many. As a result, it has been the source of considerable attention in

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[125] See e.g., Christol, supra note 116, at 33.

[126] Bowman, Arms Control in Space, Air U. Rev., Nov.-Dec. 1985, at 58.

[127] Bowman, The Militarization of Space? The Real Issue is the Weaponization of Space 7 (1984) as cited in Matte, Space Stations: A Peaceful Use for Humanity?, 10 Annals of Air & Space Law 417, 439 (1985).

international forums over the past decade.[128] The efficacy of using a weapons--no weapons distinction in an effort to control the military use of outer space is questionable. As technology has advanced, many of the so-called passive systems are in fact critical components of integrated weapons systems. A seemingly innocuous navigation satellite for instance, can provide an in-flight ICBM with data to increase its on-target accuracy dramatically, making it almost as important as the warhead itself.[129] This not only blurs the line between passive (no weapons) and weapons uses, it also demonstrates the problems caused by too easily accepting artificial distinctions. Just because a system is not in and of itself a weapon does not mean that it is truly passive. By the same token, a weapon can be used for eminently peaceful purposes. A laser on the space station to protect it from debris is but one such example. In any event, there appears to be nothing in international law that dictates such a distinction be made. Its attractiveness lies in the fact that it is a more restrictive variation of the non-aggressive - aggressive view of peaceful purposes. The latter, rooted in an interpretation of the law favored by the U.S., the Soviet Union and many other countries, in reality does little to control military activities in space.

The United States has maintained that the non-aggressive - aggressive view is the correct interpretation of existing law:

> The position of the United States and most Western powers has been, and continues to be, that "peaceful purposes" does not mean non-military, but rather "Non-Aggressive." The U.S. has never departed from the view that the peaceful purposes

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[128] See e.g., Report submitted to the House Comm. on Foreign Affairs, 97th Cong., 2nd Sess., The Second U.N. Conference on the Peaceful Uses of Outer Space (UNISPACE 1982) Aug. 9-21, 1982 (Comm. Print 1983).

[129] See Bowman, supra note 126, at 60.

> requirement allows all non-aggressive military activities in space, other than those specifically prohibited. One basis for this view, it has been said, is that "non-military," as a standard, implies total demilitarization and neutralization--a situation that could only result from a comprehensive disarmament treaty. (citation omitted)[130]

Consequently, while the debate over what the meaning of peaceful purposes is, or ought to be, may continue, the United States is likely to proceed as it has for 30 years. Military space systems that the U.S. deems desirable will be labelled defensive and will thus be considered non-aggressive. As such, their deployment will be in accordance with international law. Any limits on this otherwise permissible regime will come in the form of a policy that has traditionally eschewed placing weapons in space or, should such a policy not be forthcoming, limits imposed by Congress.[131]

Chapter V.3: The Military Use of Space in the Eyes of the Partners

A. Canada. The Canadian position regarding the interpretation of the phrase "peaceful purposes" as used in the Outer Space Treaty and elsewhere, is identical to that of the United States. In working papers submitted to the Conference on Disarmament, Canada identified the two basic approaches to the peaceful purposes debate.[132] They were labelled the "restrictive" interpretation (non-aggressive) and the "non-

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[130] M. Zehner, Off. of the General Counsel, U.S. Air Force, International Law and Military Activities in Space (unpub. paper 1985).

[131] The best example of this latter type of limitation is the ASAT testing ban imposed by Congress in 1987, when the Administration decided to proceed with ASAT development. See National Defense Authorization Act for Fiscal Year 1987, Pub. L. No. 99-661, Sect. 231, 100 Stat. 3847 (1986).

[132] Canada, Working Paper, Terminology Relevant to Arms Control and Outer Space (Jul. 1986).

restrictive" (non-military) interpretation. After reviewing the negotiating history and language of the Outer Space Treaty, the relevant provisions of the U.N. Charter, and the practice of states since 1958, the Canadian papers concluded "that the restrictive interpretation is the most appropriate ...."[133] Certain military uses of space are recognized as inherently stabilizing, including reconnaissance to verify arms control agreements, early warning, and communications.[134] Analogizing space operations to those conducted on the high seas, Canada also determined that:

> In the absence of an existing specific prohibition (such as, for example, the one against nuclear weapons) and on the assumption that the activity in question is not contrary to an existing principle of international law (such as the non-use of force) the placement of weapons in orbit is not per se unlawful.[135]

The "passive use - weaponization" approach, used to limit the scope of the non-aggressive interpretation, was rejected as being ambiguous and without meaning.[136]

This is not to suggest that in practice Canada is a clone of the United States. Although their interpretations of the law are quite similar, Canada has tended to be much more equivocal than the U.S. in actually using space for military purposes. Canada does not have a military space program of its own. It does however, as a member of the North Atlantic Treaty Organization (NATO) and the North American Aerospace Defense Command (NORAD), contribute to the cost of, and uses the services of, a

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[133] Id., at 13.

[134] Id., at 3.

[135] Id., at 14.

[136] Id., at 13.

variety of military satellite systems. The Canadian government has expressed its displeasure however, with systems that approach the "weaponization" of space, although it acknowledges that there are no current legal constraints on most of the systems it objects to. In international forums, Canada has frequently called for efforts at reaching agreements that would ban ASATs and anti-ballistic missile systems.[137] The strength of Canada's commitment to an outer space without anti-ballistic missile systems was called into question however, by its decision in September of 1985 to permit private Canadian companies to engage in U.S.-sponsored SDI research while avoiding such activities on a government-to-government level.[138] In short, Canada's views on a specific system or set of circumstances are difficult to predict. Nowhere was this more evident than in the space station negotiations. The government was apprised early in the development process that

> The Space Station is not a military facility and has no connection with the U.S. Strategic Defense Initiative, commonly known as "Star Wars." There is, of course, no guarantee that aspects of Space Station technology will not be used for military purposes, but if that occurs it is most likely to be in the realm of surveillance, rather than weaponry.[139]

This implied a willingness to accept some operational military uses of a "passive" nature beyond mere research and scientific activities. Yet shortly after DoD expressed new interest in the station, the Canadian Minister of State for Science and Technology is reported to have stated that in the event the U.S. chose to have operational military activities

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[137] See, Stojak, supra note 38, at 144-145 and sources cited therein.

[138] A. Young, Law and Policy in the Space Stations' Era 422-423 (unpub. dissertation submitted to McGill Univ. 1987).

[139] Canadian Inst. for Advanced Research, Canada and the Space Station, A Report to the Government of Canada 5 (1986).

on the station, Canada would withdraw.[140] This may well have been nothing more than a negotiating ploy. As with so many other aspects of the space station arrangements that Canada had staked out "firm" positions on, in the end the government did not win its point.[141] The space station agreements permit the U.S. to conduct any national security activity that it deems lawful, i.e., in accordance with its peaceful purposes interpretation.[142] This will permit operational uses which may also include SDI-related activities. How Canada will handle such an eventuality is uncertain.

B. Japan. The Japanese government has maintained a modest space launch program since 1958.[143] It has never been accused of having military implications. Despite being allied with the U.S. government on other defense matters, there is no relationship similar to that between the U.S. and its European allies regarding military space programs. The Japanese interpretation of "peaceful purposes" or uses was first articulated in a 1969 resolution of the Japanese Diet, which provided in

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[140] Comments of the Hon. Frank Oberle at Univ. of Manitoba, Winnipeg, CN., on Jan. 30, 1987. Summarized in Wirin, Constraints on Military Manned Activities in Space 9 (unpub. paper presented to AFCEA Symposium on Man's Role in Space, Aug. 1987).

[141] In a Sept. 1987 speech a legal advisor for the Dept. of External Affairs articulated some "fundamental" principles upon which Canadian involvement rested: First, the space station legal regime was not to be based on the territoriality theme and, second, that a binding dispute mechanism had to be provided for; "It is Canada's view that it would be clearly imprudent if not irresponsible to embark on the program without such an arbitration mechanism." See text, speech by Edward G. Lee, Canadian Views on Legal Aspects of the Manned Space Station Project, presented to the Int'l Bar Assoc. Comm. on Outer Space, Sept. 17, 1987. Canada did not achieve either goal.

[142] See, supra Chap. IV.1.A.

[143] Japan's first launch, to an altitude of 30 miles, occurred on Jul. 1, 1958.

essence that the use and launching of space objects into space should be carried out exclusively for peaceful purposes.[144] At the time of the resolution's promulgation, the Secretary of State for the Science and Technology Agency confirmed that "exclusively for peaceful purposes" meant non-military.[145] In recent years, however, there has been some confusion over the absolute nature of this interpretation. In February 1985, the Japanese Prime Minister stated that general technology not used "directly for killing and wounding or destruction is without prejudice to the peaceful purposes," or words to that effect.[146] This "clarification" of the 16 year old Diet resolution came close on the heels of President Reagan's invitation to Japan to join the U.S. in conducting SDI research, and seems to say that military research activities are permissible. In fact, given the Prime Minister's language, one could argue that the Japanese position appears to be one of allowing passive uses but not those involving weapons. At least one Japanese commentator has made the observation that the government position is simply a variation of the non-aggressive interpretation.[147] Japan has gone on to engage in SDI research at a government-to-government level.[148] Whether or not this interpretation will extend to the space station is unknown. When DoD made its December 1986 announcement,

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[144] Recounted in Tatsuzawa, Some Observations on the Meaning of the Term "Peaceful Use" in Space Law, in Proc. of the 30th Colloquium on the Law of Outer Space 93, 96 (1987).

[145] Id., at 96.

[146] Id.

[147] Id., at 96-97.

[148] Japan, U.S. Agree on SDI Participation, Avia. Wk. & Space Tech., Jul. 27, 1987, at 23.

Japanese officials issued somewhat conflicting reports. One is supposed to have said that Japan would object to SDI or military research being conducted on the station, but would not rule out "small" DoD research activities.[149] Others stated that their understanding was that the "space station could be used only for peaceful purposes."[150]

As with Canada, the equivocal nature of Japan's views make it difficult to predict exactly what Japan will accept in the way of military use of the station. The official view, if one exists at all, appears to fall somewhere between non-military and non-aggressive.

C. European Space Agency (ESA). Nine members of ESA signed the IGA in Washington D.C. on the 29th of September 1988.[151] All are members of NATO, and as with Canada, already contribute to and use several military satellite systems. Only Spain, which is not integrated into the command structure of NATO, is somewhat apart from the alliance's command, control, and reconnaissance activities. Implicitly then, none apparently view the phrase peaceful purposes as prohibiting all military activities in space. Most seem to be content with the de facto "passive - weapons" distinction, when the issue is addressed at all. The ESA Convention contains language in Article II to the effect that ESA will "provide for and promote, for exclusively peaceful purposes, cooperation among European States in space

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[149] Covault & Foley, Defense Decision to Use Space Station Will Delay International Negotiations, Avia. Wk. & Space Tech., Dec. 22, 1986, at 23, 24.

[150] DoD Worries Halt Station Talks, Space Business News, Jan. 12, 1987, at 6. See also A. Young, supra note 138, at 431, footnote 131, where an official of the Japanese Embassy in the U.S. is supposed to have said the same thing.

[151] Belgium, Denmark, France, West Germany, Italy, Netherlands, Norway, Spain, United Kingdom.

research and technology and their space applications ...."[152] This is not seen however, as requiring the member states to adopt any particular interpretation of peaceful purposes. That task remains with the individual states.[153] The policies of some of the larger ESA members participating in the space station program are summarized below.

1) France. Without a doubt, France has the most ambitious military space program of any of the ESA members. It has had a military version of the SPOT remote sensing satellite, called SAMRO, on the drawing board for several years.[154] A new generation of reconnaissance satellites, code named Helios, is also being developed, as are advanced versions of the Syracuse military communications satellite.[155] In 1984 President Francois Mitterand went so far as to suggest that Europe develop a manned, military space station.[156] Despite appearances however, in the past France has drawn the line at placing weapons in outer space, occasionally stating that it considers such uses to be prohibited.[157] It initially looked at SDI participation with some skepticism, but not for legal

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[152] Convention for the Establishment of a European Space Agency, opened for signature May 30, 1975. (Entered into force Oct. 30, 1980). Reprinted in Basic Texts of the European Space Agency, Vol. 1.

[153] Young, supra note 138, at 432.

[154] Voute, A European Military Space Community, Reality or Dream, Space Policy, Aug. 1986, at 206, 208. This program may include the Fed. Republic of Germany as a partner in the future.

[155] Id.

[156] Mitterand Outlines Military Space Station, Avia. Wk. & Space Tech., Feb. 20, 1984, at 20.

[157] See statement of Dr. Hubert Curien, Report prepared by the House Subcomm. on Space Science and Applications of the Comm. on Science and Tech., 95th Cong., 2nd Sess. 33, International Space Activities (Comm. Print 1978).

reasons. France felt that its ability to rely on its nuclear deterrent, the "force de frappe," would be undermined by SDI and the inevitable Soviet response.[158] France has gradually moved towards some level of participation in the SDI program.[159]

2) United Kingdom. The United Kingdom has been directly involved in U.S. and NATO military satellite programs since 1965. The U.K. launched its first military satellite, Skynet 1A in 1969.[160] Not nearly as extensive as France's military space program, the British program has concentrated on communications. Like most of the other space station partners, the U.K. views SDI with some ambivalence. Although the first European country to endorse the program in December 1985, the U.K. has nevertheless been lukewarm towards SDI.[161] Progressing beyond the research stage would in the British view, be contrary to the ABM Treaty as well as the U.K.'s national interests.[162]

3) Federal Republic of Germany. Against heavy political pressure at home, German Chancellor Helmut Kohl signed an agreement in 1986 with DoD Secretary of Defense Weinberger covering SDI research. This was after Germany had laid down, as a condition of its participation in the space station program, the principle that the station was to be used only for

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[158] Voute, supra note 154, at 209.

[159] Id., at 209-210.

[160] Id., at 210.

[161] See e.g., Britain Questions "Star Wars" Plan, N.Y. Times Mar. 16, 1985, at A-8.

[162] Id.

peaceful purposes.[163] The fact that Germany has never had a military space program may have prompted the latter event and accounted for the resistance Kohl received in the former. On the whole, Germany seems to have had little problem embracing the U.S. view of peaceful purposes, although it would also be likely to limit military uses to those not involving weapons.[164]

4) Italy. Like Germany and the smaller member nations of ESA, Italy has no national military space program. After a lengthy review, the Italian government decided to support, in principle, the SDI research program.[165] It also seems to have had little trouble in accepting some military uses of space.

5) The Netherlands. The Dutch government has consistently refused to endorse the SDI concept in any fashion, although it has not prohibited its firms from competing for related contracts. Compared to the larger partner members of ESA, the Netherlands has been far more outspoken on the need for international arms control agreements. It has also conspicuously absented itself from several proposed European military space programs, including Francois Mitterand's proposal for a Europe-wide military space community.[166] Permitting any military use of the space station would appear to be out of character, yet the Netherlands has never adopted the position that peaceful purposes prohibits all military involvement.

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[163] Gregory, Joining the Station, Avia. Wk. & Space Tech., Jan. 28, 1985, at 13.

[164] Vouche, supra note 154, at 211-212.

[165] Id., at 212.

[166] Id., at 212-213.

world agreeing to a benign regime for the continent before military bases, maneuvers and other involvement could take root.[167] By the time of the first space law treaty in 1967, a similar "window of opportunity" had long since passed. Both the U.S. and U.S.S.R. had large and expanding military space programs. Many have suggested that in this environment, the best that could be hoped for was to partially demilitarize an already militarized outer space.[168] Cynics suggested that even in those cases where the major powers agreed to refrain from certain activities, those activities were ones in which neither party had any real interest.[169] In any event, the approach taken by the U.S. over the past three decades has consistently included the following features. First, space activities are analogized to activities permitted on the high seas. That is, the peaceful use of the medium means non-aggressive use. Military activities are permitted so long as they are not aggressive in nature and as long as there are no specific prohibitions against them. Maneuvers, weapons testing, surveillance, intelligence gathering and the like are perfectly acceptable. Second, the activities allowed under this interpretation are much more extensive than those the U.S. has actually chosen to conduct in the past. For a variety of practical and policy reasons, the U.S. has avoided placing weapons in space. This is not dictated by the law, but by other considerations. Third, the argument that any provision of law,

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[167] The Antarctic Treaty, supra note 83.

[168] See e.g., Dembling, Treaty on Principle, Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies, in Manual on Space Law 14 (Jasentuliyan & Lee eds., 1979).

[169] W. McDougall, supra note 25, Art. IV.1.

whatever its source, prohibits all military activity in space, is dismissed out of hand.

Applying the U.S.' approach to defining peaceful purposes, and based on the discussion in Chapter V.1 and V.2, the following are examples of military activities that would be prohibited on-board the space station:

- The stationing of nuclear weapons or other weapons of mass destruction on-board the station.[170]

- The deployment of any BMD system on-board the station, or in any way being a part of an operational, deployed, space-based BMD.[171]

- Activities involving nuclear explosions.[172]

- Activities involving the use of armed force beyond that made necessary by legitimate self-defense needs.[173]

- Certain types of BMD testing and development activities.[174]

- Certain Environmental modification activities.[175]

- Interfering in some manner with the space objects or operations of another nation without permission.[176]

Among the military activities permitted as a result of the non-aggressive interpretation of peaceful purposes:

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[170]Outer Space Treaty, supra note 25, Art. IV.1.

[171]ABM Treaty, supra note 44, Art. V.1, Art. IX, Agreed Stmnt. D.

[172]Limited Test Ban Treaty, supra note 19, Art. I.1(a).

[173]U.N. Charter, supra note 5, Art. 2.4.

[174]Carefully constructed and accomplished BMD experiments can avoid the prohibitions of the ABM Treaty, see discussions, Chap. V.1.D., supra.

[175]See discussion, Chap. V.1.C.3., supra.

[176]See discussion, Chap. V.1.C.2., supra.

- All of the "traditional" passive uses, including reconnaissance, surveillance, intelligence, early warning, meteorology, navigation, communications, targeting, mapping, etc., regardless of whether they are being conducted for research or operational purposes.

- Deployment of weapons which are not nuclear weapons, weapons of mass destruction, or part of a deployed space-based BMD architecture. This would therefore allow non-nuclear ASATs, conventional strategic or tactical armaments.

- Research of almost any type. This would include nuclear weapons research, biological and chemical weapons research, SDI related work, and of course, conventional weapons research. There are no international legal restrictions on research other than those treaty provisions having an indirect impact.

- Military maneuvers and weapons firings (that do not interfere with another state's activities and do not otherwise violate one of the few specific prohibitions).

These lists are not meant to be inclusive, particularly the latter one. The point to be made however, is that the scope of permissible military activities under existing international law is quite broad, and extends to a number of operational uses. In short, international law does very little to curtail military activities in space or on the space station. So long as a system is characterized as being purely for defensive use and does not violate one of the handful of specific provisions of international law, the use will most likely be deemed peaceful.

As mentioned previously, the only limitations imposed on this otherwise very broad interpretation do not arise from international law. U.S. domestic policy and practice implemented pursuant to that policy have

prevented the U.S. military space program from growing in some areas. Despite repeated attempts over the years by the armed services to expand the envelope of permissible military activities further along the non-aggressive continuum, successive Administrations have generally declined to go along. In practice, through articulated or implicit policy, the U.S. drew the line at placing weapons in space. The reluctance to cross this imaginary line is evident when one reviews the U.S.' ASAT history. Both operational ASAT systems possessed by the U.S. in the 1960s-1970s were ground-based, although both the Army and the Air Force had frequently called for a manned or unmanned space-based ASAT.[177] When the ASAT was revived in the late 1970s by President Carter, it too was to be a ground-based system for both practical and political reasons. Placing weapons in space, while legal under the U.S.' traditional non-aggressive analysis, was simply seen as too dangerous a precedent to set.[178]

The practice of the United States to date generally comports with that of its space station partners. With the possible exception of Japan, most of the partner countries have accepted the non-aggressive interpretation for some time. All however, have limited the interpretation's scope in a manner similar to that of the United States. The "weaponization" of space, while apparently not illegal, is nevertheless viewed with considerable unease. Again, as a relatively easy line to draw, none of the partners wish to cross it and set a precedent. All are aware that the next stop along the non-aggressive

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[177] For an excellent summary of U.S. ASAT development between 1957-1970, see P. Stares, supra note 68, at 106-134.

[178] Id., at 206-212.

continuum is not until the end--where anything defensive is not aggressive--with the likelihood of an outer space arms race in-between.

As long as U.S. policy continues to abstain from placing a military system in space that is in and of itself a weapon, the station partners will not have much to object about. All have embraced the "passive" military uses of space, although a few tend to forget that fact occasionally. A problem will arise however, should the U.S. decide to proceed with an SDI program that includes, as it does now, plans for space-based weapons. Even if characterized as being for defensive uses only, they are still weapons. While perfectly legal under the analysis of existing international law accepted by all of the partners, such weapons will nevertheless force significant changes in policy that have been in place for decades. To a large extent, limits imposed by policy in any context come about because they reflect a consensus of political opinion on the subject. Regardless of the legality of an action, attempting to change a policy without first achieving a consensus of opinion to support the change will make such a move difficult. This may help to explain why the Administration has faced such stiff opposition to both its SDI program and its call for an ASAT. In both instances Congress, a necessary partner in both endeavors, has resisted and unilaterally imposed limitations. By controlling appropriations, Congress has been successful in forcing the Administration to remain within the bounds of existing policy. Should the next Administration generate the consensus that has so far eluded President Reagan, then the policy parameters may change, and expand the "envelope of acceptability" along the non-aggressive continuum. If this occurs, then the partners could face political trouble at home, where no such consensus may exist.

CONCLUSION

There is no doubt that if the international space station ever becomes operational, military activities will be conducted on-board. The U.S. has preserved its right to use the station for national security purposes, and received at least an implicit acknowledgment from its partners that such uses are permissible. The real questions concern the degree of DoD interest and what factors will shape the military's involvement. The conclusions below are directed to these questions and are based on an assessment of the legal, political, and practical factors previously discussed.

- Research. Designed to function primarily as a research facility, the scientific capabilities of the U.S. elements of the space station are certain to be exploited by DoD. A review of the experiments proposed over the years for the various manned military programs provides some insight into the type of research one might expect to see. It is worth noting however that those experiments have not changed much through the various iterations. Without a manned platform to conduct proof of concept studies, the concepts themselves have not evolved. This should change in the near future as the MMIS program begins to take advantage of the STS's secondary payload capabilities. By the time the station is operational, many of the experiments proposed for it will have already been accomplished on the STS. As a result, a more advanced, second generation slate of projects should be available. The MMIS program will allow DoD to do what it has wanted to do for years--find out where a military man in space can contribute to the effectiveness of DoD missions. If the studies are right, the MMIS program will discover

through its STS experiments that man is able to contribute most in those areas that the U.S. and its allies have traditionally avoided developing--operational space control and force enhancement. There are two basic types of research DoD could conduct on the station--purely scientific, and operational research. The former should cause little concern among the partners, since so much of the fundamental research to be conducted has both military and civilian applications. Operational research may give rise to some concern, depending on the nature of the activity. Testing new optical devices from the station for instance, to determine if they can enhance man's ability to spot targets on the ground, should present few problems. On the other hand, using a payload attachment point to mount a laser that is tested by having it illuminate and destroy naval targets, would certainly raise some eyebrows. One can envision a whole range of experiments between these two extremes, but it does seem to point once again towards a weapons - no weapons dichotomy. In trying to predict the nature of operational experiments that may be conducted on-board the station a number of factors must be considered. First, the limitations of the facilities themselves. Second, the availability of suitable alternative platforms, such as the STS, which would be more attuned to DoD's security concerns. Third, the limits, if any, imposed by law and policy. If the U.S. continues its long-standing policy of shying away from placing weapons in space, then the operational research conducted on the space station should be relatively innocuous and not attract much opposition. This could include some forms of SDI-related research. If, on the other hand, the U.S. changes that policy and allows non-nuclear weapons development and testing in space, whether SDI-related or not, then the partners will be in a difficult predicament. Neither

international law nor the space station IGA/MOUs provide them with a remedy in the event the U.S. unilaterally changes its policy in this manner. The great unknown of course, is the fate of the SDI program. It has provided the impetus behind moves by the Administration to make policy adjustments in the direction of expanding the scope of permissible military activities in space. Should the SDI program survive, there seems to be little doubt that there will be a research presence on the station. This was apparently the motive behind DoD's renewed interest in late 1986. In short, the station will have some potential for research aspects of the SDI program. Nothing in the current legal regime is available to prevent the station from being used for that purpose. Should that research extend to weapons development and testing, the partners' options will be extremely limited.

- Operational military use. This means using the station for actual DoD operational missions, such as command and control, surveillance, and the like. Once again, the factors to be taken into account include practical, political and legal ramifications and limitations. Practical considerations, ranging from a virtually useless orbit and altitude for most military missions, to concerns over data security, figure heavily in the conclusion that extensive operational military use of the station will be highly unlikely. An analysis of the role international law and domestic policy might play in shaping the nature of any operational use of the station would be almost identical to that for research. The difference between the two is that whatever latitude is allowed by the law and/or policy, is negated by a host of practical limitations. It is doubtful for instance, that the station would ever be tasked to serve as a man-in-the-loop command center for a deployed SDI system. Its altitude

makes it vulnerable to the Soviet's present co-orbital ASAT, as well as unsuitable for direct communications. Land-based control centers are far more impervious to enemy attack, can function just as effectively at a fraction of the cost, and don't carry the political baggage and unwelcome attention that would attend a manned command and control center in space. The space station's most likely military role may be as a satellite service center for the constellation of SDI satellites being planned. Even this has its drawbacks however, since most military satellites, including those planned for SDI, operate in polar, semi-synchronous, or geo-synchronous orbits. It may not be economical to service them from the station's equatorial orbit. In the unlikely event that an operational mission for the space station does develop, international law as interpreted and applied by the U.S. and its partners will be of little value in limiting the scope of that use. Use of the station as a conventional weapons platform would not be prohibited. Under current policy, using observers on the station to direct ground forces in battle would also be allowable, since it is a "passive" use. The same could be said for functioning as a navigation fix point for an ICBM making mid-course corrections in order to increase its accuracy. Since it would not, in and of itself, be a weapon, current policy would permit such an activity.

The space station IGA/MOUs are disappointing in a number of respects. Among other things, they do not definitively deal with the military use issue, they perpetuate a territorial scheme that in this instance will probably be at the expense of smoother and more integrated operations, and they provide an inadequate dispute resolution mechanism. Nevertheless, they represent a series of compromises without which there probably would

not have been an agreement at all. In the end, the scope and character of any military use of the space station will not be decided by the current international legal regime. The multilateral instruments in force prohibit only those activities that neither space power has been particularly interested in carrying out. The ABM Treaty is on the verge of being interpreted into obsolescence and in any event, addresses only BMDs. The IGA and MOUs are wholly ineffectual in dealing with military use. Ultimately, the nature of any military activity on-board the station will be decided primarily by practical and policy considerations. In practice this will mean that the U.S. will be largely free to conduct its military activities as it sees fit, subject only to the whims of Congress and domestic policy makers. The partners are simply along for the ride.

SELECTED BIBLIOGRAPHY

I. BOOKS, STUDIES AND MAJOR RESEARCH (excluding agency and organization reports)

BAKER, David, History of Manned Space Flight (1981).

BOCKSTIEGEL, Karl-Heinz, (ed.), Space Stations, Legal Aspects of Scientific and Commercial Use in a Framework of Transatlantic Cooperation (1984).

BOWER, Tom, The Paperclip Conspiracy, The Battle for the Spoils and Secrets of Nazi Germany (1987).

BROWNLIE, Ian, Principles of Public International Law (3rd ed. 1979).

CHRISTOL, Carl Q., The International Law of Outer Space (Vol. LV of the U.S. Naval War College Int'l Law Studies series, 1966).

CHRISTOL, Carl Q., The Modern International Law of Outer Space (1982).

EMME, Eugene M., (ed.), The History of Rocket Technology (1964).

FUTRELL, W., Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964 (1971).

GAVIN, James, War and Peace in the Space Age (1959).

GIBNEY, F., and FELDMAN, G., The Reluctant Space Farers (1965).

GRAY, Colin S., American Space Policy, Information Systems, Weapons Systems and Arms Control (1982).

HACKER, Barton C., and GRIMWOOD, James M., One the Shoulders of Titans - A History of Project Gemini (NASA 1977).

JASENTULIYANA, N., and LEE, R., (eds.), Manual on Space Law (Vol. I 1979).

LAWLER, Andrew, and VEDDA, James A., Space Station Directory (1987).

LAY, S., and TAUBENFELD, H., The Law Relating to Activities of Man in Space (1970).

LEY, Willy, Rockets, Missiles, and Men in Space (1968).

LONG, F. A., HAFNER, D., and BOUTWELL, J., (eds.), Weapons in Space (1986).

MATTE, Nicholas M., Space Activities and Emerging International Law (1984).

McDOUGALL, Walter A., The Heavens and the Earth, A Political History of the Space Age (1985).

McNAIR, L., The Law of Treaties (1961).

MEDARIS, J., Countdown for Decision (1960).

O'LEARY, Brian, Project Space Station (1983).

RA'ANAN, Uri, and PFALTZGRAFF, R. L., (eds.), International Security Dimensions of Space (1984).

SCHWARZ, M. and STARES, P., The Exploitation of Space, Policy Trends in the Military and Commercial Uses of Outer Space (1985).

SMITH, Delbert D., Space Stations, International Law and Policy (1979).

STARES, Paul B., Space Weapons & U.S. Strategy, Origins & Development (1985).

STARES, Paul B., Space and National Security (1987).

STARKE, J. G., Introduction to International Law (9th ed. 1984).

STOJAK, M. Lucie, Legally Permissible Scope of Current Military Activities in Space and Prospects for Their Future Control (unpublished doctoral dissertation, McGill University, 1985).

TAYLOR, L. B., Space: Battleground of the Future (1983).

VLASIC, Ivan A. (ed.), Explorations in Aerospace Law (1968).

VON BRAUN, Wernher, & ORDWAY, Frederick I., History of Rocketry & Space Travel (rev. ed. 1969).

WHELAN, C. R., Guide to Military Space Programs (1986).

YOUNG, Andrew J., Law and Policy in the Space Stations' Era (unpublished doctoral dissertation, McGill University, 1987).

II. AGENCY AND ORGANIZATION BOOKS, REPORTS, AND STUDIES

Air Force Space Command, The Utility of Military Crews in Space, A Report from the Military Crews in Space Study Group (Dec. 1985).

Air Force Space Command, Military Man in Space (MMIS) Handbook (Feb. 1988).

Air Force Space Command, Final Report of the Air Force Military Man in Space (MMIS) Prioritization Board 30-31 March 1988 (Apr. 29, 1988).

Amer. Institute of Aeronautics and Astronautics, Space Station: Policy, Planning and Utilization (proceedings of an AIAA/NASA symposium on the space station, 1983).

Congressional Research Service, Space Policy and Funding: Military Uses of Space (Issue Brief Number IB82117 1982, updated 1983).

Congressional Research Service, Attaining a Permanent Manned Presence in Space (Rep. No. 84-40 SPR, Mar. 6, 1984).

Dept. of Defense, A Report to the Committee on Armed Services of the Senate and House of Representatives on Potential Department of Defense Use of the Permanently Manned Space Station (Mar. 1, 1988).

Military Publishing House Moscow, "Star Wars" Delusions and Dangers (1985).

National Aeronautics and Space Administration, Space Station Program, Description, Applications, and Opportunities (1985).

National Defense Univ., (ed.), America Plans for Space (1986).

Office of Tech. Assessment, Ballistic Missile Defense Technologies (1985).

Office of Tech. Assessment, Civilian Space Stations and the U.S. Future in Space (Nov. 1984).

Office of Tech. Assessment, Space Stations and the Law: Selected Legal Issues (1986).

III. ARTICLES

BRANDT;, Thomas C., Military Uses for Space, Air U. Rev., Nov.-Dec. 1985, at 40.

COLINO, Richard R., The U.S. Space Program - An International Viewpoint, 11 Int'l Security 157 (Spring 1987).

COOK, Charles W., Use of a Space Station for National Security Missions, in The Space Station, an Idea Whose Time has Come (?) 9 (1983 pre-print).

COOPER, J. C., Self-Defense in Outer Space and the U.N., in Explorations in Aerospace Law 412 (I. A. Vlasic ed. 1968).

DIAZ, A. V., and ASKINS, B., Space Station Evolution: Planning for the Future, Acta Astronautica, Sept. 1987, at 667.

DIEDERIKS-VERSCHOOR, I. H. Ph., The Legal Aspects of the Space Shuttle, I Annals of Air & Space Law 197 (1976).

FREITAG, Robert F., Space Station Planning, in Europe/United States Space Activities 85 (P. Baiman & F. von Bun, eds. 1985).

GAL, Gyula, The Peaceful Uses of Outer Space - After the Space Treaty, in Proc. of the 10th Colloquium on the Law of Outer Space 129 (1967).

GALLOWAY, Eilene, The Relevance of General Multilateral Space Conventions to Space Stations (paper prepared for an Int'l Colloquium on Space Stations, Cologne, FRG, Oct 3-4, 1984).

GALLOWAY, Eilene, Conditions Essential for Maintaining Outer Space for Peaceful Purposes, in Proceedings of the 27th Colloquium on the Law of Outer Space (1984).

GALLOWAY, Eilene, The Space Station: United States Proposal and Implementation, 14 J. Space L. 14 (1986).

GARWIN, Richard L., National Security Space Policy, 11 Int'l Security 165 (Spring 1987).

GIBSON, Roy, The Next Step - Space Stations, in The Exploitation of Space, Policy Trends in the Military and Commercial Uses of Outer Space 123 (M. Schwarz & P. Stares, eds. 1985).

LOGSDON, John M., International Involvement in the U.S. Space Station Program, Space Policy, Feb. 1985, at 12.

LOGSDON, John M., The Decision to Develop the Space Shuttle, Space Policy, May 1986, at 103.

MARKOFF, Marko G., Disarmament and Peaceful Purposes Provisions in the 1967 Outer Space Treaty, 4 J. Space L. 3 (1976).

MARKOV, Marko G., The Juridical Meaning of the Term "Peaceful" in the 1967 Space Treaty, in Proc. of the 11th Colloquium on the Law of Outer Space 30 (1968).

MARKOV, Marko G., Against the So-called Broader Interpretation of the Term "Peaceful" in International Space Law, in Proc. of the 11th Colloquium on the Law of Outer Space 73 (1968).

MOSER, Thomas L., NASA and the Space Station: Current Status, Acta Astronautica, Sept. 1987, at 595.

MENTER, Martin, Peaceful Uses of Outer Space and National Security, 17 Int'l Lawyer 581 (1983).

NUNN, Sam, The ABM Reinterpretation Issue, The Washington Quarterly, Autumn 1987, at 45.

PEDERSEN, Kenneth S., The Changing Face of International Space Cooperation, Space Policy, May 1986, at 120.

ROSENBERG, Robert A., The Air Force and its Military Role in Space, in Air U. Rev., Nov.-Dec. 1985, at 52.

SCHWETJE, F. Kenneth, Space Defense Systems: A Peaceful Use of Outer Space, Proc. of the 29th Colloquium of the Law of Outer Space 72 (1986).

SMITH, Milton L., Legal Implications of a Space-Based Missile Defense, 15 Cal. W. Int'l L. J. 52 (1985).

SOFAER, Abraham D., The ABM Treaty: Legal Analysis in the Political Cauldron, The Washington Quarterly, Autumn 1987, at 59.

VLASIC, Ivan A., Disarmament Decade, Outer Space and International Law, 26 McGill L. J. 135 (1981).

VON BRAUN, Wernher, Crossing the Last Frontier, Collier's, Mar. 22, 1952, at 25.

WIRIN, W. B., Constraints on Military Manned Activities in Space (unpub. paper presented to an Armed Forces Communications and Electronics Assoc. symposium, Aug. 3-6, 1987.

ZEHNER, Michael W., International Law and Military Activities in Space (unpublished paper 1986).

IV. U.S. CONGRESSIONAL DOCUMENTS

A. Staff Reports

Staff Report of the Select Comm. on Astronautics and Space Exploration, 85th Cong., 2nd Sess., Survey of Space Law (Comm. Print 1958).

Staff Study of the House Comm. on Science & Astronautics, 86th Cong., 2nd Sess., The Practical Values of Space Exploration (Comm. Print 1960).

Report prepared for the use of the Senate Comm. on Aeronautical and Space Sciences, 87th Cong., 1st Sess., Legal Problems of Space Exploration, A Symposium (1961).

Staff of Senate Comm. on Aeronautical and Space Sciences, 87th Cong., 2nd Sess., Soviet Space Programs: Organization, Plans, Goals, and International Implications (Comm. Print 1962).

Staff Report of the Senate Comm. on Aeronautical & Space Sciences, 87th Cong., 2nd Sess., Manned Space Flight Program of the National Aeronautics and Space Administration: Projects Mercury, Gemini and Apollo (Comm. Print 1962).

Staff Report prepared for use of Senate Comm. on Aeronautical & Space Sciences, 90th Cong., 1st Sess., Treaty on Principles Governing the Activities of States in the Exploration & Use of Outer Space, Including the Moon and Other Celestial Bodies (Comm. Print 1967).

Report submitted to the House Comm. on Foreign Affairs, 97th Cong., 2nd Sess., The Second U.N. Conference on the Peaceful Uses of Outer Space (UNISPACE 1982) August 9-21, 1982 (Comm. Print 1983).

B. Committee Reports

Report of the Select Comm. on Astronautics and Space Exploration, 85th Cong., 2nd Sess., The National Space Program (Comm. Print 1958).

Report of House Comm. on Science & Astronautics, 86th Cong., 1st Sess., U.S. Policy on the Control and Use of Outer Space (Comm. Print 1959).

House Comm. on Science and Astronautics, A Chronology of Missile and Astronautic Events, H. R. Rep. No. 67, 87th Cong., 1st Sess. (1961).

House Comm. on Science and Astronautics, Project Mercury, Second Interim Report, H. R. 671, 87th Cong., 1st Sess. (1961).

Report of the Senate Subcomm. on NASA Oversight of the Comm. on Science & Astronautics, 88th Cong., 2nd Sess., The NASA-DoD Relationship (Comm. Print 1964).

Report prepared by the House Subcomm. on Space Science & Applications of the Comm. on Science & Technology, 95th Cong., 2nd Sess., International Space Activities (Comm. Print 1978).

House Comm. on Science, Space & Technology, National Aeronautics and Space Administration Authorization Act, Fiscal Year 1988, H. R. 204, 100th Cong., 1st Sess. (1987).

C. Committee Hearings

International Control of Outer Space, Hearings Before the House Comm. on Science & Astronautics, 86th Cong., 1st Sess. (1959).

Defense Space Interests, Hearings Before the House Comm. on Science and Astronautics, 87th Cong., 1st Sess. (1961).

NASA Authorization for Fiscal Year 1963, Hearings Before the Senate Comm. on Appropriations, 87th Cong., 2nd Sess. (1962).

DoD Appropriations for FY 1964, Hearings Before House Subcomm. of the Comm. on Appropriations Part I, 88th Cong., 1st Sess. (1963).

Manned Orbiting Laboratory, Hearing Before the Senate Comm. on Aeronautical and Space Sciences, 89th Cong., 2nd Sess. (1966).

International Space Activities, 1979, Hearings Before the House Subcomm. on Space Science & Applications of the Comm. on Science & Technology, 96th Cong., 1st Sess. (1979).

NASA's Space Station Activities, Hearing Before the House Subcomm. on Space Science & Applications of the Comm. on Science & Technology, 98th Cong., 1st Sess. (1983).

Civil Space Station, Hearing Before the Senate Subcomm. on Science, Technology, and Space of the Comm. on Commerce, Science, and Transportation, 98th Cong., 1st Sess. (1983).

International Cooperation and Competition in Space, Hearing Before the House Subcomm. on Space Science & Applications of the Comm. on Science & Technology, 98th Cong., 2nd Sess. (1984).

Texts of Exchange of Letters

Dear ( )

With reference to our negotiations on the Space Station Intergovernmental Agreement to be submitted for signature by the Partner States, this is to confirm that, pursuant to that Agreement, which provides that all utilization of the permanently manned civil Space Station will be for peaceful purposes, in accordance with international law, the United States has the right to use its elements, as well as resources derived from the space station infrastructure, for national security purposes. With respect to such uses of these elements and resources, the decision whether they may be carried out under the Agreement will be made by the United States.

Europe Response

Dear ( )

I am writing to you in reply to your letter of _____. This is to confirm, on behalf of the representatives to the Space Station negotiations of the European States that will be signatories to the Agreement, that your letter of _____ correctly states U.S. rights under the Agreement to decide whether contemplated uses of its elements and of resources derived from the Space Station infrastructure may be carried out under the Agreement

I should like to confirm that, with respect to the use of elements of the permanently manned civil Space Station provided by Europe, the European Partner will be guided by Article II of the Convention establishing the European Space Agency.

Japan/Canada Response

Dear ( )

I am writing to you in reply to your letter of _____. This is to confirm that your letter of _____ correctly states U.S. rights under the Agreement to decide whether contemplated uses of its elements and of resources derived from the Space Station infrastructure may be carried out under the Agreeement.

(Note: The Canadian response, which the U.S. will be discussing bilaterally with Canada, would refer specifically to Article 9.8(b) and quote from that paragraph. If it would be helpful to Canada, the U.S. could then send a letter of reply to Canada confirming the U.S.'s agreement on this point)

Source: March 88 Draft Intergovernmental Agmnt., (Dept. of State 1988)