ANTISATELLITE WEAPONS AND THE QUESTION OF NEGOTIATED ARMS LIMITATIONS*

C. L. FERN**

The United States has launched over one thousand satellites into earth orbit.[1] The Soviet Union has launched well over 2,000 of

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** B.A. John Hopkins University; J.D. Harvard Law School; Associate: Donovan, Leisure, Newton & Irvine, New York, New York.

1. Kahn, *Cooperation in Space Versus the Nuclear Race*, S-12-228 SPACE WORLD 2 (December 1982). Over 1,100 spacecraft are now stationed in geosynchronous orbit—22,300 nautical miles above the earth. In this orbit a satellite travels at precisely the same speed as the earth is rotating, thus remaining continuously "parked" over the same point on the ground. The U.S. has a majority of its most valuable space assets in geosynchronous orbit. For example, the Air Force communications channels hosted on satellites (AFSATCOM) and the Navy Fleet Satellite Communications System (FLSATCOM) are parked in geosynchronous orbit. The Defense Support Program (DSP) satellites, which constitute a part of the nation's command, control, communications and intelligence (C^3I) system are also in this orbit, carrying infrared sensors to continuously monitor the Atlantic and Pacific Oceans, the Soviet Union, and China in search of the "early warning" rocket heat of an ICBM or SLBM launch. THE CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE, CHALLENGES FOR U.S. NATIONAL SECURITY 85, 119 (1982) [hereinafter cited as CARNEGIE REPORT]. Additionally, the Department of Defense has its Defense Satellite Communications System (DSCS) in geosynchronous orbit. This system consists of four satellites and two spares which provide "worldwide point-to-point communications for fixed ground stations." Bell, *America's Other Space Program*, Q-4-196 SPACE WORLD 4, 7 (1980) (reprinted from THE SCIENCES, December 1979). Moreover, six of the eighteen planned 1,000 pound satellites for the new NAVSTAR Global Positioning System (NAVSTAR GPS) were already in orbit as of October, 1982. The remainder of the spacecraft are scheduled to be in operation by 1988. Halloran, *U.S. Plans Big Spending Increase for Military Operations in Space*, N.Y. Times, Oct. 17, 1982, at 60, col. 5.; *see also* Vilkin, *Space Law*, 2 CALIFORNIA LAWYER 32 (1982).

Most of the fifteen U.S. reconnaissance, electronic intelligence (ELINT), navigational, ocean surveillance, and meteorological satellites orbit the earth at less than 600 miles (1,000 kilometers). Low-level satellites provide super-clear photographs of military maneuvers around the world. As well as providing the U.S. with intelligence information, these satellites are critical in determining the Soviet Union's adherence to arms limitation agreements. In polar orbits, the United States has two weather satellites. Each circles the globe in twelve hours, and is militarily important because it can, for example, be used to decide where photographic satellites should be positioned. Moreover, the Department of Defense has a separate weather satellite system—the Defense Meteorological Satellite Program (DMSP) in polar orbit. This system circles the earth every 101 minutes relaying complete weather data within 20 minutes after passing overhead. The Department of Defense's Satellite Data System (SDS) is comprised of three satellites in polar orbit. This system contains the only U.S.

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these spacecraft.[2] Other nations, collectively termed "Nth" countries, also have assets in earth orbit.[3] These satellites have a multitude of military and civil uses,[4] including navigation, weather

communications satellites which are not in geosynchronous orbit. No satellites are reported to be presently stationed in hypergeosynchronous orbit (beyond 22,300 nautical miles). Reportedly, however, new "VELA" satellites are to be stationed 60,000 miles out in space to detect nuclear detonations through the use of heat sensors. Tsipis, *U.S.-USSR Confrontation or Cooperation in Space*, in NINETEENTH STRATEGY FOR PEACE CONFERENCE REPORT 17 (1978) Bell, *supra*, at 7; CARNEGIE REPORT, *supra*, at 119; Halloran, *supra*; *see also* Wilford, *Military's Future in Space: A Matter of War or Peace*, N.Y. Times, Oct. 19, 1982, at C2, col. 3; Scoville, *Problems of International Security in Outer Space*, in EIGHTEENTH STRATEGY FOR PEACE CONFERENCE REPORT 23 (1977).

2. Kahn, *supra* note 1. In contrast to the U.S., the USSR launches many more satellites, although these satellites are shorter-lived. For example, in 1981 the Soviets launched 125 satellites to 16 launched by the U.S. However, some Soviet satellites "burn out" within a six month period. Although some U.S. satellites also "burn out" in six months, many U.S. satellites can operate for 10 years. While much less information is available about Soviet military and defense activities, it is known that the USSR has invested much less in "C^{3}I" satellites than has the U.S. *Cf.* Halloran, *supra* note 1, at A60, col. 2. (Statement by former Defense Secretary Harold Brown that "the Soviets, by virtue of their geographically central position, have less need to rely on space-based systems. . . ."). Furthermore, the Soviet Union's current space assets are largely in low-altitude orbit. Tsipis, *supra* note 1, at 19.

The USSR uses low-orbiting reconnaissance satellites, much as the U.S. does, to gather intelligence information and verify U.S. adherence to arms limitation agreements. Additionally, it has spacecraft aloft for the specific purpose of tracking warships. The Soviets also have a three-system network of communications satellites. One of these systems is in low orbit and consists of satellites launched in groups of eight. The two other systems are in somewhat higher orbit. The Soviet Union thus has most of its communications satellites, as well as three early warning satellites, in highly eccentric, low-dipping orbits. CARNEGIE REPORT, *supra* note 1, at 119, 133.

The USSR is, however, apparently increasing its use of geosychronous satellites. The Soviets are also developing the "Glonass" system, which will eventually perform navigational tasks similar to those of NAVSTAR. *Soviets Integrating Space in Strategic War Planning*, 118 AVIATION WEEK & SPACE TECHNOLOGY, March 14, 1983, at 110, 111. A new super high frequency communications research spacecraft was launched in 1982. Reportedly, another new Soviet communications spacecraft, designated "Potok," is planned for the same orbital location. On March 13, 1983, the Soviets reportedly launched the "Ekran" television relay satellite into geosynchronous orbit. *Soviets Launch Winged Spacecraft*, 118 AVIATION WEEK & SPACE TECHNOLOGY, March 21, 1983, at 18.

3. *See* United Nations Committee on Disarmament, Report by the Committee, U.N. Doc. CD/335 at Appendix III, Volume VII, Final Record of the One Hundred and Eighty-Sixth Plenary Meeting, U.N. Doc. CD/PV.186 at 9 (1982)(Statement of Mr. Saran of India) [hereinafter cited as Disarmament Report]; *see also Id.* Final Record of the One Hundred and Eighty-Fourth Plenary Meeting, U.N. Doc. CD/PV.184 at 35 (1982) (statement of Mr. Fields of the United States). India, France, the Federal Republic of Germany and the People's Republic of China have significant space assets in earth orbit. Any consideration of anti-satellite weaponry must therefore take into account the interests of these nations. Tsipis, *supra* note 1, at 18.

4. *See generally* Halloran, *supra* note 1. Though the USSR launches more satellites, the U.S. is much much more dependent on satellites, especially for strategic "C^{3}I" use. Halloran, *supra* note 1 (statement of General James V. Hartinger, head of the U.S. Space Command in Colorado Springs, that there is routine military reliance on satellites, partly for the

forecasting, communications, intelligence, and mapping.[5]

The United States and the Soviet Union have been developing their respective capacities to destroy each other's space assets for a number of years.[6] Currently, the USSR has an antisatellite (ASAT) capability.[7] The United States originally planned to develop its own ASAT by 1983, although to date it has not done so.[8]

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command and control of the nation's far-flung military forces. "Over 70% of our long-haul communications are handled by satellites."). *We are Ahead by a Substantial Margin*, 93 U.S. NEWS & WORLD REPORT, Nov. 22, 1982, at 43 (statement by NASA Administrator James M. Beggs, on the numerosity of such launches as a sign of Soviet weakness: "their [Soviet] satellites are less sophisticated than ours and require replacement more often. They don't have the life that ours do, and they are not multipurpose, as many of ours are. And so they have to launch more in order to do a similar amount of work."). It is doubtful whether adequate verification of arms control agreements would be feasible without reconnaissance satellites. *Cf.* Tsipis, *supra* note 1, at 18, 21-22.

Moreover, the U.S. and the USSR are increasing their commitments to the defensive and military use of outer space. The U.S. in particular places a high value on its approximately forty satellites in "C^{3}I" use. Many functions are consolidated for the U.S. in a small number of satellites. Furthermore, the U.S. has a capacity substantially inferior to that of the Soviet Union to replace its losses or augment its capability in a crisis situation. CARNEGIE REPORT, *supra* note 1, at 119. The U.S. will continue to be significantly more dependent than the USSR on space assets. This is particularly true if President Reagan follows through on his stated intent to increase military exploitation of outer space, including an orbiting antiballistic missile defense system. *See* Weisman, *Reagan Proposes U.S. Seek New Way to Block Missiles*, N.Y. Times, March 24, 1983, at A1, col. 6. *See* Halloran, *supra* note 1 (statement by Under-Secretary of the Air Force Edward C. Aldridge that the Reagan Administration plans to increase military space spending by more than 10% each year; that in 1982 the military space budget was 6.4 billion dollars; that the Administration plans to spend over 20 billion dollars more, mostly on space communications); *see also* Fact Sheet Outlining U.S. Space Policy, 18 WEEKLY COMP. PRES. DOC. 872-76 (July 4, 1982).

5. Halloran, *supra* note 1, at A1, cols. 5, 6. The function of a satellite varies in part according to the altitude at which the spacecraft orbits: *E.g., see supra* notes 1-2.

6. Hafner, *Brobdignagian Skeet Shoot*, 5 INT'L SECURITY 41, 44 (1981). At the present time, the Soviet Union has the ability to destroy low-level U.S. reconnaissance and intelligence satellites. The U.S. does not presently possess a similar capability, although it probably will by the late 1980's. Both nations are currently working on the use of directed energy or laser weapons (DEWS) in space. Such weapons will be able to reach space targets in geosynchronous orbit. The USSR is generally assumed to be significantly "ahead" of the U.S. in laser research and development. Covault, *Space Command Seeks ASAT Laser*, 118 AVIATION WEEK & SPACE TECHNOLOGY, March 21, 1983, at 18, 19.

7. See *infra* note 20.

8. Hafner, *supra* note 6; *cf.* Butler-Hannifin, *Unispace '82: Apprehension and Boredom*, S-11-227 SPACE WORLD 8, 12 (1982). The Reagan administration plans an even more ambitious "C^{3}I" role for geosynchronous spacecraft. MILSTAR will be a seven satellite defense communications network. Initial operation is planned for 1987, with the system to be fully operative in 1990. Halloran, *supra* note 1. Early warning satellites currently in use are reportedly to be replaced by improved mosaic "frog's eye" satellites that can track a moving target and maintain surveillance simultaneously. Additionally SOFAR, an emergency launch satellite system, will provide the U.S. with redundant sensing capabilities. Hotz, *The Real Star Wars*, S-8-9-224-225 SPACE WORLD 10, 16 (1982).

Other Defense Department plans for space can be presumed from the estimated in-

There are several types of weapons that are described in the literature as either actual or potential ASATs. The co-orbital interceptor[9] is a satellite which moves into the same orbit as a target satellite and then destroys it, usually by self-detonation.[10] The co-planar interceptor is a satellite that orbits the earth in the same orbital plane as its target, eventually destroying the target when the orbital paths intersect and the two satellites collide.[11] A direct-ascent interceptor is a satellite launched from earth and aimed directly at a target, destroying it by impact or explosion.[12] Lasers and particle-beam weapons are two examples of what are collectively termed directed energy weapons (DEWs). These weapons can be ground- or space-based and have the potential to destroy in-flight ballistic missiles and satellites.[13] A nuclear detonation, perhaps at a distance of several thousand miles,[14] could also disable or destroy a target satellite.[15] Additionally, electronic interference or an attack on satellite ground facilities[16] could currently be used to disable satellites.[17]

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creases in spending on military uses of space. Under-Secretary of the Air Force Edward C. Aldridge has described the U.S. intent to depend heavily on space as justified by the U.S. need for force multipliers. Halloran, *U.S. to Increase Military Funds for Space Uses*, N.Y. Times, Sept. 29, 1982, at A1, col. 2.

In addition to the "C^{3}I", defense and other military uses of geosynchronous orbit, various proposals also exist for commercial use of satellites at this altitude. For example, the Heritage Foundation has suggested a solar powered satellite that would generate energy for a space station. *See* David, *The "High Frontier" Strategy*, S-6-222 SPACE WORLD 22, 23 (June 1982). Professor Kosta Tsipis of M.I.T. warns however, that "[the] promise of new industrial techniques and methods (for example, materials processing in a zero-g/high vacuum environment) may encourage a much larger extension of the earth's economy into space." Tsipis, *supra* note 1, at 13, 17.

9. Co-orbital interceptor ASATs are commonly referred to as "killer satellites." *See* Hafner, *supra* note 6, at 44.

10. CARNEGIE REPORT, *supra* note 1, at 120 (also discussing the so-called "space mine," which is a co-orbital interceptor that is left dormant next to a target satellite for later use).

11. *Id.*

12. *Id.* at 121.

13. *See* Boffey, *Laser Weapons: Renewed Focus Raises Fears and Doubts*, N.Y. Times, March 9, 1982, at C1, col. 5.

14. *See* Manno, *The Risks of Warfare in Space*, 235 THE NATION 492, 493-5 (November 13, 1982) (discussing "Project Fishbowl," a 1962 U.S. nuclear test explosion at 250 miles altitude that caused low-orbiting satellites thousands of miles away to malfunction. Eight days after the explosion, Ariel I, a U.S.-U.K. research satellite was crippled; U.S. Air Force spy satellites were also damaged. Ground radio telescopes malfunctioned, a new intense radiation belt was formed, and a subsequent test planned at 500 miles altitude was cancelled).

15. *Id.*; *see also* CARNEGIE REPORT, *supra* note 1, at 121.

16. CARNEGIE REPORT, *supra* note 1, at 121.

17. *Id.* (noting that U.S. ground facilities are more vulnerable to attack than are Soviet

Antisatellite weapons pose a threat to United States, Soviet and "Nth" Nation space assets. The development of such weaponry is generally destabilizing to international security.[18] Furthermore, the proliferation of ASATs may also violate international law, which suggests an even stronger argument against their existence and development. This article will evaluate the legal status of the current Soviet ASAT, the Miniature Homing Vehicle (MHV), the Space Shuttle,[19] DEWs, and the use of nuclear detonations for the purpose of destroying satellites.

I. THE LEGALITY OF ASATs

The USSR has been overtly developing ASATs for over twenty years.[20] The United States has also been developing its

ground facilities, apparently due to the fact that DSP relies on only a very few ground stations).

18. The use of reconaissance satellites and other national technical means (NTM) by the U.S. and the USSR is considered to add support to international stability. The existence of these assets makes it impossible, in theory, for any nation to conceal its military maneuvers for any length of time. Antisatellite weapons, including current Soviet and planned U.S. and USSR models, threaten the entire existing system of monitoring and verification provided by reconnaissance and early warning satellites, as well as strategic "C^{3}I." Jastrow, *The Lesson of Soviet Space Exploration*, N.Y. Times, Oct. 3, 1982, § VI, at 33, col. 1; *cf. Arms Control and Outer Space* report of Canada to the U.N. Committee on Disarmament, U.N. Doc. CD/320 at 12, 13 (26 August 1982) [hereinafter cited as *Canadian Report*].

19. The U.S. Space Shuttle, which orbits the earth at an altitude of several hundred miles, is considered by the Eastern bloc to be an antisatellite weapon. The USSR in particular has protested the Shuttle as a plot by the "United States elite classes to place weaponry in space." The U.S. has not denied the Shuttle's military potential, but has instead protested that the USSR can easily protect against the Shuttle as an ASAT by attaching a charge to each potential target satellite which would detonate if the target was tampered with. Although the Department of Defense has insisted that the Shuttle will not be used as an ASAT, it might be used indirectly to support ASAT weaponry. For example, it can theoretically place directed energy weapons in orbit; the first test of such a capability is slated for 1984. Burt, *Soviet Said to Ask Space Shuttle Halt*, N.Y. Times, June 1, 1979, at A6, col. 1; *see also* Reed, *Military Use of the Space Shuttle*, 13 AKRON L. REV. 665, 671-673 (1980). *See* Hotz, *supra* note 8, at 10. Golden, *Battlestar "Columbia"?*, 117 TIME, April 27, 1981, at 20, 22; Bell, *supra* note 1, at 7, 8. *See also* Committee, U.N. Doc. CD/335 at Appendix III/Volume VII, Final Record of the One Hundred and Eighty-Sixth Plenary Meeting, U.N. Doc. CD/PV.186 at Appendix III/Volume VII, Final Record of the One Hundred and Eighty-Fourth Plenary Meeting, U.N. Doc. CD/PV.184 at 19 (1982) (statement of Mr. Erdembileg of Mongolia).

20. The USSR began investigation of ASATs sometime about 1962. Bell, *supra* note 1, at 9. In 1964, ASAT development began in earnest, as evidenced by the setting up of a "PKO" unit. Hafner, *supra* note 6, at 46 n.5 (defining "PKO" or "Protivo-Kozmicheskaya Oborona" literally as "anti-cosmic defense"). Testing of the co-orbital interceptor commenced in 1967. Tests continued in 1968 and 1969. In the early 1970's flight tests ceased and apparently were not resumed again until 1976, when approximately four test launches occurred. The Soviets observed a moratorium on ASAT tests from 1978 to 1980, the duration

ASAT capabilities.[21] ASAT limitation talks were held in the late 1970's.[22] These facts indicate that the United States and USSR do

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of U.S.-USSR ASAT talks. Following the failure of those talks, the Soviets began tests again in 1980. The current Soviet ASAT is a direct descendent of the early Soviet ASAT. Burt, *Russians Again Test a "Killer Satellite,"* N.Y. Times, April 19, 1980, at 28, col. 1; *We are Ahead by a Substantial Margin*, 92 U.S. NEWS AND WORLD REPORT, Nov. 22, 1982, at 43; Burt, *U.S. Seeks to Curb Killer Satellites*, N.Y. Times, April 10, 1979, at 1, col. 4; *cf.* Smith, *Soviets Lag in Key Weapons Technology*, 219 SCI. 1301, (March 18, 1983) (statement of Under-Secretary of Defense for Research and Engineering Richard DeLauer).

The Soviet ASAT is a satellite launched by an SS-9 ICBM launcher. This co-orbital interceptor maneuvers close to its target and then explodes, throwing out shrapnel which destroys the target satellite. Broad, *A Fatal Flaw in the Concept of Space War*, 215 SCI. 1372 (March 12, 1982) at 1372. *But see* CARNEGIE REPORT, *supra* note 1, at 121 (classifying the Soviet ASAT as a coplanar interceptor). Soviet ASAT tests have been successful. At least one of these tests involved a Soviet target which moved into an orbit "similar" to that of U.S. reconnaissance satellites. *Cf.* Weinraub, *Soviet Antisatellite Test Reported*, N.Y. Times, Oct. 28, 1977, at 4, col. 3.

The Soviet co-orbital interceptor apparently can currently reach only low-orbiting satellites. Reports of the actual altitudes presently attainable range from 600 miles to 1,250 miles. In addition, the ASAT reportedly has a quick-launch capability, and can destroy a target during the target's first orbit with a small chance of U.S. surveillance. Hafner, *supra* note 6, at 46 (noting that no capacity to intercept satellites in geosynchronous orbit has been demonstrated). Hotz, *supra* note 8, at 11.

21. In 1958, U.S. ASAT research began with a grant by the Defense Advanced Research Projects Agency (DARPA) to develop a maneuverable co-orbital interceptor. Between 1959 and 1961, the Department of Defense, the Army and the Air Force experimented with direct-ascent ASATs. By 1962, the original co-orbital program which eventually resulted in the research and development stage of the United States Air Force Satellite Interceptor Program (SAINT) was cancelled. In 1964 the Air Force conducted ASAT tests on Johnston Island in the Pacific. That project, which theoretically would have resulted in the ability to conduct direct-ascent interception of orbiting Soviet bombers, was cancelled in the early 1970's. Bell, *supra* note 1, at 9; Hafner, *supra* note 6, at 45-47. *Cf.* Butler-Hanninfin, *But Who Guards the Guardians?*, S-11-227 SPACE WORLD 11 (1982) (reporting that SAINT would have used nuclear warheads, and actually was tested).

Until the late 1970's, no further development of a U.S. ASAT was made public. However, in 1979, following the unsuccessful U.S.-USSR ASAT talks, the Carter Administration began a new ASAT development program. The result of the Carter Administration's effort was a non-nuclear direct-ascent interceptor called the Miniature Homing Vehicle (MHV), which was slated to be tested in 1983. This ASAT will be launched from an F-15 plane by a two-stage rocket, and will destroy its target on impact. Reportedly, the MHV will not be fully operational until the late 1980's. The U.S. MHV will be unable to reach low-orbiting satellites, that is, those orbiting up to an estimated altitude of 2,000 miles. However, it will be able to reach the majority of Soviet reconnaissance and communications satellites, as well as any orbiting Soviet space platform. *Cf. Soviets Integrating Space in Strategic War Planning*, *supra* note 2, at 110; *see* e.g., CARNEGIE REPORT, *supra* note 1, at 120, 121; Covault, *Space Command Seeks Asat Laser*, 118 AVIATION WEEK & SPACE TECHNOLOGY, March 21, 1983, at 18, 19.

22. *See infra* text accompanying notes 164-264. President Carter proposed ASAT negotiations with the Soviet Union in March, 1977. Bilateral talks began in June 1978 in Helsinki, moved to Berne in February 1979, and finally to Vienna in April 1979. Negotiations were ended by Carter on December 24, 1979. Shortly following the breakdown of the ASAT talks, the Soviets resumed testing their co-orbital interceptor. A self-imposed Soviet morato-

not believe that ASATs violate the present regime of international law.[23]

International custom is one of the major sources of current international law. The use of space, however, is a relatively recent phenomenon and little customary international law has developed in the area.[24] As a result, positive law must be relied on as the primary source of law for determining ASAT legality.[25] The several relevant treaties, agreements, and constitutions will therefore be considered as sources of international law.

There have been various UN resolutions calling on nations not to extend rivalries and arms into outer space.[26] Most of these reso-

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rium on testing had been in effect throughout the negotiating period. Hafner, *supra* note 6, at 42. *But see* CARNEGIE REPORT, *supra* note 1, at 125 (stating that that by the time of the Afghanistan crisis, ASAT negotiations had already been suspended to permit Carter to devote his full attention to SALT II).

Very little information is available about these negotiations. Evidently, the U.S. desired a halt on all ASAT testing, a dismantling of the Soviet system, and adequate verification. The Soviets apparently wanted a one year ban on testing, an inclusion of the U.S. Space Shuttle in negotiations, the protection only of U.S. and USSR space assets, and an exclusion of protection for all satellites engaged in hostile activities. United States complaints about the Soviet position included the fact that the U.S. wanted to protect all satellites in which the other side "has an interest," in that way protecting the spacecraft of allies and NATO. Goedhuis, *Some Observations On the Efforts to Prevent a Military Escalation in Outer Space*, 10 J. SPACE L. (1982), at 19. Further, the U.S. proposed protecting all kinds of spacecraft, evidently including those engaged in hostile activities. Abandonment of the Space Shuttle was not acceptable to the U.S. Vlasic, *Disarmament Decade, Outer Space and International Law*, 26 MCGILL L. J 135, 153 (1981); CARNEGIE REPORT, *supra* note 1, at 125.

Former Secretary of Defense Harold Brown is among those who believe that negotiations aimed at banning space weaponry are urgently needed. In fact, most arms control specialists outside the government consider the present the ideal time to reopen ASAT negotiations. The stage of ASAT development is considered prime for limitation: The U.S. ASAT has yet to be tested, and DEW ASATs are in the research and development stage. Wilford, *Military's Future in Space: A Matter of War or Peace*, N.Y. Times, Oct. 19, 1982, at C2, col. 6.

23. The Reagan Administration takes the position that the U.S. has an advantage in space technology, which should be exploited through the development of ASATs. According to this view, arms control is to be rejected due to the problems of verification and breakout, and because any treaty will necessarily restrain U.S. flexibility in deploying its defenses. The current Administration thus asserts that the development of ASATs is not prohibited. It would, however, consider use of an antisatellite system against national technical means prohibited. CARNEGIE REPORT, *supra* note 1, at 131; *but see Compliance with Salt I Agreement*, Special Report No. 55, United States Department of State, Bureau of Public Affairs (July 1979).

24. *Cf.* Goedhuis, *The Changing Legal Regime of Air and Outer Space*, 27 INT'L & COMP. L. Q. 576 (1976).

25. *Id.*

26. *E.g.*, G.A. Res. 1348, 13 U.N. GAOR Supp. (No. 18) at 5, U.N. Doc. A/4009 (1958); G.A. Res. 1884, 18 U.N. GAOR Supp. (No. 15) at 13, U.N. Doc. A/5571 (1963); G.A. Res. 1962, 18 U.N. GAOR Supp. (No. 15) at 14, U.N. Doc. A/5656 (1963); G.A. Res. 1963, 18

lutions express the General Assembly's intent to avoid war in space, and to develop space for peaceful purposes.[27] Recently, a resolution was passed specifically encouraging an ASAT limitation agreement.[28] While General Assembly resolutions do not impose any legal obligation on UN members,[29] it is considered politically unwise for even dissenters to act contrary to a resolution's provisions. Accordingly, these resolutions will also be taken into account.

A. Legality of Interceptors[30] ("Conventional" ASATs)

1. *The Outer Space Treaty.* The Outer Space Treaty[31] was signed by the United States, the Soviet Union, and the United Kingdom in 1967. Its purposes were threefold: (1) to provide for the cooperation of parties exploring space, (2) to guarantee space as the "common heritage of mankind," and (3) to prevent the arms race from spreading to outer space.[32] While the treaty does not speak directly to the question of ASAT weapons, it does contain several relevant provisions.

Article II of the Outer Space Treaty states, "Outer space, including the moon and other celestial bodies is not subject to national appropriation by claim of sovereignty, by means or use of occupation, or by any other means."[33] In a situation where a nation with an interceptor ASAT weapon attempted to destroy all the satellites of another nation, outer space would arguably be "appropriated," and Article II would be violated. Thus, such a use of interceptors would be prohibited. In addition, Article IV, paragraph 1 of the Outer Space Treaty states that "Parties to the Treaty under-

U.N. GAOR Supp. (No. 15) at 15, U.N. Doc. A/5656 (1963). *See also infra* text accompanying notes 164-264.

27. Galloway, *Space Law and Astronautics for Peace and Human Understanding*, in 21 PROCEEDINGS OF THE COLLOQUIUM ON OUTER SPACE 178 (1979).

28. G.A. Res. 36/97 C, U.N. Doc. A/RES/36/97 (1982) (Resolution passed December 9, 1981) [hereinafter cited as Western States' Resolution].

29. *See infra* notes 119-127 and accompanying text.

30. The Soviet ASAT is classified as a coorbital interceptor. There is also some evidence that it can work as a coplanar interceptor. *Cf.* CARNEGIE REPORT, *supra* note 1, at 121. The U.S. Space Shuttle, if deployed in an "ASAT mode," could function either as a coorbital or coplanar interceptor.

31. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies, *done* Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 (entered into force Oct. 10, 1967) [hereinafter cited as Outer Space Treaty].

32. *See* Zedalis & Wade, *Anti-Satellite Weapons and the Outer Space Treaty of 1967*, 8 CALIF. W. INT'L L.J. 454, 456-9 (1978) [hereinafter cited as Zedalis & Wade].

33. Outer Space Treaty, *supra* note 31, art. II.

take 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."[34]

Dispute over this provision commonly centers on whether or not ASATs fall under the "nuclear weapons or . . . weapons of mass destruction" rubric. An ASAT carrying a nuclear warhead would violate Article IV, paragraph 1. To date, however, none of the interceptor weapons use nuclear warheads.[35] Whether or not the Soviet ASAT, MHV, or Shuttle constitute "weapons of mass destruction" is unclear since "mass destruction" is left undefined by the Outer Space Treaty. It is generally thought, however, that weapons employing conventional materials do not constitute "weapons of mass destruction."[36] Conversely, weapons employing nonconventional components, such as nuclear, chemical, and bacteriological mechanisms would be classified as "weapons of mass destruction."[37] Thus, the nature of the weapon, not its destructive capacity, is the deciding factor in categorization.[38]

The U.S. MHV and Space Shuttle, as well as the Soviet ASAT, use a conventional mechanism. Therefore, none of these weapons appear to violate the letter of Article IV, paragraph 1, although each may well violate its spirit.[39] Paragraph 1 has consequently been termed a "partial" disarmament of outer space.[40] Article IV, paragraph 2 of the Outer Space Treaty states:

> 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 fortifica-

34. *Id.* art. IV, para. 1.

35. *See supra* note 21.

36. *Outer Space Treaty: Hearings Before the Senate Committee on Foreign Relations, Executive D*, 90th Cong., 1st Sess. 22, at 23, 76 (1967) (statement of Arthur Goldberg) [hereinafter cited as *Outer Space Treaty Hearings*].

37. *Id.*; *see also id.* at 100 (statement of Cyrus Vance).

38. When a new weapon, not readily categorizable under this scheme, is developed, its destructive capacity determines its classification. Thus if a new weapon's destructive impact is of "catastrophic proportions," it will meet the "mass destruction" definition. For statements of Goldberg and Vance defining "catastrophic proportions" as that magnitude of harm done by a nuclear, biological, or chemical weapon see S. GOROVE, STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS 86 (1977) (stating that "catastrophic proportions" have not been met if fewer than twenty or thirty people have been affected); *Outer Space Treaty Hearings*, *supra* note 36, at 23 (statement of Arthur Goldberg).

39. Zedalis & Wade, *supra* note 32, at 459.

40. Markoff, *Disarmament and "Peaceful Purposes" Provision in the 1967 Outer Space Treaty*, 4 J. SPACE L. 3, 4 (1976).

> tions, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.[41]

Disputes over this treaty provision generally revolve around the fact that the "peaceful purposes" clause omits any reference to outer space. Apparently this omission was intended by the drafters.[42] The most generally accepted interpretation of this clause is that the military use of outer space is not prohibited.[43] Some scholars have argued, however, that "peaceful purposes" applies to outer space, notwithstanding the omission. They argue that the provisions of any treaty must be interpreted together as a whole.[44] Therefore, Article XIII's provision that "[t]he provisions of this Treaty shall apply to the activities . . . in . . . *outer space* . . . ."[45] must be construed together with Article IV, paragraph 2, thereby making outer space usable only for peaceful purposes.[46]

Two major interpretations of "peaceful purposes" have won support in the literature. The "nonaggressive"[47] approach, followed by the United States, basically allows military personnel and equipment in outer space.[48] The Soviet Union also adopts the "nonaggressive" approach, but does so only specifically in regard to outer space.[49] It adopts a "non-military" definition of "peaceful purposes" with respect to the moon and other celestial bodies.[50] Under the "non-military" interpretation, all military activity is ordinarily barred.[51]

Whichever interpretation of "peaceful purposes" is eventually

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41. Outer Space Treaty, *supra* note 31, art. IV, Para. 2.

42. S. GOROVE, *supra* note 38, at 88.

43. Robinson, *Militarization and the Outer Space Treaty—Time for a Restatement of "Space Law,"* 16 ASTRONAUTICS AND AERONAUTICS 28 (February 12, 1978).

44. Zedalis & Wade, *supra* note 32, at 477.

45. Outer Space Treaty, *supra* note 31, art. XIII.

46. Zedalis & Wade, *supra* note 32, at 477.

47. "Aggression" is usually defined 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 U.N. . . . ." G.A. Res. 3314, 29 U.N. GAOR Supp. (No. 31) at 142, U.N. Doc. A/9631 (1974).

48. *Outer Space Treaty Hearings*, *supra* note 36, at 59 (statement by Senator Gore); *cf.* S. GOROVE, *supra* note 38, at 90.

49. Zedalis & Wade, *supra* note 32, at 470 n.59.

50. *Id.*

51. *The Legality of Antisatellites*, 3 B.C. INT'L & COMP. L.J. 467, 483 n.130. (1980).

accepted, military personnel and equipment will be permitted for research or other actual peaceful uses.[52] Similarly, under both interpretations, an aggressive attack by any ASAT, including the MHV or Shuttle, would be prohibited.[53] Furthermore, several authorities argue that the mere presence of an ASAT in outer space is itself aggressive.[54] If the argument that Article IV, paragraph 2 applies to outer space prevails, then at the very least, aggressive ASAT activities will violate that clause.

Article III of the Outer Space Treaty reads:

> States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding,[55]

In a similar vein, Article I asserts: "Outer Space, including the moon and other celestial bodies, shall be free for exploration and use by all States in accordance with international law."[56] In this manner, Articles I and III explicitly make international law and the provisions of the UN Charter[57] applicable to outer space.

Article 2(4) of the UN Charter states that "[a]ll Members shall refrain in their international relations 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."[58] An MHV, Shuttle, or Soviet interceptor attack against the space assets of another nation would likely be prohibited as a "use of force" under this Article.[59] Article 51 of the

52. *Id.* at 483.

53. *Id.*; *see* Announcement of Administrative Review—United States Space Activities, 14 WEEKLY COMP. PRES. DOC. 1135, 1136 (June 20, 1978) (statement of President Jimmy Carter that "[t]he United States holds that the space systems of any nation are national property and have the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement upon sovereign rights").

54. *Cf.* O. OGUNBANWO, INTERNATIONAL LAW AND OUTER SPACE ACTIVITIES 25, 32 (1975). *But cf.* HENKIN, PUGH, SCHACHTER & SMIT, INTERNATIONAL LAW 1000 n.4 (1980) [hereinafter cited as HENKIN].

55. Outer Space Treaty, *supra* note 31, art. III.

56. *Id.* art. I.

57. U.N. CHARTER 59 Stat. 1031, T.S. 993, 3 Bevans 1153 (entered into force Oct 24, 1945).

58. U.N. CHARTER art. 2, para. 4.

59. *Cf. supra* note 53 and accompanying text.

UN Charter does, however, allow the use of force in self-defense.[60] Thus, the United States and the Soviet Union both subscribe to the view that if one nation is attacked, and retaliates with an ASAT attack in self-defense, then no violation of Article III occurs.[61] Neither the Soviet Union nor the United States would currently view anything less than an aggressive ASAT attack as a violation of international law.[62] Some scholars, however, have argued that the mere existence of ASATs may be contrary to international legal norms.[63]

2. *The Accident Measures Agreement and the Prevention of Nuclear War Agreement.* At least one scholar has asserted that conventional ASATs would be unlawful were they to interfere with the early warning systems of the U.S. or USSR.[64] This argument rests on a combined reading of the Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War[65] and the Agreement on the Prevention of Nuclear War.[66] United States early warning satellites are for the most part in geosynchronous orbit.[67] Therefore, under this formulation, only the conventional Soviet ASAT with a booster capable of placing it in geosynchronous orbit would be illegal. The Soviet Union's early-warning satellites, however, do dip into low orbits[68] and therefore the conventional MHV or Shuttle might be banned.

Article 3 of the Accident Measures Agreement states:

> The Parties undertake to notify each other immediately in the event of detection by missile warning systems of unidentified objects, or in the event of signs of interference with these systems or with related communications facilities, if such occurrence could create a risk of outbreak of nuclear war between the two

60. U.N. CHARTER art. 51 (stating, in relevant part, "[n]othing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. . . .").

61. *The Legality of Antisatellites*, *supra* note 51, at 490 nn. 205-09.

62. *Id.* at 484; *see supra* note 53 and accompanying text.

63. *See supra* note 54 and accompanying text.

64. Goedhuis, *supra* note 22, at 13, 14 (1982).

65. Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War, Sept. 30, 1971, U.S.-U.S.S.R., 22 U.S.T. 1590, T.I.A.S. NO. 7186, 807 U.N.T.S. 57 [hereinafter cited as Accident Measures Agreement].

66. Agreement on the Prevention of Nuclear War, June 22, 1973, U.S.- U.S.S.R., 24 U.S.T. 1478, T.I.A.S. No. 7654 [hereinafter cited as Prevention of Nuclear War Agreement].

67. *See supra* note 1.

68. *See supra* note 2.

countries.[69]

Compliance with this provision clearly depends on the existence of early warning systems. The Prevention of Nuclear War Agreement, however, is not quite as direct in its reference to early warning. Article IV makes the following reference: "If at any time relations between the Parties or between either Party and other countries appear to involve the risk of a nuclear conflict, or if relations between countries not parties to this Agreement appear to involve the risk of nuclear war [then the Parties shall notify each other] . . . ."[70] The success of the latter article is thus dependent on the existence of early warning systems; without such systems, the risk of nuclear conflict would be apparent to neither party. Thus, the United States and the Soviet Union are "oblige[d] . . . to refrain from interference with the . . . early-warning systems of either side . . . ."[71]

3. *The NTM Provisions.* Interceptor-type ASATs may violate international law under the national technical means (NTM) provisions first set out in Article XII, paragraph 1 of the Anti-Ballistic Missile Systems Treaty.[72] This provision states that "[f]or the purpose of providing assurance of compliance with the provisions of this Treaty, each party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law."[73] This provision reappears

69. Accident Measures Agreement, *supra* note 65, art. 3.

70. Prevention of Nuclear War Agreement, *supra* note 66, art. IV.

71. Goedhuis, *supra* note 22, at 14. An operational Soviet ASAT has been tested to altitudes of at most 1,250 nautical miles. All U.S. satellites orbiting the earth at less than 1,250 nautical miles are therefore potential targets. The U.S. Space Shuttle falls within this range, as do many low-altitude reconnaissance and intelligence satellites. If USSR has, in fact, developed a ground-based laser in an ASAT mode, such a laser would likely be effective only against low-altitude U.S. targets. Either system, laser or interceptor, threatens the United States ability to observe Soviet military maneuvers, thereby jeopardizing arms control verifiability. *Gains by Soviet Reported in Test to Kill Satellites*, N.Y. Times, March 19, 1981, at 1, col. 5.

Most U.S. communications, navigation and early warning satellites are in geosynchronous orbit and are presumably safe from ASAT attack at the present time. If the Soviets are successful in their development of a space-based laser ASAT, however, U.S. assets in geosynchronous orbit will also be threatened. Similarly, if conventional Soviet ASATs are launched by a huge new booster into geosynchronous orbit, U.S assets in that orbit will be endangered. Either development would jeopardize NAVSTAR and early warning satellites, as well as all "C^3I" and other satellites launched into geosynchronous orbit. Presumably, polar orbiting satellites would also be threatened. *Id.*

72. The Treaty on the Limitation of Anti-Ballistic Missile Systems, Oct. 3, 1972, U.S.-U.S.S.R.., 23 U.S.T. 3435, T.I.A.S. No. 7503 [hereinafter cited as ABM Treaty].

73. *Id.* art. XII, para. 1.

in Article V of SALT I[74] and in Article XV of SALT II.[75]

"National technical means" has not been defined. It has generally been said to refer, at a minimum, to reconnaissance and intelligence satellites.[76] The continued appearance of the NTM term is a tacit acknowledgment of the fact that photographic satellites, ELINTS and the like are stabilizing forces that are crucial to the verification of arms control pacts. Article VII, paragraph 2 of the ABM Treaty provides that "[e]ach Party undertakes not to interfere with the national technical means of verification of the other Party operating in accordance with paragraph 1 of this article."[77] It is abundantly clear that paragraph 2, coupled with the same provisions in SALT I and SALT II,[78] bars either nation from interfering with those satellites used in NTM.[79] The NTM provisions, however, do not refer to non-reconnaissance satellites.[80] Consequently, only an attack on a reconnaissance satellite violates Article XII. Moreover, if a party's satellite is not operating in accordance with "international law,"[81] that satellite could be attacked under Article XII, paragraph 2.[82]

B. Legality of Space-Based DEWs

1. *The Outer Space Treaty.* Article II of the Outer Space Treaty[83] prohibits a nation from attempting to attain sovereignty over outer space through the use of the MHV, Space Shuttle, ASAT or other conventional interceptors. *A fortiori*, the use of lasers or other DEWs as ASATs in outer space is similarly prohibited.[84]

74. Interim Agreement on Certain Measures With Respect to the Limitation of Strategic Offensive Arms, May 26, 1972, U.S.-U.S.S.R., art. V, 23 U.S.T. 3462 T.I.A.S. No. 7504 (entered into force Oct. 3, 1972) [hereinafter cited as SALT I).

75. U.S. Dept. of State, Bureau of Public Affairs, *SALT II Agreement* 21 (Selected Document No. 12A, 1979) [hereinafter cited as *SALT II*].

76. Christol, *Article Four of the 1967 Principles Treaty: Its Meaning and Prospects for its Clarification*, 21 PROCEEDINGS OF THE COLLOQUIUM ON OUTER SPACE 192, 199-200 (1979); *cf.* Goedhuis, *supra* note 22, at 15.

77. ABM Treaty, *supra* note 72, art. XII, para. 2.

78. *See supra* notes 72-75 and accompanying text.

79. *Cf.* Scoville, *Can Space Remain a Peaceful Environment?*, 18 STANLEY FOUNDATION OCCASIONAL PAPER 15 (1978).

80. *See supra* notes 72-75 and accompanying text.

81. *See supra* note 73 and accompanying text.

82. *SALT II*, *supra* note 75, art. XV, para. 2.

83. Outer Space Treaty, *supra* note 31, art. 2.

84. There is substantial doubt in the scientific community as to whether laser ASATs can ever be physically operational. Tsipis, *Laser Weapons*, 245 SCI. AM. 51, 56-57 (December 1981); *see also* Boffey, *supra* note 13 (opinions of M.I.T. Professor Tsipis, IBM Physicist Garwin, and Charles Townes, who shared the Nobel Prize for developing the laser). *But cf.*

Under Article IV, paragraph 1, the orbiting or stationing of nuclear weapons or weapons of mass destruction is prohibited.[85] The test of legality for lasers and DEWs thus becomes whether or not they are nuclear weapons or weapons of mass destruction.[86]

Although lasers and DEWs are not nuclear weapons, if a laser or DEW has a "catastrophic impact" it will be banned from space as a weapon of mass destruction. It is a generally accepted princi-

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Robinson, *Defense Dept. Backs Space Based Missile Defense*, 117 AVIATION WEEK & SPACE TECHNOLOGY, Sept. 27, 1982, at 15 (stating that Secretary of Defense Weinberger was told by his advisors that the capability currently exists to build a laser capable of overcoming Soviet targets). Nonetheless, the U.S. does have research underway, and huge sums of money have already been expended on such study. Halloran, *U.S. Plans Weapon Against Satellites*, N.Y. Times, June 6, 1982, at 19, col. 1. No specific time for deployment of DEW ASATs has yet been specified. Various estimates for lasers are as early as the mid 1980's, for particle-beams, late 1980's, 1990's or perhaps never. Broad, *A Fatal Flaw in the Concept of Space War*, 215 SCI. 1372 (March 12, 1982).

As early as 1979, it was reported that the Pentagon planned to develop a DEW, specifically, a satellite-mounted laser ASAT. Buckley, *TV: Study of Real War in Space*, N.Y. Times, Nov. 12, 1979, § III, at 20, col. 4. The Reagan Administration has actively pursued such a system, and has set forth a plan to develop space-based lasers. Covault, *Space Command Seeks ASAT Laser*, 118 AVIATION WEEK & SPACE TECHNOLOGY, March 21, 1983, at 18, 19 (quoting U.S.A.F. General James V. Hartinger, head of the Space Command, who said "laser ASAT is a technology that looks like it could possibly fulfill our requirements better than the aircraft-launched ASAT [MHV] we are developing now"). The U.S. Air Force has also recently drafted a statement of need for an ASAT laser. *See also* Robinson, *supra*, at 14.

Like the U.S., the USSR is developing DEWs, especially laser weapons. The Soviets, however, are devoting two to three times more resources to lasers than is the Pentagon. A Soviet ground-based laser, with ASAT capability, has apparently already been developed. The first demonstration of a Soviet space laser ASAT is expected by 1985. Burt, *U.S. Says Russians Develop Satellite Killing Laser*, N.Y. Times, May 22, 1980, at 9, col. 1. *See also* Wilson, *Soviets Reported Ready to Orbit Laser Weapons*, Washington Post, March 3, 1982, at A1, col. 6. Reports of estimated time to deployment in space vary from the mid-1980's to the 1990's. *See Soviet Efforts Point to Antisatellite Laser*, 118 AVIATION WEEK & SPACE TECHNOLOGY 19 (March 21, 1983) (quoting the classified five-year military plan called "Fiscal Year Defense Guidance 1984-1988": "The Soviets could launch the first protoype of a space-based laser antisatellite system in the late 1980's or very early 1990's. An operational system capable of attacking other satellites within a few thousand kilometers range could be established in the early 1990's"); *see also* Hafner, *supra* note 6, at 42.

The USSR is also reportedly developing a large-capacity booster that could be used to launch a laser ASAT system into space. This booster may also be used to launch conventional ASATs into geosynchronous orbit. Should this development come to pass, the USSR would have the capacity to intercept geosynchronous space targets. *U.S. Vigilance Over Soviet Space Activities Increased*, 117 AVIATION WEEK & SPACE TECHNOLOGY 53 (Oct. 4, 1982).

85. *Id.* art. IV, para. 1.

86. *Id. But see* Zedalis & Wade, *supra* note 32, at 461-65 (setting out the argument of some writers that nuclear and mass destruction weapons by themselves may orbit the earth; they are only prohibited when stationed on a separate body which orbits the earth. Zedalis & Wade respond that the Vienna Convention on the Law of Treaties [U.N. Doc. A/CONF. 39/27, May 22, 1969] precludes any such iterpretation).

ple that lasers are in fact weapons of mass destruction.[87] Therefore, Article IV, paragraph 1 plainly prohibits lasers from orbiting the earth or from being stationed in outer space "in any other manner."[88]

The argument that space may be used only for non-aggressive purposes carries much more weight in the area of laser ASAT weaponry. The reason for this is that the mere presence of laser weapons in outer space might well violate the non-aggression definition set out by the UN General Assembly.[89] The extra force and danger presented by a laser ASAT in space certainly warrants the fear of greater aggression.

The application of international law to outer space in Articles I and III prohibits the threat or use of force through laser ASATs just as it prohibits the same threat through conventional ASATs.[90] A laser ASAT attack by one nation against the space assets of another would be prohibited under Article III of the Outer Space Treaty[91] and Article 2(4) of the UN Charter.[92]

Under the Outer Space Treaty, laser ASATs are clearly banned from outer space because they are weapons of mass destruction under Article IV, paragraph 1. If such weapons were actually used, additional sections of the Treaty, as discussed above, would also be infringed.

2. *The Accident Measures Agreement and the Prevention of Nuclear War Agreement.* The Accident Measures Agreement and the Prevention of Nuclear War Agreement together obligate the U.S. and USSR to refrain from interfering with each other's early warning systems. This carries even more force in the area of laser weapons, since laser ASATs will, in fact, be able to reach geosynchronous orbit, where virtually all U.S. early warning satellites are stationed.[93] Similarly, laser ASATs would likely be able to reach the Soviet early warning satellites in their present elliptical, low-dipping orbits.[94] The obligation not to intervene with such systems

87. S. GOROVE, *supra* note 38, at 87; Zedalis & Wade, *supra* note 32, at 465; *see also* Comment, *The Treaty on Outer Space: An Evaluation of the Arms Control Provisions*, 7 COLUM. J. TRANSNAT'L L. 259, 274 (1968).

88. Outer Space Treaty, *supra* note 31, art. IV, para. 1.

89. *See supra* note 47 and accompanying text.

90. Outer Space Treaty, *supra* note 31, arts. I and III.

91. *Id.* art. III.

92. U.N. CHARTER art. 2, para. 4.

93. *See supra* note 1.

94. *See supra* note 2.

would be violated if laser ASATs were used to destroy early warning satellites.[95]

3. *The NTM Provisions.* It has been suggested that the "national technical means" term of ABM, SALT I and SALT II would preclude the United States or the Soviet Union from using conventional ASATs to destroy reconnaissance satellites and the like.[96] *A fortiori*, laser ASATs, if used to attack reconnaissance satellites, would also violate the NTM provisions.[97]

Laser ASATs more clearly violate the terms of positive international law than do conventional ASATs. Laser ASATs violate the Outer Space Treaty merely by being deployed, regardless of whether or not they are actually used against reconnaissance or early warning satellites.[98] When laser ASATs are used against early warning satellites, they may implicitly violate the Accident Measures Agreement and the Prevention of Nuclear War Agreement.[99] In addition, when laser ASATs are used against reconnaissance satellites, they will violate the national technical means provisions.[100]

C. *Legality of Laser ABMs*

While the legality of conventional ASATs is questionable, an even stronger case may be made against new systems presently under consideration. For example, the Reagan Administration is currently planning an ABM system that would consist of lasers mounted on an orbiting space platform.[101] Technologically, a system built to knock out ballistic missiles can itself be used to destroy satellites. The technologies of the two systems are similar, and one system can be easily altered to perform functions of the other.[102] Therefore, a space-based laser ABM system would have at least some antisatellite capability.

Article V of the ABM Treaty[103] states, in pertinent part, that "[e]ach Party undertakes not to develop, test, or deploy ABM systems or components which are sea-based, air-based, *space-based*, or

95. *See supra* notes 64-71 and accompanying text.
96. *See supra* notes 72-82 and accompanying text.
97. *See supra* notes 72-75 and accompanying text.
98. *Cf.* Outer Space Treaty, *supra* note 31, art. IV, para. 1.
99. *See supra* text accompanying notes 93-95.
100. *See supra* text accompanying notes 96-100.
101. *See supra* note 4 and accompanying text.
102. *Id.*; *see Canadian Report*, *supra* note 18 at 11-13.
103. ABM Treaty, *supra* note 72.

mobile land-based."[104] Therefore, the planned Reagan space-based laser ABM system is presumptively illegal. Furthermore, it could be used as an ASAT. This possible use bars it from outer space under Article IV, paragraph 1 of the Outer Space Treaty.[105] If in the alternative the Administration designates this weapon as a laser ASAT, it could be used to counter ballistic missiles, and in that mode would violate Article V of the ABM Treaty.[106]

D. Legality of Ground-Based and Air-Based Laser ASATs

Weapons of this type do not orbit the earth and are not stationed in outer space. Accordingly they do not violate Article IV, paragraph 1 of the Outer Space Treaty.[107] If, however, these weapons are used either aggressively or in an attempt to appropriate outer space, then Article IV, paragraph 2 and Article II would be violated.[108] Moreover, Article III of the treaty and Article 2(4) of the UN Charter ban the use of these ASATs against another country's space assets unless used defensively under Article 51 of the UN Charter.[109]

Laser ASATs violate the Accident Measures Agreement and the Prevention of Nuclear War Agreement if they are used to intervene with early warning satellites.[110] The NTM provisions similarly bar ground and air-based ASATs from attacking reconnaissance satellites.[111]

Article V(1) of the ABM Treaty specifically makes air-based ABM systems illegal.[112] Therefore, the development, testing, or use of an air-based laser ASAT, if technologically interchangeable with an air-based ABM system, would violate the ABM Treaty.[113]

E. Legality of Nuclear Explosions

The United States and the Soviet Union, as well as other nations, have the current capability to use a nuclear explosion in outer

104. *Id.* art. V, para. 1 (emphasis added).
105. Outer Space Treaty, *supra* note 31, art. IV, para. 1.
106. ABM Treaty, *supra* note 72, art. V, para. 1.
107. Outer Space Treaty, *supra* note 31, art. IV, para. 1.
108. *Id.* art. II and art. IV, para. 2.
109. U.N. CHARTER art. 51.
110. *See supra* notes 64-71 and accompanying text.
111. *See supra* notes 72-75 and accompanying text.
112. ABM Treaty, *supra* note 72, art. V, para. 1.
113. *Id.*

space to destroy satellites.[114] However, in 1963 the United States and the Soviet Union signed the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water (Test Ban Treaty).[115] Article 1 of the Test Ban Treaty states:

> 1. Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear 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 under water, including territorial waters or high seas . . . .[116]

This provision clearly prohibits nuclear tests in outer space. The United States and the Soviet Union are thereby prohibited from using nuclear explosives to destroy satellites.

F. Legality of Other ASATs

It should be noted that there are in existence today a multitude of weapons, primarily designed for some other purpose, which can be used against satellites.[117] For example, a satellite can be "peacefully" launched and not be activated until needed to intervene with another satellite. Ground-based lasers used in scientific research could be switched into an "ASAT mode" and used to destroy a space target.[118]

None of these mechanisms necessarily violate international law until deployment in an ASAT mode. Nevertheless, they provide a stumbling block to those who view verification as absolutely crucial to arms control.[119]

G. The Legal Effect of Positive Law

Assuming that the ASATs described above violate the UN Resolutions, UN Charter, and the various treaties set forth above, the crucial issue to be determined is the enforceability of those pro-

114. Boffey, *supra* note 1 (reporting the Congressional Research Service's assertion that "a single nuclear warhead could conceivably disable all satellites," including those in geosynchronous orbit, leaving unharmed only those satellites protected by the earth's shadow.)

115. Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, Oct. 10, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43 [hereinafter cited as Test Ban Treaty].

116. *Id.* art. 1 (emphasis added).

117. *See e.g., infra* notes 165-228 and accompanying text.

118. *Id.*

119. *Id.*

visions. This section will discuss the effect of this presumed illegality on the continued existence of ASATs.

1. *UN Resolutions.* "Even those who are the most opposed to attributing any direct legislative effect to General Assembly resolutions will usually concede that they are capable, like many other things, of contributing to the *lex communis*."[120] In that sense, General Assembly resolutions constitute material that influence the content of law, although they do not create it. Nevertheless, "virtually, all governments have affirmed the general line that [UN] General Assembly resolutions are not legally binding per se."[121] On other hand, even States adhering to the formulation that UN resolutions are "non-legally binding" have asserted that declarations and resolutions may express international law in specific cases.[122] Resolutions are thereby relied upon to resolve actual disputes.[123] Therefore, despite the lack of reference to UN resolutions in Article 38 of the Statute of the International Court of Justice,[124] legal effect may be given to the collective pronouncements of the General Assembly and of international conferences.[125]

Although some assert that resolutions are merely political, at least one well known scholar claims that actions of the United Nations do in fact have legal significance.[126] Professor Oscar Schacter suggests that the value of a resolution or declaration as evidence of customary international law depends on whether the provisions of the resolution or declaration are followed in actual practice.[127]

The various acts of the United Nations General Assembly are probably best viewed as evidence of customary international law. However, should an antisatellite case actually be brought before the International Court of Justice, the I.C.J. could conceivably give legal effect to the UN's resolutions and declarations.[128]

120. Fitzmaurice, *Special Report to the Institut de Droit International*, 1973 LIVRE DU CENTENAIRE 1873-1973 269, *quoted in* HENKIN, *supra* note 54, at 103 n.5.

121. Schachter, *The Evolving International Law of Development*, 15 COLUM. J. TRANSNAT'L L. 1, 4 (1976).

122. *See generally* Fisheries Jurisdiction Case, 1974 I.C.J. 24; Namibia Case, 1971 I.C.J. 16.

123. *Id.*

124. Statute of the International Court of Justice, art. 38, 59 Stat. 1055, T.S. 993, 3 Bevans 1179.

125. Schachter, *supra* note 121, at 5.

126. *See id.*, at 4-7.

127. Schachter, *Towards a Theory of International Obligation*, 8 VA. J. INT'L L. 300, 311-19 (1968).

128. *See supra* notes 122-123 and accompanying text.

2. *Agreements.* Among the relevant provisions in this area are the Accident Measures Agreement, the Prevention of Nuclear War Agreement,[129] and the NTM provisions of SALT I and SALT II.[130] There is some dispute as to whether agreements have, or ought to have, the same legal significance as treaties.[131] Under domestic law, if an agreement is signed by the President and then accepted by two-thirds of the joint Congress, it is a complete alternative to a treaty.[132] Under international law, agreements carry virtually the same obligations as do treaties.[133] There is, however, some dispute as to the constitutionality under U.S. law of such agreements.[134]

3. *Treaties.* In regard to *non*-disarmament treaties, the International Law Commission has restated the rule that a material breach of a multilateral treaty will allow any party to the treaty "specially affected by the breach" to "invoke it [the breach] as a ground for suspending the operation of the treaty in whole or in part in the relations between itself and the defaulting state."[135] A material breach of a bilateral treaty by one party "entitles the other to invoke the breach as a ground for terminating the treaty or suspending its operation in whole or in part."[136] If the "other" party contests the breach, under the UN Charter and under general international law the parties are obligated to seek a solution of their dispute through peaceful means.[137] The underlying principle of these rules is that no State can be called upon to meet its treaty obligations when another party to that treaty fails to fulfill obligations thereunder. Nevertheless, this inherent right to terminate or suspend is "without prejudice to the injured party's right to present an international claim for reparation on the basis of the other party's responsibility with respect to the breach."[138]

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129. *See supra* notes 65-66.

130. It is not critical to the analysis undertaken herein that SALT I is no longer in effect and SALT II never was in effect. The relevant "NTM" provisions in SALT I and II are also set out in the ABM Treaty, which is in effect. *See supra* notes 72-82 and accompanying text.

131. L. HENKIN, FOREIGN AFFAIRS AND THE CONSTITUTION 173-76 (1972).

132. *Id.*

133. *Id.* at 184-86.

134. *Id.* Any detailed discussion of this dispute is beyond the scope of this work.

135. *See generally Int'l Law Commission Report*, 2 Y.B. INT'L L. COMM'N 1 169-227 (1966) (construing art. 60 of the Vienna Convention on the Law of Treaties, *done* May 23, 1969, U.N. Doc. A/Conf. 39/27 (entered into force January 27, 1980)).

136. *Id.*

137. *Id.*

138. *Id.*

Disarmament treaties are governed by a different rubric. Whether multilateral or bilateral, a "breach [of a disarmament treaty] by one party tends to undermine the whole regime of the treaty as between *all* the parties."[139] International law therefore provides that, in order to protect any one State from the threats of another State, "any party must be permitted without first obtaining the agreement of the other parties to suspend the operation of the treaty with respect to itself generally in its relations with all the other parties."[140]

It is clear that a nation can escape its obligations under an arms control treaty by the breach of another party. Similarly, international law does not provide for the specific performance of treaties. Any such notion would be diametrically opposed to the idea of state sovereignty.[141] However, the rule of *pacta sunt servanda*[142] does apply in the international law context.[143] Furthermore, Article 2(2) of the UN Charter states that, "[a]ll Members . . . shall fulfill in good faith the obligations assumed by them in accordance with the present Charter."[144] In an actual case, however, it is hardly likely that the U.S. or USSR would attempt to enforce its rights judicially. If abrogation was in a nation's best interests, such abrogation would almost certainly occur before the I.C.J., for example, became involved.

The various treaties and agreements to which the U.S. and USSR are parties all impose obligations that theoretically must be followed under penalty of appropriate sanctions.[145] Yet under Article 60 of the Vienna Convention, a State can essentially abrogate an arms control treaty at its initial "material breach."[146] Therefore, if the contingencies discussed above occur, and the current arms control treaties and agreements discussed above are violated, the most likely result will be abrogation.

4. *Withdrawal Clauses.* Certain similar provisions, referred to herein as "withdrawal clauses," recur in the Test Ban, Outer Space and ABM treaties. The Test Ban Treaty,[147] in Article 4,

139. *Id.*
140. *Id.*
141. *See* CHAYES, EHRLICH & LOWENFELD, INTERNATIONAL LEGAL PROCESS 997 (1969).
142. Literally, agreements of the parties must be observed at all costs.
143. *See* MCNAIR, LAW OF TREATIES 493 (1969).
144. U.N. CHARTER art. 2, para. 2.
145. *Id.*
146. Vienna Convention on the Law of Treaties, *supra* note 135, at art. 60.
147. Test Ban Treaty, *supra* note 115.

gives each party the right to withdraw if "it decides that extraordinary events, related to the subject matter of this Treaty have jeopardized the supreme interests of its country. It shall give notice to all other Parties to the Treaty three months in advance."[148] Similarly, Article XVI of the Outer Space Treaty[149] provides that: "Any State Party to the Treaty may give notice of its withdrawal from the Treaty one year after its entry into force by written notification to the Depositary Governments. Such withdrawal shall take effect one year from the date of receipt of this notification."[150] Article XV(2) of the ABM Treaty[151] resurrects the language of the Test Ban Treaty, stating that each party has a right to withdraw ". . . if it decides that extraordinary events related to the subject matter of this Treaty have jeopardized its supreme interests."[152] Hence, a nation wishing to be freed of its obligations under an arms control agreement need not breach the ABM, Outer Space, or Test Ban Treaties. Instead, such a nation could choose the more acceptable option of exercising a withdrawal clause.

5. *Consultation Provisions and Treaty Interpretations.* It has been demonstrated above that it is not particularly difficult for a party to an arms control treaty to abrogate its responsibilities thereunder if it so chooses. The relevant literature frequently emphasizes ways to avoid one's disarmament or arms limitation obligations.[153] Law review articles as well as industry journals interpret the Outer Space Treaty as narrowly as possible, allowing the development of ASATs if at all possible.[154] Indeed, there is a widespread tendency to read the current treaties, which are worded to prohibit specific activities, as implying that "everything that is not prohibited is allowed."[155] As new technologies are developed, such advances will necessarily be permissible under these interpretations of the relevant law. "Technological advances in this way tend to undermine arms control treaties."[156]

One might reverse this trend by interpreting the relevant treaties in a way that enforces their consultative language. Each treaty

148. *Id.* at art. 4.
149. Outer Space Treaty, *supra* note 31, art. XVI.
150. *Id.*
151. ABM Treaty, *supra* note 72, art. XV, para. 2.
152. *Id.*
153. Goedhuis, *supra* note 22, at 25.
154. *E.g.*, Zedalis and Wade, *supra* note 32.
155. Goedhuis, *supra* note 22, at 25.
156. *Id.*

and agreement discussed appears to have been drafted to take account of future contingencies.[157] For example, the Outer Space Treaty provides for "international" consultations concerning activities that might harmfully interfere with the activities of party States.[158] Likewise, the ABM Treaty expands on this idea by setting up the Standing Consultative Commission (SCC) to consider questions, settle disputes, discuss amendments, and the like.[159] SALT I and SALT II similarly make provision for the SCC mechanism.[160] Other agreements also provide for consultation.[161] For example, the Prevention of Nuclear War Agreement states that in cases of danger, the U.S. and USSR "shall immediately enter into urgent consultations with each other and make every effort to avert this risk."[162] The consultation provisions, if literally read, place a positive obligation on nations.[163] Assuming that nations have agreed to the various arms control provisions because they enhance stability, then perhaps more public pressure ought to be brought to bear on enforcing these consultation clauses.[164]

II. SUGGESTIONS

A. Scholarly Thought on Delimiting ASATs

Space law scholars are in accord that "further positive law is required to limit ASAT development and deployment."[165] This section will discuss some of the major proposals under consideration.[166]

1. *Carl Christol.* Professor Christol would revise Article

157. *See supra* notes 20-116 and accompanying text.
158. Outer Space Treaty, *supra* note 31, art. IX.
159. ABM Treaty, *supra* note 72, art. XIII.
160. SALT I, *supra* note 74, art. VI; SALT II, *supra* note 75, art. XVII.
161. *E.g.*, Accident Measures Agreement, *supra* note 65, art. 7.
162. Prevention of Nuclear War Agreement, *supra* note 66, art. IV.
163. For example, the word "shall" is used to impose a duty.
164. *See infra* notes 165-264 and accompanying text.
165. *The Legality of Antisatellites*, *supra* note 51, at 492.
166. *See also*, Zedalis and Wade, *supra* note 32; Vlasic, *supra* note 22; Perry, *Advanced Technology and Arms Control*, 26 ORBIS 351 (1982) (from an edited revision of a paper presented at the 2nd Annual Conference on Security and Arms Control held outside Moscow in December, 1981); Almond, *Military Activities in Outer Space—the Emerging Law*, 23 COLLOQUIUM ON THE LAW OF OUTER SPACE 149 (1982); Address by Albert Carnesale, Interdisciplinary Conference at Harvard Law School: Law and Lawyers in Arms Control and Peacemaking (Feb. 11, 1983); Wilford, *Military's Future in Space: A Matter of War or Peace*, N.Y. Times, Oct. 19, 1982, at C2, col. 6.; Remarks by John Steinbruner, *The Future of Strategic Arms Control in the Wake of Salt II*, 34 AM. SOC'Y OF INT'L L. PROC. 212, 216-17 (1981); Garthoff, *Banning the Bomb in Outer Space*, 5 INT'L SECURITY 25, 39 (Winter 80/81).

IV[167] as follows:

> Paragraph one should be extended to cover conventional weapons. It is no longer acceptable to limit the scope of this paragraph to nuclear or mass destruction-type weapons. If there were any doubt whether an ASAT is a conventional weapon, it would be desirable to provide specifically that ASATs may not be launched into, tested in, or used in the space environment.[168]

This revision would effectively eliminate conventional ASATs from outer space. Christol would go on to provide for the most stringent verification procedures. To accomplish that end, he would amend Article IV, paragraph 2[169] so that it would state that "space objects be equipped with docking facilities meeting a common international standard so that inspections could be accomplished by non-national including multi-national, inspecting satellites."[170]

Christol argues that the policy reason motivating the Outer Space Treaty, that is, a fear of "Bombs in Orbit,"[171] is not suited to the 1980's. He contends that States are no longer as worried about the possibility of nuclear bombs in outer space[172] as they are about the need to extend some sort of Article IV protection to conventional weapons.[173] He concludes that "[a] new arms race in the space environment would be destabilizing," and that, as Article IV is currently inadequate to deal with the testing, deployment, or use of an interceptor satellite, revisions must be made.[174]

2. *Herbert Scoville.* Scoville recommends a bilateral agreement between the Soviet Union and the United States.[175] Such an agreement would, at a minimum, ban the use of ASATs, but preferably would also ban testing and deployment. An immediate goal would be to "put a ceiling on current space weapons, as well as attempting to restrict the development of new weapons systems in outer space."[176] A forum modeled on the ABM Treaty's Standing Consultative Commission[177] would be used to discuss problems as

167. Outer Space Treaty, *supra* note 31, art. IV.
168. Christol, *supra* note 76, at 203.
169. Outer Space Treaty, *supra* note 31, art. IV, para. 2.
170. Christol, *supra* note 76, at 203.
171. *Id.* at 206 n.53.
172. Such bombs are presumably banned from outer space under the terms of the 1963 Test Ban Treaty. *See supra* notes 115-116 and accompanying text.
173. Christol, *supra* note 76, at 206.
174. *Id.*
175. Scoville, *supra* note 79, at 18-20.
176. *Id.* at 22.
177. ABM Treaty, *supra* note 72, art. XIII.

they arose. Additionally, Scoville would proscribe all space weapons systems, since a simple prohibition on ASATs might encourage States to deploy other types of weaponry.[178]

3. *Goedhuis.* Professor Goedhuis suggests, preliminarily, that in the context of Article IV(2)[179] of the Outer Space Treaty, the term "weapons of mass destruction" ought to be defined so that it is clear whether or not ASATs and lasers are prohibited.[180] He also suggests defining the term "peaceful purposes" in Article IV(2).[181] Goedhuis approves of the UN Committee on Disarmament's current ASAT negotiations.[182] Furthermore, he believes that "a resumption of the bilateral talks between the United States and the Soviet Union on banning anti-satellite weapons would be appropriate as a complimentary negotiation to the discussion in the Committee on Disarmament."[183] However, he approvingly quotes Barry Blechman, who says that:

> there has been a tendency to seek U.S.—Soviet agreement as a first step, believing that once that nut has been cracked, wider agreements would follow. This has not only placed undue burdens on U.S.—Soviet relations, but has nurtured the fears of those who see arms control as an expression of the U.S.-Soviet Condominium thereby aggravating the political problems already surrounding the negotiations.[184]

Goedhuis believes that lasers and other directed energy weapons should be top priorities of the Committee on Disarmament.[185] He suggests that all nations take a new approach to the interpretation of treaties. Under Goedhuis' new approach, treaties would be formulated in such a way that only certain named activities would be allowed; everything else would be prohibited.[186] Goedhuis recognizes the importance of world politics in the achievement of any ASAT agreement.[187] He further suggests that it is supremely important to "create and arouse" world public opinion on this

178. Scoville, *supra* note 79, at 22.

179. Professor Goedhuis probably meant Art. IV(1).

180. Goedhuis, *supra* note 22, at 18.

181. Outer Space Treaty, *supra* note 31, art. IV, para. 2.

182. *See infra* notes 229-246 and accompanying text.

183. Goedhuis, *supra* note 22, at 23.

184. Blechman, *Do Negotiated Arms Limitations Have a Future?*, 59 FOREIGN AFF. 102, 124 (Fall, 1980).

185. Goedhuis, *supra* note 22, at 25.

186. *Id.*

187. *Id.* at 26.

matter.[188]

4. *Hafner.*[189] Ideally Hafner would require the Soviets to dismantle their current ASAT system. He would also accept an accord without such dismantlement.[190] Any agreement actually negotiated would work via one of two main approaches. First, one could define in detail what an ASAT weapon consists of, and thereafter ban all such weapons.[191] Alternatively, one could ban the testing, deployment, or use of any weapon in a manner appropriate for attacking satellites.[192] Hafner feels that the first approach of "banning things" has several inherent problems. Banning individual weapons will often provide a blueprint of the way to circumvent the intent of the treaty, while staying literally within its letter. Moreover, many component parts of ASATs will be present in nonthreatening spacecraft.[193]

Hafner prefers a treaty banning all ASAT activities.[194] Such a treaty would be modeled on the ABM Treaty. It would include these provisions: (1) each side would agree not to use, deploy, or test any weapon or system for damaging or destroying satellites; and (2) each side would agree not to interfere with the functioning of the other's satellites.[195] Hafner's proposal would stop the growth of offensive ASAT technology, but allow defensive measures for protecting satellites.[196] Such an accord would prevent the testing of ASATs at higher altitudes. Hafner fears an "unbridled" ASAT competition, with the Soviets acquiring an improved capability even as the U.S. places greater reliance on space assets.[197]

Hafner believes that his agreement would be verifiable by currently existing intelligence and surveillance facilities.[198] He is un-

188. *Id.*

189. L. Donald Hafner was an advisor to the SALT delegation in Geneva and an analyst with the NSC ASAT Working Group involved in the 1978-79 U.S.-U.S.S.R.. ASAT talks.

190. Hafner, *supra* note 6, at 57.

191. *Id.* at 54 ("banning things").

192. *Id.* ("banning actions").

193. *Id.* at 55.

194. *Id.*

195. *Id.*

196. *Id.*

197. *Id.* at 60.

198. *Id.* at 57 (specifically making reference to the Space Detection and Tracking System (SPADATS) which detects, classifies, and maintains a file of all space objects; and to the GEODDS high altitude tracking system that will monitor objects as small as 1 foot in diameter at a distance of up to 23,000 nautical miles).

concerned about the verification problem that troubles so many others. Hafner explains that:

> any ASAT system would expose itself at many points to detection: e.g., direct-ascent, co-orbital, and space-based laser interceptors would require launch preparations, launching, and maneuvering to altitudes and orbital planes appropriate for ASAT attacks; ground or space-based lasers or charged particle weapons [DEWs] would involve the rapid discharge of high levels of energy and possible waste products of power generation; in all cases the damage, intense heating, destruction, or displacement from its orbit of a target could be detectable.[199]

Hafner's only real verification concern[200] is the fact that the current Soviet ASAT uses components of other Soviet weapons, and is similar to other Soviet space missions. He believes, however, that this concern can be alleviated through satellite hardening measures and by dismantlement of the current Soviet ASAT.[201] According to Hafner, the United States "loses nothing by continuing to explore Soviet interest in ASAT constraints along the lines sketched here."[202]

5. *Carnegie Institute.* The Carnegie Institute suggests that the United States has more to gain from its own use of space than from denying the Soviets their use of it.[203] Therefore, the Institute would at least investigate the use of arms control agreements to protect the United States' sizeable military and economic investment in its assets.[204] The Institute pessimistically focuses, however, on the deficiencies that would inhere to any ASAT agreement. It postulates that even with such an agreement, one could not fully protect satellites from attacks by nuclear blast, electronic interference or attacks on "C^{3}I" ground facilities.[205] The Institute also discusses the traditional worries in arms control agreements: verification, circumvention, and breakout.[206] Nevertheless, four areas are identified as

199. *Id.*

200. *Id.* at 59 (noting that ASAT research and development would be allowed because the verification problem at the laboratory level is virtually insurmountable).

201. *Id.*

202. *Id.* (stating further that during the 1978-79 ASAT negotiations, the Soviets showed every intention of taking the ASAT issue seriously, including the appointment of space law authority Oleg Khlestov as head of their ASAT delegation and the observance of a moratorium on testing ASATs throughout the talks).

203. CARNEGIE REPORT, *supra* note 1, at 131.

204. *Id.*

205. *Id.* at 130.

206. *Id.* at 131.

potentially ripe for a negotiated ASAT agreement.

First, a ban is hypothesized on all testing of ASAT interceptors beyond the current low-altitude range.[207] This measure would, in effect, allow the current Soviet ASAT and the planned U.S. MHV. It would theoretically not allow the launching of the current Soviet ASAT into higher altitudes with a stronger booster. This ban would not extend to DEWs or other non-interceptor type ASATs. The Carnegie Institute cautions against any more comprehensive ban on the theory that any such ban would be too hard to verify.[208] Second, a separate ban is suggested as to all space-basing of lasers and particle-beam generators.[209] The ban could be extended to ground-based laser ASATs. This solution would protect the United States' high-altitude satellites. Further, since DEW ASATs are still only in the research stage, a ban should be easier to achieve.[210] The Carnegie Institute again cautions that verification problems would exist for ground-based lasers and particle-beam weapons because the configurations of ASAT, DEWs and peacefully-used DEWs are highly similar.[211] Third, an arms control agreement could restrict the position of countries' satellites.[212] This would reduce the fear of "space mines." Furthermore, early-warning would be improved since the violation of any rule would be apparent in a crisis.[213] Finally, the Carnegie Institute suggests that an attack on another country's satellite could be defined as an act of war,[214] or an act of aggression contrary to the UN Charter.[215]

The Carnegie Institute's proposals are based on the proposition that ASAT limitation will result in some improvement in the informational part of U.S. "C³I", and hence offer some stabilization.[216] Additionally, any ASAT agreement will enhance early warning by forcing a nation to violate an arms control provision before attacking a spacecraft.[217] The Carnegie Institute is primarily concerned with protecting high altitude U.S. satellites. These pro-

207. *Id.* at 123.
208. *Id.*
209. *Id.*
210. *Id.*
211. *Id.*
212. Rules to restrict satellite position are known as "parking rules."
213. CARNEGIE REPORT, *supra* note 1, at 123.
214. *Id.*
215. U.N. CHARTER art. 2, para. 4.
216. CARNEGIE REPORT, *supra* note 1, at 125.
217. *Id.* at 124.

posals would raise U.S. confidence in the survivability of its geosynchronous spacecraft, but leave low-level assets insecure.

6. *Tsipis.* A Discussion Group of the Stanley Foundation led by Professor Tsipis has agreed that the Soviet ASAT is destabilizing, and that the increasing militarization of space is contrary to the United States' best interests.[218] The group thought that "the threat of space conflict could impede the development of the most promising civil applications of space and poses substantial risk to current and anticipated (and costly) U.S. space programs, such as the Space Shuttle."[219]

The Group declared negotiations of bilateral and multilateral treaties as "most important" to limit or prohibit ASATs.[220] The proposed treaty would provide for new international organs for arms control in space and verification.[221] All nations "concerned" would be included in discussions. Joint ownership and management was suggested to ascertain that civil programs were not being modified for military objectives.[222] The treaty would focus on testing restrictions.[223] A ceiling would be placed on current weapons and new weapons would be restricted.[224] A nonuse treaty was considered worthless, because testing and deployment would be permitted.[225]

Tsipis' group noted the difficulties inherent in verifying devices that can be used both hostilely and peacefully.[226] Nonetheless, the group still postulated an agreement. The agreement does not depend on certain verification, but rather on consultation.[227] Ambiguities about space activities, and any other pertinent issues, are to be resolved through an organ modeled on the ABM Treaty's Standing Consultative Commission.[228]

B. Views Expressed in the United Nations

1. *Resolution of the UN Special Session on Disarmament.* The

218. Tsipis, *supra* note 1, at 19.
219. *Id.*
220. *Id.* at 20.
221. *Id.*
222. *Id.*
223. *Id.* at 21.
224. *Id.*
225. *Id.*
226. *Id.* at 16 (citing the Soviet Salyut and U.S. Space Shuttle as examples of such devices).
227. *Id.* at 21.
228. *Id.*

UN General Assembly, in its Special Session devoted to disarmament, adopted the following resolution:

> In order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held, in accordance with the spirit of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.[229]

In so doing, the view that further positive law is needed to make ASATs illegal was vindicated.[230] The UN General Assembly's resolution demonstrated its position that current international law is inadequate to guarantee peace in space.

2. *France's Proposal.* Also proposed at the Special Session was the French delegation's idea for an International Satellite Monitoring Agency (ISMA) devoted to the improved verification of arms control agreements.[231] ISMA would theoretically use Soviet and American technology to benefit the world as a whole.[232] "Through the collection of information and through the verification process, the world community [would apply] one of the most effective sanctions available in international law: international public censure."[233]

France thus aspired to solve the verification problem that is given so much weight in argument against arms control agreements. The success of any such proposal is, however, doubtful at present, in part because the U.S. and USSR are against it and because the nations that favor such a proposal are themselves uncertain as to exactly what is needed to solve the verification problem.[234]

3. *Italy's Proposal.* Further measures were suggested by Italy through a proposed new protocol to the Outer Space Treaty, introduced in the Committee on Disarmament.[235] In relevant part, the proposal prohibits the "launching into earth orbit or beyond of ob-

229. S-10 U.N. GAOR Annex 12 (Agenda Item 12) at 552, U.N. Doc. A/S-10/23 (1978) (Recommendations of Ad hoc Committee of 10th Special Session, Final Document of Tenth Special Session of U.N. General Assembly).

230. *Id.*

231. U.N. Doc. A/S-10/PV. 3 (May 25, 1978) (French proposal at 10th Special Session on Disarmament); *see* U.N. Doc. A/S-10/AC.1/7 (June 1, 1978).

232. *See* Jakhu & Trecroce, *Int'l Satellite Monitoring for Disarmament and Development*, 5 ANNALS OF AIR & SPACE L. 509, 512 (1980).

233. *Id.* at 513.

234. *See* Lay, *Recent Developments in Space Law*, 9 CALIF. W. INT'L L.J. 514, 516 (1979).

235. U.N. Doc. CD/9 (1979) (Proposal by Italian delegation to Committee on Disarmament)

jects carrying weapons of mass destruction or any other types of devices designed for *offensive* purposes, the conduct of military maneuvers as well as the testing of any type of weapons."[236] In explanation, Mr. LaRocca, the Italian delegate, stressed the importance of reconnaissance, surveillance, and communications satellites to stability and verification.[237] Although the Italian proposal did not speak specifically to ASATs, the test ban on "any type of weapons" presumably would cover ASATs.

4. *Soviet Draft Treaty.* On August 10, 1981, Foreign Minister Gromyko sent a Draft Treaty on the Prohibition of the Stationing of Weapons of any Kind in Outer Space[238] to the UN Problems with the draft were identified by the 34th UN General Assembly. For example, in Article 1(1), only space-based ASATs are banned; nothing is explicitly said about ground-based weapons. The treaty only operates prospectively; nothing at all is said about dismantling current ASATs. Next, the draft provides for verification by national technical means.[239] Most States, except for the U.S. and USSR, prefer an ISMA arrangement. The U.S. and USSR prefer NTM.[240]

If ASATs are defined as "weapons" by the Soviet Draft, they will be prohibited from space. Otherwise, the Soviet Draft leaves open many of the Outer Space Treaty's loopholes, allowing a nation which wants ASATs to easily avoid the letter of the treaty. Furthermore, ground-based ASATs are not banned at all.

5. *Western States' Resolution.* The Western nations' dissatisfaction with the Soviet Draft led to the passage of a resolution entitled "Prevention of an Arms Race in Outer Space."[241] This resolution passed unanimously, with only the Soviet bloc countries abstaining. The Western States' Resolution specifically urged the Committee on Disarmament[242] to negotiate an "effective and verifi-

236. *Id.* (emphasis added).

237. *See* Goedhuis, *supra* note 22, at 20 (statement of Mr. LaRocca).

238. Draft Treaty on the Prohibition of the Stationing of Weapons of Any Kind in Outer Space, U.N. Doc. A/36/192 (August 10, 1981) [hereinafter cited as Soviet Draft]. For a good survey of Soviet legal views, *see* Comment, *Military Activities in Outer Space: Soviet Legal Views*, 25 HARVARD I.L.J. 153 (1984).

239. *See* Goedhuis, *supra* note 22, at 21.

240. Tsipis, *supra* note 1.

241. G.A. Res. 36/97C, U.N. Doc. A/RES/36/97 (1981) (Prevention of an arms race in outer space) [hereinafter cited as Western States resolution].

242. At the urging of the United States, the Committee on Disarmament was given responsibility for this negotiation instead of UN COPUOS (UN Committee on the Peaceful Use of Outer Space) which had negotiated the Outer Space Treaty. The U.S view was that

able agreement" to prohibit ASAT weapons. National technical means of verification were not specifically referred to in this resolution.

The Committee on Disarmament was bottlenecked over the issue of whether or not a working Committee ought to be formed to draft an agreement.[243] Soviet bloc countries supported the creation of the Working Committee. Western bloc nations, however, opposed its creation, claiming it was too early for such a committee to accomplish anything productive.[244]

6. *Eastern Bloc Resolution.* On the same day that the Western States' Resolution was passed, a resolution introduced by Mongolia was unanimously approved, with only the Western States abstaining.[245] This resolution, in substance, reiterated the Eastern bloc's desire for a treaty on the order of the Soviet Draft.

The passage of both resolutions on the same day illustrates the Eastern preference for a broad ban on weapons in outer space and the Western preference for a narrower agreement specifically prohibiting anti-satellite systems.[246] The fact that passage occurred unanimously may indicate one of two things. First, both resolutions may be acceptable to all nations, though certain nations prefer one or the other. Second, it may be politically unacceptable for any nation to actually vote against peace in outer space. It may be subtler, and therefore more acceptable, for a country to in effect vote "no" by creating a stalemate within the Committee on Disarmament.

C. Views Since the UN Stalemate

1. *At the UN COPUOS.* The military implications of outer space activities was not an item specifically on the COPUOS agenda in 1982.[247] One year after the resolutions were referred to the UN Committee on Disarmament, "[a] number of [COPUOS]

since security in space is inseparable from security on earth, the issue is beyond the jurisdiction of COPUOS.

243. *See* United Nations Committee on Disarmament, Report of the Committee, U.N. Doc. CD/335 (Sept. 17, 1982).

244. *Id.*

245. G.A. Res. 36/99, U.N. Doc. A/RES/36/99 (1981) [hereinafter cited as Eastern States' Resolution].

246. *E.g., Prohibition of the Stationing of Weapons and Prevention of an Arms Race in Outer Space*, 6 U.N. DISARMAMENT Y.B. 265-275 (1981).

247. Jasentuliyana, *The Work of UN COPUOS in 1981*, 10 J. SPACE L. 41, 46 (1982) (Report of the Executive Secretary of UN COPUOS).

delegations [still] expressed their concern regarding the growing danger of military use of outer space, and pointed to the urgent need to prevent an arms race in outer space."[248] Several delegations still requested that the question be dealt with by COPUOS. The U.S. and USSR, on the other hand, felt that the 1981 decision to employ the Committee on Disarmament should still hold.[249]

2. *Unispace '82.* The Unispace '82 Conference was primarily devoted to new civil technologies.[250] Although not initially an item on its agenda, the Conference agreed to "express its grave concern over the extension of an arms race into outer space and urged all nations to contribute actively to the prevention of this."[251] However, "[a]ttempts of a large majority of the countries to introduce language to the effect that the testing and deployment of ASAT weapons should be banned and that the inviolability of all peaceful space activities must be guaranteed did not find a general consensus."[252] It is not clear whether the failure to introduce the language above was due to a problem in the language itself or instead to the possibility that the UNISPACE '82 Conference was an inappropriate forum.

3. *1982 Colloquium on the Law of Outer Space.* At the 1982 Colloquium, the two views of space arms control embodied by the 1981 Resolutions were reiterated. The Western States still preferred regulating ASATs, while the Eastern countries still preferred outlawing all weapons in outer space.[253]

4. *Seventh International Arms Control Symposium.* The conference noted that the current escalation in the military use of outer space, if continued, would probably change the strategic balance in favor of the U.S.[254] From this premise, Colin Gray stated his belief that "only a perfectly verifiable arms control regime does not look very attractive compared to the U.S. prospective ability to compete effectively militarily, in space."[255] Gray also noted the necessity of "C^3I" vitality to both the U.S. and USSR in a superpower crisis.

248. *Id.*

249. *Id.*

250. Pal, *Unispace '82 and Beyond*, 10 J. SPACE L. 181, 183 (1982) (Report of the Secretary-General).

251. *Id.* at 185.

252. *Id.*

253. Diederiks-Verschoor, *25th Colloquium on Law of Outer Space*, 10 J. SPACE L. 210 (1982)

254. Burton, *The Seventh Int'l Arms Control Symposium: A Conference Report*, 26 ORBIS 749, 755 (Fall, 1982).

255. *Id.* at 756.

Gray proposed, therefore, that no treaties be negotiated that might preclude the U.S. from developing an anti-Soviet "C³I" space systems capability.[256]

5. *Space Law Session, 1982 International Law Association Conference.* At this conference, it was concluded that further escalation in the military use of outer space would destroy the strategic balance.[257] Hence, the Conference supported the negotiations work of the UN Committee on Disarmament.

D. Views in the United States Congress

The United States Congress has repeatedly voiced its support for arms control. Most recently, several pieces of legislation specifically related to outer space have been submitted for consideration.

Rep. George Brown, Jr. (D-CA) introduced the National Space Policy Act of 1983.[258] This bill seeks to bolster civilian uses of outer space, as opposed to military uses, in order to counter the trend toward the weaponization of space.[259] Further, the bill reiterated the view that any use of ASATs would be illegal, and provided for verification modeled on the French ISMA proposal.[260]

In 1982 Congressmen John Moakley (D-MA) and Harold Hollenbeck (R-NJ) together introduced House Joint Resolution 607.[261] This resolution called upon President Reagan to immediately enter negotiations with the USSR and the rest of the nations of the world to verifiably ban weapons of any kind from outer space. Resolution 607 also directs the President to "seek the establishment of a working group with the United Nations Committee on Disarmament . . . to provide a forum for discussing the issues . . . ."[262]

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256. *Id.*

257. Goedhuis, *Space Law Session, International Law Association Conference*, 10 J. SPACE L. 219, 220 (1982) (Report of the Chairman of the Space Law Committee).

258. H.R. 478, 98th Cong., 1st Sess. (1983) (referred to the Committee on Science and Technology).

259. *Id.*

260. *Id.* In § 4, H.R. 478 states that: "the United States considers that the space systems of all nations . . . are [their] property . . . and that infringement with space systems will be viewed as an infringement on sovereign rights." In § 5 (b), H.R. 478 lists as among the U.S. goals "the investigation . . . [of] international cooperation in the use of remote sensing systems, including the fullest possible declassification of . . . data. . . ."

261. H.J. Res. 607, 97th Cong., 2d Sess. (1982) (referred to the Committee on Foreign Affairs).

262. *Id.* The Resolution provides that:

> The President shall resume immediately bilateral talks with the Soviet Union for the purpose of negotiating a comprehensive treaty prohibiting—
>
> (1) the testing, deployment, production, or use of any space-based, air-based,

Senate Resolution 43 similarly calls upon the President to enter negotiations with the Soviets to ban ASATs.[263] The Senate resolution states, in relevant part, that "the President should immediately prepare a proposal and invite the Soviet Union to negotiate a verifiable ban on the development, testing, production, and deployment of antisatellite weapons as a first step toward prohibiting all space-based and space-directed weaponry . . . ."[264] Hence, there is a substantial public support in the United States, as indicated by the Congress, for ASAT measures.

III. CONCLUSION

The United States and the Soviet Union, as well as other nations, each possess space assets which are of great value. This article has striven to demonstrate that while the United States probably has more assets which would be vulnerable to an operational ASAT, the Soviet Union's increasing use of outer space make it similarly, if somewhat less, vulnerable to an ASAT attack. Moreover, if ASATs were able to tamper with national technical means of verification, the value of all current arms treaties would be compromised.

This work has shown that some narrowly defined groups of ASATs may be illegal today under positive international law. However, the particular ASATs on which the Soviet Union and the United States are presently concentrating efforts are *not* expressly barred by current treaties, as construed under current modes of interpreting those agreements.

While most authorities in the field of space weapons and space demilitarization agree in the diagnosis that current treaties are inadequate to prevent ASAT development, these authorities disagree on the course of treatment that should be prescribed. This author firmly believes that Scoville's provisions for immediate consultation are a useful beginning. However, the crux of the current impasse in

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or ground-based weapons system which is designed to damage, destroy, or interfere with the functioning of any spacecraft or any nation; and

(2) the stationing in orbit around the Earth, or any celestial body, or at any other location in outer space of any weapon which has been designed to inflict injury or cause any other form of damage on the Earth, in the atmosphere, or on objects placed in space.

Any such treaty shall establish a procedure for verifying compliance with its terms.

263. S. Res. 43, 98th Cong. 1st Sess. (1983) (referred to the Committee on Foreign Relations).

264. *Id.*

negotiating positions is the fact that international law does not currently bind States in the same way that domestic law binds individuals. Until the rule of law changes, the negatively defined treaty offers the brightest hope of the ideas presented herein. If a treaty were drafted in such a way that "all things not expressly allowed are presumed to be barred," the current ruse of reading exceptions into every agreement might be avoided. Similarly, Professor Christol's suggestion of closing the existing loopholes in the Outer Space Treaty might offer an alternative solution. This writer awaits the anticipated fall negotiation—perhaps it may offer an even better result.