"STAR WARS": ANTISATELLITES AND SPACE-BASED BALLISTIC MISSILE DEFENSE

ISSUE BRIEF NUMBER IB81123
UPDATED 01/16/84

AUTHOR:

Marcia S. Smith

Science Policy Research Division

THE LIBRARY OF CONGRESS

CONGRESSIONAL RESEARCH SERVICE

MAJOR ISSUES SYSTEM

DATE ORIGINATED 08/25/81

FOR ADDITIONAL INFORMATION CALL 287-5700

0117

ISSUE DEFINITION

Two events in the past six years have stimulated interest in issues involving the prospect of a real "Star Wars," specifically the 1977 decision by President Carter to develop a U.S. antisatellite (ASAT) device to counter a system that has been tested by the Soviets since 1968 (and considered operational by the Department of Defense), and the 1983 speech by President Reagan calling for research and development on systems to defend the United States and its allies against ballistic missiles. One option is to base such a system in space.

The debate over whether or not to develop and deploy space weapons intensified considerably after President Reagan's speech, and legislation has been introduced in Congress on both sides of the issue. The central points of the debate are whether the deployment of the U.S. ASAT system (expected to be operational in 1987) will spur an arms race in space, and whether establishment of a space-based ballistic missile defense system would be a stabilizing or a destabilizing influence on relations between the United States and the Soviet Union.

BACKGROUND AND POLICY ANALYSIS

Numbers in parentheses and designated "#" refer to footnotes. The BACKGROUND portion of the issue brief is divided into the following sections:

INTRODUCTION

Services provided by Earth-orbiting satellites are used by most nations of the world for purposes such as communications, remote sensing, and meteorological observations. In addition, the United States and Soviet Union make extensive use of space-based intelligence systems. Five countries and one international organization (China, India, Japan, Soviet Union, United States, and the European Space Agency) now have indigenous capabilities to launch satellites into orbit. The United States and Soviet Union are by far the most frequent launchers of satellites, either for their own use or for

other countries.

Of the approximately 2,300 successful earth-orbital launches conducted by the United States and Soviet Union between 1957 and 1982, approximately two-thirds have been for military purposes such as communications, reconnaissance (including photographic, ocean surveillance, electronic intelligence, early warning, and nuclear explosion detection), meteorology, geodesy, and navigation (#1). At the present time, approximately 70% of U.S. overseas military communications are routed through space (#2). The Soviets also rely heavily on space systems for their military network. The other countries with launch capabilities have indicated interest in using satellites for military purposes, and China and India have already launched satellites thought to be related to development of a reconnaissance capability.

Antisatellite (ASAT) devices are designed to destroy the operational capability of satellites. The Soviets have been testing an ASAT device since 1968, and in 1977 the U.S. Department of Defense (DOD) declared that system operational. President Carter subsequently authorized development of a U.S. ASAT system while simultaneously calling upon the Soviets to negotiate a treaty to ban weapons from space. Three rounds of talks were held in 1978-1979, without resolution.

Space can also be used as a base for weapons to destroy ballistic missiles that pass through space enroute to their targets (this includes intercontinental ballistic missiles, but not necessarily submarine launched ballistic missiles). The potential of space-based ballistic missile defense (BMD) was raised following a March 1983 speech by President Reagan which called upon the Nation's scientists to pursue research that could provide defense against ballistic missiles for the United States and its allies.

In August 1983, the Soviets introduced a treaty at the United Nations to ban the use of force in space, which would include ASATs and BMD. This is a revision of their 1981 draft treaty; no negotiations have been held on either text.

TYPES OF ANTISATELLITES

The term "antisatellite" (ASAT) is generically used to describe any device that can be used to destroy the operational capability of satellites in Earth orbit. These devices can be based on the ground, on airplanes, or in space. Ground- and air-based systems can involve (1) the direct ascent launch of a missile carrying either a nuclear or non-nuclear warhead; (2) co-orbital devices with explosive warheads; or (3) use of a directed-energy weapon such as a laser beam. Space-based systems could involve explosive "space mines," conventional interceptors, or directed-energy weapons.

Nuclear Devices

Nuclear warheads have a relatively large kill radius, which is an advantage in terms of not requiring highly accurate targeting systems, but a disadvantage in that the resulting radiation would affect both friendly and enemy satellites. (See mini brief 82221 -- Nuclear Explosions in Space: The Threat of EMP.) Another consideration is that the use of nuclear weapons in space is prohibited by treaty, although the United States did have an ASAT

capability using nuclear warheads from approximately 1963 to 1975. (Some western experts believe that the Soviet Union has had a similar capability since the early 1960s.)

Conventional Weapons

Non-nuclear warheads for ASATs could involve explosive devices or impact vehicles. Explosive devices are the orbital type now being tested by the Soviet Union. The interceptor must maneuver close enough to the target so that shrapnel produced by the interceptor's explosion will destroy the target's operating systems. The interceptor could be launched to attack a satellite at a specific time, or it could be placed in orbit in a dormant state and activated when needed (a "space mine"). Impact vehicles are the type being developed by the United States. In this system, highly accurate targeting mechanisms are required to bring the interceptor into a direct collision with the target satellite. A variation of this system has been proposed in the High Frontier study for a space-based ballistic missile defense system (see below).

Lasers and Particle Beams

Directed-energy weapons (lasers or particle beams), which would also require highly accurate targeting mechanisms, are now being researched in both the United States and Soviet Union. Some western analysts believe that the Soviets already have an operational ground-based laser ASAT system. The United States has conducted airborne tests of a laser system, the technology for which may have ASAT applications in the future. Lasers can be used to "blind" the sensors on a satellite, or if sufficient power is available, to destroy the satellite through heating. Particle beams (charged or neutral atomic particles -- electrons, protons, or neutrons) could destroy a satellite through heating or by disrupting its electronics.

A major advantage of directed-energy weapons is that their destructive energy travels at the speed of light, denying the target sufficient time for any possible evasive maneuvers. Also, several targets could be engaged consecutively in very short periods of time. The major disadvantage is that the systems require great amounts of energy and large associated structures, making them difficult and expensive to construct in space and vulnerable to attack. The alternative, basing laser systems on Earth and aiming them up into space, presents difficulties because the Earth's atmosphere tends to disperse the beam, and only a small fraction of energy reaches the target. For particle beam weapons, Earth-basing would present the possibility of the path being deflected by the Earth's magnetic lines.

Laser weapons have been tested within the atmosphere already, and supporters of such efforts maintain that space-based lasers for ASAT purposes might be available within this decade, although critics suggest they may be 20-30 years in the future. Particle beam weapon technology is generally considered to be much further behind lasers. Directed-energy weapons could also be used for ballistic missile defense.

SOVIET AND U.S. ASAT PROGRAMS

SOVIET UNION

Ground-Based Systems

The Soviet Union may have several different ASAT systems, but only one, a ground-based co-orbital system, has been publicly termed "operational" by the U.S. Department of Defense. Rumors of a direct-ascent nuclear ASAT and of a ground-based laser have never been confirmed by either U.S. or Soviet officials.

Co-orbital. The system attracting the most attention is a ground-based, explosive type of ASAT system in which an interceptor is launched by a variant of the SS-9/Scarp launch vehicle. The interceptor's orbit can be elliptical so that it intercepts the target either at apogee (highest altitude) or perigee (lowest altitude); co-planar (co-orbiting) with the target; or variable ("popping-up" from a lower orbit using on-board propulsion) (#3). Once within range, the interceptor maneuvers very close to the target satellite and explodes, impacting the target with shrapnel.

The Soviet Union has conducted 20 tests of this antisatellite system (#4). From October 1968 to December 1971, seven tests were made. A four-year, three-month hiatus followed, with tests resuming again in February 1976. What prompted the resumption in ASAT testing is unknown, although some western analysts have speculated that it might have been meant as a warning to the Chinese, who launched their first reconnaissance satellite in September 1975. (The test also came within a year of the deactivation of the U.S. ground-based ASAT system.) Nine more Soviet ASAT tests were made from 1976-1978, at which time testing was again suspended during the ASAT limitation talks between the Soviet Union and United States (see below). In April 1980, after it became clear that the United States would postpone both ratification of the SALT II treaty and further ASAT limitation talks, testing was resumed, with one test conducted that month. Two more tests were made in 1981. The most recent test involved an ASAT target launched on June 6, 1982, the day before the opening of the U.N. Second Special Session on Disarmament. The interceptor was launched on June 18, 1982. Press reports were mixed as to whether the test was successful or not.

Assessing how many of the tests have been "successful" is difficult, since the intentions of the Soviets are not known. According to the media, only one target has actually been destroyed by an ASAT (the March 1981 test), but this has been disputed by other western observers since the target is still in orbit intact. In all other cases, apparently the interceptor has either been commanded to reenter the atmosphere, or has been exploded in orbit after moving away from the target. Some western analysts have even suggested that there are two ASAT programs: one to inspect a target but not destroy it, and the other to serve the destruct function. Nicholas Johnson of Teledyne-Brown Engineering has published a report which lists 9 of the tests as successes and 11 as failures (see REFERENCES).

This system so far is limited to altitudes and orbital inclinations achievable with the SS-9 rocket and its associated launch pads. All ASAT interceptors to date have operated between 62 degrees and 66 degrees inclination and have been launched from the Soviet facility at Tyuratam. The highest altitude reached in a Soviet ASAT test is approximately 2,300 kilometers (1,400 miles) (#5), within the range used by U.S. military

reconnaissance, meteorological, and Transit navigational satellites. The U.S. space shuttle also flies within this range. Other U.S. military satellites (the DSCS and FLTSATCOM communication satellites and early-warning satellites, for example) are placed in geosynchronous orbit at 35,800 kilometers (22,300 miles) altitude over the equator. Still others, such as the NAVSTAR navigation satellites, are placed at altitudes between these ranges (NAVSTAR operates at 20,000 kilometers). The Soviets have not yet demonstrated a capability to destroy these higher altitude satellites. Conceivably, much larger launch vehicles could be used to reach higher altitudes.

Direct-Ascent. In a July 16, 1962, interview with American newspaper editors, Soviet Premier Nikita Khruschev stated that the Soviet Union had a missile that could "hit a fly in outer space." Some western experts interpreted that statement as indicating a Soviet ASAT capability and speculated that it could refer to a Galosh missile armed with a nuclear warhead (similar to the U.S. ground-based ASAT system discussed below), possibly based near Moscow or at the Sary Shagan development facility. The existence of such an ASAT system and its current status cannot be confirmed from the public record.

Lasers. Rumors have also persisted for several years that the Soviets have an operational ground-based ASAT system using a laser to blind the sensors on enemy satellites. These reports have never been confirmed either by the Soviets or by official U.S. sources. In 1975, for example, an American early warning satellite and two other Air Force satellites were "illuminated" by a strong infrared radiation source from the Soviet Union. At that time, the question arose as to whether this was a test of a ground-based laser device, but the U.S. Department of Defense (DOD) later stated that the effect was caused by a high intensity fire resulting from a rupture in a natural gas pipeline.

In February 1983, "Aviation Week and Space Technology" reported that a U.S. reconnaissance satellite had ceased functioning while it was over the Soviet Union, and that some U.S. analysts were concerned that a Soviet ground-based laser might have been the cause. DOD had no comment on the report.

DOD officials have estimated that the Soviets are spending three to five times more than the United States on high energy laser research.

Space-based systems

Conventional Systems. In its Oct. 26, 1981 issue, the magazine "Aviation Week and Space Technology" reported that the "Soviet Union is operating in low earth orbit an antisatellite battle station equipped with clusters of infrared-homing guided interceptors that could destroy multiple U.S. spacecraft." In subsequent issues, Aviation Week claimed that the "battle station" was the satellite Kosmos 1267, which was docked with the space station Salyut 6. The Soviets had previously identified this satellite as a test vehicle related to constructing modular space stations (as part of their goal of establishing a permanent earth-orbiting space station). The U.S. Department of Defense denied the Aviation Week allegations, and the Salyut 6/Kosmos 1267 combination was deorbited in 1982.

Lasers and Particle Beams. Speculation has existed for several years that the Soviet Union is developing space-based laser and particle beam weapons. "Aviation Week and Space Technology" reported in October 1978 (see

REFERENCES) that the Soviets had conducted eight successful electron beam atmospheric propagation experiments using unmanned Cosmos spacecraft, the manned Soyuz spacecraft, and the manned Salyut space station. There have also been reports that space-based lasers have been tested. None of these reports has been openly confirmed by either Soviet or official U.S. sources.

In March 1982, portions of a classified DOD assessment of the Soviet laser effort were inadvertently read into the record by a Member of Congress at hearings. That part of the report suggested that DOD believes the Soviets are capable of placing a space-based laser in orbit in 1983. After further clarification by Undersecretary of Defense for Research and Engineering, Dr. Richard DeLauer, it appears that 1983 was considered the bottom range of possibilities which DOD considered likely. DeLauer later stated that he believed the Soviets have about a 5-year lead in space-based laser technology over the United States, and that since we could place such a weapon in orbit possibly in 10 years, then the Soviets may do so 5 years from now.

In its March 1983 version of "Soviet Military Power", DOD stated that the Soviets could launch the first prototype of a space-based laser system in the late 1980s or early 1990s, and that an operational system capable of attacking satellites within a few thousand kilometers could be established in the early 1990s. The report added that a space-based ballistic missile defense system using lasers might be tested in the 1990s, but probably would not be operational until the year 2000.

UNITED STATES

Ground-Based System

Although several systems were discussed in the early 1960's, the only operational ground-based ASAT system developed by the United States used nuclear warheads launched by Air Force Thor missiles from Johnston Island and Army Nike-Zeus missiles from Kwajalein Atoll, both in the Pacific. Tests of the Army system were conducted beginning in May 1963, but the system was deactivated in 1964. The Air Force tested its system beginning in May 1964 and it remained operational until 1975 (#6).

Air-Based System

A new ASAT system is now being developed by DOD in which a miniature homing vehicle (MHV) (#7) would be launched from a two-stage rocket (consisting of a short-range attack missile (SRAM) and an Altair stage) carried by an F-15 aircraft (#8). An inertial guidance system located in the Altair stage would guide the device to the proper location in space. Using sensors, the MHV would locate the target satellite, after which it would separate from the Altair, track the target, and proceed to impact the target with destructive force. This air-launched approach would provide considerably greater flexibility than the system now used by the Soviet Union.

The altitude range of the U.S. ASAT is classified, but is thought to be similar to that of the existing Soviet ASAT. Thus, Soviet reconnaissance, weather, and Tsikada navigation satellites (comparable to U.S. Transit satellites) would be within range, as would the Salyut space stations and their associated manned and unmanned ferry and resupply vehicles. In addition, the flexibility of the U.S. system permits its basing throughout

the world, and if ASAT-carrying F-15's were placed in the southern hemisphere, Soviet communications and early warning satellites would be vulnerable since they reach the low point in their orbits (perigee) of approximately 500 kilometers in that part of the world. The prime target for the U.S. ASAT system has been reported to be Soviet nuclear reactor-powered ocean reconnaissance satellites (#9). As with the Soviet ASAT, more capable launch vehicles could be utilized to increase the altitude range of the U.S. ASAT device.

On Jan. 27, 1983, GAO released a classified report on the U.S. ASAT program (an unclassified fact sheet is available, see REFERENCES). According to GAO, the air-launched ASAT system was selected as a relatively cheap, quick way to get an ASAT capability, but it has become "a more complex and expensive task than originally envisioned, potentially costing in the tens of billions of dollars." GAO recommended that Congress review the current ASAT program and consider alternative technologies for accomplishing the mission before the air-launched vehicle enters production.

In April 1982, Dr. Robert Cooper, director of DARPA, stated that 15 aircraft would be equipped for the ASAT role. In April 1983, he was quoted in the trade press as saying that 6 captive tests of the ASAT had been successfully completed. Other press reports state that active tests will commence in 1983, but that a test against a space target will not take place until 1984.

Funding for the U.S. ASAT system was $148.8 million in FY82 and $218 million in FY83. The FY84 request was $225 million including $19 million for procurement (the first time procurement funds have been requested), and it was approved by Congress, although the procurement money cannot be expended until certain conditions are met (see CONGRESSIONAL ACTION).

Space-Based System

Conventional Systems. From 1960-1962, the United States had a program to develop a satellite capable of rendezvousing with enemy satellites in Earth orbit. Called SAINT, the program never reached the flight test stage. (The Aeronautics and Space Reports of the President for the time period involved here indicate that the acronym SAINT stood for Satellite Inspector. Other reference sources state that it meant Satellite Interceptor, or Satellite Inspection and Negation.)

Lasers and Particle Beams. The United States now has an active program for developing the technology for space laser weapons that could have ASAT applications. Tests of an airborne gas dynamic laser for use against tactical missiles have been conducted by the Air Force. As stated in 1981 by then Air Force Secretary Hans Mark: "These efforts will lead naturally to the solution of problems that will be faced when we are ready to put high-energy lasers in space."

DARPA has a program for developing space-based laser technology which involves three technologies, and is referred to as the "space-laser triad" (#11). The first technology, for acquisition, pointing and tracking of the target, is code-named Talon Gold; it will be tested in 1985 aboard the space shuttle as part of the Air Force Space Test Program. The Talon Gold experiment will test a low power laser against both high-altitude aircraft and space targets (#12). The second technology area, high efficiency infrared chemical lasers, is being developed under the name Project Alpha; it is a ground test program to establish the feasibility of a laser suitable for use

in space. Chemical lasers are considered better than gas dynamic lasers for space purposes because they are smaller, require low temperatures and a vacuum (the conditions in space) for operation, and the toxic wastes would not present a disposal problem. Alpha was originally designed to produce 5 megawatts of power, but recent developments may enable doubling that power level (#13). New advances in short wavelength lasers may show that these would be preferable to chemical long wavelength lasers. The third technology, mirror and beam control optics, is being studied under the name Lode (large optics demonstration experiment); it is designed to establish the feasibility of large aperture beam control in space. DARPA's high energy laser program was funded at $129 million in FY83, while the FY84 request is $172.6 million.

The individual services (Army, Air Force, and Navy) each have their own high energy laser programs, and, together with DARPA, have spent a total of approximately $2 billion on high energy laser research. Estimates vary as to when the United States might have space-based lasers operational, with advocates saying they could be available within this decade and critics suggesting it may be 20 to 30 years.

During consideration of the FY83 request for space-based laser research, a debate emerged over whether to continue with the existing research program for developing chemical lasers, or to proceed with a short wavelength laser technology effort. The FY83 DOD funding bill (P.L. 97-252) added $20 million for short wavelength laser technology to the $27.6 million that had been requested. The FY84 request for space-based laser research (as opposed to high-energy laser research in general) is $36 million for the Air Force and $173 million for DARPA. During floor debate on the FY84. DOD authorization bill, Senator Wallop sought to add $125 million to the space-based laser program, and to transfer it from DARPA to the Army's Ballistic Missile Defense Office. His amendment was defeated 27-65 on July 19.

The DOD appropriation bill (P.L. 98-212) created a new Strategic Laser Systems Technology program for which $51.5 million was provided ($28 million for space-based lasers). Other space laser funding is included in the Advanced Radiation Technology program ($52.53 million), and DARPA's Strategic Technology Program ($280.5 million, not all of which is for space-based lasers).

The United States began particle beam research in 1958 under a DARPA program called SEESAW. Although SEESAW was terminated in 1972, the Navy established a particle beam research program in 1974 called Chair Heritage; it was transferred to DARPA in 1979. A year later, the Army's program in particle beam research, called Sipapu or White Horse, was also transferred to DARPA. It is generally agreed that particle beam development is many years behind that of lasers.

For FY83, Congress authorized and appropriated $33 million for particle beam research, an increase of $2 million over the request. The FY84 appropriation is $33.1 million.

Space Shuttle Role in ASAT Programs

The Soviet Union has indicated that it considers the U.S. space shuttle (see issue brief 81175, Space Shuttle) an ASAT-related vehicle on the basis that it can maneuver close to satellites, friendly or enemy. According to the Soviets, the shuttle's Remote Manipulator System (RMS), designed to deploy and/or retrieve satellites in orbit, could be used either to destroy

Soviet satellites directly or emplace destructive mechanisms on them. Similar charges could be raised about the remotely controlled Teleoperator Retrieval System. The shuttle will be used to test systems which might have ASAT applications (such as Talon Gold), and could be used to carry components of space-based weapons into orbit for assembly, but the shuttle is not a weapon itself.

Conversely, some concern has been expressed by U.S. sources about the vulnerability of the space shuttle to a potential Soviet ASAT attack, raising the possibility that the shuttle may someday be equipped with a defensive laser system (which could be used for offensive purposes as well).

SPACE-BASED BALLISTIC MISSILE DEFENSE

Many of the technologies already described for ASAT applications could also be used for destroying ballistic missiles enroute to their targets. Intercontinental ballistic missiles (ICBMs) and some submarine-launched ballistic missiles (depending on their range and target) arc through space to reach their destinations, so a space-based system could destroy the missiles, preferably during the boost phase, prior to the separation of individual warheads. Tactical nuclear missiles would not be affected unless an extremely powerful directed energy weapon was used to penetrate the atmosphere.

In 1982, a group called High Frontier, then affiliated with the Heritage Foundation, released a report outlining a long-term National strategy for defense, which the group claimed would change U.S. policy from that of mutally assured destruction to mutally assured survival by relying on defensive technologies to protect the country against nuclear attacks. Among the proposals was a Global Ballistic Missile Defense (GBMD) system which included a space-based BMD system. The group recommended placing 432 satellites in Earth orbit (enough so that all Soviet ICBM silos would be covered at all times), each armed with 40-50 miniature homing vehicles based on the design for the F-15 ASAT system (described earlier). The group emphasized that a space-based BMD system could be established with existing technology, while allowing that someday lasers might be used for such a mission. The cost of the conventional GBMD system was estimated by High Frontier at $15 billion. Other groups have esimated much higher costs; DOD expects that the Higher Frontier proposal would cost $60-100 billion. Critics also point out that the High Frontier system would violate the 1972 ABM treaty since it uses conventional technology.

Lasers or particle beams could also be used for space-based BMD according to some analysts, although physicists vehemently argue on both sides of the issue as to whether they are technically feasible or not. The cost for such a system has been described by some DOD analysts as "staggering," with the estimate that 50-100 space-based lasers would be required for a minimum system. Since an actual system has not yet been designed, providing an actual cost is impossible, although clearly it would be greater than for the High Frontier concept which uses existing technology. The 1972 ABM treaty prohibits development of space-based ABM systems, except that those based on "other physical principles" than were in use for ABM purposes in 1972 are exempted. This would seem to include lasers and particle beams, so development of such a system does not necessarily violate the treaty. Another question is the vulnerability of a space-based system to attack by ASATs, including space mines, and to countermeasures such as painting the

missile with a highly reflective coating.

REAGAN ADMINISTRATION POSITION

ASATs

The Reagan Administration established an Intergovernmental Group (IG) within the Executive Branch to review and study ASAT policy. The IG is co-chaired by Richard Burt of the State Department and Richard Perle of DOD. The Arms Control and Disarmament Agency (ACDA), the Joint Chiefs of Staff, the National Security Council, the National Aeronautics and Space Administration, the Office of Science and Technology Policy, and the Central Intelligence Agency are also represented on the IG.

President Reagan reaffirmed the U.S. commitment to pursue an operational ASAT system in his Oct. 2, 1982 pronouncement on U.S. strategic defense systems (including the M-X missile and the B-1 bomber). In his space policy directive issued on July 4, 1982, the President further emphasized his commitment to the ASAT program "with operational deployment as a goal." The policy statement also identifies the primary purpose of the ASAT system as deterring threats to space systems and denying "any adversary the use of space-based systems that provide support to hostile military forces."

In August 1982, DOD released an unclassified fact sheet (based on a classified study) outlining its space policy. Regarding ASATs, the policy directs the continued development of an ASAT "within such limits imposed by international law," adding that DOD planning "emphasizes adherence to the existing international legal regime which pertains to space" and that DOD would "consider verifiable and equitable arms control measures that would ban or otherwise limit the deployment of specific weapons systems should those measures be compatible with United States national security."

Space-based BMD

On Mar. 23, 1983, in a televised address to the Nation, President Reagan noted that the United States had increasingly based its strategy of deterrence "upon the threat of retaliation." He then asked if it wouldn't be better if the United States could "intercept and destroy strategic ballistic missiles before they reach our own soil or that of our allies" instead. He announced that he would direct a "comprehensive and intensive effort to define a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles." According to press accounts, the White House had indicated prior to the speech that these references included the possibility of establishing a space-based ballistic missile defense system, while cautioning that this was not necessarily an endorsement of the High Frontier concept, and that the long-term R&D effort would include a wide array of potential technologies, including, but not limited to, lasers, particle beams, and microwaves.

Two groups were established following the President's speech to make recommendations on what technologies to develop. Although the studies have not been officially released, their results have been disclosed in Aviation Week and Space Technology (see REFERENCES). The Defensive Technologies Study Panel, headed by former NASA Administrator James Fletcher, concluded that a wide range of technologies should be explored and that boost phase intercept of ICBMs would be the key element to protecting the U.S. from a Soviet

attack. A parallel study, the Future Security Strategy Study, headed by Fred S. Hoffman of Pan Heuristics, also provided input in these issues. An interagency group melded the results of these two reports, concluding that with vigorous technology development programs, BMD could be demonstrated by the early 1990s. Technologies would include ground- and space-based options.

President Reagan was briefed on the results of these studies on Nov. 30, 1983, and reportedly was enthusiastic about the possibilities, although no decisions were made on whether or not space-based weapons would actually be deployed. Funding levels for FY85 and beyond have not been precisely determined, but it is anticipated that the FY85 DOD budget request will include a 25-50% increase for BMD development. The Fletcher Commission suggested two approaches to funding the program. The first is "fiscally constrained," with recommended levels of $1.3 billion inFY84, $1.9 billion in FY85, $2.5 billion in FY86, $3.1 billion in FY87, $3.7 billion in FY88, and $4.3 billion in FY89. The second is "technology limited," with recommended levels of $1.3 billion in FY84, $2.3 billion in FY85, $3.4 billion in FY86, $4.3 billion in FY87, $4.6 billion in FY88, and $4.9 billion in FY89.

TREATY POSSIBILITIES

Existing Treaties

Several existing treaties affect military operations in space, but none prohibits development or use of non-nuclear ASATs. The 1963 Limited Test Ban Treaty and the 1967 Outer Space Treaty prohibit placing nuclear weapons or any other weapons of mass destruction in space. The 1972 SALT I treaty (Treaty on the Limitation of Anti-Ballistic Missile Systems) prohibits interference with "national technical means of verification," a phrase commonly thought to refer to reconnaissance satellites. Other types of satellites probably would not be protected under that treaty, however. The 1972 accord also prohibits develpment, testing, or deployment of space-based ABM systems, although systems based "on other physical principles" are subject to further discussions. Finally, the charter of the United Nations prohibits States from the threat or use of force against the territorial integrity of any State. This language has been used customarily to include ships and airplanes, and thus may also apply to spacecraft.

1978-1979 Limitation Talks

At a Mar. 9, 1977, press conference, President Carter announced that he had approached the Soviet Union about the possibility of forgoing "the opportunity to arm satellite bodies and also to forgo the opportunity to destroy observation satellites."

Three rounds of ASAT limitation talks were held: June 8-15, 1978, in Helsinki; Jan. 23-Feb. 16, 1979, in Bern; and Apr. 23-June 17, 1979, in Vienna. Further talks were planned, but following the Soviet invasion of Afghanistan in December 1979, the climate for arms control talks chilled and no further meetings have been scheduled.

U.S. objectives at the talks included developing a treaty forcing the cessation of ASAT tests, requiring the Sovet Union to dismantle its system, and providing for verification (#14). How successful the talks were in achieving these objectives is difficult to assess. The Soviets, for example, claimed that the U.S. space shuttle is an ASAT and therefore should be

discussed in the context of the limitation talks. As noted earlier, the shuttle may be used to carry experiments with eventual application to the development of ASATs, but is not itself a weapon, and the U.S. rejected the Soviet position. Another obstacle in achieving an agreement may have been Soviet concern over the Chinese space program. Eight Chinese satellites were launched from 1970 to 1978, of which four were reportedly related to reconnaissance.

1981 and 1983 Soviet Draft Treaties

On Aug. 11, 1981, the Soviet Union submitted to the United Nations a draft treaty banning the stationing of weapons in space. The draft was sent to the First Committee from the General Assembly, which subsequently referred the matter to the Committee on Disarmament. No further action was taken.

On Aug. 18, 1983, Soviet Premier Andropov met with nine U.S. senators who were visiting Moscow. Andropov expressed concern about space weapons and called for a "complete prohibition of the testing and development of any space-based weapons for hitting targets on Earth, in the air or in outer space." He further committed the USSR "not to be the first to put into outer space any type of antisatellite weapons" as long as other countries, including the United States, will "refrain from stationing in outer space antisatellite weapons of any type." Thus, although Andropov still did not admit that the USSR has an ASAT system, he apparently is willing to both suspend its testing and discuss its dismantlement in return for a U.S. commitment not to station weapons in outer space. What is unknown is whether he meant to call for a U.S. ban on testing ASAT weapons and on deploying the F-15 ASAT, which is "stationed" on an aircraft, not in space.

On Aug. 22, 1983, the Soviets introduced a revised draft treaty at the United Nations which is substantially different from the 1981 draft. The new text would ban the use of force in space, rather than simply the stationing of weapons. Also, it calls for dismantlement of existing ASAT systems, although the Soviets still do not admit that they have such a system. Another provision would prohibit the use of any manned spacecraft for military purposes, which would probably prohibit the use of the space shuttle to launch any military satellite.

The new draft was referred to the First Committee, and it appears as though it will be referred from there to the Committee on Disarmament. On Nov. 25, 1983, the United States was the only country to vote against a resolution in the First Committee calling for negotiations on a treaty to ban weapons from space (although not necessarily on the Soviet text). The vote was 120-1, with one country (the United Kingdom) abstaining. The United States position is that it is not ready to negotiate at this time.

Verification Problems

Verification is the most often cited potential obstacle to reaching an ASAT accord. The level of difficulty will depend in large part on exactly what the treaty prohibits (development, testing, possession, deployment, or use) or demands (e.g., dismantlement of existing systems).

Since only the Soviet co-orbital system is considered operational, and therefore is likely to be the cornerstone of discussions on an ASAT treaty, it will be the focus of this discussion of potential verification problems. In the case of the U.S. F-15 ASAT, it can be assumed that the Soviets would have similar difficulties in verifying that the U.S. is not developing or

testing that system. In fact, the problems might be more severe since the U.S. ASAT is so small and can be placed on any F-15, whereas the Soviet ASAT can only be readily launched from two launch sites. One advantage the Soviets would have is that so much more information is publicly available in the United States.

In the case of the Soviet co-orbital ASAT, the time for prohibiting development has long since passed. The use of the ASAT is relatively easy to detect, although if the Soviets perfect a single-orbit intercept this may become more difficult, since distinguishing between a satellite that has malfunctioned or been hit by a piece of space debris and one that has been attacked by an ASAT is extremely difficult if the approach of the ASAT towards the satellite has not been seen.

If testing were banned, a number of difficulties would be encountered in verification. For example, the SS-9 used to launch the ASAT is also used for launches of radar ocean reconnaissance satellites (RORSATs) and electronic ocean reconnaissance satellites (EORSATs). Whether or not U.S. national technical means of verification can tell if a payload on top of an SS-9 is an ASAT, RORSAT, or EORSAT is classified, so suffice it to say that some measures may have to be taken to insure that an ASAT is not being carried by the SS-9 (perhaps by "functionally related observable differences" as suggested for cruise missiles in the SALT II agreed statement).

Other difficulties would arise if changes were made to the now well-recognized pattern in which ASAT tests are conducted. At the present time the tests have a distinctive signature: a target is launched from Plesetsk with an SS-5 missile into an orbit with an inclination near 65 degrees; sometime later (days, weeks, or even months) an interceptor is launched by an SS-9 from Tyuratam with a similar inclination; after one or two orbits the target is intercepted and the interceptor either explodes or is deorbited. Changes that might occur include launching the interceptor against a point in space instead of an object, so the target's launch, which currently provides the first clue that an ASAT test is imminent, could be avoided. Also, a different launch vehicle could be used, for example, a larger vehicle for testing an improved ASAT. A different SS-9 pad at Tyuratam or Plesetsk could be used. Also, although it has been reported that the telemetry stream from an ASAT can be monitored (#15), the transmissions could be altered so that it could not be monitored in a useful manner. Thus, verifying that ASAT tests are not being made may not be a simple matter.

Concerning prohibitions against deployment of an ASAT, many of the above considerations would apply. In addition, assurances that the existing system was dismantled and could not be quickly reconstituted would probably require on-site inspection, but even that might not be sufficient. The SS-9 would probably continue in production for its use as a launcher for other satellites, and a small number of ASAT payloads could conceivably be hidden from on-site investigators or simply moved off-base until they had left. Some have suggested that possession of an ASAT capability be permitted as long as it is not deployed. The circumstances under which a system would be considered "deployed" instead of simply "possessed" is unclear.

The ultimate concern is that there are relatively few U.S. satellites that would have to be neutralized in order to impact the U.S. strategic posture. Thus, if even a few ASATs escape the verification process, a severe impact on U.S. national security could result. This is not the case for ballistic missiles, where hundreds are permitted by treaty, so if a few are missed, it would barely make a difference. Thus, fool-proof verification

measures are more critical in the case of ASATs.

CONGRESSIONAL ACTION

97th Congress Three resolutions were introduced in the 97th Congress concerning space weapons. In 1981, Senator Pressler introduced a resolution (S.Res. 129) calling for a resumption of ASAT limitation talks, and hearings were held in the Senate Foreign Relations Committee on Sept. 20, 1982. Following the hearings, Senator Pressler introduced a resolution (S.Exec.Res. 7) calling for negotiation of a protocol to the 1967 Outer Space Treaty providing for a complete and verifiable ban on the development, testing, deployment, or use of antisatellite weapons.

On Sept. 23, 1982, Representative Moakley and 29 co-sponsors introduced H.J.Res. 607 calling for immediate negotiations for a ban on weapons of any kind in space. Senator Matsunaga introduced a resolution on Sept. 29 (S.Res. 488) calling for talks with the Soviet Union and other countries with a space capability concerning the possibility of establishing a weapons-free international space station as an alternative to creating competing armed space stations.

No further action was taken on any of these resolutions.

98th Congress

Congressional interest in space weapons has risen considerably in the 98th Congress. One resolution has been reported from committee in the Senate and two are pending in the House which call for a resumption of the ASAT limitation talks with the Soviets, while one House and one Senate resolution would promote international cooperation in space as an alternative to a space arms race. Conversely, one Senate resolution, one Senate bill and one House bill would instead accelerate U.S. space weapons programs. Five sets of hearings have been held specifically on this topic. In addition, two amendments were debated on the House floor and two on the Senate floor during consideration of the FY84 DOD authorization bill relating to space weapons, and language was added to DOD appropriations bill as well.

Legislation Opposed to Space Weapons. The two resolutions in the House are H.J.Res. 87, introduced by Representative Kastenmeier on January 25, and H.J.Res. 120, introduced by Representative Moakley and 76 co-sponsors on February 2. The two resolutions are very similar and call on the President to resume talks with the Soviet Union aimed at banning all weapons from space. The Moakley resolution directs the President to request the United Nations to initiate negotiations aimed at expanding Article IV of the 1967 Outer Space Treaty to include such a ban. Hearings were held on the Moakley resolution by the House Foreign Affairs Committee on Nov. 10, 1983.

In the Senate, S.J.Res. 28 was introduced by Senator Tsongas and two co-sponsors on February 3; it was identical to Representative Moakley's resolution. On February 2, Senator Pressler and 6 co-sponsors introduced S.Res. 43 which called for negotiations to ban antisatellite weapons as a first step towards banning all weapons from space. Following hearings on Apr. 14 and May 18, 1983, Senators Pressler and Tsongas and others introduced a compromise resolution, S.J.Res. 129, which was favorably reported by the Senate Foreign Relations Committee on Nov. 18 (S.Rept. 98-432).

Senator Matsunaga introduced S.Con.Res. 16 on March 10 which would express the sense of the Senate that the President renew the space cooperation agreement with the Soviet Union and explore opportunities for cooperative ventures in space as an alternative to an arms race in space. A similar resolution, H.Con.Res. 140, was introduced by Mr. Levine and six co-sponsors on June 30, 1983.

Legislation in Favor of Space Weapons. On Mar. 24, 1983, Senators Wallop and Laxalt introduced S.Res. 100 calling for the President to expeditiously request funding to make a space-based ballistic missile defense system a reality as soon as possible. The resolution was referred to the Armed Services Committee.

On May 19, Representative Kramer and 11 co-sponsors introduced H.R. 3073, the People Protection Act. Among other things, the bill would establish a new agency for accelerating the development of directed-energy technology. The bill was referred jointly to the Committees on Armed Services, Foreign Affairs, and Science and Technology, and hearings were held by the House Armed Services Committee on Nov. 10. Senator Armstrong introduced an identical bill (S. 2021) on Oct. 28.

Hearings. Five days of hearings have been held specifically on the subject of space weapons, and it was also mentioned during hearings on the FY84 DOD funding bills.

In addition to the two House hearings noted above, the Senate Foreign Relations Committee held hearings on space weapons and the President's March 23 speech in particular on April 14 and May 19.

The Senate Armed Services Committee held one day of hearings specifically on this topic on May 2.

Floor Debate. During House consideration of the FY84 DOD authorization bill, H.R. 2969, Representative George Brown introduced an amendment to deny procurement funding ($19.4 million) for the U.S. ASAT system, although R&D funding would not have been affected. The amendment was vigorously debated on May 26 and June 14, and was defeated by a vote of 177-243. On July 21, Representative Seiberling introduced an amendment to prohibit flight tests of the U.S. ASAT until authorized by Congress. The amendment was defeated 142-275.

In the Senate, on July 18 an amendment introduced by Senator Tsongas was adopted by a vote of 91-0 that provides that no funding can be obligated or expended to test any explosive or inert ASAT against objects in space unless the President determines and certifies to Congress that (1) the U.S. is endeavoring in good faith to negotiate a treaty with the Soviet Union for a mutual and verifiable ban on ASATs, and (2) that pending such an agreement, such tests are necessary for the national security.

Separately, on July 21 Senator Wallop introduced an amendment to increase funding for space-based laser programs by $125 million and to transfer the program out of DARPA and into the Army's Ballistic Missile Defense Office. The amendment was defeated 27-65.

DOD Appropriation Bill. During mark-up of the DOD appropriation bill (H.R. 4185), the House Appropriations Committee decided to delete the $19.4 million for procurement of the U.S. ASAT, pending a report from the President on his policies regarding arms control in space (H.Rept. 98-427,

Oct. 20, 1983). The Senate did not take similar action, and during conference (H.Rept. 98-567, Nov. 18, 1983) a compromise was reached whereby the money has been withheld until such a report is submitted, after which it may be spent. The report must be submitted by Mar. 31, 1984. The bill passed both Houses, and was signed into law on Dec. 8 (P.L. 98-212).

SURVIVABILITY OF CRITICAL U.S. MILITARY SATELLITE SYSTEMS

In the absence of an ASAT limitation agreement, increasing attention has been given to the issue of satellite survivability -- methods of increasing the chances of critical U.S. military satellite systems surviving attacks by Soviet ASATs.

Several methods to increase survivability exist. For example, most U.S. military satellites are powered by solar panels, which would be vulnerable to a shrapnel attack. Using radioisotope thermal generators (RTGs) instead of solar cells could alleviate this problem, since RTGs can be located inside the spacecraft rather than protruding from the outside.

Another survivability measure is to provide critical satellites with a maneuvering capability in order to move away from an interceptor (#16). Adequate warning time must be provided for the satellite to escape, and the Air Force is acquiring new space surveillance systems to better monitor activities of satellites in orbit.

Another approach is to store spare satellites in orbit (possibly at very high altitudes -- perhaps 115,000 kilometers). Specially designed so that they would not be detected by radar systems, and maintained in a powered down mode so infrared sensors could not detect them, these satellites would be activated in the event primary systems were destroyed. Decoy satellites could also be placed in orbit.

Still other options include hardening the satellites against certain types of radiation, or equipping satellites with defensive systems.

A related problem concerns determining when a satellite has in fact been attacked. A satellite can cease operation for many reasons, and confirming that it has been attacked by an ASAT is very difficult. The United States is now placing sensors on board some satellites which will be able to determine whether they have been attacked (#17). Advanced space surveillance systems might also reduce this problem by more closely monitoring the location and maneuvers of non-U.S. satellites.

Survivability of the ground stations and data links required for command and control of satellites is another area being studied by DOD.

The costs associated with techniques for increasing survivability can be high, and decisions must still be made as to which U.S. satellites are critical enough to be equipped with survivability features, as well as determining what level of conflict the satellites should be designed to survive.

ISSUES FOR CONGRESSIONAL CONSIDERATION

1. Rationale for the U.S. ASAT Program

Two rationales for U.S. development of an ASAT have been offered. The first is that the U.S. needs a system to counteract the Soviet ASAT system. Is the Soviet ASAT a significant threat to U.S. satellites, or could U.S. satellites be equipped with survivability features (such as maneuverability) at less expense than developing an ASAT, and without the possibility of creating an arms race in space? The second rationale is that the Soviets have low-orbiting satellites that can target U.S. ships, and the U.S. needs a capability to negate these satellites in times of crisis. How critical is the threat from these satellites? How accurate is their targeting capability? Are there effective countermeasures against these satellites which could make them useless to the Soviets? How many of these satellites are in orbit and working at any given time? Are the Soviets developing advanced systems which might create a more significant threat in the future, and therefore justify a U.S. ASAT regardless of the existing threat?

2. U.S. ASAT Policy

Under what circumstances would the U.S. use its ASAT? During a limited war outside the boundaries of the United States? Only when an attack on the United States itself is imminent? What is U.S. policy regarding response to a Soviet ASAT attack against a U.S. satellite? Would the U.S. use its ASAT device to negate a Soviet satellite in response, or would greater retaliation be called for? Would a Soviet attack prompt concern that an all-out strike was about to ensue, thus causing military planners to prepare for war?

3. Space-Based Ballistic Missile Defense

Would establishment of a space-based BMD system create a stabilizing influence, because the Soviets would realize the futility of launching a strike against the United States? Would it be destabilizing, causing the Soviets to attack before the system is operational, either because it would be their last chance or because they might fear a U.S. first strike, since Soviet retaliatory missiles would be destroyed by the system?

It has been argued that a space-based BMD system would also be useful in the event a country other than the Soviet Union launched nuclear-armed ballistic missiles against the United States. How likely is it that an unfriendly country would devlop both nuclear weapons and an ICBM delivery system?

How effective would a space-based system be against nuclear missiles other than ICBMs? Are the countermeasures against space-based systems so effective that a space-based system would be useless at the time of actual conflict, or are they capable of self-defense? Considering the great cost of placing a weapons system in space, are there less expensive ways of accomplishing the same goal?

4. Treaty Considerations

Current U.S. policy is that the U.S. is not ready to negotiate with the Soviets about space weapons because no verification schemes have been worked out. Would it be fruitful to enter negotiations on a treaty even without

answers to verification questions, with the expectation that those questions could be settled during what would likely be an extended negotiation perod? Why are the Soviets so willing to negotiate about a treaty when they would probably have greater difficulty verifying U.S. compliance than the U.S. would have with them? Are they likely to lose interest in negotiations once the U.S. ASAT has been tested? Without knowing exactly what the treaty would prohibit or demand, how can verification issues be resolved in advance?

FOOTNOTES

1. Robinson, Clarence A. Space-Based Systems Stressed. Aviation Week and Space Technology, Mar. 3, 1980: 25.

2. Ibid.

3. U.S. Funds Killer Satellite Effort. Aviation Week and Space Technology, Feb. 6, 1978: 19.

4. Information on Soviet ASAT Test compiled from following sources: (1) Soviets Test Killer Spacecraft. Aviation Week and Space Technology, Oct. 30, 1978: 17. (2) Covault, Craig. New Soviet Antisatellite Mission Boosts Backing for U.S. Tests. Aviation Week and Space Technology, Apr. 28, 1980: 20. (3) Soviet ASAT Mission Judged Close Enough For a Kill. Aerospace Daily, Feb. 4, 1981: 172. (4) Soviets Test Another Killer Satellite. Aviation Week and Space Technology, Mar. 23, 1981: 22-23. (5) U.S. Congress. Senate. Committee on Aeronautical and Space Sciences. Soviet Space Programs 1966-1970. Committee Print. Washington, U.S. Govt. Print. Off., 1971; (6) U.S. Congress. Senate. Committee on Aeronautical and Space Sciences. Soviet Space Programs 1971-1975. Committee Print. Washington, U.S. Govt. Print. Off., 1976. (7) Sheldon, Charles. United States and Soviet Progress in Space: Summary Data Through 1980 and a Forward Look. CRS Report No. 81-27 S., Jan. 15, 1981.

5. Ibid.

6. Information on U.S. ground-based ASAT system compiled from the following sources: (1) Anti-Satellite Polaris Being Developed. Aviation Week and Space Technology, Sept. 28, 1964: 18-19. (2) Satellite Killers. Aviation Week and Space Technology, June 21, 1976: 13. (3) Antisatellite Effort Decision Awaited. Aviation Week and Space Technology, Jan. 24, 1977: 19. (4) Remarks of President Lyndon Johnson in Sacramento, California, Sept. 17, 1964 (Public Papers of the Presidents, Book II).

7. Perry Sees Technology Shifts to Soviets. Aerospace Daily, Mar. 4, 1981: 18.

8. Covault, Craig. Antisatellite Weapon Design Advances. Aviation Week and Space Technology, June 16, 1980: 243-7.

9. Priorities Set for Antisatellite System. Aviation Week and Space Technology, Sept. 3, 1979: 57.

10. Robinson, Clarence A., Jr. Strategic Defense Draws Strong Focus. Aviation Week and Space Technology, Apr. 13, 1981: 70.

11. Ulsamer, Edgar. Advanced Technology in Space. Air Force Magazine, June 1981: 99.

12. Defense Advanced Research Projects Agency plans to launch the Talon Gold laser pointing and tracking payload on the space shuttle in 1985. Aviation Week and Space Technology, Apr. 27, 1981: 23.

13. Senate Directs Air Force to Formulate Laser Plan. Aviation Week and Space Technology, May 25, 1981: 53.

14. Chinese Space Gains Hamper Antisatellite Limitation Treaty. Aviation Week and Space Technology, July 9, 1979: 18-19.

15. Pike, John. Verification of Limits on the Soviet Antisatellite Weapon -- a staff study. Congressional Record, July 21, 1983: H5415.

16. Ulsamer, op. cit., p. 101.

17. Priorities Set for Antisatellite System, op. cit.

LEGISLATION

P.L. 98-94, S. 675

Authorizes appropriations to the Department of Defense for FY84. Reported from House Armed Services Committee on May 11 (H.Rept. 98-107); passed House July 26 after defeating the Brown amendment to deny procurement funding for the U.S. ASAT program, and the Seiberling amendment to prohibit flight tests of the U.S. ASAT until authorized by Congress. Reported from Senate Armed Services Committee on July 5 (S.Rept. 98-174); passed Senate July 26 after adopting Tsongas amendment to prohibit ASAT tests against space objects until the President certifies to Congress that he is endeavoring to negotiate an ASAT ban with the Soviet Union and that, pending such an agreement, ASAT tests are necessary for national security reasons. Senate also rejected the Wallop amendment to increase funding for space-based lasers and to transfer the program from DARPA to the Army. Conference report (H.Rept. 98-352, Sept. 12) passed Senate Sept. 13, House Sept. 15. Signed into law Sept. 24.

P.L. 98-212, H.R. 4185

Appropriates funding to DOD for FY84. Reported from House Appropriations on Nov. 2 (H.Rept. 98-427) denying the $19.4 million requested for procurement of the U.S. ASAT, and requiring a report from the President on his policies regarding arms control in space. Reported from Senate Appropriations on Nov. 8 (S.Rept. 98-292) approving all ASAT funding. Conference report (H.Rept. 98-567, Nov. 18) included language withholding the

$19.4 million until the report requested in the House version is provided by the President, which must be no later than Mar. 31, 1984. Conference report passed the House and Senate on Nov. 18. Signed into law Dec. 8.

H.J.Res. 87 (Kastenmeier)

Joint resolution calling for a verifiable comprehensive treaty banning space weapons. Introduced Jan. 25, 1983; referred to Committee on Foreign Affairs.

H.J.Res. 120 (Moakley et al.)

Joint resolution calling for immediate negotiations for a ban on weapons of any kind in space. Introduced Feb. 2, 1983; referred to Committee on Foreign Affairs. Hearings held on Nov. 10, 1983.

H.Res. 215 (Whitehurst et al.)/ S.Res. 100 (Wallop and Laxalt)

Expresses the sense of the Senate that the President expeditiously recommend to Congress the budgetary steps necessary to build a space-based ballistic missile defense system by the earliest possible date. Referred to respective Armed Services Committees.

H.Res. 259 (Bennett)

Similar to H.Res. 215 and S.Res. 100, but does not specify that the BMD weapons be based in space. Referred to House Armed Services Committee.

H.R. 3073 (Kramer et al.)/S. 2021 (Armstrong)

People Protection Act. Would establish an agency to accelerate development of directed energy technology, create a unified space command, transfer to DOD space-launch vehicles (such as the space shuttle) necessary for national security space activities, and order development of a manned space station for national security and other space activities. H.R. 3073 introduced May 19, 1983; referred to Armed Services, Foreign Affairs, and Science and Technology. Hearings held by Armed Services on Nov. 10, 1983. S. 2021 introduced Oct. 28; referred to Armed Services.

S.Con.Res. 16 (Matsunaga and Pell)/H.Con.Res. 140 (Levine et al.)

Resolution expressing the sense of the Senate that the President renew the 1972-1977 agreement with the Soviet Union for cooperation in space activities, and to initiate talks with the Soviet Union and other interested governments on the opportunities for cooperative ventures in space as an alternative to an arms race in space. Referred to Senate Committee on Foreign Relations and House Committee on Foreign Affairs.

S.J.Res. 129 (Pressler et al.)

Calls for a mutual and verifiable ban on weapons in space and on weapons designed to attack objects in space. This is a compromise between S.J.Res. 28 (Tsongas et al.) and S.Res. 43 (Pressler et al.). Reported from the Senate Foreign Relations Committee on Nov. 18, 1983 (S.Rept. 98-342).

HEARINGS

U.S. Congress. Senate. Committee on Foreign Relations. Subcommittee on Arms Control, Oceans, International Operations and Environment. Arms control and the militarization of space. Hearings, 97th Congress, 2d session. Sept. 20, 1982. Washington, U.S. Govt. Print. Off., 1982.

----- Controlling space weapons. Hearings, 98th Congress, 1st session. Apr. 14 and May 18, 1983. Washington, U.S. Govt. Print. Off., 1983.

REPORTS AND CONGRESSIONAL DOCUMENTS

U.S. Congress. Committee on Conference. FY84 Department of Defense Appropriations. Nov. 18, 1983. Washington, U.S. Govt. Print. Off., 1983. (98th Congress, 1st session. House. Report no. 98-567)

U.S. Congress. Senate. Committee on Commerce, Science, and Transportation. Laser research and applications. Washington, U.S. Govt. Print. Off., 1980.
At head of title: 97th Congress, 2nd session. Committee print.

U.S. Congress. Senate. Committee on Foreign Relations. Outer space arms control negotiations. Nov. 18, 1983. Washington, U.S. Govt. Print. Off., 1983. (98th Congress, 1st session. Senate. Report no. 98-342)

CHRONOLOGY OF EVENTS

11/30/83 -- President Reagan was briefed by the National Security Council on recommendations concerning ballistic missile defense technologies.

11/18/83 -- Congress passed FY84 DOD appropriation bill conference report, witholding procurement funding for the U.S. ASAT until the President submits a report outlining his policy on arms control in space, which must be submitted no later than Mar. 31, 1984.

-- Senate Foreign Relations Committee reported out S.J.Res. 129.

09/24/83 -- FY84 DOD authorization bill was signed into law (P.L. 98-94), including the Tsongas amendment.

08/22/83 -- Soviets introduced a new draft treaty at the U.N. calling for a ban on the use of force in space and dismantlement of existing ASAT systems.

08/18/83 -- Andropov stated that the USSR would not be the first to put ASATs in outer space as long as other countries refrained from stationing such weapons there (avoiding the admission that the Soviets already have an ASAT system). He also said that he is prepared to agree to dismantle existing ASAT systems and prohibit the development of new ones.

07/21/83 -- Senate rejected the Wallop amendment to the FY84 DOD authorization bill to increase funding for space-based laser development by $125 million and to transfer the program from DARPA to the Army.

-- House rejected the Seiberling amendment to the FY84 DOD authorization bill to prohibit testing of the U.S. ASAT device until authorized by Congress.

07/18/83 -- Senate adopted the Tsongas amendment to the FY84 DOD authorization bill to prohibit in-space testing of the U.S. ASAT until the President certifies to Congress that he is endeavoring to negotiate an ASAT ban with the Soviets, and that pending such an agreement, such tests are necessary for national security reasons.

06/14/83 -- Congressman Brown's amendment to the DOD authorization bill to delete procurement funding for the ASAT system was defeated.

05/19/83 -- Senate Foreign Relations Committee held hearings on space weapons.

05/02/83 -- Senate Armed Services Committee held hearings on space weapons.

04/14/83 -- Senate Foreign Relations Committee held hearings on space weapons.

03/23/83 -- President Reagan made a nationally televised address in which he announced the initiation of a comprehensive and intensive effort to define an R&D program leading to a defensive system to destroy ballistic missiles, which his advisers explained might include space-based systems.

09/20/82 -- Senate Foreign Relations Committee held hearings on weapons in space.

07/04/82 -- President Reagan announced his new space policy, which included a reaffirmation of his commitment to developing an ASAT system.

06/18/82 -- Soviets conducted twentieth test of their ASAT

system.

10/02/81 -- President Reagan reaffirmed the U.S. commitment to pursue an operational ASAT system.

08/11/81 -- Soviet Union submitted draft ASAT treaty to the United Nations banning the stationing of weapons in space.

04/18/80 -- Soviets resumed testing of their ASAT system after a two year hiatus during ASAT limitation talks and SALT II consideration. The test is considered a probable failure.

04/23/79 -- Third session of ASAT limitation talks began in Vienna, Austria. Further talks have been postponed indefinitely.

01/23/79 -- Second session of ASAT limitation talks began in Bern, Switzerland.

06/08/78 -- First session of ASAT limitation talks between the U.S. and Soviet Union began in Helsinki, Finland.

05/19/78 -- Soviets conducted sixteenth test of their ASAT system, just three weeks prior to scheduled ASAT limitation talks with the United States. Last test until April 1980; considered a possible success.

00/00/75 -- U.S. deactivated its ground-based ASAT system.

10/03/72 -- SALT I agreements were signed.

10/20/68 -- Soviets conducted the first test of their space-based ASAT system, which is considered a probable failure.

09/17/64 -- President Johnson announced that the United States had an operational ASAT system.

07/16/62 -- Soviet Premier Khruschev stated that the Soviet Union had a missile capable of "hitting a fly in outer space," interpreted by some western experts as a reference to an ASAT capability.

ADDITIONAL REFERENCE SOURCES

Damaged satellite. Aviation week and space technology, Feb. 21, 1983: 13.

Defensive technologies study sets funding profile options. Aviation week and space technology, Oct. 24, 1983: 50-51.

Hafner, Donald L. Averting a Brobdingnagian skeet shoot: arms control measures for anti-satellite weapons. International security, Winter 1980/81: 41-60.

Henderson, Wallace D. Space-based lasers: ultimate ABM system?

Astronautics and aeronautics, May 1982: 44-53.

High Frontier Project. High frontier: a new national strategy. Washington, High Frontier, 1982.

Jasani, Bhupendra, ed. Outer space -- a new dimension of the arms race. London, Taylor & Francis, 1982.

Johnson, Nicholas. Soviet year in space. Costa Mesa, Calif., Teledyne-Brown Engineering, 1982.

Robinson, Clarence. Panel urges defense technology advances. Aviation week and space technology, Oct. 17, 1983: 16-18.

----- Panel urges boost-phase intercepts. Aviation week and space technology, Dec. 5, 1983: 50-56.

----- Study urges exploiting of technologies. Aviation week and space technology, Oct. 24, 1983: 50-51, 55-56.

Smernoff, Barry J. Strategic and arms control implications of laser weapons: a preliminary assessment. Air University Review, Jan.-Feb. 1978: 38-50.

Tsipis, Kosta. Laser weapons. Scientific american, Dec. 1981: 51-57.

U.S. Department of Defense. Soviet military power. Washington, U.S. Govt. Print. Off., 1983.

U.S. General Accounting Office. DOD's space-based laser program: potential progress and problems. Washington, U.S. GAO, Feb. 26, 1982. C-MASAD-82-10

----- U.S. antisatellite program needs a fresh look. Washington, U.S. GAO, Jan. 27, 1983. GAO/C-MASAD-83-5. 3 pp.

U.S. Library of Congress. Congressional Research Service. Space policy and funding: military uses of space [by] Marcia S. Smith. (Continuously updated)
Issue Brief 82117

----- Space shuttle [by] Marcia S. Smith. (Continuously updated)
Issue Brief 81175