HR 2977 IH

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H. R. 2977

To preserve the cooperative, peaceful uses of space for the benefit of all humankind by permanently prohibiting the basing of weapons in space by the United States, and to require the President to take action to adopt and implement a world treaty banning space-based weapons.

IN THE HOUSE OF REPRESENTATIVES

October 2, 2001

Mr. KUCINICH introduced the following bill; which was referred to the Committee on Science, and in addition to the Committees on Armed Services, and International Relations, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To preserve the cooperative, peaceful uses of space for the benefit of all humankind by permanently prohibiting the basing of weapons in space by the United States, and to require the President to take action to adopt and implement a world treaty banning space-based weapons.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the `Space Preservation Act of 2001'.

SEC. 2. REAFFIRMATION OF POLICY ON THE PRESERVATION OF PEACE IN SPACE.

Congress reaffirms the policy expressed in section 102(a) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2451(a)), stating that it `is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind.'.

SEC. 3. PERMANENT BAN ON BASING OF WEAPONS IN SPACE.

The President shall--

(1) implement a permanent ban on space-based weapons of the United States and remove from space any existing space-based weapons of the United States; and

(2) immediately order the permanent termination of research and development, testing, manufacturing, production, and deployment of all space-based weapons of the United States and their components.

SEC. 4. WORLD AGREEMENT BANNING SPACE-BASED WEAPONS.

The President shall direct the United States representatives to the United Nations and other international organizations to immediately work toward negotiating, adopting, and implementing a world agreement banning space-based weapons.

SEC. 5. REPORT.

The President shall submit to Congress not later than 90 days after the date of the enactment of this Act, and every 90 days thereafter, a report on--

(1) the implementation of the permanent ban on space-based weapons required by section 3; and

(2) progress toward negotiating, adopting, and implementing the agreement described in section 4.

SEC. 6. NON SPACE-BASED WEAPONS ACTIVITIES.

Nothing in this Act may be construed as prohibiting the use of funds for--

(1) space exploration;

(2) space research and development;

(3) testing, manufacturing, or production that is not related to space-based weapons or systems; or

(4) civil, commercial, or defense activities (including communications, navigation, surveillance, reconnaissance, early warning, or remote sensing) that are not related to space-based weapons or systems.

SEC. 7. DEFINITIONS.

In this Act:

(1) The term `space' means all space extending upward from an altitude greater than 60 kilometers above the surface of the earth and any celestial body in such space.

(2)(A) The terms `weapon' and `weapons system' mean a device capable of any of the following:

(i) Damaging or destroying an object (whether in outer space, in the atmosphere, or on earth) by--

(I) firing one or more projectiles to collide with that object;

(II) detonating one or more explosive devices in close proximity to that object;

(III) directing a source of energy (including molecular or atomic energy, subatomic particle beams, electromagnetic radiation, plasma, or extremely low frequency (ELF) or ultra low frequency (ULF) energy radiation) against that object; or

(IV) any other unacknowledged or as yet undeveloped means.

(ii) Inflicting death or injury on, or damaging or destroying, a person (or the biological life, bodily health, mental health, or physical and economic well-being of a person)--

(I) through the use of any of the means described in clause (i) or subparagraph (B);

(II) through the use of land-based, sea-based, or space-based systems using radiation, electromagnetic, psychotronic, sonic, laser, or other energies directed at individual persons or targeted populations for the purpose of information war, mood management, or mind control of such persons or populations; or

(III) by expelling chemical or biological agents in the vicinity of a person.

(B) Such terms include exotic weapons systems such as--

(i) electronic, psychotronic, or information weapons;

(ii) chemtrails;

(iii) high altitude ultra low frequency weapons systems;

(iv) plasma, electromagnetic, sonic, or ultrasonic weapons;

(v) laser weapons systems;

(vi) strategic, theater, tactical, or extraterrestrial weapons; and

(vii) chemical, biological, environmental, climate, or tectonic weapons.

(C) The term `exotic weapons systems' includes weapons designed to damage space or natural ecosystems (such as the ionosphere and upper atmosphere) or climate, weather, and tectonic systems with the purpose of inducing damage or destruction upon a target population or region on earth or in space.

From the ENMOD Convention 1977

ADDITIONAL PROTOCOL I: BAN ON THE USE OF METHODS AND MEANS OF WARFARE THAT DAMAGE THE ENVIRONMENT

Protocol I of 1977 additional to the Geneva Conventions of 1949 applies to international armed conflict and contains two specific provisions for the protection of the environment. These provisions are clearly complementary to the ENMOD Convention in the event of armed conflict: while the Convention prohibits deliberate modification of the environment as a means of warfare, Additional Protocol I prohibits attacks on the environment as such, regardless of the means used. Article 35, para. 3 of Additional Protocol I prohibits the use of "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment". Using the same language, Article 55 aims to protect the population, whose health and survival in the event of armed conflict could be endangered by damage to the environment. The article also prohibits attacks on the natural environment by way of reprisals. The Rome Statute of 1998 incorporates some of the prohibitions contained in Additional Protocol I. For instance, the future International Criminal Court will have jurisdiction in respect of war crimes that consist in "intentionally launching an attack in the knowledge that such attack will cause incidental [...] widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated" (Article 8, para. 2 [b, iv]).

Source: http://www.icrc.org/Web/eng/siteeng0.nsf/iwpList74/195998B28FD631C0C1256B6=6006021F5

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Annex 1 reference material to accompany IUCN Statement

5 The definitions are as follows: widespread: encompassing an area of several hundred square kilometres; long-lasting: lasting for a period of months, or approximately a season; severe: involving serious or significant disruption or harm to human life, natural and economic resources or other assets. As examples, the Understandings also include a non-exhaustive list of phenomena that could result from the use of environmental modification techniques: earthquakes and tsunamis; an upset in the ecological balance of a region; changes in weather patterns (clouds, precipitation, cyclones and tornadic storms); changes in climate patterns; changes in ocean currents; changes in the state of the ozone layer and changes in the state of the ionosphere. ADDITIONAL PROTOCOL I: BAN ON THE USE OF METHODS AND MEANS OF WARFARE

THAT DAMAGE THE ENVIRONMENT Protocol I of 1977 additional to the Geneva Conventions of 1949 applies to international armed conflict and contains two specific provisions for the protection of the environment. These provisions are clearly complementary to the ENMOD Convention in the event of armed conflict: while the Convention prohibits deliberate modification of the environment as a means of warfare, Additional Protocol I prohibits attacks on the environment as such, regardless of the means used. Article 35, para. 3 of Additional Protocol I prohibits the use of "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment". Using the same language, Article 55 aims to protect the population, whose health and survival in the event of armed conflict could be endangered by damage to the environment. The article also prohibits attacks on the natural environment by way of reprisals. The Rome Statute of 1998 incorporates some of the prohibitions contained in Additional Protocol I. For instance, the future International Criminal Court will have jurisdiction in respect of war crimes that consist in "intentionally launching an attack in the knowledge that such attack will cause incidental [...] widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated" (Article 8, para. 2 [b, iv]).

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6 006021F5

Space Based Laser [SBL]

The potential to intercept and destroy a missile over enemy territory soon after launch, rather than over friendly territory, makes the development of a boost phase intercept (BPI) capability very desirable. In concert with ground based theater missile defense (TMD) systems already under development, the U.S. continues to investigate BPI concepts for BMD systems.

The SBL program could develop the technology to provide the U.S. with an advanced BMD system for both theater and national missile defense. BMDO believes that an SBL system has the potential to make other contributions to U.S. security and world security as a whole, such as inducing potential aggressors to abandon ballistic missile programs by rendering them useless. Failing that, BMDO believes that the creation of such a universal defense system would provide the impetus for other nations to expand their security agreements with the United States, bringing them under a U. S. sponsored missile defense umbrella.

An SBL platform would achieve missile interception by focusing and maintaining a high powered laser on a target until it achieves catastrophic destruction. Energy for the sustained laser burst is generated by the chemical reaction of the hydrogen fluoride (HF) molecule. The HF molecules are created in an excited state from which the subsequent optical energy is drawn by an optical resonator surrounding the gain generator.

Lasers have been studied for their usefulness in air defense since 1973, when the Mid Infrared Advanced Chemical Laser (MIRACL) was first tested against tactical missiles and drone aircraft. Work on such systems continued through the 1980s, with the Airborne Laser Laboratory, which completed the first test laser intercepts above the earth. Initial work on laser based defense systems was overseen by the Defense Advanced Research Projects Agency (DARPA), but transferred to the newly created Strategic Defense Initiative Organization (SDIO) in 1984. Work continues today under the auspices of the BMDO, the successor to the SDIO.

The SBL program builds on a broad variety of technologies developed by the SDIO in the 1980s. The work on the Large Optics Demonstration Experiment (LODE), completed in 1987, provided the means to control the beams of large, high powered lasers. The Large Advanced Mirror Program (LAMP) designed and built a 4 meter diameter space designed mirror with the required optical figure and surface quality. In 1991, the Alpha laser (2.8 mm) developed by the SDIO achieved megawatt power at the requisite operating level in a low pressure environment similar to space. Numerous Acquisition, Tracking, and Pointing/ Fire Control (ATP/ FC) experiments both completed and currently underway will provide the SBL platform with stable aimpoints. Successes in the field of ATP include advances in inertial reference, vibration isolation, and rapid retargeting/ precision pointing (R2P2). In 1995 the Space Pointing Integrated Controls Experiment offered near weapons level results during testing.

Most recently, the Alpha LAMP Integration (ALI) program has performed integrated high energy ground testing of the laser and beam expander to demonstrate the critical system elements. The next step is an integrated space vehicle ground test with a space demonstration to conclusively prove the feasibility of deploying an operational SBL system.

Future plans include orbiting the SBL Readiness Demonstrator (SBLRD) in order to test all of the systems together in their intended working environment. Designs for the SBLRD satellite call for four major subsystems: the ATP system; providing acquisition, tracking, targeting, stabilization, and assessment capabilities; the laser device, providing the optical power, and beam quality, as well as maintains nozzle efficiency; the optics and beam control systems, enhancing and focus the beam, augmenting the capabilities of the laser device; and the space systems, providing a stable platform, storage of the reactants, and furnish electrical power (but do not power the laser).

The SBLRD is intended to demonstrate the capability to perform boost phase Theater Missile Defense from space. The objectives of the space demonstration include gaining performance information critical to the development of an operational SBL system, as well as gain a general understanding of operating such a system.

BMDO and the Air Force agreed to transfer the execution of the SBLRD project and the related SBL technology developments to the Air Force. BMDO retained overarching SBL architecture responsibilities.

Alpha High Energy Laser (HEL)

Megawatt class power levels were first achieved by the Mid-Infrared Advanced Chemical Laser (MIRACL) originally sponsored by the Navy, later by DARPA, and then by BMDO. Because the design was intended for sea level operation, the MIRACL laser does not achieve the optimum efficiency necessary for space-based operation. DARPA launched the Alpha laser program, with the goal of developing a megawatt level SBL that was scaleable to more powerful weapon levels and optimized for space operation. In this design, stacked cylindrical rings of nozzles are used for reactant mixing. The gain generation assembly achieves higher power by

simply stacking more rings. In 1991, the Alpha laser demonstrated megawatt class power levels similar to MIRACL, but in a low pressure, space operation environment. Alpha demonstrates that multi-megawatt, space-compatible lasers can be built and operated.

Large Advanced Mirror Program (LAMP)

To demonstrate the ability to fabricate the large mirror required by an SBL, the Large Advanced Mirror Program (LAMP) built a lightweight, segmented 4 m diameter mirror on which testing was completed in 1989. Tests verified that the surface optical figure and quality desired were achieved, and that the mirror was controlled to the required tolerances by adaptive optics adjustments. This mirror consists of a 17 mm thick facesheet bonded to fine figure actuators that are mounted on a graphite epoxy supported reaction structure. To this day, this is the largest mirror completed for use in space. This LAMP segmented design is applicable to 10 m class mirrors, and the Large Optical Segment (LOS) program has since produced a mirror segment sized for an 11 m mirror. The large dimension of this LOS mirror segment approximates the diameter of the LAMP mirror

Beam Control- Large Optics Demonstration Experiment (LODE) and ALI

The ability to control a beam was demonstrated at low power under the Large Optics Demonstration Experiment (LODE) in 1987. The current high power beam control technology is now being integrated with the Alpha laser and the LAMP mirror in a high power ground demonstration of the entire high energy laser weapon element. This is known as the Alpha-LAMP Integration (ALI) program.

Acquisition, Tracking, Pointing (ATP)

The ATP technologies required (sensors, optics, processors, etc.) have been validated through a series of component and integrated testing programs over the last decade. In 1985, the Talon Gold brassboard operated sub-scale versions of all the elements needed in the operational ATP system including separate pointing and tracking apertures, an illuminator, an inertial reference gyro system, fire control mode logic, sensors and trackers. Talon Gold achieved performance levels equivalent to that needed for the SBL. In 1991, the space-borne Relay Mirror Experiment (RME), relayed a low-power laser beam from a ground site to low-earth orbit and back down to a scoring target board at another location with greater pointing accuracy and beam stability than needed by SBL. The technology to point and control the large space structures of the SBL was validated in 1993 by the Rapid Retargeting and Precision Pointing (R2P2) program that used a hardware test bed to develop and test the large and small angle spacecraft slewing control laws and algorithms. The Space Pointing Integrated Controls Experiment (SPICE) demonstrated in 1995 near weapon scale disturbance isolation of 60-80 db and a pointing jitter reduction of 75:1. In 1998, the Phillips-Laboratory-executed High Altitude Balloon Experiment, (HABE) will demonstrate autonomous end-to-end operation of the key ATP-Fire Control (FC) functions in a realistic timeline against actual thrusting ballistic missiles. HABE will use a visible low-power marker beam as a surrogate to the megawatt HF beam and measure beam pointing accuracy, jitter and drift against a fixed aimpoint on the target.

Current SBL planning is based on a 20 satellite constellation, operating at a 40° inclination, intended to provide the optimum TMD threat negation capability. At this degree of deployment, kill times per missile will range from 1 to 10 seconds, depending on the range from the missile. Retargeting times are calculated at as low as 0.5 seconds for new targets requiring small angle changes. It is estimated that a constellation consisting of only 12 satellites can negate 94% of all missile threats in most theater threat scenarios. Thus a system consisting of 20 satellites is expected by BMDO to provide nearly full threat negation.

SBLRD Characteristics
Weight: 17,500 kg Length: 20.12 m
Diameter: 4.57 m Mirror Diameter: 4.0 m

- Hydrogen fluoride chemical energy powered laser.
- On board surveillance capabilities.
- Super reflective mirror coatings allowing for uncooled optics.

• Concurrent NMD / TMD capability.

Resources

• Space-Based Laser Project Office - AF SMC

• LASERS IN SPACE TECHNOLOGICAL OPTIONS FOR ENHANCING US MILITARY CAPABILITIES by Mark E. Rogers, Lieutenant Colonel, USAF November 1997 Occasional Paper No. 2 Center for Strategy and Technology Air War College Maxwell Air Force Base, Alabama
• Lasers and Missile Defense: New Concepts for Space-based and Ground-based Laser Weapons, William H. Possel, Lt Col, USAF -- CSAT Occasional Paper No. 5 Center for Strategy and Technology Air War College, July 1998
• Laser Options for National Missile Defense Steven G. Leonard; Mark L. Devirgilio (Faculty Advisor) Air Command and Staff College 1998 - The Space Based Laser (SBL) can meet the NMD requirements. A 24 SBL satellite constellation can kill 20 Taepo Dong 2 missiles launched anywhere in the world at anytime. Each SBL satellite is projected by BMDO to weigh 17,500 kilograms. Using the Aerospace Corporation's historical cost verses weight information, which shows that satellites average cost is roughly $50,000 per pound, the first satellite in this constellation would approach $2 billion dollars.

• SPACE BASED LASER INTEGRATED FLIGHT EXPERIMENT The U.S. Air Force contracted with an industry joint venture on February 08, 1999 for the Space Based Laser Integrated Flight Experiment (SBL IFX). The award constitutes the first increment of a Cost Plus Award Fee/Cost Plus Fixed Fee contract valued at approximately $2-3 billion once completed.

• Space Based Laser Readiness Demonstrator Acquisition Approach Space and Missile Systems Center Advanced Systems Directorate -- 01 September 1998

http://www.fas.org/spp/starwars/program/sbl.htm