Four years of sabotage of U.S. beam weapons

by Robert Gallagher

In May 1977, the defense industry trade journal, *Aviation Week and Space Technology,* presented the American public with the first in-depth treatment of Soviet advances in the development of particle-beam weapon technologies on the basis of the revelations of recently retired Air Force Gen. George Keegan. Within three years, the modest U.S. beam weapons effort in progress at the time of the Keegan revelations was dismantled by U.S. Secretary of Defense Harold Brown and other officials under the Office of the Secretary of Defense (OSD).

Brown transferred the Navy and Army particle-beam weapon programs from the services to the Defense Advanced Research Projects Agency (DARPA), a recognized opponent of developing beam technologies. At the same time, Brown slashed the budgets of the Navy, Army, and Air Force high-energy laser programs, degraded the programs to mere tactical battlefield applications, and transferred the funds cut to DARPA to establish a containable program for space-based laser weapons. Under the DARPA laser weapons program, the Department of Defense (DOD) will make no decision on the feasibility of space-based laser weapons until 1987. Prior to Brown's actions, the services were projecting deployment of ground- and space-based beam weapon anti-satellite (ASAT) and anti-ballistic missile (ABM) systems for the mid-1980s.

The day following the disclosure of the Keegan revelations May 2, 1977 in *Aviation Week,* Brown issued the following statement to the press:

> Senior officials of the Defense Department do not believe that the Soviet Union has achieved a breakthrough in research which could soon provide a directed-energy beam weapon capable of neutralizing ballistic missile weapons. Based on all information now available to the U.S. intelligence community, this possibility is considered remote.

At a May 30 press conference, Brown announced that it was impossible to solve the high-energy physics problems required for beam weapons development. The defense press immediately compared Brown to Vannevar Bush, who had told a Senate Committee in 1945 that development of an intercontinental ballistic missile was "impossible."

At the time of the Keegan revelations, all U.S. programs in particle-beam weapons technologies and the bulk of programs in laser weapon technology were sponsored and managed by the three military services. DARPA funding for high-energy lasers constituted a mere 13 percent of total funding in the area in fiscal year 1977; DARPA provided no support for particle-beam technology programs. To date, all demonstrations of beam weapons technology have been carried out by the services.

The stated goal of these programs was the development of the entire range of beam weapons applications from destruction of artillery shells on the battlefield to space-based anti-ballistic missile systems. Most technology relevant to battlefield applications is applicable to ABM and ASAT systems, and vice versa.

In 1976, the Army Mobile Test Unit laser weapons system destroyed guided tactical battlefield missiles in several engagements, and in 1978 a Navy/TRW deuterium-fluoride chemical laser, directed by a pointing and tracking system developed by Hughes aircraft, destroyed a tethered Bell Helicopter UH-1.

Service officials repeatedly emphasized that the purpose of these tests was to demonstrate the feasibility of larger ground-based and space-based ASAT and ABM systems and win support for a well-funded program.

In January 1981, then U.S. Air Force Secretary Hans Mark—now deputy administrator of the National Aeronautics and Space Administration—announced that the results of a recent test of pointing and tracking systems aboard the Air Force Airborne Laser Laboratory demonstrated that it was possible to "now think about shooting down the other fellow's ballistic missiles without using nuclear warheads." (Nuclear-armed ABM missiles are the only ABMs deployed to date by the United States.)

As early as 1978, Air Force officials were pushing hard for $143 million in funding to build two ground-based chemical lasers as the nucleus of an operational anti-satellite system in 1983. In 1980, the Air Force projected tests to demonstrate the feasibility of space-based laser ABM systems from the Airborne Laser Lab. Flying at 35,000 feet, the Lab was to shoot down a Polaris missile as it emerged from the sea. A second test was to involve shooting down a Minuteman III fired from Vandenberg Air Force Base.

Similarly, Navy Sealite laser program managers, who have built the most powerful laser in the Western world, the 2.2 Megawatt Mid-infrared Chemical Laser (MIRACL), proposed in 1980 to demonstrate a ground-based anti-satellite laser in 1986 against satellites in low earth orbit.

Particle beam program dismantled

The United States owes a debt to General Keegan for bringing the prospect of beam weapons and the Soviet lead in this technology to the public eye. Before he resigned as chief of the Air Force Intelligence in early 1977, there was no public literature whatever available on the subject. However, virtually every official government body who reviewed the intelligence assembled by Keegan and his associates on the Soviet Semipalatinsk particle-beam facility rejected all

the evidence of a three- to five-year Soviet technology lead. The list includes the CIA's Nuclear Intelligence Board and the Air Force Scientific Advisory Board. This official response quickly translated itself into an attack upon the existing U.S. program.

While service program chiefs called for the establishment of a distinct government agency with the mission to build beam weapons, they found their own programs disappearing under their feet.

In 1977 there existed three U.S. particle-beam weapon programs. The Navy managed a program to develop a charged particle-beam weapon for defense of aircraft carriers and ballistic missile defense. The Army sponsored two programs: development of a neutral particle beam for a space-based ABM system, and development of a powerful ground-based auto-resonant accelerator for development of a particle-beam weapon to destroy incoming nuclear-armed re-entry vehicles. The design of the Army neutral particle beam for space-based ABMs (like the DARPA charged particle beam program today) is based on fragmentary reports in the Soviet literature on the Soviets' radio frequency quadrapole accelerator.

Early in 1978 Brown and other DOD officials used their influence with the House Armed Services Committee to transfer the Navy's charged-particle beam program to DARPA. Dr. Ruth Davis, deputy director of defense research and engineering, told the House Committee that the advanced development efforts of the Navy's Chair Heritage program had to be stopped. "I have taken steps to better focus our efforts on the science and technology of charged particle beams." (Brown is a past director of defense research and engineering.) According to *Aviation Week,* DOD officials gave the rationale that major technical milestones must be reached "prior to any attempt to weaponize."

The House Armed Services Committee research and development staff, headed by Anthony Battista, told *Aviation Week* that it transferred the Navy program because it was convinced that the services were not competent to manage a cost-effective program. "When we saw plans to integrate particle beam accelerators on specific ships and knew that pointing and tracking requirements are not yet satisfied within the state of the art, we wanted the Navy's program redirected," one staff member said. The committee then eliminated the Navy's budget for Chair Heritage and added the funds to DARPA.

In late 1978, the Army Ballistic Missile Defense Command announced that Sipapu, its program for development of space-based neutral-particle-beam ABM systems, could be ready for launching as an anti-satellite weapon between 1981 and 1983. The program had advanced to the stage of construction of laboratory hardware and required additional funding to continue the pace of the effort. The funding never came. In early 1980, both Sipapu ("sacred fire") and the Army program for an auto-resonant accelerator were transferred to DARPA. DARPA did not request the funds required for construction of hardware. The fate of the auto-resonant accelerator program was more severe. It died a quiet death at DARPA.

Brown's new interest in space-based lasers

The principal argument for the transfer and delay of particle beam programs in 1978 was that "DARPA would do a better job." That sort of lying reached new proportions in the destruction of the services' high-energy laser programs in 1980.

Early in that year, a Senate committee invited four laser-weapon experts from Lockheed, TRW, Draper Labs, and Perkin-Elmer to present their views in a classified session on the feasibility of space-based lasers for ABM applications. The four specialists told the senators that an effective space-based laser ABM system—comprised of 18 battlestations—could be built with existing technology. A smaller program, they said, could appreciably blunt any Soviet ICBM attack. The Senate then sought additional funds for space-based lasers.

The Office of the Secretary of Defense threatened to terminate the contracts of the companies that employed the men if the men were ever seen again in Washington! Several months later the DOD surprisingly reversed itself. A DARPA study confirmed the industry experts' contention that current technology had a margin over possible hardening of ICBMs' surfaces against space-based lasers. Then, in July, Defense Secretary Brown wrote a letter to the secretaries of the Navy, the Air Force, and the Army mandating them to emphasize space defense with lasers. (Imagine the puzzled looks of the services when this came out.) Brown told the services to reduce funds for early endo-atmospheric demonstrations of laser technology. It was with these very demonstrations planned by the services that they hoped to break OSD resistance to a highly funded ABM program.

All in all, $40 million was cut from the services high-energy laser programs for FY1981 as a result of Brown's action. Together with the cuts made in the FY1980 budget immediately following his letter, these funds comprised the entire DARPA space-based laser weapon budget for FY1981. The schedule for laser weapon development released by DARPA saw a space-based system operational in the mid-1990s. United Technologies and McDonald-Douglas informed OSD that they would no longer commit their own R&D funds to supplement the government's in laser technology. One official explained: "Industry believes the country is not really serious about near-term laser weapons use, and as a result the companies are more and more reluctant to commit their R&D funds."

Both the Navy and the Air Force programs were gearing up to demonstrate lethality in the tests described above. One official said: "The major problem now is that every time a program reaches the point where the U.S. is almost ready to deploy a laser weapon system, the funds evaporate or the program changes course and starts off in a new direction."