Missile interceptor test shows ABM defense capability is within reach

by Paul Gallagher

On June 11 a Rockwell-made U.S. Army interceptor missile, with Honeywell-designed infrared guidance systems and computers on board, rose 100 miles into space and flew several hundred miles to hit an ICBM re-entry vehicle on the nose, destroying the "ultimate weapon" in mid-course. The successful test of the army interceptor, launched by a Minuteman I booster, made headlines around the world.

Dr. George Keyworth, President Reagan's science adviser, gave a briefing that afternoon in Washington for other nations' press correspondents on the U.S. anti-ballistic-missile defense program, known as the Strategic Defense Initiative. For the first time for any ranking administration military/science official, Keyworth stated that the United States and its allies could build and *potentially deploy* some elements of a multi-layered ABM system during the 1980s.

Keyworth made clear that he referred to elements of beam-weapon systems—such as ground-based high-powered lasers shot up from earth and reflected off orbiting mirrors—and not merely to older anti-missile interceptor technologies such as those the Army is currently testing.

Last May, in the Airborne Laser Laboratory test series against Sidewinder missiles, the Air Force demonstrated that a refiring laser can repeatedly shoot down missiles. Now the Army test has demonstrated capabilities for precise guidance, tracking, and homing in on a target at 5-10 miles per second combined speed, and sensing of the destruction of the target. These are essential command and control features of any ABM system, whether using frontier energy-beam technologies or older interceptors.

At the same time West German work on laser interception of *short-range* attacking missiles, essential for the defense of Western Europe, is making significant breakthroughs. Japan is working on the high-power laser, laser sighting, and stealth technologies essential to overall strategic anti-missile defense. And U.S. laboratories are reported solving the "impossible" problems of propagation of high-power lasers and particle beams for long distances through the atmosphere without losing focus (see *EIR*, June 19).

Rapid technological breakthroughs continue across the board in the U.S./NATO/Japanese effort—which is still critically underfunded, an order of magnitude smaller than comparable Soviet programs, and under Soviet-coordinated attack by the entire "MAD lobby" in Washington and the capitals of Europe.

The precision factor

The Army's Homing Overlay Experiment (HOE) interceptor test was a significant achievement in precision sensing and guidance. Even more crucial in defending against a general missile attack is the ability to determine instantly whether the target has been destroyed or not—this was accomplished in the HOE test by a combination of optical (laser), radar, and infrared sensors.

Ground-based interceptor missiles can, and have, accomplished the same results without such precision. Army Ballistic Missile Defense Commander Maj. Gen. Elvin Heiberg announced after the successful test that "the direct intercept was a first for the United States, and, as far as is known, for the world." But *destruction* of reentry vehicles in space, without direct interception, by the blast from interceptor missiles' nuclear warheads, was successfully demonstrated 20 years ago by the U.S. Project Defender program.

Heiberg said that the Soviet Union has nuclear-tipped antiballistic missiles that can destroy targets inside and outside the atmosphere. He added that a nuclear-armed interceptor does not need the pinpoint accuracy of a non-nuclear "collision kill" rocket because of its far-reaching blast effect.

Ground-based ABM interceptor system designs during the 1960s combined a long-range, "Spartan" interceptor like the current HOE, and a short-range but very fast-rising "Sprint" interceptor for last-chance point defense. Both had nuclear warheads for the ability to "kill" re-entry vehicles across a radius of one kilometer or more.

If such interceptors were fitted with *neutron* warheads (enhanced radiation nuclear explosives), the kill radius would become larger, up to five kilometers or more, and the interceptors far more efficient. If in addition they were given current U.S. guidance and tracking capabilities as used by

the "HOE," then a very efficient two-layer backup to beam-weapon systems could be deployed.

The HOE test success must be gauged against Soviet results. The Soviets have the kill capability of a whole regional system of nuclear-tipped interceptors guided by long-range radar target acquisition systems, already deployed. But they may not have the same precision guidance capabilities that the United States has now demonstrated. Sources indicate that the Swiss and Swedish "businessmen" arrested in March on the initiative of U.S. Customs, were trying to smuggle to the Soviet Union the computer capabilities to achieve the level of guidance precision of the HOE for their ABM interceptors. If true, these reports indicate not a "Soviet catchup attempt," but that the Soviets were seeking to add precision to an in-depth interceptor capability which otherwise far exceeds that of the United States.

Included among defense budget funds which the House has tried to cut, but the Senate has so far sustained, are projects to develop a high-altitude aircraft for long-range infrared scanning out into space; and an advanced space-based sensor to track targets for high-power lasers in space.

Laser and optics breakthroughs

High-power lasers based at high-altitude sites on earth will have multiple uses in anti-missile defense, ranging from short-range firing at reentry vehicles to interception of missiles thousands of miles away by reflection off orbiting mirrors—once we solve the problems of propagation of the beams through the atmosphere.

Breakthroughs in optical elements which correct for atmospheric diffusion or "spreading" amplify the beams and maintain "lock-on" of the beam to a distant moving target. Experimenters at Hughes Lab and Los Alamos National Laboratory forecast the ability to propagate high-power lasers for 60 miles through the atmosphere in a bright, focused state—enough to "burn a hole" out into space. This is one of the achievements which a successful beam-weapon defense will require, and which the Pugwash Conference's disarmament lobby insists is "against the laws of the universe."

In the West German aerospace industry region south of Munich, the Messerschmidt-Bölkow-Blohm (MBB) firm, among others, is reported to be developing a laser for defense against aircraft or tactical missiles, with a range of 10 kilometers for "point defense." The laser will be based either on an armored vehicle or on the ground, according to the May 21 edition of *Aviation Week*.

Large numbers of such fixed and mobile ground-based laser weapons for use against short-range and tactical nuclear missiles are essential for a beam-weapon defense of Europe. While Soviet SS-20s are the primary threat, and can be attacked through space with lasers and long-range interceptor rockets, shorter-range tactical nuclear missiles and aircraft will obliterate European cities unless those missiles can be attacked and disabled from the ground with very fast firing (i.e., pulsed laser and particle beam) weapons.

The laser weapon technologies MBB is developing at its laser test site near Munich are also directly applicable to defense of naval task forces against missile attack at sea.

Advances in Japan

Japan is directly contributing technology vital in a number of areas to the Strategic Defense Initiative. According to informed sources, Japan is contributing new capabilities in high-power lasers, ceramic and lamination techniques, static-reducing technology for microchips, and stealth technologies—the most important countermeasures against beam weapons—in which Japan reportedly leads the world.

Japanese industry is working on "3-D" radar systems said to be capable of pinpointing incoming missiles while deflecting enemy jamming beams. It is also developing superconducting technologies for superfast computers, necessary for battle management of speed-of-light defensive weapons. Japan has done extensive work on extremely high-power laser-matter interaction and x-ray lasers.

One large Japanese firm is developing a new tank with a laser gun sight that is extremely accurate, able to line up targets at 60 miles per hour on rough terrain.

Dr. Bethe vs. the x-ray laser

Both the United States and the Soviet Union currently have productive underground tests underway to develop a bomb-powered x-ray laser, the most efficient of the anti-missile technologies being actively developed today—although electromagnetic particle accelerators and plasma beam accelerators may become even more precise and efficient.

X-ray lasers, because of the extremely short wavelength radiation which makes them so lethal to missiles, must be fired from just above and outside the earth's atmosphere. American, Soviet, and Japanese laser scientists have proven the feasibility and deadliness of these anti-missile devices. Thus the Pugwash opponents of anti-missile defenses, led by Dr. Hans Bethe of Cornell University, have resorted to the argument that the compact, light x-ray laser device cannot be rocketed up above the atmosphere fast enough to hit an ICBM on the rise thousands of miles away. The solution to this problem requires the development of extremely fast-rising rockets to carry the x-ray laser devices into low orbit within a few minutes, from polar submarines or other launch sites near the Soviet Union where the attacking missiles are rising. Sources at the nation's most experienced military rocket-makers, such as Martin-Marietta, indicate that this problem too is on the verge of solution.

The technological breakthroughs in ABM systems such as the world saw on June 11 are sweeping aside the objections of the Pugwashers. But the serious question is still the relative rate of U.S. and Soviet development. The Soviets still lead, and may seek a "Sputnik"-type demonstration of that fact in the aftermath of the U.S. Army success.