Antisatellite Weapon Sets Dangerous Course

The United States is about to test an ASAT that has no obvious target except Soviet early-warning satellites

Within a month or two, an Air Force F-15 jet fighter will fly to a spot over the Pacific Ocean to test one of the most controversial new weapons in America's strategic arsenal: a compact two-stage rocket capped by a small metal cylinder. The purpose of the test is merely to demonstrate the fighter's ability to launch the rocket into outer space. But subsequent tests—to be conducted next year—are supposed to demonstrate the ability of the metal cylinder to ram and destroy critical Soviet military satellites orbiting up to 1200 miles or so above the earth.

The fruition of a 20-year research effort, America's new antisatellite weapon, or ASAT, is clearly one of the most sophisticated and threatening items in the Pentagon's repertoire. Unlike the crude nuclear-tipped ASAT's deployed by the United States in the 1970's, the new ASAT will enable the Pentagon to destroy the space-based eyes and ears of the Soviet Union without causing any collateral damage to its own satellites in outer space. Its construction in effect marks the demise of the "open skies" doctrine first announced by President Eisenhower, in which U.S. officials maintained that outer space was a sanctuary from which the superpowers could keep tabs on each other for the purpose of ensuring world peace.

Despite the obvious strategic implications of the new ASAT, it remains one of the most closely guarded subjects of Pentagon research. Although the outlines of the ASAT program have by now become well known, its precise military goals have been carefully obscured by a shifting series of official statements and a curtain of Pentagon secrecy. Employees of the U.S. Air Force, which manages the ASAT program, have been specifically barred from releasing any information about the ASAT's development, testing, and capabilities. Even the House and Senate Armed Services Committees have paid scant attention to the ASAT in recent years, and any substantive information they turned up has been carefully excised from the public record.

As a result, the Pentagon has been able to complete much of its work on the program unimpeded by any informed public debate. Thus far, the government has spent roughly $1.5 billion on the ASAT and related reconnaissance and communications equipment. By 1987, when 28 of the weapons will first be ready for use by a squadron of F-15's, this amount will have swelled to at least $4.5 billion. Because the Defense Department must assume that the Soviets will respond to the U.S. ASAT by improving their own ASAT capability, it also plans to spend at least $1 billion a year over the next few years to try and ensure that U.S. satellites remain immune to the enhanced Soviet threat.

Three general themes can be discerned in the Pentagon's shifting public defense of these expenditures. First, there is the uncomplicated explanation that because the Soviets have an operational antisatellite weapon, the United States must also have one. Absent this parity, how can the Soviets be expected to bargain seriously at talks designed to ban ASAT's on both sides? This was a popular argument during the Carter Administration, as illustrated by a 1978 White House statement on space policy. "While the United States seeks verifiable comprehensive limits on antisatellite capabilities, in the absence of such an agreement, the United States will vigorously pursue development of its own capabilities," the statement said.

Under the Reagan Administration, in contrast, there has been little interest in banning ASAT's and the program's directors have attempted to rewrite history by denying that the ASAT was ever approved to foster arms control negotiations. "Our ASAT development program, contrary to . . . misconception, has never been a 'bargaining chip' for arms control," says Richard DeLauer, the under secretary of defense for research and engineering. Robert Cooper, the director of the Defense Advanced Research Projects Agency, agrees with DeLauer and insists that the ASAT was devised as a means of destroying Soviet satellites that pose a threat to ships in the U.S. Navy. "Up until a few years ago . . . we were willing to fight all battles with the Soviet Union leaving their spacecraft in a sanctuary," he told Congress last March. "It was not until the use of the Soviet low earth orbiting satellites and their ocean surveillance capabilities, that we began to feel those spacecraft were so threatening to our forces in their ability to target . . . ground-based, airborne, and subsurface assets to attack those ships, that we realized we probably should have an antisatellite capability."

Cooper was talking about the four satellites presently orbited by the Soviets to keep track of U.S. aircraft carriers and other large ships. Two, which use radar, are of the type that achieved wide notoriety in recent years by accidentally falling to earth and leaving bits of its nuclear power plants strewn over the Canadian countryside. The other two use passive sensors to detect electronic emissions at sea. The fear is that both will be used to direct the fire of nearby conventional Soviet forces, and the intention is that the United States would use its ASAT's to destroy them in the early stages of a conflict.

The attack would probably be initiated at McChord Air Force Base in Seattle, Washington, where one of the first ASAT-equipped F-15 squadrons is scheduled for deployment. Tracking data from U.S. optical and radar satellite sensors located in the Philippines and Hawaii, and on Kwajalein Island, will be analyzed by computers at the Space Defense Operations Center in Colorado, and the attack coordinates will be relayed to the F-15's, probably in midflight. A sophisticated computer onboard the ASAT will instruct the pilot on the appropriate flight plan and signal when the missile should be released. Powered by an efficient solid-fueled engine, the missile will accelerate into outer space, reaching the incredible speed of 8 miles a second.

When the rocket fuel is exhausted, the initial stages will drop away and a metal cylinder measuring 12 by 13 inches will home in on the target using a cryogenically cooled infrared sensor. During its brief flight, the cylinder will navigate by firing a ring of thrusters around its midsection in a sequence commanded by the computer. Only minutes elapse from launch to satellite intercept. If these ASAT's should for some reason fail,

another squadron of ASAT-equipped F-15's based in Langley, Virginia, will get a second shot moments later.

This, at least, is how the ASAT weapon works in theory. The Vought Corporation and the Boeing Aerospace Corporation, its principal manufacturers, have repeatedly encountered technical difficulties, which have forced a series of delays in the expected date of the first operational test. The troubles have also at least doubled the program's cost since the late 1970's, according to congressional sources.

Assuming that the ASAT can eventually be made to work, there still remain serious doubts about the usefulness of knocking out Soviet ocean reconnaissance satellites during a superpower conflict. First, there is some skepticism, both inside and outside the Pentagon, about the ability of the Soviet satellites to perform as advertised. Noel Gayler, a retired Navy admiral who became familiar with the Soviet ocean reconnaissance systems as a commander in chief of U.S. forces in the Pacific and as a director of the National Security Agency, says that information from both active radar and passive electronic satellites "can be ambiguous. In addition, the difficulty of correlating the two is great and the countermeasures against them are fairly straightforward."

There is also the question of whether it matters if the Soviet satellites are able to perform their targeting task. Stated more directly, in the event of a global nuclear conflict is survival of the surface Navy relevant to national security? Adequate retaliation can be accomplished by land-based missiles, submarines, and long-range bombers. Gayler pauses before addressing this question to note that he devoted 15 years of his military career to service with naval carrier groups at sea. "In the event of a general nuclear war," he says, "on this scale, what happens to a carrier group is not a big concern." Why, then, is the Defense Department so concerned? "It's almost a knee-jerk reaction," Gayler says. "Whenever the Soviets do something, we have to do one thing better."

A third Pentagon defense of the ASAT program is that it will deter the use of ASAT's by the Soviets, by permitting the United States to threaten a tit-for-tat response to destruction of its satellites in a conflict that falls short of a global nuclear war. Kent Stansberry, a physicist who works on ASAT issues in the Defense Department's strategic arms control policy office, says that he can envision a hypothetical scenario in which U.S. forces are fighting a Soviet-backed regime in, say, Africa or the Middle East. In such a conflict the United States could deter an attack on its critical low-altitude photoreconnaissance and weather satellites only by threatening to respond in kind against similar Soviet satellites, he says.

F-15 jet fighters

One squadron will have ASAT's by 1987.

Scenarios such as these assume first that the Soviet ASAT is effective and reliable enough to ruin U.S. low-altitude satellites—a doubtful assumption according to experts inside and outside the Pentagon. The system consists of a huge explosive device that sits atop a 150-foot booster rocket, which can only be launched from a missile base at Tyuratam, in the southwest corner of the Soviet Union. One version uses radar, another uses an infrared sensor. Both orbit the earth several times and then destroy the target by exploding nearby. Neither is highly accurate and both may be subject to simple countermeasures such as spoofing, jamming, and maneuvering. In 1979, for example, General David Jones, then chairman of the Joint Chiefs of Staff, characterized the Soviet ASAT as follows: "Our general opinion is that we give it a very questionable operational capability for a few launches. In other words, it is a threat that we are worried about, but they have not had a test program that would cause us to believe it is a very credible threat." More recent Soviet tests have been characterized as almost uniformly unsuccessful by Nicholas Johnson, a Defense Department consultant on Soviet satellite systems.

Stansberry's scenario for potential Soviet ASAT use also assumes that destruction of U.S. photoreconnaissance and meteorological satellites would seriously degrade the effectiveness of conventional U.S. forces. This viewpoint is challenged by several weapons consultants including Richard Garwin of IBM. If the satellites were destroyed, he says, "we would not be without information." The United States could simply launch meteorological sounding rockets and missiles with high-speed cameras or radars on board. "If it cost you a million dollars per flight and you had to do this for 100 days it would be nothing," he says, compared with losing an Army division. Robert Buchheim, a former chief scientist for the Air Force, who also served as deputy assistant director of the Arms Control and Disarmament Agency, agrees that use of such short-duration rockets, balloons, and aircraft would eliminate "the benefit to the Soviet Union from destruction of those satellites."

Stansberry also makes a questionable assumption that the United States would not regard the destruction of its satellites as a provocation requiring more than a response in kind. Garwin, for example, says that he doesn't see "any way that a shooting war in space would be limited to space. It would extend to earth: to [the F-15] aircraft, to the launching sites of the [Soviet] antisatellite missiles." Everyone agrees that if a space war escalated into a more serious nuclear battle, the information provided by low-altitude U.S. satellites would be completely irrelevant.

If all of the standard public justifications for the U.S. ASAT seem illogical, then a question remains about why it is being developed. By a process of elimination, experts such as John Pike of the Federation of American Scientists speculate that one of the ultimate motivations behind the ASAT program is a desire by American strategic planners to target Soviet early warning and military communication satellites, both needed to guarantee adequate retaliation in the event of a preemptive U.S. attack. At present, the Soviets have 17 or so such satellites, all in highly eccentric *Molniya* orbits, with the perigee over Antarctica and the apogee over the Northern Hemisphere. Satellites in such an orbit can achieve the same or similar results as those in geosynchronous orbit, for much less cost. But their low perigee makes them highly vulnerable to a limited range ASAT

weapon such as that under development by the Pentagon.

Defense officials point out that according to present unclassified plans, the U.S. ASAT will be unable to reach Soviet early warning and communication satellites, due to the limited combat radius of the F-15 squadrons based in Washington and Virginia, as well as the limited range of the existing ASAT booster. This could be changed with only slight additional effort, however. The easiest of several options would be simply to station airborne tankers in the Pacific for inflight refueling so that the existing ASAT squadrons are able to reach the Southern Hemisphere; alternatively, the squadrons themselves could be stationed somewhere in the Southern Hemisphere (a few experts have remarked on the suitability of the Falkland Islands). Another option would be to modify the F-14, which is based on U.S. aircraft carriers, so that it, too, can carry the existing ASAT, and then deploy the carriers in the Southern Hemisphere.* A third option is to extend the range of the ASAT itself. Stansberry notes that this problem "is not so much technical as financial." The Pentagon has already determined that it would cost $1 billion to $2 billion for a better air-launched booster rocket and $2 billion to $6 billion to adapt a long-range Minuteman or Trident booster.

Although potentially expensive or operationally difficult, the benefits of targeting Soviet early warning and military communication satellites are substantial. Deprived of an early look at a U.S. attack, the Soviets could have less than 15 minutes to prepare for retaliation and then encounter enormous difficulties in transmitting orders to its forces stationed around the globe. One Air Force officer who asked to remain anonymous noted that destruction of early warning satellites by either side would in particular "provide an excellent cover for a limited nuclear strike." When the Joint Chiefs of Staff described the technical requirements for the U.S. ASAT in a highly classified document in 1981, they specified that the ASAT be capable of destroying these key Soviet satellites. This requirement was until recently concealed, and references to it in the open literature are somewhat oblique. In recently declassified congressional testimony, however, the Air Force responded to criticism of the ASAT's short range by noting that "the Secretary of Defense has chosen to apply available resources to only a subset of the JCS document at this time. [We] continue to evaluate systems which would provide a higher altitude capability should the Soviets begin deployment of [deleted] satellites in higher orbits."

The Air Force is already taking steps to increase its capability to locate and track Soviet high-altitude satellites. A series of electrooptical cameras, located in Korea, Hawaii, on an island in the Indian Ocean, and in New Mexico, has been upgraded to permit surveillance of objects as high as 30,000 miles above the earth, and to provide instantaneous information to the Space Defense Center in Colorado. Radars in North Dakota and on Kwajalein Island in the Pacific have been modified to complement these cameras. And a series of probes has been launched from a missile range in White Sands, New Mexico, to gather background information on starlight and heated space dust, in preparation for the potential launch in the late 1980's of four advanced infrared tracking and surveillance satellites. Rockwell International, Aerojet-General, the University of Arizona, and A. D. Little are collaborating on development of the components of the satellites, which are designed particularly for tracking Soviet satellites in *Molniya* and geosynchronous orbits. The estimated cost is at least $2.2 billion.

The U.S. ASAT looks at first glimpse like a collection of sophisticated hardware without any place to go. Potential uses listed by the Pentagon are discredited as strategically unnecessary and irrelevant by independent military experts who have been following the program closely. If the real goal is to destroy the sensors that would warn the Soviets of a U.S. attack, the ASAT has the potential to disrupt the present formulation of deterrence; continued ASAT development therefore seems likely to launch the country on a highly uncertain strategic course.—**R. JEFFREY SMITH**

*Noel Gayler notes that the F-14 now carries the Phoenix air-to-ground missile, which is only slightly smaller than the U.S. ASAT.

Carving Up TMI's Class Action Fund

The law firm that sued the utility is now being criticized by local groups for its management of a $5-million research fund

A distinguished Philadelphia law firm with a record of championing liberal and underdog causes now finds itself cast as an overlord at Three Mile Island (TMI), where it has been given charge of a $25-million trust fund for local citizens. The money was awarded by the owners and builders of the TMI reactor in settlement for damages caused by the accident of March 1979. They put up $20 million to pay for economic losses and another $5 million for research and public education on radiation through a "Public Health Fund."

The settlement, issued on 17 February 1981, sets up five areas in which the research and education money may be spent: monitoring radiation from TMI, studying the health-related effects of the accident, educating the public, designing evacuation plans, and doing general research on the effects of low-level radiation. The health studies, which could be politically explosive, must meet the approval of the judge and also a court-appointed science adviser, Baruch Blumberg, winner of the Nobel Prize in 1976 for physiology or medicine. Although he is not an expert in the effects of radiation, he was chosen as an eminent referee acceptable to both defendants and plaintiffs. All expenditures must be cleared by the court.

Some people living near the TMI reactor say that the law firm managing the settlement funds—David Berger, Attorneys at Law—has been slow to develop a research plan and reluctant to explain how it will propose spending the $5 million for science and education (now about $6.5 million, with interest). There are a couple of reasons for concern: with every day that passes, some of the available health data are lost, and every day brings closer a deadline set by the court. Money not committed within 5 years must be returned unspent. The settlement went into effect 2 years ago, in November 1981, and the Berger firm recently estimated that only about $250,000 has been committed thus far.