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A Political Strategy for Antisatellite Weaponry

Lieutenant Colonel
William H. Rohlman
U.S. Air Force

Faculty Research Advisor
Colonel Mary McCully, USAF



The Industrial College of the Armed Forces
National Defense University
Fort McNair, Washington, D.C. 20319-6000

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A POLITICAL STRATEGY FOR ANTISATELLITE WEAPONRY

RESEARCH STATEMENT

This paper analyzes and develops a political strategy for United States (US) antisatellite (ASAT) weapon programs. Currently, the US has no fielded capability to negate enemy satellites (Smith, 1991, p. CRS-2). The Russians have demonstrated and fielded a capability, but it has numerous operational constraints which keep it from being a strategically threatening weapon (Stares, 1987, p. 89).

Domestic support for ASAT weapons is weak at best. A revised political strategy for ASAT weapons is required to deal with the new US political conditions and world order. This paper:

- provides background on the geography of space and a definition of ASATs and their uses
- examines the national requirements for ASAT weaponry
- discusses relevant ASAT policy issues
- assesses the domestic political situation for ASATs
- presents options for the future of US ASAT programs

BACKGROUND

Geography of space

The United States is a trading nation, relying on free access to all earth's regions. People are readily familiar

with international commerce on the seas and the movement of goods worldwide via land and air routes. Such trade relies upon freedom of access and navigation.

Our thinking needs to be extended further into the third dimension. The United States is critically dependent on the freedom of passage in space in addition to air, land, and sea. This dependence is growing daily, with tremendous commercial and scientific opportunities expected before the end of this century, if not already.

Let's consider the "geography" of space. Collins (1989, pp. 6-22) divides the Earth-Moon system into four discrete regions, briefly defined as:

Earth and atmosphere. This region includes our planet and the atmosphere extending above the Earth to about 60 miles. A number of installations on Earth provide support for space operations in the following regions.

Circumterrestrial space. This region of space extends from about 60 miles above the earth's surface to 50,000 miles, an arbitrary upper limit. This region contains almost all US satellites, including those in geosynchronous, medium, and low earth orbit.

Moon and environs. This region is shaped like a quarter slice of pie and extends from 50,000 to 360,000 miles from earth, with the moon in the middle of the sector.

Outer envelope. This encompasses a globe-shaped area from 240,000 to 480,000 miles from earth.

This paper focuses on circumterrestrial space (60 to 50,000 miles), since this is the region where political, economic, and military development are most likely to occur over the next 20 years. This is also the region where ASAT weapons could be employed.

Definition of antisatellite weapons

So what are antisatellite, or ASAT weapons? It is interesting to note the term is not defined in Joint Chiefs of Staff publications. Colonel Robert C. Hughes, USAF, (1990, p. 239) defines antisatellite weaponry as:

"A weapon designed to destroy satellites in space. The weapon may be launched from the ground or an aircraft or be based in space. The target may be destroyed by nuclear or chemical explosion, collision at high speed, or directed energy beam".

A Canadian, Mr. Peter C. Hughes, describes ASAT weapons as having two key properties:

- they are capable of inflicting major harm on satellites; and
- their owners intend them to inflict major harm on satellites, if sufficiently provoked (Hughes, 1991, section 2.1).

Note first how broad the ASAT definition is and second how it is impossible to be certain of intent. These ambiguous aspects of ASATs, capability and intent, complicate any

for certain modes of satellite harm. (Hughes, 1991, section 4.1)

Hughes then identifies five demonstrated ASAT capabilities, two of which are "space-to-space weapons; the remainder are ground-launched direct-ascent weapons, without orbiting capabilities." These five are:

- The US F-15 miniature homing vehicle, which collides with a target. It was terminated after demonstration.
- The US nuclear ASAT, deactivated 20 years ago.
- The US exoatmospheric reentry interceptor system (ERIS), a strategic defense weapon with inherent ASAT capabilities. This kinetic kill weapon is not fielded.
- The Russian's nuclear ASAT, deployed around Moscow.
- The Russian co-orbital ASAT, operational and demonstrated 20 times (Hughes, 1991, section 2.4).

Additionally, there are many developmental weapons with ASAT potential including lasers, rail guns, and space-based interceptors such as Brilliant Pebbles (Hughes, 1991, sections 2.4).

This background section of the paper discussed the geography of space and our interest in circumterrestrial space. It defined what an ASAT weapon is and reviewed the types of harm ASATs could do to satellites. It concluded with five demonstrated ASAT capabilities and showed there are other systems with potential ASAT applications under development.

NATIONAL REQUIREMENTS FOR ANTISATELLITE WEAPONRY

This section assesses US national interests and objectives relating to ASAT weaponry. Military requirements and economic interest in space are reviewed. This analysis then forms the basis for an assessment of where policy might be headed under the new Administration.

Relevant national security interests and objectives

ASATs are one means by which the nation could actively protect its space assets (through deterrence and defensive satellites) as well as prevent other countries from controlling or dominating circumterrestrial space. As stated in the current National Security Strategy:

"Foremost, the United States must ensure its security as a free and independent nation, and the protection of its fundamental values, institutions, and people". Supporting goals include "protecting the United States and its citizenry from attack" and "ensuring no hostile power is able to dominate or control a region critical to our interests" (1993, p. 3).

Further, one national security objective is to seek "an open international trading and economic system which benefits all participants", including the "free movement of goods, capital and labor" (1993, p.3). As noted earlier, space is a vital region for our economic development, where we depend on free access and navigation.

Our national security interests and goals are further defined in the National Space Policy which directed the

Department of Defense to "develop, operate, and maintain enduring space systems to ensure freedom of action in space. This requires an integrated combination of antisatellite, survivability, and surveillance options." (National Space Policy, 1989, p. 10). Of course, this space policy may well change with the Clinton Administration. The next two sections further explore our military requirements and economic interests in space, specifically in regards to ASATs.

Military requirements for ASATs

In the past, the discussion of ASATs was always in a bipolar context, examining the stability of space weapons in the context of the US-USSR impasse, deterrence, and stability (May, et al, 1988). This limited analysis of ASAT weaponry is no longer appropriate for the emerging world order, and needs to be broadened in light of developments at home, as well as the changing threat environment.

Desert Shield/Desert Storm operations highlighted the need for control of space in a post-Cold War environment. Some interesting facts include that over 70% of long-haul communications went by satellite and most mapping was generated from satellite imagery. Weather forecasting, based on the Defense Meteorological Satellite Program, was critical to target selection and battle damage assessment. The Defense Support Program satellites provided warning

information necessary for Patriot intercepts of tactical ballistic missiles (which travelled through space to strike Saudi Arabia and Israel). Finally, the Global Positioning System provided accurate navigational information for all the forces deployed (Hughes, 1993, class notes).

LtGen Moorman, the Air Force Space Command commander summarized the lessons learned as follows:

"The ability of the United States to maintain the initiative and to sustain surprise by masking its military actions would have been much more difficult if Saddam Hussein - or a future adversary - had his own space reconnaissance assets. This prospect argues for an ASAT system to assure that, just as US forces achieved control of the air and the battlefield, we can control space as well (i.e. achieve space superiority)." (Moorman, 1992, p.22)

Military requirements exist for ASAT capabilities. The Joint Requirements Oversight Council issued initial kinetic energy antisatellite requirements in 1990 (JROCM-009-90, Feb 90), which is under review, per Congressional direction. The Office of the Secretary of Defense is required to submit a revised Operational Requirements Document to the Congress in May 1993 (Chadbourne interview, Jan 93).

Economic interests

Currently the United States has invested at least \$400 to \$500 billion in space and its related infrastructure (Smith, 1992, November 12, p. CRS-7). This does not include investments made by the National Reconnaissance

Organization, which classifies its space budget. While about half of our assets is military hardware, the United States also has a significant market sector, telecommunications, which is critically dependent on satellite assets.

This telecommunications sector is growing rapidly. Today, over \$300 trillion of financial transactions move worldwide via satellites (Copaken, class notes). The space market is expected to expand beyond telecommunications and grow up to as much as \$50 billion a year by 2000, in the areas of space infrastructure (\$15.6B), satellite technology (\$17.8B), and space-material processing (\$17.9B) (Thurbach, 1988, p 32).

The United States faces stiff competition for the commercial development of space. The European Space Agency and Russia already compete against the US in certain space technologies and applications, such as commercial imagery (Spot Image) and launch services. Additionally, the Japanese are developing an indigenous space industry, which may be operational by the end of the decade (Hughes, class notes).

History is replete with examples of conflict arising from the commercial development of new territory. Whether it be the development of spice routes, exploitation of the New World's natural resources, or the European division of the African continent, each has led to disputed claims of rights to develop. These disputed claims inevitably led to the development of military forces to assert rights and wars to

ensure "fair" access to new markets. What has changed to believe the friction of economic competition will be any more peaceful than the economic competition of the last 6000 years of recorded history?

In summary, the nation and military has identified national objectives, strategies, and requirements for ASATs. Yet, reduced funding has prevented real progress on developing a demonstrated ASAT capability. This reduced ASAT funding reflects waning legislative and congressional support. This support has weakened because of the rapidly changing domestic and global environment, which reemphasized a number of fundamental ASAT policy issues.

RELEVANT ASAT POLICY ISSUES

This section summarizes several of the key policy issues involved with the ASAT debate.

What is the ASAT threat?

The demise of the Soviet Union in 1989 changed the United States Congress' perception of the threat. During the Fiscal Year 1993 budget deliberations, the House Armed Services Committee stated "the committee does not believe that it is necessary to continue with our kinetic energy and directed energy ASAT programs." (HR 102-527, May 92)

The Senate was not convinced the threat evaporated. In the joint committee report on the National Defense Authorization Act, the conferees noted "the number of Third World nations that are gaining access to data derived from satellites" is increasing. (HR 102-966, Oct 92)

Our satellites may also be threatened by Third World ASATs in the next ten years. At the conference "Space Policy for the 1990s", some space policy experts noted that miniaturized technology, coupled with commercially available boosters, make it possible for the development of a relatively cheap ASAT for low earth orbit satellites (1993). Critics argue it is difficult technically to develop a complete ASAT system (including target identification, tracking, command and control) that would be effective in negating a redundant space function such as communication.

Such a weapon, while perhaps not a significant military threat, could raise the political stakes of a regional conflict. Suppose Saddam Hussein could have destroyed a space shuttle or other low-earth orbit satellite? The political stakes would have changed, just as the Al Hussein tactical ballistic missile changed the politics and strategy of the war.

Should space be a sanctuary?

Many opponents of ASATs argue that space is, and should remain, a sanctuary free from offensive or defensive

... that space is already
several nations use it for military
navigation, surveillance, and weather
Additionally, space is the highway through
missiles with ranges over about 500 km must
travel to reach their targets.
Yet, there is a powerful push to keep from extending the
space battleground. Those in favor of a space sanctuary
argue that:

- Since very few or no ASAT weapons are currently deployed, now is the perfect time to "keep the genie in the bottle" (Hughes, 1991, section 2.4).
- Proliferation of ASATs poses more of a threat to the US, since our assets are relatively more sophisticated, expensive, and we rely on them more (Smith, 1991).
- The physics of the space environment may create a hostile junkyard of orbiting debris if a space battle were fought.
- People are fearful that a space arms race will develop if ASATs are deployed, just as nuclear and conventional arms races developed (Hughes, 1993, class notes). They base this on previous arms races, whether chemical, nuclear, or conventional. A space arms race might include more than just ASAT versus ASAT, but could also include proliferation of systems, whether development of stealth spacecraft, or preemptive destruction of space capabilities.

Will arms control agreements work for ASAT?

"Both the Bush and Reagan administration have considered ASAT arms control measures as inequitable, unverifiable, not in the interest of national security, unworkable, and p. 35). This stems from the very broad definition of national security." (Peterse, 1991, p. 35)

is an ASAT, and the numerous ways a variety of devices can harm other satellites, intentionally or not. The history of arms control doesn't fully support our ability to gain compliance from a wide variety of actors on stopping weapons proliferation. Examples of the difficulties with arms control agreements include:

- Soviet acknowledged abuse of the antiballistic missile (ABM) treaty through building the prohibited Krasnoyarsk ABM radar and claiming it was for air defense.
- Soviet breaking of the intermediate-range nuclear forces (INF) treaty by allowing East Germany to secretly keep 20 of the outlawed missiles.
- Frequent violations of the prohibitions against chemical warfare by Middle eastern countries.
- Continued proliferation of nuclear missiles despite the Non-proliferation Treaty and Missile Technology Control Regime.

Nations will continue to act within their own national security interests, in spite of international agreements.

Proponents of the arms control treaties would point out the elimination of a class of nuclear arms, significant reduction in conventional forces in Europe, and the START reductions in strategic nuclear arms as significant steps in promoting peace and stability worldwide.

Hughes outlines possible verification measures for ASATs, including the use of keep out zones around satellites and other confidence building measures, such as inspections.

Are U.S vital national interests at stake with ASATs?

Considering the state of today's ASAT technology and the financial status of Russia, it is hard to assert that either the survival of the United States or our economic well-being is threatened by the lack of a US ASAT capability or the presence of a rudimentary Russian capability. However, there are several salient points that directly affect US interests. Consider the following Gulf War scenario from Woodward's book, The Commanders (1991, p 199):

"All three Iraqi armored divisions had uncoiled and moved forward to within three miles of the Kuwait border. It was breathtaking, a beautiful military maneuver...It was a genuine line of death, miles long... As Lang's [senior Defense Intelligence Agency national intelligence officer for the Middle East] eyes raced over the images [satellite photos], he realized that armored units could not more vividly advertise their intent."

We were able to decisively win the ensuing war through superior intelligence, superior technology and firepower, and superior soldiers. Would the casualties have been so low if Saddam had been able to see our formations and maneuvers with equal clarity; possessed similar weapon technologies; or been able to move, shoot, and communicate with the astonishing speed and accuracy that satellites enabled us to?

As we move to regional confrontations, the US will depend heavily on its satellite technology to prevail quickly and with low loss of life. It is in our interests to be able to

exploit space freely for executing our military responsibilities. Additionally, the next century will see increasing economic uses of space raising the stakes for our country.

Conclusions on ASAT policy issues

ASAT threat. The Russians possess the demonstrated capability, though not practiced in ten years, to destroy low-earth orbit satellites. Space played an important role for the United States in Desert Storm. Many Third World countries will gain access to battle information from space systems, and some could develop a rudimentary ASAT capability with available technology.

Space sanctuary. There are powerful emotional and logical arguments to keep from extending the space battleground. These are rooted in a variety of peaceful, strategic, and physics reasons. The fundamental question is whether we have ever managed to keep any terrestrial media as a sanctuary, except in very limited ways (such as a church) and only at the will of the powerful (such as Switzerland in World War II).

Space arms race. ASAT critics believe the development of a US ASAT capability will lead to a destabilizing arms race that will be extremely expensive. Questions exist about who has the strength to conduct such an arms race.

Arms control. There is intense debate on whether an ASAT treaty could be verified and enforced, since antisatellite actions may be ambiguous and there aren't ways to derive intentions. Arms control advocates admit the difficulties with treaties, but contend an arms race in space is the unpleasant alternative.

U.S vital national interests. Though not confronted with the imminent destruction of the US or our economy, the US has significant military and economic interests in maintaining free access to space and the capability to deny potential adversaries the use of space. ASATs may enable us to control the space environment and prevent a potential enemy's use of it.

DOMESTIC POLITICAL SITUATION FOR ANTISATELLITE WEAPONRY

Executive support for ASAT is waning

For twelve years (1980 to 1992), national space policy strongly supported ASAT development and deployment. However, this strong support, from the President, National Space Council, Secretary of Defense, and Chairman of the Joint Chiefs of Staff positions, was unable to move US ASAT capabilities forward in a major way.

Significantly, the Bush Administration appeared to have backed off the importance of ASATs in their last published National Security Strategy (White House, 1993), which

doesn't address ASAT policy statements. This was a marked departure from the previous National Security Strategy (White House, 1991) and National Space Policy (White House, 1989), which made multiple, explicit references to the need for developing and deploying an ASAT capability.

The perceived diminished threat, coupled with immense pressures on our budget, helped change defense priorities. ASAT is one of the controversial programs that may see reduced executive support. President Clinton has not spoken directly to the issue; however, he has spoken out against space-based weapons for the Strategic Defense Initiative (Thompson, 1992, p. 15). Importantly, two of his key staff, the Vice President and Secretary of Defense, have gone on record opposing ASAT weaponry.

Vice President Gore consistently voted against ASAT weaponry when he was in the Senate (Congressional Digest, 1988 to 1992). He will probably have significant influence on space policy, especially against ASATs, since he will chair the National Science, Technology and Space Council (Lawler, 1993, p. 4). He was also the chairman of the Senate Science, Commerce, and Transportation subcommittee (Barone, 1992), so he likely retains some influential ties in the Senate related to ASAT.

The Secretary of Defense, the Honorable Les Aspin, led the House fight against ASAT when he was a Representative. As late as May, 1992, his House Armed Services Committee

...ger a need for ASAT. (House
May 92) It is unlikely he will support
ending budget cutting exercises. He has
expressed the low priority of space weapons, such as
Brilliant Pebbles (Aspin, 1993, p.16).

Even during over a decade of strong Republican support, the
ASAT strategy had "been plagued not by a lack of perceptive
review, but by a failure to gain a national consensus on a
course of action. Apparently, the arguments have not been
sufficiently compelling, the prescriptions not catalytically
persuasive." (Nielson, 1989, p.9)

Now, with a revised National Security Strategy and a change
of leadership in the Executive branch, there is practically
no support for the development of an ASAT capability, at
least by the top three decision makers. There is no
compelling threat or clear need which would cause the
Executive leadership to focus on ASATs - especially given
the overall lack of Congressional support.

Legislative support for ASAT is waning

There have been strong Congressional pressures to kill the
ASAT program outright. The lack of Congressional support
for ASAT may be because the American public is relatively
uninformed and it is hard to describe why this passes the
"so what" test in the face of severe budgetary pressures,
deficit spending, and unemployment. With th

Soviet Union, there just does not appear to be a threat to the US.

In fact, during the Fiscal Year 1993 budget deliberations, the House Armed Services Committee, under Representative Les Aspin (D-WI), noted in their committee report:

Previous arguments for continuing even a meager program for antisatellite (ASAT) weapons was a hedge against the Soviet Union as the only country in the world that had tested an ASAT weapon. Now that the Soviet Union has dissolved and the United States is working on more cooperative efforts with the Commonwealth of Independent States (CIS), the committee does not believe that it is necessary to continue with our kinetic energy and directed energy ASAT programs. (House Resolution 102-527, 1992)

The Senate was not convinced the threat evaporated. In the joint committee report on the National Defense Authorization Act for Fiscal Year 1993, the conferees noted:

"that the Army's current kinetic ASAT weapon system is being developed to counter Soviet (now Russian) satellites. At the same time, the number of Third World nations that are gaining access to data derived from satellites" is increasing. (House Resolution 102-966, Oct 92)

Concerned with a possible third world threat, the Senate restored minimal FY 93 funding, and it was approved in the conference bill that was later passed.

The overall Congressional picture is mixed but predominantly leaning against ASAT. The House is likely to continue its opposition to ASAT development and the Senate will likely counterbalance that view to some extent. However, with no

support from the White House or Secretary of Defense, it is unlikely ASAT will survive in its present form.

Conclusions on the domestic political situation on ASAT

In the past year, a significant shift occurred with decreased executive and legislative support for ASAT. The Administration is not likely to support development of ASAT weapons, if previous history on the President, Vice President, and Secretary of Defense hold true.

Congress is likely to remain largely opposed to ASATs, especially in the House. Senate support for ASAT may waver without Executive Branch support.

Many players are involved with a decision on ASAT; most are opposed or indifferent. The uniformed military remains convinced of a requirement for the weapon, since there are fielded capabilities (Russia), the possibility of third World ASATs within a decade, and the potential need for a US ASAT in a regional contingency.

OPTIONS FOR US ASAT PROGRAMS

The military must consider its options for the US ASAT program, given this disconnect between our political and military strategies. The military could choose from a spectrum that includes these three examined paths:

- Maintain the status quo and continue the present approach of developing a ground-based ASAT system for deployment. At present funding levels, it would take up to 20 years to deploy a system.
- Radically revamp the program and pull ASAT program from the acquisition process and pursue prototype technologies.
- Stop all work for now. Negotiate an ASAT ban.

Each will be considered, followed by a recommendation.

Maintain the status quo

This option includes leaving the ASAT program in the acquisition process, maintaining minimal funding around \$25 million annually, and striving for an ASAT deployment capability.

Pro. There's still a defined requirement. This maintains Congressional and Office of the Secretary of Defense oversight on the ASAT program.

Con. This option is politically and financially dead. At \$25 million, this is not an executable acquisition strategy. There is practically no executive or legislative branch support. There is no public support. The Army is backing away from its support, in a declining budget environment, due to higher priorities. It would not give a capability for many years, against an evolving and uncertain threat.

Radically revise the ASAT program. This option involves pulling the ASAT program from the acquisition process and breaking it down into a number of key technologies essential to demonstrate an ASAT system. An ASAT program per se would go away. The key technologies would be spread to the most competent executing agents. A technology manager would oversee technology progress and address technology integration issues.

Pro. This program would help maintain technical superiority for key items, while killing the development of an integrated ASAT weapon. Dual use technologies could help build a consensus for individual experiments. None of the experiments would be an ASAT experiment.

An example could be a precision location and identification experiment for space objects. This experiment would have a dual use - collision avoidance for commercial and military spacecraft, as well as targeting information for an ASAT. Another example might be debris research to understand what must be done to protect spacecraft from debris. This would provide safety information as well as survivability information for US spacecraft. It might also reveal lethality mechanisms. Defensive satellite concepts could also be explored.

The distributed research on key technologies would still need to be integrated for potential ASAT applications. A technology manager, either in the services, or at the

Advanced Research Projects Agency, could pull together the different technology threads into a potential ASAT application. Such work was done with the Patriot missile, which enabled the Patriot to field an anti-missile capability, even though this was not the primary purpose.

Con. Technical integration of key technologies without a prototype can lead to no realistic solutions. Additionally, Congress might charge that the services are just trying to hide the program. However, there is a difference between fundamental and applied research, versus demonstration and validation. Technical management of multiple technical efforts is also difficult to keep the researchers focused.

Stop all ASAT work

This option is pretty straightforward - cancel the ASAT program. Don't do any more work.

Pro. This option would have some strong political support. As well, there are arguments the system is not necessary at this time. It stops controversial work and frees up at least \$25 million. The US will not be perceived as threatening space warfare and will stand on a strong moral ground to negotiate prohibitions to ASAT weaponry.

Con. This option ignores the fact that ASAT capabilities already exist, they may spread in the next

... reasons in our national interests
... emphasizes the capabilities versus
... The Russians already have the capability.
... arms control efforts have not prevented the
... proliferation of weapons.

Recommendations

I believe we can maintain a technological hedge against a future ASAT requirement if we radically revise the current ASAT program. I recommend we:

- Immediately withdraw the ASAT program from the acquisition process.
- Reprogram the \$25 million into key technology demonstrations that would have dual-use for defense, civilian, and ASAT objectives.
- Appoint a technology manager at Advanced Research Projects Agency for potential ASAT applications.
- Focus the intelligence community on analyzing and projecting ASAT threats.
- Educate the public, Administration, Congress, and national security and economic well-being.
- Communicate potential threats to our well-being.
- Maintain space as a sanctuary as long as feasible, but continue US research on defending US assets and attacking hostile satellites should it be in our national interests.
- Rewrite the ASAT Operational Requirements Document. Expand it from the Russian-only threat.
- Work with National Science, Technology and Space Council on developing a space policy which recognizes the need to protect the US and our assets, e.g. space regime

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