

Why the Weaponization of Space Should Not Be Pursued

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The military might of the United States lies not in overwhelming numbers but in the ability to rapidly project force anywhere on the globe. Central to this power is space technology. Satellites provide intelligence, carry communications, and guide bombs. Space power is thus integral to the success and safety of the modern war fighter. Currently, no other nation enjoys the same level of sophistication. The United States Space Command's vision for 2020 aims to further this advantage through the complete exploitation of space, resulting in the ability to counter any threat on the globe (United States). Such an unparalleled ability would be quite comforting, but space power does not end there. Space is also the key to many civilian technologies, and plays a large role in the economies of not only the US, but also the entire western world.

Clearly, space is a great asset. An enemy capable of disabling or destroying portions of the US satellite net would be able to deal a devastating blow to the functionality of the superpower. Some would argue that in order to counter this potential threat, steps must be taken to mitigate foreign space power. They also argue that space must become not merely a tool for the battlefield, but a battlefield itself. Many ingenious devices and systems have been conceived along these lines. However, this argument is based on several false assumptions, and the reality is that the weaponization of space will cause exactly what it tries to prevent. This paper will explore the demerits of the weaponizers' arguments, illustrate the dangers that weaponization presents, and offer an

alternative policy regarding military action in space.

The Space Society

When most people hear talk of the “space age” they imagine a distant era of flying cars and shoes that tie themselves. On the contrary—the space age has already arrived. As a nation and as a culture, the US is now dependent on space. Although the general population may be missing out on this, others—including top military brass—are not. Today, the US military makes extensive use of space. There are over 100 (Caceres) operational military satellites in orbit at present that provide reconnaissance, communication, and other services. Without these satellites, the worldwide coordination of military operations would not be possible. Their usefulness extends all the way from the strategic level to the level of the individual soldier, who may rely on satellites with infrared cameras to spot targets inside buildings. Of course, the most dramatic example of space power was the shock and awe campaign, when in 2003, the US invaded Baghdad. A significant portion of the hundreds of precise missile hits would have been impossible without global positioning systems.

The future direction of the military is one that furthers the use of space. The current commander in chief, North American Aerospace Defense Command, General Howell M. Estes III, stated that “we must be prepared to exploit the advantages of the space medium” (United). Indeed, that is exactly the mission plan for the US military through 2020. The basis for future operations relies on information superiority, and only a large network of satellites with their accompanying infrastructure can produce a

satisfactory level of intelligence. Thus, space will continue to be the cornerstone of military operations.

In addition to military applications, space and space technologies play a key role in everyday civilian life. Most notable are the telecommunications systems that route international cell phone calls and handle an ever-increasing load of radio and television traffic. Space also affects the economy through wireless bank transfers and real-time stock market information. Airplanes and cruise ships navigate via GPS. It is logical to assume that space will continue to permeate western culture just as computers have done. Since space is already crucial to the operation of the country, and will become even more so, a school of thought has arisen within military strategy that the United States must act to defend these assets by weaponizing space.

Cycles of Weaponization

What is space weaponization? Weaponization of space is the utilization of systems to either attack or defend space assets. The weaponization of space began in the 1960s with the development of the first weapon to travel through space: the Intercontinental Ballistic Missile (ICBM). Although initially designed to destroy populations, ICBMs were eventually dedicated mainly to destroying other ICBMs before they could be launched. Thus, an arms race began between the factions of the Cold War. This buildup cost the US over \$8 trillion (LaFeber). Though the Cold War has ended, the arms race has not, as the US is now rapidly pursuing a “missile shield” that can stop incoming ICBMs. The idea of the missile shield has led to more insidious missiles, such as ones that deploy electronic countermeasures or secondary decoy warheads. Of course,

these developments led to the creation of newer defense systems, such as the Airborne Laser, a 747 airplane equipped with a massive iodine-oxygen laser that can damage missiles enough during their boost phase so that they will not reach their targets.

As space systems grow in complexity and usefulness, satellites themselves become the new weapons. Perhaps the most dangerous are kinetic kill vehicles, small microsattellites that position themselves near a target and explode. Analogous to a fragmentation grenade, the microsattellites shred the target with shrapnel, creating a huge amount of untrackable debris in the process. These types of systems can be implemented without major technological innovations—the mechanics behind them are well established. Other potential systems are more exotic projects, such as space-to-ground energy weapons, but these require significant advances in physics and ease of space access. Nevertheless, pro-weaponizers insist on the development of all of these systems.

Deficiencies in the Arguments for Inevitability

The pro-weaponization adherents' arguments of inevitability focus on the notion that the United States must have an early lead in space weapons or suffer the consequences. They have several reasons for believing in inevitability; however, each argument contains logical fallacies that preclude it from representing a rational policy. Karl Mueller of the International Studies Association best sums up the deficiency of their arguments, which are “based on a smattering of evidence and logic, extrapolated into facile overgeneralizations that are well-suited for television talk-show punditry but which provide a poor basis for national policymaking (Mueller).” Their first argument is that inevitability is a consequence of human nature. This is blatant pessimism as there are

many weapons such as chemical missiles and radiation bombs that provide tactical advantages but have been shied away from. Agreements such as the Chemical Weapons Convention banned the use of these weapons, because it is difficult to control their effects and they create hazardous environmental conditions. The signature of 182 states (Status) on this agreement signifies that logic can override baser instincts towards violence.

The second argument for inevitability draws on historical analogies of the weaponization of the sea and air. Though it seems that the progression to space power would mirror the progression to sea power, this is not the case, as there is a difference of functionality. Navies were developed to defend against pirates and raiders, but there are no analogous threats to the theater of space that would warrant a buildup of defensive weapons. The similarities between air and space are more intuitively striking, at least at first glance. In fact, the two theaters have not evolved along the same lines at all. One reason is timescale: less than ten years after Kitty Hawk there were airborne weapons in World War I, yet after more than fifty years since the launch of Sputnik, there has been no great buildup. The other difference is a lack of a multiplying effect in space. In the case of air power, the development of one system, such as a bomber, necessitated other developments, such as escort fighters. In contrast, the deployment of a new satellite constellation does not require a new weapon system. It seems then that drawing conclusions from sea and air power history fails to provide any support for weaponization.

The third argument for inevitability is that the expanding influence space has on the economy will precipitate an attack on space systems. Pro-weaponizers see the economic dependence on space as a vulnerability waiting to be exploited. However, the

logic behind such an attack is lacking. It is unreasonable for another nation state to attack US space assets for the sole purpose of economic disruption. Because the US is a superpower, its economy is interlinked with the rest of the world, so that if another nation—for instance, China—damaged US space assets, it would most likely feel the economic effects of the attack itself, namely through the loss of the \$200 billion (Trade) of goods it exports to the United States.

Similarly, attacking space assets as a terrorist action is also illogical. There are many surface targets whose destruction would also cause widespread havoc such as dams, bridges, refineries, computer systems, and so on. All of them require far less sophistication to destroy than satellites.

The final and most solid case for inevitability rests on the fact that space assets are an excellent military target, and attacking them would be an effective precursor to terrestrial warfare. The argument has some merit, as it has been shown that space plays a key role in the abilities of the US military. The argument states that if the US does not develop space weapons, someone else will, placing the US at a disadvantage. This is reasonable but not conclusive. If an enemy did want to disrupt US space power, it would not necessarily need to weaponize space. The earth-based portions of space systems, such as ground control stations and communication dishes, are equally vulnerable and can be destroyed with existing, far cheaper systems: a few men with bombs can disable a satellite network just as well as a ballistic missile. In summary, the arguments for inevitability fall short of being substantive, relying on little more than the “sky is falling mentality” (Belote).

Dangers of Weaponization

It is clear that the weaponization of space is not inevitable. However, does the concern of foreign weaponization justify the pursuit of space weapons anyway? The answer is an emphatic no. Although doing so would seem to increase the asymmetric space advantage the US has, it would actually have a destabilizing effect and result in a decreased advantage. The idea of space weapons brings to mind visions of military omnipotence, with the US able to easily strike down any adversary without fear of retaliation. Such an ability would deter many conflicts. A similar rationale developed in the 1940s with the creation of the atom bomb. It too seemed to provide infinite power that would cause the rest of the world to kneel before the US or suffer unimaginable retaliation. This idea worked once, ending World War II. Once the atom bomb became public, it sparked a massive arms race as other nations developed nuclear power. The stockpiling of nuclear arms led to the Cold War, an era defined by a world on the brink of destruction and rapidly shifting political climates. It is not a large leap in logic to conclude that since space weapons offer advantages of similar magnitude to nuclear weapons, their development will cause a similar situation. Other nations will not stand idle as the US weaponizes space—they will follow suit. In the end, space will become a volatile political liability and the medium for a new Cold War–style weapons spiral.

Another reason to avoid weaponizing space is that to do so would threaten the burgeoning space industry. Presently, there are several companies developing launch vehicles to lift payloads to space at far lower costs than any government agency. Also, there is the space tourism and travel industry to consider. No longer in an embryonic

state, commercial flights will be available as early as 2009 (Overview). In the near future, suborbital flights will become as common as trans-Atlantic flights are today. They are the first step towards a general private use of space. There is a great deal of potential economic growth tied up in these ventures, but none of it will mature if people feel that they would be flying through enemy territory, so to speak, or that their investments are at too great a risk. Since there is no orbital analogue to airspace, future spaceflights could be endangered by weapons from any country regardless of their trajectory. It is even possible that weapons could be deployed against civilian space targets without detection. There would not be any evidence to assign blame to a particular nation, making spaceflights a tempting target. Even if they were not targeted directly, spaceflights would still be at a significant risk from the debris resulting from the use of space weapons. Much like chemical weapons, space weapons create a hazardous environment. Simple physics insists that even a tiny piece of shrapnel from a destroyed satellite can cause major damage when it is travelling at orbital velocities. In light of these concerns, the weaponization of space would not benefit the United States and could potentially cause great damage, both politically and economically.

An Alternative Solution

A far better option than the weaponization of space is the adoption of a posture that promotes stability yet still assures all interested parties that the United States will have access to space when it is required. There are several facets to this space assurance policy. The first is to continue to maintain the overwhelming advantage that the military enjoys in conventional warfare. Hopefully, this power alone would deter any attack

against US space assets. However, hopes are not enough, so other steps must be taken. The most crucial of these is to minimize the potential damage caused by a space-based attack. This means the military must not fully rely on satellites to manage an effective fighting force. Unfortunately, this idea goes against the plan from the 2020 Vision discussed earlier. Currently, all of the funding is to increase reliance on space assets. It is not hard to see that this is tactically unwise. Even though it flies in the face of current Air Force leadership, the rational direction for US space policy is one that develops not only space technology, but also other technologies that synergize with space assets, and if necessary, replace them. An example of such technology, and one that is popular with the Air Force, is near-space. Near-space is defined as the high atmosphere, between an altitude of 23 and 100 km (Near). There are a large number of near-space systems in development, ranging from weather balloons to unmanned aerial vehicles. Remarkably, near-space systems can do almost everything that satellites can do, at a far cheaper cost: a few thousand dollars compared to the 450 million dollar average of a space shuttle launch (Kennedy). They are also easier to replace. Implementing near-space ideas would help the space assurance posture because they provide redundancy, reducing space system vulnerability.

In addition to near-space, space assurance calls for an increased situational awareness within space. The best way to accomplish this is to increase tracking abilities. Doing so would allow defense planners to monitor potentially dangerous satellites more easily, as well as provide better path determination for debris fields. The benefit of this knowledge is twofold: it reduces risk to space assets by making it harder for adversaries to strike with impunity, and it improves the safety of the space environment by allowing

time for satellites to be moved, if possible, away from incoming debris. The final cornerstone of space assurance is the creation of a new international treaty, one designed specifically to ban the use of weapons in space or against space assets. Such treaties have seen success before, such as the Outer Space Treaty of 1967, which banned the placement and use of nuclear weapons in space (Krepon). As of today, 97 nations have ratified this treaty. As it stands, there is nothing to lose from proposing a ban on all space weapons.

Conclusion

The weaponization of space will be destabilizing to the global economy and could cause another costly arms race similar to that during the Cold War. Rather than instigate hostility through the development of space weapons, the adoption of a space assurance posture would both foster a mutual atmosphere of trust and reduce the vulnerability of space systems without the need for weaponization. Due to its influence in world policy, the US is in prime position to set the example and to encourage the world to allow everyone safe access to the benefits of space. By refusing to weaponize space, the United States can better protect itself through strategy than with any new weapon.

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