

CHAPTER 4

SPACE ASSURANCE OR SPACE WEAPONS

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The United States has an important choice to make on whether to pursue space assurance or space weapons. Space weapons are defined here as devices that are designed and flight-tested to disrupt, impair or destroy objects in space, as well as devices based in space that are designed and tested to attack terrestrial-based targets. Space assurance is defined here as a policy choice to leave space unencumbered by weapons, so as to reap commercial and scientific benefits, as well as to reduce the scope and violence of armed conflict on Earth. Space assurance can be achieved by international norms, cooperative measures, codes of conduct, treaties and military hedges designed to prevent and deter dangerous military activities in space.

The flight-testing and deployment of space weapons by the United States would surely prompt low-cost, low-tech countermeasures in the form of space mines and other anti-satellite (ASAT) devices, just as the flight-testing and deployment of space weapons by other countries would surely prompt a vigorous response by the United States. A situation in which satellites orbiting the Earth are interspersed with objects designed to destroy or disable them is inherently destabilizing, given the vulnerability of satellites and the ease with which they could be harmed. Potential adversaries in space would be faced with the dilemma of shooting first or risking the loss of critical satellites.

The quest to secure dominion over space would therefore elevate into the heavens the hair-trigger postures that plagued humankind during the Cold War. The first use of space weapons would be a historic act, and could have catalytic effects in space, as well as on the ground. All states that derive benefits from satellites would be punished by space warfare, but none more so than the United States, which employs satellites for commercial, military,

communications, early warning and intelligence functions. While space warfare would complicate US military operations, it would not alter the outcome of combat. Instead, asymmetric warfare by means of attacking US satellites would, in all likelihood, increase the severity and the collateral damage of warfare. All countries would lose more than they would gain by resorting to space weapons.

Even if the United States seeks to minimize the destructive effects of space warfare by using non-explosive techniques, other nations are likely to choose different standards for defending their national security interests in space. The debris and disruption caused by space weapons would thus result in extended impairment of global commerce that relies on satellites to transmit data, while producing environmental damage and creating hazards to space exploration. Companies that depend on space-aided commerce would be particularly hard hit by the flight-testing, deployment or use of space weapons. Insurance companies that cover space-related activities would look for less risky investments, or raise their rates appreciably.

There is a widespread international desire to avoid the flight-testing and deployment of space weapons. At the same time, a number of nations appear to be hedging their bets by engaging in research and development programmes that would allow them to compete effectively in the event that another country crosses these thresholds first. Only one country—the United States—has publicly endorsed a doctrine of “space dominance” that includes “space force application”. The full fruition of this doctrine would deepen fissures in alliance ties and relations among major powers, whose assistance is most needed to form “coalitions of the willing” to stop and reverse proliferation.

The choice between space assurance and space weapons is therefore fundamentally important since it will shape the contours of international security, global commerce, alliance ties and relations between major powers. The United States and other countries cannot have it both ways: the flight testing and deployment of space weapons will come at the expense of space assurance, and space assurance is undermined by the pursuit of space weapons.

The United States’ choice is therefore stark and clear: it can either take the initiative to flight-test and deploy space weapons on the assumption that

conflict in space is inevitable or useful, or it can seek to reinforce an interlocking network of restraints designed to avoid the crossing of these key thresholds. US restraint, however, would not ensure similar restraint by others. Indeed, potential adversaries might mistakenly conclude that they could gain advantage by covertly developing, flight-testing and then using space weapons against the United States first.

The execution of a surprise attack against the United States in space would generate a response no less resolute than previous surprise attacks in December 1941 and September 2001. Nonetheless, to further clarify the penalties to others for the first use of space weapons, the United States would be wise to adopt a hedging strategy that includes research and development—but not the flight-testing and deployment—of space weapons. As noted above, other nations are similarly poised to engage in such a competition, if it is deemed necessary to do so. There is no compelling need, however, to engage in the flight-testing and deployment of dedicated space weapons, in part because many nations already possess military capabilities designed for other missions that could, in extreme circumstances, serve as a response to the first use of space weapons by another state. Such “residual” space warfare capabilities have paradoxically served as a brake against the flight-testing and deployment of space weapons in the past.

The weaponization of space is not inevitable. If it were, it would have occurred during the Cold War. Rather than engaging in such a competition now, a far wiser course would be to strengthen efforts to promote space assurance. Key elements of a space assurance posture include unilateral initiatives that enhance situational awareness in space and reduce satellite vulnerability; research and development programmes that deter others from crossing key thresholds and hedge against adverse developments by potential adversaries; and cooperative measures, international agreements and codes of conduct for responsible space-faring nations. Cooperative measures, including information exchanges and greater transparency regarding space launches and payloads, could lend credence to declaratory statements of peaceful intent, while also serving to clarify threatening and destabilizing activities in space. Transparency measures must be sufficient enough to alleviate concerns over worrisome activities, particularly that military capabilities designed for other purposes are not being tested in ways that are virtually indistinguishable from preparations for space warfare. If states are sufficiently concerned about the

weaponization of space, they will agree to significant, intrusive and broad-ranging cooperative and transparency measures.

Cooperative behaviour could be codified in bilateral or multilateral executive agreements as well as in treaty form. Alternatively, cooperative behaviour might result from quiet consultations that do not yield written accords of any kind. It makes sense to accomplish what is politically feasible and useful first, while still pursuing other avenues of cooperation in space that are not yet ripe for accomplishment. The pursuit of initiatives that are unlikely in the short term—such as an international convention banning certain destabilizing activities in space—could still have utility, as this effort would demonstrate global sentiment in favour of space assurance and against the flight-testing, deployment and use of space weaponry. If a bipartisan consensus in Washington in favour of space assurance and against space weapons is not forthcoming, the clarification of this choice elsewhere—particularly among US allies, friends and major powers—has particular value.

While many countries have used space to support military operations, no weapons are deployed in space; interactive ASAT testing during the Cold War ended two decades ago, and no satellites have been destroyed in warfare. Thus, the weaponization of space is certainly not inevitable, unless this mindset holds sway.

The potential for space warfare has long existed in the form of long-range missiles carrying nuclear weapons, as well as additional weapon systems designed for other missions, such as missile defence interceptors. These latent or residual capabilities have not led inexorably to an arms race in space. To the contrary, these residual capabilities serve as hedges against unwelcome and unwise decisions by potential adversaries. Residual capabilities to engage in space warfare will continue to exist and serve as a necessary hedge against unwelcome surprises as well as an alternative to dedicated platforms designed for space warfare. Existing military capabilities designed for other missions that could be used for space warfare do not impair space assurance, as long as they are not tested in ways that mimic space warfare.

By virtue of its leadership position in space commerce and military power, the United States has unprecedented leverage to shape whether the peaceful conditions that now exist in space are maintained, or whether

space becomes weaponized. If the United States exercises restraint in the flight-testing and deployment of space weaponry, while maintaining readiness to respond if others do so first, there is a reasonable chance that these thresholds will not be crossed. If, however, the United States takes the lead in flight-testing and deploying space weaponry in the vain pursuit of still greater military supremacy, Washington will find little diplomatic support and much low-tech competition. As a consequence, by initiating the weaponization of space, Washington will find itself isolated diplomatically while placing still greater burdens on US armed forces.

The salience of space weapons will remain low if such techniques are not flight-tested or deployed. Given the extraordinary and growing differential in power that the United States enjoys in ground warfare, sea power and air power, it is hard to find compelling arguments for seeking to supplement these advantages by weaponizing space. If the United States pushes to extend its pronounced military dominance into space, others are likely to view this pursuit through the prism of the Bush Administration's national security strategy, which places emphasis on preventive war and pre-emption.

Existing accords, regulatory regimes and treaties provide the building blocks for a space assurance regime. Key elements of a space assurance regime can be found in the 1967 Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water (the Outer Space Treaty), the 1968 Agreement on the Rescue of Astronauts the Return of Astronauts and the Return of Objects Launched into Outer Space (the Astronaut Rescue Agreement), the 1972 Convention on International Liability for Damage Caused by Space Objects (the Liability Convention), the 1975 Convention on the Registration of Objects Launched into Outer Space (the Registration Convention), and the 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies (the Moon Agreement).

The cornerstone of space assurance remains the Outer Space Treaty, which provides the basic framework on international space law, including the strictures that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind; that outer space shall be free for exploration and use by all states; that nations shall not place nuclear weapons or other weapons of mass destruction (WMD) in orbit or on celestial bodies or station them in

outer space in any other manner; that the Moon and other celestial bodies shall be used exclusively for peaceful purposes; that nations shall be liable for damage caused by their space objects; and that nations shall avoid harmful contamination of space and celestial bodies. The Outer Space Treaty also establishes the principle that governments are responsible for space-related activities carried out within national borders and for assuring treaty compliance “whether such activities are carried on by government agencies or by non-governmental entities”. When space activities are undertaken by international consortia, responsibility for compliance “shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization”.

One value of adding to treaty-based prohibitions on space warfare lies in the strengthening of international norms that define unacceptable behaviour in space. Treaty regimes, when combined with military capabilities to deny gains or to punish violators, have more of a salutary deterrent effect than either would have in isolation. Deterrence is further enhanced when treaties contain intrusive monitoring provisions and complementary transparency measures. When deterrence by means of treaty constraints and supplementary military capabilities fails, treaty signatories are on much firmer ground in taking compensatory military steps than in the absence of treaty norms.

Negotiating a multilateral treaty prohibiting space warfare in general and ASAT tests in particular will not be easy. The forum in Geneva established for this purpose, the Conference on Disarmament (CD), now has 66 members and operates by consensus. The United States has opposed a negotiating mandate for space arms control, and appears reluctant even to engage in preliminary discussions on this subject. Several nations are likely to be uncomfortable with the transparency measures necessary to provide assurance of compliance and early warning of troubling activities. Nor will it be simple to construct a widely acceptable, common sense definition of what constitutes the acts of space warfare to be prohibited. The mix of monitoring arrangements and transparency measures sufficient to verify that prohibited activities are not being carried out also poses a significant challenge.

If the CD remains deadlocked over space arms control, then a single state or a grouping of states might decide to take the lead in tackling these difficult questions. The model here would be the Government of Canada's

role in promoting an international convention banning the use of landmines. The “Ottawa process” was given a significant boost by the technical inputs and energy provided by non-governmental organizations that convened alongside governmental experts. The advantage of this approach is that a coalition of the willing would not be constrained by the requirement for a diplomatic consensus. The disadvantage is that some key states could be absent from the drafting process and would feel no compulsion to join the draft agreement.

An alternative or complementary approach would be to pursue a code of conduct or agreed “rules of the road” for responsible space-faring nations. The resulting accords could take the form of bilateral or multilateral executive agreements. During the Cold War, the United States entered into executive agreements with the Soviet Union to prevent dangerous military practices at sea, on the ground and in the air. Comparable cooperative measures could also provide useful building blocks for a space assurance regime.

A model code of conduct for responsible sea-faring nations was negotiated in 1972 after a series of highly dangerous military manoeuvres between US and Soviet combatants and naval aircraft. The 1972 Agreement Between the Government of The United States of America and the Government of The Union of Soviet Socialist Republics on the Prevention of Incidents On and Over the High Seas (“Incidents at Sea” agreement) established important rules of the road. These include avoiding collisions at sea; not interfering in the formations of the other party; avoiding “maneuvers through areas of heavy sea traffic where internationally recognized traffic separation schemes are in effect”; requiring that “ships engaged in surveillance of other ships shall stay at a distance which avoids the risk of collision and also shall avoid executing maneuvers embarrassing or endangering the ships under surveillance”; using mutually agreed signals when ships manoeuvre near one another; not simulating attacks at, launching objects toward, or illuminating the bridges of the other party’s ships; informing vessels when submarines are exercising near them; requiring the greatest caution and prudence in approaching aircraft and ships of the other party; and not permitting simulated attacks against aircraft or ships, performing aerobatics over ships, or dropping hazardous objects near them. The US–Soviet Incidents at Sea (or INCSEA) accord has served as a model for comparable agreements signed by more than 30 other navies.

Another bilateral accord of particular relevance to the establishment of a space assurance regime is the 1989 Prevention of Dangerous Military Activities Agreement, which focused on four specific categories of “dangerous military activity”, including “interfering with command and control networks in a manner which could cause harm to personnel or damage to equipment of the armed forces of the other Party” as well as the use of lasers “in such a manner that its radiation could cause harm to personnel or damage to equipment of the armed forces of the other Party.” It established procedures to deal with border or boundary incursions, including the provision of designating “special caution areas”.

The pursuit of a code of conduct or rules of the road for responsible space-faring nations might draw and expand upon these sensible provisions. This effort would need to surmount many challenges, including how to define what constitutes dangerous military practices in space and how to devise suitable transparency measures to provide assurance of compliance or to warn of possible non-compliance. While executive agreements have the same standing as treaties in international law, this approach, even if widely replicated, is unlikely to be as inclusive as a multilateral treaty negotiated at the CD. As with efforts to negotiate an international convention, important space-faring nations might not choose to join. The choice between rules of the road and an international convention is not mutually exclusive. To the contrary, executive agreements establishing a code of conduct to prevent dangerous military practices in space could facilitate the eventual negotiation of a multilateral treaty that is more ambitious in scope.

None of these approaches will find favour with those in the United States who seek maximum freedom of military manoeuvre in space. In this view, space provides the means for quick, lethal strikes in regions that are currently remote to US power projection. US advocates of “capturing the high ground” view space as a medium in which opposing WMD could be neutralized, where information warfare could be waged and where US military dominance could be accentuated into the indefinite future. An essential corollary to this view is that weaker adversaries would seek to nullify US military superiority by attacking or disabling US space assets that have become essential for the conduct of military operations. Supporters of a space dominance posture argue that, precisely because potential adversaries are so disadvantaged in terrestrial confrontations with the United States, they will engage, perhaps covertly, in the flight-testing and

deployment of space weaponry. In this view, a surprise attack in space by a far weaker foe could have significant adverse impacts for the United States. Moreover, because the first use of space weaponry could have such deleterious impacts, weaker adversaries would not follow the US example of restraint. The 2001 *Report of the Commission to Assess United States National Security Space Management and Organization (The Rumsfeld Space Commission)* reflects this perspective.¹

By definition, any military or terrorist actions against the United States would constitute asymmetric warfare, given the overwhelming military superiority the United States now enjoys. Concerns over asymmetric warfare are completely warranted and steps need to be taken to reduce US vulnerabilities on the ground as well as in space. However, paranoia and worst-case thinking makes prioritization difficult: disruption in space is far more likely to happen as a result of a computer hacker than from a space mine or an ASAT. Attacks to critical infrastructure—including ground stations that control satellites—offer relatively low barriers to entry, multiple paths of disruption and greater potential difficulty in assessing responsibility for the crime. Adversaries would be far more likely to carry out sneak attacks against the United States in cities, ports and wherever the American flag is flown abroad, than to engage in surprise warfare in space.

The weaponization of space is an environmental as well as a national security issue. The environmental degradation of space created by space-faring nations constitutes a danger to space exploration, the space shuttle and other peaceful uses of space. Space litter also poses difficulties for the military uses of space. The weaponization of space, particularly with respect to the flight-testing of ASAT weapons, would greatly compound existing concerns over safe passage. In the event of a resumption of ASAT tests, the Pentagon would attempt to mitigate space debris, as it does with respect to missile defence tests. Other states that test ASATs might not be as conscientious about debris mitigation. The actual use of ASATs would compound these dangers exponentially. Debris fields in the upper reaches of space could be more long lasting than environmental degradation on Earth. Traffic management and debris mitigation efforts are essential components of space assurance.

In conclusion, the United States and the international community face a fundamental choice in the years ahead. That choice is between space assurance or space weapons. If space becomes another medium for

deploying weapons of any kind, hair-trigger postures that plagued policy makers and humankind during the Cold War will be elevated into the heavens. The weaponization of space would impair global commerce and scientific exploration, while increasing the severity of warfare on Earth. It would also weaken US alliances and ties with major powers that are essential to counter proliferation. Without question, the United States and the international community have more to lose than to gain by flight-testing and deploying space weapons.

The weaponization of space was avoided during the Cold War, even though both superpowers jockeyed for military advantage on virtually every other front. Space weaponry can also be avoided in an era of US military supremacy—if Washington exercises restraint, adopts prudent hedges and joins others in diplomatic efforts to pursue space assurance. By advancing the peaceful uses of space rather than weaponizing this realm in previous decades, the United States and other countries have reaped extraordinary rewards. Any nation that initiates the weaponization of space, would invite the forfeiture of these benefits.

The choice before us is either space assurance or space weapons. The flight-testing and deployment of space weapons would beget space mines. ASATs would beget more ASATs. The side that shoots first in space would cross a critical threshold in the history of combat, without realizing significant or long-lasting benefits. A far wiser course would be to refrain from crossing the critical and verifiable thresholds of flight-testing and deploying space weapons. A restraint regime of this kind would require transparency measures and cooperative monitoring by China, India, Japan, the Russian Federation, the United States and other space-faring nations.

There is much to do here on Earth to deal with the challenges of environmental degradation, terrorism and proliferation. New impulses are needed to widen the benefits of economic security, pursue comprehensive threat reduction, enhance regional security, repair alliances and improve relations among major powers. The flight-testing and deployment of space weapons adds nothing to and subtracts much from this far-reaching agenda. The time is ripe to think creatively and to act energetically to build barriers against the weaponization of space.

Note

- ¹ United States, 2001, *Report of the Commission to Assess United States National Security Space Management and Organization*, Washington, DC, Government Printing Office.