

STIMSON

Anti-satellite Weapons, Deterrence and Sino-American Space Relations

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Introduction

US national security experts spend years studying, seeking to avoid and sometimes helping to mediate or prosecute conflicts. Over time, veteran policy hands in the executive and legislative branches, as well as academia, think tanks and the media, come to believe that they understand all the important dimensions of security. And yet, for most, one dimension – space – presents a significant gap in their understanding. Space's importance is major, growing and underappreciated inside the Washington Beltway.

Over a half century ago, the US-Soviet space race captured the imagination of the American people, and the manned space program from the 1960s onward bred national competence in the design, manufacture and launch of rockets, satellites and payloads with ever-greater capabilities. Scientific study, helped by access to space, flourished. Civil and military use of space-based communications grew fast as the internet, personal computing and cellular telephony gained widespread adoption beginning in the 1990s. By the end of the decade, the Pentagon recognized that the US military had developed a dependence on space-based communications, such that a sudden denial of space-enabled information in wartime could impair the effectiveness of combat units.

The military saw from wargaming simulations of future conflict that space assets were like a crystal goblet: exquisite but easily shattered. An adversary would naturally contemplate measures to disable US forces' ability to command and control operations across an entire theater of operations, and to access real-time intelligence and targeting data supplied from distant sources. The enormous warfighting advantage afforded to US forces by space systems was, because of its vulnerability, perceived as an Achilles heel. The conclusion was logical: space had to be defended.

Space became a "domain," talked about by defense analysts as one of several discrete arenas of potential confrontation, like air, land, sea or nuclear – or more recently, cyber. For security experts, these can be useful categories; yet here is where the underappreciation of space becomes acute. It is not just that traditional "terrestrial" warfare, involving loss of life, destruction of property and territorial conquest imposes readily-visible costs that society has long recognized as vital interests, while the idea of attacking satellites in space seems a lesser level of aggression. The deeper problem is with the long-term consequences of destructive conflict in space, for these may be

poorly anticipated by policymakers during a time of hostilities, and yet, in retrospect, these may prove to be more regrettable than all but the most destructive acts of war in the other "domains."

Presidents in the 21st century will expect to exercise close control over any major future crisis; many regard the 1962 Cuban Missile Crisis as the template for wise, clever, well-advised presidential decision-making in an escalating confrontation. And yet, as useful as experience from the nuclear playbook is, wargames have suggested important differences, one of which is that the space domain imposes a particularly forbidding time element on the management of a space crisis. Not only will time be lost in detecting that US space systems have been interfered with, but knowing with certainty that a space system anomaly was due to attack, and assigning unmistakable attribution, will consume precious time as well.

Because entire constellations of valuable satellite systems rotating the Earth could be destroyed quickly if indeed an adversary is targeting them, military commanders with expertise and responsibilities in the space domain will press for an immediate presidential grant of authority to take action. Are security generalists comfortable that they could advise the president on decisions and actions that would best serve the US interest in such a scenario?

What makes this domain, and the study of deterrence in space, at once different and underappreciated, is the aftermath. Conventional wars can produce fearsome destruction; lost lives cannot be replaced, but societies recover. Even the nuclear accidents at Chernobyl and Fukushima instruct us that relatively small nuclear exposure of civilian populations can be extremely hazardous and hard to manage; yet societies can pursue measures to cope with their effects, and recover.

Imagine, however, a future conflict in which space assets are targeted with destructive force. The US Air Force Space Command in recent years hosted wargaming exercises that simulated, in one instance, hostilities that required US and allied forces to operate for "a day without space." While loss of space-based communications was mitigated by terrestrial systems, the consequences for operating in space were certainly not remedied in a day. Indeed, participants were left to speculate if the United States might be contemplating a century or even much longer "without space."

Consider what this could mean for the reputation of the United States, and for the trajectory of human discovery. Unchecked, hostile action in space could produce debris, orbiting the earth at nine times the speed of a bullet, so prevalent as to put at risk all

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sophisticated spacecraft including satellites. This could place manned and unmanned space flight at unacceptable risk of mission failure due to catastrophic collision with debris. Not only would investment in, and insurance for, advanced spacecraft and launch engineering be extinguished. Of much greater importance, mankind's access to space for exploration and pursuit of knowledge would be closed off – for young and old alike, for schoolchildren, scientists and aspiring astronauts, in America and around the world, possibly for a very long time. A more toxic legacy for US security policy would be hard to conceive.

That is why the study of space deterrence should matter to all policymakers, and why the Stimson Center's Space Security project, led by Stimson co-founder Michael Krepon, is pleased to present this collection of six essays studying deterrence of destructive acts in space, drawing from lessons from the nuclear era. I hope you find them of interest.

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