

PROMOTING US NATIONAL AND ECONOMIC SECURITY INTERESTS IN SPACE

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Chairman Rogers, Ranking Minority Member Cooper, Members of this Subcommittee: Thank you for inviting me to offer my personal views on how best to safeguard US national and economic security interests in space.

The challenge of deterring attacks on US space assets and supporting infrastructure is not new. We faced this challenge during the Cold War against a very powerful ideological and geopolitical foe. The United States and the Soviet Union fought through proxies and experienced intense crises. We engaged in conventional and nuclear arms races, as well as a space race. And yet, anti-satellite (ASAT) weapons were tested infrequently and both Superpowers refrained from stationing weapons in space. Despite many predictions that warfare to seize the high ground in space was inevitable -- and despite the absence of meaningful trade or financial relations to moderate the Superpower competition -- warfare in space was avoided.

Why did deterrence of space warfare work during the Cold War? One reason was that national leaders figured out that conflict in space couldn't be fire-walled against uncontrolled escalation and warfare in other domains - including the potential use of nuclear weapons. Another reason was that military technologies and delivery vehicles designed for other purposes could readily be re-purposed for space warfare, if the need arose. Everyone understood that counter-space capabilities were a fact of life, even if they weren't often demonstrated. A third reason was that satellites were vulnerable, and that even great additional expense could not alter this fact, except at thin margins.

Vulnerability plus an inferred capability to inflict great damage helped avoid warfare in space.

Now fast forward to a rising China which is investing in space capabilities across the board – including capabilities to damage US satellites. In some ways, it's harder to deal with a rising power than a peer. Communication channels with China are unsatisfactory, and we're not sure if Beijing will approach these issues in the same way that Moscow did back then. Some US analysts have warned of a "Space Pearl Harbor," just as some warned of a "bolt-out-of-the-blue" nuclear attack during the Cold War. What is the best strategy for the United States to continue to rely on the national security and economic benefits that derive from satellites and to deter worst cases? I will suggest a multi-layered approach that involves several common sense components.

Several key conditions that led to the absence of warfare in space during the Cold War still apply today. The possibility of uncontrolled escalation, the vulnerability of satellites, and the means to damage them haven't gone away. If anything, satellite vulnerability and damage potential are greater now than during the Cold War. In addition, there is another factor that could help restrain reckless activities in space: a mutual dependence on international trade and finance between the United States and China that was absent between the United States and the Soviet Union. Plus, as China's military dependency on space grows, its vulnerabilities in this domain will also grow.

These factors could result in the avoidance of a space war with China -- but the United States can't rely on them. If we can't take responsible Chinese behavior in space for granted, how might we influence Beijing's national calculus?

Greater resiliency in space assets can help deter some types of interference, but nothing can protect satellites from a determined, capable attacker willing to suffer the consequences. We can spend money to try to make satellites less vulnerable to some kinds of disruption. But other methods of protection will not be cost-effective, practical or successful.

We can add to dissuasion through disaggregation. Because satellites will remain vulnerable and targetable, it makes more sense to have a greater number of satellites providing repetitive coverage than to rely on a small number of extraordinarily expensive satellites. Deterrence of attack is increased by complicating the plans of the attacker.

Deterrence also rests on knowing the state of play, receiving timely warning of troubling developments, interpreting intelligence and warning signs correctly, and

taking appropriate measures to avoid being greatly disadvantaged. In other words, deterrence rests on space situational awareness (SSA). If funding and capabilities for SSA are declining, then the basis for deterring hostile acts and responding to them appropriately could also decline -- even when other elements of a multi-layered strategy are in place. Deterrence of hostile acts in space, as with nuclear deterrence, also rests on secure retaliatory capabilities sufficient to deny advantages to an attacker, as well as effective command and control mechanisms.

Does deterrence of warfare in space, as with nuclear deterrence, also require a dedicated force of ASAT interceptors that are repeatedly flight-tested and ready for use on very short notice? The historical record suggests otherwise. Latent counter-space capabilities point to the same answer.

There are already many ways for major powers to interfere with, damage, or destroy satellites and space-supporting infrastructure, including the use of jammers, lasers, cyber, ballistic missile defense interceptors, and various kinds of missiles. When so much latent capability exists to mess with satellites and infrastructure, dedicated capabilities can be unnecessarily costly and redundant. The testing and use of certain types of ASAT weapons -- those with indiscriminate and long-lasting effects -- would be particularly damaging to US national and economic security interests. Because the testing or use of these weapons threatens every nation that relies on space, there is a potential basis to reach tacit or other kinds of agreements controlling them.

Take, for example, nuclear testing in the atmosphere. In 1962, a single, powerful US test damaged or destroyed perhaps six satellites. Not all of them were ours. One was Telstar -- the satellite that sparked great public excitement and a hit instrumental record. Kinetic energy ASAT tests can also have indiscriminate, long-lasting effects. In 2007, China tested hit-to-kill ASAT technology against one of its satellites, creating a mutating debris field that continues to pose threats to a great many satellites and human spaceflight -- theirs, ours, everyone's. A treaty is in place that bans atmospheric nuclear tests. A proposed international Code of Conduct for space, which I will turn to next, would help establish a norm against testing ASATs that generate lethal, long-lasting debris fields.

We learned during the Cold War that threatening great harm is insufficient for successful deterrence, and that chances of success are greatly improved when diplomacy supplements military capabilities. Nuclear deterrence has been backstopped by treaties. But it's hard to envision treaties banning space warfare, since these capabilities reside in so many military technologies and platforms.

There is, however, still room for diplomacy in a multi-layered strategy to promote US national and economic security interests in space. Deterrence can be strengthened by diplomacy that clarifies differences between responsible and irresponsible behavior in space. Rules of the road do not ensure responsible behavior, but without rules, there are no rule-breakers. Rules of the road can also facilitate appropriate responses to rule breakers. Washington and Moscow have codes of conduct and rules of the road for our navies, armies and air forces operating in close proximity. But there is no comparable agreement for space.

The United States, the European Union, Japan and other countries are working on draft language for an international Code of Conduct for responsible space-faring nations. China and Russia prefer to negotiate an unverifiable treaty filled with loopholes. Last fall, they agreed to a space Code of Conduct in principle, but have yet to sign on to the current draft.

To conclude, there are many layers to a common sense strategy that can help deter hostile actions against US space capabilities. They include the ability to respond appropriately to attacks on US space assets, greater resilience and redundancy, better space situational awareness, improved command, control, and intelligence capabilities, and sound diplomatic initiatives. This multi-layered approach can continue to be as successful today as it was during the Cold War.