



U.S. Counterspace Capabilities

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What Is Counterspace?

Counterspace operations can be either *offensive* or *defensive*. Offensive [counterspace operations](#) aim to deceive an adversary, disrupt the use of a space system (such as a satellite), temporarily deny the use of a space system, degrade or impair an adversary's space system, or permanently eliminate a space system. Defensive counterspace operations protect space assets from attack, interference, or other hazards. The military uses counterspace operations to gain space superiority, which is the ability to use space for U.S. military purposes or deny an adversary's use of space, the area beyond 100 km above sea level.

Background

The United States government and private entities have long operated military and civilian spacecraft, including the Global Positioning System (GPS) and the NASA-led International Space Station, largely without the threat of disruption or attack by other nations. As adversary space capabilities have improved, U.S. policymakers have discussed how best to protect U.S. interests in space and from space-based threats, including hostile action as well as hazards such as debris from testing or using counterspace weapons. According to the Defense Intelligence Agency, foreign governments, primarily [China and Russia](#), have developed counterspace weapons that may challenge U.S. capabilities in space. The FY2020 NDAA [established](#) the Space Force and the current iteration of Space Command (SPACECOM) in 2019. The Space Force is developing counterspace capabilities to defend against and deter potential adversary attacks. (See CRS In Focus IF12610, *Defense Primer: The United States Space Force*, by Jennifer DiMascio.)

Under several international treaties, including the [Outer Space Treaty of 1967](#), signatories agreed not to place weapons of mass destruction in space and to use space for peaceful purposes. In 2022, the White House issued a [moratorium](#) on testing a type of counterspace capability, direct-ascent anti-satellite (DA-ASAT) weapons, promoting a test ban as a potential international norm for responsible behavior in space. The White House also said a “shared understanding of what constitutes safe and responsible space activities” can reduce the “risk of miscommunication and miscalculation.”

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Types of Counterspace Weapons

- **Kinetic** counterspace weapons strike a satellite with physical force. Kinetic weapons include DA-ASAT weapons, which are missiles shot from the ground or the air, and co-orbital (or space-based) ASAT weapons that destroy a satellite from space. Kinetic weapons also may strike satellite infrastructure, such as ground control stations that maintain a satellite's stable orbit and receive and transmit communications.
- **Non-kinetic** counterspace weapons can inflict damage via radiation produced by a nuclear detonation or directed-energy lasers and microwaves that can blind, or “dazzle,” but not necessarily disable an adversary satellite. (See CRS Report R46925, *Department of Defense Directed Energy Weapons: Background and Issues for Congress*, coordinated by Kelley M. Sayler.) Non-kinetic weapons can be employed from the ground or in space.
- **Electronic** weapons use the [electromagnetic spectrum](#) to temporarily jam or spoof satellite links to disrupt a signal, such as GPS or communications.
- **Cyber** weapons interfere with a satellite's computer networks to disrupt or deny a satellite's ability to collect, process, and disseminate data.

Expanding U.S. Capabilities

Chief of Space Operations (CSO) General B. Chance Saltzman has [stated](#) the United States needs to field “counter-targeting capabilities” both to ensure its ability to operate in space and to maintain its ability to protect the United States and U.S. forces from a space-enabled attack. Similarly, SPACECOM Commander General Stephen Whiting [stated](#) that the command intends to prioritize acquisition of offensive space weapons in future years.

The United States is not known to have an active direct-ascent DA-ASAT program; however, the United States [tested](#) an ASAT missile in the 1980s. Furthermore, analysts have [observed](#) that DOD ballistic missile defense systems, designed to intercept ICBMs outside the Earth's atmosphere, could be capable of destroying a satellite in low Earth orbit. Additionally, U.S. defense officials have [acknowledged](#) the development of directed-energy weapons for use in space but have shared few details publicly about them.

The Space Force is publicly requesting FY2025 funding for research, development, test, and evaluation of at least [two counterspace systems](#), one offensive and one defensive. According to budget documents, the Counter Communications System (CCS) is a mobile electronic warfare system that blocks adversary satellite communications. The CCS is used to deny command and control and early warning communications. The Space Force also is requesting continued funding for Bounty Hunter, a defensive space electronic warfare system. Ground-based and deployable, this system geolocates satellite communications and can detect electromagnetic interference across multiple radio frequency bands. Bounty Hunter also can identify friendly and unfriendly radio frequency signals. A Space Force [fact sheet](#) states that the Air Force Bounty Hunter was delivered to U.S. Indo-Pacific Command in 2018 and to U.S. Central Command in 2019.

Figure 1. Counter Communications System

Source: L3Harris Technologies.

Other U.S. spacecraft may support counterspace missions, such as the detection, tracking, cataloging, identification, and attribution of—and warning about—objects in space, activities known collectively as space domain awareness (SDA). SDA experiments and operations are conducted by platforms including the X-37B Orbital Test Vehicle and Geosynchronous Space Situational Awareness Program (GSSAP) satellites. The reusable X-37B resembles a miniature space shuttle and is known to conduct research missions. GSSAP satellites conduct rendezvous and proximity operations of space objects for “anomaly resolution and enhanced surveillance.”

Considerations for Congress

SPACECOM and Space Force officials are advocating for [counterspace and SDA](#) funding, as well as ways to increase space launches to support deployment of such capabilities. Members of Congress may approve, provide guidance to inform, reject, or modify those requests. Congress also could study the feasibility and effectiveness of those plans.

The U.S. commercial space industry (see CRS Report R44708, *Commercial Space Industry Launches a New Phase*, by Rachel Lindbergh) has grown significantly in the past decade. DOD purchases services from many commercial satellite operators. Congress may consider the risks that counterspace operations may pose to U.S. commercial satellite operators.

The James M. Inhofe National Defense Authorization Act for FY2023 (P.L. 117-263 §1602) required DOD to report on its strategy to protect military and intelligence satellites. Congress could seek a report on the risks to the United States’ growing commercial space industry.

Many Members of Congress also have expressed concern about space threats from [China](#) and [Russia](#), particularly [Russia’s potential development](#) of a space-based nuclear weapon. Some [analysts](#) suggest the United States should respond to the risk by hardening U.S. satellites to withstand a nuclear attack. Others [state](#) the United States currently has multiple means to thwart an attack.

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