USAF Counterspace Operation Doctrine, 2004

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The U.S. Air Force, for the first time ever, has developed and approved a new doctrine document outlining the service's approach to warfare in space. Called *Counterspace Operations* (AFDD 2-2.1) and dated August 2, 2004[1], the doctrine details the planning and execution of operations against space systems and satellites, both for defensive and offensive purposes.

The new document establishes U.S. Air Force intentions not only to weaponize space, but also to conduct anti-satellite operations, possibly preemptively, against enemy military satellites, those with primarily civilian functions and satellites owned or operated by third-parties (whether governments or commercial entities).

The document's precepts are subordinate to higher-level Air Force and Joint Chiefs doctrine, and Department of Defense (DoD) policies.

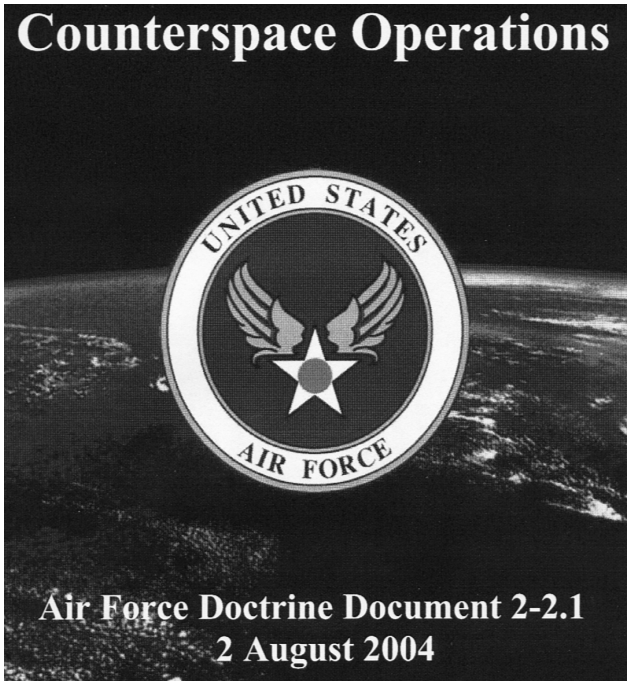
It represents the first time the Air Force has officially articulated counterspace as a part of it's overarching mission. It states:

> "This publication codifies U.S. Air Force beliefs and practices on the use of counterspace operations in planning and executing military operations."[2]

It further seeks to establish "space superiority," with counterspace as the "ways and means" to that end, as a first-order strategic and tactical priority for all military operations, on a par with achieving air superiority:

> "U.S. Air Force counterspace operations are the ways and means by which the Air Force achieves and maintains space superiority. Space superiority provides freedom to attack as well as freedom from attack (AFDD 1). ...Space and air superiority are crucial first steps in any military operation."[3]

It also assumes that space warfare has been approved at the highest levels of the U.S. government. While the administration of President George W. Bush has, for more than a year, been reviewing current National Space Policy, promulgated by President Bill Clinton in 1996[4], no official update has been released. The current policy, while vague and somewhat self-contradicting, was widely interpreted during the Clinton administration (including by the Air Force) as eschewing (if not prohibiting in some cases) the deployment of Anti-Satellite weapons and on-orbit weapons.[5] That said, it is not the first Air Force or DoD document to make that assumption – several other higher-order documents have included concepts for operations against enemy space systems either to protect U.S. assets or to degrade an enemy's capabilities on the ground. This has been accomplished, in large part, by what might be seen as a reinterpretation of the Clinton policy by the Pentagon.



This document makes it clear that offensive operations against space systems (in some cases, preemptively) is as much a priority for future combat operations as is defense of U.S. space assets. Until now, Air Force officials emphasized protective purposes, although previous documents (including Joint Doctrine) have laid out the basic concept of offensive counterspace operations as part of "space control." Gen. John Jumper, Air Force chief of staff, in the Foreword, asserts that:

> "The development of offensive counter-space capabilities provides combatant commanders with new tools for counter-space operations.… Counterspace operations are critical to success in modern warfare.... Counterspace operations have defensive and offensive elements.... These operations may be utilized throughout the spectrum of conflict and may achieve a variety of effects from temporary denial to complete destruction of the adversary's space capabilities."[6]

The *Counterspace Operations* document further states:

> "Potential adversaries have access to a range of space systems and services that could threaten our forces and national interests. Even an adversary without indigenous space assets may use space through U.S., allied, commercial or consortium space services. These services include precision navigation, high-resolution imagery, environmental monitoring and satellite communications. Denying adversary access to space capability and protecting U.S. and friendly space capability may require taking the initiative to preempt or otherwise impede an adversary."[7]

The document's language also supports the use of kinetic energy (or perhaps even explosive) antisatellite (ASAT) technologies – weapon systems U.S. officials have denied pursuing. The document articulates air-launched missiles, direct-ascent ASATs and on-orbit ASATs as potential systems for destroying satellites. While it does not elaborate on the nature of the missiles or ASATs, it is obvious that a missile can either use kinetic energy or explosives as a means of destruction:

> "[Offensive Counterspace] operations [against on-orbit satellites] may target the mission sensor or the satellite bus. For example, a laser may deny, disrupt, degrade or destroy

certain types of sensors. Kinetic antisatellite weapons on the other hand, usually target the satellite bus for physical destruction."[8]

The use of kinetic-energy ASAT systems was also postulated in the U.S. Air Force *Transformation Flight Plan* released in November 2003.[9]

Such weaponry, along with directed energy weapons that would destroy satellites on-orbit, are controversial because their testing and usage would create space debris, which is universally recognized as a danger to satellites and spacecraft. The international community – with NASA a leading player – is seeking to develop a set of measures for mitigating the creation of debris to avoid further polluting usable orbits.[10]

Although *Counterspace Operations* makes no mention of the dangers of space debris, both National Space Policy and DoD Space Policy[11] make debris mitigation a priority. Joint Publication 3-14: *Joint Doctrine for Space Operations* (Aug. 9, 2002), notes:

> "Space combat operations may impact friendly forces.... The creation of space debris or jamming actions may impact friendly systems."[12]

The *Counterspace Operations* document does not articulate a policy of first relying on "temporary and reversible" means to counter or attack enemy space systems before using debris-creating measures – a policy Air Force officials repeatedly have stressed in public. For example, Lt. Col. Andy Roake, a spokesman for Air Force Space Command, was quoted by *Wired.com* on October 1 as saying,

> "We're concentrating on effects that are reversible. … [I]f you blow something up in space, you create lots and lots of bitty pieces that threaten your own assets."[13]

It is unclear whether this policy has been codified. The only reference in *Counterspace Operations* states:

> "Planners must decide on the desired effect – deception, disruption, denial, degradation and destruction – when targeting an adversary's space capability. There may be times when temporary, reversible counterspace operations prove more appropriate than operations that permanently degrade or destroy space capabilities."[14]


Jumper

"The development of offensive counter-space capabilities provides combatant commanders with new tools for counter-space operations"

Definitions and Operations

Counterspace Operations details both Defensive Counterspace Operations (DCS) and Offensive Counterspace Operations (OCS).

DCS are defined as providing:

> "the means to deter and defend against attacks and to continue operations by limiting the effectives of hostile action against U.S. space assets and forces. DCS operations include deterrence of attacks against our space system, defense of our space systems as they come under attack, and ... recovery of our space forces and assets."[15]

Types of DCS include passive protection measures, attack detection and characterization, and "active measures" such as maneuvering, but also what might be termed shoot-back capabilities. The latter types of actions, dubbed "Suppression of Adversary Counterspace Capabilities" (SACC), include:

> "attacks against adversary anti-satellite weapons (before, during or after employment), intercept of antisatellite systems and destruction of [radio-frequency] jammers or laser blinders."[16]

OCS are defined as those that:

> "preclude an adversary from exploiting space to their advantage. OCS operations may target an adversary's space capability (space system, forces, information links or third-party space capability), using a variety of permanent and/or reversible means."[17]

As in previous documents, the types of OCS are designated the "5 D's": deception, disruption, denial, degradation and destruction. The OCS section also designates specific target sets: on-orbit satellites, communications links, ground stations; launch facilities; command, control, communication, computer, intelligence, surveillance and reconnaissance (C^4ISR) systems, and "third-party providers."[18] As for the latter set, the document explains:

> "An adversary may gain significant space capabilities by using third-party space systems."[19]

Under a later section on targeting, weather satellites and satellite navigation systems are cited as specific potential targets.[20]

The document also identifies resources and forces for both DCS and OCS. Possible offensive counterspace forces the U.S. Air Force might use are: aircraft, missiles (including for ASAT attack), special operations forces, dedicated offensive counterspace systems (such as the Counter Satellite Communications System) and ASATs (including "direct ascent and co-orbital systems [with] mechanisms to affect or destroy an on-orbit spacecraft"), directed energy weapons (including destructive lasers), network warfare operations, electronic warfare weapons, C^4ISR systems and surface forces.[21]

Unintended Consequences

Interestingly, the document admits that counterspace operations could have "unintended consequences," both on "blue forces (i.e. U.S. forces)" and on neutral or not-so-neutral third-party assets (i.e., owned by foreign governments and/or commercial providers). This admission is significant, although the document does not explain how Air Force planners should address such possible consequences. This is not a trivial subject. One of the potentially fatal flaws in the logic of space warfare is the complexity of using space weapons because of the potential for political, economic or strategic backlash. In military terms, there are problems with the concept of operations. The Air Force is postulating the de-

struction of third-party assets being used by an enemy, whether with the knowledge of the third party or not, such as weather satellites that provide civilian authorities with essential data, and commercial communications satellites that are relied upon for everything from emergency communications to wireless bank transfers. There would obviously be consequences not just for the "third party," but also for potentially millions of non-combatants in neutral or friendly nations.

Counterspace Operations is in some ways quite clear about the potential for complications. Some examples:

"Deconfliction is just as important in counterspace operations as it is in other military operations. Electromagnetic spectrum and physical deconfliction must be accomplished to avoid 'blue on blue' impacts and unintentional interference with other parties." (p.22)

"Counterspace operations can create effects at the tactical, operational and strategic level of war. Denying an adversary's access to space can carry many intended and unintended consequences transcending military operations, potentially impacting a nation's economy and diplomatic position. Due to the potential for wide-ranging effects, when planning counterspace actions, airmen ensure the tactical action supports the operational and strategic level objectives and strategies." (p.29)

The document asserts that counterspace operations are legal under the UN Charter (an assertion that some legal scholars may well challenge, particularly when neutral third-party assets are involved), but then notes:

"In all cases, a judge advocate should be involved when considering specific counterspace operations to ensure compliance with domestic and international law and applicable rules of engagement." (p.39)

"Many communications satellites are owned and controlled by third party providers, to include governments, commercial interests and multinational consortia. Multiple transponders allow providers to service the communications requirements of many users, including some who may be adversarial and others who may be friendly or neutral. Therefore, planned action against space communications assets must be carefully deconflicted to avoid unintended consequences." (p.40)

"When planning operations against an adversary's space-based weather capabilities, consider potential collateral impacts on friendly or neutral nations' assets or information."

"Counterspace operations must be deconflicted with other friendly operations to minimize unintended effects.... Deconflictions of counterspace and information operations may be required given that counterspace operations can result in substantial losses in exploitable intelligence." (p.41)

"Certain counterspace operations may carry greater consequences than others. For example, operations against on-orbit systems may have greater consequences than others. Likewise, counterspace operations against adversaries using third-party space capabilities may have economic, diplomatic and political implications." (p.42)

While the possibility of unintended and negative consequences is raised, the document does not provide instructions about how to judge when those potential consequences are deemed to outweigh an operation. This seems to be a critical lack. It fails to provide Air Force planners with methods to judge the efficacy and desirability of a planned counterspace operation. Perhaps worse, it could give planners the impression that rather than being serious issues requiring in-depth analysis, such possible consequences by and large represent the eggs that must be broken to make the omelet.

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Potential for Mistaken Attack

Just as worrisome as the question of "collateral damage" is the other major concept of operations problem with regard to counterspace operations – the potential for space accidents to be misperceived as attacks. The doctrine document touches on very real possibility of the U.S. mistaking an accident in space for an attack and that a response might be taken against a doubly-innocent third-party's space system:

"Operators must be able to differentiate between natural phenomena interference and an intentional attack on a space system in order to formulate an appropriate response."[22]

The document later states:

"The ability to quickly and accurately distinguish between hostile, unintentional and natural events is critical.... Without such confirmation, operations in retaliation should not be undertaken."[23]

While the latter statement seems to place a burden of proof on a commander calling for a counterspace strike, the doctrine paper does not identify what criteria might constitute establishing such certainty or how a commander can establish it. There are no systems or technologies now (or in the near-term) to diagnose the causes of an on-orbit satellite's malfunction, nor to inspect satellite damage.

Commanders are likely to react with "worse case scenario" in mind, and assume an attack rather than an accident. This would be exacerbated if space weapons were owned by other nations besides the U.S. The high value of space assets, particularly on-orbit weapons, will foster a "use 'em or lose 'em" mentality, similar to the "hair-trigger" dynamic of nuclear confrontation.

This potential for mistaken response is exacerbated by the doctrinal document's instructions on how rapidly a counterspace mission should be put together. It says planning and executing a counterspace attack should take no more than four days – 72 hours for planning, 24 hours for execution – but that the cycle could be lengthened or shortened "to meet battle rhythm." This is despite the complexity of determining if something was an attack and having to ensure against unintended consequences against either "blue forces," allied forces or non-combatants.

Conclusion

The new *Counterspace Operations* Doctrine is the latest in a string of recent DoD and U.S. Air Force policy and doctrinal publications to assert the necessity to conduct warfare in space, represented in the concept of space control. It is also the latest in a string of U.S. Air Force publications asserting that the service's space control mission not only includes, but necessitates, offensive, first-strike means. While less direct in its language than other Air Force planning documents (particularly the November 2003 *Transformation Flight Plan*), the Counterspace Operations Doctrine confirms that the service has not ruled out the use of kinetic-energy and other debris-producing ASAT weapons.

The document raises issues that should be subject to wider review by other U.S. governmental agencies, Congress and the public. There is absolutely no evidence that Congress and the U.S. public have accepted the idea of the U.S. being the first nation to arm the heavens. Just the opposite: public opinion polls show a great resistance to space weapons. In the absence of an overarching policy debate (or even a new policy), the current DoD and Air Force course is not justified.

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The fact that achieving space control through a heavily offensive counterspace strategy (rather than a combination of diplomatic means and protective measures) requires the U.S. to contemplate attacks upon and possible destruction of the satellites and space systems of allies, friendly or neutral nations and third-party commercial providers. This should be the subject of a wider policy debate and, it ought to be vetted and coordinated through the Departments of State, Commerce and Justice to review possible political, economic and legal consequences.

It would be helpful if Air Force officials explained to Congress, and the U.S. and international public, how the myriad pieces of emerging U.S. space-superiority strategy fit together. Unfortunately, three critical questions about remain unresolved:

- Will the U.S. be the first to deploy ASAT and on-orbit weapons, and what will be the consequences?
- How will allies and the rest of the world react to a strategy that deliberately targets their space capabilities and assets?
- Will such a strategy make the U.S., and our critical space assets, safer, or rather, more insecure?

Endnotes

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5. Theresa Hitchens, "National Space Policy: Has the U.S. Air Force Moved the Goal Posts?" May 24, 2004, Center for Defense Information web site, <www.cdi.org/program/document.cfm?DocumentI D=2231>
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14. *Counterspace Operations*, p. 40.
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17. *Ibid*, p. 31.
18. *Ibid*, pp. 32-33.
19. *Ibid*, p. 33.
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21. *Ibid*, pp. 33-34.
22. *Ibid*, p. 22.
23. *Ibid*, p. 26.

Source: Centre for Defense Information, Space Security, October 4, 2004, <www.cdi.org/program/document.cfm?documentid=2504>