



**In for the ‘Soft’ Kill?
The People’s Liberation Army’s Discussion of U.S. Offensive Space
Capabilities**

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The U.S. “Defense Space Strategy” summary, released 17 June 2020, outlines the U.S. objective of space superiority and identifies space as “a distinct warfighting domain.”¹ On 9 March 2020, the “first offensive weapon system in the United States Space Force (USSF), the Counter Communications System Block 10.2 (CCS B10.2), achieved Initial Operational Capability.”² On 17 May 2020, the USSF launched the X-37B space plane’s sixth mission, which included a number of classified experiments and the deployment of small satellites.³ Against the backdrop of an increasingly explicit U.S. space strategy, these two space capabilities have turned heads, especially within the People’s Liberation Army (PLA). The PLA views both as potential offensive space weapons.

Using publicly-available Chinese-language sources, which may reflect the current climate within the PLA, this article highlights the PLA’s most poignant concerns regarding USSF space capabilities and the insight these concerns may provide into the PLA’s own capabilities. These sources voice broader concerns which echo PLA views on the formation of the USSF, citing the U.S.’ hegemonic tendencies and the lack of oversight from international treaties as the most pressing interests.⁴ However, the sources also highlight several key concerns within these two offensive systems. Parsing these narratives not only reveals which aspects of these capabilities seem most threatening to the PLA, but also how the PLA is preparing to defend against or engage with these capabilities.

Although the USSF official statements have described CCS B10.2 as an “offensive weapon system,”⁵ it has not made the same classification of the X-37B. However, China’s definition of “space weapon” seems to be loosely applicable to many of the USSF space capabilities. In 2014, China and Russia submitted a draft of the “Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects” to the Conference of Disarmament. Chinese authors frequently cite the U.S. rejection of this treaty as a U.S. failure to engage in space arms control negotiations.⁶ The text of the treaty defines a “weapon in outer space” as “any outer space object...produced or converted to eliminate, damage, or disrupt normal functioning of objects in outer space,” and declares that all States party to the treaty “shall not place any weapons in outer space,” unless acting in self or collective defense.⁷ This proposed definition is important to note, not only for what it includes, but also for what it does not. Under these definitions, if the X-37B is used offensively, it would indeed be considered a ‘space weapon,’ and therefore, could warrant PLA retaliation. On the other hand, while the terrestrial-based CCS

B10.2 can disrupt the functioning of Chinese space objects, it is not in violation of the proposed treaty. Though the PLA may view the CCS B10.2 as an escalation of U.S. offensive action, the loophole in the proposed treaty indicates that the PLA has given itself leeway to develop similar capabilities.

Counter Communications System Block 10.2 (CCS B10.2)

As far as publicly-available U.S. sources have revealed, the CCS was first introduced in 2004, and the CCS B10.2 features a “transportable space electronic warfare system that reversibly denies adversary satellite communications.”⁸ According to U.S. sources regarding the early development of CCS, the reversible communication-jamming properties of CCS were preferable to kinetic anti-satellite (ASAT) systems because CCS “is not likely to encourage other countries to pursue the development of destructive systems that could cause [space] debris,” although it still has the ability to disrupt or destroy an adversary’s communications.⁹ The next iteration of CCS, code-named “Meadowland,” will feature open architecture and a more compact and therefore maneuverable system.¹⁰ PLA sources are concerned with the USSF’s planned procurement of 48 sets of ground jamming devices by 2027, claiming that such action represents an acceleration of U.S. space militarization and a shift to offensive strategy, as the U.S. military strength in space now “far exceeds its own defense needs (远超其自身防御需要).”¹¹ This offensive weapon is also seen as a “double standard” in U.S. space superiority, a narrative which is common in the PLA view of U.S. military action.

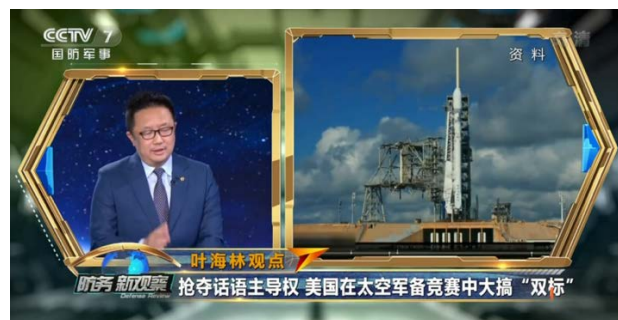


Figure 1: The Chinese caption on the screen reads: “Ye Hailin’s (叶海林) perspective: In dominating the discourse of the space arms race, the U.S. has set up a ‘double standard’” Credit: CCTV (June 05, 2020).

In a recent *Global* magazine (环球杂志) article, Zhang Xuefeng (张学峰), the Editor-in-Chief of the *China Air Force* magazine¹² (中国空军), which is managed by the Political Work Department of the PLA Air Force, stated:

“While the U.S. has criticized Russia and other countries for developing anti-satellite weapons, it has ‘turned a blind eye (睁一只眼闭一只眼)’ to its allies and desired partners...India, Japan, France, and other countries are also working to develop space capabilities. Their actions include establishing military organizations to specialize in space-related issues, which will almost certainly include ‘anti-satellite missions.’”¹³

The deployment of CCS B10.2 and the future “Meadowland” system introduce a number of further concerns to the PLA view of USSF offensive operations, as well as heightened some pre-existing concerns. Most notably:

- Concern with the ‘soft kill’ capabilities of the CCS B10.2 and its implications on the pace of space conflict and militarization;
- Concern with a lack of detection or accountability for such ‘invisible’ weapons;
- Concern with the ‘low-technical threshold,’ which makes the capability easy for other countries to imitate.

While previous disputes regarding the militarization of space have centered on kinetic or “hard kill” weapons, the CCS B10.2’s reversible and temporary “soft kill” capability creates a new set of concerns. A recent article by journalist Zhao Wentao (赵文涛) and PLA engineer Huang Wei (黄巍) asserted that the new capability gives more options for U.S. offensive action and yields fewer consequences.¹⁴ Some PLA sources consider the CCS B10.2 to be “more lethal” than other ASAT capabilities because it has the ability to covertly interfere with a satellite’s orbit, operation, and control.¹⁵ Sources seem concerned that U.S. procurement of ‘soft kill’ weapons will result in more frequent offensive action. In an opinion piece written for the *PLA Daily* (解放军报), Lan Shunzheng (兰顺正) stated:

“The consequences [of ‘soft-kill’ weapon’s] capability of inflicting on an adversary’s space assets are less than those of ‘hard-kill’ weapons, such as space-based weapons, kinetic kill vehicles (动能打击武器), etc. However, the problem lies in the fact that the cost of using electromagnetic countermeasures is low, and the technological threshold is not high. Not only will countries with a strong space presence, such as the U.S., be able to easily procure this capability, it is not unattainable for other countries and even localized organizations. Therefore, in operating this offensive weapon system, the U.S. could give rise to imitators. Not only will this speed the pace at which similar capabilities emerge, it could lead those who possess it to rush into using it (抢先使用) when they encounter conflict.”¹⁶

The sources cite lesser risk of admonishment or retaliation, due to the challenge in attributing such capabilities. This, they claim, could speed the pace of space conflicts, as the decision to use the capability might not be weighted as heavily, and the advantage would go to the first actor.¹⁷ In laying out the new strategic need for quick and decisive action, the PLA may be indicating what aspects of space strategy it will be emphasizing.

The features of CCS B10.2 and the future “Meadowland” system indicate that the systems are highly maneuverable and easily concealed. PLA sources bring up this point in several articles and highlight the threat of an ‘invisible’ weapon.¹⁸ Without the ability to detect U.S. satellite-jamming and hold them accountable, China can also blame the U.S. CCS for any space capability failures.¹⁹

However, the lack of attribution will make it harder to condone any retribution. In 2015 many Chinese media outlets circulated comments from the Heritage Foundation's Dean Cheng as he discussed the 'invisible' weapons China was allegedly developing. Cheng stated that such weapons allow countries to "shirk responsibility," making them nearly impossible to attribute and later retaliate against.²⁰ 'Non-attributable' space capabilities have not otherwise been widely discussed in publicly-available PLA sources. On the other hand, the PLA has been more forthcoming with its concerns regarding 'non-attributable' cyber weapons and electronic warfare in general. As Yuan Yi (袁艺), a scholar from the Chinese Academy of Military Sciences, asserts, network warfare can be used "in advance, used throughout, and used repeatedly (先期使用, 全程使用, 反复使用)," but there is always difficulty in tracing the source. Yuan stated:

*"Cyber operations are characteristically difficult to trace the source of (溯源困难) and complicated to collect evidence for (取证复杂). The attackers could admit responsibility, but they could also deny any responsibility or pin the blame on a non-governmental hacker organization."*²¹

That being said, Joseph Nye, an influential international relations scholar who is commonly cited in Chinese media and PLA sources, claimed that "while attribution is crucial for punishment, it is not important for deterrence by denial or entanglement."²² This sentiment seems to be echoed in other PLA sources on cyberspace and space deterrence. Additionally, PLA views on cyberspace deterrence seem to conclude that in many cases attribution is a political issue, rather than a technical one, and resources should go towards other aspects of deterrence.²³ The PLA seems to view electronic warfare, cyber warfare, and 'soft' space capabilities through a similar lens and will likely employ similar strategies in attribution and deterrence.

Additionally, the low technical threshold and overall cost of CCS are raised as concerns that the capability can be easily implemented in other countries.²⁴ PLA sources seemed concerned with other countries' imitation of these capabilities as a further spiral into a militarized space domain. However, their concern that other states or non-state actors with little power in space could imitate the capability also indicates the ease with which China, with its wealth of resources, can or already has developed a CCS-like system.

Given these concerns, the PLA is taking the necessary steps to build up defense capabilities. As early as 2003, PLA experts were devising mechanisms to defend against electronic warfare,²⁵ and the PLA's 2013 edition of *Science of Military Strategy* (战略学) stresses the importance of "space information support," claiming that "when necessary," China must prevent the "interference or destruction (干扰或摧毁)" of its information systems.²⁶ There is indeed concern in the PLA's ability to defend against CCS B10.2, as the "lack of protective measures" in commercial and civilian satellites, which provide a considerable amount of support to Chinese military operations, make them vulnerable to electronic attacks.²⁷ Raising this concern suggests that China will be pursuing greater protective measures for their satellites. Several sources also underline the importance of anti-jamming technology in the PLA's own defensive capabilities, revealing that their development has been keeping pace with U.S. offensive capability development. Sources which demonstrate a thorough understanding of how USSF CCS works also lend weight to the assumption that these capabilities are already developed in China.

X-37B Space Plane

Almost all information circulated by PLA sources regarding the X-37B space plane is pure speculation. In 2019, former Secretary of the Air Force Heather Wilson revealed that the X-37B “can do an orbit that looks like an egg and when it’s close to Earth, it’s close enough to the atmosphere to turn where it is.”²⁸ However, the classified nature of its missions or further capabilities have led Chinese experts to speculate its status as a potential weapon. In their article for *Technology Daily* (科技日报), Zhao Wentao and Huang Wei state:

“The United States’ X-37B space plane can conduct space reconnaissance (航天侦察), communications command (通信指挥)... involved in confrontations in space (空间对抗) and long-range precision strikes (远程精确打击), and it can be reused and quickly deployed in combat operations.”²⁹

News coverage of the sixth launch of the X-37B also mentioned “accelerated testing of the X-37B’s air combat capabilities.”³⁰ Beijing military expert Cao Weidong (曹卫东) believes the X-37B’s orbit and cruising capabilities could be used to covertly release satellites or to carry other weapons,³¹ and other reports have claimed it is a prototype for a “space fighter,” with its capability of reaching 35 times the speed of sound allowing it to evade radar detection when striking a target.³² While none of the Chinese sources seemed to include definitive estimates of what the X-37B will be used for, one relied on Russian media polling which indicated that nearly half of 3,000 respondents thought the X-37B was a space weapon, and 30 percent thought it could be used to capture or destroy an adversary’s satellites.³³ This inclusion, while not representative of any official estimation, at least indicates the areas in which the X-37B might be most threatening to China and Russia, as well as the areas in which China could potentially use such a capability.

Concluding Thoughts

Given the PLA’s concern with ‘offensive space weapons,’ and the loose way in which that term is applied, the newest USSF space capabilities are a cause for concern in China. The main concerns raised in PLA discussions highlight the difficulties of defending against and attributing adversaries’ “soft kill” capabilities. The PLA seems to be concerned that the flexibility afforded by non-lethal weapons will allow the U.S. and others to take more offensive steps without having to engage in space conflict.

While the U.S.’ heavy reliance on satellites makes it vulnerable to interference, China’s vulnerability is steadily growing. As Michael Krepon, founder of the Stimson Center, pointed out in 2014, the asymmetry of U.S. versus Chinese vulnerability to satellite attacks is decreasing, as China also becomes more dependent on satellite technology, especially in its strategy of anti-access/area denial.³⁴ Chinese-language PLA sources have reinforced this point, citing the importance of satellites in “reconnaissance, surveillance, communication, navigation, and early warning,” as well as in around-the-clock battlefield assessments.³⁵ Therefore, China will likely consider these capabilities a high priority in developing its defenses.

However, the PLA assessments of these capabilities also suggest the PLA has or will develop similar systems and may use them in much the same way. Regardless of whether U.S. capabilities have been designated as ‘offensive,’ the PLA sources seem to view all U.S. space build-up as mobilizing for conflict. The PLA will be closely monitoring space for any U.S. actions which could be deemed a ‘first step’ in escalating conflict, as PLA experts have underscored the importance of seizing the initiative in space conflict.

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Endnotes

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