



PLA Arms' Tactical Support to Joint Warfighting: Aerospace Force

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This paper is one of four papers written for the China Aerospace Studies Institute (CASI) 2026 Biennial Conference panel on the “People’s Liberation Army’s (PLA’s) Arms’ Tactical Support to Joint Warfighting” examining the tactical role of the PLA Aerospace Force, Cyberspace Force, Information Support Force, and Joint Logistics Support Force. This paper reviews the PLA Aerospace Force (ASF). The panel participants’ focus on tactical support to PLA Theater Commands is intended to deepen analysis on each branch’s deployment with PLA services to enable fires and maneuver for joint warfighting.ⁱ

These papers define the tactical level of war according to the PLA’s 2006 *Science of Campaigns*: single engagements of shorter duration or multiple engagements, i.e., battles of longer duration.¹ This definition is similar to the one found in the U.S. Joint Chiefs of Staff Publication 3-0 *Joint Operations*, which describes tactics as “the employment of units in combat” to win engagements and battles, with battles defined as a series of engagements.² Building on these definitions, two caveats must be considered.

Based on the findings of these conference papers, the PLA may interpret the tactical level of warfare differently across domains. The authors of the Aerospace Force and Cyberspace Force papers, for example, find that the PLA may define levels of war by the geographic location of targets or the effects of actions: actions against locations in theater may be tactical, while actions against the United States—with the exception of Guam—may be strategic. By contrast, the authors of the Information Support Force and Joint Logistics Support Force papers appear to define the tactical level of war as actions conducted by units below the division level. As a result, each paper in this series takes a different approach to addressing the tactical level of war.

ⁱ Joint Publication 1-02 defines “fires” as, “The use of weapon systems to create specific lethal or nonlethal effects on a target” and “fire support” as, “Fires that directly support land, maritime, amphibious, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives.”

Second, according to both U.S. military and PLA conceptions, the tactical level of war can have strategic and operational implications.³ This panel assumed a tactical purpose in its analysis. However, depending on the multitude of hypothetical Taiwan scenarios, the United States and China may inaccurately interpret each other's early actions as tactical or strategic, especially because the West typically thinks about the space, cyber, information, and logistics domains primarily from a strategic perspective. Indeed, according to the United States Joint Chiefs' Joint Publication 3-0, "the strategic, operational, or tactical purpose of employment depends on the nature of the objective, mission, or task," which is to say, the actor's purpose or objective is what determines the level of war.⁴

Finally, the importance of understanding the role of the four arms in PLA operations at the tactical level of war is based on the PLA's conception of future warfare and, in particular, joint operations. Indeed, the 2020 "Outline of Joint Operations of the Chinese People's Liberation Army (Trial)" emphasizes the role of the four arms in supporting joint operations. In 2022, the Chinese Ministry of National Defense said that as a result of the guidelines,

New operational area and new quality forces—including army aviation, special operations, electronic warfare, unmanned systems, cyber warfare, and aerospace forces—are deeply integrating into joint combat systems and exercise workflows.... barriers hindering 'coordination' between services and arms operations and 'integration' between operational domain capabilities have gradually been broken. Supported by network-information systems and linked by operational data, a command chain that remains open and unobstructed around the clock has been constructed.... With all operational forces acting in concert to realize the overarching strategic intent, the concept of joint operations has shifted its focus from the "service affiliation" of forces to their "operational domain" alignment—a transformation that has become a defining characteristic of future joint warfare.⁵

As a result, the four arms play a central role in transitioning the PLA to not just become a joint force, but to become a force capable of conducting multidomain operations. Understanding the evolution of their role within the PLA joint force will thus provide an important window into assessing the PLA's ability to conduct modern war.

Introduction

On April 19, 2024, the CMC announced that it had disbanded the PLA Strategic Support Force (SSF) to create three separate arms, each organized under the Central Military Commission (CMC). The former PLASSF Space Systems Department was renamed the "Military Aerospace Force," making it the only new arm with the word "military" (军事) in its title. As of the latest reforms, the ASF's structure does not strictly align with the regional Theater Commands (TCs) like the Cyberspace Force and Information Support Force (ISF). This is because its mandates continue to be primarily functional and strategic, making the unique lens of this report valuable. Additionally, at least for now, the ASF still provides support to the non-military national space program, such as the United States Space Force's management of satellite

launch centers and the National Aeronautics and Space Administration's management of the International Space Station.⁶ Additionally, since the establishment of the ISF, the ASF has offloaded much of the ground-based space information support to military end-users to the ISF.⁷ This enables the ASF to focus on delivering, operating, and maintaining advanced on-orbit capabilities, including on-orbit servicing.

The ASF's tasks

Starting with a high-level look at the ASF's overarching responsibilities will help to situate its tactical support to joint warfighting under the respective mission areas. At the ASF's formal inception in April 2024, the Chinese Ministry of National Defense spokesman stated that the CMC will continue to task the ASF with strengthening China's "capacity to safely enter, exit, and openly use space."⁸ Authoritative PLA texts have typically explained the three tasks as "enter, exit, and openly use," with slight variations. For example, "enter and exit" have been described together as "access" and "openly use space" has typically been described simply as "use."⁹

Given that the CMC's most recent iteration in April 2024 included three tasks: "enter, exit, and openly use," and other PLA descriptions also typically include three tasks: "access," "use," and a third category that this report interprets as including the word "openly" as capturing the third task. In the past, the CMC has used the third category to describe the ASF's task to *ensure* they can openly access and use space, indicating a fear that their adversaries may try to keep them from openly accessing and using space.¹⁰ For example, to describe the PLA's need to ensure they can openly use space, PLA texts have described offensive and defensive operations, and in other texts, described their definition of bounded space "control."ⁱⁱ¹¹ As will be described in detail in a forthcoming paper, the PLA defines space control differently from the United States. Because of that, this CASI paper proposes interpreting the ASF's three tasks as "access"; "use"; and "ensure open use," to blend the various PLA usages together.¹²

Within this framework, "access" and "use" refer to the ability in peacetime and in conflict to successfully carry out launch, reentry, satellite communication and control, and space and ground-based services. For the purpose of an initial discussion on the ASF's tactical support to joint warfighting, it is important to note the same mission can support different tasks. Of the missions that the textbook describes as tactical: defense and blockade, defense operations appear under each of the three tasks (see below). Also, according to the PLA's updated textbook on space operations, the ASF's task of "use" is "currently the most important task," and is likely where they are spending the majority of their time.^{13,iii} The most important mission is defense,

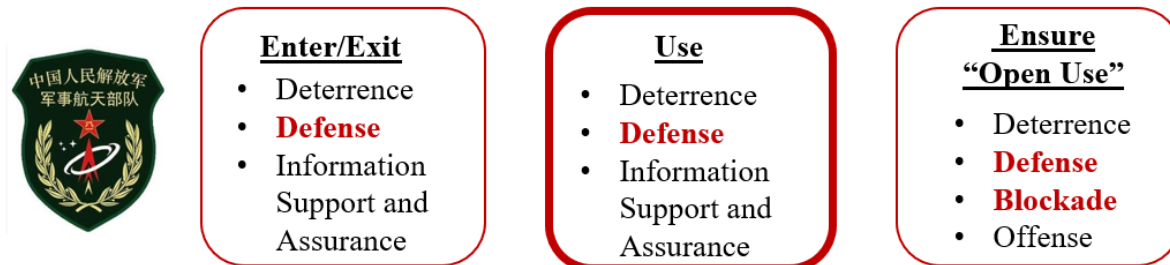
ⁱⁱ See follow on report: *The PLA's Updated Space Operations Textbook: What You Need to Know* for a deep diver on the Chinese phrase English speakers typically, and possibly inaccurately, translate as "control."

ⁱⁱⁱ As mentioned above, "ensure open use," is the author's recommended description for the third task that the CMC set for the ASF in September 2024, based on a variety of other authoritative descriptions.

which the textbook describes as “the most important and the most difficult mission,” of which on-orbit spacecraft defense is of utmost difficulty.¹⁴



PLA ASF 3 Tasks and 5 Missions



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Also within this framework, “ensure open use” would mean that the ASF must be able to defend its right to openly use space, with the Chinese character for “rights” (权)^v regularly included in the CMC’s descriptions of the third task.¹⁵ PLA textbooks describe the ASF’s need to “ensure open use” with primarily joint ground-based capabilities. The *PLA Science of Military Strategy* in 2020 described the requisite capabilities for this task as “strategic early warning and surveillance capabilities, ballistic missile long-range precision strike capabilities, space-to-ground strikes, and on-orbit defense capabilities.”^{16,vi} The updated PLA space operations textbook in 2024 described that the conditions for determining “ensured open use” are met when the ASF has confidence in the “survivability of military satellites, the reliability of space data support that enables ground-based operations against an enemy’s strategic targets, and defensive capabilities to protect against threatening spacecraft with reversible and destructive methods.”¹⁷

ASF Tactical Missions

To meet the CMC’s requirements for access, use, and the ability to “ensure open use” in support of PLA operations, the ASF has five mission areas, most of which are joint operations. The ASF’s five mission areas are: deterrence operations (太空威慑作战); space blockade operations (太空封锁作战); offensive operations (进攻作战); defensive operations (太空防御作战); and space information support and assurance operations (太空信息支援保障作战).¹⁸ These missions are intended to support the three tasks. For example, “access” requires strategic

^{iv} Presentation slide from the ASF Tactical Support to Joint Warfighting presentation in Washington D.C., May 2026.

^v A challenge with this translation is that “权” is also used for “supremacy”, e.g. Air supremacy: 制空权. The author of this CASI report judges the best translation of the PLA idea into English is “ensure open use”.

^{vi} Note the *Science of Military Strategy* also describes “strategic early warning and surveillance capabilities as space situational awareness (SSA). Note the “space-to-ground fires” refer to orbital bombardment, which the PLA’s Space Operations textbook describes as “ground-space-ground” offensive operations to target space ground stations.

and tactical operations from deterrence, defensive, and support missions. For the purposes of this paper, only those missions that capture what would be tactical from an ASF perspective are discussed below. Towards that end, the PLA space operations textbooks states that three mission areas enable “ensure open use”: defensive operations, space blockade operations, and offensive operations. Of those, the new and updated versions of the textbook state that only the space defensive and space blockade mission areas include tactical operations. To have tactical operations included within the defense mission, which is the most important and difficult mission for the ASF, indicates that this is also an important way that the ASF must adapt and improve support to joint warfighting.¹⁹

Using the PLA’s categorization of the ASF’s tactical missions, the rest of this report dives into the ASF’s tactical defensive and blockade operations in terms of how they support joint warfighting.^{vii} In the two mission area sections, this paper will describe the mission, significant changes between the PLA’s 2013 space operations textbook titled *Lectures on the Science of Space Operations* and the revised version published in 2024 by the original PLA Academy of Military Sciences author called *Introduction to Space Operations*. This paper will then include recent examples of related ASF tactical equipment or weapons development to update prior research.²⁰ Last, this report will provide additional updated information describing ASF personnel deployment with, or in coordination with, the PLA’s TCs and their Joint Operations Command Centers (JOCCs).

Defensive Operations (太空防御作战)

Generally, PLA textbooks describe defensive space operations as “passive and reactive” measures to counter adversary tactical, campaign, and strategic ballistic missiles, and defend against attacks on China’s spacecraft or space bases, to include its maritime tracking ships.²¹ Indeed, the PLA continues to describe three types of defensive space operations:

- Counter-missile operations
- Spacecraft defense
- Space base defense

Defensive operations are the “most important mission” for the ASF because while “the ‘spear’ of global space forces has already shone brightly in actual combat, the project to forge the ‘shield’ is still under exploration.”²²

Defensive space operations are also the most important ASF mission because China is increasingly reliant on its space infrastructure. The tone of PLA authoritative texts implies that

^{vii} At the start of this project, the author assumed that the mission for “space information support and assurance” would be a primary example of the ASF’s tactical support to joint warfighting. However, it turns out that the CMC transferred the tactical aspects of that mission area to the Information Support Force. The reader can get more details of this mission area here: (Kristin Burke, “PLA Reorganizes Space Information Support and Assurance Mission,” *China Brief*, February 20, 2026, <https://jamestown.org/pla-reorganizes-space-information-support-and-assurance-mission/>.)

the CMC worries that China's adversaries will attack the PLA's growing number of domestic ground bases and support infrastructure. The concern is just as strong, if not stronger, than the concern that PLA adversaries will destructively attack its satellites. The updated space operations text elevates the role of terrestrial space bases in PLA thinking by saying, "The threat to space bases is becoming increasingly serious. Therefore, the deployment of defense forces for space bases must integrate land, sea, and air defense forces, and strategically allocate forces across different regions and domains to ensure the air security of the space base...and surveying vessels."²³ This indicates that defensive terrestrial operations to ensure "access" for joint warfighting are growing in importance along with terrestrial defensive operations to ensure "use."

Of the three types of defensive space operations, counter-missile and space base defense operations are exclusively reactive, and may be joint or independent ASF tactical actions. The ASF leverages independent and joint force monitoring and early warning systems to identify threats to its terrestrial space bases; the ASF would then leverage PLA joint force firepower to defend space bases from missiles. The ASF is most likely responsible for its own information and cyber security of Chinese space bases, with the ISF primarily managing joint information systems.²⁴ The ASF's other independent role in space base defense seems to be in building the capability to carry out its "access and use" mandate with mobile launchers in the event that its space bases are attacked.

Both the 2013 and the 2024 versions of the PLA's space operations textbook describe the ASF as having a role in independently and jointly conducting defensive counter-missile operations against "strategic, campaign, and tactical" ballistic missiles.²⁵ The ASF and PLA Air Force's early warning radar integration to better detect, track, and target low altitude and space targets is where the ASF likely supports counter-tactical ballistic missile operations. The ASF, PLA Air Force, and PLA Rocket Force are all versed in mid-course higher altitude strategic and campaign counter-missile operations.²⁶ The updated space operations textbook is clear that only for strategic and campaign activities would the PLA joint force use high-altitude missiles against satellites.²⁷ The textbook also newly emphasizes that direct ascent anti-satellite missiles are best used in deterrence operations to sway public opinion and influence adversary thinking.²⁸

Regarding the last type of defensive operation, spacecraft defense refers to space-based activities that are distinct from those the PLA describes as orbital blockade operations and will be discussed below. In terms of defensive operations, the updated PLA textbook reserved the Chinese adverb "zui" (最, meaning "most") to describe spacecraft defense operations as having the utmost level of difficulty and importance.²⁹ Space-based spacecraft defense operations could be independent ASF or joint actions, if a cyber weapon is used.

Despite acknowledging the difficulty of on-orbit defense operations, the textbook, only in this section, includes the ambiguous term "active-defense," used by both the Chinese and U.S. militaries.^{30, viii} In the updated textbook, the author states that, "To ensure the targeting, accuracy,

^{viii} According to the USSF's March 2025 "Space Warfighting: A Framework for Planners," "Active space defense consists of direct actions taken to disrupt, degrade, deny, or destroy ongoing or imminent attacks against friendly

and effectiveness of orbital counterattack, various space forces must be utilized before the battle to promptly understand the space environment situation. To prevent sudden space attacks by the opponent, early warning forces must be promptly deployed.”³¹ This indicates that the ASF has the lead in orbital preventive and orbital reactive defensive measures.³² The ASF’s new Base 37 for Military Space and Missile Early Warning will probably provide the “early warning forces” to deliver high confidence situational awareness, with ASF Base 36 still in the process of developing on-orbit defensive tactics, techniques, and procedures.³³ Regarding these preventative on-orbit spacecraft defensive measures, one interpretation is that the PLA seems to assume that through its improved and expanded ground and space-based space and missile early warning system, the ASF will correctly identify signs of adversary intention to launch a counterspace weapon against China.^{ix}

The core assumption underlying the CMC’s aspiration for the ASF to correctly interpret their adversaries’ intent is that global space powers will act first.^x Throughout the updated textbook, the authors use China’s priority order of access, use, and if necessary, “ensure open use,” except in this section. The updated textbook emphasizes the ASF’s need to be prepared to rapidly conduct spacecraft defense because, according to the authors, global space powers prioritize space control and taking the initiative over access and use.^{34,xi} In other words, the PLA assumes countries like the United States and Russia will act in space first and the ASF will need to be ready to defend its right to openly use space.

Tactical Defensive Operations: Examples

Space base defense. The ASF’s tactical defensive operations to support joint warfighting with access to space will include increasing exercises for launch center personnel with China’s mobile launch and tracking vehicles.³⁵ After the U.S. initiated the “operationally responsive space” plan in the early 2000s, China started its own efforts towards a responsive launch capability, successfully launching the first Kuaizhou vehicle in 2013.³⁶ The Chinese are still pushing for what they call “emergency launch,” as described below. The PLA is building an “emergency launch force” to ensure access to space if its adversaries damage China’s launch centers.

- Officers studying at the ASF’s Space Engineering University (SEU) in 2019 presented a paper in English at the 10th Asia Conference on Mechanical and Aerospace Engineering reviewing global rapid response launch vehicles. In regard to China’s status, they stated, *“From the emergency launch force construction, China has no precedent to follow, the*

space forces, assets, and capabilities...Active space defense includes three operations used to achieve specific space superiority effects: escort, counterattack, and suppression of adversary counterspace targeting.”

^{ix} This language and assumption of correct interpretation of intent is echoed in the U.S. Space Force doctrine in regards to defensive operations and the USSF’s definition of “active defense.”

^x When the PLA refers to its space adversaries, it includes India, Japan, and the United States. When the PLA refers to global space powers acting in space first, requiring a PLA response, it is referring to the United States and Russia.

^{xi} The PLA author’s interpretation is also accurate, based on U.S. Space Force Doctrine Document 1 and other documents which list space control as the first priority.

space emergency launch force construction theory, combat training methods, and other basic elements of force construction have not yet been fully practiced... In the face of the new goal of improving the new quality combat effectiveness, it is urgent to learn from the experience of the space launch force of advanced space powers, especially the construction of emergency launch force, in order to accelerate the generation of China's emergency launch combat capability."³⁷

- The ASF's drive for emergency launch persists. For example, Chinese defense contractor China Electronics Technology Group Corporation in April 2025 published a technical report describing scenario planning for multiple mobile tracking and launch vehicle deployment locations to optimize flexibility without mutual interference. The author stated, *"Space emergency launch capability is an important component of my country's space launch capabilities and a necessary measure in a space confrontation environment. It mainly addresses situations where ground-based fixed tracking and control systems or equipment are vulnerable to attack and unusable during wartime. It involves mobile tracking and control during the rocket launch phase to maximize the satisfaction of tracking and control requirements, enabling rapid spacecraft insertion into orbit or constellation replenishment and networking. This is a key measure to maintain my country's space emergency launch capability."*³⁸

Anti-missile operations. The ASF's main mode of tactical support for anti-missile operations is through ground- and space-based early warning, tracking, targeting, and missile guidance. Over the last decade, the CMC has restructured China's ground-based space situational awareness command and control to include a new ASF Monitoring and Early Warning Base 37 in Shaanxi Province, Xi'an City, Lintong District.³⁹ The ASF's Base 37 specializes in military space and missile early warning with ground fixed and mobile infrastructure, and it likely supports requirements for China's ongoing efforts for a space-based missile early warning system.⁴⁰

- The probable ASF unit 63768 in Lintong District of Xi'an City in 2022 published a technical report with PLA Air Force anti-missile colleagues on their proposed system to merge all ground-based air and space monitoring systems for anti-ballistic missile operations. The authors stated that the enemy would probably attack from six different directions, and they needed to ensure China's various radars didn't interfere with each other. Their work was also the first step before additional research could be conducted on "multi-source heterogeneous early warning resources" such as "space-based early warning satellites, ground-based early warning radars, and sea-based early warning radars."⁴¹
- The ASF's Beijing Institute of Tracking and Telecommunications Technology (BITTT), also known as ASF Unit 63921 in 2023 published a technical report on the status of a geostationary Earth orbit (GEO) satellite with an infrared payload in a missile early warning task. The paper described their attempt to improve Chinese missile early warning satellites' ability to detect boost-phase ballistic missiles regardless of the background, i.e., land, air, or sea-based launch at different times of day to trigger anti-missile targeting. The authors said, *"In space-based detection scenarios, the*

*...backgrounds differ significantly and vary across time, space, and spectral bands; consequently, it is extremely difficult to acquire infrared detection imagery spanning diverse spatiotemporal conditions, observation angles, and spectral ranges solely through actual observation or experimental simulation. Therefore, conducting research into simulation methods for space-based infrared detection imagery of moving targets against complex backgrounds—and utilizing simulation techniques to generate comprehensive, full-element imagery—can provide a fundamental basis for the conceptual validation of space-based detection systems and the optimized design of their payloads.”*⁴² Based on the time the authors submitted this paper and their example satellite used during a June missile launch, it is possible they tested their proposed method during China’s June 2022 anti-ballistic missile test with either the TJS-4 or FY-2H GEO satellite.⁴³

- The CMC has recently revealed the ASF’s tactical role in not just tactical, campaign, and strategic missile reconnaissance, but also related information countermeasures. The three PLA parades since the establishment of what was formerly the Strategic Support Force have indirectly, and as of 2025, directly included the ASF as joint operators of electronic radar and communications countermeasure equipment with the PLA Army.⁴⁴

On-orbit spacecraft defense. The ASF probably has the lead in orbital preventive and reactive defensive measures. In terms of preventive measures, according to the 2024 and 2013 editions of the space operations textbook, in peacetime the ASF is tasked with layering defensive capabilities, including comprehensive concealment and camouflage, small-satellite and multi-satellite networking, and the ability to maneuver and evade. Reactive defensive measures require the use of “space-based directed energy (DE) and space-based kinetic energy weapons to counter threats,” with the kinetic weapons most often referred to as space mines.⁴⁵ It seems the CMC has approved reactive spacecraft defensive measures once the ASF is certain they are under attack, so both non-reversible and reversible effects would be approved.

- According to the updated PLA space operations textbook, global space powers, to include the U.S., Russia, and China, “have achieved phased results in space-based lasers and microwave weapons,” which includes high-powered microwave weapons for non-reversible effects, as well as radio frequency jamming for reversible effects.⁴⁶
- The PLA is known to have at least two experimental space-to-space SATCOM jammers on-orbit, one in LEO and another in GEO.⁴⁷ ASF Base 36 Unit 32032 likely operates them, based on the unit’s invention patent in 2022 for a system that can determine the status of a satellite’s electronic reconnaissance or jamming payload, the publication of which followed its report in 2019 on natural and manmade sources of space-based interference.⁴⁸ ASF Base 37 Unit 32039 has tested tracking and detecting the GEO experimental satellite’s ability to effectively carry out its jamming test. These authors also referred to an early 2000s probable LEO-based test satellite that practiced jamming with different methods.⁴⁹
- Most recently, the ASF Unit 32032 in January 2024 published a technical report simulating a space-based laser for use on the China Space Station. The authors said their work built on other Chinese research reports from 2017 and 2019, which had not

provided enough information for a feasible simulation. In the updated report, the authors set parameters with a laser beam propagation distance of 100km for debris sized between 1-10cm that could be launched to and used on the Chinese space station. The authors stated, “*While the aforementioned studies summarized the technical principles of laser ablation for debris removal and validated the feasibility of space-based laser systems for clearing space debris, none have yet provided a detailed design for actual operational systems and scenarios...To address these issues, [we] designed a specific operational scenario for space-based laser debris removal...This approach aims to reduce launch costs and enhance cost-effectiveness.*”⁵⁰

Blockade Operations (太空封锁作战)

In general, PLA textbooks describe space blockades as offensive operations that can be conducted at any level of war and are appropriate only when the PLA believes it has the upper hand. In those cases, the CMC can approve joint forces’ use of reversible or destructive weapons to keep an enemy from accessing and using space. In other words, all types of space blockades are intended to keep the enemy from launching new capabilities or communicating with their existing orbital systems, with a complete severing of a strategic node’s connection with space. Space blockade operations are most often joint operations that can be at the strategic, campaign, or tactical level. According to the PLA textbooks, space blockade operations should always be conducted to facilitate a PLA ground-based operation.^{xii} An important change that will be discussed below is the deemphasis on orbital blockades and shift to emphasizing space base and information blockades.

There have historically been four types of PLA space blockades:

- space base blockade
- orbital blockade
- launch path blockade
- information blockade

The updated space operations textbook provides general descriptions of them that track with the 2013 version, except in two ways, which will be discussed below. The consistent general explanations are as follows: For the first type of blockade, space base blockades leverage other services and arms’ capabilities for an offensive strategic mission. The textbooks state that other services and “information warfare forces” will attack space bases with ground infiltration by PLA Special Operations Forces (SOF), multi-service missile attacks, or the information warfare force’s cyber and jamming weapons.

The second type of blockade, called orbital blockades, is space-to-space attacks with non-reversible, fully or partially destructive weapons, such as space mines or DE weapons, which

^{xii} In this regard, the PLA’s description of the orbital blockade is nearly opposite of its description of orbital defensive operations, as discussed above.

include the full range of spectrum weapons. It is not clear if orbital blockade is strategic or tactical. It is probably both, as the 2013 and 2024 versions of the textbook spend significant time describing the chances of accidental “self-blockade” and cautioning against its use.^{xiii}

The third type of blockade, launch path blockade, specifically includes both space-based and terrestrial weapons. The space-based launch blockade includes the use of DE and space mines to interfere with orbital placement. The terrestrial-based launch blockade includes the use of joint PLA missile forces for mid-course, exo-atmospheric interception of adversary satellite launch vehicles. Other terrestrial-based weapons for launch blockade include meteorological weapons such as cloud seeding to create weather conditions unsafe for satellite launch. Launch path blockade could be tactical if the adversary satellite launches are at bases in the theater; a terrestrial space launch blockade for a satellite launch from the continental United States would be strategic.

The fourth and last type of blockade, called information blockade, emphasizes severing the lines of communication between important space ground-segment nodes and satellites using “information warfare weapons.”⁵¹ Information blockades are not the same as jamming a single user’s downlink connection; instead, they are focused on longer-term or wide-area impacts. The original and new versions of the textbook both reference early warning and navigation satellite information systems.⁵² Information blockades could be strategic or tactical and are conducted jointly with multiple services’ information warfare units to target an adversary’s launch, telemetry, and control system, i.e., these weapons are not necessarily directed at satellites in space. Hence, the textbook authors also urge extreme caution against self-blockade to avoid both jamming friendly users and introducing an uncoordinated information operation, like spoofing, that causes internal and external confusion. Information blockade weapons include reversible and low-powered non-reversible spectrum weapons, spoofing, as well as computer command and control cyber attacks, the latter of which is conducted by the Cyberspace Force, not the ASF.

While the general explanation of offensive joint space blockades has persisted, two important changes can impact the ASF’s tactical support for joint warfighting. First, an important sentence has been removed from the opening of the blockade section, the textbook no longer states that “The main activities of space blockade operations are all conducted in outer space.”⁵³ Instead, there is a heavier emphasis on blocking enemy space bases with terrestrial operations, firepower and cyber especially. Attacks against key nodes of the adversary’s ground segment are elevated over orbital operations because “space bases are the ‘roots’ of various space systems,” which could better achieve a blockade’s goal for wide-area impacts.^{54, xiv} This new emphasis shines a light on a repeated sentence from both versions of the textbook that joint forces will “utilize long-range precision strikes to launch targeted attacks against key enemy space bases.”⁵⁵

^{xiii} The PLA space operations textbooks are for cadet education, i.e. it introduces theoretical concepts as well as discusses what meets China’s local conditions.

^{xiv} As a result of the new emphasis on long-range precision strikes on enemy ground-based space bases, the authors distinguished between two methods which had been combined into one previously (SOF and firepower). The deemphasis on orbital blockades resulted in the authors nesting it into a description of joint comprehensive blockades.

Additionally, the textbook author's removal of the sentence about orbital blockades could imply that the PLA does not expect to have the upper hand in space-based activities, as is required for blockade operations, hence the textbook's emphasis on preparing for defensive orbital activities, as discussed above.

Second, the updated textbooks include an additional type of information blockade to reflect the new emphasis on space base blockades. In addition to the original three types of information blockade described above, where early warning and navigation satellite information systems were specifically mentioned, there is now also a fourth type that exclusively emphasizes communication satellites and their ground segment. It says, "Attacking communication satellites and their ground stations is the main method of achieving information blockade" because "it is equivalent to completely depriving the opponent of their space-based capabilities."⁵⁶ Given that interference with missile early warning satellites could trigger a strategic response, and non-reversible navigation attacks have military and civilian impacts, the PLA's new focus on communications satellites probably seems both impactful and less escalatory.^{xv}

The implications of these two changes seem to be that the CMC has, on the one hand, tightened the restrictions on tactical ASF orbital blockades and, on the other hand, encouraged more ASF integration with joint operations to attack the space ground segment, presumably by honing ground and space-based systems for long-range precision fires and evaluation. Indeed, other PLA training texts focused on on-orbit operations like the book *Research on Intelligent Planning of On-Orbit Servicing Tasks* also states that, "Due to the limitation of knowledge reserve, we feel that there are still many problems worthy of further research and exploration," meaning that the PLA is developing the orbital operations force, but that the CMC's not ready to move beyond educational simulation and experimentation.⁵⁷ Importantly, prior research showed that two of the three *Research on Intelligent Planning of On-Orbit Servicing Tasks* authors were at one time a director and members of the ASF's Base 36 Unit 32032, indicating that their caution could be representative of the on-orbit experiments attributed to the unit.⁵⁸

Tactical Blockade Operations: Examples

There is currently a gap in open source research on space blockades, especially those at the tactical level. Given that space base blockades are strategic if targeted at the continental United States and probably campaign level if targeted at U.S. overseas or allied bases, and that the textbook has deemphasized ASF orbital blockades, this section would only cover the remaining two types: space launch blockade and information blockade, the latter of which includes an orbital component. However, for space launch blockades to be tactical, they would presumably need to be conducted against in-theater satellite launches, i.e., launches from U.S.

^{xv} The reader should note that the updated textbook was published in 2024, but editing likely began around mid-2021, based on the year of the author's introductory note. The new section is less about Starlink and more about growing sophistication in the PLA's thinking on risks to their own access and use of space.

regional allies and partner sites.^{xvi} The ASF could play a tactical role with their joint mobile reconnaissance and counter-missile radars, which the CMC displayed in the 2025 PLA parade. Hypothetically, if the ASF's mobile satellite launch vehicles could double as missile launch vehicles, like the Kuaizhou 1A or 11, the ASF could play a tactical role in more than just counter-missile and launch vehicle electronic countermeasures and have a direct counter-launch vehicle effect. However, China has not used its mobile Kuaizhou vehicles from locations like Wenchang, which would make a tactical attack on a regional adversary's launch vehicles more feasible.^{xvii} For those reasons, this section focuses on the limited available examples of information blockades.

Information Blockade

The PLA textbook included early warning, navigation, and communications satellite communications bases and launch centers as targets for information blockades. The PLA joint force continues to manage their own means of PNT blockades.⁵⁹ The ASF is probably able to do both PNT and other ground, and maybe space-based, information blockades such as for early warning satellites—which this report assumes to be infrared missile early warning satellites—and communications satellites.^{xviii} As the textbook describes, information blockades that can completely block access with joint operations would require layered effects using multiple services' ground equipment and ASF space-based equipment.⁶⁰

- The ASF has at least one experimental GEO communications downlink jammer, which could achieve the wide-area effects required for an information blockade. PLA authors have also discussed their work on inter-satellite data links, which could be achieved through sophisticated laser dazzling or by maneuverable satellites physically blocking the link path of a usually stationary GEO communications satellite.⁶¹ A complete severing of LEO communications satellites does not yet seem possible.
- ASF Base 36 Unit 32031 in 2024 published an update to its ongoing effort to develop a ground-based higher-powered laser for “optical countermeasures” over “long distances.”⁶² Even to conduct ground-based dazzling of a GEO infrared early warning satellite would require high power for precise pointing at that distance.
- The joint PLA Army-ASF group in the 2025 PLA parade included multiple types of mobile electronic countermeasures equipment for reconnaissance and counter-reconnaissance. One vehicle displayed what might be a high-powered microwave, which could enable ground-based tactical information blockades directed at adversary satellite communications bases in theater.⁶³

^{xvi} The author of this report assumes that the PLA would consider launch path blockades against satellite launches from the U.S. as strategic.

^{xvii} China's emphasis of sea-based launch for its commercial space industry decreases the likelihood that it is a possible platform for launch path blockade, especially because the availability of non-traditional launch centers is extremely important for PLA thinking on preparing for attacks at their land-based sites.

^{xviii} This is clear from the continued work from the CMC Equipment Department's Base 33.

The ASF's joint deployment and coordination with TCs

As discussed above, the ASF provides tactical support to joint warfighting primarily through its defensive and blockade mission areas. The ASF's joint tactical counter-ballistic missile reconnaissance and countermeasure equipment and possible terrestrial high power microwave equipment are the most likely contenders for a Theater Commander's tasking. The ASF's bases 37 and 36 likely operate this equipment. The ASF's tactical defensive operations to defend China's space bases are not included below, as there is currently a gap in information on whether that would be coordinated at the CMC or TC level.

- The PLA Central Theater Command, since at least 2020, has been planning for joint information warfare information blockades with ground-based mobile laser dazzlers targeting missile early warning satellites.⁶⁴ This may or may not include a joint tactical role for the ASF post 2024 reform. Ground-based DE is still a TC-taskable counterspace weapon.
- The 2025 PLA parade confirmed that the ASF, for now, likely deploys with the PLA Army to conduct electronic reconnaissance, tracking, targeting, and countermeasures against radars and communications, most likely for counter-missile operations.⁶⁵ This would be complementary to ASF Base 37's role in military space and missile tracking and early warning. A unit of the former Strategic Support Force, not necessarily the ASF, joined the Army's information operations group in the 2017 and 2019 PLA parades, which in total has confirmed joint tactical operations spanning at least the Western, Central, and Northern Theaters.⁶⁶
- At the first anniversary of the CMC's trial joint operation guidance in 2022, China's Ministry of Defense (MOD) highlighted leading types of joint operations in the theaters. The MOD specifically referenced the joint role of services and arms in air defense and counter-missile operations in the western and northern theaters.⁶⁷ This likely includes the ASF, as it is consistent with a single early reference in 2018 to Base 36's "combat company" participating in a counter-air operations exercise in Luoyang, Henan Province, which was probably hosted by CMC Equipment Development Department Base 33.⁶⁸ In another early example, Base 36 subordinate Unit 32031 participated in an SSF-hosted exercise in 2019, where participants exercised unscripted operations to "interfere with the enemy" and "prevent reconnaissance of important areas."⁶⁹
- In November 2025, a Chinese blogger described ASF training with or in the likes of the PLA Army: "At the training ground, they [the ASF] need to sharpen their tactical foundation and temper their will to fight like all their Army comrades... Because military space forces do not exist in a vacuum, they are also combat units and must have the ability to protect critical facilities and ensure mission continuity in any environment."⁷⁰

The reference to the ASF needing to be able to protect critical facilities is consistent with what the updated space operations textbook says about the ASF's emergency launch force and other defensive operations at China's space bases. As stated above, it is unclear whether the protection of Chinese launch centers is a TC or CMC wartime responsibility. Each TC, except the Eastern

Theater, now has a regional launch center, so these facilities may be on the TC's critical defense infrastructure list.

If information blockades are under the direction of the TCs, the CMC would have provided strategic guidance on when the TC could request coordination with space-based reversible blockade weapons, in addition to the ASF and the Army's ground-based capabilities. Available evidence suggests that the CMC intends decentralized TC authority of tactical and campaign level information blockades, and intends to provide clear guidance on requesting space-based support, but that currently there still remain challenges in coordinating spectrum warfare units across the PLA services and arms.

- In August 2025, a *PLA Daily* article provided important clarification on the general role of centralized and decentralized command when conducting joint operations. It said, *“The centralized command approach of ‘strategic-level command, tactical-level action’ is not fully applicable to large-scale joint operations. Therefore, no matter how advanced network information systems are and how intelligent warfare becomes, combat command must leverage the dynamics of decentralized command...even with the assistance of command information systems, commanders can only absorb, digest, and apply limited information within a given timeframe. This is determined by the nature of human function. Therefore, some combat tasks should be devolved and delegated to subordinates, who should make their own decisions and implement them...Warfare practice demonstrates that both absolute centralization and absolute decentralization are flawed. Centralized and unified command in strategy and decentralized command in campaigns and tactics will retain their vitality in future warfare.”*⁷¹
- In October 2025, a different *PLA Daily* article confirmed that the ASF and Cyberspace Force (CSF) have their respective spectrum warfare units and like the other PLA services, must first internally deconflict spectrum activities, and then presumably with the Information Support Force (ISF), deconflict and coordinate across arms and services for campaign and tactical operations under the TC.⁷² Available evidence shows that the ISF has absorbed the CMC's spectrum units that deconflict across services and arms to avoid “self-blockade.”⁷³

As for the ASF, it has a long history of ground spectrum coordination with the other services, and probably internally coordinates for space-based usage. The implication of this setup, and indeed implied in the tone of the article, is that the integration and coordination of information blockades still needs improvement.

- Indeed, in January 2026, a less sanguine *PLA Daily* article stated, *“‘Full-scale joint operations’ [should] break down service boundaries and inter-domain barriers...It [should be] a deep coupling of forces from land, sea, air, space, cyber, and electronic domains, (陆, 海, 空, 天, 网, 电) and an organic integration of traditional combat forces with new-domain and new-quality forces... ‘General connectivity’ remains at the superficial stage of ‘universal basic interconnection’ within the system... Essentially, it is still a patchwork of forces, unable to unleash the multiplier effect of system synergy.”*⁷⁴

- In February 2026, the PLA again described its status in integrating individual services and arms' spectrum warfighting capabilities. A *PLA Daily* article indicated some regions of the spectrum may be more integrated than others. It said, *"Specifically, communication countermeasures, radar countermeasures, and optoelectronic countermeasures [in the past] were mostly deployed and operated independently, with relatively singular functions. There was a lack of deep interaction and unified scheduling between actions in different spectrum domains.... [Now they have] become increasingly closely integrated for combat operations. The relationship between various units has also shifted from "simple superposition" to "integrated fusion" based on system confrontation."*⁷⁵

The status of well-coordinated information blockades directly impacts the TC's ability to direct kinetic and directed energy fires, to include those for tactical space launch blockades or Chinese space base defense.

- In February 2026, a *PLA Daily* article explained that, *"electromagnetic dominance is equivalent to information dominance on the battlefield. In the context of joint operations, "information-led, firepower-driven" has become the most basic and common mode of warfare. Its integration of information and firepower necessitates a systematic and joint approach to spectrum operations. This means that spectrum operations must be deeply integrated into the joint operations system, closely coordinated and integrated with firepower strikes, forming an organic whole of system-on-system confrontation."*⁷⁶

Given the CMC's intention for decentralized command of information blockades and the ASF's role in counter-ballistic missiles at the tactical, campaign, and strategic level, the TC's ability to coordinate and task relevant services and forces likely continues to have gaps, regardless of the newly built national military communications networks. To mitigate these gaps, especially in wartime, the TCs probably have an ASF liaison co-located for real-time reach-back to the ASF's on-orbit operations in Xi'an and Beijing. Information on the Joint Logistics Force's liaisons at the TCs and the ISF detachments with the services implies that even though the arms are organized under the CMC, they still closely interface with and take direction from the TCs per the CMC's approved guidance.⁷⁷

Conclusion

The ASF's three tasks and five supporting mission areas, while largely strategic, do include often overlooked tactical missions. These are mostly joint ground operations that can also target ground space bases. First, the ASF's joint defensive operations in missile reconnaissance and counter-tactical ballistic missile operations will leverage the ASF's historical role in supporting missile and satellite launch vehicle tracking and testing. The integration of military space and missile early warning sensors under the ASF will likely enable large improvements to the PLA's already demonstrated counter-missile systems. The ASF's joint information blockades with primarily multi-service ground-based spectrum weapons targeting regional or in-theater adversary space bases and launch centers are another often overlooked ASF contribution. The 2025 PLA parade showcased joint Army and ASF mobile equipment, including

what may be the ground-based high-powered spectrum weapons often discussed in PLA space operations textbooks. The ASF may contribute ground equipment or its orbital SATCOM jammers if the CMC approves a “coordinated information blockade.”

There are also less obvious support missions, distinct from space information support missions, that the ASF must independently contribute. First, the ASF will ensure mobile and remote launch and TT&C capabilities with a dedicated emergency launch force in anticipation of needing to continue operations after China’s launch centers are attacked. Second, the PLA intends on-orbit refueling and maintenance to be another independent ASF support to ensure satellite availability.

In addition to on-orbit servicing, the CMC has approved the ASF to conduct another independent space-based tactical operation that directly supports joint warfighting: on-orbit spacecraft defense. According to the PLA space operations textbook, the ASF will primarily use concealment and evasive maneuvers for defensive operations. The CMC has approved the ASF’s “active spacecraft defense” using language similar to that found in U.S. Space Force doctrine. Both parties seem to assume they will correctly interpret each other’s on-orbit intent. However, interpreting on-orbit behavior as offensive or defensive has multiple inherent risks, one of which is that the PLA has a different space object catalog that leverages their more numerous space-based space situational awareness sensors. Assuming correct interpretation, the ASF is then also approved to use spectrum weapons like on-orbit jammers or dazzlers to defend China’s spacecraft from an adversary’s counterspace weapons.

Specific to spectrum weapons, the CMC intends to enable decentralized TC control, to include tasking ASF joint ground spectrum weapons. While problems with coordination persist, the ISF’s role in spectrum deconfliction over time will likely iron out these challenges. Additionally, in order for a TC to request ASF space-based information blockade support of a wide-area “coordinated information blockade,” there is probably an ASF liaison co-located in the TC Joint Operations Command Centers, similar to the ISF and JLSF liaisons, to facilitate reach-back to Beijing, where the Base 36 units that have historically tested on-orbit jammers reside.

The new emphasis on attacking enemy space bases that control communications satellites and C2 over independent satellites or their ground users could negatively impact the U.S. and allied interpretation of PLA activity in a Taiwan scenario. Together with the PLA’s signals reconnaissance ships and the growing number of geosynchronous Earth orbit satellites that patrol the Eastern longitudes, the PLA continues to improve its understanding of regional spectrum use in preparation for wide-area information blockades. While, of course, this includes enemy weapons’ spectrum use, it also certainly includes regional space base communications spectrum as well. The interpretation gap could be simply assuming the ground spectrum weapons are targeting one system while they damage another.

Other areas of likely misinterpretation in a Taiwan scenario could arise in attempting to correctly identify missiles and interpret on-orbit behavior. First, without considering the ASF’s tactical joint role in other services’ counter-missile operations or counter-space launch vehicle operations, the U.S. may inaccurately assume the ASF’s involvement implies the camouflaged

equipment is a direct ascent anti-satellite missile, rather than a mid-course ballistic missile interceptor. Second, the CMC seems certain that the U.S. will act in space first and has approved the ASF to prepare to defend its spacecraft. It is important to remember that orbital blockades have been deemphasized, which are offensive, while spacecraft defense has been elevated in the ASF mission set. At the same time, the U.S. also seems certain that the PLA will act in space first to attack the U.S.'s Achilles heel. However, China now emphasizes that the Achilles heel is the ground segment, leaving room for mutual insecurity in on-orbit behavior.

Last, this paper provides initial findings to support deeper research on how the CMC and the ASF describe and demonstrate joint warfighting, especially at the tactical level. Based on the PLA's conception of which ASF actions count as "tactical," the question to U.S. planners and warfighters is: "does that change your calculus?" Depending on the multitude of hypothetical Taiwan scenarios, the United States and China may inaccurately interpret each other's early actions as tactical or strategic, and this could lead to disproportionate responses with unintended outcomes.

Additionally, the examples above provide evidence that although each PLA service and branch specializes in a particular environmental domain, joint operations can involve the participation of multiple services in any given domain. This may be what the CMC meant by "joint domains" in its "One Year Review of the 'Outline for Joint Operations'" when it said,

The philosophy of jointness is gradually being established, barriers hindering the 'coordination' of actions among different military services and branches—as well as the 'integration' of capabilities across various operational domains—have been gradually dismantled. Joint employment of land, naval, air, and rocket forces within shared domains—along with the cross-domain fusion of operational spheres such as space, cyberspace, and the electromagnetic spectrum—is steadily becoming a reality.⁷⁸

At least based on the evidence above, the PLA considers joint operations to be more than simple coordination. One interpretation is that this holistic jointness would be difficult to achieve in the short and medium term, and possibly impossible, but if achieved, it would make the PLA a competitive and capable adversary.

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