THE NEW STRATEGIC SUPPORT FORCE OF THE CHINESE MILITARY AND IMPLICATIONS FOR REGIONAL SECURITY

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Executive Summary

1. China established a Strategic Support Force (PLASSF) in the People's Liberation Army (PLA) in late 2015. The new service has integrated the PLA's national-level space, SIGINT, cyber, electro-magnetic and psychological operations capabilities into a coherent organisation.

2. A critical rationale for launching the PLASSF is the concern for security of China's expanding national interests and capabilities in space. The central role of the PLASSF thus is to provide security for the growing Chinese interests and capabilities in space and in the associated electro-magnetic, cyber and psychological domains by reducing their vulnerability.

3. The establishment of the PLASSF helps institutionalise the development of the PLA's space, SIGINT, cyber, electro-magnetic and psychological operations capabilities. This institutionalisation may enable more optimal use of resources for developing these capabilities.

4. The integration of PLASSF capabilities into the PLA regional theatre operations may also enhance the effectiveness of the PLA joint operations.

5. Finally, the new service adds more and more effective technological tools to the tool kit available to the top leadership for reducing the perceived threat to China's security.

6. The establishment of the PLASSF, however, does not cause a fundamental change to China's military policy and posture in the Asia-Pacific region, which were in place before the existence of the PLASSF.

7. The technological gaps and lacklustre performance of some PLASSF capabilities also limit the policy influence of the PLASSF.

8. Moreover, China's top civilian leadership, but not the PLA, decides China's military policy and posture, which serve to guide and steer the development of the PLA.

9. Finally, China's post-2015 military reform has substantially diminished the policy influence of PLA services, including the PLASSF.

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LI Nan & Ryan CLARKE*

Establishing the New Strategic Support Force

1.1 In late December 2015, the Strategic Support Force (PLASSF) of China's People's Liberation Army (PLA) was established. China's military analysts claim that the primary mission and task (使命任务) of the PLASSF is to provide strategic battlespace support to enable PLA local superiority (局部优势) on the aerospace (航天), outer space (太空), network or internet (网络), electro-magnetic spectrum (电磁空间) and psychological warfare (心理战) battlefields in war.

1.2 These analysts also state that PLASSF operations would be integrated seamlessly (融为一体) with those of the PLA Army (PLAA), PLA Navy (PLAN), PLA Air Force (PLAAF) and PLA Rocket Force (PLARF) and run throughout the war (贯穿始终). PLASSF thus constitutes a critical force (关键力量) of the PLA for fighting and winning a war.[1]

1.3 The emerging organisational structure and leadership of the new PLASSF reflect well the emphasis on developing and employing functional and technical capabilities and expertise for warfare in the aforementioned spatial domains.

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[1] China's Military analysts cited in "What Kind of Military Force Is the Strategic Support Force of Our Military?" ("Wojun zhanlue zhiyuan budui shi yizhi shenmoyang de junshi liliang?"), www.people.com.cn, 6 January 2016 and in "What Kind of Force is the Strategic Support Force that Xi Jinping Inspects?" ("Xi Jinping shicha de zhanlue zhiyuan budui shi yizhi zhenyang de liliang?"), www.cctv.com, 30 August 2016.

Organisational Structure and Leadership

2.1 Like other PLA services, the PLASSF has a headquarters that consists of theatre-leader-grade (战区级) line commanding officers including a commander, a political commissar and their deputies. It also has four staff departments including the staff, political work, logistics and armament departments.

2.2 These four departments offer staff support to the line commanding officers in planning and making decisions on force construction and operations. They also provide professional guidance (业务指导) to lower-level organisations and units of the PLASSF in their functional domains. They however do not possess the power and authority to issue orders to them. The power and authority reside with the chain of command constituted by line commanding officers.

2.3 Some analysts suggest that unlike the headquarters of other PLA services where there are four major departments, the headquarters of the PLASSF consists of six major departments, including the two additional Space Systems Department (航天系统部) and Network Systems Department (网络系统部).[2]

2.4 This observation reflects a misunderstanding of the role of these two departments. As Chart 1 shows, these two departments constitute the PLASSF *operational forces* (作战部队) that provide battlespace support. Unlike the other four departments, they are not tasked to offer direct staff assistance to planning and decision-making by line commanding officers within the PLASSF headquarters.

2.5 These two departments thus are comparable to the five theatre army forces of the PLAA, three theatre naval forces (fleets) of the PLAN and five theatre air forces of the PLAAF. Similarly, all these forces, including the two PLASSF departments, are deputy-theatre-leader-grade (副战区级) organisations commanded by two-star generals or admirals.

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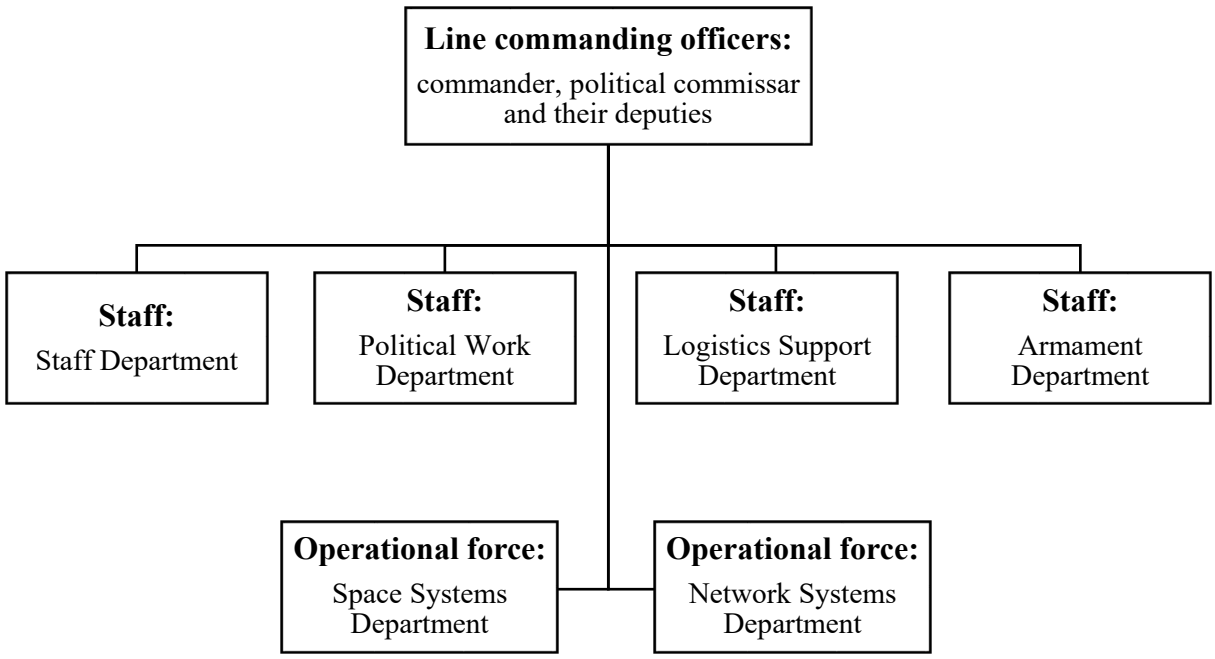
[2] John Costello and Joe McReynolds, "China's Strategic Support Force" in Phillip C Saunders, et al (eds.), *Chairman Xi Remakes the PLA* (Washington, DC: National Defence University, 2019). See particularly Figure 2 on p. 445.

CHART 1 ORGANISATIONAL STRUCTURE OF THE PLASSF



Source: This chart is a refinement of Figure 2 in John Costello and Joe McReynolds, "China's Strategic Support Force" in Phillip C Saunders, et al (eds), *Chairman Xi Remakes the PLA* (Washington, DC: National Defence University, 2019).

2.6 The PLASSF operational forces are organised nationally into two PLASSF "departments" because these forces are nationally distributed but not regionally concentrated. Some of their operations also involve remote and "soft" kills through operations in environments that may be considered outside of the conventional realm of warfare, such as key offices and laboratories.

2.7 In the post-2015 military reform, four PLA general departments including the General Staff, Political, Logistics and Armament Departments were dismantled. As a result, no intermediate layers of command have existed between PLA services and regional theatres on the one hand and the Central Military Commission (CMC) on the other. PLA services, including the PLASSF, thus report directly to the CMC.[3]

[3] Li Nan, *Civil-Military Relations in Post-Deng China: From Symbiosis to Quasi-Institutionalization* (Palgrave Macmillan, 2021), pp. 122-123. Since Xi holds the positions of Party general secretary and state president as well as CMC chair, he works as a part-timer in the CMC. As a result, PLA services, including the PLASSF, are likely to report directly to the uniformed CMC vice chair responsible for force construction and military operations.

Space force

2.8 Informally known as China's space force (天军), the Space Systems Department of the PLASSF brought under its command the sprawling military space-related forces and capabilities nationwide in late 2015. These forces and capabilities, mostly as deputy-corps-leader-grade (副军级) organisations commanded by one-star generals, were traditionally run by the now defunct PLA General Armament Department (GAD).

2.9 They include space launch capabilities such as the Jiuquan Satellite Launch Centre (Base 20), Taiyuan Satellite Launch Centre (Base 25), Xichang Satellite Launch Centre (Base 27) and the relatively new Wenchang Space Launch Centre in Hainan. They also include space telemetry, tracking and control capabilities such as the Beijing Aerospace Flight Control Centre, Xian Satellite Control Centre (Base 26), and China Satellite Maritime Tracking and Control Department (Base 23) which maintains a fleet of *Yuanwang* space tracking ships.

2.10 Moreover, major PLA organisations managing the space-based satellite reconnaissance, communications and navigation capabilities were transferred to the PLASSF Space Systems Department from the now defunct PLA General Staff Department (GSD). They include the Aerospace Reconnaissance Bureau (航天侦察局) of the former GSD Intelligence Department, Satellite Communications General Station (卫星通信总站) of the former GSD Informatisation Department and Satellite Positioning General Station (卫星定位总站) of the former GSD Operations Department.

2.11 Finally, the Armament Institute (装备学院) of the former GAD was transferred to the PLASSF Space Systems Department and renamed the PLA Aerospace Engineering University (航天工程大学).[4]

[4] For organisational composition of the PLASSF Space Systems Department, see Costello, et al, "China's Strategic Support Force", pp. 456-458.

Network force

2.12 Nicknamed China's network or cyber force (网军), the Network Systems Department of the PLASSF in reality runs the PLA's national-level signal intelligence (SIGINT), cyber operations, electronic warfare (EW) and psychological warfare forces and capabilities.

2.13 The former GSD Third Department, a corps-leader-grade organisation also known as the GSD Technical Reconnaissance Department, ran a national SIGINT network of 12 technical reconnaissance bureaus (技术侦察局) and three SIGINT and computer research institutes. This network was consolidated and transferred to the command of the new PLASSF Network Systems Department in late 2015.

2.14 The infamous PLA Unit 61398, which allegedly engaged in computer hacking against the United States and belonged to the Second Technical Reconnaissance Bureau of the former GSD Third Department, is likely to have been transferred to the PLASSF as well.[5]

2.15 Somewhat similar to the role of the US National Security Agency, the SIGINT network of the PLA has traditionally functioned to monitor, intercept, de-encrypt, translate and analyse foreign telecommunications signals for valuable intelligence. In recent decades, as computer networks have become more critical as new venues of information acquisition, transmission, processing and use, the SIGINT network of the PLA has also developed expertise and capabilities in cyber operations and "computer network exploitation".[6]

2.16 The Luoyang Foreign Languages Institute of the former GSD Third Department was also downsized and integrated into the PLA Information Engineering University, which now reports to the PLASSF Network Systems Department.

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[5] For Unit 61398, see "Chinese Army Unit Is Seen as Tied to Hacking against U.S.", *New York Times*, 18 February 2013.

[6] For a detailed discussion of this network, see Mark A Stokes, et al, *The PLA Signals Intelligence and Cyber Reconnaissance Infrastructure* (Washington, DC: Project 2049 Institute, 2011).

2.17 Furthermore, the EW forces of the former GSD Fourth Department, also known as the GSD Electronic Countermeasures Department, were transferred to the command of the PLASSF Network Systems Department in late 2015. They include several electronic countermeasure (ECM) brigades, detachments and stations, and the 54th Research Institute that specialises in ECM research.

2.18 Finally, the PLASSF Network Systems Department allegedly brought under its command a PLA psychological warfare force known as Base 311 in late 2015. A deputy-corps-leader-grade organisation headquartered in Fuzhou, this base was under the command of the now defunct General Political Department (GPD). It reportedly has six subordinate regiments.[7]

2.19 Some analysts speculate that Base 311 may "fall under the PLASSF's Political Work Department". With the alleged transfer of this base to PLASSF from the former GPD, they also wonder "what responsibilities the (new) CMC Political Work Department will have for political warfare and psychological operations", particularly those that were traditionally run by the former GPD Liaison Department.[8]

2.20 The speculation and the question reflect a lack of understanding of a critical objective of the post-2015 PLA reform. This objective is to divest the staff departments of the responsibility to run operational forces in major PLA headquarters. These departments thus can be streamlined and dedicated to offering staff support to line commanding officers in planning and making decisions on force construction and operations.

2.21 This objective may explain the alleged transfer of Base 311 to the PLASSF Network Systems Department, an operational force of the PLASSF, and not to the Political Work Department of the PLASSF, a staff department in its headquarters. It may also help understand why this base is separated from the new CMC Political Work Department.

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[7] For organisational composition of the PLASSF Network Systems Department, see Costello, et al, "China's Strategic Support Force".

[8] Ibid, p. 466.

2.22 The CMC Political Work Department, including its subordinate Liaison Bureau, is now dedicated to offering staff support to line commanding officers such as CMC leaders in planning and making decisions on force construction and operations. It also provides "professional guidance" to lower-level organisations and units in PLA services and theatres, including those in PLASSF such as Base 311, in its functional domains such as "psychological warfare, public opinion warfare and legal warfare". Unlike its predecessor the GPD, the new CMC Political Work Department, including its new Liaison Bureau, no longer runs operational forces of its own.

2.23 Similarly, as shown earlier, the operational forces of the former GSD Third and Fourth Departments were transferred to the PLASSF so that the new CMC Joint Staff Department (JSD), including its subordinate Network-Electronic Bureau (NEB or 网电局), can be dedicated to providing staff support to CMC leaders in planning and making decisions on force construction and operations. The JSD-NEB also offers "professional guidance" to lower-level organisations and units in PLA services and theatres, including those in PLASSF, in its functional domains such as computer network operations, EW and "integrated network-electronic warfare" ("网电一体战"). Unlike the former GSD and its Third and Fourth Departments, the JSD-NEB no longer runs operational forces of its own.

"Chinese Characteristics"

2.24 Unlike some other aspects of China's post-2015 military reform, military analysts in China claim that the establishment of the PLASSF reflects "Chinese characteristics"-based conceptualisation that is "more advanced" than that of the US military. The PLASSF, for instance, has integrated the national-level space, SIGINT, cyber, electro-magnetic and psychological operations capabilities into a coherent service. This integration helps to optimise the use of resources for developing these functional capabilities and for military operations.

2.25 In contrast, according to these analysts, these capabilities are decentralised and dispersed in different military services and government agencies in the United States. This dispersion causes inter-service and inter-agency rivalry-driven competition for

funding and resources (争夺经费资源), and wasteful, redundant development (重复建设).[9]

PLASSF leadership

2.26 Like other major PLA services, the PLASSF is a full-theatre-leader-grade (正战区级) organisation led by three-star flag officers. It is under a "dual-command system" ("双首长制") where it is commanded by a commander and a political commissar (PC). The PC shares the same bureaucratic grade as the commander and therefore has the power to cosign orders with the commander.

2.27 In the post-Deng era, however, PCs have largely been internalised into the PLA to enhance its organisational cohesiveness, promote its institutional interests, and assist it in perfecting its functional and technical expertise and fulfilling its warfighting missions.

2.28 Similarly, commanders are fully responsible for handling military and operational issues and have the "authority to command according to circumstances" ("临机指挥权") without interference from the PCs in times of crisis and war.[10] An analysis of the career experience of the commanders thus is sufficient to help understand the future direction and priority of the PLASSF development.

2.29 Table 1 shows the profiles of the current and former commanders and deputy commanders of the PLASSF. It is worthy to note that the PLASSF was not commanded by senior officers who rose through the ranks of its own space and network forces when it was founded. From 2015 to 2019, for instance, it was commanded by Gao Jin, a senior officer of PLARF service background. From 2019

[9] China's military analysts cited in "Experts Claim that the Concept undergirding the Establishment of PLASSF as an Independent Service Is More Advanced than That of the U.S. Military" ("Zhuanjia chen zhanlue zhiyuan budui duli chengjun linian lingxianyu meijun"), *Qianjiang Evening News* and www.xinhua.com, 7 January 2016.

[10] For changing functions of the political commissars in the PLA, see Li, *Civil-Military Relations in Post-Deng China*, Chapter 2.

to June 2021, it was commanded by Li Fengbiao, a senior officer of PLAAF service background.

TABLE 1 COMMANDERS AND DEPUTY COMMANDERS OF PLASSF

Name	Date of birth	Education/ major	Major positions in PLASSF	Unit origin	Major positions held	New position
Gao Jin (高津)	1959	Second Artillery Command College	Commander of PLASSF (2015-19)	PLARF	Commander of a missile launch brigade; commander of Second Artillery Base 52; and president of Academy of Military Science	Director of CMC Logistics Support Department (2019-present)
Li Fengbiao (李凤彪)	1959	National Defence University/ military command	Commander of PLASSF (2019-21)	PLAAF	Commander of 44th Airborne Division and 15th Airborne Corps; and chief of staff of PLA Central Theatre	
Li Shangfu (李尚福)	1958	National University of Defence Technology; Chongqing University	Deputy commander and chief of staff of PLASSF (2015-17)	PLASSF space force	Commander of Xichang Satellite Launch Centre; and chief of staff of GAD	Director of CMC Armament Development Department (2017-present)
Rao Kaixun (饶开勋)	1964	National Defence University/ military command	Deputy commander (2016-19) and chief of staff of PLASSF (2017-19)	PLAA	Commander of 149th Division and 13th and 14th Group Armies; and director of GSD Operations Department	Demoted to deputy-corps-leader-grade position for violating discipline in 2019
Hao Wei-zhong (郝卫中)	1961	Tianjin University/ precision instrument	Deputy commander and chief of staff of PLASSF (2019-present)	PLASSF space force	Commander of Taiyuan Satellite Launch Centre; and deputy commander of PLASSF Space Systems Department	
Shang Hong (尚宏)	1960	Taiyuan Mechanical Engineering Institute/ autonomous control	Deputy commander of PLASSF and commander of PLASSF Space Systems Department (2015-present)	PLASSF space force	Commander of Jiuquan Satellite Launch Centre; and chief of Staff of GAD	
Zheng Junjie (郑俊杰)	1957		Commander of PLASSF Network Systems Department (2017-2019) Deputy commander of PLASSF (2015-present)	PLASSF network force	Deputy director of GSD Third Department; and president of PLA Information Engineering University	
Ju Qian-sheng (巨乾生)	1962		Commander of PLASSF Network Systems Department (2018-2021) Commander of PLASSF (2021-present)	PLASSF network force	Deputy director of GSD Third Department	

Source: The information of individual profiles is from sources such as the Personnel (人事风向) section of https://www.thepaper.cn (澎拜).

2.30 This anomaly may be explained by the fact that the PLASSF is a new assemblage of PLA organisations with diverse functional and technical specialisations and relatively low bureaucratic grade. Such a complex and new organisational set-up thus may not quickly produce three-star flag officers with strong credentials from its own ranks.

2.31 Furthermore, compared to the PLAA, PLAN, PLAAF and PLARF, major units that constitute the PLASSF were traditionally considered space test and intelligence support organisations and not combat forces. They thus did not constitute the primary pools for the selection and promotion of the most senior PLA officers.

2.32 Selecting senior officers with PLARF and PLAAF career background to command the PLASSF may also reflect the preference of the top PLA leadership to appoint those who have technical expertise and experience that the PLASSF shares to run the new service.

2.33 PLARF officers, for instance, are generally experienced in leveraging rocket-based and space-related technologies and capabilities in their operations. The PLARF may also be tasked with direct ascent anti-satellite (ASAT) and ballistic missile defence missions. China, for instance, conducted an ASAT test in 2007. A kinetic kill vehicle mounted on a modified DF-21 ballistic missile was used to destroy a defunct Chinese satellite in the test. China also successfully conducted a land-based anti-ballistic missile test in 2021, employing a similar kind of missile interceptor.[11]

2.34 Likewise, the PLAAF is tasked with land-based defence against missile threats, including hypersonic missiles from near space. The PLA's Air and Missile Defence Institute (防空反导学院), for instance, is located in the PLAAF Engineering University in Xian.[12] PLAAF officers also publish research on defence against hypersonic missile threat from near space.[13]

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[11] For the two tests, see "SC-19 ASAT" and "SC-19 Anti-Ballistic Missile Interceptor", retrieved on 16 March 2021 from https://www.globalsecurity.org/space/world/china/sc-19-asat.htm and https://www.globalsecurity.org/space/world/china/sc-19-abm.htm.

[12] For details of this university, check http://www.afeu.cn/web/afeu/index.html, accessed 20 July 2021.

[13] Colonel Hu Xiaolei, Senior Colonel Yin Dahu and Colonel Chen Langzhong, "The Impact of Near-Space Hypersonic Weapons on Aerospace Security" ("Linjin kongjian gaochao yinsu wuqi dui kongtian

2.35 More importantly, the PLAAF has promoted an operational concept of "aerospace integration for offence and defence" ("空天一体, 攻防兼备") for many years, arguing that China's military space force and capabilities should be integrated with the PLAAF. The decision to establish a separate PLASSF that incorporated such force and capabilities is likely to have estranged many senior PLAAF officers.

2.36 Appointing a PLAAF officer to command the PLASSF thus may help mitigate such estrangement associated with inter-service rivalry. Xu Qiliang, the first CMC vice chair and a combat pilot by training and experience, could have played a role in appointing a PLAAF officer to command the PLASSF.

2.37 However, appointing senior officers of PLARF and PLAAF career backgrounds to command the PLASSF was only an interim arrangement. As the PLASSF becomes more institutionalised over time, senior officers of PLASSF career background are appointed to command the PLASSF.

2.38 Table 1 shows that after serving as commander of the PLASSF Network Systems Department from 2018 to 2021, Ju Qiansheng succeeded Li Fengbiao as commander of the PLASSF in June 2021. It also shows that among the four incumbent commanding officers of the PLASSF, including the commander, two deputy commanders and the chief of staff, two rose through the ranks of the PLASSF space force and two advanced their careers in its network force. A balance thus has been struck between the number of commanding officers with space force skill set and the number who specialise in network force expertise.

2.39 There are however persuasive reasons to believe that the PLASSF may prioritise development of its space force in the future. Besides the PLASSF, for instance, other PLA services and regional theatres have under their command SIGINT, network/cyber, electro-magnetic, and political and psychological operations forces and capabilities. The PLASSF, however, has a virtual monopoly of PLA space operations, which other PLA services and theatres are only marginally capable of.

anquan de yingxiang"), *China Military Science*, No. 3, 2019. The authors are senior engineers of the PLA Unit 93221, a PLAAF organisation.

2.40 The space operations force and capabilities thus give PLASSF a comparative advantage that adds critical value to PLA joint operations. Such force and capabilities are likely to incentivise the PLASSF to leverage and reinforce this comparative advantage by developing them further.

2.41 Finally, a critical driver for establishing the PLASSF is China's concern for space-based threats to its national interests and security. The new PLASSF thus is formed to develop capabilities that can provide defence against such threats. China's military analysts also argue that cyber warfare and EW capabilities should be employed to support space operations, including disabling the rival's satellites by hacking into their computer network-based operations systems and jamming the uplink and downlink of their signals.[14] The PLASSF thus is likely to prioritise the development of its space operations force and capabilities in the future.

Rationale for Establishing the PLASSF and Its Evolving Role

Rationale

3.1 One critical rationale for launching the PLASSF is the concern for security of China's expanding national interests and capabilities in space. China's military analysts believe that besides horizontal (平面) expansion, China's national interests have also expanded vertically into space (垂直空间), particularly in deploying more space-based platforms and capabilities including satellites, manned and unmanned spacecraft, space probes and space stations.

3.2 The integration of space launch and information technologies, for instance, makes it possible for extensive deployment of such platforms and capabilities. As observation platforms (观察平台), these platforms and capabilities can leverage the height and width of the space to monitor the earth from different altitudes and collect massive amount and various types of electromagnetic radiation information on the

[14] Shi Fei and Guo Shuju, "How to Turn off the 'Sky Lights' over the Head of the Rival in Space Operations" ("Taikongzhan zhong ruhe guanbi duishou touding de 'tiandeng'"), *Liberation Army Daily*, 19 June 2020 and William Broad, "How Space Became the Next 'Great Power' Contest between the US and China", *New York Times*, 24 January 2021.

earth's atmosphere, ocean and land. Such information is critical for weather forecast, military reconnaissance, and natural resources survey and exploration.

3.3 As relay stations (中继站), these platforms and capabilities make it possible for long-distance and global transmission of data and telecommunications signals on the surface of the earth. As reference points (基准点), they provide global positioning and navigation for users equipped with signal receivers on land and at sea.

3.4 These platforms and capabilities thus play a critical role in surveillance and information collection, telecommunications and broadcast, logistics and transportation, and natural disaster relief and crisis management.

3.5 Finally, space possesses rich resources including space orbits, planet-based minerals, solar energy and space environmental resources. Space exploration also drives development of cutting-edge, high value-added space, new materials, new energy and information technologies.[15]

3.6 Furthermore, China's military analysts highlight space as a critical domain of military competition. The military application of information technology (IT), for instance, makes warfare in the information age more agile, faster and more effective. It represents a major departure from the rigid and slow mechanised warfare of the industrial age as well as nuclear war that is unwinnable due to mutually assured destruction.

3.7 To compete for information superiority on the battlefield, space-based IT is a critical multiplier since military operations become increasingly dependent on it for effective early warning, reconnaissance, communications, force deployment and warfighting.

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[15] Senior Colonel Tian Anping, et al, *Conception of China's Aerospace Security Strategy* (Zhongguo kongtian anquan zhanlue gouxiang) (Beijing: Liberation Army Press, 2016), pp. 10, 23, 25-26. The research of this book is funded by China's National Science Foundation. It is co-authored by Tian, a professor at the PLAAF Engineering University, and a team of six scholars from the same university.

3.8 The military application of space-based IT thus has been widened from upstream activities including information acquisition and transmission from space, to midstream undertakings such as information processing and use in electro-magnetic, cyber and psychological domains, then to the terminal phase of precision-guided firepower strikes. Space thus has become a critical domain of military competition for information superiority.[16]

3.9 China's military analysts believe that space has become increasingly critical to safeguarding China's expanding national interests including its sovereignty, security and development interests. These interests range from the issue of Taiwan, Chinese rights and interests in the South and East China Seas and the Yellow Sea, vital international sea lanes and "choke points" that China's external commerce and trade and supply of natural resources depend on, China's overseas interests, Chinese assets in space, space resources that China is entitled to, to China's continued economic development and its domestic social and political stability.[17]

3.10 China's military analysts also believe that China's space-related assets are highly exposed and vulnerable. The manoeuvrability of space-based platforms, for instance, is hampered by limited and predictable orbits and restrictive mission requirements and fuel. They thus are easy to detect and attack in times of crisis and war, including capture and destruction.

3.11 Similarly, the space, electro-magnetic and cyber domains-based information collection and supply chains are vulnerable to major disruptions and degrading such as jamming, interception and hacking. In addition, the land and aerospace-based support infrastructure, including space launch and landing bases, docking and tracking facilities, command and control centres and telecommunications stations, exhibit distinguishable characteristics and thus are easy to detect and destroy in times of crisis and war.

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16 Ibid, p. 40 and Li Zhi and Zhang Zhanyue, "Space Force: Seizing the Commanding Height of War" ("Taikong Liliang: Qiangzhan zhanzheng zhigaodian"), *Liberation Army Daily*, 29 January 2016.

17 Tian, et al, *Conception of China's Aerospace Security Strategy*, pp. 24-25.

3.12 The vulnerability of space-related assets is likely to be worsened as major powers develop directed energy and kinetic energy weapons, ASAT satellites and missiles, and reusable spaceships that can manoeuvre and switch orbits to grab or attack.[18]

Evolving role

3.13 The central role of the PLASSF thus is to provide security for the growing Chinese interests and capabilities in space and the associated electro-magnetic, cyber and psychological domains by reducing their vulnerability. Such security enables normal and effective functioning of the space-based capabilities in peacetime, which provide effective information support to the normal functioning of the national economy and infrastructure.

3.14 These capabilities also reinforce military preparedness and enhance military deterrence against critical threats. If deterrence fails, these capabilities can be employed to compete for aerospace superiority (制空天权) to win a war. Such superiority allegedly enables all-domains information support (全域信息支援) for joint military operations, including aerospace-based early warning, intelligence and surveillance, and aerospace-based initiative for defence and offence against the rival.[19]

3.15 Military operations to compete for "aerospace superiority", according to China's military analysts, entail two major types. The first is aerospace information operations (空天信息作战), which is based on the premise that aerospace operations are more integrated with network/cyber operations and network operations are more intertwined with EW.[20] Aerospace information operations thus

18 Ibid, p. 46, 110-111.

19 Ibid, pp. 14, 59-61.

20 For integrated space-network operations, see Feng Songjiang, "Integrated Space-Network Operations Arrive Quietly" ("Tianwang yiti qiaoran lailin"), *Liberation Army Daily*, 4 December 2018. For integrated network-electronic operations, see Dong Kuiyi and Bi Aihong, "Integrated Network-Electronic Operations Will Break the Balance of the Battlefield" ("wangdian yitizhan jiang dapo zhanchang tianping"), *Liberation Army Daily*, 3 January 2017.

involve EW (电子战), network operations (网络战) and psychological operations (心理战).

3.16 EW refers to degrading and disabling the rival's aerospace-based reconnaissance and surveillance, telecommunications, and navigation and positioning systems and their data-linkages to ground and sea-based facilities. Such operations are conducted through electro-magnetic interference or jamming (电磁干扰) and electronic flanking movement (电子佯动) and deception.

3.17 EW may also involve "accompanying interference" ("伴星干扰") and "spraying interference" ("喷涂干扰") of the rival's satellites. Moreover, unmanned aerial vehicles (UAV) may be employed to induce the activation of the rival's aerospace-based electro-magnetic radiation sources. These activated sources may provide the needed electro-magnetic parameters that guide anti-radiation missiles to their targets.[21]

3.18 Network operations refer to exploiting the vulnerabilities of the rival's computer networks that serve as mediums for transmitting and processing the aerospace-originated information. These vulnerabilities are embedded in the networks' operating systems and software that may be susceptible to infiltration and hacking. Successful infiltration and hacking in turn enable control and use of these networks.

3.19 Such control makes it possible to disrupt the identification systems of these networks, change their data and issue false information and directives, thus misleading and degrading the rival's command and operations. Virus attacks may also be conducted to degrade the rival's computer networks that support its aerospace operations. Furthermore, electro-magnetic pulse weapons can be employed to sabotage or destroy the electronic equipment of these computer networks, thus degrading and incapacitating the rival's aerospace operations.[22]

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[21] For EW, see Tian, et al, *Conception of China's Aerospace Security Strategy*, p. 268.

[22] For network operations, see ibid, pp. 268-269 and Colonel Wang Yonghua, "On Systemic Structure and Competition Levels of Network Space" ("Lun wangluo kongjian de tixi jiegou ji duikang cengci"), *China Military Science*, No. 1, 2017. Wang is a researcher in Operations Theory and Doctrine Department of China's Academy of Military Science in Beijing.

3.20 Finally, psychological operations, an important component of aerospace information operations, are considered critical to multiply the effects of such operations. Psychological operations aim to achieve the effects of psychological deterrence (心理威慑), inducement (诱导) and demoralisation (动摇军心) on the rival by leveraging publicity leaflets, radio and television, and internet and social media to mobilise public opinion against the rival.

3.21 Such operations also project psychological weapons including noise simulators (噪音模拟器), thought control weapons (思想控制武器) and virtual space means (虚拟空间手段) on the rival to instil psychological fear and hallucination. These operations serve to shake the rival's will to fight and degrade its combat effectiveness.[23]

3.22 Besides aerospace information operations, the other type of military operations to compete for "aerospace superiority" is aerospace joint firepower strike (空天联合火力打击). To degrade and disable the rival's aerospace operations capabilities, co-orbital counter-space weapons (共轨式反航天武器) could be employed to conduct "soft kills", including accompanying and circling the rival's satellites to block (遮断), clog (阻塞) and shield (屏蔽) their microwave and electro-optical sensors. Miniature intelligent spacecraft (微型智能航天器) may also be attached (吸附) to the rival's satellites for their capture, control and use.

3.23 "Hard kills", on the other hand, involve the use of directed energy weapons such as laser, particle beams and microwaves as well as kinetic energy weapons to attack and destroy space-based targets of the rival. They also involve the use of land-based, direct-ascent counter-space missiles to attack these targets. Moreover, air, missile and special operations may be conducted to attack the rival's land-based facilities that support aerospace operations. These facilities include space launch and landing bases, space early warning and monitor installations, space flight control centres and space information support centres.[24]

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[23] For psychological operations, see Tian, et al, *Conception of China's Aerospace Security Strategy*, p. 269.

[24] For these operations, see ibid, p. 270.

3.24 Finally, China's military analysts highlight the critical importance of winning the initial battle (初战) in aerospace operations. Compared to operations in other domains, aerospace operations are characterised by a higher level of stealth and element of surprise, faster speed, more agility, more precision and therefore a higher degree of lethality and decisiveness. Initial battle thus is considered critical not to the direction of such operations but to the outcome of war.[25]

Implications for Regional Security and Their Limits

4.1 Conventional wisdom suggests that the new PLASSF may fundamentally change China's military policy and posture in the Asia-Pacific region, which may have critical implications for regional security. This wisdom may be flawed as even before the existence of the PLASSF, China had actively been developing and deploying its space, SIGINT, cyber, electro-magnetic and psychological operations capabilities. China is likely to continue the development and deployment of these capabilities with or without the PLASSF.

4.2 China, for instance, has been launching and deploying hundreds of satellites of various sizes and types in space, including those that specialise in atmosphere, ocean and earth observation and surveillance, global telecommunications, and global positioning and navigation. It has also been developing and deploying a robust space exploration and operating infrastructure, including manned and unmanned spacecraft, space probes and space station modules armed with artificial intelligence-enabled robotic arms. These space-based capabilities are sustained by a powerful space launch system of heavy-lift rockets that China has actively been developing, and an extensive ground and sea-based space tracking and control infrastructure.

4.3 Due to their dual-use nature, these space-based capabilities provide critical information support for the normal functioning of the national economy and infrastructure in peacetime. These capabilities allegedly reinforce military preparedness and enhance military deterrence as well, particularly over contentious

[25] Ibid, p. 173.

issues that may escalate to military conflicts involving China. These issues include Taiwan, the South China Sea, the Sino-Indian border and the Korean Peninsula. In times of military crisis and conflict, these capabilities can be employed to compete for aerospace superiority.[26]

4.4 Similarly, PLA SIGINT and cyber capabilities and operations have encompassed regions and countries that are considered critical to China's security, including US military presence in the Asia-Pacific region, the Korean Peninsula, Japan, Taiwan, Southeast Asia, South Asia, Central Asia and Russia.[27] These capabilities and operations provide strategic information support for high-level decision-making and military operations, particularly in times of crisis and conflict that are associated with the aforementioned regional flashpoints.

4.5 Likewise, PLA political and psychological operations are conceptualised and conducted to influence public opinion in regions that China does not control. The PLA Base 311, for instance, had attempted to influence public opinion in Taiwan by exploiting local social media even before the existence of the PLASSF.[28]

Major limits

4.6 There are also major limits that help understand why the new PLASSF is unlikely to fundamentally change China's regional military policy and posture. The functional capabilities of the PLASSF, for instance, are far less than optimal. China's military analysts acknowledge that China's space capabilities still lag behind the United States in terms of investment, human capital, conceptual and technological innovation, systems integration and critical technologies such as reusable rocket engines.[29]

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26 Tian, et al, *Conception of China's Aerospace Security Strategy*, pp. 257-272.

27 Stokes, *The PLA Signals Intelligence and Cyber Reconnaissance Infrastructure*.

28 Nathan Beauchamp-Mustafaga, et al, "Exploring Chinese Military Thinking on Social Media Manipulation Against Taiwan", *China Brief*, Vol 21, No. 7, 12 April 2021.

29 Tian, et al, *Conception of China's Aerospace Security Strategy*, pp. 52, 127, 141, 168.

4.7 Similarly, the political and psychological operations of the PLASSF were clearly unsuccessful in Taiwan as reflected in the landslide victory of Tsai Ing-wen of the pro-independence Democratic Progressive Party in the 2020 presidential election. Major technological gaps and unsuccessful operations do not help expand the policy influence of the new service.

4.8 Furthermore, the top civilian leadership, but not the PLA, makes decisions on critical military policy issues such as the most likely type of war and scope of military conflict that the PLA should prepare to fight and win. The top civilian leadership makes these decisions based primarily on an evolving assessment of China's external security environment and its domestic policy priorities.

4.9 The civilian leadership subsequently leverages these decisions to guide and steer the organisational and technological development of the PLA. Since these decisions have a big impact on the allocation of resources to the military, this is a critical method that the civilian leadership uses to control the military in China.

4.10 Faced with a possible Soviet invasion of China in the late 1960s, for instance, Mao Zedong wanted the PLA to prepare to fight an "early, total, nuclear war" ("早打, 大打, 打核战争") against a possible Soviet invasion, a concept endorsed in the political report of the Ninth Party Congress held in 1969.[30]

4.11 China established diplomatic relations with the United States in 1979 and began to improve relations with the Soviet Union in the mid-1980s. China's domestic policy priority has also shifted from "class struggle" to economic development since 1979. As a result, Deng Xiaoping ordered the PLA to make a "strategic transition" ("战略转变") from preparing for an "early, total, nuclear war" against a possible Soviet invasion to "peace-time army building" in 1985.

[30] Huang Yingxu, "Adjustment of Military Strategic Guidelines in the 1960s and 1970s of the 20th Century" ("20 shiji 60-70 niandai de junshi zhanlue fangzhen tiaozheng"), *Yanhuang Chunqiu*, No. 9, 2017. Huang is a retired senior colonel of the PLA and former director of Mao Zedong Thought Studies Institute of China's Academy of Military Science.

4.12 At a CMC conference held in late 1988, Deng particularly required the PLA to prepare to fight and win a possible "local war" over contingencies on or near the margins of China. Such contingencies may involve China's territorial disputes with its neighbours.[31] The concept of "local war" has subsequently been endorsed by Jiang Zemin, Hu Jintao and Xi Jinping to guide and steer the organisational and technological development of the PLA.

4.13 As a result, rather than the broad arena of military policy, the PLA has narrowly been confined to perfecting its functional and technical expertise in its war preparations. Similarly, establishing the PLASSF serves this narrow purpose for a few critical reasons.

4.14 First, the PLASSF has integrated the PLA's national-level space, SIGINT, cyber, electro-magnetic and psychological operations capabilities into a more coherent service. This integration is to institutionalise the development of these capabilities and use resources more efficiently and effectively. Second, the PLASSF forces and capabilities are being integrated into the PLA regional theatre operations to enhance the effectiveness of the PLA joint operations. Both aim to enhance the overall effectiveness of PLA war preparations.

4.15 The new service also adds more and more effective technological tools to the tool kit available to the top leadership for reducing the perceived threat to China's security. These changes, however, occur within the narrow organisational and technological realms of the PLA. They do not cause a fundamental change to China's military policy and posture.

4.16 The emphasis on enhancing the organisational and technological efficacy of military operations without fundamentally changing military policy is reflected in the attempt of China's military analysts to explain the role of the new PLASSF. These analysts highlight the US killing of Bin Laden, a small-scale military operation that received information support from a big system of systems (小规模行动, 大体系支撑), to illustrate the importance of the new PLASSF.

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31 Ibid.

4.17 According to their analysis, even though this US operation involved only two Black Hawk helicopters and 24 navy SEALs, it was supported by several reconnaissance and communications satellites, one stealth UAV responsible for real-time information transmission and wireless monitoring, several F/A-18 combat jets that provided air cover, one aircraft carrier strike group, two US bases in Central Asia, five US command centres and more than 10,000 support personnel.[32]

4.18 Finally, the policy influence of PLA services, including the PLASSF, has continuously been diminished by institutional changes introduced in the post-2015 military reform. PLA service chiefs, for instance, served as members of the CMC, China's highest military policy council chaired by Hu Jintao. They however were removed from these positions after Xi Jinping came to power.[33]

4.19 Xi also stripped PLA service chiefs of the power and authority for operational command and control of their service forces. Such power and authority were transferred to the chiefs of the PLA regional theatres. The power and authority of the service chiefs, including the chief of the PLASSF, are now narrowly limited to peacetime "construction and administration" of their service forces.[34]

Conclusion

4.20 In the final analysis, the establishment of the PLASSF helps institutionalise the development of the PLA's national-level space, SIGINT, cyber, electro-magnetic and psychological operations capabilities, which may enable more optimal use of resources. The integration of PLASSF capabilities into PLA regional theatre operations may also enhance the effectiveness of PLA joint operations. Finally, the new service adds more and more effective technological tools to the tool kit available to the top leadership for reducing the perceived threat to China's security.

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32 China's military analysts cited in "Demystifying the First Strategic Support Force of Our Military" ("Jiemi wojun shouzhi zhanlue zhiyuan budui"), *People's Daily*, 24 January 2016.

33 Li Nan, "Party Congress Reshuffle Strengthens Xi's Hold on Central Military Commission", *China Brief*, Vol. 18, No. 3, 26 February 2018.

34 Li, *Civil-Military Relations in Post-Deng China*, p. 124.

4.21 The establishment of the PLASSF, however, does not cause a fundamental change to China's military policy and posture in the Asia-Pacific region, which were in place before the existence of the PLASSF. The technological gaps and lacklustre performance of some PLASSF capabilities also limit the policy influence of the PLASSF. Moreover, China's top civilian leadership, but not the PLA, decides China's military policy and posture, which serve to guide and steer the development of the PLA. Finally, China's post-2015 military reform has substantially diminished the policy influence of the PLA services, including the PLASSF.