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THE CHINESE REVOLUTION IN MILITARY AFFAIRS

IMPLICATIONS FOR INDIA

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Introduction

The 21st century has mostly been characterised by low-intensity conflicts, with major world powers mostly focusing on dealing with terrorist groups around the world. However, with the reduction in power of most terrorist groups around the world (with the notable exception of the Taliban), militaries around the world are re-orienting themselves to focus more on conventional and large-scale operations, with the world now heading away from the age of a unipolar world headed by the USA, and instead heading into a multipolar world, with alliances such as NATO, AUKUS and the QUAD opposing the rise of the Russia-China Nexus, with both countries being increasingly expansionist in the face of their new-found power.

This, combined with the massive technological changes brought about in the 21st century, especially in the spheres of information technology, has resulted in what is being described as a ‘Revolution in Military Affairs’, with militaries around the world engaging in ambitious modernisation programs, while introducing the use of new technologies to the military sphere, and combining it with new doctrines, focusing on concepts such as integration, combined arms warfare and information warfare, in an attempt to achieve their goals in a swift manner, with as little time and collateral damage as possible.

It is in this backdrop that China has embarked on its latest and most ambitious military reforms in 2016, which aims, in three stages, to transform the conscript-based army resembling the soviet army of the 1980s, and aims to transform the PLA, in the short term, into a fully professional force capable of fighting a Modern 21st century conflict, one that would even be capable to protect Chinese interests overseas, should the need to do so arise. The PLA aims to first achieve by 2020 what it calls as mechanisation, where all its equipment would be integrated into a joint communications network to make full use of informationised warfare. In the second stage, it aims to modernise its forces and achieve integration and maturity in conducting joint operations by the year 2035. In the long term, these reforms are supposed to transform the PLA into a truly world-class force, capable of conducting operations almost

anywhere in the world, and capable of rivalling the USA, if not overtaking it, by the year 2049, the centenary of the People's Republic of China, and the year by which Xi Jinping aims for the 'National Rejuvenation of the Chinese Nation'.¹

To that end, the Chinese have focused on a wide variety of reforms, from organisational, to operational and doctrinal, changing training practices to fit new requirements, to the implementation of new concepts and cutting-edge equipment developed by the Chinese industries. The Chinese have also relied heavily on western experiences while forming their new doctrine, and have utilised aspects of both the Western and Russian military reforms while reforming the PLA.

This paper aims to present the changes that have taken place in the PLA, and will analyse developments in all the arms of the PLA, the Central Military Commission, Technological developments and fields the Chinese have tried to focus on, and the changes made to PLA doctrine and training in order to help it better execute the objectives its political masters would set for it.

Organisational Changes

The pre-existing command structure of the PLA had a very complex Military-Region system, like that of the Soviet era. Here, the units would come under the command of their respective service HQs, but would be commanded by the commanders of the military regions in wartime. This was an unwieldy and complicated system, which necessitated a change in the entire command structure in times of war.²

Perhaps one of the most important changes was the abolishment of the 7 Military Regions, which would go on to be replaced by the 5 new Theatre Commands.³ Here, unlike the previous military region system, the Theatre commander retained control over all his assets during both

¹ McCauley, Kevin (2018), The PLA Accelerates Modernization Plans, China Brief Volume 18 Issue 1, Jamestown Foundation. <https://jamestown.org/program/pla-accelerates-modernization-plans/>

² Gill, M.S (2021), Theatre Commands: Pros and Cons, Issue Brief, Centre For Security Studies, O.P Jindal Global University. https://www.cssjsia.com/files/ugd/348fae_78047eb2b946460894c305c6b154640f.pdf

³ Allen, Blasko & Corbett (2016), The PLA's New Organisational Structure: What is Known, Unknown and Speculation, China Brief, Volume 16. https://jamestown.org/wp-content/uploads/2016/02/Updated_The_PLA_s_New_Organizational_Structure_-_What_is_Known_Unknown_and_Speculation_Parts_1_and_2.pdf?x12383

war and peace, and had full leeway to command, train and deploy his units. The role of the three services was restricted mostly to administration and capability development.

The reforms announced included a reduction of 300,000 troops, mostly non-combatant units and those equipped with old weapons (although this wasn't an actual reduction in size, these units were mostly just turned over to the People's Armed Police). The CCP also announced the formation of a Joint Operations command authority under the CMC, and a reform of all military colleges.

The Second Artillery Corps of the PLA, which was in effect totally autonomous, described as 'an independent branch treated as a service', was now formally upgraded as a full service with its own insignia to become the People's Liberation Army Rocket Force. However, there was no change in the ranks and grade of its commander as those were already on par with the other services.⁴

Another important change that took part was the Abolishment of the 4 very powerful General departments within the PLA (General Staff Department (GSD), General Political Department (GPD), General Logistics Department (GLD), and General Armament Department (GAD), which had been plagued by corruption and extreme centralisation of power. These were instead replaced by 15 sections, including 7 new departments, 3 commissions and 5 offices, which are all directly subordinate to the CMC. The GSD has particularly lost out a lot, especially the EW capabilities it had access to, which have now gone on to the new PLASSF. The GLD has also been replaced by the CMC's Joint Logistics Support Force.⁵

There has also been talk of reform in China's rank and grade system. In the PLA, it is not just the rank that determines an officer's seniority, but the grade as well. Oftentimes, the grade is given far more importance than rank, and the grade usually corresponds to the command held by the officer (e.g., company leader, battalion leader etc). There is also a disparity between grades and ranks, as rank promotions happen less often than grade promotions, and there are often multiple ranks at the same grade. In some cases, this even results in officers junior in rank but senior in grade being senior to another officer who may be senior in rank. Similarly,

⁴ Ibid

⁵ Ibid

retirement ages in the PLA are set by grade, not by rank, along with other pay related benefits etc.⁶

Unlike western armies, the first general officer rank starts at Major General, who has one star, then Lt Gens with Two and Full Generals with three. This sometimes leads to issues regarding protocol, particularly on foreign exchanges and visits, along with prestige issues. There has, therefore, been a proposal to convert the Senior Colonel rank to that of Brigadier General, giving the rank one star, and adding another star to the other general officer ranks. However, an analysis of recent photographs of the PLA suggest that this rank reform has not yet taken place, and the old rank insignia is still being used.

Along with these reforms, there is also talk of reducing the influence of the grade system, and even some suggestions of abolition of the grade system completely, and using only rank as a measure of seniority, like in the West. However, there does not seem to be much progress on that front, particularly as officers continue to wear their grade ribbons as part of their uniform.

PLA ARMY

Organised as a separate service with its separate headquarters post the 2015-2016 reforms, the PLA Army is the largest of all the services in the PLA, with 975,000 active-duty members, and is the primary ground force. The PLA Army has been tasked with transitioning from regional defence operations to focusing on developing capabilities to fight multi-domain, trans-theatre operations.⁷

The PLA Army is divided into the 5 theatre armies, with the Xinjiang Military District and Tibet Military district, while being part of the WTC, still maintain limited operational autonomy due to the requirements of these ‘separatist’ regions. Consisting of 13 ‘Group Armies’ (which can be equated to Corps level formations in the Indian Army), which consist of roughly 78 combined-arms brigades between them. Even though China has taken heavy inspiration from Russia while converting its regiment and divisional structure to a NATO-like

⁶ Allen, Kenneth (2017), China Announces Reform of Military Ranks, China Brief, Issue 17, Jamestown Foundation <https://jamestown.org/program/china-announces-reform-military-ranks/>

⁷Chinese defence white paper 2019. <https://www.andrewerickson.com/2019/07/full-text-of-defense-white-paper-chinas-national-defense-in-the-new-era-english-chinese-versions/>

brigade structure, it still maintains some independent divisions for special cases in sensitive areas such as Xinjiang, Tibet and Hong Kong.⁸

While the PLAA has been rapidly modernising, there is still a way to go, with the US Department of Defense estimating that roughly 40% of the PLA's MBT force is 20-40 years old. The PLA has also understood the importance of Army Aviation and SOF units in modern warfare, and aims to assign at least one brigade of each to every Group Army. The PLAA is reported to have more than 1000 helicopters in service,⁹ and aims to have even more in the future. Here, it must be noted that the PLA's shift from the conscripted infantry army of the past to a modern mechanised and professional army would result in further defence spending, something that China seems more than capable of, and willing to spend in.

The PLA Army has massively ramped up training programs, be they within the service, or joint operations, and even including foreign exercises, most notably those with Russia. There has been a particular focus on Amphibious operations, and High-Altitude warfare, as a focus on a Taiwan situation or a confrontation with India.

PLA NAVY

The People's Liberation Army Navy is now the world's largest Navy, consisting of more than 350 vessels, including around 150 major surface combatants. Of all the services within the PLA, the PLAN is the most modern, consisting mostly of modern weapons systems.¹⁰

The 2015-16 reforms removed PLAN HQ from the decision-making process giving commands to the HQs of the respective Theatre commands. The 2019 Defence white paper reflects China's growing confidence in its navy, where it directed the Navy to covert from area-defence to actively becoming a Blue-Water navy, and to carry out missions in the high seas. The PLAN has been gaining valuable experience from Anti-piracy operations, most notably off the coast of Africa and Aden.

⁸ U.S. Department of Defense, Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2021.

⁹ Blasko, Dennis J (2017), Recent Developments in the Chinese Army's Helicopter Force, China Brief Volume 17, Jamestown Foundation. <https://jamestown.org/program/recent-developments-chinese-armys-helicopter-force/>

¹⁰ U.S. Department of Defense, Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2021

The PLAN has a robust shipbuilding industry to support it, producing all sorts of ships from Destroyers, Corvettes, Aircraft Carriers and Landing Helicopter Decks, Amphibious Assault craft, to Anti-Submarine Warfare craft. This has resulted in force projections of up to 420 ships by 2025 and 460 ships by 2030. Most of this increase is expected to be in major surface combatants, along with a modernisation of its submarine force, by replacing the old Russian Kilo class submarines it operates with newer homegrown submarine designs.

Here the PLAN's lack of experience in maritime operations must be noted. While the PLAN has conducted anti-piracy operations, these are nowhere near simulating actual combat against an adversary's navy. The PLAN is a force that has not yet matured, and is still feeling its way, by slowly and surely improving its capabilities. The best example of this can be the PLAN's ZHANLAN 2020A exercise, where it has been speculated that the PLAN simulated an attack on Hawaii, and now had capabilities to conduct offensive operations outside the first island chain, the region it had typically focused on conducting area defence.¹¹

Another interesting trend to be noted is the increasingly aggressive use of the Chinese Maritime Militia, a network of privately owned fishing vessels, which try to be seen as engaged mostly in commercial fishing operations, thus giving the PRC plausible deniability, but in fact cooperate closely with PLA Authorities in obstructing the activities of other countries within China's Nine-Dash line claim. Over the years, this militia has been involved in dangerous manoeuvres to threaten ships, along with operations aimed at taking control of disputed islands.

PLAN- MARINE CORPS

The PLAN's land combat arm, the Marine corps had not been focused on, with only light capabilities, and amphibious operations were still part of the Army's mandate, with army amphibious units getting heavier equipment. Till the last round of reforms, the Marines consisted only of 2 brigades.¹² However, this round of reforms saw an announcement that the Marine corps would now be increased to 8 brigades.¹³

¹¹ Lee, Roderick (2018), The PLA Navy's ZHANLAN Training Series: Supporting offensive strike on the High Seas, China Brief Volume 21, Jamestown Foundation <https://jamestown.org/program/the-pla-navys-zhanlan-training-series-supporting-offensive-strike-on-the-high-seas/>

¹² Blasko, Dennis J (2010), China's Marines: Less is More, China Brief, Volume 10, Jamestown Foundation <https://jamestown.org/program/chinas-marines-less-is-more/>

¹³ Blasko, Lee (2019), The Chinese Navy's Marine Corps, Part 1: Expansion and Reorganisation, China Brief Volume 19, Jamestown Foundation <https://jamestown.org/program/the-chinese-navys-marine-corps-part-1-expansion-and-reorganization/>

These reforms saw an addition of 4 more combined-arms brigades to the Marines, along with the addition of the PLAN's SOF brigade and an aviation Brigade. Here an interesting thing to note is that none of the brigades transferred to the marines from the Army were amphibious units, and the PLAA continues to operate amphibious brigades. This shows that the leadership does not want an immediate increase in amphibious capabilities, as training these new units in amphibious warfare and letting them mature would take time.

The pattern of Marine Corps deployments suggest that these units will not fall under the command of the Theatres, but are in fact under the MCHQ, which seems to maintain independent command. The PLANMC has also sent units to the Gulf of Aden to support the PLAN's counter-piracy operations, as well as garrisoning facilities in disputed territories in the South China Sea.¹⁴

The PLANMC has also conducted exercises in not only amphibious operations, but has focused on areas such as rapid movement from different theatres, to training in different terrain types, such as cold weather training, jungle, desert and plateau warfare and conducting operations far from home.¹⁵ PLANMC units also garrison the PLAN base at Djibouti. PLA statements also point to the PLANMC intended to be unit with High-readiness ready to leave to protect Chinese interests around the world. All these also point to the fact that the PLA intends for the PLANMC to be an expeditionary corps, similar in tasks and capacity to the US Marine Corps.

In the case of an invasion of Taiwan, the Marine corps are intended to be the first ones ashore, however with their light equipment, their main task would be to take the beaches and form a bridgehead from where the heavier and more numerous Army amphibious units would take over and break Taiwanese lines in a major offensive.¹⁶

PLA AIR FORCE

The 1990s saw the PLAAF invest in a program to upgrade its old fighters and acquire more modern 4th gen fighters. By 2015, more than 51 percent of the PLAAF's fighter fleet was 4th

¹⁴ Lin, Ying Yu (2020), New Wine into New Wineskins: The Evolving Role of the PLAN MC in Amphibious Warfare and Other Mission Areas, China Brief, Volume 20, Jamestown Foundation <https://jamestown.org/program/new-wine-into-new-wineskins-the-evolving-role-of-the-pla-navy-marine-corps-in-amphibious-warfare-and-other-mission-areas/>

¹⁵ Blasko, Lee, The Chinese Navy's Marine Corps, Part 2: Chain of Command Reforms and Evolving Training, China Brief Volume 19, Jamestown Foundation <https://jamestown.org/program/the-chinese-navys-marine-corps-part-2-chain-of-command-reforms-and-evolving-training/>

¹⁶ Ling (2020) Ibid.

gen or above, and in the last 7 years the number has only gone up, with old antiquated cold war era designs and soviet copies being replaced by modern 4th gen fighters such as the home-grown J-10, J11s and J-15s, Chinese copies of the Flanker series. China has also developed its own 5th gen fighter, which is already in active service, in larger numbers than even Russia.¹⁷

The PLAAF has also focused on building up its transport and helicopter fleet. It has achieved great successes in its transport fleet, with the Y-20 proving to be a reliable workhorse for the PLAAF, and increased PLAAF confidence in the aircraft resulting in it being used to ferry men and equipment to foreign exercises as well, and to supply aid to other countries etc.¹⁸

However, one issue the PLAAF has had to contend with is the lack of talented and well-trained pilots. A study conducted showed that PLA pilots had issues in training, with them not being able to react to new situations, discipline being very lax and a lack of tactical acumen. PLAAF pilots constantly rely on ground control for orders and fail to show initiative.¹⁹ However, to counter this, the PLAAF has established a network of Youth Aviation schools. These youth aviation schools are very tough to get into, only the crème de la crème get into these schools. However, these schools have had a very good success rate, with a lot of its students being accepted into both military and civil aviation programs, and those who did not make it into aviation still joining other branches of the military.²⁰

In addition to cultivating talent from a young age, there are also attempts being made to improve pilot training. In particular, the PLAAF has focused on training fighter pilots under actual-combat conditions. This is done by making training scenarios as realistic as possible by adding conditions such as night training, electromagnetic training, geographical peculiarities and combined arms training including SAMs and AAA systems.²¹

The PLAAF, thus, aims to make itself into what is defined as a strategic air force,²² that enables it to project power across continents, and make it an integral part of the PLA's capabilities. The

¹⁷ Bommakanti, Shivamurthy (2021), China's Military Modernisation: Recent Trends, Observer Research Foundation. <https://www.orfonline.org/research/chinas-military-modernisation-recent-trends-2/>

¹⁸ Van Oudenaren, John S. (2022), Military Operations Other than War: Antidote to the PLA's Peace Disease?, China Brief, Volume 22, Jamestown Foundation <https://jamestown.org/program/military-operations-other-than-war-antidote-to-the-plas-peace-disease/>

¹⁹ Morris, Heginbotham (2016), China's PLAAF pilot training program undergoes major overhaul, The National Interest <https://nationalinterest.org/blog/the-buzz/chinas-plaaf-pilot-training-program-undergoes-major-overhaul-18205>

²⁰ Jensen, Aaron (2018), A look at the PLA's Youth Aviation Programs, China Brief, Volume 18, Jamestown Foundation <https://jamestown.org/program/pla-air-force-and-navy-air-force-developing-youth-aviation-programs/>

²¹ Morris, Heginbotham (2016) Ibid.

²² Chase, Garafola (2015), China's Search for a Strategic Air Force, China Brief, Volume 15, Jamestown Foundation <https://jamestown.org/program/chinas-search-for-a-strategic-air-force/>

PLA's SAM systems and air defence systems are amongst the best in the world, with a combination of both Russian-made and Chinese-made S-400s and S-300s, along with layers of fighters and interceptors ensuring a robust air-defence system.

PLA ROCKET FORCE

Known earlier as the Second Artillery Force, an autonomous force within the Army, the PLA Rocket Force was formally made a separate service at the end of 2015, as a part of the wide-sweeping reforms of 2015-2016. The establishment of the PLARF has been seen as a sign of the increasing importance of missiles, both conventional and nuclear, to China's overall strategy and doctrine.²³

The establishment of the PLARF can be attributed to multiple reasons, for bureaucratic reasons: first, as the Second Artillery operated in effect as an independent service; second, to recognise the importance of missile forces; third and most importantly, to make it better aligned to the formation of the theatre commands, which would give operational control of assets to the theatre commanders, and leave the service with duties such as training and force development.

While the new service has the same core mission of strategic deterrence and nuclear counterattack, along with precision missile strikes, the elevation of the Second Artillery as a service has made the PLARF's role far more expansive than that of its predecessor, including preparing for and carrying out a range of both deterrence and wartime operations, giving it even more autonomy, but putting on it higher requirements for the construction of Chinese missile forces and capabilities, and having to develop a full spectrum of all kinds of missile capabilities, including new technologies, supporting Doctrine, intelligence, communications etc.²⁴

However, the PLARF has had its fair share of issues. One of these is Command and Control structures, especially when the PLARF get more and more assets, and these are further dispersed across the countryside, creating a strain on C&C mechanisms. Furthermore, it is also plagued by a lack of experience and real-world combat training, something that seems to plague the other services of the PLA as well.

²³ U.S. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2021*.

²⁴ *Ibid.*

A major issue being faced by the PLARF is a lack of a good human talent pool, especially because the PLARF needs the highest proportion of high-quality and well-educated operators, officers, commanders, scientists and technicians due to the extremely complex nature of the task. Adding to the lack of talent is the extremely harsh working conditions of the PLARF, where soldiers have to spend extended amounts of time in underground bunkers and on extremely low rations during exercises. This has resulted in soldiers of the PLARF having the worst mental health of all the services within the PLA.²⁵

PLA STRATEGIC SUPPORT FORCE

Established in late 2015 as part of the major reforms announced at the time, this young organisation has been described as a ‘new-type combat force’, which can be seen as an attempt to leverage new technologies and capabilities such as Space, EMS and network capabilities as key enablers to fight joint operations across multiple domains.

Simply put, the SSF is the new information umbrella of the PLA, providing it with information on warfare capabilities and the capability to leverage and aid in identification and growth of new technologies. It has two main missions, wherein the first is to provide the PLA information through various means including space and network capabilities, including navigations, communications, intelligence, surveillance and protection of Military information. Secondly, it is to conduct operations against the enemy, in the realms of space, EMS, cyber, psychological ops etc., and undermine the enemy in any way.

The PLASSF, thus, becomes the inheritor of all the PLA’s information capabilities, which were earlier split amongst the four general departments. The creation of a force dedicated to information warfare is a clear demonstration of the importance of information warfare, and the so called ‘strategic frontiers’ of space, EMS and cyberspace to Chinese military Strategists.²⁶

²⁵ Zi Yang (2019), Assessing Mental Health Challenges in the People’s Liberation Army, Part 2: Physical Operational Environments and Their Impacts on PLA Service Members, China Brief, Volume 19, Jamestown foundation <https://jamestown.org/program/assessing-mental-health-challenges-in-the-peoples-liberation-army-part-2-physical-operational-environments-and-their-impacts-on-pla-service-members/>

²⁶ Ni, Gill (2019), The People’s Liberation Army Strategic Support Force: Update 2019, China Brief, Volume 19, Jamestown Foundation. <https://jamestown.org/program/the-peoples-liberation-army-strategic-support-force-update-2019/>

Technological Developments

Over the years, PRC strategists have realised that the technological lead of the USA was far ahead of the curve, and that a blind chase for technological superiority would not see them win out against the USA. Therefore, Chinese planners aim to incubate the growth of technology and innovation in such a way as to cut down the differences between the two, and allow the PRC to fight an asymmetric conflict. The PRC feels that the primary way to do this is via economic growth. After all, it is the ability to throw around money that has resulted in its military and diplomatic strength.

One field that the PRC has particularly focused on is Military-Civil Fusion,²⁷ which seeks to bind together the civilian and military sectors, by funding private companies that develop technologies with military applications etc., which are also called as Dual Use technologies. China has also made heavy use of its civilian companies to invest in the US economy and gain patents and technology which could then be modified to suit military needs, most notable of which is the PLA's use of U.S. Satellite technology.²⁸

China has also spent resources on developing what it calls as 'New-concept weapons',²⁹ which encompass technologies such as ASAT weapons, directed energy weapons such as LASER and Microwave, new atomic weapons such as anti-matter bombs, stealth weapons, hypersonic kinetic weapons etc. The US DoD notes that China already leads the world when it comes to hypersonic missile technology. However, the huge costs of these NCWs means that Chinese research in this area is extremely careful and frugal to avoid any faux-pas of the kind quite common in the USA wasting huge sums of money.

PRC research has constantly focused on methods to improve communications. PLA strategists place a very important role for communication and coordination in any military operation, especially in an asymmetric conflict while facing a superior foe. Thus, they have made efforts to improve communications by making them faster and more secure. This has led to a push in

²⁷ Levesque, Greg (2019), Military-Civil Fusion: Beijing's 'Guns AND Butter' Strategy to become a technological superpower, China Brief, Volume 19, Jamestown Foundation <https://jamestown.org/program/military-civil-fusion-beijings-guns-and-butter-strategy-to-become-a-technological-superpower/>

²⁸ Haver, Zachary (2021), China's use of U.S Satellite Communications technology in the South China Sea, China Brief, Volume 21, Jamestown Foundation <https://jamestown.org/program/chinas-use-of-u-s-satellite-communications-technology-in-the-south-china-sea/>

²⁹ Clay, Marcus (2021), New Concept Weapons: China explores new mechanisms to win war, China Brief, Volume 21, Jamestown Foundation <https://jamestown.org/program/new-concept-weapons-china-explores-new-mechanisms-to-win-war/>

research in quantum communications. The PRC has also announced its intention to launch its own Satellite internet megaconstellation, similar to the Starlink network operated by SpaceX.³⁰ There have also been attempts to leverage blockchain to manage communication and administrative networks.³¹

AI has been an area where the PLA has spent considerable time and effort, and to great results as well. AI and Machine learning help commanders notice patterns which they might not, and speed up the decision-making process considerably. If AI were to get developed well enough and were to mature, it could one day become a virtual staff officer, and free up officers for other tasks. AI has also been considerably used in wargaming, and to give PLA commanders tougher and more realistic battle scenarios to contend with. AI has proven to be so effective that it beat human commanders 7 to 1 at a wargaming exercise in 2017.³²

The PLA has also started focusing on renewable energy to power its facilities in remote areas such as the South China Sea islands and in Tibet, to ensure an adequate energy supply to these regions, to ensure self-sufficiency in the critical energy sector and to power military equipment in these areas. This becomes particularly important when it is noted that China relies mostly on fossil fuels for its energy needs, the supply of which could easily be cut off in the event of a conflict. There has also been widespread cooperation between the civilian-military complex in the field, with a lot of major renewable energy companies getting funding from the PLA and/or having business ties with them.³³

3D printing is a technology that the PLA has moved rapidly to make full use of, and is one of the most critical technologies under MCF.³⁴ Chinese publications note that 3D printing can revolutionise warfare by bringing in immense changes in logistics to armaments to manufacturing and to conducting complex repairs in a short time with complex parts being manufactured quickly in the field.

³⁰ Waidelich, Brian (2021), A Chinese Starlink? PRC Views on building an internet satellite megaconstellation, China Brief, Volume 21, Jamestown Foundation <https://jamestown.org/program/a-chinese-starlink-prc-views-on-building-a-satellite-internet-megaconstellation/>

³¹ VornDick, Wilson (2018), Beyond Bitcoin: Could China Embrace Blockchain for Defence and Security Applications? China Brief, Volume 18, Jamestown Foundation <https://jamestown.org/program/beyond-bitcoin-china-embrace-blockchain-defense-security-applications/>

³² Kania, Elsa (2019), Learning without fighting: New developments in PLA Artificial Intelligence War-Gaming, China Brief, Volume 19, Jamestown Foundation <https://jamestown.org/program/learning-without-fighting-new-developments-in-pla-artificial-intelligence-war-gaming/>

³³ VornDick, Wilson (2017), Renewable Energy and the PLA's next generation of self-sufficiency, Parts 1 & 2, China Brief, Volume 17, Jamestown Foundation <https://jamestown.org/program/renewable-energy-plas-next-generation-self-sufficiency-part-1/>

³⁴ VornDick, Wilson (2018), An instant PLA: Just add 3D printing, China Brief, Volume 18, Jamestown Foundation <https://jamestown.org/program/an-instant-pla-just-add-3d-printing/>

Nanotechnology is a field which could totally revolutionise warfare. Simply put, nanotechnology aims to make things as small as possible. What this would result in is electronic equipment and computers becoming smaller, and even faster, with uniforms being thinner and stronger, with protective gear lighter and stronger and so on. China has been making major strides in the field, and is one of the world leaders in nanotechnology.

Biotechnology is another field the PRC is working on,³⁵ and is an excellent example of MCF in the PRC. China has always thought of bioweapons as a suitable weapon, something a lot of people have realised since the COVID-19 Pandemic, which is most probably a bioweapon that was leaked from a Chinese lab in Wuhan. Other than spreading viruses and diseases, other uses of bio-technology could be genetic altering to create stronger and smarter humans as soldiers etc., something that has raised serious concerns in the west.

Training and Doctrine

A critical weakness of the PLA that cannot be solved by just throwing money around is its lack of real-world combat experience, and its lack of realistic training scenarios. PLA strategists have realised this, and are making efforts to try and reform the training structures and regimen for officers and men alike.

The two conflict areas that the PLAA is currently focusing on is an amphibious invasion of Taiwan and a border war against India. Therefore, it has been training heavily on amphibious assault tactics and mountain warfare tactics. However, the PLA as a whole is also focusing on maturing its theatre commands by taking part in large scale joint manoeuvres using its combined arms brigades along with air and sea power.

The PLAAF, as mentioned earlier, is now focusing on addressing multiple issues that it faces, including lax discipline amongst its pilots, a lack of tactical acumen and a lack of realistic training. To that end, the PLAAF has also started using EMS training, along with training against SAM units etc.

The PLAN has carried out anti-piracy operations in the Gulf of Aden which have helped it gain experience operating far from home, and have given it more confidence. Furthermore, the

³⁵ Kania, VornDick, (2019), China's Military Biotech Frontier: CRISPR, Military-Civil Fusion, and the New Revolution in Military Affairs, China Brief, Volume 19, Jamestown Foundation <https://jamestown.org/program/chinas-military-biotech-frontier-crispr-military-civil-fusion-and-the-new-revolution-in-military-affairs/>

PLAN's ZHANLAN exercises have evolved in scope over the years, increasing the distance it has travelled and the scope of its actions, evolving from A2AD to offensive action on the high seas.

The PLA has also engaged more and more with foreign militaries, particularly the Russian and Thai forces, in an attempt to get more foreign exposure and gain much needed expertise by conducting exercises with them.

Of particular note is the PLA's Stride Red-Blue exercises,³⁶ as is done in most western armies. However, unlike western armies where the blue force is friendly and red the enemy, here it is the opposite. This is an attempt to move from the PLA exercises of the past, which were accused to being too overly scripted and unrealistic, where the focus was only on winning and propaganda, rather than testing the operational readiness of troops.

These exercises are conducted at Zhurihe military facility at Inner Mongolia, where the PLA's 195th Mech Inf. Brigade has been formed as a dedicated Blue-Force. The use of American military doctrine by this unit has been noted. These exercises have had good effects, with more and more improvisation and innovation being noted in these exercises, such as the use of computer codes being written in the battlefield itself to counter electromagnetic interference, or the use of fireworks to create smokescreens when their smoke grenades did not work.

There were a lot of breaks from exercises of the past. For example, units were earlier recommended by superior commands, however at Stride they were picked at random. Over time, red forces have gone from being assigned only offensive to being assigned defensive roles as well. There was also heavy use of SOFs, technology, aircraft and EMS warfare.

This break from being scripted and the push towards realism has shown the true state of the PLA, where in 2014 the red forces suffered at the hands of blue forces, where the blue forces had a win ratio of 6:1 against red forces, and red forces suffered 70% casualties. However, there has been limited progress, when in 201, the red forces managed to score a simulated kill on the blue force commander, although that wasn't enough to win the battle for the reds. One particular interesting incident occurred, when the extremely low success rate of red Forces had given rise to a battle cry of capturing the blue-force commander to rally the troops!

³⁶ Logan, David C. (2017), The Evolution of the PLA's Red-Blue Exercises, China Brief, Volume 17, Jamestown Foundation <https://jamestown.org/program/evolution-plas-red-blue-exercises/>

These red-blue exercises also help other countries understand what kind of threats China anticipates to find in the future, as can be seen in the composition of the blue-force that they face and the tactics used by the blue force. While there is still a long way to go for the PLA to sufficiently add realism to its training, the PLA seems to be on the right track. However, just one blue force will not do, it needs more blue forces, perhaps one for every theatre command to be better able to exercise and give its men experience on countering its adversaries.

The PLA has also noticed that its officers have mostly been in the same career streams, and therefore, lack cross-service exposure and training, something which can prove to be very detrimental in modern day combined arms warfare. The PLA has noticed that its academies still teach outdated concepts and courses, with poor planning in these academies and corruption plaguing the system.

PLA thinkers feel that the next revolution in military affairs will be centred around intelligent warfare, and as such they feel that there should be more focus on intelligent technologies in the classroom.

The PLA also seeks to implement and perfect the ‘Triad’ military education reforms,³⁷ which focuses on three areas: military academy education, unit training practice and military professional education. While these areas were already taught in academies, the new reforms aim to fuse all these systems to show the relation between them and to create synergy. This is critically important for the PLA, which feels that it is the human factor that is the most decisive on the battlefield, and seeks to cultivate its human talent as much as it can, especially the talent in the field of joint warfare.

To that end, the PLA has also re-invented its Academy of Military Sciences, and the National Defence University, two of its premier military academies, which now offer joint courses to its officers. These academies have also started focusing on science and technology,³⁸ and have been actively supporting new research and development in both military and civilian fields and have been contributing heavily to MCF. The PLA also aims to create a virtual staff college for its officers with MOOCs. Theatre commands have also initiated on the job training for joint

³⁷ McCauley, Kevin (2019), ‘Triad’ Military Education and Training Reforms: The PLA’s cultivation of talent for integrated joint operations, China Brief, Volume 19, Jamestown Foundation <https://jamestown.org/program/triad-military-education-and-training-reforms-the-plas-cultivation-of-talent-for-integrated-joint-operations/>

³⁸ Kania, Elsa (2018), Incubating Innovation? New directions for the PLA Academy of Military Science, Battlefield Singularity <https://www.battlefieldsingularity.com/post/incubating-innovation-new-directions-for-the-pla-academy-of-military-science>

officers. There is also a focus on developing what the Chinese have described as a ‘systems of systems’ operations capability, putting network centric joint-warfare at the forefront.³⁹ While these reforms seem to be successful on the face of it, the fact remains that all other educational reforms in the last two decades failed, and only time will tell if these reforms have been successful or not.

Conclusion & Implications for India

The major organisational changes and force restructuring announced in 2015-16 is, at least on paper, complete. However, a lot of these newly created formations, be they land or air formations, either lack equipment, or field old equipment. Large amounts of modern equipment still need to be fielded to bring them up to strength.

The PLA has made substantial progress towards the reforms, with the PRC Defence ministry announcing in November 2020 that the PLA had basically achieved mechanisation. Here mechanisation means that equipment would be able to be integrated into modern communications networks, and make full use of modern informationised and intelligentised warfare. However, according to the US DoD, separate statements indicating that the final stages of PLA mechanisation would occur in either 2021 or 2022 make it appear that the PLA has not been able to meet its 2020 deadline to mechanise its forces. However, the reference to either 2021 or 2022 means that the PRC is just a year or two behind its timeline, and is more or less on track in its long-term modernisation goals.⁴⁰

The PLA has also moved far ahead of other countries in the technological sphere, and is on the cutting edge of scientific innovations and breakthroughs, being competitive to the US and even surpassing it in some fields. The PLASSF has been particularly instrumental in incubating innovation and research in related fields, and PRC’s development strategies such as MCF appear to be paying off.

³⁹ Wuthnow, Joel (2019), China’s “New” Academy of Military Science: A revolution in theoretical affairs? China Brief, Volume 19, Jamestown Foundation <https://jamestown.org/program/chinas-new-academy-of-military-science-a-revolution-in-theoretical-affairs/>

⁴⁰ U.S. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2021*.

The PLA must be credited for recognising its weaknesses, and working to improve upon them. The PLA has had a focus on professionalising its armed forces, and has sought to include realism as much as it can, though it still has a long way to go. This issue can only be solved with time and effort, but the PLA does seem to be on the right track in doing so. However, the PLA must get rid of conscription if it has to further professionalise its resources, as it relies upon almost 200,000 conscripts every year, who only serve for 2 years, and therefore, also cost a lot to the government for relatively less gains.

The PLA has also worked hard to develop new theories and doctrine and are determined to be one of the first countries to initiate the new revolution in military affairs, instead of just being a follower into the reforms. The PLA is making substantial progress, and at this time looks poised to meet its 2035 deadline of fully modernising its armed forces and maturing its joint networks.

For India, this situation is utterly critical. India has been lagging far far behind in its own military reforms, facing constant issues from slow beauracracy, politicians and the old school nature of the armed forces, who have refused to evolve and adapt to the changing times. The signs are simple, India must act, and act fast, devoting more resources to its armed forces, and pushing through the long-stalled reforms it so badly needs. India has also had constant issues with integration and joint warfare, despite trying to set up tri-services commands, and there is still bitter rivalry amongst the three services.

India would do good to follow the Chinese lead in organising and modernising both its economy and therefore, its armed forces. The use of dual-use technologies and MCF can prove to be extremely helpful, as was seen during the COVID-19 crisis where the oxygen systems developed for the Indian Tejas LCA was used in making cheap oxygen systems for the public. Similarly, Indian planners must study Chinese experiences in military reforms to help them better cope with issues while reforming their own armed forces. India must also strengthen its alliances, particularly with the West. While India has still been wary of getting very close to the west because of Russia, India cannot continue doing so, and must come to terms with the fact that sooner or later, it will have to cosy up to the west, and that Russia may have been a great alky in the past, but it does not and will not serve any purpose in the future.

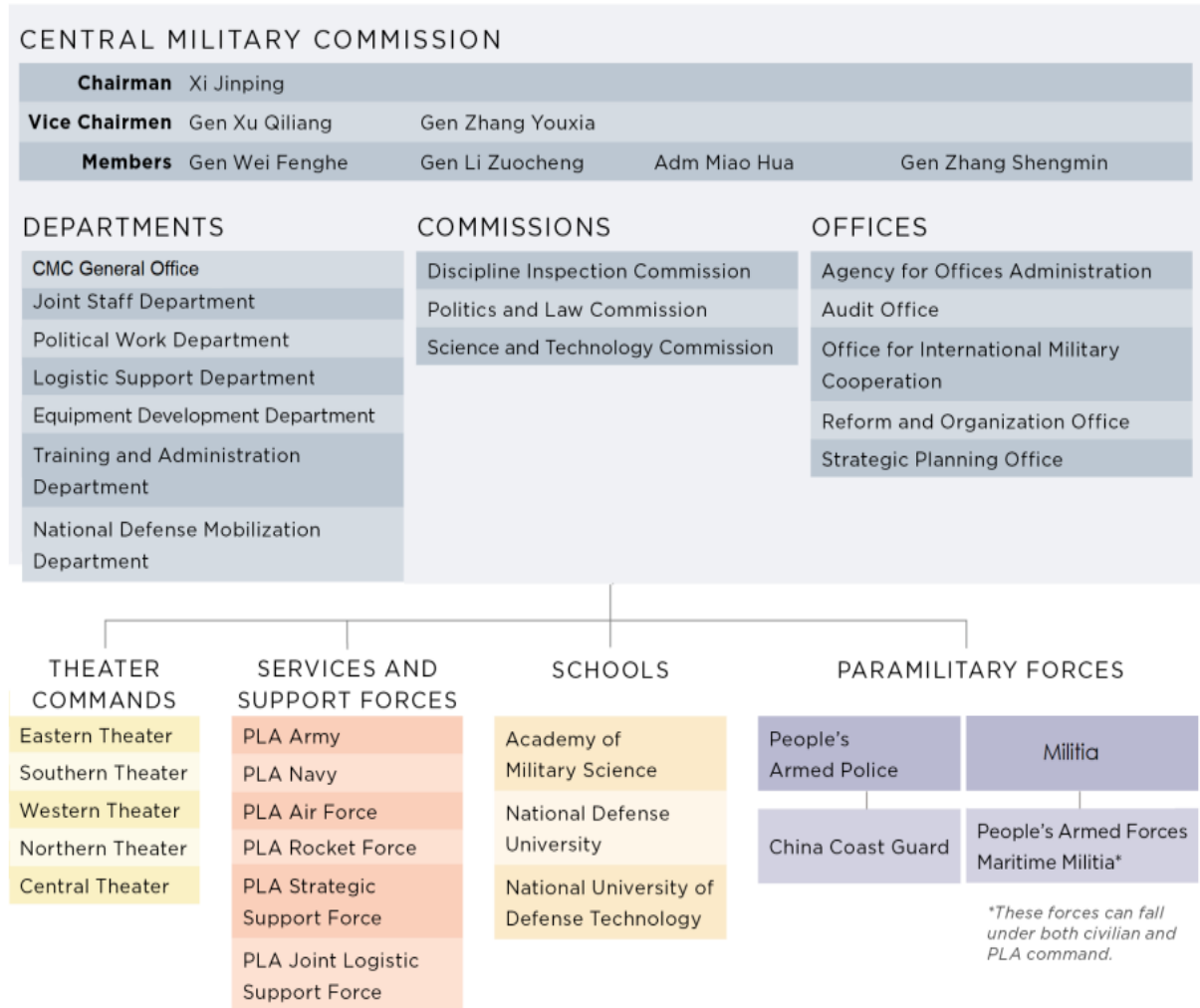
Simply put, India is a whole generation behind the Chinese PLA, and if the Indian Govt. and the Armed Forces do not get their act together, then a modernised PLA by the late 2030s would

easily smash through Indian forces if a war were to occur. While India has used the bravery of its troops as a talking point, bravery did not win India the 1962 war, and in the 21st century, where warfare is mostly non-contact, in the electromagnetic sphere, or at the touch of a button, the bravery of the soldier will mean nothing against 21st century technology if the Indian soldier is not well equipped or if the Indian commander does not know how to fight a modern war.

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APPENDIX 1

China's Military Leadership

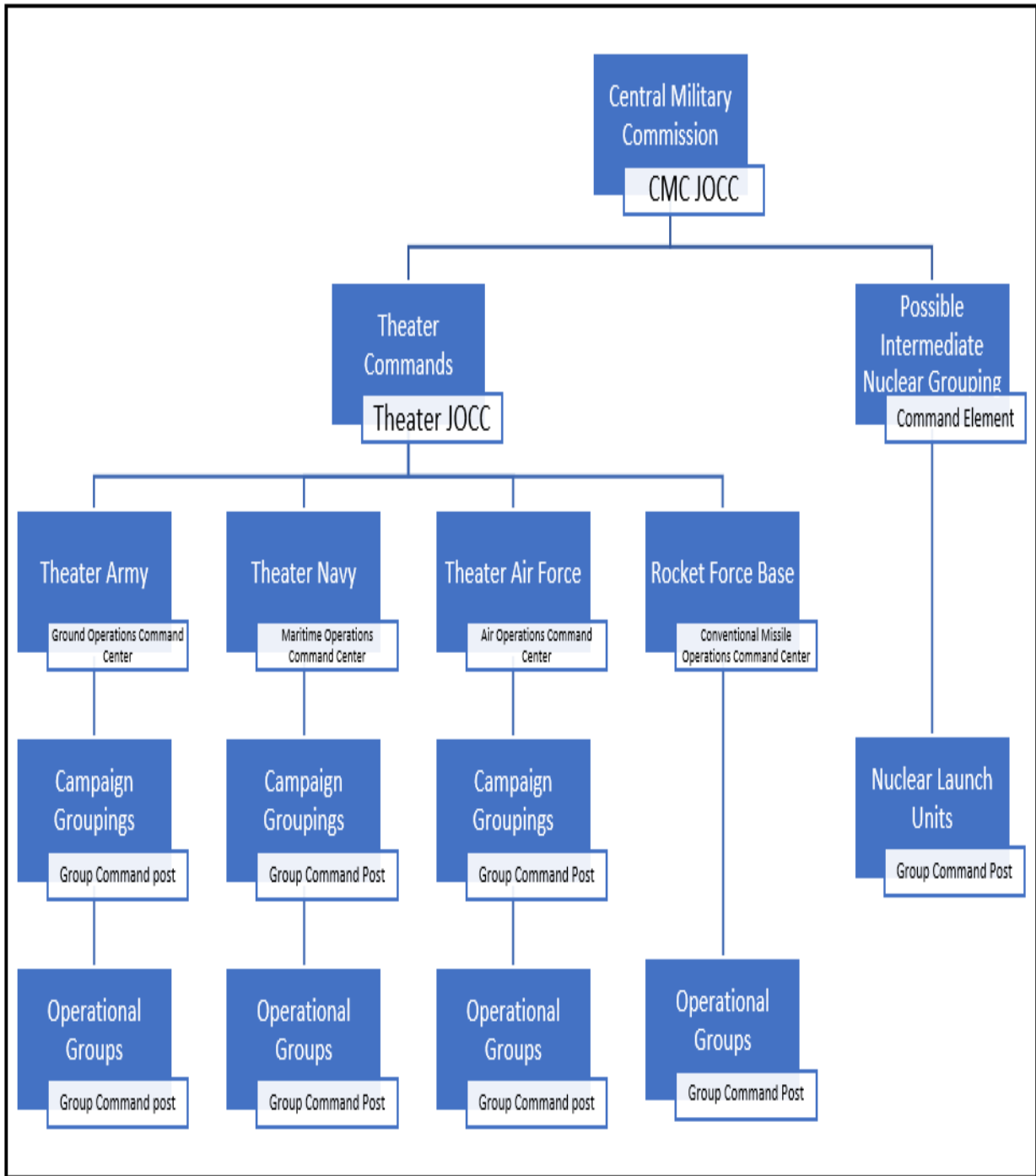


This chart does not depict the Ministry of National Defense (which is not in the chain of command), general offices, military districts, garrisons, sub-districts, and People's Armed Forces Departments (which command the militia)

Source: U.S. Department of Defense

APPENDIX 2

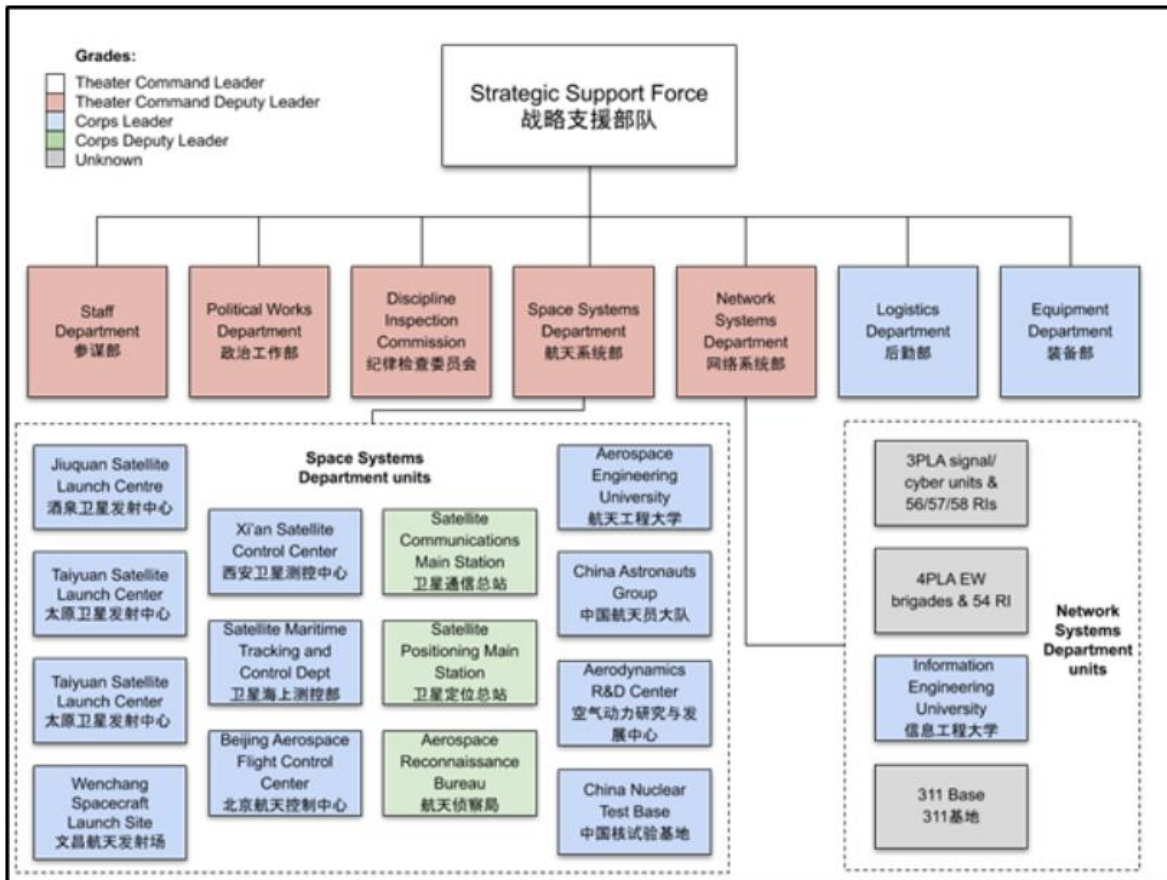
PLA OPERATIONAL CHAIN OF COMMAND



Source: Jamestown Foundation

APPENDIX 4

PLASSF ORGANISATION



Source: Jamestown Foundation

ABBREVIATIONS

A2AD- Anti-Access/ Area Denial

AAA- Anti Aircraft Artillery

AI- Artificial Intelligence

C4ISR- Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance

CCP- Chinese Communist Party

CMC- Central Military Commission

DoD- Department of Defense (US)

EMS- Electromagnetic Spectrum

EW- Electronic Warfare

GAD- General Armament Department

GLD- General Logistics Department

GPD- General Political Department

GSD- General Staff Department

LCA- Light Combat Aircraft

MBT- Main Battle Tank

MR- Military Region

PRC- People's Republic of China

PLA- People's Liberation Army

PLAA- People's Liberation Army Army

PLAAF- People's Liberation Army Air Force

PLAN- People's Liberation Army Navy

PLAN-MC- People's Liberation Army Navy- Marine Corps

PLARF- People's Liberation Army Rocket Force

PLASSF- People's Liberation Army Strategic Support Force

RMA- Revolution in Military Affairs

SAM- Surface to Air Missile

TC- Theatre Command

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