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Assessing Operations and 'Jointness' in the PLA Western Theater Command

Anushka Saxena

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This document assesses the operational structure, training mandates and warfighting priorities of the Chinese People's Liberation Army Western Theater Command, with a special emphasis on the theater's 'multi-domain integrated joint operations' capabilities.

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I. Executive Summary

Under Chinese President Xi Jinping, since 2015-16, the Chinese military force, the People's Liberation Army (PLA), has undergone massive reforms. As part of the reforms, the PLA has focused intensively on preparing for combat under conditions of the 'Information Age', integrating its services, arms and systems into a joint, network-centric fighting force. The PLA Western Theater Command (WTC) in particular, has played a proactive role in working under conditions of 'informatization' and 'intelligentization' to secure China's southern and southwestern borders, prepare for conventional and non-conventional warfighting, and acclimatise its personnel to the rough terrains and harsh altitudes of Xinjiang and Tibet. From an Indian interests point of view, this discussion document assesses the operational structure, training mandates and warfighting priorities of the WTC, with a special emphasis on studying the theater's 'multi-domain integrated joint operations' efforts and capabilities.

This document has been formatted to be read conveniently on screens with landscape aspect ratios.

Please print only if absolutely necessary.

Author

Anushka Saxena is a China Studies Research Analyst with the Indo-Pacific Studies Programme at the Takshashila Institution, Bengaluru.

II. Scope of this Study

This study explores features of the PLA WTC's operational work vis-a-vis combat preparedness, terrain and altitude training, talent cultivation, and efforts towards standardisation of transportation and air superiority. It does so by analysing official Chinese sources, as well as research conducted by military analysts. However, save for a few cases, the study does not analyse individual doctrines and mandates set out by the WTC or PLA on say, requirements for armour and artillery. Neither does the study delve into procurement measures undertaken by the WTC or the PLA to meet requirements of 'jointness', save in the form of examples where necessary. Finally, the study does not allude to the integration of the People's Armed Police Forces (PAP) into the work of the military, in areas such as maintenance of snowed-in roads at high altitudes. These are important aspects of operations and 'jointness' in the PLA-WTC, and may be explored in subsequent studies.

III. Introduction

The reforms in the Chinese People's Liberation Army (PLA) since 2015 have resulted in the creation of theater Commands (TCs) that enable 'jointness' and interoperability between the different services. The reforms also upgraded the former Second Artillery Corps to a new service, namely the PLA Rocket Force, which is responsible for managing China's nuclear arsenal, thereby increasing the complexity of jointness and interoperability. The goal is to create warfighting readiness and circumvent the challenges[1] posed by the previous 'Military Region' (MR) model, under the conditions of informatization and intelligentization.

One such key challenge was the inability of MR commanders to mobilise joint operations training programmes with each of the three services being given equal importance. Moreover, during wartime mobilisation, the ad hoc commanders-in-charge were to be assigned from the now-dissolved General Staff Department of the Central Military Commission, instead of the service chiefs in an MR. Theater commands are now assigned individual operational directions, and their joint combat preparedness work is undertaken in a manner where a single theater command can enable inter-service training focused on dealing with specific missions.

In this context, operations pertaining to India fall under the remit of the PLA Western Theater Command (WTC). Understanding the achievements and challenges of its Multi-Domain Integrated Joint Operations (MDIJO; 体化联合作战)[2] endeavours is therefore consequential to Indian decision-making.

IV. Key Terminologies and Organisational Structure

Before this study delves into the WTC's roadmap to achieve MDIJO, it is vital to consider definitions of three terminologies that are key to China's military reforms, and also pertain to the WTC:

1. **Informatized Warfare (智能化战争):** In the Chinese conception, victory shall be determined by the network centricity and information dominance of forces in battle. As argued in a commentary[3] published by the *PLA Daily* in December 2019, "*Unlike any other form of warfare in history, information warfare is not a simple additive or locally dispersed confrontation of various combat units or elements, but a comprehensive confrontation of systems against systems.*" This hence defines informatized warfare as a method of combat that uses information

technology as an "adhesive force" to convert individual services, platforms, and support arms into a warfighting "system." Such a network-dependent combat system is most likely to succeed because it can leverage battlefield intelligence information from various sources (such as space, unmanned underwater systems, and ground control), provide a decisive advantage by utilising information-based tactics of fighting and battlefield infiltration (such as through the use of electromagnetic warfare), and blur the lines between ground, air, naval, cyber, and other domains of warfare. Informatized warfare forms one of the three fundamental "-izations" (三化) of Chinese military modernisation[4] — the other two being mechanization and intelligentization.

2. **Intelligentized Warfare (智能战斗力):** Globally, the Revolution in Military Affairs (RMA) is entering an era of using "intelligent means" to fight wars. Acknowledging this radical shift that has the potential to provide disproportionate warfighting advantages, the 2019 White Paper on National Defense published by China's State Council Information Office argued,[5] "*War is evolving in form towards informationized warfare, and intelligent warfare is on the horizon.*" The PLA has hence embarked on a journey to become an "intelligentized" force, which depends on the interplay of "intelligent weapons and intelligent forces." Intelligent weapons are referred to as those that are Artificial Intelligence (AI)-enabled, and intelligent forces are referred to as

personnel that can provide support to the decision-making of intelligent weapons while engaging minimally in taking action. As highlighted in a commentary[6] published by *people.cn* in January 2021, the three stages of achieving intelligentization are — "human-led with unmanned support," "unmanned-led with human support," and "rules with human, actions without human." In addition, the idea of "intelligentized" warfare in the Chinese conception also includes "intelligent" tactics of battle, which means reducing dependence on firepower and human mobility in favour of cognition-centric and unmanned-led battlefield operations.

3. **Multi-Domain Integrated Joint Operations (MDIJO; 体化联合作战):** The *Science of Military Strategy* (战略学) document published by the Military Strategy Studies Department of the PLA Academy of Military Science in 2013,[7] lucidly explains the pillars of MDIJO. The primary goal of the PLA is to become a force that can win "localised wars under conditions of informatization" (信息化局部战争). To be able to do that, the requirement is two-fold — that the services and support arms of the PLA fuse their operational expertise and platforms to the highest possible degree (i.e. preparing a "joint combat force"),[8] and that they do so via a "seamlessly linked up networked military information system." The former constitutes the material basis on which operational strengths can be complementarised and the

boundaries and hierarchies of services and arms can be transcended. The latter constitutes the safe and reliable supporting link so that all operational elements have a common awareness of battlefield postures. Throughout this study, jointness, interoperability, and integration will be considered as synchronous pillars of achieving MDIJO.

Additionally, it is crucial to note the organisational structure of and surrounding the WTC, to trace the chain of command and gauge the complexity of achieving jointness.

1. While the WTC itself rests under the direct control of the Central Military Commission (CMC), the ground, air, and missile forces assigned to it answer on operational matters to the WTC commanders, meaning that wartime mobilisation as well as combat preparedness are overseen by leaders of the WTC.

2. The headquarters of the PLA Army, Air Force, and Rocket Force respectively undertake processes of "construction" or "force-building,"[9] which, as separate from operational command, indicates responsibility for organising, equipping and training for deployment. These HQs themselves rest under direct control of the CMC, alongside the theaters.

3. With the initiation of the 2015 reforms in the PLA, a key "below the neck" (脖子以下) reform included the shift from a service-specific group army-division-regiment structure to a standardised group army-brigade-battalion structure. Under the WTC, there exist two group armies – the 76th and 77th, and under their ambit exist various light, heavy and medium combined arms brigades (CABs),[10] which are classified according to the weapons systems they predominantly integrate (light CABs are high-mobility, air-assault, mountain and motorised, and medium and heavy CABs include wheeled and tracked armoured systems respectively).[11] Additional brigades specialise in operational elements, such as an artillery brigade, an air defence brigade, army aviation brigade, a special operations forces (SOF) brigade, an engineer and chemical defence brigade (may be combined or separate), and a sustainment brigade.

4. Further, there are about 15 border defence regiments[12] attached to the WTC-PLAA. Present across Xinjiang and Tibet, these regiments continue to operate under their pre-reform commands of the prefecture-level Military Sub-Districts (MSDs), such as Ngari and Hotan.

5. Additionally, the WTC hosts the 64th PLA Rocket Force Base (which, as of 2019, comprises four brigades - 809, 812 and 823),[13] and the Xi'an flying academy, which specialises in training of personnel with fighter jet trainer aircraft such as JL-9 and JJ-7.[14]

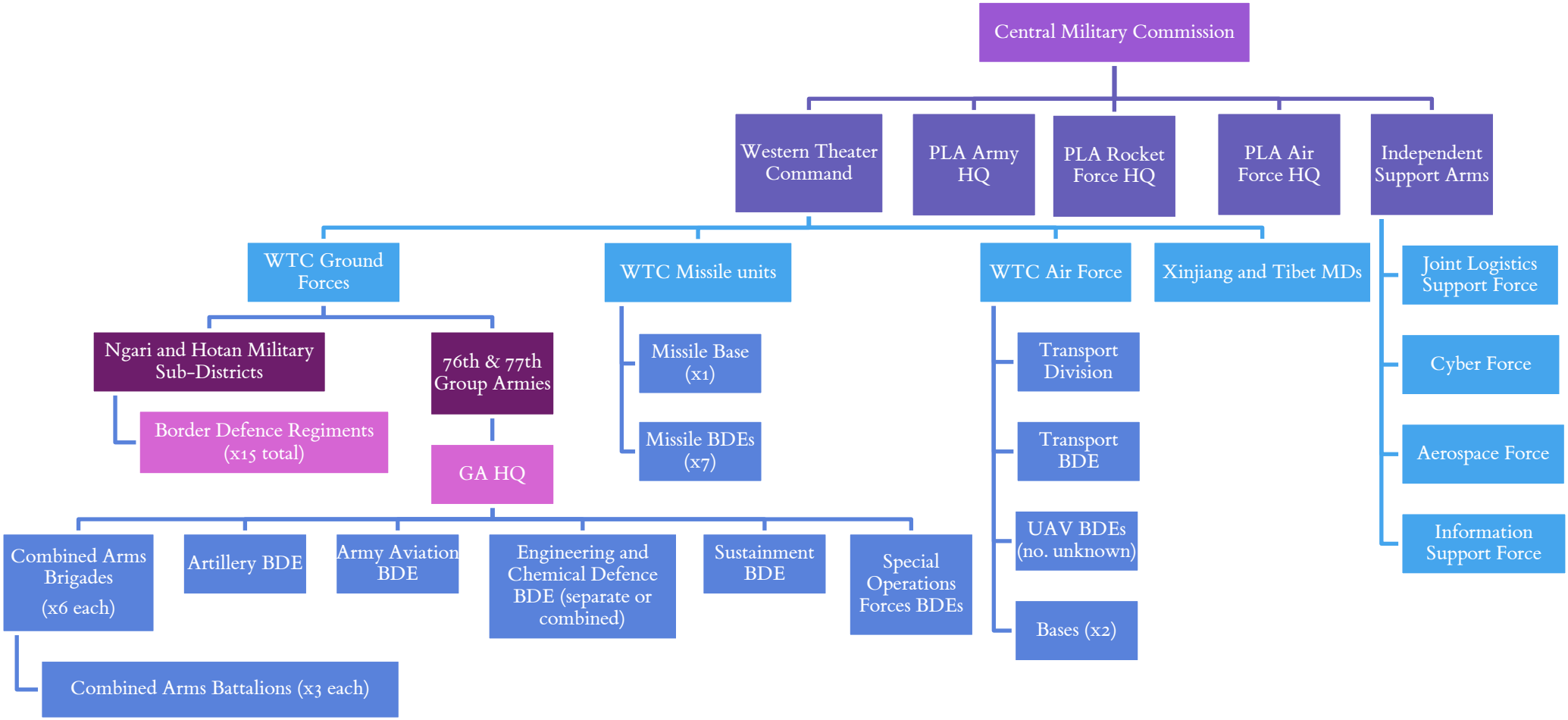
6. The WTC is unique as compared to its counterpart theaters in that it also boasts two group army/ sub-theater level Military Districts (MDs) in Tibet and Xinjiang. The two MDs further boast various infantry battalions, border defence regiments, and mountain infantry brigades.[15] An example of an infantry battalion with a special assignment for border defence is the Gyantse County 1st Independent Battalion (Military Unit Cover Designator 77655).[16] Placed under the ambit of the Tibet MD, this battalion is designated to be deployed for operations on China's borders with India and Bhutan.

7. The WTC is supported by the operations of the four support arms of the PLA, namely the Joint Logistics Support Force, the Cyber Force, the Aerospace Force, and the most recently inaugurated Information Support Force.[17] WTC commanders mobilise resources jointly with these arms to create a "whole-of-systems" atmosphere for integrated joint operations in the theater.

8. Each theater command, including the WTC, also hosts a 'Joint Operations Command Center" (JOCC; 联合作战指挥中心). As per a report of the PLA Daily from 2022, the WTC-JOCC has become the "smartest brain," performing the role of strategising over and simulating battlefield performance (similar to a tactical wargaming 'think tank'), while providing data and "intellectual" support for operational command.[18] The report also suggests that the team at the JOCC comprises personnel from all four services, and most of them are aged 35 or under, and have won various "scientific and technological progress awards" during their educational years.

9. As of December 2023,[19] the WTC also boasts a "dispatch centre" (调度中心) in seven provinces covered under the theater. The primary function of the dispatch centres is to coordinate transportation of personnel, logistic equipment and food and water across altitudes and terrains through railway means.

WTC Organogram - Services



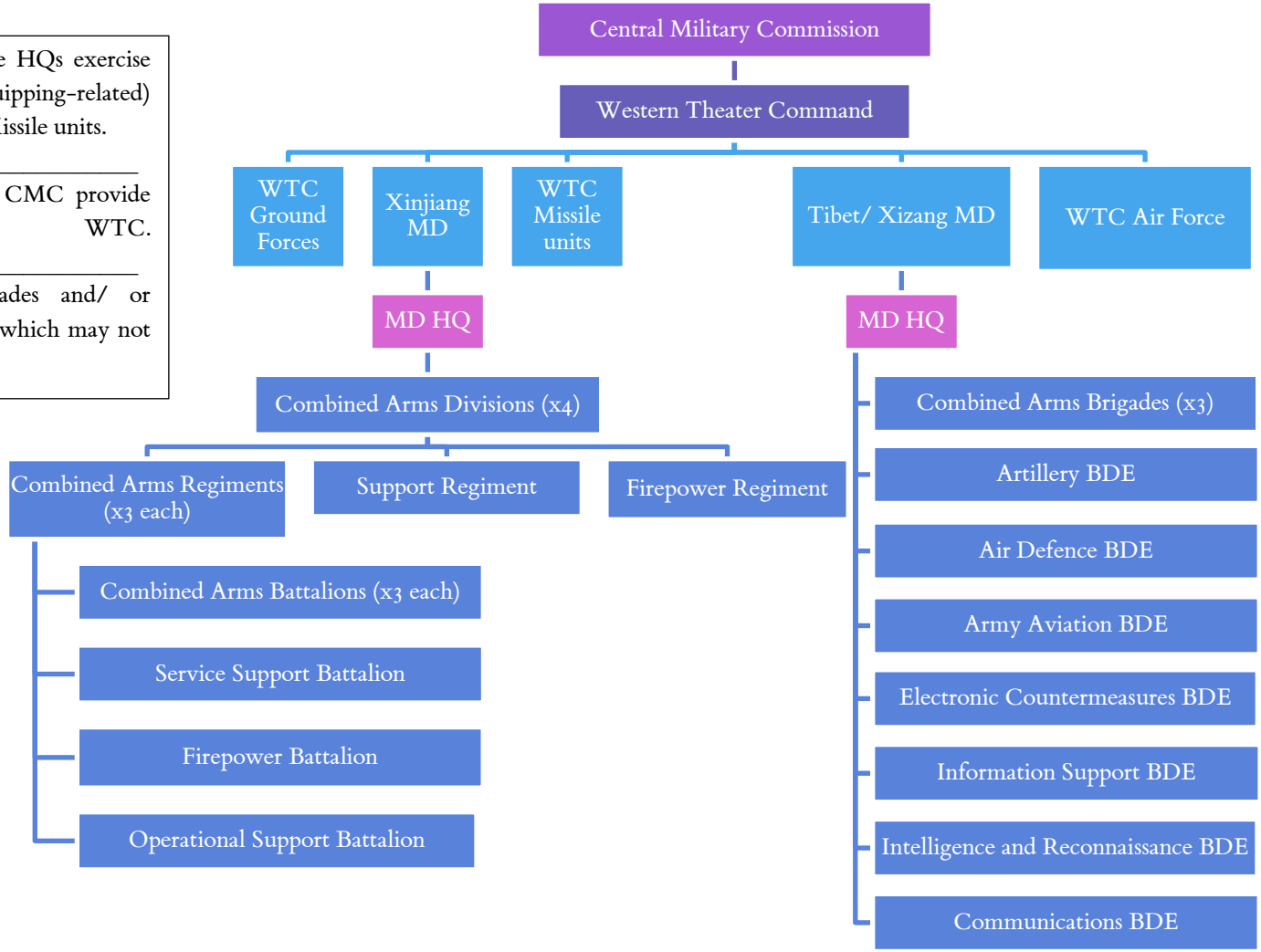
Collated by Author

WTC Organogram - MDs

The PLA Army, Airforce and Rocket Force HQs exercise administrative (organizing, training and equipping-related) control over the WTC Army, Airforce and Missile units.

The Independent Support Arms under the CMC provide tactical support to the WTC.

There may exist other specialised brigades and/ or departments under the Tibet/Xinjiang MD, which may not be depicted in the Organogram.



Collated by Author

V. The PLA-WTC's 'Roadmap' for Jointness

The earliest record of the WTC studying a "roadmap" for jointness training comes from a February 2016 meeting of over 100 officers from the theater's political organs, troops, academies, and military branches, just a few days after the theater commands were first created.[20] The report from this meeting highlighted three key imperatives to underpin the WTC's combined operations efforts. First, the refinement of border control and social stability in the autonomous regions of Xinjiang and Tibet. Second, the building of a "small but refined" joint operations command centre. Its work was to be supplemented by other joint operations support and guarantee teams in areas such as surveying and navigation and "comprehensive information services". This can be understood as alluding to cyberoperations and the enhancement of Intelligence, Surveillance and Reconnaissance capabilities through an elaborate Command, Control, Communications and Computer, or C4ISR infrastructure. Third, the development of situational awareness capabilities for aerial superiority, given the benefits of air power in unfavourable terrains covered by the WTC.

Since then, the WTC has prepared a roadmap to achieve 'MDIJO', which revolves around three key factors:

1. **Conducting combat training and preparedness exercises:** Such exercises feature a range of scenarios and simulations that engage services, force capabilities and weapons systems. The goal across these exercises is to experiment joint operations among the services using the latest technologies and weapons systems, as well as older systems retrofitted with novel equipment, while also assessing **officers' skillsets. Combined Arms Divisions (CADs)** also play a special role in enabling joint combat training.

2. **Getting Acquainted with the terrain:** What is particularly special about the WTC's training is that it also experiments with terrains, given that it is the largest theater command by area and covers both the arid north-western deserts of Xinjiang and the high altitude areas of Tibet, along the border with India. Terrain training is a central pillar of the WTC's jointness capabilities, as the ability to achieve interconnected goals in complex environments would fundamentally shape the results of conflict.

3. **Aerial superiority and transportation training** find special emphasis in terrain training work, but also transcend beyond the same, acting as vital components of achieving comprehensive success in battlefield operations of the WTC.

VI. Combat Preparedness

To test its joint operations capabilities, the WTC invests significantly in training and simulation. Interestingly, accounts of such exercises feature both the successes and the failures, which provides insights into its achievements and challenges.

It can be inferred from the reportage on such exercises that there is a common format that is followed. The nature of the task and mission is first announced by the commander, relevant formations and personnel then take positions, and a surprise element is introduced mid-exercise to test joint responsiveness. **At the end, scoring of the exercise as pass or fail is done on the basis of certain parameters. These include the ability of command and control to relay emergency instructions in time, the ability of personnel to perform tasks (including response to the surprise situation), and the ability of some officers to take up elements of the mission that they do not conventionally specialise in.**

This is illustratable through details of some exercises conducted by the WTC in the past few years. In August 2018, for example, an anti-aircraft artillery unit of Xinjiang Military District (MD) conducted[21] a live-fire exercise in Tianshan Mountains with an aim to refine the troops' integrated combat capabilities.

These capabilities include aerial situational awareness, command and control (C2), and firepower strikes under complex weather conditions. Step one of the exercise was for troops to organise basic air defence reconnaissance, establish communication hubs, and conduct firepower strikes from the moment they occupied their positions. Step two was to engage with the surprise element, where simulated enemy aircraft randomly ascended, manoeuvred unpredictably and flew between medium and low altitude ranges, and launched attacks on various anti-aircraft positions. This was a test of the interplay between C2 and ground-based air defence units, as it required ground commanders to make decisive shots between altitudes. During the evaluation stage at the end, damage assessment revealed that many anti-aircraft positions were in flames, which indicated a failure on the surprise attack test.

Usually, a supervision unit is assigned to make training assessments during exercises. The importance of supervision and inspection teams has been established since March 2018. An exercise conducted by an Air Force brigade of the WTC at that time revealed that while soldiers in a formation performed tasks satisfactorily, random selection led to soldiers "delivering unclear commands, performing awkward movements, and lacking understanding of the principles."[22]

Subsequently, the WTC's training inspection focus has been on evaluating personnel, starting with officers at the headquarters and then evaluating company and platoon leaders. The goal with this is to make supervision and inspection a top-down process and not a grassroots-centric process, so as to eliminate any scope of amateurism among training instructors and high-level officers, who ultimately go on to train soldiers at a lower level.

Under the conditions of informatization, the WTC's combat preparedness work is also integrating new-age weapons systems and technologies. For example, in August 2023, it was reported[23] that an Air Force unit under the WTC is now testing the Chengdu GJ-2 Armed Reconnaissance Drone for reconnaissance and strike capabilities in realistic combat scenarios in the North-western deserts of Xinjiang. Piloted by remote operators, the drone was tasked with searching, detecting, identifying, locating and attacking multiple targets within a single sortie. In drone-led operations, at the current stage of development, success is measured by assessing the operators' ability to manoeuvre drones across terrains, altitudes and weather conditions.[24]

VI.I. Officers' Skillsets

Achieving MDIJO requires the creation of a "joint operations staff" (联合作战参谋人才). Personnel in this department pool skills and resources to break the boundaries of hierarchy and expertise. The expectations from the personnel of a 'Joint Operations Staff', as highlighted in a *PLA Daily* commentary[25] authored by Hao Changqing of military unit 66325, are fourfold. In terms of strategic vision, they should have comprehensive foresight and judgement; in terms of organisation and management, they should have the ability to overall plan and coordinate; in terms of military literacy, they should have the ability to command and control joint operations; in terms of decision-making, they should have the ability to respond to emergencies and risks. These parameters have now become part of talent assessment in the WTC and beyond.

Since 2018, the WTC Joint Staff Department has adopted a "four capabilities" (四能) elite training programme for staff,[26] based on the "Handbook of Knowledge Necessary for Joint Operational Command" (联合作战指挥应知应会知识手册) which is compulsory reading material for talent building in the WTC since 2016.

While these four capabilities are not explicitly highlighted in any report in the past five years, they can be inferred from coverage[27] around the matter that they revolve around imbibing cutting-edge theories of combat, broadening technological horizons, concentrating training towards jointness, and contributing to a strong joint operational command structure. Subsequently, talent training has been incorporated into every aspect of MDIJO preparedness in the WTC.

VI.II. Combined Arms Divisions

MDs in the WTC incorporate under their ambit special Combined Arms Divisions (CADs) which are the only division-level structures in the WTC, and deploy various combined arms battalions under their command. They pool in capabilities of weapons from across brigades. CADs have more artillery than brigades, can independently conduct long-range strikes, and are larger in size, with almost twice the personnel as compared to a brigade.

The Xinjiang MD boasts four CADs,[28] including the "Tianshan Heroic Division"/4th Division (天山雄師/第4師), "Plateau Elite Division"/6th Division (高原勁旅/第6師), "Tianshan Iron Cavalry Division"/8th Division (天山鐵騎/第8師), and "Red Army Division"/11th Division (紅軍師/第11師).

Since February 2021, the Xinjiang MD CADs are equipped with the new "informatized" tank of the PLA, the type 99A. The 99A is equipped with advanced fire control and automatic tracking systems,[29] making it capable of automatic parameter calculation, automatic aiming, and precise targeting. At the same time, it can collect data on enemy positions, distances, and terrain environments, sharing them with other tanks and enabling joint combat capabilities of tank formations. The operations of the 99A are also supported by the Type 15 light armoured tank, also commissioned by the Xinjiang MD in February 2021.[30] The *Global Times* report on the commissioning of the Type 15 and 99A tanks acknowledges that while the 99A tank is heavy-duty and difficult to operate in a tough terrain such as that in Xinjiang, the Type 15 is lighter and can "outgun and outrun" any enemy fire.[31] In this regard, Type 99A is meant to "have its back" in the case the Type 15 encounters a "hostile heavy tank."

Research from the United States Department of the Army[32,33] suggests that the PLA is likely to use CADs for both defensive and offensive operations. Defensive operations include positional, mobile and withdrawal operations that respectively rely on strong entrenchment, blocking and restraining actions, and organised retreat, to subdue the enemy using a fundamentally defensive construct. Offensive operations include envelopment, penetration, firepower attack, ambush, and raid. Together, these constitute "active defence."

VII. Getting Acquainted with the Terrain and Altitude

A significant aspect of any jointness training endeavours in the WTC is getting acquainted with the complex terrain and environment within the Command's geographical area. Terrain training can be achieved through both combat and non-combat tasks. For example, in February 2023, it was reported[34] that personnel deployed at the radar station of an Air Force brigade in the WTC managed to connect its dormitories to a tap water pipeline. The radar station was described as being situated in a snow-covered plateau at a height of about 4000 metres, indicating that this could be a station located in Tibet, since the PLA uses the term Plateau (高原) to denote the Tibetan Plateau. This development, among others, depicts emphasis on resource constraints and the subsequent importance of terrain acquaintance work in the WTC.

The report also highlighted what the nature of the challenge is, and what makes water connectivity an achievement. It argued that in the past, "*due to factors such as the high altitude of the position, thick rock layers at the mountain top, and high technical requirements for well drilling, it was very difficult to lay tap water pipelines.*"

Solutions adopted, in this regard, included the building a large water tank close to the radar station, and the allotment of a detachment of water trucks which, every now and then, replenished the water tank — unless of course they were snowed in and couldn't make it. This no doubt proved unsustainable, and efforts were hence made to build a tap water pipeline. The next step of the air force brigade's work would be to ensure water quality, filtering, and so on.

Similarly, shovelling snow in the Tibetan mountains or in the high-altitude Xinjiang desert areas is a core non-combat task that WTC personnel are required to perform. While the nature of the task itself is non-combat, it has significant applications in combat work. A *CCTV* report[35] from January 26, 2023, for example, highlighted the significance of practising to shovel snow for the Tieleketi Border Detachment of the Xinjiang's Tacheng Military Region. The border detachment, located at the foot of the Barluk Mountains on the China-Kazakhstan border, faces 200 days of gale winds in the new year period that lead to snow accumulation, estimated to be as high as 2-2.5 metres, and for as far as 60 metres.

As per the report, during its training work during the new year period in 2023, personnel of the Tieleketi Border Detachment undertook a border observation patrol, and encountered severe snow accumulation. It was then that they demonstrated their snow shovelling skills to clear

the 'snow ridge'. Then too, soldiers had to reach the final patrol point on foot.

And even though the report made it evident that soldiers took turns shovelling snow by hand, by now, both the Tibet and Xinjiang military districts have inducted advanced bulldozers run by drivers of the company or brigade in question.

Similar snow shovelling exercise in Tibet, conducted by a border security detachment in April 2019 | Source: 81.cn

A still from a Bayi (August 1; 八一) video from March 2023, when a company in Xinjiang also used a bulldozer to conduct a snow shovelling operation on a border highland | Source: 81.cn

Combat tasks, too, are formulated to prepare for the terrain and altitude conditions. Earlier this year, for example, an Army Brigade of the WTC was conducting snowfield training to enhance combat preparedness under cold (high altitude; 高寒) and hypoxic (low oxygen; 缺氧) conditions. This is essential to meet the criteria of "effective training" in the PLA, wherein combat situations are simulated as accurately as possible, and tasks are assigned to test multiple components of a joint/ integrated operation.

This exercise in particular, described[36] the setting up of the scene as follows:

> *In the front, an engineering team uses the ice and snow environment to disguise their movements, opening up routes to assist the forward movement of artillery positions. In the rear, a communication team sets up a command system platform to ensure smooth communication. In the air, drones precisely detect and real-time transmit target location information. On the ground, the artillery team, with close coordination from various units, simulates precision strikes at extreme distances* (随战车穿梭训练场,实战气息扑面而来。前方，工兵分队利用冰雪环境伪装潜行,开辟通路助力火炮阵地前移；后方，通信分队搭设指挥系统平台,确保通信联络畅通；空中，无人机精准探测,实时回传目标位置信息；地面，炮兵分队在多方密切配合下,模拟实施极限距离精准打击).

Developments on this front have, in fact, been underway since 2018, when the WTC personnel posted along the Kunlun mountains (covering both Xinjiang and Tibet) began constructing Army Command Posts concealed near snow lines at altitudes of over 4000 metres. Their goal has been to continuously lead troops to conduct effective on-site research, planning, and training in high-altitude zones. These command posts also formulate measures for high-altitude training and preparedness to be implemented across the board, and conduct concealment tests for personnel, vehicles, and tents, sometimes

even changing locations every few months. Then, the personnel are required to pursue other combat preparedness tasks, such as testing of marching speed over several hundred kilometres (more specifically, 800, from an exercise conducted in October 2018),[37] as well as practising live-fire shootings to determine the shooting parameters of artillery at various altitudes.

From the Indian perspective, this is significant because, over time, some of these concealed positions and tactical arrangements have come to restrict Indian forces' access to key patrolling points along the LAC.[38]

There is also a concerted effort to make sure that border camps accompanying these positions are comfortable, well-endowed, and snow and water-proof. Since August 2018, for example, the Tibet MD is focused on improving the accommodation and living facilities for high-altitude stationed officers and soldiers, accelerating the progress of a new round of barracks renovation. The 'Gangba' camp outpost was the first to be tested for windproof effect, by building of an exterior wall with thermal insulation mortar and of windows with broken bridge aluminium alloy double frames. A combination of waterproof coatings and waterproof rolls have also been used to ensure the effectiveness of the new barracks' waterproofing (踩着边关大幅降温的脚步，西藏军区急事先办，抓紧检测岗巴“高原戍边模范营”哨楼的防风降噪、防漏保暖效果，确保哨楼功能齐全。8月26日下午，岗巴边防营所属一线连队哨所，已全部搬入新型保温营房。该营教导员洛

松江措说："入秋后高原天气多变、昼夜温差大，各级党委特事特办、集力攻关，紧前改善一线官兵住宿条件，我们提前入住温暖舒适的新家").[39]

In terms of weapons use, too, the complexity of the environment is being taken into account. For example, in one of the largest weapons acquisition drives the Xinjiang MD conducted in May 2021, it was announced[40] that a combined arms battalion of the MD has commissioned new self-propelled mortars based on a four-wheeled off-road assault vehicle. In moving away from self-propelled howitzers (which have a larger angular firing spectrum than mortars) to self-propelled mortars, the MD's goal is to utilise target firing weapons systems that are more mobile and easier to operate in hypoxic plateau conditions. The report of the announcement[41] argues that the self-propelled mortars demonstrated high accuracy and fire rate, which may not be as high as a self-propelled howitzer, but the flexibility in deployment makes up for the choice.

Furthermore, since August 2022, Border Defense Companies in Xinjiang have been testing a new "integrated individual system," which includes a new-type helmet, multi-function night vision goggles, portable computer, individual load carrier, assault rucksack, and others. The challenge will be to integrate adaptedness to hypoxic conditions with the ability to carry heavy loads that come with this new integrated system (the material load seems to be about 30 kg).[42]

Apparently, this new system is also integrated with "informatization and intelligence capabilities" that enable an individual soldier to be informed about the location and mission of their teammates. This indicates that the next step in combat altitude training in the WTC is for individual soldiers to become more independent and resilient.

VIII. Air Superiority

Given the tough nature of the terrains covered by the WTC, and the existence of complex environments at high altitudes, aerial dominance is central to the WTC's warfare training, and also its biggest challenge. When pitted against India, an assessment of the Orders of Battle (ORBATs) formulated by the Belfer Centre[43] indicates that, as of 2020, the Ground Forces deployed on both sides of the border are similar in numbers (over 2,05,000 troops), while Indian fighter jets outnumber Chinese jets deployed in the WTC – a 250 to 157 balance, to be precise. Additionally, to enable air-based ground defence, China has deployed over 50 precision strike, ground attack and reconnaissance Unmanned Aerial Vehicles (UAVs) in the WTC. India, on the other hand, has deployed four Heron drones[44] (since 2021) and 68 ground attack aircraft across the Eastern, Central and Western Air Commands.

In terms of ground-based air defence, four Air Defence Brigades are attached each to the Xinjiang and Tibet MDs and the WTC 76th and 77th Group Armies. At the same time, the WTC-PLAAF has its own long-range surface-to-air missile installations. Further, WTC is enabling PLAA and PLAAF to conjoin air defence systems. For instance, air defence battalions affiliated with an Army Air Defence Brigade have now started to integrate into the chain of command of an Air Force Base.[45] The goal behind this move is for the PLAAF to lend its long range expertise to the more mechanised ground forces, and for the PLAGF to lend its expertise in handling low-level targets. Another report from 2021 suggests that cross-service air defence integration in the WTC is geared towards achieving successes in early warning and network systems jointness, so that there is no delay in battlefield data transmission.[46]

India is investing in its own indigenous Very Short-Range Air Defence Systems (VSHORADS) and Man-Portable Air Defence Systems (MANPADS) to expand Army Air Defence (AAD) capabilities.[47] Clearly, vis-a-vis aerial superiority, there exists a tough capacity competition between China and the WTC's principal operational target, India.

Moreover, in a tactical systems warfare scenario, which is central to combat training and essentially refers to combat between two 'systems' (or two rivals) with one emerging decisively victorious, the key element

is coordination between command and control, reconnaissance and intelligence, firepower, electronic warfare (EW) and cyber warfare, engineering, and battlefield management.[48] Achieving such coordination requires top-notch aerial reconnaissance to provide information on enemy positions, heavy rocket artillery to overwhelm enemy C2 and air defence positions, and supplementary EW and cyber capabilities as countermeasures. This is also why over the years, anti-aircraft artillery units, together with ground-to-air missile units, have become part of the backbone of the WTC's integrated capabilities.

In this light, in May 2021, the Xinjiang MD engaged in six rounds of weapons acquisition. At the time, India and China were still only recovering from deadly clashes in the Galwan Valley region of June 2020. The fifth and sixth rounds of this acquisition focused solely on aerial superiority[49] through the induction of the PHL-11 122 mm calibre self-propelled multiple rocket launcher system and the HQ-17A field air defence missile system.

Similarly, electromagnetic warfare training is becoming increasingly significant to the PLA in general and the WTC in specific. With the realisation that China during battle will be in a "complex electromagnetic environment" (CEME)[50] wherein there will be a need to deploy counter electromagnetic warfare to ensure systems security, in July 2022, the PLA inducted a new variant in FH-95 series of drones developed by Aerospace Times Feihong Technology.[51]

These drones are capable of performing electromagnetic jamming and armed reconnaissance, especially in border patrol scenarios. In fact, this latest variant is being first put to test by the Xinjiang MD. Further, to practise "effective concealment" (藏得好) in combat training, Air Force Brigades in the WTC have also been deploying measures[52] to "clear the electromagnetic fog" in simulated scenarios. Such a "fog" refers to a situation in which radar systems experience interference, leading to the loss of the "enemy aircraft signal" (敌机信号). Together, the abovementioned efforts are indicative of a "whole-of-systems" approach to achieving joint operational capacity with air superiority at the core in the WTC.

IX. Tactics of Transportation

The challenge of transportation is equally central to training in complex terrains with unpredictable environments. Military transportation in the WTC is led by dispatch centres spread across the seven provinces under the Command's ambit. These dispatch centres undertake two primary types of tasks to maintain smooth mobility of goods and personnel across the wide geographical stretch of the WTC:

1. **Personnel management during transfer to and from high altitudes:** To travel to base camps, personnel have to cover low-altitude distances on an ordinary passenger train, but as soon as they reach a certain altitude, they are required to transfer to an oxygen-equipped high-altitude passenger car. As per a report released in the *PLA Daily* in March 2022,[53] this is a task performed by the Golmud Military Representative Office of the WTC dispatch centre in Qinghai province. It can be inferred from the report that representative offices such as the one in Golmud play a key role during transportation, providing hot food and hot water to transferring personnel, reminding personnel of guidelines for self-preservation in cold environments, and communicating between military commanders and local authorities. The above-mentioned report describes the set of tasks stationed representatives perform as "four seasons changing in a day" (四季更替) – "*in the morning, guiding troops in locating and securing equipment amidst heavy snowfall; at noon, organising joint inspections with the task force and railway departments under the scorching sun; in the afternoon and evening, organising the departure of military trains in freezing conditions.*" It is important to note that while there is one representative office handling military transportation in Golmud, we are unaware of many such offices that might exist.

2. **Creating standardised methods of military-civilian collaboration for effective transportation:** The WTC's dispatch centres have engaged in active efforts to leverage civilian expertise to make military supply support work smooth and effective. This is because of the importance of various civilian stakeholders, such as local government officials of the provinces under the WTC, as well as the multiple local railway companies that maintain transport networks. Leveraging their regional coordination expertise, in 2020, dispatch centres in the WTC introduced "Collaborative Mechanism for Military Supply Support Work in Seven Provinces and Municipalities in the Western Region" (西部7省区市军供保障工作协作机制),[54] with an aim to standardise delivery, loading and unloading methods across the stretch of the WTC and assess whether standards of business and infrastructure construction are met across railway companies. Further, in December 2023, dispatch centres also formulated the "General Implementation Measures for Sharing Loading and Reinforcement Plans for Military Transportation" (有关军事运输装载加固方案共享通用实施办法).[55] It standardised the loading requirements for equipment materials, the approval process for transport plans, and the updating process for data of newly allocated equipment materials for troops. With successful civil-military collaboration in the PLA's supply support work, the WTC is enabling a shift from single railway delivery support to comprehensive support including "rail, road, water, and air;"

> from fixed-point supply to flexible regional supply; and from small-batch conventional supply to large-batch simultaneous supply at multiple locations.

Further, given the "last-mile delivery requirements" of high-altitude zones specifically in the WTC, unmanned aerial vehicles (UAVs) are being adopted for transporting food and essentials to active personnel. This is in addition to the induction of the Xi'an Y-20 heavy-transport aircraft, the 'Kunpeng', which in 2021 demonstrated its capability to fly winter gear to border troops stationed along the LAC within seven hours.[56] Evidence for the use of UAVs comes from a November 2020 drill conducted by the logistics departments of the PLA Army and the Tibet MD, wherein the goal was for a drone delivery unit to transfer hot food, water, medicine and other urgently needed materials to personnel located at a base in the mountains, assuming that the manned mobile ground transportation unit was "blocked by enemy fire."

As claimed in the report of this drill,[57] the success of the drone delivery unit was determined by the fact that amidst bad weather and high altitude conditions, drone operators were decisive in making a comprehensive judgement on terrain, wind speed, temperature and other factors to ensure the drones' safe landing at the predetermined destination. The report further promises that the PLA Army logistics department is preparing to expand drone delivery to armament and ammunition supplies to active last-mile locations.

X. Conclusion

In an era where the Information Age is enabling Revolution in Military Affairs (RMA), the PLA is adapting to new modes and methods of warfighting. Of these, MDIJO, informatization, and intelligentization are key to the PLA achieving its goal of becoming a "world class force" by 2049. To this end, the PLA WTC appears to be rapidly evolving its approach to enhance combat preparedness. Since its formation in February 2016, the WTC and its various sub-commands have developed standardisation of measures in everything from reconnaissance and fighting drills, to communications, transportation and delivery, with talent at its core. Over the next few years, it is only likely that the WTC doubles down on such measures, creating a joint force truly capable of conducting successful combat operations, especially under conditions of intelligentization. In such a case, India must continue to observe developments in the WTC, and direct its efforts towards countering them.

XI. References

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