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CHINESE MILITARY DRONES AND APPRECIATED EMPLOYMENT IN WESTERN THEATRE COMMAND

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Abstract

As per Chinese perspective, military drones have risen from auxiliary tools to core combat forces, and their technological evolution and market landscape are undergoing profound changes. From bionic drones, manned-unmanned teaming (MUMT) and collaborative human-machine operations to the large-scale application of low-cost equipment, from international arms trade competition to dominance of the global industrial chain, the People's Republic of China (PRC) has managed to achieve a multi-dimensional breakthrough in the field of drones. From the viewpoint of the People's Liberation Army (PLA), drones are not only reshaping the future form of warfare, but are also becoming an important indicator of the PRC's defence science and technology strength as witnessed in the 03 September 2025 military parade. While accepting that US is at the forefront of high-end drones' advancements, the Chinese military and drones' industry view the core trends in the current development of military drones in two main directions: "manned-unmanned collaboration" and "low-cost scalability." While MUMT is represented by "loyal wingmen" which utilizes artificial intelligence (AI) technology to achieve deep cooperation with manned vehicle, requiring only limited commands from the pilot to perform complex tasks such as

reconnaissance, surveillance, fire strikes, and electromagnetic countermeasures, the rise of low-cost drones is typified by the first-person view (FPV) drones. These drones, supported by a mature industrial chain including carbon fibre frames and brushless motors, facilitate low manufacturing costs while possessing both high manoeuvrability and precision strike capabilities. The future, as per PLA, thus belongs to a balanced array of Small Unmanned Aerial Systems (sUAS), multi-domain unmanned vehicles (MDUVs), swarms, Quantum AI enablement and large drones at hypersonic speeds.

This monograph has thus explored the Chinese military drones in three varieties- the Short-Range (SR) drones, the Medium-range (MR) drones, and the long-range (LR) drones. It has then analysed the C-UAS equipment, various drones' advancements and MUMT concepts, equipping of the various PLA entities from CABn to the level of theatre command (TC) within Western TC (WTC) to bring out the implications for India.

Key Words

Drones, UAV, Unmanned Combat Aerial Vehicle (UCAV), Medium-altitude Long Endurance (MALE), High-altitude Long Endurance (HALE), Unmanned Ground Combat Vehicles (UGCVs), Robot Dogs, Counter-UAS (C-UAS), PLA, PRC, Manned-Unmanned Teaming (MUMT), Communist Party of China (CPC), WTC, Eastern TC (ETC), Tibet Military Region (TMR), Xinjiang Military Region (XMR), Group Army (GA).

Introduction

"Those who take the battlefield first and wait for the enemy are at ease;
those who arrive later and rush to battle are weary."
- Sun Tzu's "Art of War"

Chinese civil drones firm DJI has globally become synonymous with drones as much a global military push to shift away from reliance on drones' components from China. While both Russia and Ukraine are engaged in a drones technological and doctrinal developments cat and mouse game in the ongoing conflict since February 2022, both sides particularly Russia have been heavily reliant on critical components from China. The intense density of drones on the Ukrainian battlespace has changed the

battlespace geometry completely but the more concerning issue for India is that the majority of the drones' components sustenance is happening due to the drones' industrial might and rapid innovation pace within China. Chinese drone exports do not rely on a single model, but rather have formed a complete product matrix ranging from bionic drones, micro robots, small and medium-sized tactical drones to large long-endurance equipment, meeting the operational needs of different countries. If you add the Myanmar civil war, tactical level equipping of Pakistan Army, Houthis' repeated attacks in the Red Sea or various battles in West Asia and Africa, one thing is proven beyond doubt is the drones' overcapacity of the PRC to handle any future war to be fought by the PLA.

The Russia-Ukraine war has adequately emphasised the importance of multi-domain unmanned platforms (MDUVs) in the tactical battle area and geometrically enhanced the combat contested zone. PLA was already ahead of the learning curve by inducting drones within its Combined Arms Battalions (CABn) before the Ukraine war and was already working on the UGCVs before 2022. Through the PRC's grand military parade on 03 September 2025, PLA told the whole world the official induction of variety of UGCVs and robot dogs in its 71st Group Army (GA). Additionally with the display of Type 100 family of mechanised platforms – ZTZ 100 Main Battle Tank (MBT) and ZBD 100 Combat Support Vehicle (CSV), PLA heralded the MUMT era from tactical to strategic levels with J20S 5th generation aircraft controlling four or more loyal wingmen of three different varieties standard UCAVs for recce and striking ground targets, Unmanned Aerial Dominance Fighters (UADF) for air-to-air battles and Collaborative Combat Aircrafts (CCA) for ground strike missions. PLA's WTC has inducted some of those most advanced weapons and conducted numerous MUMT exercises at Tibetan plateau along Indian border. Hence, this paper shall attempt to quantify PLA's drones might in its Western Theatre Command (WTC) and the implications for India.

Types of Drones

Chinese have various ways for classifying drones: by purpose, they are divided into military and civilian drones; by wing structure, they can be divided into fixed-wing, rotary-wing, unmanned airships, paragliding, and flapping-wing drones, etc; by size they can be divided into micro, light, small, and large drones; by operational radius,

drones they are divided into ultra-short-range (USR), short-range (SR), medium-range (MR), and long-range (LR) and Ultra LR (ULR) drones; and by mission altitude, they are be divided into ultra-low-altitude, low-altitude, medium-altitude (MALE), high-altitude (HALE), and ultra-high-altitude drones.[1]

This monograph will classify PLA's drones into the following categories – USR and SR up to combined arms battalion (CABn) level; MR or up to combined arms brigades (CAB); HALE / MALE and the loyal wingmen variety which includes CCA and UADF at GA and above level; and Swarms. China has an extremely wide variety of drones and it's very difficult to cover them all in a single monograph. Hence, only the major variety of drones likely in service with PLA within these types are discussed in succeeding paragraphs.

USR / SR-UAVs up to CABn

CH / Rainbow-Series. PLA's "Rainbow" series of man-portable drones includes three main models: CH-801, CH-802 and its relief CH-902. Both are hand-launched and feature multiple landing methods, including deep stall, parachute descent, and hard belly landing. While the family of CH sUAS is large, only more relevant ones are discussed below.

- **CH-801**. It is a hand-launched drone with a Maximum Take-off Weight (MTOW) of 2.3 kg and endurance of 70 minutes.[2] The CH-801 can be packed into a backpack without folding, making it easy to use and operate. [3]
- **CH-802**. Operated by a single soldier, they are used by PLAGF's reconnaissance squads to support company-level reconnaissance and surveillance within a 20km range. It's an electric, hand-launched, reconnaissance sUAS and is recovered by parachute. Its take-off weight is 6.5 kg, and its full load weight is 10 kg. Its ceiling altitude is over 4000 meters, endurance is 1.5 hours, and its cruising speed is 40-80 kmph. It has a claimed target positioning accuracy of 8m within a 10 km radius and is fully equipped with visible light and infrared/ thermal imaging reconnaissance equipment, enabling day and night operations. It has a dedicated ground station and data transmission radio, allowing for flight path planning.[4] The

CH-802 can be easily disassembled and remains normally folded inside the packaging of an armoured reconnaissance vehicle. However, wings and propellers need to be temporarily assembled for missions. Its autopilot function is claimed to make operating the aircraft much simpler.[5]

Figure 1: CH-802 UAV

(Source- QQ.com[6])

The CH-802 were inducted in PLAGF's CABns around 2015, [7] SF and PLAAF's AB Corps. [8]

Figure 2: PLAGF's CABn Soldiers Operating CH-802 UAV

(Source: Chinese Military site 81.cn and Unofficial Site 163.com[9])

- **CH-901 / BZK-08**. CH-901 kamikaze LM's induction in PLAGF was confirmed during the 2015 military parade. With a weight of 9.7 kg, the fixed-wing LM has an endurance of 2 hr and a range of 15 km at speed of 15-150 kmph. It's got a retractable EO turret containing 2 km range FLIR and CCD camera for reconnaissance and it can crash into enemy targets, detonating its warhead. It

can be mounted on a 4x4 armoured fighting vehicle (AFV) armed with a pop-up hatch that carries eight CH-901 pneumatically launch tubes. The CH-901 LM is most probably held with Special Operations, or amphibious and airborne troops, which do not have assured conventional air and artillery support.

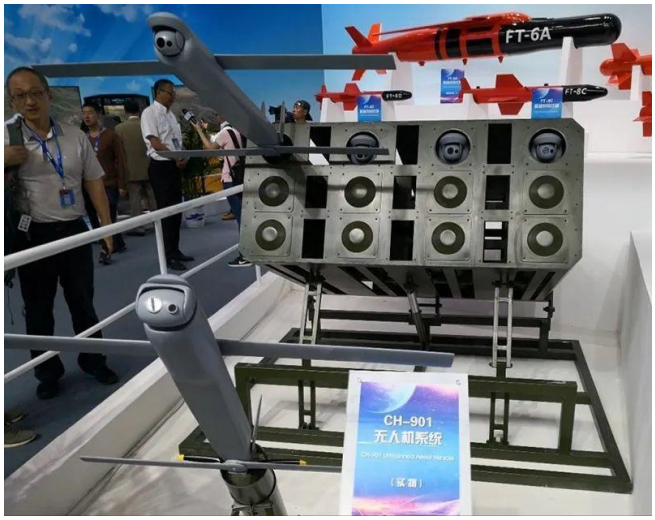

Figure 3: CH-901 LM

(Source-Toutiao[10])

- **CH-902**. Developed by the China Aerospace Science and Technology Corporation (CASTC), the CH-902 has a MTOW of 3.5 kg thereby reducing the burden of manual launch for individual soldiers. It is claimed to be launchable and retrievable within minutes. With a new generation of ground terminals, it supposedly offers enhanced information reception and processing capabilities. A recent Chinese official media reports showed that during an urban warfare offensive and defensive exercise conducted by CAB ex 72nd Group Army of the ETC, the reconnaissance battalion used the CH-902 USR UAV to conduct three-dimensional infiltration reconnaissance to locate the Blue Force command post and artillery positions. [11] It has a range of 15 km, an endurance of 1 hour, and a maximum speed of 80 kmph. CH-902 is the replacement of CH-802 at CABn level.[12]

Figure 4: CH-902 sUAS

(Source- QQ.com[13])

CH-902 is currently the main hand-launched drone in service with the PLAGF's CABns.

Figure 5: PLAGF Soldiers with CH-902

(Source-Toutiao[14])

- **CH817 / 817A Suicide Drones**. The CH-817 is a miniature suicide drone designed for individual soldiers while 817A has undergone significant modifications wherein one soldier can carry about 20 such drones.

Figure 6: CH-817A Micro Suicide Drone

(Source-Toutiao[15])

"Feihong" series of sUAS. The PRC's "Feihong" series of UAVs comprises 30 models across four major categories: high-speed and low-speed complementarity, fixed-wing and rotary-wing capabilities, and ranging from 300g to 8t, encompassing ultra-SR, SR, medium-to-long-range, and LMs. The most famous systems are the FH-901 loitering swarm system, the FH-902 single-soldier fixed-wing UAV system, the FH-91 reconnaissance UAV system, and the FH-96 long-endurance UAV system. The FH-901 LM is a missile similar to a UAV, featuring twin wings and a vertical tail, with a sensor pod at the front for optical navigation. [16]

Figure 7: FH-901 Loitering Swarm UAV

(Source- QQ.com[17])

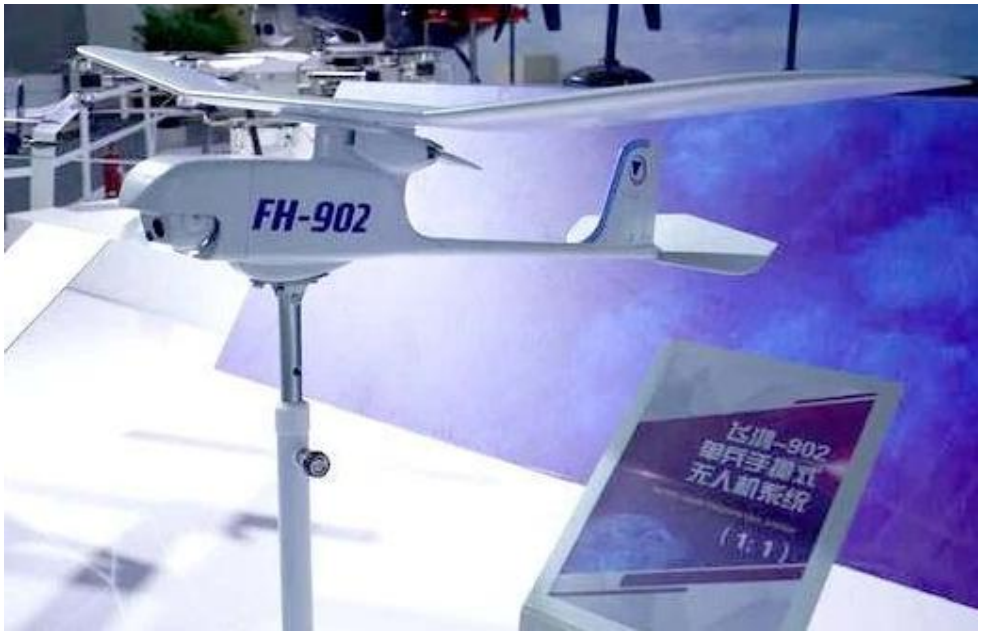

Figure 8: FH-902 Man-portable Fixed-Wing UAV System

(Source- QQ.com[18])

HW and Hawa Series. While a wide variety of Harwar and Hawa series of drones are used in civil field, few important models inducted in PLA are discussed below: -

- **HW-350**. CASIC's long-endurance sUAS features a high-performance aerodynamic design and a composite material fuselage, boasting long flight time, and wide applicability. Its diverse range of payloads include optical pods, communication equipment, navigation equipment, and small SAR to perform tasks including target search, communication relay, and fixed-point surveillance. Its claimed suitable for a variety of missions including maritime surveillance, magnetic submarine detection, meteorological observation, experimental flight testing, emergency communication, and rescue. [19]
- **H16-V12**. It's a reconnaissance and strike drone produced by Hawa International Aviation Technology Company. It can carry a maximum payload of 25 kg, a maximum flight time of 60 minutes, and all-weather combat capabilities including wind resistance up to level 7, rain and dust resistance, and adaptability to environments from -40°C to 85°C with an assessed range of 15 km. It's claimed to carry out special missions such as reconnaissance, illumination, bomb delivery and strike by grenades. The Hawa UAV high-altitude forward launch module (YT-SGG) large-calibre grenade launcher integrates a sight and a high-definition camera, carries 5 grenades, has an attack range of

130-200 m, and can fire 38mm calibre ammunition including stun grenades, tear gas grenades, high-explosive fragmentation grenades, biological and chemical grenades, smoke grenades, and cluster munitions. Chinese propaganda outlets also claim that the H16-V12 also possesses the capability to launch guided missiles. [20]

Figure 9: H16-V12 Drone in Tibet MR's SOF Exercise

(Source-163.com[21])

DJI Series. Since DJI series is commonly available and its design parameters are known, it's not discussed hereinafter. However, it's important to note that DJI's racing drones have significantly contributed to the evolution of FPV drones initially and optical-fibre cable (OFC) drones later. Also, a variety of these models are evolved to develop the bomber drones introduced in the PLAGF of which details are not known.

Figure 10: Bomber / Multi-Munition Dispenser System (MMDS) Drones

(Source-Sino-Defence Forum)

OFC FPV Drones. Based on Ukraine war lessons learnt, PLA's 71st GA had shown induction of OFC FPV drones early in 2025 within its CABs. In a variety of videos which have been propagating on Chinese media thereafter, variety of PLAGF and PAPF units can be seen training on flying, assembly and repair of both RF and OFC based FPV drones. Every FPV drone mission observed in Russia-Ukraine war has been simulated during the training and their propagated videos. China has a distinct advantage in OFC FPV drones by not only being the major producer of desired lightweight OFC but also the innovator and the originator. Chinese media claims that:[22] "*China is currently the world's largest producer and supplier of OFC, with a production of 320 million core km in 2023, accounting for approximately 55% to 60% of global production capacity*."

Figure 11: OFC FPV Drones in 71st GA's CAB

(Source- CCTV and Toutiao[23])

A Chinese article on Toutiao describes the composition and functioning technology of an OFC-based guidance system for a FPV drone: -[24]

> "*The fibre optic guidance system consists of two parts: a seeker and a fibre optic bidirectional transmission system. The former comprises an image sensor, a stabilization system, control circuitry, a torque servo system, and an image tracker, with the image sensor being the key component. The latter consists of an onboard optoelectronic transceiver (also used in anti-tank missiles), an onboard bidirectional coupler, optical fibres, a ground-based bidirectional coupler, and a ground-based optoelectronic transceiver. The core component is the optoelectronic transceiver, which is primarily responsible for transmitting/receiving*

optical signals and converting between optical and electrical signals. The OFC FPV drones currently used by Russia and Ukraine have simpler guidance systems, consisting of only a FPV camera and a drone control system. All operations and guidance are performed by the drone pilot, making it a wired remote-control system. No FPV drones using end-of-pipe intelligent image guidance systems have yet been discovered." (which means intelligentised OFC FPV drones are in planning and implementation stage in PLA).

"*The OFC isn't released on the ground; instead, it's flung off the drone's OFC spool. The drone flings the cable backward as it flies, resulting in very low stress on the cable and a very small tensile force on the drone—only 2.45 Newtons. Furthermore, after release, most of the cable falls to the ground, rather than the drone bearing the entire tensile force of the OFC. Therefore, even when the FPV drone performs complex manoeuvres, the cable doesn't get tangled, twisted, or broken*."

"*The two main advantages of OFC drones are their ability to effectively avoid electromagnetic interference and their stable signal transmission, resulting in high-quality returned images. The latter, in particular, allows Russian and Ukrainian drone pilots to achieve precision strikes and provides commanders on both sides with extremely clear battlefield information, facilitating subsequent battle planning. Due to the intense demands of warfare, the iteration speed of fibre-optic guided FPV drones is astonishing. In just over a year, this weapon has been updated several times by the Russian and Ukrainian militaries (actually, it's from Huaqiangbei, a major electronics market in Shenzhen), and widely used on the battlefield. After multiple iterations and upgrades, the Russian military's OFC drones now have a maximum attack range of 25 km (Russians are claiming 40-60 km), while the Ukrainian military's similar drones (the "Banner-10" model) have a maximum attack range of 41 km, giving OFC drones extremely strong beyond-visual-range strike capabilities*."

Chinese company Wuhan Skywalker Technology Company produces OFC guidance kits in 1-km, 5-km, and 10-km versions which can be easily integrated with consumer-

grade drones. The 5-km guidance kit weighs approximately 1.1 kg, while the 10-km kit weighs 2.2 kg.

Figure 12: 1 km, 5 km and 10 km OFC Guidance Kits

(Source- Toutiao)

The OFC FPV Drone displayed by PLA has a larger OFC spool likely and thus maybe having longer range than 10 km. Few Chinese drones' producers advertise their OFC FPV drones with ranges of 40 km, with customisable options of 80 km range.

Figure 13: OFC FPV Drones in 71st GA's CAB

(Source- CCTV and Toutiao[25])

SKP-880FM OFC Multi-Functional Quadcopter Drone. Chinese claim that their SKP-880FM OFC drone model was innovated internally before introduction of the same in the Russia-Ukraine war.

Figure 14: SKP-880FM OFC Multi-Functional Quadcopter Drone

(Source-Toutiao[26])

The 2025 Chinese UAV Industry report[27] highlights that

> "*In real-world combat scenarios, the value of FPV drones has been fully validated. Ukraine's monthly FPV drone production reached 200,000 units in 2024, and plans to further increase this to 500,000 units per month by 2025, integrating them into the main force of CABns to perform missions ranging from reconnaissance to precision strikes. In terms of technological iteration, FPV drones are upgrading towards "three-light fusion" and "intelligent anti-jamming," combining infrared, low-light night vision, and visible light imaging to accurately identify targets in complex environments such as darkness and smoke. The application of fibre optic communication technology significantly improves anti-electromagnetic interference capabilities, increasing the hit rate from 30% with traditional radio control to over 50%.*"

Universal Precision Modification Kits (UMPK). A Chinese Chongqing Xitong Aviation Service Company claims to have presented new generation UMPKs that can convert conventional 130mm, 152mm, and 155mm artillery shells into guided glide bombs. Each system consists of a set of short, retractable wings that deploy after release, an integrated inertial guidance unit, a BeiDou GNSS receiver, and a tail section fitted with four aerodynamic control fins. The tail also includes a small rocket motor, which provides mid-course corrections and allows the munition to glide toward its target with far greater accuracy than conventional shells. The addition of laser guidance capability further enhances precision, combining inertial, satellite, and optical navigation into a hybrid guidance solution. The 155mm variant is designed for maximum flexibility: it can be fired not only from standard howitzers but also from vehicle-mounted multiple rocket launchers and tactical missile systems, enabling cross-platform coordinated strikes. These kits are compatible with multiple warhead configurations, including tandem shaped charges capable of penetrating over 1,000 mm of RHA steel, as well as thermobaric warheads designed for saturation attacks against underground bunkers and hardened fortifications. To ensure stability and manoeuvrability in flight, the PGMs can employ either canard aerodynamic control surfaces or miniature thrust-vectoring nozzles, allowing real-time trajectory adjustments during the mid-course phase.

Figure 15: UPMK Kits

(Source-Sino-Defence Forum)

MR UAVs / Up to CAB

This section will focus on the types of drones available in various combat support units available in a CAB.

ASN / KVB Series. The ASN and KVB series dual-purpose UAVs are produced by Xi'an's Aisheng (ASN, Northwestern Polytechnical University) UAV Technology Group and have been the most commonly used drones by the combat support battalions in a CAB. They can be equipped with SAR, EO, EW, electronic intelligence systems (ELINT), ground target identification (GTD) sensors, and communication relay payloads.

- **ASN-206**. The ASN-206, also called JWP-01, with a range of about 150 km was inducted in the PLA in the 1990s. Its various variants are artillery fire directing (JWP01A/JWP02), communication jamming (RKT164, RKT167), communication relay (TKJ226), decoy (RKL165) and ECM (RKZ167).[28] The decoy variant RKL-165, developed as a "false target drone" is likely to be employed to lure enemy's EW and AD reaction to confirm their location.[29]

- **ASN-207**. ASN-207, also called JWP-02, has a claimed range of 600 km with enhanced performance. With unique mushroom shaped receiving antenna and paraded in the 2009 National Day Parade, its various variants have most probably been inducted in the PLA. The missile brigades of PLARF Bases 61 and 62 are assessed to be holding the ASN-207 UAVs. [30]
- **ASN-209**. A variant of the ASN-209, "Silver Eagle," medium-altitude medium-endurance (MAME) UAV, it is operated by PLAN's three naval fleets since 2011. With 200km range and 10 hours endurance, it has been effectively employed for communications support and EW, and for guidance for targeting missiles. [31] Launched via catapult from a modified 6 x 6 wheeled truck, its MTOW is 320 kg with a payload 50 kg, ceiling of 5,000 m, at speeds of 180 kmph. A net arrangement is presumably used to reclaim the UAV on return to the ground. The complete UAV system comprises a GCS, 6-10 vehicles, each with an ASN-209 UAV and a TO projectile. [32] It is most probably held by the ETC's East Sea Fleet's UAV Regiment at Daishan Air Base.

Figure 16: ASN-209 UAVs and a BZK-005 drone at the 2015 Victory Day Parade

(Source-Dan Gettinger[33])

- **ASN-229A**. This drone can perform reconnaissance and precision strike missions, up to an endurance of up to 20 hours, and has satellite communication (SATCOM) data links. It carries miniature precision-guided munitions thereby enhancing the combat capability of ground forces in reconnaissance and strike missions.[34]
- **ASN-301 LM**. A reverse engineered model of Israel's Harpy LM, ASN-301 is an anti-radiation LM most probably with PLAAF's ECM Regiments. The August 2017 parade witnessed ASN-301 being paraded by a fire unit comprising 54 LMs.[35] China National Aero-Technology Import and Export Corporation

(CATIC), the sales arm of the PRC's AVIC, describes this LM as a 'mobile anti-radiation drone system' primarily designed to attack radar systems and most effective for Suppression of Enemy AD (SEAD). With 135 kg and 2.5 m length, its claimed range is 288 km and endurance is 4 hours at a speed 220 kmph. It can target up to eight pre-set radar targets with frequencies in the 2-16 GHz range. Its radar homing device has a search range of 25 km while its 7,000-fragment warhead has a proximity laser fuse with a destructive range of 20 m.[36]

Figure 17: ASN-301 Anti-Radiation LM

(Source- Sino-Defence Forum[37])

- **KVB001B (T-6B)**. KVB001B is a UAS in service with the PLAGF since 2018 as an artillery directing drone. A single MV3 launch vehicle supposedly carries and launches two KVB001Bs and employs rocket assisted take off (RATO) and parachute landing. It has a retractable EO/IR turret underneath the forward fuselage and alternatively can carry a small SAR thereby ensuring all weather coverage. At the 2019 military parade, the KVB001D or KVB001G? communication jamming variant was possibly displayed which carried multiple blade antennas for jamming of enemy communications.[38]
- **KVB802A**. Also called T-20, it's PLAGF's small UCAV with two KD-9 laser-guided ATGMs. With multiple tasks like recon and artillery directing missions, it may also carry PL-90 AAMs in a tactical aerial battle against slow moving targets like drones or helicopters. With a swept wing design, it is powered by a piston engine with a four-blade propeller. With MTOW of 900kg, payload of approximately 150kg, endurance of 20 hours, and ceiling 8,000 m, it has RATO and parachute landing.[39]

Manpack / Portable LMs. While PRC's drone industry can offer a variety of portable LMs, this article will analyse one latest option offered. The KL-3 man-portable LM has electric propulsion and can also be launched from air as per the marsupial drone concept. With a wingspan of 900mm and length of 750mm, it has a claimed CEP <2m, range of 10 km, endurance of 30 min and take-off weight of 3kg. It can achieve a maximum speed of 140kmph while loitering at an altitude of 100 to 3000m. Its total launch preparation time is ≤10 minutes.[40]

Figure 18: PRC's KL-3 Man-portable LM

(Source- Sino-Defence Forum[41])

Swarms

Chinese military and drones' industry have realised the relevance of drone swarm warfare as the new technological hotspot. They realised that by combining AI algorithms with swarm technology, hundreds of drones can achieve autonomous coordination and decentralized operations, forming a saturation strike capability.[42] A Taiwanese officer's article 0f 2023 claimed that: [43] -

> "*PLA's swarm tactics can control a large number of small drones, which can be launched from different platforms, fired like artillery shells, and after entering the designated flight path, unfold their wings to lock onto targets for tactical reconnaissance. For example, this year's Zhuhai Airshow (2023) showcased a vehicle-mounted swarm weapon system that can launch a wave of 48 swarm drones, each equipped with a camera on its head, allowing for precise strikes through optical remote control.*"
>
> "*PLA's swarm tactics will be implemented in different types, functions, and sizes of drone swarms, and will continue to develop in conjunction with AI, enabling future groups to possess autonomous combat capabilities without a control centre. Utilizing bionic technology to simulate biological swarm flight behaviour, they can autonomously establish networks, communicate, and make decisions. The structure is flexible and can be dispersed and*

reorganized at will. Even if drones in the formation malfunction or are damaged, they can adapt to environmental scenarios and autonomously repair the formation without interfering with each other. There is even research on recovering launched swarm drones in actual combat through "hive" technology."

China Electronics Technology Group Corporation's (CETC) Land-Air Coordinated Fixed-Wing UAV Swarm System. In 2020, CETC conducted test flights and verification experiments on its land-air coordinated fixed-wing UAV swarm system. The UAV swarm is deployed through by ground launch, aerial manoeuvring, hovering and delivery. Multiple UAVs then precisely form formations and change positions in the air, with a maximum of 200 UAVs capable of coordinated operation at a time. This UAV system also has sea-air mission capabilities, allowing it to be carried on ships or air-launched via large transport aircraft to perform maritime or aerial missions, depending on mission requirements. [44]

The CETC's "Miniature Swarm Reconnaissance UAV System" comprises minimum 20 UAVs. It employs self-organizing network technology with a network formation time of nearly 10 seconds, an inter-UAV transmission bandwidth of 10 Mbps, an operating radius of 10 km, and an endurance of 40 minutes. The system consists of a swarm autonomous management system, airborne data link nodes, reconnaissance payloads, ground data link nodes, and ground stations. It possesses both flight path control and integrated navigation functions, enabling collaborative operations such as swarm task decomposition, formation flight, target tracking, and autonomous obstacle avoidance. [45]

Figure 19: CETC UAV Swarm System

(Source- QQ.com[46])

ULR / LR UAVs at GA, Equivalent and Above

China, US, Türkiye, and Israel constitute the four core exporting countries in the global military MALE and HALE drones' market. The PRC has tried to leverage the claimed performance advantages and cost-effectiveness of its "Wing Loong (WL)" and "Caihong (CH) / Rainbow" series of reconnaissance and strike drones. The PRC's 2025 UAV Industry report claims that that from 2010 to March 2025, it has exported a total of 370 military drones, covering more than 20 countries. Saudi Arabia, Pakistan, and the UAE are the main export destinations, accounting for 29%, 19%, and 12% of total exports, respectively. The WL-2, CH-3, and CH-4B have been the main export models. The WL-2 UCAV, comparable to American MQ-9 Reaper drone, has topped the list with 87 units exported, accounting for 24% of China's total HALE/ MALE exports. The CH-3 and CH-4B, with their flexible mission adaptability, are widely used in counter-terrorism and border defence missions in West Asia and North Africa.[47] It's important to understand the various engine options for PRC's HALE / MALE drones as Chinese have struggled to overcome their dependence on Russian aircraft engines.

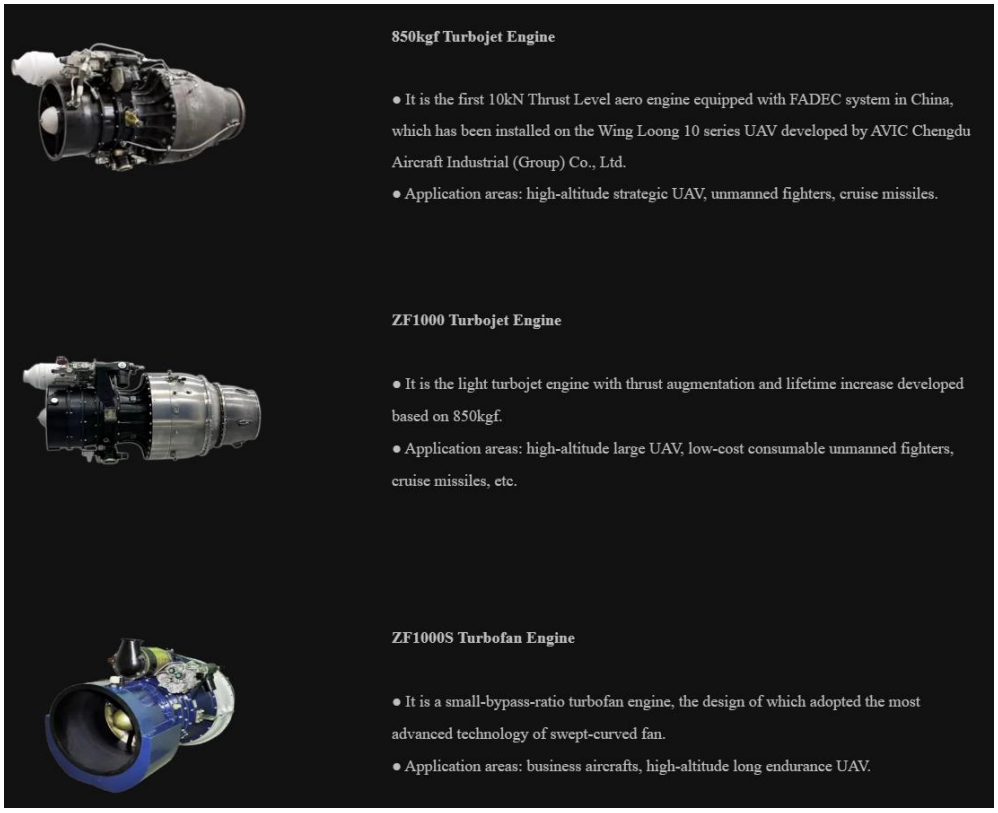

Figure 20: Chinese Drones Engines Options
(Source- Sino-Defence Forum[48])

Parameter	850k	ZF100	ZF-1000S
Max Thrust (daN)	833	1000	1100
Airflow (kg/s)	13.5	15.7	21.4
Theoretical Service Ceiling (km)	21	21	21
Thrust-to-weight ratio	4.3	4.9	5.1

Table 1: Comparison of Key Chinese Drones Engines

(Source- Sino-Defence Forum[49])

CH / Cai-Hong (彩虹)Series. The CH-series represent PLA's HALE / MALE drones combining both reconnaissance and strike roles. CH-1, 2 and 3 were the initial versions of CH series.

- **CH-4 (CH4B Export / KVD002 PLA)**. China Aerospace Science and Technology Corporation (CASTC) displayed CH-4 MALE UCAV at the 2012 Air-show with additional capabilities over CH-3 to operate in harsh environments. While 'CH-4A' was supposedly primarily for reconnaissance, the 'CH-4B' was marketed as the strike version. Initially, the line of sight (LOS) version had a range of 250 km. However, it has a claimed range of 2,750 km with satellite data links. The UCAV with four to six under-wing hard-points can carry two FT-5 satellite-guided bombs, two LJ-7 weapons, AR-1/2 or two Blue Arrow 7/9 ATGMs. Its 100 hp-class piston engine facilitates speeds of 180-235 kmph and 40 hours endurance with 4500 kg MTOW and 345 kg payload. Suitable for WTC for missions at altitudes of 3,000–5,000 m, it is capable of operating at a ceiling of 7,200 m. It has most probably been deployed at Kashgar / Kashi, Shigatse Hoping, Shifang, Pangta, Lhunze / Serche, Tashkorgan and Gar Gunsa / Shiquanhe in WTC along India-Tibet Border. The author's 2018 book[50] further elaborated that: -

  "*The CH-4's improved EO sensor turret Drone Eye has multi-spectral capability (visible light and infrared), software for tracking and identifying moving targets, and location-finding in adverse conditions and is retractable in flight, under the fuselage, to reduce drag. Its new turret has a 1080p digital camera capable of finding a man-sized target 20 km away and inertial guidance in case of degraded satellite navigation signals*." [51]

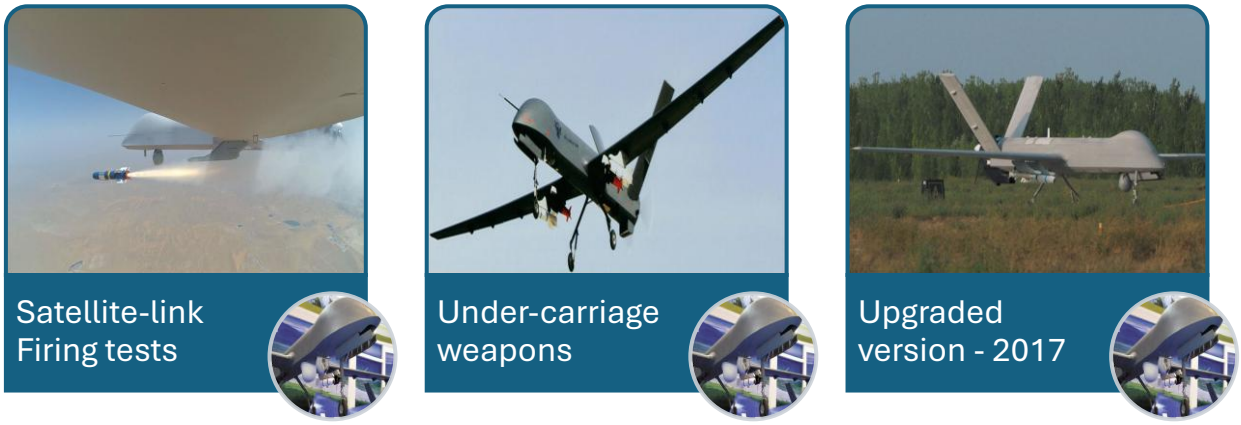

Figure 21: CH-4 MALE UCAV

(Source-Author[52])

Interestingly, while CH-4B UCAV has been the focus as the export version, Chinese media is calling the internal PLA version as the KVD-002. A Chinese article elucidates the confirmed induction of KVD-002 UCAV with Army Aviation Brigades of the Xinjiang MR and 82nd GA / NTC as under: -[53]

> "*At the 7th China Tianjin International Helicopter Exposition, the PLAGF Aviation Corps and AVIC jointly exhibited 52 aviation weapons and equipment, mainly including the Army's Z-10, Z-19, Z-20, Z-20T, Z-8L, and KVD001 and KVD002 UCAVs, as well as AVIC's AC312E and AC311A helicopters. The KVD002 MALE UCAV is the first large-scale reconnaissance and strike UAV system of the PLAGF, and marks the extension of the combat radius of the PLAGF's GAs to more than 1,000 km, giving them a veritable "long-range mace". In December 2022, the PLA Daily reported on a UAV reconnaissance company of a brigade in the XMR having a similar UAV. The KVD002 is equipped with a domestically produced heavy-fuel aviation engine, increasing its service ceiling to over 9,000 meters, 2,000 meters higher than the export version; its endurance is extended to over 30 hours, sufficient for continuous missions covering a wide area; and its payload capacity is increased by 30% to 50%, allowing it to carry more air-to-ground munitions and reconnaissance equipment. More importantly, the KVD002 is adapted to high-altitude short take-off and landing environments, perfectly meeting the Army's operational needs in complex terrain. It can conduct long-duration reconnaissance deep into enemy territory and accurately strike enemy AD systems, armoured targets, and fortified positions. It can act as a "loyal wingman," cooperating with the Z-10 and Z-19 attack helicopters of the Army Aviation Brigade to provide reconnaissance and escort for helicopter formations, and even provide target illumination for missile strikes to eliminate ground fire threats. The KVD002 UAV, of a UAV brigade of the ETC Army, has a large pod mounted on the lower part*

of its fuselage. It is speculated to be an EW pod or an integrated SAR system, which can intercept enemy radar and communication signals, lock onto targets, and directly guide missiles to attack, further enhancing electronic countermeasures and precision strike capabilities. The multi-target recognition and tracking system allows the KVD002 to quickly screen key targets in complex battlefield environments. 82nd GA in the NTC has also publicly announced its deployment. From the Air Force's Wing Loong-2 to the Army's Rainbow-4B, China has built a multi-service, multi-model large UAV system."

Figure 22: KVD-002 UCAV of 82nd GA / NTC

(Source-Toutiao[54])

- **CH-5**. CH-5 UCAV, post its maiden flight in August 2015, was officially launched at the 2016 Air-show. As one of China's largest UCAV for export with an MTOW of 3,000-3,300 kg and a payload capacity of 900-1,200 kg, its 360-horsepower fuel-efficient turboprop engine provides it a flight time of 60 hr and 6,500 km range. However, its operating range is 250 km via LOS data-link. Its six loading points can carry 16 air-to-ground weapons including Lan Jian-7 (Blue Arrow 7) laser-guided ASM, TG100 laser/INS/GPS-guided bombs, FT-7 small diameter bombs, and AR-1/AR-2/HJ-10 ATGMs. While CH-5 is most likely one-fourth the cost of US MQ-9 drone, its shelf life is just one-third. PRC was appreciated to have annual production capacity of 5-10 of these UCAVs in 2017. [55] One battalion of CH-5 is located at Aksu under WTC PLAAF's 178th UAV Brigade while up to two drones have been observed at Damxung / Donshoon in Tibet.[56] The author's 2018[57] book further amplified the advancements in the UCAV's ISR capabilities: -

"*CH-5 UCAV has a wall penetrating radar enabling the ground station to identify targets behind walls or inside buildings, with 80 km target detection capability. EW mission modules include jammers for EW, and ABEW radars to detect enemy aircraft and drones. The ABEW system enables it to act as a platform for regional surveillance and battlefield command and control. The EW instruments facilitate ELINT collection and to jam enemy communications or radar. its communications systems allow its controller to use the plane as a relay station for controlling other drones, like the CH-3 and CH-4, to conduct joint, multi-drone missions. Moreover, the CH-5 can detect underwater targets such as submarines when mounted with certain devices*."

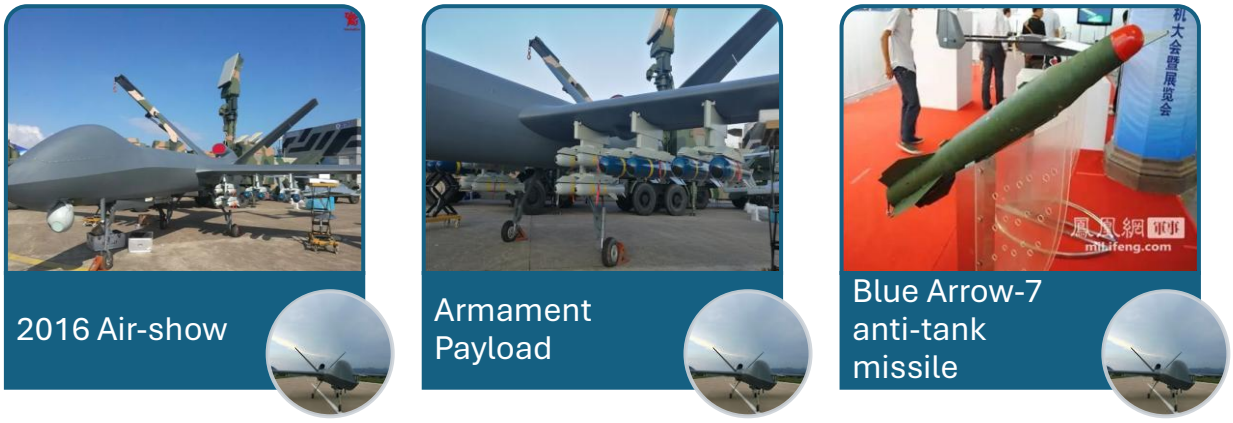

Figure 23: CH-5 UCAV

(Source-Author[58])

- **CH-7**. It is a Class III jet-powered flying-wing system developed by the CASTC's 11th Research Institute. It was unveiled in 2018 at the Zhuhai Airshow. It is scheduled to begin flight tests in 2019 and production by 2022. According to media reports, the CH-7 could be sold for export while many bloggers feel that it's only an industry project. While the data for the CH-7 is constantly changing, it is appreciated to be 10 m long, with a wingspan of 27.3 m, a maximum speed of 900 kmph, an altitude ceiling of 16,000 m, MTOW of 8 tons, and an endurance of 16 hours.[59]

Figure 24: CH-7 Flying Wing Stealth UCAV

(Source-Toutiao[60])

CH9. It was unveiled for the first time at the 2024 Zhuhai Airshow, and is appreciated to be an upgraded and enlarged version of the CH-5, equipped with PRC's advanced AEP100 turboprop engine. It has a wingspan of 24.8 m, a MTOW of 5 tons, a payload of 480 kg, a speed of 420 kmph, altitude ceiling of 11,000 m, an endurance of 40 hours, and a maximum range of 11,500 km. It can carry various small ASMs, multiple types of EW or reconnaissance pods, or even various types of underwater vehicles for anti-submarine reconnaissance missions. Few unofficial Chinese sites claim that CH9's Chinese version may be in service with the PLAAF. [61]

Figure 25: CH-9 UCAV

(Source-Toutiao[62])

Wing Loong (WL) / Yilong (翼 龙) / Gongji (GJ, 攻击) Series. The WL or GL series of UAVs are primarily the strike HALE / MALE models. PLAAF's Central Maintenance

Base's 132nd Factory of Chengdu Aircraft Corp (CAC) located at Chengdu's Huangtianba base, in Sichuan province, produces the Wing Loong series UAVs.[63] In addition to specific types assessed below, WL series drones have also been found in WTC at Shigatse Hoping, Damxung, Donshoon, Guma, Lhunze / Serche and Gar Gunsa / Shiquanhe.

- **WL-1 / GJ-1**. As PLAAF's frontline and first multi-mission HALE UCAV developed by China Aviation Industry Corporation's Chengdu Aircraft Design Institute, it has mid-air refuelling capability. It has been employed for reconnaissance, precision strike, EW and meteorological operations. While development began in early 2000s, its first flight took place in 2007, was flight tested in 2013, and entered service with the PLAAF by 2014. Witnessed during the PLA's victory parade in 2015, it was deployed at Malan in WTC. It's a 1,100 kg UCAV powered by a Rotax 914 engine with a range of 4,000 km and endurance of 20 hours. It can carry ten precision munitions worth 200 kg combat payload which may include two LE380 sensor turret laser guided KD-10/Hongjian10 (HJ-10)/Tianlei-2 (TL-2) ASMs, TY-90 / PL-90 AAMs or two 50 kg LS-6 precision satellite-guided bombs or BA-7 laser-guided ATGMs. It's PL-90 IR guided AAMs are supposedly more effective against slow moving aerial targets such as helicopters and UAVs. It was first introduced in PLAAF's "Red Sword" exercise in 2012. It's assessed to be deployed at Zhangye Chang (40.39617, 99.782843) under PLAAF's Dingxin Test and Training Base, by WTC's 178th UAV Brigade (Unit 95835) at Malan and Hotan, and by 151st UAV Brigade under Central PLAAF's Flight Test and Training Base (FTTB) at Cangzhou/ Cangxian Air Base. The Central PLAAF's Aviation University Flight Instructor Training Base has a 4th Training Regiment which also holds WL-1 UCAVs at Bengbu.[64] The PLA's grand military parade on 3.

Figure 26: GJ-1 '76024' being prepared at the Zhuhai Aero-show 2014

(Source-Popular Science[65])

September 2015 for the 70th anniversary of the victory of the Anti-Japanese War included GJ-1. The author's 2018[66] book further elucidated that: -

"*This UAV has a bulbous nose blister for housing its SAR and satellite tracking system. Underneath is a gimbal for its IR camera and fire control system. Retractable tricycle landing gear is below an elongated fuselage made of a composite material like a carbon fibre-reinforced polymer. It has a V-tail, a three-blade propeller with an underlying engine intake, and tapered mid-wing. AVIC's product literature on the Wing Loong explains its deployment in companies of four UAVs along with a GCS and logistics and payload sets. It has a pronounced forward bulge that houses a larger satellite dish, which improves both communications range and resistance to jamming*."

2015 Parade

2012 Air Show

GCS

Figure 27: Wing Loong-1 UCAV

(Source-Author[67])

- **WL-2 / GJ-2**. Claimed as PRC's first military drone assembled entirely by a private company, its HAA capability to take-off from a base at a maximum altitude of 3,800m and maximum flying altitude of 9 km overcame WTC's limitations for employment along Indian border. The participation in the PLA's 90th anniversary celebrations on 30 July 2017 confirmed its induction. The UCAV, with maximum external carriage of 480 kg armament, can carry 12 YJ-9E ASMs / Blue Arrow 7, TL-2, AG-300 ASMs, KD-9 and KD-10 laser guided missiles and the LS-9 small-diameter bomb. It's claimed to be capable of undertaking fully autonomous horizontal wheeled take-off, cruise flight and landing. Powered by a new turboprop engine (WJ-9A/AEP50E, 500kW), it has a MTOW of 4,200 kg, and 200 kg of internal equipment. It can carry SAR and laser-designators. With 11 m length, 4.1 m height, and 20.5 m wingspan, it has a speed of 340 kmph, and a 20-hours endurance. It is held by STC's UAV

Brigade at Mangshi and WTC's 178th UAV Brigade at Malan and Hotan. [68] **Pakistan has supposedly procured 48 WL-2s from China**.

- **WL-3 / GJ-3**. Claimed as the "star equipment" of 03 September 2025 parade by few Chinese websites, WL-3 is claimed to have a MTOW of 6.2 tons and a wingspan of 24 m, maximum range of 10,000 km and endurance of 40 hours. Thus, the Chinese websites claim that it can conduct long-term intercontinental surveillance and strike missions. With nine hardpoints, it can carry 16 missiles or guided bombs including the PL-10E AAM. It adopts the "loyal wingman" concept and can form a MUMT combat mode with fifth-generation fighters particularly J-20S.[69]

Figure 28: WL-3 / GJ-3 UCAV WR 321

(Source-Toutiao[70])

- **GJ-11 / Sharp Sword**. Most Chinese Bloggers claim that "GJ-11 is the world's first and only stealth strike UAV in active duty". A flying wing drone of 10m length and 14m wingspan, it has a mysterious Chinese codename: **"玄龙".** It was paraded in the 2019 military parade for the first time. GJ-11's claimed range is 2,000 to 3,000 km thereby enabling it to launch attacks outside the range of enemy AD networks with two 500kg GNSSS/Beidou guided bombs or LGBs separately inside its two internal bomb bays. [71] While in a Taiwan centric scenario, it covers the Second Island Chains (SIC), it can comfortably cover up to Central India from its frontline air bases which are gradually mushrooming. Three GJ-11 UCAVs were observed at the Shigaste Hoping Peace Airport in Tibet under WTC in August and September 2025. It's based on Sharp Sword UCAV program. An **aerial MUMT of J20S and GJ-11 UCAV has been displayed in the latest teaser in November 2025 by PLAAF.** If Chinese propaganda claims are fully true, it could be a game changer since it is appreciated to fly into highly contested and dense airspace and still deliver

either free fall weapons or stand-off weapons. While Turkish Anka-3 considered as a challenger to GJ-11 is likely to entry in service in 2026, GJ-11 was paraded in 2019 and has already been observed at both Shigatse and Malan in WTC.

Figure 29: GJ-11 UCAV doing a MUMT mission with J20S

(Source-Sino-Defence Forum[72])

A Chinese Military Aviation Blog[73] elucidates key claims of this drone: -

"*Its wings appear foldable, suggesting it could be deployed on an aircraft carrier, like X-47B. However, the engine nozzle appears to be unshielded which might increase its thermal signature. Images of an AVIC scale model (December 2017) suggested that GJ-11 has undergone some modifications including a shielded engine exhaust, a chin-mounted EOTS, conformal (phased array/EW?) antennas embedded in the leading edges of flying wing, two optimized internal bomb bays for Beidou guided glide bombs of different weights (100kg and 500kg). It was speculated that ultimately a group of GJ-11s controlled by a J-20S airborne command post or a J-16D EW aircraft might fly combat missions similar to the American XQ-58A Loyal Wingman design. A recent satellite image (July 2024) suggested that GJ-11 is in service with PLAAF, replacing the old J-6W*."

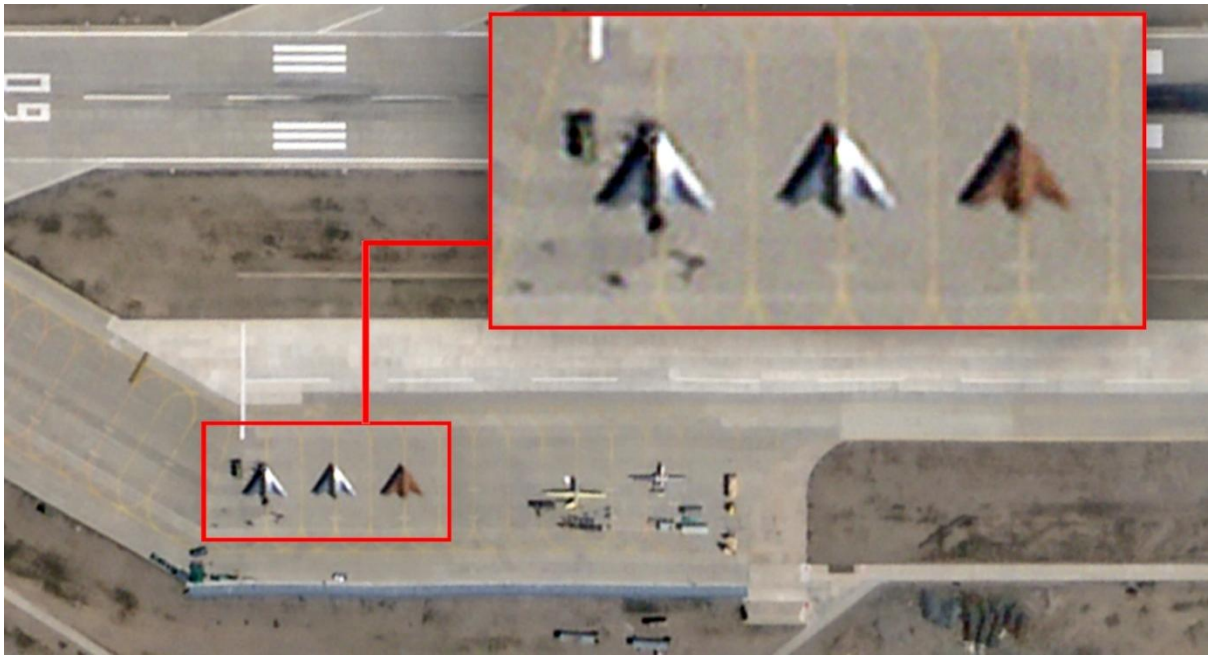

Figure 30: GJ11 at Shigatse Hoping in Tibet in PLA's WTC

(Source- Planet Labs and TWZ[74])

- **GJ-21 Naval Variant UCAV**. GJ-21 paraded on 03 September 2025 was a naval upgrade of GJ-11 UCAV paraded in 2019. It adopts a flying-wing tailless layout and a turbofan engine.[75] GJ-21 has been adapted for maritime role, by including features like folding hinges for wings as visible in the picture below. Its new inlet inclines 60 degrees vs the GJ-11's 40 degrees. It's appreciated that the PLAN's latest LHD Type 076 may be equipped with GJ-21 UCAV. This is extremely critical with LHD Type 076 if and whenever placed anywhere in Indian Ocean Region (IOR).

Figure 31: GJ-21 UCAV (Naval Upgrade of GJ11 UCAV) WR311

(Source-Toutiao[76])

- **GJ-X**. GJ-X is the name given to UAV model which appeared on the various rehearsals for the parade but wasn't present for the final day. [77]

WZ Series. The WZ-series of HALE / MALE drones are supposed to be primarily for ISR role in combat.

- **WZ-7 / Soaring Dragon**. A UAV with Guizhou WP-13 turbojet engine with 43.1 kN thrust, it attains a maximum speed of 750 kmph at a range of 7000 km, ceiling of 18 km and endurance of 10 hours. It has a box/diamond wing design to increase lift while reducing drag and weight. It was inducted in 2018.[78] The STC PLAAF's 67th Brigade holds this UAV most probably at Suixi since 2024; WTC at Damxung / Donshoon and Golmud; and NTC's 48th Brigade at Shuangliao.[79] During the Dokala standoff with India, it was deployed in Tibet. It has flown high-altitude recon missions over the Japan Sea through the Russian airspace, and over the SCS near Philippines.

Figure 32: WZ-7 UAV

(Source-Asian Military Review[80])

- **WZ-8**. A supersonic UAV produced by AVIC's 611 Institute, it was unveiled at 2019 military parade and publicly displayed at the 2021 Zhuhai Airshow. It can cruise at Mach 3+ (as claimed) with 2 YF50 rocket motors at a claimed ceiling of 50 km. It's deployed most probably at ETC PLAAF's Lua'an base[81] along with the H-6M bomber 30th Air Regiment ex 10th Bomber Division. The US TRADOC's "World Equipment Guide" describes WZ-8[82] UAV as: -

  "*The WZ-8 Chinese UAV is unlike any other drones in the current PLAAF inventory. It is a drone aimed to provide "**Penetrating ISR**" capability against time-sensitive targets. In other words, it was designed to take advantage of its high-speed and high-altitude performance to try to evade interception from AD missiles and fighters, make a recce run through the*

area where the targets of interest are located and survey them with its onboard SAR and EO Sensor Packages in a limited time window."

- **WZ-9 / Divine Eagle**. A HALE UAV with a range of 7,000 km and endurance of 10 hours, it's also called the "Xiang Long", "Soar Dragon," and even EA-03 when it was inducted with the PLAN. It has been designed by AVICs Chengdu Aircraft Design and Research Institute as an "anti-stealth" AEW platform supposedly and produced by AVIC's Guizhou Aviation Aircraft Corporation. It has been deployed at Lingshui Naval Airbase on Hainan Island in STC; Shigatse in WTC; and Yishuntun airbase, Jilin in NTC. [83] With a wingspan of 20 m, height of 5.41 m and length of 14.33 m, it's suitable for HAA operations with an operational ceiling of 18,000- 20,000 m and requires a take-off distance of 350 m and landing distance of 500 m. Its EW version was assessed to operate as part of MUMT with fighter aircrafts. As a GNSS-jammer, it has ranges of 400 km normally and 60 km for military platforms employing advanced precision weapons and sophisticated anti-jamming devices. PLA is very effectively employing it along its coastline for maritime surveillance of foreign bases and warships, boosting PLA's A2AD capabilities.[84] Its deployment has been noticed at the PLAAF's bases at Yishuntun, STC's UAV Brigade at Foshan, STC's PLAN fleet's UAV Regiment at Lingshui and WTC's 178th UAV Brigade at Malan, Shigatse and maybe temporarily at Golmud. 162 Factory ex Guizhou Aviation Industry Company (GAIC)/ Shuangyang Aircraft Manufactory, under PLAAF's Central Maintenance Base holds WZ-9 UCAVs at Anshun Huangguoshu.[85] A Chinese Military Aviation Blog[86] highlights few major characteristics of this drone: -

  "*WZ-9 features a novel twin fuselage design with twin large vertical tailfins and an extra-long main wing extending across the rear fuselage. It also has a small canard wing connecting the head sections of twin fuselages in order to maintain the structural integrity of the UAV. A SATCOM antenna is expected to be installed inside the head bulge on the port side. As an AEW platform WZ-9 is expected to have two side-looking conformal radar antenna arrays installed along the twin fuselages. The ultra-wide electronically scanned UHF radar is capable of detecting stealth aircraft at a relatively LR but*

might suffer from a lower accuracy. Therefore, several WZ-9 may fly ahead in a group formation while being controlled via datalink by the AWACS flying behind in a safe distance or by the ground station protected by the AD unit. Together they act as an airborne multi-static radar system and are able to pick up the radar reflection signals of the same stealth aircraft from multiple directions. Resultantly, the UAV can extend both the detecting range and accuracy of the AWACS against stealth aircraft. The design of WZ-9 appear to share some similarity with the Russian Sukhoi S-62 concept which first appeared around 2000. It was rumoured that Russian assistance was sought during the initial development stage. Once entering the service, WZ-9 is the first unmanned airborne anti-stealth radar system in the world and could be used to counter American stealth aircraft such as F-22, F-35 and B-2. The latest satellite image (February 2025) indicated that at least one WZ-9 was deployed to the Hainan Island along with WZ-7s, facing the South China Sea."

- **WZ-10**. It's also called WL-10 or Cloud Shadow (Yunying, 云影) or Wind Shadow with varying names from different sources. The Cloud Shadow, with a single- WJ-600 series engine, export version was seen first at the 2016 Zhuhai Air-show and represented a Chinese attempt at a budget-friendly HALE UAV. Its three versions include a UCAV with six ammunition weights of 400 kg, and two ISR versions with EO and SAR payloads. It achieves maximum speed of 650 kmph, has a ceiling of 15,000 m, and endurance of 6 hours with LOS range of 290 km. A GCS can pilot three drones at a time, where the three versions cooperate together and fly in formation. It is modular and can be transported in six modules and can be assembled in 2-3 hours. The most probable deployments are with STC's UAV Brigade at Foshan base, 67th Brigade at Suixi (since 2024); WTC's 178th UAV Brigade at Malan; and NTC's 48th Brigade at Shuangliao (since 2023). [87] A Chinese Military Aviation Blog[88] spells out key aspects of this drone: -

  "*It features conformal ELINT antennas (multi-baseline interferometers?) on both sides of the forward fuselage to intercept multiple radar signals and locate*

their individual positions. A SATCOM antenna was installed inside the head bulge. An EO turret can be installed underneath the forward fuselage for photo recon purpose. WZ-10 is powered by twin ZF850 turbojet engines with dorsal air intakes located between the twin tail fins in order to reduce its radar and IR signatures. A CATOBAR shipborne concept (WZ-10J?) for the Type 003 aircraft carrier and/or Type 076 UAV carrier was studied. A satellite image released in 2016 indicated that a prototype was being tested using the land-based EMALS. Recent news (February 2024) suggested that the improved WL-10B UCAV has been ordered by Saudi Arabia. A recent image (May 2024) indicated that WZ-10 started to fly recon missions over the East China Sea near Japan and Taiwan. The latest news (August 2024) claimed that WZ-10 flew recon missions in the South China Sea (SCS) close to the coast of Vietnam."

BZK Series. The BZK series drones have been used very effectively for ISR by PLA with all TCs.

- **BZK-005**. Also called Chang Ying **(长鹰),** this MALE UAV has a claimed range of 2,400 km, 40 hours endurance, speed 150-180 kmph, ceiling 8,000 m, endurance 40 hr, MTOW < 1,250 kg, payload > 150 kg, take-off (TO) distance < 600 m and landing distance < 500 m. [89] It is one of the most popular PLA's ISR drones. It was designed by PRC's Beihang University's UAV Institute and the Harbin Aircraft Industry Group (HAIG) in early 2000s, was tested in 2006, and inducted in PLA around 2007. BZK-005's deployments have been confirmed by ETC at Daishan Island in Hangzhou Bay; by STC at Lingshui Air Base, Sanya Air Base, and Woody Island in the South China Sea (SCS); WTC's 178th UAV Brigade at Hotan, battalion at Lhasa Gonggar and battalion at Zhangye / South East; and by CTC at the Beijing Shahe Air Base. The BZK-005H version UAVs are held by ETC's PLAN fleet's UAV Regiment at Huangyan/ Luqiao, STC's PLAN UAV Regiment at Yaxian, Sanya and NTC' PLAN Fleet's UAV Regiment at Yantai/ Laishan. [90]

Figure 33: BZK-005 UAV

(Source-Author[91])

- **BZK-006**. An upgraded version of BZK-005, it's held by WTC's 178th UAV Brigade at Hotan. [92]
- **BZK-007**. Its most probably held by PLAGF and by ETC's East Sea Fleet's UAV Regiment at Daishan Air Base. [93]

Tengden (腾盾科技) TB-001. It is also known as "Twin Tailed Scorpion" (双尾蝎) and was developed by Tengden Technology. The Tengden UAV factory was established at Liangping in January 2016 under PLAAF's Central Maintenance Base. The TB-001 UAV was unveiled at the 14th China-ASEAN Expo in 2017 in Nanning. While the basic TB-001 has a twin-engine, twin-boom design, there are a smaller version too—the TA-001 and two rotary-wing aircrafts, the HA-001 and HB-001. It conducted its first flight tests at Liangping Airport in Chongqing province in 2017. The famous PRC's package delivery firm SF Express, has tested TB-001 modified for cargo operations in Yunnan province. ETC has TB-001 Battalion at Dongyang while PLARF's Base 61 has a TB-001 UAV Brigade at Quanzhou / Jinjiang and Jinhua / Zhejiang. TB-001 has been seen deployed at Shigatse Hoping on few occasions.[94]

Shahed / Geran Equivalent Kamikaze / One-Way Attack (OWA) Drones

There is a big rush amongst Chinese firms to field their equivalents of Iranian Shahed / Russian Geran series of drones in order to develop the cheapest possible drones

and replicate a major lesson of Russia-Ukraine War that “Quantity has a quality of its Own”. Some of these variety of drones are discussed in the succeeding paragraphs.

Feilong (飞龙) Series of LMs.

- **Fielong-60A LM**. In March 2025, PRC’s official media People Daily highlighted a new LM the “Feilong-60A” specifically designed for rocket artillery. Since it is stored in launch canisters, it is claimed to be compatible with any Chinese modular rocket artillery system. [95] The Feilong-60A LM adopts a tandem wing layout wherein each pair of wings can be folded and thus can be stored in the launch box. It therefore achieves the integrated design of storage, transportation and launch. It obviates the requirement of external intelligence support since it can automatically network with rocket launchers, conduct battlefield reconnaissance, target identification and precision strikes. Feilong-60A can also be used with various types of cruise missiles by combining heterogeneous swarms for mixed combat. Based on their respective characteristics, it is claimed to be capable of intelligently assigning attack targets. Its multifunctional warhead is claimed to possess both armour-piercing (AP) and surface-damaging capabilities. It can thus strike armoured vehicles, personnel, equipment and buildings within a certain range.[96]

Figure 34: Feilong-60A LM

(Source- China Academy[97])

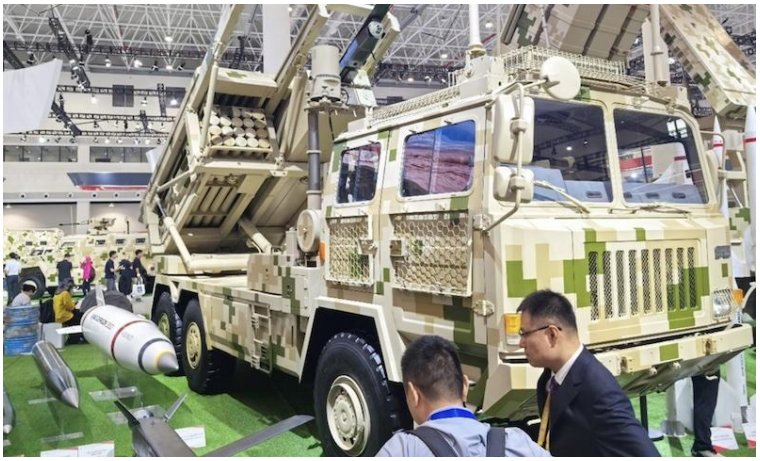

Figure 35: Fielong-60A LM Onboard SR-5 MLRS

(Source-Aviation Week[98])

A China Academy article claims that [99]

"*After launch, the Feilong-60A unfolds its wings and loiters in designated airspace for extended periods. During tests on the Tibetan Plateau, its electric propeller propulsion system demonstrated an endurance of up to 7 hours. But the Feilong-60A does more than just loiter. Its onboard camera can autonomously identify ground targets and conduct precision strikes, using specialized warheads to attack the vulnerable top armour of enemy vehicles. It can also transmit real-time imagery to the launch vehicle, enabling battle damage assessment, guidance for subsequent conventional strikes, or target designation for other units*."

Figure 36: Feilong-60A Loitering Munition from a 6x6 Launcher / MLRS

(Source- China Academy[100])

Algerian Army has been probably the first foreign customer of Feilong-60A LM. An online article reported that:

"*The Feilong-60A (FL-60A), meaning "Flying Dragon," is a loitering munition or kamikaze drone designed for both ISR and strike missions in a single unit. Once*

launched, it autonomously patrols, identifies, and engages ground targets. Developed by Norinco, the system is optimized for SR5[1] launchers: each SR5 module holds six munitions, totalling twelve per vehicle. It features intelligent guidance—likely GNSS/inertial hybrid—and an explosive payload tailored for soft or lightly armoured targets. The onboard system enables fully autonomous engagement without operator intervention. The unit cost is estimated at around $68,000, making it significantly cheaper than Western systems like the Switchblade 600, which reportedly costs up to $180,000. NORINCO demonstrated the FL-60A during 2025 field trials in Inner Mongolia, targeting static and moving targets under semi-permissive conditions."

A Russian website article, by Chinese propaganda author, claims[101]: -

"*In terms of missile design, the Feilong-60A represents an unprecedented innovation. The traditional cylindrical shape typically used in LMs has been replaced with a rectangular cross-section. This transformation not only improves aerodynamic efficiency but also significantly enhances the efficiency of internal space. Calculations show that the battery capacity and space for multi-functional warheads are 30% larger than conventional designs, providing a robust structural foundation for more complex payloads and extended endurance. More importantly, the rectangular body shape is ideally suited for the modular launchers of the SR-5 and PCH-191 rocket artillery systems, enabling seamless "munition-artillery fusion" with immediate launch capability, significantly enhancing system compatibility and rapid response capabilities. The Feilong-60A LM's wing design also represents a revolutionary change. An innovative serial wing folding system reduces the launch space, and after launch, the wings automatically deploy within 0.3 seconds, achieving a wingspan of 2.1 meters. This deployment speed on the 401TP3T exceeds that of the Russian Lancet loitering munition, ensuring a faster and more reliable transition from launch to loitering flight. The high-aspect-ratio wing ensures stable control at low flight speeds with excellent lift-to-drag ratio, and also meets*

[1] Algeria adopted the Chinese SR5—an advanced multi-calibre rocket launcher from Norinco. The SR5 is capable of launching both 122 mm rockets and 300 mm tactical missiles, and has claimed to have offered the kind of battlefield flexibility the Algerian military sought.

the aerodynamic requirements during high-speed breakouts, ensuring superior flight performance at various mission stages.

The Feilong-60A missile's propulsion system is a hybrid solid-fuel booster/electric propeller configuration. The solid-fuel rocket motor is used during the initial launch phase, quickly accelerating the missile to Mach 2, ensuring rapid target acquisition and enhanced penetration. During the loitering phase, the system automatically switches to electric propulsion, maintaining noise levels below 60 decibels, comparable to that of a household air conditioner. This high-low propulsion combination enables both rapid response and high-speed penetration of enemy defences, while maintaining low observability and extending loitering time, significantly enhancing combat survivability and mission flexibility.

Feilong-60A uses a new, multi-functional warhead that combines focused energy charges and pre-formed fragmentation, providing both anti-armour and area-effect damage capabilities. This allows it to strike armoured vehicles and damage personnel, equipment, and buildings within a defined area, greatly enhancing its damage effectiveness. In testing, the Feilong-60A 's new multi-functional warhead has undergone extreme environmental static blast testing. One warhead was frozen for 48 hours in temperatures as low as -55°C, while another was subjected to 70°C heat for two days. In both tests, the warhead successfully penetrated a 350mm armour plate, making it effective against the top and side armour of heavy tanks. The multi-functional warhead also includes both square and spherical pre-formed fragments. The heavier spherical fragments can penetrate 6mm thick steel plates at distances of 5 to 8 meters, ideal for striking light-armoured vehicles. The lighter square fragments have a larger dispersion area, making them effective against personnel and soft targets. This makes the Feilong-60A capable of attacking a variety of targets with a single weapon system."

- **Fielong-300A LM**. The Feilong-300A is mounted on the MV3 series medium-size off-road truck chassis, with a maximum range of approximately 280 km and an endurance of up to 4 hours.
- **Fielong-300D LM / Kamikaze ULR Drone**. The Feilong-300D low-cost recce and strike drone debuted at the 15th Zhuhai air show in 2024, is a mass-

producible LM and its lowest cost could be US$10,000 per unit. Developed by the North Industries Group Corporation's (NORINCO), Feilong-300D strikes armoured targets and conducts ISR missions. NORINCO claimed that the product's delta-wing configuration enabled "extended range under equivalent power conditions" with expected range beyond 1000 km. The SCMP article also elaborated the LM's capabilities to coordinate with PLAAF's fighter jets and variety of SSMs during a drill using adaptable warheads that allowed "users to select options based on varying operational requirements". [102]

Figure 37: Feilong-300D ULR Suicide Drone / LM

(Source-SCMP[103])

Various Chinese websites indicate that Feilong-300D has a triangular flying wing layout with the central fuselage integrated with the wings, and independent control surfaces at the wingtips. The warhead is located internally in the fuselage, weighing over 50 kg, and the engine is located at the rear of the fuselage, driving a two-bladed propeller. The Feilong-300D drone has a flight speed of up to 220 kmph and a range of approximately 1000-2000 km. It has both INS and BeiDou GNSS guidance and variety of warheads weighing around 50 kg- high-explosive fragmentation, airburst pre-fragmentation, and armour-piercing warheads while the fuse has both impact and proximity detonation modes. The fragmentation warhead, upon activation, generates 7,000 high-speed fragments with a kill radius of 20 meters.

A Chinese website article of November 2025, explaining the low cost of Fielong-300D drone elucidates that: -[104]

"*It uses a mature piston engine with an extremely low failure rate, abandoning the complex and expensive turbojet or turbofan engines. It*

uses readily available ordinary gasoline, eliminating the need for special fuels and greatly reducing battlefield resupply difficulties. The avionics system is completely focused on the core function of precision strike, discarding unnecessary auxiliary designs and maximizing cost reduction with a "good enough" approach. This strategy of prioritizing quantity over quality is the core competitiveness of the Feilong-300D and the key to its ability to disrupt the global arms market with low prices. In the officially disclosed simulated exercise, this drone, with its flexible flight trajectory, successfully evaded the simulated enemy's AD radar detection and interception system, and accurately hit the simulated military base thousands of miles away, proving that flying far and hitting accurately are not mutually exclusive."

Figure 38: Fielong-300D LM / Kamikaze Drone
(Source- SCMP[105])

PD-2900 Kamikaze Drone. It's an imitation cum upgrade of Iranian Shahed Drone's concept of "One Machine, Multiple Capabilities" and is manufactured by China Pudu International Aviation Technology (Dongguan) Company. Its images started circulating on Chinese internet in August 2024 with a claimed range of 2,500 km and flight time 12 hour. Claimed at one-tenth the cost of Russian Geran and Iranian Shahed, its lower cost is attributable to carbon fibre (Nanjing Julong) fuselage and use of composite materials, and a twin-piston engine (possibly Longsheng Technology) with a 160-liter Kevlar explosion-proof fuel tank (Taihe New Materials). Its unique features claimed are self-organizing network, self-relay, frequency hopping, anti-jamming (Fuji Electronics) antennas, optional carriage of 40 small Hidden Blade missiles (Rainbow Aerospace), and Beidou GNSS high-precision navigation chip (Zhenxin Technology). The Chinese search website Toutiao[106] claims that: -

> "*Its dual-motor engine combination costs only 10,000 yuan (cost of one engine, 1100 USD). Combined with the large-scale use of a carbon fibre fuselage and 3D-printed components, the overall cost is reduced to a critical 8,000 yuan. Iran's Shaheed 136 costs $20,000, Russia's Geranium 2 costs $30,000, and the US's Lucas costs $40,000—ours (Chinese) are the lowest in the world. Why are we so cheap? The secret lies in our supply chain. The core is our two motorcycle engines. We can produce 20 million piston engines annually, and with mass production, costs will continue to fall. The PD-2900's price advantage represents a generational shift. While Russia's monthly production capacity of 2,700 Gerans (this is Chinese claim in 2024, Russia has already crossed 5,000 monthly production) and Ukraine's planned 2,000 units are already reaching their limits, the PD-2900, leveraging its mature civilian industry chain, can easily achieve a monthly production capacity of tens of thousands of units. This production advantage, when translated into a tactical advantage, creates a stunning spectacle of "tens of thousands of aircraft launching simultaneously"—its firepower density far surpassing that of traditional long-range fire systems, rendering any AD system vulnerable to interception. Military experts estimate that, if 30,000 PD-2900s were deployed simultaneously to create an attack wave, existing AD systems would be able to intercept at most 30% of them, and the cost of interception would be over 50 times the cost of the attack (Ukrainian*

concept of drone interceptors has drastically reduced those costs). This "cost asymmetry" completely overturns the balance between offense and defence, forcing a restructuring of traditional air."

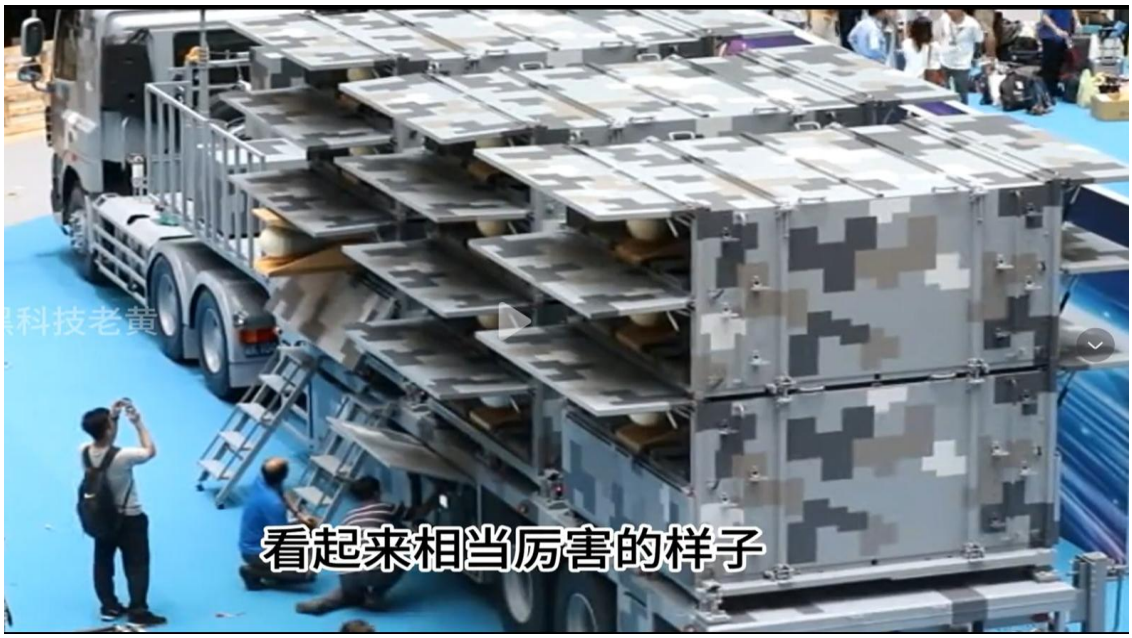

Figure 39: PD-2900 Kamikaze Drone Launcher

(Source-Toutiao[107])

Comparison of PLA's Options of Kamikaze Drones. Having analysed few designs of Kamikaze drones being produced and offered in China, the table below summarises the comparison between Fielong-300D, PD2900, another Chinese model TXZ recently introduced and the Iranian Shahed 136 / Russian Geran 2.

Parameter	Fielong-300D	PD2900	TXZ	Iranian Shahed 136 /Geran 2
Range (km)	1000-2000	2500	1500	970-1500 / 2000-2500
Endurance (h)		10-12	9	11.5
Ceiling (m)		5000	>4000	18,288
CEP (m)			<20	
Speed (kmph)	220	150-180	220-250	185
Cruise Altitude (m)			200-500	1000
Payload (kg)	50	50-100	50	50-90
Wingspan (m)		2.95	2.42	2.5
Length		3.97	2.76	3.5
MTOW (kg)		220	230	200

Table 2: Comparison of Chinese Equivalent Models with Iranian Shahed 136 / Russian Geran 2 Delta-Winged LMs / Kamikaze Drones

(Source-Author)

Collaborative Combat Aircrafts (CCA). While American Air Force had been designing and working on its CCA models for long, PLA introduced its CCA models in the September 2025 military parade.

- **Type D Supersonic Collaborative Combat Aircraft (CCA) or "Stealth Unmanned Wingman"**. With diamond wings, the Type D CCA has canted tail fins, a dorsal engine intake and a single engine. This unmanned wingman model is optimized for air-to-ground missions carrying small PGMs. As per China Military Aviation Blog, it most probably entered service with PLAAF in Southwest China (S/N 53x3x). [108]

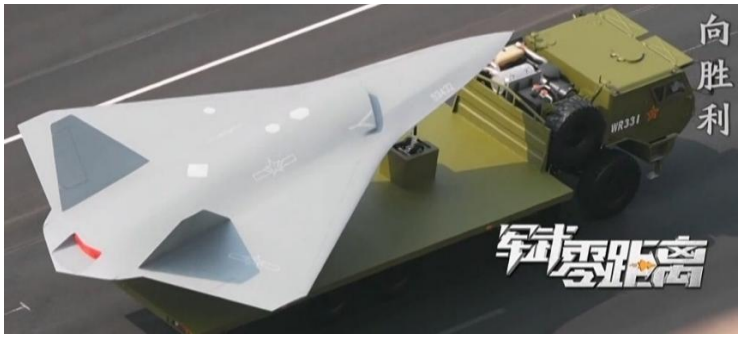

Figure 40: New Stealth Unmanned Wingman (1) / Type D WR331

(Source-Toutiao[109])

- **Type C Subsonic CCA or "Stealth Unmanned Wingman-2"**. This CCA has swept wings and canted tail fins as per Chinese Military Aviation Blog. With an internal weapon bay, a dorsal engine intake and a single engine, few western bloggers estimate it to be similar to American XQ-58A. It is appreciated that this unmanned wingman is suitable for flying air-to-ground missions carrying small PGMs. It also most probably entered service with PLAAF stationed in Southwest China (S/N 53x3x). [110] This model, as per Janes, matched a model seen in Hotan in WTC. [111]

Figure 41: New Stealth Unmanned Wingman (2) / Type C WR332 /53431

(Source-Toutiao[112])

Unmanned Aerial Dominance Aircrafts (UADF). Like the CCAs, PLA introduced the UADF to use UCAVs as loyal wingmen to undertake air-to-air battle.

- **Type B UADF**. Type B is possibly a large supersonic UCAV or UADF for achieving air superiority for PLAAF. With tailless diamond wings and all moving wingtips, it features an internal weapon bay in the belly. It is estimated to have entered service with PLAAF in Southwest China. Developed most likely by 611 Chengdu Aviation Company, it adopts few 6th generation fighter technologies. A July 2021's satellite image showed the UADF prototype was being tested at Chengdu Aviation Complex. [113]

Figure 42: Type B (53536, WR 341) Unmanned Aerial Dominance Fighter

(Source- Chinese Military Aviation Blog[114])

Janes' article designated model number 53536 as CCA 4 and claimed that it is associated with an unidentified UAV unit at Hotan airbase reporting directly to the CMC. Jane's article elaborated that: -[115]

> "*With an estimated length of about 18 m, CCA 4 appears to be longer than CCA 3 (model number 53636, discussed later). However, in comparison with the latter, CCA 4 has an estimated 11.7 m wingspan. CCA 4 also differs from CCA 3 in having diamond-shaped wings and an electro-optical targeting system (EOTS) under the nose, forward-angled engine intakes with diverter less supersonic inlet (DSI) bumps, and laser warning sensors (LWSs) on the external sides of both engine intakes. This CCA also has a small infrared (IR) /laser port on the portside dorsal area of the nose. The configuration of CCA 4's rear landing gear also appears to differ from that of CCA 3. CCA 4's rear landing gear bay extends along the fuselage, while that on CCA 3 appears to fold into the lower wing.*"

- **Type A UADF**. Developed by 601/Sichuan Aviation Company, it is appreciated to be a UADF or large supersonic UCAV. It adopts few 6th generation fighter technologies and is optimized for air superiority as per Chinese Military Aviation Blog. It features possibly partially foldable tailless lambda wings and all moving

wingtips. The UADF has two internal weapon bays on both sides. Based on a single WS-10C engine (14 tons class), it has a TVC nozzle. It's appreciated to be capable of extreme high-g manoeuvring. It most likely entered service with PLAAF stationed in Southwest China (S/N 53x3x). [116]

Figure 43: Type A (53636, WR 342) Unmanned Aerial Dominance Fighter

(Source- Chinese Military Aviation Blog[117])

Janes has given the nomenclature of CCA3 to the model number 53636 which it has described as: -[118]

> "*CCA 3 has a wingspan of almost 13 m. CCA 3 was equipped with lambda-shaped wings and two caret-shaped engine intakes with splitter plates. The aircraft also appeared to have foldable wings, indicating it has a role in naval aviation. However, the CCA appears to lack the twin wheels and the reinforced landing gear associated with carrier-borne aircraft. The aircraft also appeared to not possess a tail hook. CCA 3 also exhibited features associated with internal bays on its sides. However, it is not yet known if these are additional weapons bays.*"

Jutian Mothership UCAV.Also called the "Nine Heavens" Drone, the Chinese claim it as a global drone with a range of 7,000 km and ceiling of 15,000m. Its turbofan-jet hybrid power system, enables cruise speeds of 600 to 700 kmph. Chinese propaganda boosts the most about its powerful weapon-carrying capability since it has eight weapon hardpoints under its wings which are almost on par with the weapon pylons of the J-16 fighter jet. The "Jiutian" can carry 1,000-kilogram guided bombs, AAMs, anti-ship missiles (AShMs), and even advanced EW pods. More importantly as a mothership drone, its "heterogeneous honeycomb pod" can accommodate hundreds of loitering munitions or sUAS. Overall, Chinese claim that with high-tech AI and directed energy weapons, the "Jiutian" UAV is expected to form a new combat chain of "cloud command - swarm execution - intelligent assessment".[119]

Figure 44: Jutian Drone

(Source-163.com[120])

Figure 45: Heterogeneous Honeycomb Pod of Jutian Mothership Drone

(Source-163.com[121])

C-UAS Platforms

Having discussed various Chinee drones, it's important to analyse key Chinese C-UAS platforms inducted in PLA.

YLC-48, DWL002 Radars. These are held by PLA specifically for small drone detection using active and passive sensing.

Tianqiong (Sky Dome) System It integrates radar and EO/IR for detection and tracking, RF jammers and directed energy for soft and hard kill mitigation.

TDOA (Time Difference of Arrival) UAV Detection, Identification, and Positioning Equipment. The equipment uses time difference of drone signals to detect drones, the model identification and location positioning. It can detect more than 800 types of conventional brand drone models, homemade drones, racing drones, and various unconventional models. The equipment is easy to install in just a few minutes. Under

ideal conditions, the detection radius can reach 5 km. It can also be used on handheld terminals to constantly update the location of the "enemy" drone pilots.[122]

Figure 46: PLA's TDOA Equipment

(Source- Toutiao[123])

Lasers. The light-speed strike capability and zero recoil of laser weapons make them particularly suitable for engaging low-altitude, low-speed, and small UAS. PLA displayed two lasers on the September 2025 parade- OW5-A10 High Energy Laser Weapon System probably held by the AD Battalion in a CAB which is likely to achieve a range of 5 km with 10 kw power laser with possible focus against OFC First Person View (FPV) Drones; and OW5-A50 Laser Weapon System held either by PLAGF AD Brigade or more probably PLAAF's SAM Brigade with laser power generation capability of 50kw. Chinese online article even claimed that: - [124]

> "*During the 2024 Zhurihe exercise, a laser battery shot down 32 simulated suicide drones in 120 seconds, destroying over 100 drones in a single day—exercising counter-drone swarm tactics; intercepting 122mm rockets (interception rate ≥ 91%, according to CCTV's "Military Report" in March 2025); suppressing enemy anti-tank missile seekers, reducing the loss rate of MBTs*."

Figure 47: OW5-A-10 (10 Kw) Low-power Laser on Parade

(Source- Sino-Defence Forum)

Gun-Missile Systems. Two gun-missile systems Type 625 and FK-3000 were paraded on 03 September 2025 thereby indicating the enhanced C-UAS capabilities with the CAB's AD Battalion.

Figure 48: Type 625 Gun-Missile AD System

(Source- Sino-Defence Forum)

In an October exercise by ETC's 72nd GA, the AD Battalion of 90th Light CAB (LD36) was confirmed to be showcasing the new HQ-13 SAM system in action. The HQ-13, also known in its export variant as the FB-10A, provides SHORAD against aerial particularly drones. It is capable of engaging targets at ranges of 18 km and altitudes of 7,500 m, utilizing a dual guidance system that combines IR imaging with radio command correction. It clearly proves the seriousness of PLA's prioritizing of C-UAS and precision-strike AD capabilities.

HPM. The Hurricane-3000 HPM C-UAS platform made its first active-duty appearance at the September 2025 parade. It uses gallium nitride semiconductor technology, as per Chinese website, to achieve an output power of 2,000 megawatts at an effective range of 3,000 m. It is claimed to simultaneously intercept 12 targets within 15 seconds. Thus, this cluster target processing capability will be very important for mitigating enemy's "swarm" tactics. It theoretically possesses "near-unlimited ammunition" allowing it to continue fighting as long as sufficient power supply is provided. [125]

Figure 49: Hurricane 3000 HPM

(Source- Sino-Defence Forum)

TD-827C C-UAS UAV. One latest C-UAS options, not confirmed inducted in PLA is the TD-827C C-UAS drone. Its claimed capabilities include shooting a 3m² net to capture and disable unauthorized drones, autonomously tracking and capturing drones without minimum operator input. [126]

Figure 50: TD-827C C-UAS UAV

(Source-Sino-Defence Forum[127])

Key Technology Advancements

Breakthroughs in the performance of military drones rely heavily on technological support from all aspects of the industry chain. Thus, PRC has taken dual-purpose technological advancements in drones, space and cyber domains to a very advanced level of civil-military fusion. While there is an array of technological drones'

advancements, only key issues being pursued by Chinese drones' industry and PLA are discussed below in the succeeding paragraphs.

Component Materials. In the field of core materials, carbon fibre composites have become mainstream. Their lightweight and high-strength properties can facilitate weight reduction of the drone's airframe by more than 30%, while simultaneously refining stealth capabilities. Currently, composite materials account for 60%-80% of the composition of mainstream drones. The US X-45 UCAV and China's Wing Loong-2 both extensively utilize carbon fibre components. [128]

Variable-Geometry UCAV. A Chinese research paper has proposed the concept of undertaking transformation from tailed to tail-less UCAV depending on mission profile and flight regime. The proposed model may have a MTOW of 15 tons with payload of 800 kg and a T/W ratio: 1.02.[129]

AI-Powered Drones. Chinese drone companies are increasingly providing simple AI chips to be placed on variety of drones particularly sUAS to make it fully AI-enabled. Variety of such AI modules can be seen on various propaganda coming out of China in numerous exercises and events. This Intelligentisation of drones is providing both options to PLA- fully autonomous mode wherein a drone may take off and engage a target on its own or assistance mode- wherein the AI algorithm facilitates the human operator in ease of handling of drone, flying in a jamming or GNSS-denied environment, automating target recognition and finally target engagement through target lock-on etc.

Figure 51: AI Powered FPV Drones on Display at PRC's Changchun Air Show November 2025

(Source- Sino-Defence Forum[130])

QAI Enablement. A November 2025 article by Hongkong based SCMP claims that PRC's three institutes Chip Hub for Integrated Photonics Xplore (CHIPX), Shanghai Jiao Tong University, and Turing Quantum, have jointly achieved technological breakthrough in co-packaging of photons and electronics, chip-level integration and claimed world's first wafer-scale mass production of photonic quantum chips. This is already boosting its aerospace industry[131] and will thus strengthen the Quantum AI (QAI) enablement of drones in sensing, secured communication, faster analysis and compressed kill chains.

Bionic Mosquito Drones. A recent Chinese propaganda video showed their latest bionic "mosquito drones" which PLA's National University of Defence Technology is calling "invisible assassins" on the microscopic battlefield. This drone weighs only 0.3 grams, and supposedly integrates complex systems including sensors, control chips, miniature cameras, and power units, achieving a manufacturing precision of 50 nanometres. The mosquito drone's wings can vibrate 500 times per second, enabling stable flight in extreme environments simulating Force 8 winds. The PRC media claims that its flight posture is a near-perfect replica of a real mosquito. Everything is seemingly identical to the biological prototype from hovering in the air to the subtle limb movements during landing, and thus its highly biomimetic design is claimed to be indistinguishable to the human eye. The Chinese media further elaborates its claims as: -[132]

> "*The mosquito drone achieves ultra-low noise and near-heat-free characteristics, giving it a "natural stealth" effect against traditional detection methods such as infrared radar, making it virtually undetectable in the battlefield environment. With its extremely small size, it can disguise itself as a swarm of mosquitoes and silently infiltrate key areas such as enemy command centres and military facilities, using its built-in sensors to collect intelligence in real time, while remaining undetected by enemy defence systems. The mosquito drones can construct high-precision battlefield situational awareness networks with a positioning accuracy of up to 5 cm. They can also carry electronic jamming equipment to interfere with critical enemy electronic devices; and can even be equipped with miniature combat weapons to form attack swarms and conduct saturation strikes against key targets. In the civilian sector,*

mosquito drones also hold great promise. In disaster relief, they can penetrate deep into crevices in rubble inaccessible to search dogs, using infrared and acoustic sensors to locate signs of life. In industrial inspection, they can infiltrate large machinery to inspect for minute faults, avoiding the inefficiency of downtime dismantling. In the medical field, there are even plans to use them for intravenous injection, delivering drugs directly to the lesion and providing new approaches to the treatment of diseases such as cancer."

Bionic Pigeon. PLA's bird-like flapping-wing drone "Pigeon" is small in size, lightweight, has good concealment, and does not produce noise from rotor movements, making it difficult for radar to detect and identify. PLA is likely to employ it to infiltrate dense deployment areas for secret reconnaissance or infiltration missions. Its body is equipped with a high-resolution camera, GPS antenna, and is paired with a flight control system and satellite data link, allowing real-time transmission of collected intelligence images via satellite communication. Additionally, it is equipped with anti-shake software to ensure clear and stable imaging during flight, unaffected by flapping wing movements. Due to the realistic appearance and low noise characteristics of the "Pigeon," it can attract flocks of birds to fly in formation. Even if detected by radar, it can easily deceive human eyes thereby causing a loss of alertness and achieving a deceptive effect. [133]

The PRC's technical community is not only applying bionic technology to aerial drones but also has many products published for land and underwater environments, mimicking the appearance and movement postures of various real animals, continuously evolving and enhancing secret surveillance and reconnaissance operations through deceptive camouflage and other packaging. [134]

Micro-Robots. Beihang University is claimed to have developed a biomimetic "insect" robot, only 2 cm long and weighing 1.76 grams. It integrates independent systems for energy, control, and communication, and can move freely without external equipment. The Chinese are planning to integrate these with mosquito drones to form a three-dimensional combat network of "aerial reconnaissance + ground infiltration".[135]

Brain-Computer Interface Technology Applications. In recent years, the PRC's S&T community has showcased its research achievements in brain-machine interface technology combined with biomedicine, computer technology, and communication engineering through various academic exchange meetings. Most importantly, PLA is trying to integrate brain-machine interfaces for swarm control technology in drone formation flying. PLA realises that this technology still has a long way to go before it can be used militarily, with limited control radius and operational range. However, it is still working on the technology to fully control the billions of neurons in the brain to develop brain-machine interface technology, combined with swarm control and biomimetic technology. The most likely ambition is to make small drones to appear in enemy areas in ways that are not easily perceived by the naked eye, or to infiltrate adversarial critical infrastructure, conducting intelligence gathering or secret sabotage missions, and making them tools for special operations. [136]

Tactical Multi-Domain MUMT Test Exercise – 76th GA / WTC

The PLA is learning lessons closely from the Ukrainian war where they highlight that the unmanned equipment has rendered traditional warfare methods insignificant. The unmanned equipment has been employed for missions from reconnaissance and surveillance to firepower strikes, from mine laying and clearing to persuading and capturing enemy soldiers, drones, unmanned vehicles, and other equipment, with their unexpected tactical effects and cost-effectiveness. Apropos, robot dogs jointly developed by China Ordnance Equipment Group and CloudDeep Technology, made their appearance at the 2024 Zhuhai Airshow. Under the concept of "Let Machines take the first bullet", PLA aims to integrate aerial drone swarms with ground-based unmanned combat vehicles and individual soldier exoskeleton systems, and various types of equipment to establish an interconnected and organic MUMT.[137]

Multi-Domain MUMT Exercise by CAB ex 76th GA. With the aim to establish such integrated multi-domain MUMTs, Chinese articles talk about a recent exercise conducted by the 76th GA. While PLA confirmed the induction of robot dogs and UGVs with a CAB under 71st GA / ETC at the 3rd September 2025 grand military parade, this exercise on Tibetan plateau supposedly in mid-2025 confirmed the induction of quadruped robot dogs with a CAB in the 76th GA / WTC. Chinese article claims that

the CAB established a **three-tiered unmanned equipment system at the brigade, battalion, and squad levels forming an integrated air-space-ground reconnaissance and strike chain** and using the classic **"three-three system" tactical formation** to traverse the battlefield as under: -[138]

- The **brigade** level is equipped with **long-endurance reconnaissance drones**.
- The **battalion** level is equipped with **reconnaissance and strike drones**. The unmanned combat team supposedly can autonomously network within a 2-km radius and support up to 30 nodes to coordinate operations. This systematic combat capability makes it even more powerful on the battlefield.
- The **squad** level is widely equipped with **consumer-grade modified drones and adopted a "three-three" tactics with robot dogs**. Each infantry squad is equipped with three quadruped robotic dogs each, **forming three combat MUMTs** with nine soldiers, each fulfilling their specific duties while working together in unity.
    - The 1st robot dog is equipped with a thermal imager and a laser rangefinder, serving as the forward reconnaissance eyes. The 2nd robot dog is equipped with a machine gun and a grenade launcher, transforming into an iron fist for fire support. The 3rd robot dog serves as a tactical reserve, capable of flexibly switching between anti-armour and anti-aircraft modes, making it a versatile fighter against the enemy.
    - This formation expands the combat radius of a single squad by more than three times and increases firepower density by more than two times, fully demonstrating the concept of distributed lethality and creating a disruptive impact on traditional infantry tactics.

Simulation Exercise for Land-Based Hexagon Warrior CAB by NORINCO.

Chinese propaganda of the latest "Land-based Hexagon Warrior CAB" test exercise undertaken by NORINCO involved a wide range of drones to choose from. The exercise showed the following sequence of combat actions by unmanned assets[139]: -

- **Reconnaissance Forces "Penetrate" / “Flying Frog”**. Initial recce by BZK-05 MALE drone for early warning of targets to locate their positions, determine target parameters, guide attacks, or take other strike actions.
- “**Smart Brain” of the Command Centre**. PLA’s satellites, ground reconnaissance networks, and radar systems closely collaborated to converge and download massive amounts of intelligence into the "Smart Brain" of the Command Centre.
- **“Raid + Overlook”**.Fielong-80A VTOL UAV maintained overwatch over the target as the PCL-181 Self-Propelled Howitzer (SPH) engaged the targets.
- **Coordinated Strikes by the Unmanned Combat Swarms**. Under the command of the "smart brain" of the Command Centre, unmanned swarms launched a rapid offensive
- **“Nerve Severer” and “AD Buster” / “Flying Falcon” Drone**. ASN-301 anti-radiation LMs penetrated the adversary air space to engage enemy’s AD radars, and Command and Control Centres.
- **Armour Hunter / “Black Bee” Drone**. Networked Fielong-60A LMs were launched as they possessed both reconnaissance and strike capabilities to hunt armoured targets.
- **"Fire Sweeper" Reconnaissance and Strike Drone / “Flying Whale” Drone**. The rotary wing UCAVs Carrying Blue Arrow / HJ missiles undertook precise interception and destruction of "enemy" reinforcements.
- **"Heavyweight Terminator"**. Vehicle-mounted anti-tank loitering munition launched a lethal strike on the remaining heavy targets.
- **Clear**. This stage involved saturation strikes by light and small drones.
- **Denial**. In this stage, the anti-drone systems were activated. The integrated system intercepting enemy’s aerial attacks comprised multi-level, multi-stage and multi-method C-UAS platforms- lightweight anti-aircraft missiles, a combined missile and gun AD system, high power lasers anti-nuclear system kills the enemy silently and invisibly.

PLAGF Equipping

The PLAGF primarily commenced using the 300kg-class ASN206 UAVs at the CAB level approximately around 2018. At the CABn level, PLAGF equipped them with the 10kg-class CH-802 UAV, like the American Raven UAV. The CH-802 was given to the guard and reconnaissance companies of armoured brigades and motorized infantry brigades before 2015 reforms, but was widely deployed with CABns by 2015. With effect from 2018 onwards, PLAGF started replacing CH-802 with lighter and advanced version CH-902 at CABns level. Similarly, at the CABs, the UAVs were upgraded to the ASN206 UAVs previously used by Group Armies. This upgrade allowed the PLA brigade-level units to achieve a reconnaissance depth of over 100 km, and the battalion-level reconnaissance depth to increase to 20 km.[140] Most Chinese articles towards a new trend where **PLA plans to have a drone squad in every company, drone platoon in every battalion and a drone company in a brigade with C-UAS capabilities** too included.

Combined Arms Battalions (CABns). PLA, post its 2015 reforms, has ensured the modularity of its combat companies- whether infantry, tanks or mechanised infantry, to raise standard Heavy, Medium, Light, Amphibious or Mountain CABns during peacetime and flexible during war time as per combat situation.

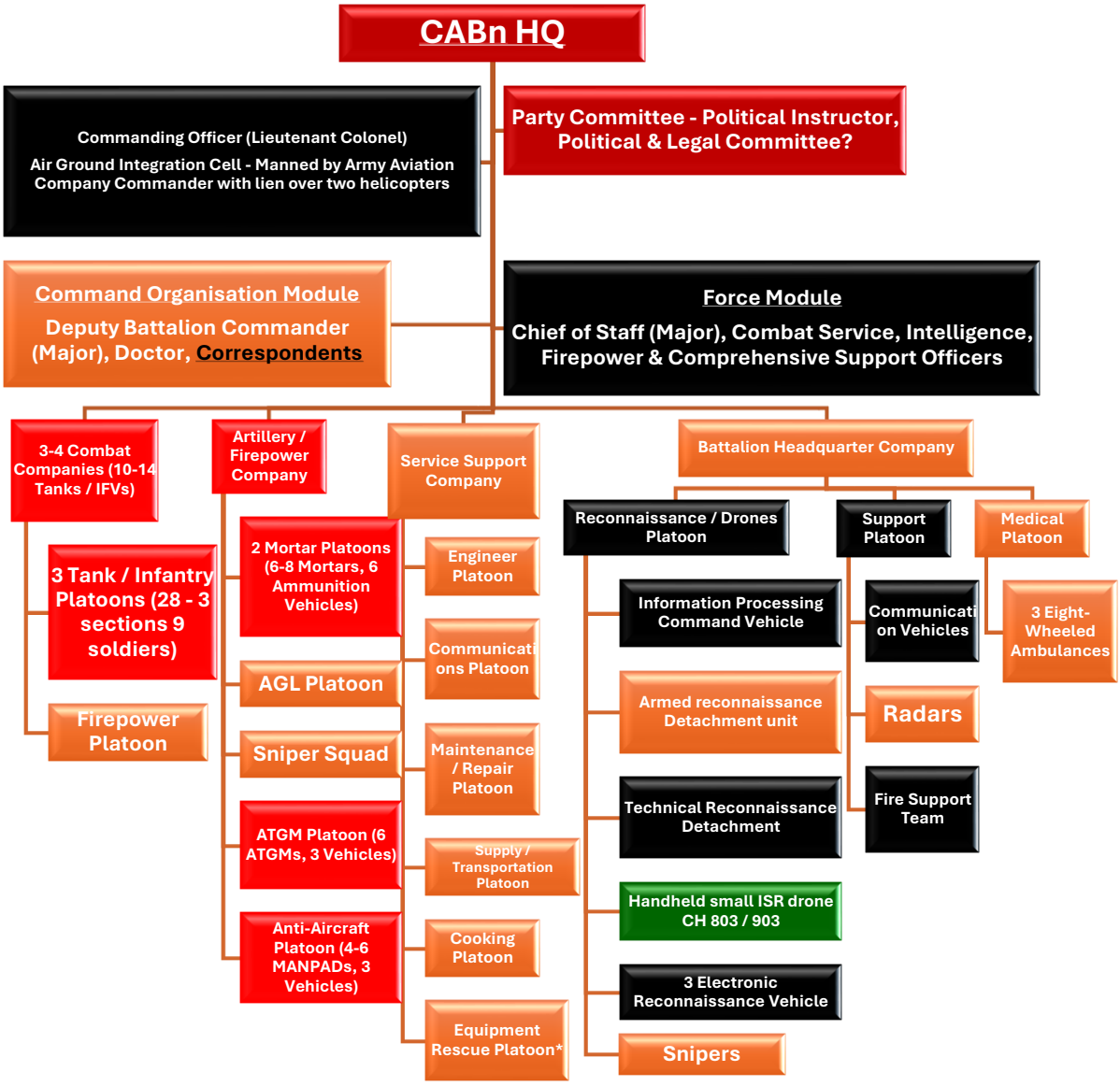

Figure 52: Standard Combined Arms Battalion (CABn)

(Source- Author's Book PLA's Tactical Transformation)

It's amply clear that the drone warfare tactics employed by the Russian and Ukrainian militaries are being systematically and extensively applied by the PLA at the battalion level. Various PRC's official, semi-official and unofficial media and Chinese netizens claim the following: -

- The CABns in many cases have 100% manpower trained on drones with approximately 80% proficient. One article goes on amplify this point: -

  "*A CABn of a CAB under the 76th GA has not only achieved "every soldier in the battalion can fly drones," but has also built a complete operational*

ecosystem encompassing assembly, maintenance, tactical modification, and individual soldier carriage."[141]

- They have inducted a variety of drones – First Person View (FPV), Bombers (may also be called Multi-Munition Dispenser System, MMDS), recce and short range (sUAS). PLA has not followed the Russian or Ukrainian model of specialised drone units but undertaken systematic training of its CABns. The Chinese propaganda claims that: -

Figure 53: PLA's Backpack that can hold six FPVs externally, with two side pockets for Goggles and Controllers

(Source-CCTV 7 and Sino-Defence Forum)

"*Ordinary infantrymen can not only skilfully operate suicide drones, but also switch operating modes according to mission requirements, turning drones from "special equipment" into "standard equipment for individual soldiers." The specially developed drone backpack is a "tactical marvel": the exterior features a* ***quick-release design that can securely carry 6 suicide drones****, which the pilot can retrieve in seconds; the interior has reserved battery compartments and warhead storage space, and can be equipped with anti-personnel fragmentation warheads and anti-armour shaped charge warheads, achieving "****one drone, multiple functions, and on-demand switching****. Each infantry squad can instantly gain the capability for six precision strikes during an offensive, completely breaking the traditional infantry combat cycle of "probing-calling-waiting. This battalion, however, achieves* ***"detect and destroy": drone pilots accompany the infantry advance****, delivering strikes to exposed targets within seconds. CCTV footage shows that drones have been integrated into squad-level tactical formations."* [142]

- They have inducted a variety of Counter-UAS (C-UAS) systems within a CABn – Shotguns, MANPADS (Man-portable Air Defence Systems) and maybe lasers too.

Drones within a CABn. It's absolutely clear that PLAGF has been able to induct drones up to squad / section level in most CABns and is planning for the complete army at the earliest possible. A possible array of known and unknown scales of drones is elucidated at the figure below in a CABn.

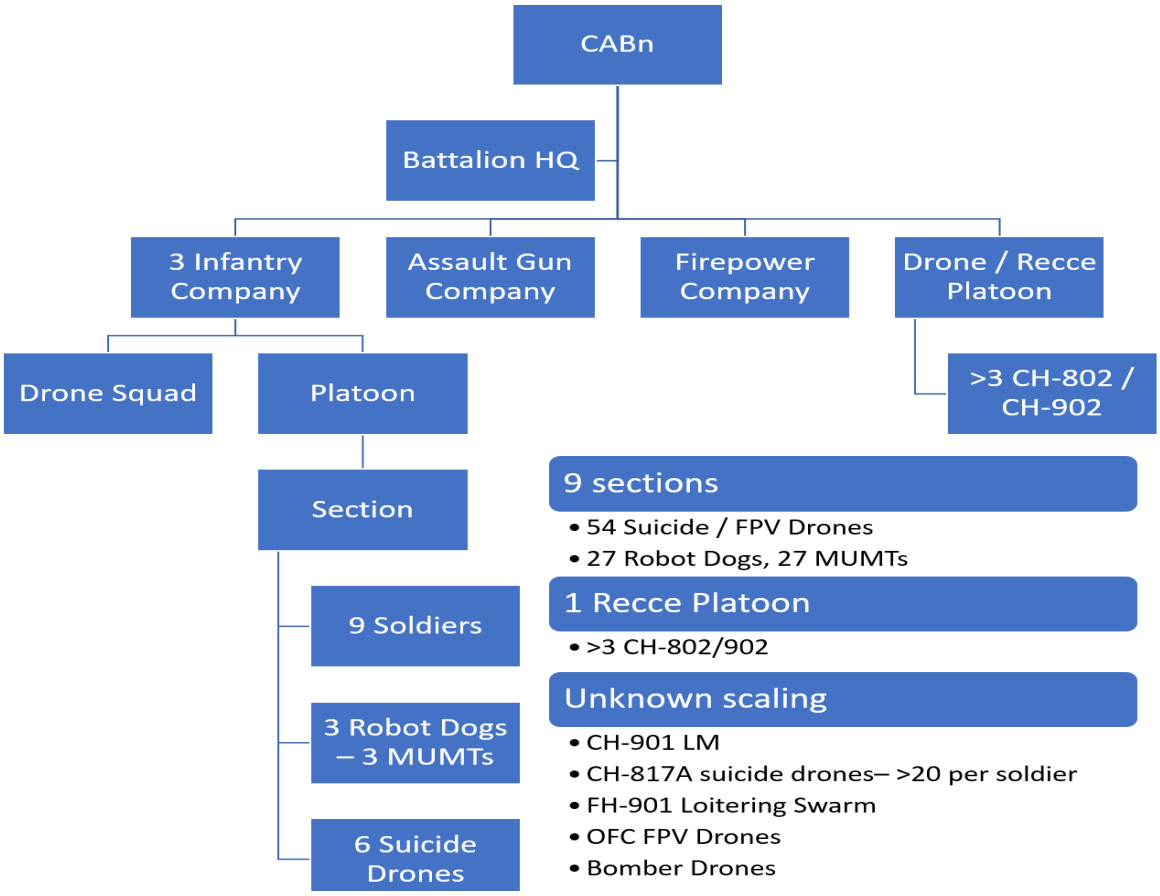

Figure 54: Appreciated Holding of Drones and Robot Dogs in a CABn

(Source-Author's Research)

While UGCVs have not been discussed separately in this monograph, PLAGF has inducted robot dogs and UGCVs in various CABs as shown with 71st GA during the September 2025 military parade or otherwise with the 76th GA as such. Thus, it's important to analyse the tactical employment and possible battle array at company level. As witnessed during the two unmanned assaults in the Ukraine war, PLAGF will

most likely adopt multi-domain UVs within the offensive battle array and company level defended localities even in HAAs.

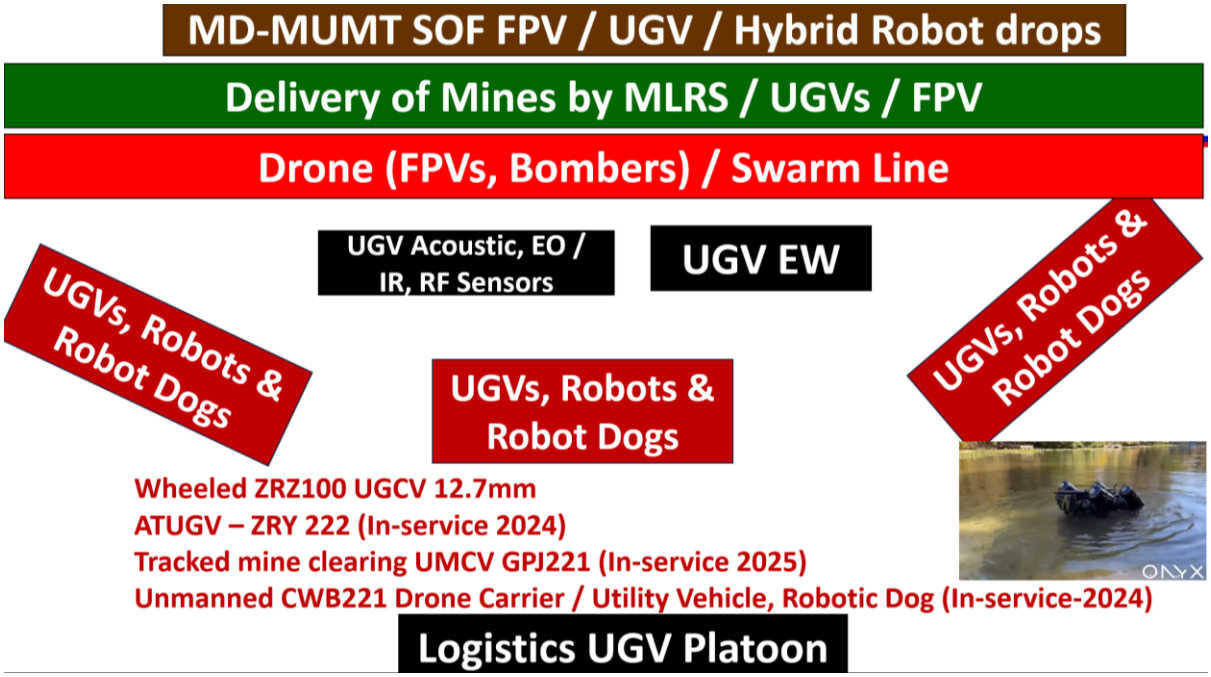

Figure 55: Appreciated PLA's Employment of MDUVs

Combined Arms Brigades (CAB)

PLA, like the integral CABns, has variety of CABs – Heavy, Medium, Light, Amphibious, and Mountain. A standard CAB has four CABns, and five other battalions- Recce, Artillery, AD, Combat Support and Service (Logistics) Support. The key battalions holding drones are the CABns already discussed above, the Recce Battalion, the Artillery Battalion and the Combat Support Battalion.

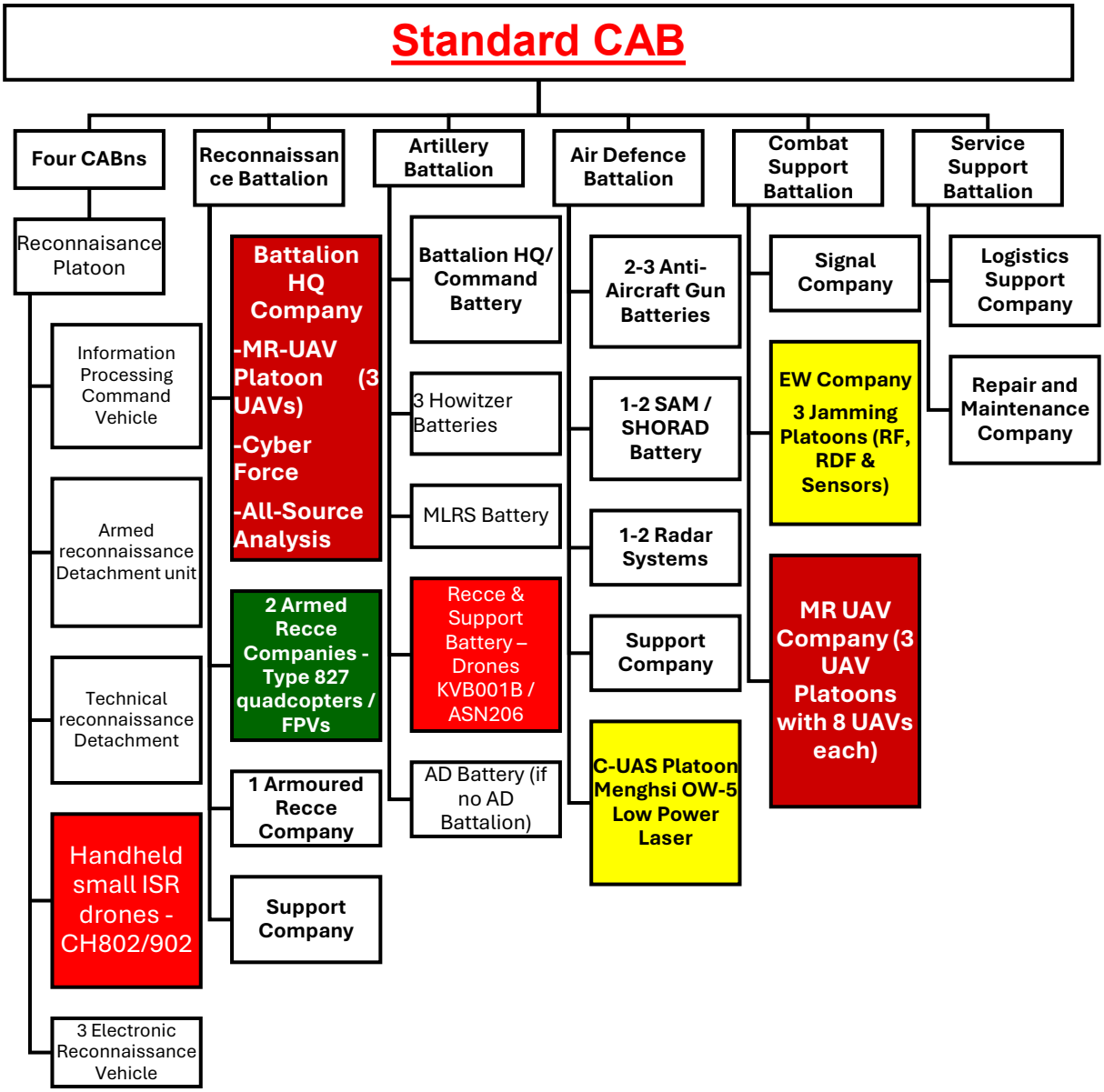

Figure 56: Standard CAB's Organisation

(Source- Author's Book PLA's Tactical Transformation)

Figure 57: Drone Platoon of a Reconnaissance Battalion CAB of 74th GA / STC

(Source- PLA Daily[143])

A CCTV documentary of the 03 September 2025 also displayed the formation badge of one of the PLAGF soldier which indicated the establishment of C-UAS platoons in a CAB which could probably be within the organisation structure of a PLAGF AD Brigade or SAM Brigade or maybe even CAB's AD Battalion.

Figure 58: PLAGF Formation Sign Displaying the OW5-A50 Laser Weapon as part of a C-UAS Platoon

(Source- CCTV)

Analysis of various Chinese media and western analysis of PLA including US TRADOC assessments reveal the appreciated holding of drones within a standard CAB: -

- Total 600-700 UAVs with nearly 27 MR, unknown number of suicide / FPV / OFC FPV, and bomber drones, 9 SR, >16 Handheld (CH-802/902), LMs, KVB-001 UAVs with Artillery battalion and transport drones. The appreciated total demand for the entire PLAGF is approximately 60,000-70,000 drones excluding expendable drones.[144]
- With inclusion of suicide drones/ LMs, the total number needs to be estimated in the hundreds of thousands. [145]
- The current number of small drones at the grassroots level and large drones at the Corps level is still insufficient, requiring continuous expansion to achieve full-domain coverage. Artillery reconnaissance drones are basically in place, and other types are being rapidly deployed. [146]
- The demand for suicide drones and LMs has expanded from "hundreds of thousands to millions," representing a key area for future growth. [147]
- A range wise holding of drones in a CAB is tabulated below for easy assimilation of CAB's capabilities.

Distance	CABn	Recce / Artillery / Combat Support Battalions
15-20 km	**ISR** – CH-802 / CH-902 **Strike** – OFC FPV Drones; CH-817A suicide drones; Bomber drones; CH-901/BZK-08 LM **C-UAS** – MANPADS, Shotguns	**ISR** – CH-802 / CH-902 **Strike-** ASN-301 Anti-radiation LM
Up to 150 km & beyond		**ISR** – ASN-206 **Other** - communication jamming (RKT164, RKT167), communication relay (TKJ226), decoy (RKL165) & ECM (RKZ167) **Strike** – UPMK Kits, FH-901 Loitering Swarm; H16-V12; CETC's Swarm; Fielong-300A LM

Table 3: Range Wise Capabilities of a CAB

It's important to appreciate the possible employment of drones by a CAB across various zones, in conjunction with drones from higher echelons. A table below appreciates the quantum while an infographic after that appreciates the employment in tactical battle area.

Type	Percentage	Daily Sorties	Purpose
ISR	35%	80-120	Continuous surveillance
Strike – FPV / LMs	15%	60-90	Precision attacks
OWA	5%		
Bomber	10%		
EW	5%	30-45	Jamming/deception
Decoy	15%	20-30	Saturation/confusion
Relay	5%	10-15	Communication extension
Interception	10%		

Table 4: One Assessment of PLA Drones Mixture Analysis

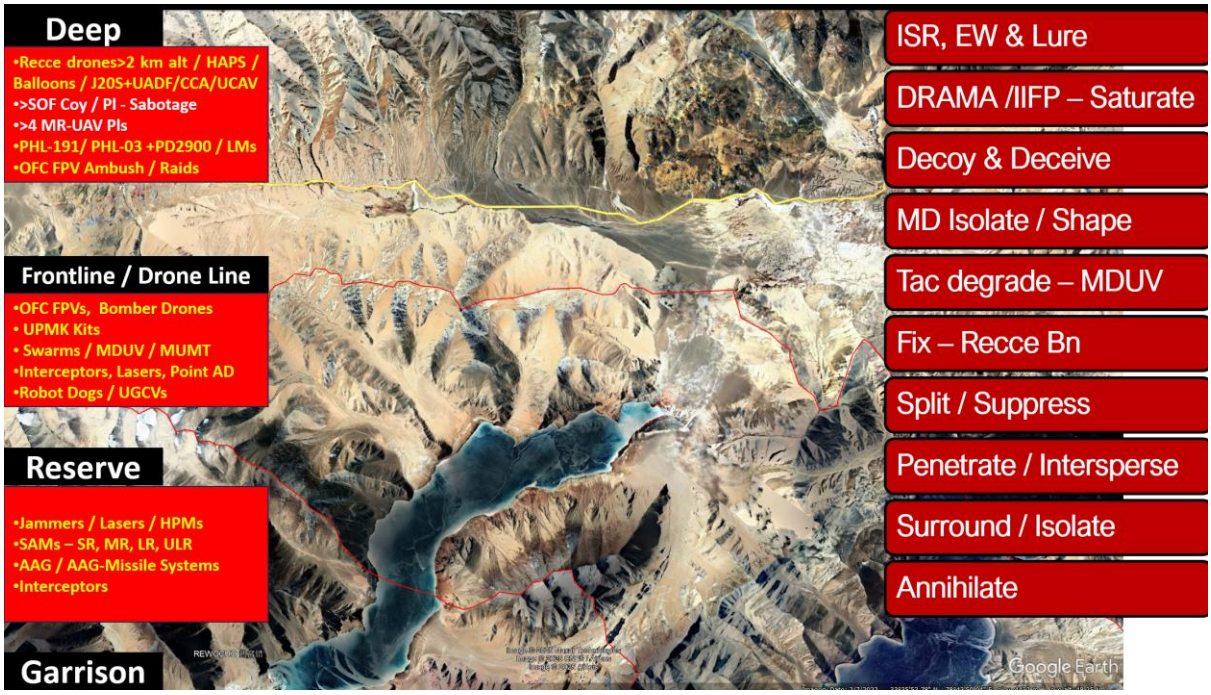

Figure 59: Appreciated Tasks and Varieties of PLA's Drones in TBA

(Source-Author's Appreciation)

WTC. After taking into account assets ex GAs, MRs and PLAAF, WTC's holding of drone organisations is represented as a graphic below.

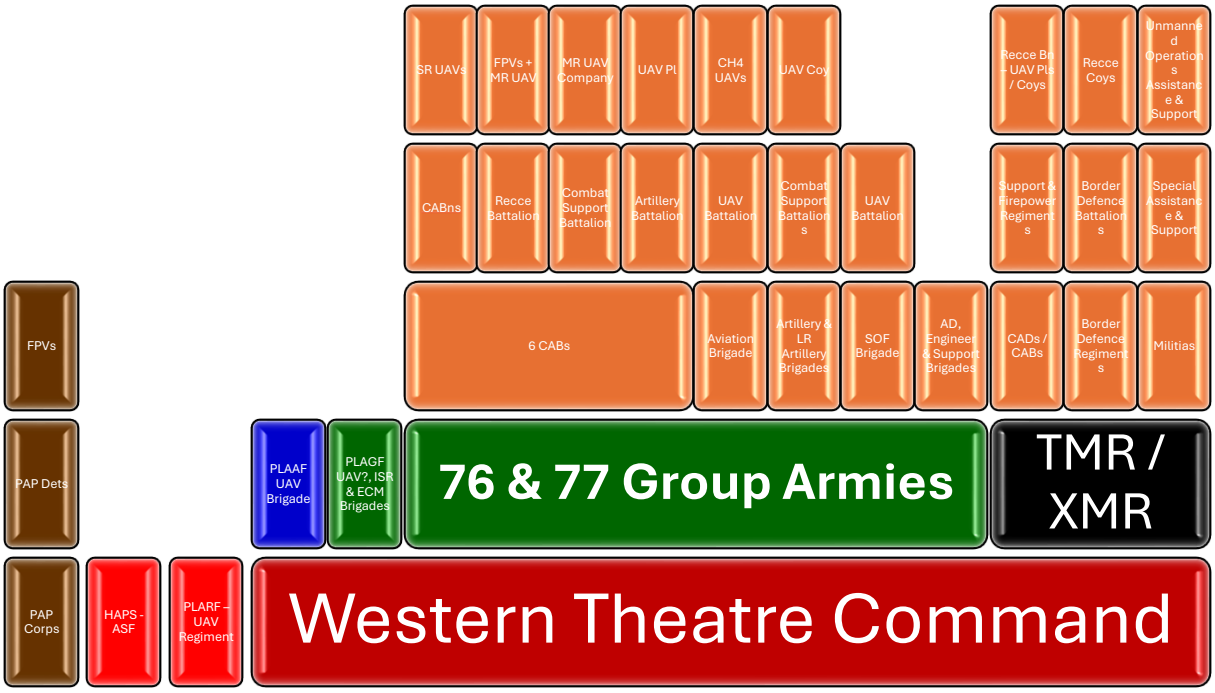

Figure 60: WTC's Array of Drone Units

(Source- Author's Appreciation)

Implications and Takeaways

Although the PLA has been working intensely on developing fully AI-enabled swarm technology, its key technologies are not yet mature. There are still limitations and weaknesses in swarm control and biomimetic technology. The major Russian drone suppliers in various online interviews have also highlighted the limitations of Chinese drones particularly combat-hardening. However, the gap with India is till widening significantly. The key implications and takeaways are elaborated below.

Chinese Methodology of Drones Improvements. As per a Taiwanese Army Officer in his 2023 report, the PLA first stabilize their basic requirements for integrated reconnaissance and strike capabilities in every new drone model. They want their drones not only to have reconnaissance capabilities but also to be able to strike immediately after detecting a target, to shorten operational efficiency. Thereafter, PLA focusses on enhancing endurance capabilities, enabling its drones to perform tactical to strategic reconnaissance in different airspaces. Thereafter, they improve the performance of existing models, by increasing weapon payload capacity, flight speed, or altitude ceiling limits. [148]

Drones Production Shortfalls. Citing data of 2023, a Chinese article highlighted the need to meet the surging demands of drones.

> "*China's military drone market size reached approximately $2 billion in 2023, with an annual growth rate exceeding 7%, and production capacity provides a foundation for scale expansion. Its global military trade market share reached 17% (2010-2020), ranking third, and export potential is supporting the upgrading of domestic equipment. There is a significant gap between the current deployment quantity (nearly 3,000 units) and the target demand (over 70,000 units for the Army + consumable incremental units), reflecting that the armed forces are still in a phase of rapid expansion*." [149]

Global Supply Chain Domination. In the key component segments, the PRC has formed a complete industrial chain, from flight control systems and power units to mission payloads. Domestic companies such as Jilin Chemical Fiber and Zhongjian Technology have achieved independent supply of component materials, breaking the

international monopoly. In the flight controller field, companies like FastBee and FlyingWing hold major global market shares; in motors and propellers, brands like T-Motor and Wingfly offer products that combine performance and cost-effectiveness; and lithium battery supply is another area of strength for China, with companies like Grepow providing stable power for drones using lithium polymer batteries. This complete industrial chain advantage not only supports domestic drone R&D and production but also enables global domination of drones' components supply chain. A prime example is that China holds over 70% of the global FPV drone production capacity share, making it the core of the global low-cost drone supply chain. [150]

Integration of Data Links and Satellite Control. PLA realises that data links serve as the "nerve centre" for its informationized warfare. Apropos, PLA's DTS-03 tactical data link (exhibited at the Zhuhai Airshow, similar to the US Link-16 data link) and the XS-3 broadband high-speed data link (publicly released by the China Aerospace Long March International Trade Company) demonstrate its advancements in transmission speed, capacity, confidentiality, and anti-electronic interference technology. PLA is thus rehearsing integration of increasing number of operational units, weapons, detection, and command systems on land, sea, air, space, and electronic domains to achieve Multi-Domain Integrated Joint Operations (MDIJO) capability. The parading of ISF on 03 September 2025 showed PLA's intentions to establish a comprehensive data link for the entire military, installed on various equipment such as aircraft, ships, and ground-based systems, achieving high-speed data communication for joint operations amongst the CPC's three armed forces and four services and arms within PLA. The claimed key characteristics of its data links are confidentiality, anti-jamming, and beyond-line-of-sight communication and frequency hopping capabilities. As per ROC's army report: -[151]

> "*In terms of networking technology, it (PLA's data links) can form a network independently without fixed facilities. Each network member can quickly enter and leave the network, providing greater flexibility. Small civilian drones, due to their low cost and limited power, are often used as reconnaissance, surveillance, and attack weapons. Generally, they do not have a specially installed data link function, but data links can be combined and used in unmanned aerial vehicle "aircraft carriers" that can accommodate small drones. Through data link command, "drone swarm operations" and asymmetric*

warfare methods can be constructed, utilizing satellite guidance to provide high-precision synchronized status for various operational units of the "integrated command platform" in the air and on the ground."

Countering Swarm Drones. Drones, in swarms must continuously coordinate control through information exchange within the group, relying on core control technology to simultaneously interact with multiple ground control stations. To maintain a cluster formation, communication must be established. The C-UAS platforms by using advanced EW soft-kill methods, can disrupt and block the control signals of major cluster nodes thereby rendering the cluster capabilities ineffective, ensuring collapse, or even causing total loss. [152]

Bionic Drones. In pursuit of realism, they face significant limitations in size and kinetic energy. Although they are not easily detected by radar, they are still susceptible to environmental weather influences and electromagnetic interference. In addition to detection via radio, human vigilance is still required in peace time to avoid sabotage by enemy agents[153] as seen in the recent possibilities in the Delhi blast in November 2025.

Combat Application Scenarios. PLA's planning of employment of its military drones has expanded from traditional reconnaissance and strike capabilities to diverse fields such as EW, communication relay, and autonomous resupply. In urban warfare, they plan to employ sUAS to penetrate building gaps to conduct indoor reconnaissance; in ocean-going operations, shipborne unmanned helicopters are planned to extend the EW range of carrier battle groups; and in logistical support, unmanned transport platforms are planned for achieving precision logistics. With the integration of AI, quantum and advanced sensor technology, Chinese want to ensure that future drones will possess stronger autonomous decision-making capabilities, further reducing reliance on human control and becoming "intelligent combat units" on the future battlefield.

Major UAV Factories. The major PRC's UAV factories are tabulated below: -

Factory	UAV	Location	Coordinates
CAC's 132nd Factory	WL series	Huangtianba Base in Chengdu	30°42'12"N 103°56'58"E
Tengden UAV Factory	HA-001, TA-001, TB-001	Liangping, under PLAAF Central Maintenance Base	30°40'46"N 107°47'10"E
Chengdu Aircraft Industrial (Group) Company		Zigong/ Fengming under PLAAF Central Maintenance Base	29°22'37"N 104°37'32"E
162 Factory - Guizhou Aviation Industry Company (GAIC)/ Shuangyang Aircraft Manufactory	WZ-9 / EA-03 UAV	Anshun/ Huangguoshu	26°15'39"N 105°52'26"E

Table 5: PRC's UAV Factories

(Source- Author's Research and Scramble PLAAF ORBAT site[154])

Figure 61: Chengdu Aircraft Industrial (Group) Company's UAV Manufacturing Base at Zigong / Fengming in PRC's Sichuan Province 29°22'37"N 104°37'32"E

Scramble ORBAT site claims that "*On 29 April 2024, AVIC Chengdu Aircraft Industrial (Group) Co., Ltd. and the Zigong municipal government jointly started an industrial base focused on producing unmanned aerial vehicles at Zigong/Fengming General airport*" [155]

Collusive Provision to Pakistan. While PRC has significantly assisted Pakistan in production of drones, Pakistan military is now acquiring HALE and MALE drones majorly from Türkiye. However, the major issues to be noted now are: -

- The Wing Loong UAVs for Pakistan are produced by the CAC's 132nd Factory located at Huangtianba Base in Chengdu, Sichuan.[156]

- The South China Morning Post article of 02 November 2025, quoting Chinese defence manufacturer NORINCO's report highlighted the cost-effectiveness of China's mass-produced suicide drones like Feilong-300D as an appealing acquisition for potential customers such as Pakistan by elaborating that "Should the Pakistani military procure significant quantities, the Feilong-300D would be offered at an exceptionally attractive price, potentially as low as US$10,000. The Feilong-300D could provide an affordable yet highly capable weapon option for smaller nations."[157]

Confirmed Deployments in WTC

Malan /Uxxaktal (ZWML) is the most important PLAAF's UAV Base in the entire PRC with most UAVs being tested there. WL-1 UAVs made its first appearance at Malan around 2011. The satellite images of Malan base always provide a view of wide variety of Chinese drones under test or induction. In 2025 itself, a massive flying wing drone was imaged on the base. [158] PLA has recently made a new HAA UAV test in near India-Tibet border. The confirmed deployments witnessed in WTC over the last four years are tabulated below.

Location	UAV / UCAV	Formation	Coordinates
Aksu / Wensu	CH-5	Battalion ex 178th UAV Brigade	41°15'47"N 80°17'22"E
Damxung / Donshoon	CH5, WZ7, WL series	WTC PLAAF	30.491208N 91.076529E
Huangtianba, Chengdu	Wing Loong	132nd Factory CAC ex PLAAF's Central Maintenance Base	30°42'12"N 103°56'58"E
Gar Gunsa / Ngari / Shiquanhe	CH4B / KVD002, WL series	XMR / 84th GA	32.104957N 80.057952
Golmud	WZ7, WZ9?	WTC	35.7171N 94.0148E
Guma	WL series	?	37.6145N 78.2282E
Gyantse	Unknown UAVs	?	28.8714N 89.5321E
Hotan	BZK-005, BZK-006, GJ-1, GJ-2	178th UAV Brigade, Serial number 53x3x	37°02'24"N 79°51'42"E
Kashi / Kashgar	CH4B / KVD002	UAVs first seen in 2014; XMR / 84th GA	39°32'33"N 76°01'12"E

Lhasa Gonggar	BZK-005	Battalion – 178th UAV Brigade	29°17'53"N 90°54'44"E
Lhunze / Serche	CH-4B /KVD002, WL series	TMR / 85th GA	28.42225N 92.343616E
Malan/ Uxxaktal	WL1, WZ9, WZ10	178th UAV Brigade, Serial number 78x9x	42°10'51"N 87°11'11"E
Pangta	CH4B/ KVD02	77th GA?	30.545592N 97.108623E
Shifang	CH4	77th GA?	31.118198N 104.00481E
Shigatse Hoping	WZ-9, CH4	178th UAV Brigade; TMR / 85th GA	29°21'08"N 89°17'06"E
Shiquanhe South East		New UAV HAA Test Base	32.4283N 80.2093E
Tashkorgan	CH4	XMR / 84th GA	37.660743N 75.294801E
Zhangye South East	BZK-005	178th UAV Brigade	38°48'08"N 100°40'30"E

Table 6: WTC's Drone Deployments

(Source- Author's Research and Scramble PLAAF ORBAT site[159])

Daily Production of Suicide Drones / LMs. The three and a half years plus of Russia-Ukraine War has shown that Russians started saturating Ukrainian AD when they started launching 500 plus Geran / Shahed class suicide drones in conjunction with missiles with maximum single day number being 800 Geran drones. The more relevant point is that while Russia was rapidly prototyping Iranian Shahed drones to mass produce its own Geran drones, the basic components both for Geran and smaller drones like FPV drones etc were all being provided by China. China was not only providing drones components for the Russia-Ukraine war but also for the Myanmar civil war and most of the other ongoing global conflicts. The biggest advantages of these kinds of drones are their capability to saturate adversarial AD at much lower cost with minimal production requirements. One Chinese blogger gave a very simplistic manner to quantify Chinese overcapacities for producing kamikaze drones in war. As per his calculations, PRC's production of electric motorcycles in 2024 was nearly 3.5 million and gasoline motorcycles was approximately 20 million. Additionally, China produced over 1.6 billion mobile phones and 25 million small gasoline engines in 2024 for various non-transportation applications like lawn mowers, generators, and water pumps. The blogger simply totalled the production of these circuit boards, housings, and power sources, to assume that in a comprehensive

mobilization, PRC could easily scale up production of kamikaze / OWA drones like the Iranian Shaheed annually to 25-30 million units. Thus, daily production is near 80,000 OWA drones over a range of 1,000-2,500 km. Thus, PRC's industrial share of approximately 40% of the global capacities is a frightening fact.

Even if we treat the above calculations as over exaggeration and complete propaganda, we can reasonably assume 1% of that capacity. The 1% capacity simply translates to 800 OWA drones per day. Thus, if Russia could launch 800 suicide drones on few days with PRC's help, PLA's daily 800 drones launch capabilities will be a safe assumption. **Hence, Indian military's "Mission Sudarshan Chakra" has to build capabilities to intercept multi-layered multi-stage salvos of 800 plus suicide drones flying 1000-2500 km from their launch point**, **in addition to anticipated conventional IRBMs and MRBMs and thousands of sUAS**. Additionally, assured Indian second-strike capabilities to display minimum credible deterrence requires guaranteed survivability, sustainability and resilience of own AD, airbase and SSM / MLRS / LM launch complexes.

Future Air Strike Package. In any future war, it's important to estimate as to what PLAAF's future air strike package. With J-36 and J-XDS prototypes shown and induction of GJ-11 confirmed and its naval variant GJ-21 paraded on 03 September 2025, PLAAF strike package should include a J20S led MUMT comprising GJ-11, GJ-X, CCAs, UADFs, J-36, J-XDS, J35s, J20As, CCA (x2), UADF (x2), KJ-3000, KJ-600, various tankers/special mission aircrafts, and various other UAVs.

Threat Library. It's absolutely essential to maintain a threat library of all possible Chinese drones with all possible entities to ensure effective and timely identification of aerial threats. These AI enabled threat libraries must be created by Indian military centrally and shared at the earliest with all possible affected entities including C-UAS startups and industry.

C-UAS Grid's Integration with AD and BMD Grid. Having learnt the Russia-Ukraine war lessons and watched Indo-Pakistan DRAMA conflict of May 2025 and Iran-US-Israel in June 2025, PLA went on to display an integrated convergent C-UAS,

AD and BMD capabilities across all levels, stages and domains. The same is illustrated in various layers and organisational structures.

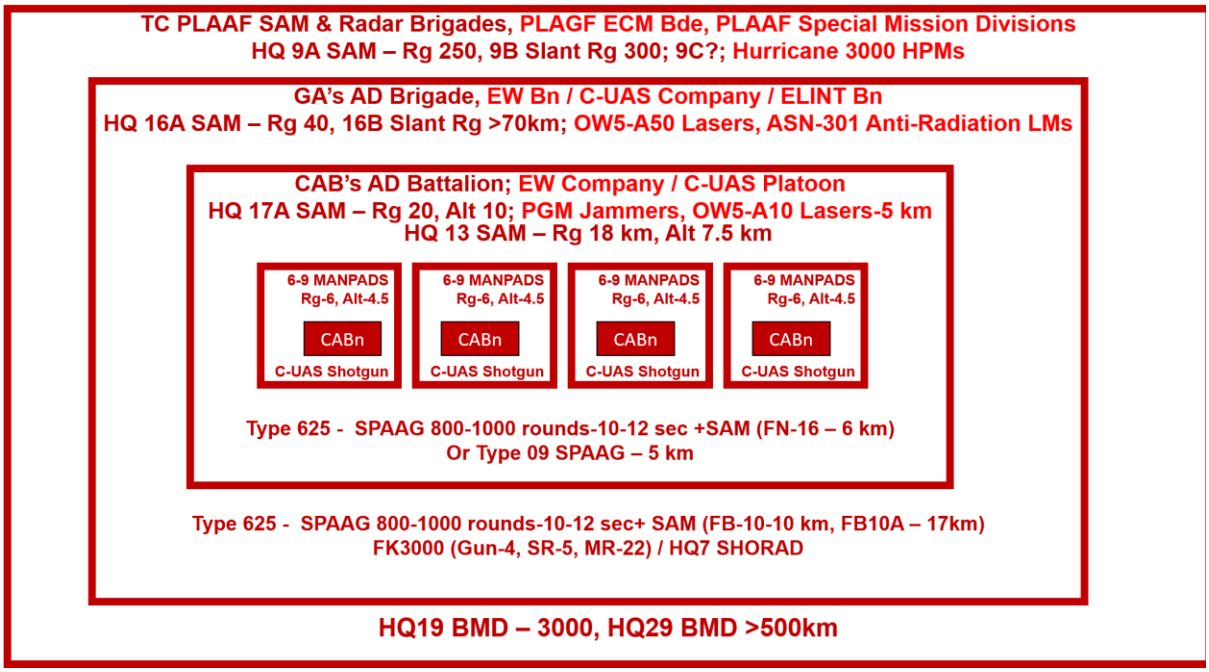

Figure 62: PLA's Multi-Stage Integrated AD, C-UAS and BMD Grid

Penetration of PLA's A2AD Bubble. Indian military in close collaboration with the drones' industry needs to undertake the following essential steps to penetrate the dense C-UAS grid of the PLA: -

- **Indigenous TEAM BHARAT**. No single Indian startup or even leading drone company can produce a fully indigenous drone today. **There is an urgent need to stitch a team which collaborates to build India's fully indigenous drone**.
- **Diverse Frequency Bands**. There is a need to change the RF policy for allowing diverse frequency bands for our drones.
- **AI Mapping**. The drone, satellite, DRDO, ISRO, Indian military and government agencies need to build a fully indigenously seeded AI-based mapping solution for autonomous flying of drones across the border in a GNSS-denied and densely contested EM environment.
- **CRPA Jamming Resistant Antennas**. CRPA antennas which are jamming resistant need to be indigenously designed need to be put on our drones.

- **Validation of "Mass Scaling Up" Capabilities**. India needs to validate its one-week drones manufacturing capacities and appropriately match it up with global capabilities and threat assessment.
- **Drones' Pilot Skills**. There is an urgent need to enhance the drones' pilot skills not only within the military but in the civil too. There is thereafter a need to maintain a record of critical talents within India of drones' pilots, cyber, AI coding etc.
- **Whole-of-Nation Drones and C-UAS Doctrine**. There is a need to define a dual-purpose whole of nation drones and C-UAS doctrine at the earliest.
- **Rudra Brigade and Ashni Platoons**. The Rudra brigades, Ashni Platoons need to not only look at drones and C-UAS only but also at UGVS, robot dogs, bionic drones, swarms, suicide drones and drone interceptors. A suggested 10-day drones' requirement for a combat-arms battalion in an intense attrition environment, based on ongoing conflicts and PLA's C-UAS framework, is recommended below: -

Category	Daily Need	Daily Loss	Balance Next Day	10-Days with Daily Replenishment	30% Reserve	Total
ISR with EW	12	4	8	48	16	64
FPVs / FPV Swarms						
OFC FPVs	24	24	0	240	80	320
Cellular FPVs	12	12	0	120	40	160
RF FPVs (5 inch) – Sec 2IC	48	36	12	372	124	496
Decoys	24	18	6	186	62	248
Interceptors / CAP	60	42	18	438	146	584
Bomber / MMDS	12	4	8	48	16	64
UGV Support	24	6	18	186	62	248
UGV Assault / Defend	12	8	4	84	28	112
C-EW / Comn	6	2	4	44	16	60
Total	234	156	78	1766	590	2356
UPMK Kits	6	6	0	60	20	90

Table 7: 10 Days Requirements for a Combat Arms Battalion in Intense Attrition Environment

(Source-Author's Recommendation post Research)

Conclusion

PLA has a major objective of modernisation by 2027 ahead which is just 13 months ahead. The forceful unification of Taiwan may or may not be one of the major objectives of the PLA's 2027 Centenary goal. However, the increasing intensity of PLA's exercises in the Taiwan Strait surely indicate that PLA is enhancing its combat preparedness for such an eventuality. The problems of crossing the Taiwan Strait and the anticipated large quantum of nearly 50% casualties during the first wave of amphibious operations necessitates PLA's adoption of the dictum of "Let the Machines Take the First Bullet". Appropriately, CMC is focussing on unmanned combat through MDUVs and MUMTs from the sub-tactical to strategic level so that drones and unmanned platforms take on the maximum dull, difficult, dangerous and disruptive tasks to cause maximum destruction of the enemy. Hence, each and every PLA's entity including militia and reserves and even PAPF are training on complete variety of drones- bionic, sUAS, FPV, bombers / MMDS, suicide / kamikaze / LMs, HALE / MALE / MAME, CCA / UADF, HAPS etc and even unmanned platforms- UGVs / UGCVs, robots / robot dogs, torpedoes etc.

While PLA's array of unmanned combat systems is untested on the battlefield, their technology is surely advancing and the PRC's drones' industry is dominating the global market particularly the global drones' components' supply chain. This surely is adversely impacting India. WTC's build-up of aviation infrastructure much closer to the LAC is further strengthening PLA's capabilities and widening the asymmetrical gap with India. Thus, the Indian military, academia, S&T organisations and the drones' industry need to collaborate together as TEAM BHARAT to take on this daunting challenge. Numerous solutions exist which need to be taken immediately before time runs out. Indian military must pursue transformation in the drones' domain on all fronts priority wise – indigenisation, talent and skill development including domain specialisation and super-specialisation, organisational structuring particularly MUMTs, coherence and interoperability across services for development of a multi-domain kill web including C-UAS grid, doctrinal development, combat-sustenance, scaling-up potential for mass prototyping, multi-domain resilience and re-energised leadership and management techniques of managing MUMT.

About the Author

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