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"From Vision to Victory"

China's UAS Revolution Advances From Prototype to Practical Application

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China's People's Liberation Army (PLA) is rapidly developing advanced uncrewed systems to support all domains and achieve "intelligentized" warfare by 2035, posing significant challenges to U.S. or friendly forces in the event of large-scale combat operations (LSCO) with China.[1] PLA unmanned aircraft systems (UAS) provide intelligence, surveillance, and reconnaissance (ISR); data relay and communications support; support to information operations; precision strike; and logistical support. They are integrated with other platforms to deny adversaries the ability to operate across all domains.[2,3] The PLA's emphasis on new combat capabilities, such as UAS, and its prioritization of advanced technologies mark a fundamental shift in how China will fight.

Influenced by its Ukraine war observations, the PLA sees large-scale UAS deployment as critical in future warfare, especially in a potential conflict involving Taiwan and the United States. Key systems like the WZ-7 Soaring Dragon, the BZK-005, and the TB-001 provide long-range ISR that can search for U.S. and Taiwanese ships and missile batteries. The PLA's armed WX-10 Wing Loong UAS can communicate with ISR platforms to engage enemy targets. Long-range UAS could also provide targeting data to truck-launched one-way drones like the CH-901 to neutralize Taiwanese air defense radars, artillery, and other high-value capabilities. The PLA will be able to absorb the likely significant drone losses in a conflict by deploying a robust and diverse inventory of drones.[4] The significant number and types of drones will comprise a kill web—a networked system of sensors and shooters—enabling them to strike targets with precision, establishing an asymmetrical combat advantage.[5]

By 2035, the PLA intends to transition from an informationized force to a fully intelligentized force with uncrewed systems playing a critical role.[6] Informationized warfare leans on faster transmission of information, while intelligentized warfare goes beyond this capability by incorporating artificial intelligence (AI), uncrewed systems, and advanced computing to accelerate decision cycles and increase autonomy in a dynamic operational environment.[7] The PLA views uncrewed platforms, especially UAS, as an essential tool to support the gathering of information and as a delivery platform to act on the information, supporting faster and more precise operational responses. By leveraging AI-driven autonomy, the PLA aims to enhance situational awareness, decrease human cognitive burden, and increase the survivability and effectiveness of its forces across all domains.[8] Uncrewed systems, connected by robust networks and empowered by advanced data processing, will enable coordinated

strikes, real-time targeting, and potentially even independent operations. This integration is designed to exploit vulnerabilities in adversary systems and offset traditional U.S. military advantages.[9]

The PLA intends to move beyond the paradigm of uncrewed systems being auxiliary capabilities and instead employ them as potentially decisive and dominant platforms in future conflicts, integrating them into all its operational systems. This integration fundamentally multiplies the effectiveness of its maneuver, strike, intelligence, and support forces. Lessons from the Ukraine war reveal how UAS provide vital situational awareness and enable coordinated precision strikes on enemy targets.[10] The PLA's use of UAS as decisive and dominant platforms, using combinations of electromagnetic and kinetic effects will amplify dispersed forces' lethality.[11, 12] Beyond combat roles, the PLA is developing large-capacity logistics and emergency relief UAS like the CH-YH1000 and CY-8 to expand its battlefield sustainment capabilities.[13, 14] Advanced platforms such as the carrier-based stealth GJ-11, a jet-powered UAS with a combat radius of 1,200 kilometers and a maximum speed of over 1,000 km/h, will serve as a "loyal wingman" to the PLA's fifth-generation J-20 fighter.[15, 16] The GJ-11 will provide additional weapons and sensor capacity to support the J-20's mission.[17] Together these developments demonstrate comprehensive efforts to embed uncrewed systems across the PLA's operational systems to support its approach to future conflict.

Small UAS like the Mavic 3T and FH-95 serve as critical enablers by providing ground forces with near-real-time reconnaissance, target acquisition, and electronic warfare (EW) capabilities. The Mavic 3T can detect, track, and relay targeting data to an armed Mavic.[18] It can also provide targeting data to a one-way system such as the CH-901 equipped with a fragmentary or shape charge to engage a target.[19, 20] The FH-95 extends PLA capabilities by coordinating reconnaissance, kinetic strikes, and jamming enemy sensor-to-shooter links.[21] It has also been tested in swarm operations as recently as November.[22, 23, 24] Employing UAS in swarms (two or more UAS working in unison) allows the PLA to conduct ISR, strike missions, and battle damage assessment (BDA).[25] This will potentially reduce operator demands and enable autonomous decisionmaking, furthering the PLA's advancement toward intelligentization.[26] Notably, deployment of swarms over an island like Taiwan could overwhelm air defense networks and pave the way for combined-arms strikes, including air and missile and amphibious assaults.[27]

The PLA will use larger UAS to conduct operational and strategic missions, significantly enhancing reconnaissance, targeting, and command support across multiple service branches. The PLA employed the TB-001 recently in support of exercise JOINT SWORD-24 alongside manned combat systems, such as the PLA Air Force's J-10 and J-16 fighter aircraft and the KJ-500 airborne early warning system.[28] Although reports do not specify the TB-001's role in the exercise, it likely contributed reconnaissance, targeting, and damage assessment information. The TB-001 is reportedly assigned to the Base 61 UAS Regiment of the PLA Rocket Force, which has been designated for these roles.[29] Similarly, high-altitude, long-endurance systems such as the WZ-7 Soaring Dragon appear to be affiliated with the Aerospace Support Force and would provide ISR support to theater commands and group armies.[30] The WZ-7, reaching an altitude of 18,000 meters with an endurance of 10 hours at a maximum speed of 750 km/h, can be fitted to supply targeting data for antiship ballistic missiles and cruise missiles in addition to its ISR package. At lower altitudes, artillery brigades and other formations extensively use several medium-altitude, long-endurance-type UAS to support fire and maneuver. For

example, the KVD-001/ASN-206 has been used as a communications relay node between helicopters, providing near-real-time targeting data to a team of helicopters flying below radar coverage, enabling the strike aircraft to lock on to their target and complete the attack during a training mission.[31]

Figure 1: Examples of PLA Long-Range UAS (Source: Japan Ministry of Defense (left), Wikimedia (right))[32]

Emerging PLA UAS prototypes point to rapidly advancing capabilities in suppression of enemy air defenses (SEAD), long-range strike, and hypersonic missions, signaling an expanding operational mission. The prototype FH-97 can perform SEAD missions with electronic countermeasures, ISR, and strike.[33] Supporting other tactical aircraft as a forward-deployed scout and strike platform, the FH-97 can carry multiple air-to-air missiles, including the PL-15, with a range of 100 kilometers, and the PL-10, with a range of 20 kilometers, for air-to-air attacks.[34] The CH-9 Cai Hong-9 prototype is designed as a multimission platform for tactical and strategic ISR and precision strike with a range of up to 11,500 kilometers and an endurance of up to 40 hours.[35] The MD-22 hypersonic drone possesses a maximum range of 8,000 kilometers, a 600-kg payload capacity, and can reach speeds up to Mach 7 with a near-space launch capability.[36, 37] These cutting-edge systems exemplify the PLA's intent to employ uncrewed technologies across a growing range of mission sets to dominate every domain and reshape the battlefield.

IMPLICATIONS FOR LARGE-SCALE COMBAT OPERATIONS

Addressing PLA UAS-enabled threats necessitates a concerted effort to enhance capabilities and leverage solutions across the doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) spectrum. This includes researching enhancements in innovative force protection, countering UAS swarms, conducting realistic training, DOTMLPF adaptations, enhancing operator capabilities, and integrating AI and autonomous systems.

- The PLA's networked employment of diverse uncrewed systems—from small tactical drones to strategic long-endurance platforms and emerging hypersonic UAS—is enhancing situational awareness, targeting precision, and operational tempo. This challenges traditional U.S. concepts of concealment, targeting, and force protection by increasing battlefield transparency and persistent surveillance at multiple echelons.

- The potential employment of autonomous UAS swarms capable of reconnaissance, strike, EW, and BDA could saturate and degrade U.S. air defenses and disrupt command-and-control networks if not effectively countered.
- OPFOR plays an essential role in emulating the UAS threat in training. Integrating small UAS, swarm tactics, and other uncrewed capabilities into combat training center and home-station training events challenges units to operate under conditions of increased battlefield transparency and contend with EW interference. While full replication of PLA UAS capabilities may not be possible, maximizing the use of UAS during training enables OPFOR teams to simulate the challenges of the contemporary battlefield.
- Home-station training can enhance Soldier proficiency in UAS identification and countermeasures, as well as foster robust concealment, denial, deception, and operational discipline across all warfighting functions. These measures are critical for mitigating risks associated with enemy UAS surveillance and targeting.
- DOTMLPF adaptations are necessary to effectively address the UAS threat, including doctrinal updates focused on counter-UAS (C-UAS) and counterreconnaissance, expanded and realistic C-UAS training, and materiel development that enables integration of commercial and emerging technologies to support UAS detection, tracking, and defeat.
- Addressing the shortage of expert operators, planners, and trainers requires focused investment. The expansion of these skills is essential to support integration of UAS and to generate C-UAS expertise across Army formations.
- The PLA focus on intelligentized warfare and AI-enabled autonomous systems has the potential to accelerate operational tempos and complicate U.S. decision cycles. Exploring ways to integrate AI and autonomy into its processes will allow the Army to maintain a competitive advantage.

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