Intelligence-Powered Drone Command Systems for Cross-Strait Defense: Adapting Ukraine's Delta Model to Taiwan's Maritime Strategic Environment

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Ukraine's Delta situational awareness system has revolutionized modern warfare by creating the first operational Combined Joint All-Domain Command and Control (CJADC2) system. By processing over 106,000 drone missions monthly and integrating intelligence from diverse sources, Delta enables unprecedented coordination in a high-intensity conflict (Bondar 2024). This research proposes an investigation into the feasibility of adapting Delta's software architecture for Taiwan's unique defense needs, focusing on countering a potential amphibious invasion. While Ukraine's conflict is primarily land-based, Taiwan's defense is a maritime challenge defined by the 110-mile Taiwan Strait. This study will explore the specific software capabilities required for effective drone coordination in this maritime environment and assess the strategic impact of such a system on the cross-strait military balance. Taiwan's defensive posture is shaped by the unique geography of the Taiwan Strait, where wargaming simulations by CSIS highlight that an amphibious invasion would be more complex than the Normandy landings, with only 14-20 viable landing beaches and operational windows limited to spring and fall (Cancian, Cancian, and Heginbotham 2023). These constraints channel an invading force into predictable kill zones, and simulations consistently show that with an integrated anti-ship defense, an invasion fleet would arrive "in shambles."

Exploiting this geographic advantage requires a command-and-control system tailored to maritime warfare. Unlike the short-range, low-cost drones used in Ukraine, Taiwan requires more expensive, long-range systems capable of operating over 100 kilometers and coordinating with a heterogeneous fleet of Taiwanese and American assets, including anti-ship drone boats and surveillance drones (Pettyjohn, Dennis, and Campbell 2024). Furthermore, any system must contend with China's advanced, multi-layered counter-drone capabilities, which integrate electronic warfare, kinetic interceptors, and directed energy weapons, though they have shown vulnerability to drone swarms (Ditter 2025). This research therefore seeks to answer what

specific software architecture and capabilities a Delta-analogue system would require for Taiwan Strait defense and how its deployment would alter the strategic military balance. The methodology will proceed in two phases: a deep analysis of existing literature on Ukrainian drone operations, PLA counter-drone systems, and CSIS wargaming reports to establish operational requirements, followed by the development of a conceptual mock-up of a "Taiwanese Delta" to be tested in theoretical wargaming scenarios.

A successful adaptation of Delta for Taiwan would retain its core principles of data fusion, AI-powered analysis, and a common operating picture while incorporating critical modifications for the maritime domain. While it would still aggregate data from diverse sources and use AI for automated target recognition, it would require new capabilities specifically for the maritime environment. These include specialized maritime targeting algorithms to track naval vessels, extended-range navigation and communication protocols for coordinating drones and uncrewed surface vessels (USVs) beyond 100km, weather-adaptive mission planning that integrates oceanographic data, advanced swarm coordination logic to overwhelm PLA defenses, and seamless interoperability with joint Taiwanese and U.S. command systems. This research will provide a technical and strategic blueprint for developing such an AI-enabled command system, which could serve as a significant force multiplier for Taiwan's defense.

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