

Ukraine Struggling to Counter Russian Jet-Powered Drone Campaign

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Ukrainian authorities introduced a new air raid alert system on September 6. The change is an attempt to preserve normal life and the country's economic health as Russian drone attacks become more frequent and destructive. The mass production of jet drones has enabled Russia to bypass Ukrainian air defense systems to reach a range of economic and civilian targets that Ukraine had effectively shielded from older Shahed-type drone variants. Ukraine is struggling to counter this new aerial threat. Until new countermeasures are developed, Ukrainian authorities face the difficult dilemma of saving lives, preserving societal functions, and protecting the economy all at once.

On September 6, Ukrainian authorities in Kyiv implemented a new air raid alert system. The new system divides potential threats into yellow and red levels. "Yellow" designates general drone danger, while "red" indicates an imminent ballistic missile, mass drone, or combined missile-drone attack. During a yellow alert, ground transportation remains active, and commerce activities may continue, "so long as they [businesses] comply strictly with safety requirements" (Government of Ukraine, October 6). During a yellow alert, event organizers may continue, or even begin, a public gathering. Only after a red alert is declared are citizens expected to stop their activities and take shelter (Kyiv Post, September 2; Ukrmedia, September 10; Telegram/@smolii_ukraine, September 20;).

Ukraine's tiered air raid alert system is an attempt to protect the country's economy and preserve some semblance of normal life as Russia conducts a persistent, destructive airstrike campaign, conducted with mass-produced jet-powered drones. In late summer, Russia acquired technology to 3D print jet turbine components. This technology has helped halve the cost of individual jet drone production and enabled mass production inside Russia (New Voice of Ukraine, September 2). **[1]** Russian forces increased jet-drone use eightfold between June and August (Ukrinform, September 23).

Jet-powered drones pose a threat more similar to cruise missiles than traditional Shahed-type drones (Telegram/@smolii_ukraine, September 28). Depending on the variant, they fly between 400 and 1,000 kilometers per hour (250 to 620 miles per hour), two to five times faster than their older counterparts, and fly four to seven times higher (United24 Media, September 21; Mezha, September 23). Russian forces equip these jet-powered drones with artificial intelligence-assisted guidance, anti-jamming antennas, and larger payloads (United24 Media, September 21). They frequently bypass once-effective Ukrainian air defenses and hit their targets with considerable destructive force.

Russia's jet drone campaign, having sharply intensified in late August, has already brought devastating consequences for Ukraine's economy and its people. Relentless strikes against production centers and business centers have already forced the Ukrainian government to adjust budgets. Ukrainian Economy and Environment Minister Oleksandr Kravchenko estimates that

Ukraine loses \$45 million for each hour under air raid alert (Meduza, September 30). On September 28, Ukraine's Cabinet of Ministers announced a funding delay for non-essential construction, repairs, and park maintenance (Telegram/@Novynarnia, September 28).

Russia's intentional targeting of civilian infrastructure has made everyday life even more difficult. The systematic destruction of gas stations has reached Kyiv, prompting Ukrainian gas company Ukranafta to construct shelters for 13 intact gas stations in densely populated areas (Kyiv Independent, September 28). Attacks against railroad infrastructure have also intensified, disrupting one of the last reliable means of transportation for civilians to cross the country (Japan Times, September 15; Telegram/@UkrzalInfo, September 23). Russia's self-proclaimed "mandatory digital detox," or intentional attacks on data centers and telecommunications facilities, has caused cellular data disruptions and payment system challenges (Meduza, September 28; Telegram/KyivCityOfficial, September 29). At the same time, Russia's long-anticipated campaign against Ukraine's energy infrastructure has begun, according to Ukrainian Prime Minister Sergii Koryukha (X/@KoryukhaUA, September 30).

Especially in Kyiv, the main target of this campaign so far, these hardships are accompanied by immense psychological pressure. Earlier this year, Kyiv went through hours, and even days, without an air raid alert. Between September 22 and September 29, the capital averaged eight alerts per day for an average total of seven hours (Air Raid Alert Map of Ukraine, accessed October 8). Kyiv residents spent a record 20 cumulative hours under air raid alert on September 30 (Kyiv Independent, October 1). Jet-powered drones often reach and are intercepted over the city. Buzzing, whistling, and explosions are almost constant. In these conditions, work, school, and sleep are nearly impossible.

As economic and societal problems mount, Ukraine is scrambling for answers. According to Ukrainian President Volodymyr Zelenskyy, 67 companies are now developing and producing drone interceptors capable of consistently downing new jet-powered drones (RBC-Ukraine, September 18). Overall interception rates have improved to approximately 57 percent (President of Ukraine, September 26). Much work still needs to be done to match the scale of Russia's jet drone production.

The tiered air raid alert system, a change made outside of the military realm to adjust to this new reality, has only increased civilians' anxiety and frustration. The threshold for what constitutes a "mass drone attack" remains unclear; some of the most devastating strikes on Kyiv have come during a yellow alert, when residents are less likely to be in a shelter. Pressure is building to return to the old system of air raid alerts, during which activity ceases, and civilians are expected to take shelter (Telegram/@smolii_ukraine, September 28).

Until Ukraine can develop a reliable countermeasure to jet-powered drones, authorities must contend with a near-impossible civil-defense dilemma. Treating each jet-drone incursion as a traditional air-raid threat risks transport and economic paralysis. If shelter rules stay relaxed, civilians remain exposed to increasingly dangerous, evasive weapons. This dilemma will likely grow in importance as winter approaches, bringing even more frequent strikes and their associated economic and social costs.

Note:

[1] Individual jet drone units now cost between \$50,000 and \$70,000 (New Voice of Ukraine, September 2).

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