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SPOTLIGHT

Effectiveness of Ukraine's Air Defence

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So far Russia has been unable to gain full control and dominance of Ukraine's airspace despite its quantitative edge in airplanes and air defence systems. Ukraine has not only preserved the majority of its medium-range air-defence systems but also uses very effective short-range and low-altitude defences. These systems complicate and neutralise close-air support for Russia's land forces; however, the West must do more to strengthen Ukraine's air defences. NATO can draw a few preliminary lessons from the Russian use of air power against Ukraine.

How is Russia using its air forces against Ukraine?

During the preparations for war, Russia assembled more than 300 combat airplanes in the region (it has 2,800 in total), which gave it a quantitative edge over Ukraine's air forces (110 combat airplanes). Despite the intensive use of air power on a tactical level, the Russian forces have not been able to eliminate the majority of strategic targets, instead switching to ballistic and cruise missile strikes. Russia is able to control the air space over a particular front, but is rarely hitting Ukraine's rear or reserves. The effectiveness of the Russian air operations is also constrained by the limited use of precision guided munitions and air-to-surface missiles. Even the most advanced front bombers like the Su-34 ([operating mainly from Belarus](#)) are using unguided and imprecise armaments, with accuracy depending on, for example, weather conditions. Russia's assault and transport helicopters are even less effective, as they are very vulnerable to Ukrainian local and point air defences. Except for the southern front, Russia's combat airplanes seem to operate without precise intelligence or close coordination of their operations with the land and special forces.

What air defences does Ukraine still have?

There is a large discrepancy in the estimates of Russian air power losses in the first month of war: according to Ukrainian official estimates, Russia has lost as many as 123 combat aircraft and 127 helicopters, while open sources (visually confirmed) put it at 16 aircraft and 35 helicopters. Ukraine's air defence system is based on a radar network,

backed by MiG-29 and Su-27 interceptors (before the war, it had 71 airplanes), as well as ground and mobile medium-range systems and man-portable air defence systems (MANPADS). Ukraine's air forces are operating now in harsh conditions of a limited quantity of air-to-air missiles, spare parts, and jet fuel. Ukraine is also suffering losses, with independent sources confirming 12 airplanes destroyed and 3 or 4 helicopters (in fact these might be higher). But the main burden of Ukraine's air defence is likely taken by its medium-range mobile air and missile-defence systems like the S-300PS/PT and (a few) S-300V. Around Kyiv and other cities there might also be concentrated bigger quantities of Buk and Neva air defence systems. These two layers of air defences are likely deterring Russian pilots from operating at a higher altitude, forcing them to fly at low altitudes. Even if Russian aircraft are avoiding Ukraine's medium-range air defence systems, they come under more threat from local or point defence systems. The latest of these latter platforms are mainly the Tunguska, Tor and Osa mobile (short-range defence) and MANPADS (shortest range). These point defences are spread across the Land Forces and Territorial Defence units of Ukraine, based on Igla and Strela launchers and the much more advanced Stinger, Piorun, and Grom launchers, delivered by Western countries.

How can the West augment the Ukrainian air defences?

Even if the core of Ukraine's air defence is obsolete by NATO standards, it has still prevented full air supremacy by Russia. If Russia continues its first month's tactics and procedures without precision munitions, this situation may still favour

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Ukraine. In case Ukrainian forces employ counter-offensives in the east and south of the country, there will be a much higher need for mobile air defence systems, which practically might ensure similar results to the [politically unrealistic concept of a NATO no-fly zone](#) or combat aircraft transfers. A few members of NATO have already transferred to Ukraine their post-Soviet systems, including 2,000 Igla MANPADS (obsolete). Of much more value was NATO countries' transfer of around 2,500 Stingers, which are among the huge reserves of the Alliance members and might be a source of further transfers. The UK has already started to deliver to Ukraine advanced short-range and semi-mobile Starstreak missiles, which might increase losses among Russian aircraft and helicopters. Taking into account that Ukrainian troops are familiar with HMMWV (Humvee) vehicles and Stinger missiles, there is also the opportunity for the transfer of mobile Avenger launchers. Some members and partner states of NATO may also transfer spares or reserves of their post-Soviet missiles for systems like the Buk, Neva, Tunguska, and Osa. Though problematic might be the transfer of a few S-300 systems of Bulgaria, Greece, Slovakia, and the U.S., nevertheless much easier, simpler and feasible might be the transfer of their interceptor missiles to Ukraine.

What are the preliminary lessons for the NATO air forces and air defences?

The first month of the Russian air campaign might evolve into a more intense approach, adapted to missile strikes. So far, Russia's air forces operations are not representative of previous exercises and simulations of its operations against NATO, which assumed broader use of precision-guided munitions and gaining air superiority in the Baltic region. Nevertheless, it seems to be a legitimate preliminary conclusion that the air forces of NATO have an advantage over Russia regarding the standards of their airplanes and weapons, combat readiness, and flying hours, training and operational concepts. NATO's air forces strengths are also in their capabilities to operate over long distances, combining intelligence and electronic warfare, surgical strikes and so-called [integrated air and missile defence](#). Russia's war against Ukraine also confirms the need for an expanded and advanced multi-layered air defence, [especially on the Eastern Flank of NATO](#). A separate but interrelated issue is the need for NATO's land forces to be saturated with mobile and point defences and MANPADS launchers, to neutralise threats from Russia's close-air support aircraft and helicopters.