

## BRIEF

## THE EARLY AIR WAR

RUSSIA'S WAR IN UKRAINE  
SERIES NO. 5

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**Russia held considerable airpower advantages at the start of its invasion of Ukraine. Estimates vary, but the combat aircraft it assembled within reach of Ukraine's borders outnumbered Ukraine's inventory by a factor of perhaps three. These aircraft were more modern than Ukraine's soviet-era platforms, had better weapon systems, were crewed by pilots many of whom had recent combat experience in Syria, and were supported by airborne warning and control, and intelligence, surveillance and reconnaissance assets. Russia's deployed air defence systems were also more numerous, more modern, and better integrated. Russia was expected to use these advantages at the very beginning of the war to cripple Ukraine's air- and ground-based air defence capability and secure air superiority, allowing its aerospace forces to conduct reconnaissance, strike, and close air support operations with impunity, while denying the same openings to Ukraine. It did not.**

Russia began the war with an air offensive in the early hours of 24 February. This included around 100 ballistic and cruise missile strikes and attacks by around 75 strategic and frontline aircraft targeting air defences, supply depots and airbases.<sup>1</sup> After that, Russia continued to conduct air strikes and missile attacks but with much lower intensity and effect than would be required to gain air superiority. In mid-April, the US assessed that Ukraine's air defences remained largely intact.<sup>2</sup> This brief looks at selected aspects of the early air war.

## PRELUDE: RECENT HISTORY

Russia's aerospace forces had performed poorly in the 2008 war in Georgia. Their weaknesses included a lack of real-time targeting intelligence, an inability to provide close air support or to deal with Georgia's air defences, poor

coordination between ground and air forces, training and technological shortcomings that left Russian aircraft unable to fly at night or in poor visibility, a reliance on unguided munitions, and vulnerabilities to friendly fire.<sup>3</sup> Among the key lessons for Russia was the importance of employing aerospace forces, stand-off weapons, and precision guided munitions in the early days of a conflict to deliver decisive effects, not least the destruction of an adversary's air defences. The aerospace forces were thus prioritised in the 'new look' reforms that followed the war, a programme that included the modernisation of long-range bomber fleets, the acquisition of new fighter and fighter-bomber aircraft and the upgrade of existing frontline models with improved munitions, sensors, and engines, the development of a formidable air defence system, and the expansion of training and exercises.<sup>4</sup> More than 1 000 new or modernised fixed and rotary wing aircraft were delivered to combat and reserve structures between 2013 and 2018.<sup>5</sup>

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Russia's airpower barely featured in the 2014 stealth annexation of Crimea, or in the conflict in eastern Ukraine in which Russia denied any direct involvement. Ukraine claimed to have shot down several Russian drones, but it itself incurred substantial losses – perhaps as much as half its inventory – captured in Crimea, written off as unserviceable, or shot down by separatists armed with Russian-supplied air defence systems.<sup>6</sup> In Syria, Russia was able to test and demonstrate the products of the new look reforms. Its brutal air campaign involved high numbers of tactical and strategic aircraft sorties, and aircraft carrier, attack helicopter, sea- and submarine-launched cruise missile, tactical ballistic missile, uninhabited aerial

vehicle (UAV) and air defence operations.<sup>7</sup> The armed forces increased their use of precision guided munitions over unguided munitions and practised the integration of intelligence, command and control, and precision fire.<sup>8</sup>

Russia's performance in the air over Syria was certainly an improvement over its performance in Georgia, but its adversary was an irregular force and its ambitions for and participation in the intervention were reasonably limited.<sup>9</sup> Conditions closer to those it was to experience in Ukraine in 2022 were exercised during Zapad-2021, which saw Russia's aerospace forces practise massed airstrikes against enemy assets, air-to-air combat, and air defence operations as part of a large-scale conventional war with a sophisticated adversary.<sup>10</sup>

## THE INVASION OF UKRAINE

The lack of a decisive Russian airpower offensive in the opening days of its full-scale invasion of Ukraine was one of the largest surprises of the early war. Whether through overconfidence in its ability to rapidly take Kyiv, overcaution with regard to exposing expensive airborne assets, a lack of precision guided weapons, or because the demands of conducting large-scale,

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highly complex airpower operations are simply beyond the training, experience and doctrine of its air force, Russia was unable to either inflict crippling damage on Ukraine's air defences, and thus to establish air superiority. The strategic-level impact of this failure is evident in Russia's inability to rapidly seize Kyiv, in part through an airborne attack on Hostomel Airport which was repulsed by Ukrainian air (and ground) defences, and by its later inability to provide air support to advancing ground units.<sup>11</sup> Having failed to establish air superiority in the first days of the war, Russia lost the element of surprise.

Ukraine's longer-range mobile surface-to-air missile systems subsequently proved to be difficult targets for Russia, the difficulties perhaps exacerbated by a lack of real-time intelligence and precision strike capability. Their continued operation forced the Russian Aerospace Forces

to operate either at high altitudes and stand-off ranges, or to fly at night and at low level (as did Russia's heavy reliance on unguided bombs) where they were vulnerable to short-range air defence systems and even to anti-aircraft cannon and small arms fire.<sup>12</sup> By the end of March, the open-source intelligence site, Oryx, reported that Russian forces had lost 17 aircraft, 36 helicopters and 18 UAVs against Ukraine's losses of 12 aircraft, 2 helicopters and 12 UAVs.<sup>13</sup> Meanwhile, ineffective coordination between, and command and control of, the air defence units integrated with Russia's manoeuvre forces appears to have left its advancing forces poorly defended from the air and vulnerable to Ukrainian attack.<sup>14</sup> The fact that Ukrainian pilots were able to continue to fly and to inflict damage on the Russian invaders was an important element of the information war.<sup>15</sup>

## WESTERN ASSISTANCE

Though Ukraine's airspace remained contested, it is undeniable that Russia held advantages in numbers, technology, and room for manoeuvre. It was able to achieve a substantially higher (but even then, quite low) sortie rate than Ukraine, perhaps 200-300 per day, at least in part because of its ability to launch stand-off weapons from outside Ukraine. As its ground forces became stalled, it also increased its strikes on Ukraine's northern cities, including Kyiv, with unguided bombs, damaging many non-military targets.

Unsurprisingly, then, many of Ukraine's early requests for Western assistance were related to airpower. Ukraine was quick to request NATO to enforce a no-fly zone, which was just as quickly ruled out by NATO Allies concerned about escalation.<sup>16</sup> The on-again-off-again proposal to supply Polish, Bulgarian, and Slovakian MiG-29s to Ukraine was, in the end, a self-inflicted communications debacle for Western donors, who wasted much capital bickering about an aging aircraft whose usability by Ukraine and whose military value was widely questioned, including by Ukrainian pilots.<sup>17</sup> This episode was a stark demonstration of how the political value of assistance – for the recipient, and for the domestic and international audiences – may not always equate to military need.

The proposal that Turkey should transfer its Russian-made S-400 air defence systems to Ukraine also suffered at the hands of donor

politics, with Turkey demanding an unacceptably high price, in F-35s and replacement Patriot air defence systems, for its acquiescence. Again, it was unclear how effectively Ukraine would be able to use the S-400 or integrate it into its overall air defence architecture.<sup>18</sup> Otherwise, Western donated air defence systems such as the Stinger short-range air defence missiles prioritised by several Allies in their early assistance packages, appear to have made useful contributions. Russia's claims to have destroyed donated S-300s in a cruise missile attack on Dnipro, denied by Slovakia, the most likely donor of such systems, provided another illustration of the overlap of the kinetic and information elements that has been a feature of the air war in Ukraine.<sup>19</sup>

## DRONE WARFARE

UAVs, in particular the Turkish-produced Bayraktar TB2, have provided Ukraine with cheap, precision guided capability that has been claimed as game-changing.<sup>20</sup> Ukraine and Turkey had established a defence industrial relationship related to UAVs from the late 2010s, and Ukraine was the first export market for the TB2.<sup>21</sup> At the start of the war, Ukraine was thought to possess around 20 platforms, which are supplied in sets of six, with weapons and control stations, at a cost of around 60 million euros.<sup>22</sup> Early reports suggested that the effectiveness of the systems, combined with the Ukrainians' smart targeting was having a disproportionate impact, though losses attributable to the TB2 appear to have tailed off as the war proceeded. At the end of March, Oryx reported that Ukrainian forces had destroyed or damaged 1 106 pieces of Russian equipment, 43 of them by TB2 attacks – representing a respectable 4%, but only half the kill rate reported in the middle of the same month.<sup>23</sup> Ukraine lost TB2s and other UAVs (though almost certainly not in the numbers claimed by Russia) and it was unclear at this stage of the conflict whether TB2 manufacturer Baykar was able to supply replacements.<sup>24</sup> It is also likely that Russia was able to plug (some) holes in its air defence coverage, for example by making better use of electronic warfare and air defence assets, to which UAVs – slow, high signature platforms – would be vulnerable.

Russia appears to have been unable to capitalise on its experience with UAVs in eastern Ukraine from 2014 and in Syria, as well as its

experimentation with advanced UAV concepts and technologies. Although it also employed surveillance and strike platforms (albeit in lower numbers than might have been expected) they had less impact on the course of the early conflict. Furthermore, the Ukrainians, in contrast to the Russians, were also particularly adept at using their UAV capabilities in the information war, releasing both UAV engagement videos ('kill cam' footage) and footage of other engagements filmed from UAVs that have been widely circulated on mainstream and social media.<sup>25</sup> Ukraine was also able to draw on the assets and skills of UAV hobbyists to complement its defence efforts, sometimes with substantial effect.<sup>26</sup>

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In this war, UAV capabilities have favoured the underdog allowing Ukraine to take advantage of asymmetry. This aspect is sure to be further studied as details emerge and smaller nations, especially, will want to evaluate their own UAV (and other uninhabited) concepts – though claims of their game-changing ability will need to be tempered by a recognition of both Russia's air defence failings and Ukraine's stellar information operations. UAVs are likely to be an important tool as part of a larger toolkit: as President Zelenskyy said, "With all due respect to Bayraktar, and to any hardware ... Drones may help, but they will not make the difference."<sup>27</sup>

## CONCLUSION

The most notable aspect of the early air war was Russia's failure to use its obvious airpower advantages to secure air superiority in the first days of the conflict. Had it done so, the course of the war may have been very different. Russia, and Western analysts, appear to have both overestimated its ability to carry out large-scale offensive air operations and to manage air defence in complex circumstances, and underestimated the ability of a skilled and determined defender to undermine an aggressor's apparent advantages. Capability is far more than equipment performance and numbers and future analysis will need to strive for more rounded assessment.<sup>28</sup>

Defence organisations cannot assume that Russia, or any other adversary, would make the

same mistakes again. The early air war in Ukraine has certainly not diminished the vital importance of building air defence that is integrated (within itself and with other domains), layered (to minimise gaps) and has both active (kinetic) and passive (e.g., dispersal, hardening, stealth)

components. Air defence is presently limited in Europe, in particular in its eastern half.<sup>29</sup> The air war has also added to the evidence from, for example, the 2020 Nagorno-Karabakh war of the potential value of cheap UAVs as an asymmetric asset in contemporary warfare.

## ENDNOTES

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