

# The Revolution in Drone Warfare

## The Lessons from the Idlib De-Escalation Zone

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Turkey and Russia are learning how to operationally use a new type of twenty-first-century warfare—unmanned aerial vehicle (UAV) warfare. Many historical analogies can be traced to the advent of new types of weapons and resulting strategies implemented for their use in a direct, kinetic confrontation. UAVs have existed since the Cold War, but in the 1990s few countries possessed first-generation UAV technologies. Russia and Turkey joined the military UAV technology club relatively late, and both set a straightforward aim toward creating their own indigenous drones—first for utility-based roles and then purely combat drones. Russia achieved the first aim, but Turkey soon managed to field its own combat drone. However, Russia has a larger UAV fleet.

The beginning of 2020 nearly witnessed Russia and Turkey in direct kinetic war, initially due to a successful Syrian offensive against Turkish-backed rebel forces. This success forced Turkey to enter a war against the Syrian Army, and from 27 February until 5 March 2020, an active phase of hostilities in the Idlib Province ensued. Russia and Turkey came to this confrontation well-experienced in the use of UAVs and electromagnetic spectrum (EMS) warfare technologies, having demonstrated their proficiencies in actions taken against rebel factions in Syria—and in Ankara's case against Kurdish groups in Turkey—but neither Russia nor Turkey, or other countries for that matter, have experience in employing these technologies in a direct clash against a peer competitor. It was truly a transformational confrontation that will definitely be added into military handbooks and manuals around the globe. The UAVs in this full-scale military operation were not merely an element of intelligence, surveillance and reconnaissance (ISR) but rather instruments of combat, fully integrated into the operational strategy of three countries: Syria, Russia, and Turkey. In Idlib, Russia and Syria learned the hard truth of how important UAVs are in modern warfare and duly employed significant EMS warfare countermeasures against Turkish UAVs.

### Russia's Role: Defense and Observation

The 2018–2019 UAV strikes against Khmeimim Air Base, a Syrian facility currently operated by Russia, located southeast of the city of Latakia in Latakia Governorate, Syria, were the first ever attacks of this nature against a great military

power. However, events in Idlib Province in 2020 witnessed the case study that will inform the next chapter on drone warfare, both in terms of UAV use by insurgents and UAVs being a crucial element of modern war between states.

The Khmeimim Air Base is a symbol of Russia's presence in Syria. The Assad regime has signed an agreement with Moscow that will see that presence extended for the next half century. It is the most secure Russian base in Syria and is actually considered as Russian land inside Syria. According to Russian sources, Khmeimim and its naval counterpart, Tartus (which has been leased to Russia in similar fashion), deployed sophisticated antidrone systems as early as 2017. These systems are equipped with modules to detect, fire, electronically suppress, and jam signals. Russia determined that UAVs presented a concrete threat only at the beginning of 2018. On New Year's Eve, Syrian rebels conducted the first successful collective-drone strike, employing eight UAVs in unison, and throughout January, Russian forces had to respond to intensive attacks of drones on their bases. In 2019, Russia thwarted around 60 UAV attacks at Khmeimim. Russia did not expect such a move from the rebels, and only after the first attack did Russian commanders realize how vulnerable their forces were against the such attacks. Russia lost several aircraft and soldiers during these attacks. Russia blamed the United States for the attack and for direct coordination of the drone strikes; the Russian deputy minister of defense stated that American Poseidon-8 coordinated the attacks. According to military experts, Russia imposed effective radio-electronic countermeasures against the strikes. However, in the attack on 31 December 2017, the rebels' drones snuck into Khmeimim when, for short period, the entire system of radio-electronic jamming was off. Usually, such measures regarding radio-electronic defense systems are obligatory when planes take off using their navigation system. To maintain the defense of the air base in such moments, the Russians usually put all air-defense systems at the high alert, but it seems that air-defense systems were not ready for such a massive drone attack.

On 5 January 2018, UAV attacks targeted Tartus and Khmeimim. The rebels increased the number of drones—13 this time—seven of which the Pantsir systems destroyed. Russian specialists from the electronic warfare units managed to seize control of the remaining drones. The Russians had detected the drones long before they reached the bases. Russian experts indicated that the rebels had employed sophisticated strategies, i.e., reducing the number of explosives to two and greatly reducing their speed to make the drones much harder to detect. This was when Russia learned the fact that drones employed in contemporary guerrilla warfare can play a key role and can destroy strategic infrastructure in the enemy's rear.

Ankara entered the ranks of UAV powers independently and now uses combat drones as an important instrument in protecting Turkey's national interests

throughout the entire Middle East. Sources indicate that Turkish electronic warfare systems (EWS) allowed Turkish forces to undertake all necessary tasks during the conflict with the Syrian Army, despite Russian and Syrian government forces' closure of the airspace over Idlib. According to Turkish Minister of Defense Hulusi Akar, in just one night, the army destroyed more than 200 targets, five helicopters, 23 tanks, 23 artillery pieces, and Russian-made Buk and Pantsir anti-aircraft missile systems and killed 309 Syrian soldiers. Turkish operations in Idlib involved the tactical Bayraktar TB2 and multipurpose TAI Anka medium-altitude, long-range (MALE) UAVs.<sup>1</sup> The massive employment of these UAVs ensured the unprecedented success of the Turkish Army, sending a message not only to Russia but also to Ankara's Western allies—and more importantly, to the regional powers with whom Turkey is competing for regional hegemony—that Turkey had made great leaps in this new war domain. Turkish UAVs were doing what their Russian counterparts remain in capable of doing: destroying targets immediately after detecting them.

Concurrently, in Moscow some experts provided their own version of the conflict, and of course this reflected the Russian spin.<sup>2</sup> In Idlib, Russian leaders admitted, Turkey achieved some success, but it was not a “strategic success” and the rest of Turkey's version of the story was merely rhetoric. The “air phase” of the Idlib confrontation lasted around two days and was only one part of the conflict. Neither the Russians nor the Syrians expected the Turkish Army's presence in the zone. That by itself was a key factor that altered the entire battlefield. Two days of Russian and Syrian embarrassment allowed Turkey to achieve some tactical success. However, when Syrians and Russians adjusted to the factor of Turks fighting actively on the side of the rebels on the battlefield and in the Syrian airspace, they balanced Turkey's UAV superiority by utilizing air-defense systems. The nature of Turkish UAV-based success on the first day of conflict was based on their more powerful EMS warfare systems, which operated from within Turkey and covered the area of Idlib.

The Turkish EMS system enabled Ankara to listen into Syrian Army telephones, allowing them to detect the coordinates of the Syrians. Then Turkish forces transmitted those locations to the TAI Anka UAVs, which relayed data to the combat Bayraktar TB2s for target elimination. Naturally, Russian specialists blame their adversary's success on the Syrians, saying their allies did not know how to run EMS warfare—naïvely using their cell phones. The immediate countermeasure for the Syrian Army and its local allies was primitive but effective—terminating the use of cell phones and anything that allowed others to detect their location. Orders were subsequently issued on paper, and subsequently, neither Turkish UAVs nor EMS systems could identify the Syrians.

Importantly, Western specialists completely disagree with the Russian assessment. For instance, the Institute for the Study of War—a US-based a nonpartisan, nonprofit, public policy research organization—indicated that Turkey’s destruction of Russian-provided anti-aircraft systems damaged Russia’s reputation and could reduce its subsequent arms sales. Turkish UAVs, likely using electronic jamming technology, evaded the Russo-Syrian countermeasures and destroyed at least three Russian-made state-of-the-art Pantsir-S1 air-defense systems.<sup>3</sup> Turkish specialists attribute this to Ankara’s very serious investment in electronic warfare and deployment of radar electronic attack systems including KORAL (a land-based transportable EWS developed to jam and deceive hostile radars with an effective range of roughly 200 km, which is exactly enough to reach the Idlib zone from within Turkey) to intercept and deceive radar systems in Syria.<sup>4</sup>

Regarding the Russian-made Syrian air-defense systems, Turkish sources claim to have destroyed eight Pantsir-S1s (older versions). The Russian Ministry of Defense refuted these numbers, stating that only four such systems were deployed to Idlib and Turkish attacks damaged two of those. Regardless of the figures, this was the first time Turkey managed to command the airspace over such a large area using drone swarms.<sup>5</sup> According to the Russian narrative, the main target of the Turkish combat UAVs was the heavy weaponry of the Syrian Army, and this was accomplished quite successfully.<sup>6</sup> The psychological effect of this strike was particularly important. Due to the ability of UAVs to sneak into the Syrian Army’s rear and destroy weapons systems and kill troops without any direct participation of Turkish troops in the battlefield, the continuous UAV strikes from the air led to a situation where Syrian reservists abandoned equipment and fled their positions.<sup>7</sup> Syria had deployed the first Pantsir-S1 to Idlib on 1 March, and these systems shot down roughly 10 Turkish drones within the first days. The delivery of air-defense systems according to the Russian experts stabilized the balance in the battlefield and permitted the Syrian Army to regain the strategic city of Saraqib. However, Turkish specialists insist that their UAVs are capable of destroying these systems, and as evidence, they emphasized that the UAVs had destroyed a Pantsir-S1 at very close range, when the system failed to detect the Turkish UAVs.<sup>8</sup> The fog of war and information warfare apparently remain as vital today as in the times of Clausewitz.

### **Turkey’s Role: Offense and Elaboration of Strategy of UAV Attacks**

Turkey is experiencing a golden age in the development of its military industry. In 2016, Turkey’s President of Defense Industries İsmail Demir, stated during his stay in the United States, “I don’t want to be sarcastic, but I would like to thank [the US government] for any of the projects that were not approved of by the U.S.

because this forced us to develop our own systems,” adding that Turkey no longer wanted US-made combat UAVs.<sup>9</sup> Thanks to restrictive measures on Western drone technology toward Ankara, Turkey has arguably become the leading state with combat-proven UAVs in the Middle East. Some experts are even calling Turkey a “drone superpower,”<sup>10</sup> but it is too early for such claims—despite the obvious momentum in that direction.

Neither Israel nor the United States wanted to share technologies with Turkey, but this actually worked to Turkey’s advantage.<sup>11</sup> Recently, during the Muslim holiday of Eid al-Fitr, Turkey presented a unique *YouTube* documentary about the Turkish UAV industry, entitled “AKINCI DOCUMENTARY.”<sup>12</sup> The main message is that the country has reached the highest technological stage and is able to compete at the world level with other players in the UAV market.

Turkey had used its drones previously during the 2018 Operation Olive Branch, the Turkish incursion into Syria aimed at creating a 20-mile-deep buffer zone around the Syrian city of Afrin and ousting thousands of US-supported Kurdish militiamen who had aided the US fight against Islamic State terrorists in Syria. However, the Idlib campaign (Operation Spring Shield) was the first time Turkey had used its UAVs at such a massive scale and against a foreign country with as powerful a backer as Russia. During Spring Shield, Turkish UAVs were operating almost everywhere in the greater Idlib area and reached the deep rear of the Syrian Army. The penetration into the Syrian rear had serious psychological and military consequences. The Syrians spotted Turkish UAVs in Hama and Aleppo, territories under Syrian government control.

In Idlib, the Turkish Army employed new drones for the first time, field testing its ANKA-S and Bayraktar-TB2 with intensity. Aside from traditional strategic or tactical roles, the UAVs were used to conduct so-called “sniper” missions, liquidating targeted groups and specific persons of interest. For example, Turkish UAVs reportedly liquidated two Syrian brigadier generals, a colonel, and foreign fighters from Hezbollah and Iran in an attack on Syrian headquarters in Zerba, south of Aleppo.<sup>13</sup>

Furthermore, Ankara actively promoted Turkey as the first country to employ sophisticated small drones as a swarm in combat.<sup>14</sup> Turkish officials claimed that this military innovation demonstrated Ankara’s technological prowess on the battlefield. These swarms of remotely-controlled drones destroyed Syrian bases and chemical warfare depots, as well as air-defense systems.<sup>15</sup>

The strategic success of Turkey in Idlib is undeniable. Turkish forces stopped Syrian Army operations against Turkish-supported rebels, pushing Syrian forces out of the area. Russia had to intervene in the conflict militarily and diplomatically to stop Turkey’s impressive advance.

Moscow was forced to reconsider its situation in Syria. Taking a new angle, Russia seeks a long-lasting strategy toward improving relations with Turkey and avoiding direct confrontation with Ankara. According to Russian propaganda, it was in Moscow's interest to allow the Turkish–Syrian clash in Idlib so Russia could see a NATO country in action—particularly NATO's drone strategy and tactics employed in real-time battle. This was a process of in-depth evaluation, observation, and reflection. According to this narrative, Moscow chose not to interfere too early in the conflict and enjoyed it, from a theoretician's perspective, taking valuable notes from its observations and giving Turkey the freedom of action to see what a NATO-member country is capable of doing. Strikingly, the pro-Iranian *al-Akbar* news outlet and the Syrians blamed the Russians, saying the latter had intentionally left the airspace open for Turkey to launch the full-scale UAV attack against the Syrian Army.<sup>16</sup> Russian experts raised quite an interesting possibility: that Moscow actually permitted the use of drones as result of a Turkish–Russian agreement during intensive negotiations in Ankara and Moscow.<sup>17</sup>

Ankara conducted almost all military deployment to Idlib exactly from Hatay, and a serious number of Turkish forces are now concentrated in the region.<sup>18</sup> During the operation, Turkish Minister of Industry and Technology Mustafa Varank went to Hatay with drone experts and engineers. They were working at the Second Army Command Tactical Command Center, where Operation Spring Shield was directed. During the meetings the use of defense technologies (KORAL and UAVs) was discussed, with the participation of the Ministry of Defense. This clearly illustrates that Turkey is adamantly developing its UAV strategy despite political and technological complexities. Reportedly, Turkey developed and used in Idlib the effective system of military communications that permits UAV operators to communicate directly with land units that the operator sees from the air during operations. Such a function can save the lives of troops, because the UAV operator can find the most secure path home and avoid unwanted encounters with enemy troops.<sup>19</sup>

American experts writing in the reputable *Small Wars Journal* admitted that Turkish losses were minimal and the Syrian Army is accurately accounting for the number of destroyed drones. However, destroying six UAVs against the damage to Syrian Army operation in Idlib is incomparable. This demands particularly close attention to the following limitations of Turkish drones: large measures of technical superiority, massed effect, and—perhaps most importantly—the element of surprise. While Turkey continues to maintain a level of technical superiority vis-à-vis the Syrians, achieving massed airpower and springing another surprise will be difficult. The Syrians will be better prepared next time. In light of this, the

Turkish military will undoubtedly conduct a critical examination of Operation Spring Shield, so that they are ready as well.<sup>20</sup>

### **Libya as the Largest Drone Battlefield in the World**

In the case of Libya, Turkey is achieving its geopolitical goals astonishingly successfully, in much the same way it has in Syria. The presence of UAVs does not resemble the presence of massive military force build-up in previous international conflicts, but the goals that are achievable are the same. If Russia sends its private military company, Wagner Group, which is ostensibly independent but obviously closely affiliated with Moscow, political consequences abound. However, in the case of UAVs, it is possible for Turkey to send a small team of drone operators to Libya without eliciting the same reaction sending ground troops would and while still achieving the desired political and military power projection and end state.

In Libya and Syria, the incessant use of combat UAVs allowed Turkey to alter the situation on the ground. In both cases, Turkish-sponsored forces were at a last critical point in their struggles against opposing forces. Interestingly, the United Nations Special Representative to Libya, Ghassan Salamé, called the Libyan conflict “the largest drone war in the world”—with nearly 1,000 air strikes conducted by UAVs.<sup>21</sup> According to Turkish experts, Libyan National Army (LNA)—the faction supported by Egypt, France, the United Arab Emirates (UAE), and Russia, is a component of Libya’s military forces that was nominally a unified national force under the command of Field Marshal Khalifa Haftar—acquired Chinese-made Chengdu Pterodactyl I, also known as Wing Loong, MALE UAVs in 2016, significantly enhancing the LNA’s military capabilities, and these UAVs were used effectively in the battle for Tripoli.<sup>22</sup> These Chinese-made UAVs—operated by pilots from the UAE and flown out of the Al-Khadim Air Base in eastern Libya—have a combat radius of 1,500 km (932 miles), meaning they can deliver precision-guided missiles and bombs anywhere in the country.<sup>23</sup>

One additional point should be noted, which is that the Libyan terrain is very flat, and the desert allows easy spotting of targets. Moreover, while Libya is an enormous country, it is sparsely populated, making it more feasible to utilize long-endurance UAVs for continuous ISR missions rather than using manned warplanes or ground forces. Compared with the Idlib battleground, the UAVs in Libya make it possible to continually patrol sizable territories, highly complicating the adversary’s abilities to regroup, retreat, counterattack, or deliver reinforcements. Hence, UAVs provide a real-time picture of the war as it unfolds.

If Libya is currently the largest drone battlefield in the world, the same can be said about air-defense and EMS warfare. According to American experts from the Washington Institute, the game-changing event for the Government of Na-

tional Accord (GNA)—the faction supported by Turkey, Italy, and Qatar—came when Ankara delivered different air-defense and EWS systems along with Turkish-made UAVs.<sup>24</sup> This enables the forces in Tripoli to establish a local superiority around the capital and regroup, launching counteroffensive measures against LNA forces. Turkey has undertaken measures in Tripoli to create an air-defense bubble around the capital, deploying multiple surface-to-air (SAM) systems in and around Mitiga Air Base. Employing a combination of medium-range US-made MIM-23 Hawk SAMs, Turkish-made Hisar short-range SAMs, and KORKUT 35-mm self-propelled anti-aircraft guns created a layered defense over critical infrastructure and reduced the threat to GNA drone ground stations and launch operations. Additionally, Turkey deployed its KORAL EWS, which is an integral component of the abovementioned air-defense and radio-electronic warfare complex. The KORALs are able to jam the work of the Pantsir-S1 and Chinese UAVs and can be used for jamming other target sets, including communications and other emitters, such as line-of-sight drone control links. The system also has useful direction-finding capabilities that could geolocate enemy forces by zeroing in on their radiofrequency emissions.<sup>25</sup> These systems actually cover Tripoli and its outskirts to a radius of 124 miles (200 km).<sup>26</sup> Given this, it is logical to assume that the system covered nearly the entire Idlib Province in Syria, which is under Turkish control.

All Turkish UAV operations are conducted in the operational centers in Ankara and Hatay Province, Turkey.<sup>27</sup> This province has strategic importance for Turkey, and the confrontations in Idlib once again proved to Ankara the importance of this region disputed between Syria and Turkey.

As a result of Turkey's successes with UAVs on the battlefields of Syria and Libya, Ankara promotes Turkey as a country with advanced military technologies in the international UAV market. The demand for UAVs is high and will be expanding faster than we can imagine. Thanks to Turkey's ability to demonstrate its UAVs combat-proven capabilities, Ukraine, Qatar, and Tunisia have already purchased Turkish drones.<sup>28</sup> Turkish UAVs now compete with Chinese, American, Israeli, and other major UAV-producing nations' products in the international market. Given their respective performances in Libya, nations are more likely to turn to Turkish drones than Chinese ones, which are offering a similar package.<sup>29</sup>

### **Operational Advantages and Limitations of Drone Use**

What are the operational advantages of drones in modern warfare? Lessons learned from Operation Spring Shield have shown that small- and middle-sized combat UAVs are extremely effective tools on the tactical battlefield—but not without some limitations. These advantages and limitations are as follows:

1. The UAVs are able to digitally and instantly provide the most desired and precious operational information about the battlefield. They are eyes in the skies, over a battlefield that is crammed with high-resolution optics, data links, radars, and laser-guidance systems. The UAVs' advantage is an ability to loiter, often at a high altitude over a target, watching it ceaselessly for hours, if not days, and sometimes even weeks.<sup>30</sup> In remote and unreachable areas, UAVs are quite effective tools because they conduct ISR without any detection by the enemy. The serious weakness of the UAV is a high-level of dependence on fair weather. As one child in Yemen said, all the kids are scared of blue skies, because that is when the drones come out.
2. Striking the enemy or its infrastructure in the deep rear and interrupting some operations that have strategic importance additionally with a traditional mission of ISR.
3. The Turkish and Russian experiences have demonstrated that UAVs are optimal in cooperation with heavy artillery and air forces that provide high accuracy of bombardment.
4. Price is a significant determinant that makes drones attractive for future warfare. Therefore, the governments of leading countries must consider increasing their UAV production and development. Such systems must be cheap and easily produced. It is highly likely that we will witness a massive production of military drones for all types of armies for use in land, air, and naval domains in the near future. The Turkish cases show that the price of replacement of lost drones can become burdensome to the defense budget, particularly for the more expensive combat UAVs. To minimize such expenses, Turkey promotes the Kargu kamikaze drone, which is ideal for the swarm tactic. These units are cheap and pose a serious threat to any military unit when able to evade adversaries' countermeasures.
5. Chinese experts from *China Military Online* indicated one interesting lesson for future wars was that on 1 March, the Syrian military issued a warning that any air target would be considered a hostile target and shot down, as Syria shut down Idlib's airspace. This warning indicates that destruction upon discovery has become the norm on the battlefield, which is also a point worth attention in future drone wars. On the Syrian battlefield, not only sovereign states but also violent extremist organizations have this capability and are implementing destroy-upon-discovery measures, which poses difficulties and an ethical crisis to the practice of drone warfare.<sup>31</sup>
6. The lessons learned from Operation Spring Shield teach that in an anti-access/area denial (A2/AD) environment, UAVs are the most effective instrument in fulfilling military and political goals. Turkish UAVs were

- able to reach targets that F-16s could not, obtaining the same effects as warplanes without incurring the same military or political consequences that the more traditional penetration into hostile areas might accrue.
7. UAVs serve as an integral part of network-centric warfare. In fact, UAVs made this doctrine truly operational, because such systems genuinely enabled an enhanced situational awareness, rapid target assessment, and distributed weapon assignment. Now Turkey and Russia have learned this new military reality. Turkey particularly is working on integration of UAVs and robots (under development) into this doctrine.<sup>32</sup>
  8. The drone swarm tactic makes it possible to detect and destroy enemy air-defense systems.
  9. For EWS and the air-defense forces of any country, it became clear after Idlib that antidrone tactics and technique must be developed. Antidrone systems must be more sophisticated and effective. Reports from Syria and Libya indicate that antiquated air-defense and EWS systems are able to destroy drones, but not easily.
  10. A technical aspect that manifested its importance in Idlib was the choice between an excellent quality camera and radio-electronic equipment or concentrating on the combat features of the drone. The drone's payload is limited; therefore, designers and military leaders must carefully assess what should be the priority.
  11. The case of Pantsir systems shows that the even recently developed counter technologies are ill-prepared to handle drone warfare. The Russian specialists recognized that the system's hardware and software did not detect low-speed targets. They are hopeful that following an upgrade the Pantsir system will be able to destroy different types of UAVs. However, in the competition between Turkish UAVs and the Russian Pantsir system, the measure of success is not simply counted in numbers of kills but in replacement costs. The price of a Bayraktar UAV is roughly 2.5 million USD, whereas a Russian Pantsir costs about 14 million USD. Turkey lost 19 Bayraktars, which would cost about 47.5 million USD to replace. However, Russia lost eight Pantsir systems, which would cost Moscow a whopping 112 million USD to replace. Adding in the other targets destroyed in the drone attacks, including tanks and troops, the cost ratio becomes even more significant.
  12. Drone production rates must increase. Within one month, Turkey lost a several of its drones, and to compensate for such losses, any country must develop an algorithm of drones' effective production vs. combat losses.

13. Developers must improve drones' quality, maneuverability, speed, stealth, and active or passive defense from air-to-air attack or SAMs.
14. UAVs allow for the participation of the highest-level politicians and generals in decisions for strikes against specific target in real time. Additionally, drones can conduct careful ISR and immediately destroy targets with the collective approval of all relevant decision makers. Before the advent of combat UAVs, this was the most serious weakness. The most famous incident occurred in 2000, when an American Predator UAV spotted Osama bin Laden in Afghanistan but was unable to attack. This was one of the main reasons why the weaponization of UAVs intensified.<sup>33</sup>
15. The sniper role is a unique element offered by UAVs, allowing operators to detect, track, and liquidate a particular person or a group of people whose deaths have a political or military significance.
16. Russia and Turkey have raised the issue of sovereignty over satellites. Since Moscow possesses its own GLONASS satellite navigation system, Russia only needs to wisely integrate the system into this new type of warfare. Turkey is very much aware its dependence on foreign satellite navigation systems. Ankara is planning to go in an alternative direction by developing a Navigation Feature with Internal Sensor Fusion that reportedly will reduce and possibly eliminate GPS dependency altogether.<sup>34</sup>
17. UAVs make it possible to patrol huge territories continually, highly complicating the processes of regrouping, retreating, counterattacking, or delivering reinforcements. Hence, drones provide an instant digital picture of the war in real time. The generals are able to see the war in a fashion similar to a video game, monitoring the entire battlefield without leaving their headquarters or even deploying. However, this does not make war any easier; on the contrary, it makes it highly complicated. For the generals in the building, their strategies must be more sophisticated in defining the goals and means of war at the tactical and strategic levels. Additionally, the doctrine of concealment must be improved.
18. However, the lessons learned from Operation Spring Shield have shown that small- and mid-sized combat UAVs are an extremely effective tool on the tactical battlefield. The area of the Idlib Province is 4,054 km<sup>2</sup>. Turkish commanders took this into account when they decided to use UAVs instead of warplanes. Thus, it is possible to assume that Russia will pay some serious attention to this fact, trying to compensate for such attacks in the near future.
19. The psychological effect when the enemy is unaware of the direction of the next attack is pivotal, because traditionally our mind-set is dividing

and categorizing reality. In case of war, there can be three main categories of areas: a safe zone, a war zone (the frontline), and an enemy zone. In the case of UAV use, the Idlib episode showed perfectly that soldiers' mind-sets are ruined because from now on, they cannot feel secure in their supposed safe zone with drones sneaking into the rear, striking soldiers, weapons systems, and infrastructure.

20. From the abovementioned point is derive the next—a physical effect. UAVs have revolutionized the perception of the battlefield. Since the confrontation in Idlib, it is possible to say that the traditional concept of war, where the rear is more or less stable, is over. Aircraft are flying faster and are usually making strikes in the enemy's rear and returning to the base; however, UAVs are able to control the enemy's rear constantly.
21. The main limitation of drones, as with any other weapon system, is that eventually humanity will develop countermeasures against this advanced weaponry. Nevertheless, for the immediate future, UAVs will be, to some extent, a baffling enigma. From its lessons learned in Syria and Libya, Russia is working to develop air-defense and radio-electronic warfare tactics and systems to counter UAVs.
22. The success of Turkey in building its own UAV technologies paid off the enormous investments Ankara poured into the program throughout the past few decades. Undoubtedly, Turkey's experience will serve as an example for other countries (such as Poland) that they must develop their own military technologies. In case of war, Poland definitely will face an adversary armed with UAVs, robots, and artificial intelligence-enhanced weaponry. However, most political and military leaders continue to think and plan in terms of antiquated categories and modalities of war.
23. The humanitarian or moral question of drone warfare is very significant. Allegedly, UAVs are peerless when it comes to destroying the targets; however, the use of such weapons is prone to significant collateral damage—including the killing of civilians. Another point to consider is the aspect of drone operators, sitting at a base and not bound to the real battlefield and potentially prone to making operational mistakes.
24. Finally, I would say the most important advantage of UAVs is that they are useful tools for politicians. UAVs are able to achieve a tangible result without any meaningful human engagement. The definition of war and politics was never so close as it is now to the Clausewitzian concept that “the war is continuation of politics by other means.” It is the one of the greatest advantages of the future of war that limits human losses by allowing a machine to perform missions that would traditionally have involved troops

or human pilots. This advantage will provide the impetus for the coming revolution in remote warfare.

### **The Geopolitical Implications of Tukey's Use of UAVs**

The geopolitical aftermath of the conflict in the Idlib de-escalation zone is that Turkey managed to keep Idlib Province under Ankara's control, which would have been impossible without the use of UAVs. In Turkey's fight against the Kurds within Turkey and in Idlib, UAVs demonstrated a high technological level and resolved the biggest political problem facing international conflict—the human cost of military campaigns. Without UAVs, the number of Turkish soldiers needed to accomplish the same results would have been significantly higher. Turkey lost many UAVs during the conflict in Idlib, but to a politician the destruction of a UAV is incomparable with the deaths of his/her country's soldiers, particularly if the military campaign has a political sensitivity inside the country.

UAVs as an element of the twenty-first-century warfare definitely have a significant future, although major players are obviously working on the development of countermeasures. For example, with Russian support, the Syrian Air Defense Force reportedly destroyed approximately 20 Turkish UAVs with the help of Buk-M2E (NATO nomenclature: SA-17 Grizzly) SAM systems,<sup>35</sup> illustrating that such systems can be sufficient to undermine UAVs' superiority in the air. This was previously proven during the 2008 Russo–Georgian War, when similar Russian systems destroyed several Israeli-made Georgian drones.<sup>36</sup>

Turkey's reputation for UAV-centric warfare increased in the aftermath of Operation Spring Shield, during which Turkish drones inflicted the most sensitive losses on the army of Bashar al-Assad. Definitely, neither Russia nor Syria expected such a scenario. As a Russian expert writes, in some periods of these hostilities, the Syrian Army had an overt fear of drones, reminiscent of the fear of German tanks among the Red Army during World War II.<sup>37</sup> Russian combat journalists reported about this new phenomenon in the Syrian war and were definitely unhappy about it, because they continually had to hide from UAV attacks. One such journalist recognized that Turkish drones had changed the course of the war in Idlib.<sup>38</sup> Additionally, one of the most crucial issues for Russia is the role of Turkish-made UAVs in the conflict in Eastern Ukraine. Kiev bought six Turkish drones, and after Russia's Idlib experience, Moscow reacted nervously to such news coming from Ukraine.<sup>39</sup>

Russia and Turkey behave similarly in Syria and Libya. Once Russia had to intervene in the Syrian Civil War to save the Assad regime, and the same actually happened in December 2019, when Turkey decided to openly behave as a true great-power country without Western consent. In some context, these two countries

are buttressing each other in attaining the geopolitical power of their previous historical forms: the Ottoman and Russian Empires. Drone technology has brought Russia and Turkey to the fore of modern warfare, on a par with the United States.

The theorization of the UAV phenomenon in modern warfare is already being put into action. Still, Russia has not developed its abilities as well as the West, but it is only a matter of time before it does so. For example, after the experience in Khmeimim, Russia created a specific term for such attacks: “a massive air micro-attack.”<sup>40</sup> To fight with small drones, the army must work with new scientific approaches that are able to create the weapons that work on the new physical principles (laser, particle-beam, electromagnetic, and so forth).<sup>41</sup> For example, Russia conducted at least 15 military drills in November 2019 where the main task was to fight against UAVs by means of radio-electronic warfare.<sup>42</sup>

Russia made significant conclusions from the Idlib operation, and soon it seems to expect the massive production of combat drones. Even before Idlib, Russia had deeply recognized the essence of the problem, which is the lack of combat drones. However, the situation on the battlefield was never as dramatic as it turned out to be in Idlib this year. Idlib spurred the Russian military establishment to take more concrete steps. The main drone doctrine has already been developed, focusing on reconnaissance and targeting, but it is now likely that such doctrine will be altered significantly. Undoubtedly, Russia is on the way toward the creation of combat drones, as witnessed by the development of the S-70 Okhotnik-B (also referred to as Hunter-B) stealth heavy combat UAV. However, this is a heavy strike drone, and its scope is global or continental. Its creation was meant to challenge the super heavy league: the United States, China, and so forth.

The revolution of UAV warfare is spreading across the Middle East and beyond—from Yemen to Libya and from Syria to Ukraine. Turkey and Russia, not the United States, are now determining the future of the region, which is a logical development given the history of the region. When the ideological expansion fades away, the power vacuum usually is filled by normal or traditional powers, which in this case Turkey and Russia represent. In Syria and Libya, world armies are forging the tactics, techniques, and strategies of future wars.

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