

**USE OF ARTILLERY IN MODERN WAR
(A Brief Analysis of the Ukrainian Conflict)**

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ABSTARCT

At present, modern artillery has complexes and systems capable of delivering strong and accurate strikes, firing at long distances, wide maneuverability, and sudden and rapid action in any conditions. The presence of self-propelled armored artillery systems, rocket close-fire systems, missile complexes, clustered and high-precision ammunition allows striking with minimal consumption of missiles and ammunition, open and closed, mobile and stationary, tracked and untracked, armored, single, group targets allow for use in any weather conditions, day and night. However, the most important aspect of this riot of opportunities is the financial aspect.

Non-contact description of combat operations, real-time targeting of objects, selective targeting by means of high-precision weapons, increasing the survivability of troops are being carried out in the development of these directions, on the modernization of weapons and military equipment.

The analysis of military conflicts of recent years, taking into account the prospects for the development of weapon systems, shows that their most distinctive feature is the transition from "direct" forms of hostilities, in which the main role is played by groups of armed forces on the ground without contact or are the so-called reconnaissance-flame and electronic-fire forms, in which deep flame ignition plays a major role.

Artillery is and remains the basis of ground forces' firepower, and barrel artillery and rocket-propelled grenade systems are predominantly assigned to these types of troops.

At the same time, research results show that the level of actual combat capabilities of some modern formations, parts and units no longer fully meets the requirements of the time.

Some types of artillery systems are outdated, intelligence and management are not good. All processes of troops and firefighters are not automated, and the efficiency of some types of ammunition is low.

In order to solve these and other problems, it is necessary to constantly and responsibly improve the weapons and military equipment of the troops. Today, the main factor is equipping missile troops and artillery with highly effective automated control and intelligence systems, as well as modernized or promising missile and artillery complexes and means.

If we analyze the conflict in Ukraine, it shows the importance of dispersed deployment of forces, firepower and stockpiles of weapons. The most important role of artillery turned out to be an unexpected novelty for the armies of Western Europe, whose firepower has decreased dramatically after the Cold War.

Since the Russian troops entered the territory of Ukraine on February 24 of this year, experts and commentators have repeatedly announced the future of this armed conflict. First, on the

basis of sketchy videos, they announced the death of the tank (as an effective type of weapon). Then Turkish drones were called invincible helpers that could change the course of the war, and the main role was given to Western anti-tank weapons. Now, nine to ten months after hostilities began, more balanced judgments have emerged, and other countries' armed forces can learn a lot from this.

On November 30, London's Royal United Services Institute (RUSI) think tank provided detailed information about the first five months of the war, when Ukraine was mostly on the defensive.

The authors, including Lt. Gen. Mikhail Zabrodskyi of Ukraine and several other analysts at the center, had extensive access to Ukrainian military data and solutions. Their findings paint a more complex picture than the popular notion that Russian forces cannot stand up to the nimble Ukrainians.

The invasion failed, but it was not predictable. When hostilities began north of Kiev, the Russian army had 12 soldiers for every Ukrainian soldier, and in the first 48 hours of the conflict, Russia attacked 75 percent of Ukraine's fixed air defense facilities from the air. A successful Russian cyberattack disabled Ukraine's satellite communications. Ukraine held off on this initial strike largely because it had the foresight to distribute its stockpile of munitions from major weapons a week before the invasion, a move that intensified three days before the war began. After the attack, the aircraft and air defense systems were dispersed within hours. As a result, only a tenth of the mobile air defense facilities were hit. If Russia's targeting was more accurate and fast, it would even be possible to destroy them.

According to other data from the RUSI think tank, Russian military intelligence fortunately took two days, and in some cases longer, to transmit target information to the command center in Moscow and launch a strike. America cannot expect the Chinese People's Liberation Army to make the same mistakes in the Taiwan War. "There is no shelter in modern warfare," the report concludes. "The enemy can strike the entire combat operation area." In other words, it is far behind the conditional front line.

This means that troops have to fight differently. One option is cloaking, but this is "extremely difficult to maintain," the RUSI report says, because various types of sensors, such as motion-capture optical cameras, thermal imagers, and electronic antennas that pick up radio emissions, can overlap, even with well-hidden objects. tires. Another solution is to use reinforced structures such as concrete boxes and bunkers. But they, as a rule, note the presence of the military in one place. The best way to survive is to simply spread out and move faster than the enemy notices you. Ukrainian special forces, who usually work in small groups, are also classified by Russian drones if they stay in one place for a long time.

Contrary to popular belief, the Javelin and NLAW anti-tank missiles supplied by the US to Ukraine did not save the situation, despite being widely seen in video footage during the first week of the conflict. Turkey's TB-2 drones did not help either, they were almost out of action by the third day of the battle. "The propaganda value of Western equipment was very high at the start of the war," said Jack Watling, one of the authors of the report, on the Russian Contingent podcast, which is devoted to Russian military affairs. even until April." And he proved the decisive factor rather prosaic. "The Russians were forced to withdraw from Kiev by two artillery brigades, firing every day from all available weapons.

Artillery's most important role came as an unexpected revelation to Western European armies, whose firepower had declined dramatically since the end of the Cold War. According to the International Institute for Strategic Studies, another think tank in London, the number of artillery weapons in major European armies has decreased by 57 percent from 1990 to 2020. Ukraine's arsenal was very impressive. At the start of the war, it had more than 1,000 guns (with long barrels) and 1,680 rocket launchers, more than Great Britain, France, Italy, Spain and Poland combined, making it the largest artillery force in Europe after Russia. The main shortage was ammunition.

Ukraine maintained "artillery parity" for about six weeks, far longer than almost any Western military has managed under the same conditions. Then it began to run out of shells, and by June Russia had a ten-to-one fire advantage, a disparity that continued until Ukraine received an influx of advanced Western artillery systems, including the American HIMARS.

"In the conditions of intensive military operations, the level of consumption of weapons remains very high," the authors of the report write. Few warring nations have the ability to develop new weapons, spare parts and ammunition at the required speed. NATO countries, except the United States, are not strong enough, powerful enough in these matters, and do not have enough power and capabilities.

Unmanned aerial vehicles have played a very important role, although not mainly for strikes, but for intelligence, surveillance and reconnaissance. Rather than relying on drones dispatched by senior leadership, Russian units with their own unmanned aerial vehicles (UAVs) fired accurately and hit targets within three to five minutes of spotting them, according to the center's report - historical standards. surprisingly fast sensor-to-shot cycle. For units that did not have their own UAVs, this figure was around half an hour, and not so accurately.

But the main lesson of the conflict in Ukraine is that troops need more drones than initially thought. About 90 percent of all UAVs used by the Ukrainian Armed Forces were destroyed between February and July, the authors of the report said. The average life of a fixed-wing aircraft was about six flights, while a simpler quadcopter made as few as three flights. Such destruction of drones will lead to the destruction of the fleet of European military drones in a matter of days.

This suggests that the focus should be on low-cost and simple systems that can be considered almost disposable, rather than small batches of drones with large engines that use a lot of fuel and are equipped with advanced sensors. In turn, this approach requires more trained personnel capable of handling them and a more relaxed approach to their use in peacetime. "Currently there are fewer administrative restrictions for the UK Royal Artillery to leave 155mm howitzer ammunition on civilian roads," the report says, but drones fly over airspace to monitor firing results. there are restrictions on aircraft flight.

During this conflict, it was also determined how to counter UAVs. One approach is traditional masking. Ukrainian troops discovered that when Russian intelligence units pinpointed their positions with laser pointers, they could fire smoke grenades to cover their positions. But it tended to blindside the defense unit. According to the authors of the report, the most important way to combat drones is to use Electronic Warfare, a weapon that is rarely talked about because it is invisible.

Russia has forced Ukraine to limit the use of drones. In theory, they can remotely control Russian targets and transmit real-time video footage to an artillery unit. But in practice, radio waves needed for navigation and communication from both drones and ground stations can be detected and, in some cases, disabled by electronic attack. Therefore, Ukraine is obliged to determine the routes of its UAVs in advance and upload the data after their return. This often happens after a few hours, and by then the target may have changed. According to Ukrainian data, only a third of drone flights are successful.