

**Oleksandr NASHYVOCHIKOV**

*PhD in Historical Sciences*

*The National Defence University of Ukraine*

*(Kyiv, Ukraine)*

*ORCID: <https://orcid.org/0000-0003-4197-6408>*

*Email: [dr.alexander@ukr.net](mailto:dr.alexander@ukr.net)*

**Serhii RECHYCH**

*PhD in Historical Sciences, Senior Researcher*

*The National Defence University of Ukraine*

*(Kyiv, Ukraine)*

*ORCID: <https://orcid.org/0000-0002-6156-8121>*

*Email: [serhiirechych@gmail.com](mailto:serhiirechych@gmail.com)*

**APPLICATION OF UNMANNED AVIATION IN MODERN ARMED CONFLICTS  
AS A FACTOR OF ENSURING ADVANTAGE OVER THE ADVERSARY  
(ACCORDING TO THE MILITARY-HISTORICAL EXPERIENCE  
OF ANTI-TERRORIST OPERATION OF 2014–2018)**

*The events of 2022 actualized the need for a thorough study of the combat experience gained by the military units of the Armed Forces of Ukraine in the Anti-Terrorist Operation, in particular in the part related to the use of unmanned aviation. The authors analyzed application of unmanned aerial vehicles in modern Armed conflicts and Wars, primarily russian-Ukrainian. In addition, the article analyzes possibilities, tasks and advantages of using unmanned aircraft systems in the conditions of russian armed aggression. The problematic issues of combating the enemy's unmanned aerial vehicles and the further development possibilities of this type of means of combat in the air in the near future are considered. The analysis of the experience of the use of unmanned aerial vehicles in the conditions of the russian-Ukrainian war shows that today a revolution is taking place in the field of application of robotic equipment, a new structure of the relevant units and the tactics of their actions are being formed, which prompts a change of views on the nature of future wars.*

**Keywords:** *unmanned aerial vehicle, Anti-Terrorist Operation, drone, Armed Forces of Ukraine, Armed conflict.*

**Formulation of the problem.** The open aggression of the russian federation in the form of the so-called «Hybrid War» turned out to be a serious challenge to the combat readiness of the Armed Forces of Ukraine (Mahda, Ye. V. 2015, S. 4–5). The russian federation's occupation of Crimea and continued support for separatist movements in Eastern Ukraine led to an escalation of tensions and open hostilities. The low level of combat capabilities of Ukrainian troops was explained by the fact that until 2014, the Armed Forces of Ukraine had no combat experience, except for relatively small units involved in Peacekeeping Missions. The constant reduction in the number of the Armed Forces of Ukraine, primarily combat units, also negatively affected their combat capability. Despite the relatively low combat

potential of the Ukrainian troops in the Donetsk and Luhansk regions, an Anti-Terrorist Operation was implemented in response to the actions of the russian federation. This Armed conflict can be characterized as a complex geopolitical struggle involving historical, cultural and political factors. However, it had certain features due to the gradual increase in the use of robotic equipment during hostilities, in particular unmanned aerial vehicles.

**Analysis of recent research and publications.**

The constant proliferation of research in the field of unmanned technologies emphasizes their importance. Thus, Ukrainian military researchers, in particular A. Volkov, S. Korsunov, V. Hurtovenko and others, studied the evolution of the role of unmanned aviation in modern Armed conflicts (Volkov, A.F., Hurtovenko, V.V., Korsunov, S.I.,



Oboronov, M.I., Oriekhov, S.V. & Fedchenko, S.I. 2021, s. 66–81).

It is important to note the significant scientific contribution of scientists of the National Defence University of Ukraine, in particular Yu. Danyk (Danyk, Yu.H. 2008, s. 30–43), as well as O. Oleksenko, O. Avramenko, A. Fedorova, V. Snitsarenko and O. Chernavina, who carried out significant work on the study and generalization of the use of unmanned aerial vehicles by the armed forces of the Russian Federation during the large-scale invasion of the territory of Ukraine. Although the focus of the work concerns the years 2022–2023, the authors conduct a retrospective analysis of the use of unmanned aerial vehicles during the first and second Russian-Chechen wars (1994–1996 and 1999–2003), conflicts in Georgia in 2008, Syria from 2015–2017. and hostilities in Eastern Ukraine (Oleksenko, O.O., Avramenko, O.V., Fedorov, A.V., Snitsarenko, V.V. & Chernavina, O.Ie. 2022, S. 37–42).

Researchers O. Koshets and V. Horbenko made a comparative analysis of the methods of application, tactical techniques and capabilities of unmanned aircraft systems based on the experience of local wars and Armed conflicts, including in the conditions of the Russian-Ukrainian war since 2014. In addition, the work presents problematic issues of combating the enemy's unmanned aerial vehicles (Korshets, O.A. & Horbenko V.M. 2023, S. 9–17).

At the same time, R. Koltsov, P. Vaniev and D. Indutnyi studied the features of the use of unmanned aerial vehicles in the Donetsk and Luhansk regions and identified the leading concepts for their creation (Koltsov, R.Iu., Vaniiev, P.Sh., Indutnyi, D.H. 2019, S. 29–35).

Famous Russian scientists — S. Ganin, O. Karpenko, V. Kolnogorov and G. Petrov — contributed to the study of aviation technologies and their application (Ganin, S.M., Karpenko, A.V., Kolnogorov, V.V. & Petrov G.F. 1999, 176 s.). Their comprehensive analysis of the use of unmanned aerial vehicles during the armed conflict between Armenia and Azerbaijan provides valuable information on the use and development of aerial technologies in the context of military operations. Among them, the experience of using unmanned aviation by Azerbaijan to destroy the Russian air defense system, which was in service with the armed forces of Armenia, can be of particular interest to us.

**The purpose of the article** is to identify a complex of features of the use of unmanned aviation in modern wars and Armed conflicts, which lead to its

transformation into a noticeable factor in achieving superiority over the enemy (based on the documentary materials of the Anti-Terrorist Operation in the East of Ukraine in 2014–2018).

**Presentation of the main research material.**

It should be noted that the experience of using unmanned aerial vehicles by the Russian Federation was first gained during hostilities in the Chechen war of 1994–2003 and improved in the Abkhazian-Georgian conflict of 2008. Their use played a significant role in intelligence gathering, surveillance and strikes (Volkov, A.F., Hurtovenko, V.V., Korsunov, S.I., Oboronov, M.I., Oriekhov, S.V. & Fedchenko, S.I. 2021, s. 69, 70).

Realizing the importance of unmanned aviation in modern Armed conflicts has led the Russian Federation's armed forces to close the technological gap by purchasing Israeli drones such as the Bird Eye 400 and Searcher Mk II, and to start their own production of unmanned aerial vehicles.

Shortly before the invasion of Ukraine, the armed forces of the Russian Federation adopted several types of unmanned aerial vehicles, including «Granat», «Zastava», «Layer», «Orlan-10» and «Forpost».

At the same time, the use of unmanned aerial vehicles at the beginning of the Anti-Terrorist Operation was a secondary task due to the wide use of artillery and aviation in the theater of war. First of all, they were used to perform aerial reconnaissance tasks and direct artillery fire (Korshets, O.A. & Horbenko V.M. 2023, s. 9). Therefore, the numerical superiority of the reconnaissance unmanned aviation of the Russian occupying forces did not pose a significant threat to the Ukrainian units. However, it should be noted that the Russian Federation has been using drones in Eastern Ukraine since the beginning of the Armed conflict. Thus, during the formation of the 1st and 2nd Army Corps of the so-called «people's republics», separate units of unmanned aerial vehicles were created as part of brigades and regiments (Danyk, Yu.H. 2008, s. 30–43). Since 2016, the formation of units of unmanned aerial vehicles has begun in each brigade (regiment) of the Russian occupation forces<sup>1</sup>. Usually, reconnaissance drones performed the following tasks:

- identifying the location of personnel of the Armed Forces of Ukraine, military equipment, places of their greatest concentration for further fire damage;

<sup>1</sup> HDA MOU. F. № 516. Op. A4П(с)-16. Spr. 18 (Donesennia). Ark. 2

- reconnaissance of the condition of the roads along the route of the advance and deployment of Ukrainian units, the presence of barrier lines and their characteristics;
- identification of routes of delivery of material means and ammunition;
- adjustment of artillery and mortar fire;
- detection of the state of engineering equipment and masking of the positions of the Armed Forces of Ukraine;
- conducting electronic warfare;
- carrying out sabotage activities to disable important facilities, primarily artillery depots and depots of fuel and lubricants (Na terytorii arsenalu v Ichni vyjavleno bezpilotnyk — Henshtab ZSU. 2018).

At the beginning of 2014, the Armed Forces of Ukraine were not ready to effectively counter Russian aggression, which was due to noticeable deficiencies in the defense potential. In particular, this was due to the lack of established production of own drones, training centers for operators of unmanned aerial vehicles and combat experience among the personnel of the Armed Forces of Ukraine regarding their use. This problem worsened in 2015, after the introduction of the «Minsk Agreements», which provided for significant restrictions on the use of combat aviation and withdrawal of large-caliber artillery. Although there were no drastic changes directly in the tactics of using unmanned aerial vehicles on the battlefield, the enemy constantly improved the methods of using reconnaissance drones and their technical characteristics. This very often led to numerous losses in personnel during shelling of Ukrainian positions. It became clear the growing importance of unmanned aerial vehicles during hostilities, as well as the need to establish the production of own models of unmanned aviation. Since the unmanned aerial vehicles used by the Ukrainian units were mostly represented by civilian tactical mini-drones of the DJI Mavic or DJI Spark type, which had a relatively short range, as well as reconnaissance unmanned aerial vehicles of the Soviet production, of the Strizh or Reis type, which were morally obsolete, and their performance of intelligence tasks were ineffective.

At the same time, the Ukrainian troops lacked combat experience, which, first of all, resulted from extremely limited knowledge of modern tactics and strategy of warfare, especially in comparison with units of the Russian occupation forces and private military companies. This lack of experience included,

in particular, knowledge of asymmetric actions with the help of unmanned aerial vehicles in modern wars and armed conflicts of a hybrid nature. Therefore, the military-political leadership of Ukraine made a decision to restore the parity of forces in the use of advanced military technologies.

During the Anti-Terrorist Operation, the Armed Forces of Ukraine conducted more than 270 tests and studies of promising samples of weapons and military equipment, including unmanned aerial systems (Z pochatku viiny ZSU provely 270 vyprobuvan novoho ozbroiennia — Henshtab 2018). Also, thanks to the increase in the number of reconnaissance drones «Fury», «PD-1» (developed by Ukrainian scientists in 2014) and «Stork» (developed in 2017), the intelligence capabilities of combat units have increased in the Armed Forces of Ukraine.

In July 2014, after the first clashes of Ukrainian soldiers with the enemy in the «M» sector near the settlement of Amvrosiyivka, there was an urgent need for operational information about the enemy's actions: the location of its firing positions and personnel, the location of military equipment, etc. Also, due to the large area of mining, conducting reconnaissance actions using conventional methods lost its meaning, as it exposed any reconnaissance group to the danger of getting into a minefield. Therefore, a decision was made to involve a group of volunteers in the «Aerial Reconnaissance» project (Kostiuk, B. 2016). Soon, separate air reconnaissance platoons were created as part of the reconnaissance battalions of various military units. This made it possible to increase the area of survey of the territory of hostilities and increase the depth of reconnaissance. Subsequently, on February 6, 2024, the Decree of the President of Ukraine was issued, instructing the Cabinet of Ministers and the General Staff of the Armed Forces of Ukraine to create a separate battalion of attack unmanned aircraft systems (Ukaz Prezydenta Ukrainy «Pro naroshchuvannia spromozhnostei syl oborony» 2024).

The main advantages of using unmanned aerial vehicles over manned aircraft include: (Cherviyakov, O.I., Yevtushenko, I.V., Bukriciev, O.I. & Bilous, V.V. 2023, s. 9):

- significantly smaller weight and dimensions parameters in combination with high reliability and maneuverability;
- small effective scattering area;



- relatively low cost and low spendings for their creation, production, operation, repair and restoration;
- lack of need for crews, their life support systems and airfields;
- a significant saving of resources allocated to the training of drone operators in comparison with the training of the flight crew of manned aircraft;
- insensitivity to the psychological impact of air defense fire;
- the difficulty of detecting and firing small unmanned aerial vehicles with existing anti-aircraft systems;
- relatively low level of acoustic noise.

In addition, depending on the tasks being performed, drones can be equipped with both low-noise electric motors and louder internal combustion engines. Also, unmanned aerial vehicles can be equipped with one or more different types of sensors and types of weapons.

Along with this, there are a number of disadvantages in their application, namely:

- significant load restrictions;
- high dependence in use on time of day, season and weather conditions;
- low autonomy of actions;
- low concealment of control channels;
- short range of remote control of an unmanned aerial vehicle (Volkov, A.F., Hurtovenko, V.V., Korsunov, S.I., Oboronov, M.I., Oriekhov, S.V. & Fedchenko, S.I. 2021, s. 67).

Along with the fact that unmanned aerial vehicles have significant technical and economic advantages over manned aircraft, they are already changing the course of warfare. In particular, this happens thanks to certain qualities:

- significant scope of the territory of conducting reconnaissance, since the increasing quality of optical devices of the drone allows the artillery to get a clearer picture of the location of enemy targets and covers a significant area;
- high autonomy of modern models of unmanned aerial vehicles, which allows for independent reconnaissance of enemy positions and mapping of the terrain in real time;
- low price and availability of drones, enabling small armies to successfully counter overwhelming enemy forces and establish parity of forces on the battlefield. Even a disposable kamikaze drone will cost much less for any country;
- significant destructive power of drones — at a relatively low cost, they provide the necessary

destructive power, therefore they are more in demand than missiles;

- higher damage capabilities, since the use of several strike drones allows you to hit a larger number of targets on a larger area.

In addition, unmanned aerial vehicles are used at all levels — from tactical to strategic, in areas of application where they have no manned alternative. In particular, short-range reconnaissance in the tactical zone, especially in urban conditions, as well as long-term surveillance in large areas at a distance of several thousand kilometers from the base to obtain operational and strategic information (Cherviakov, O.I., Yevtushenko, I.V., Bukriciev, O.I., Bilous, V.V. 2023, S. 9).

In our view, the integration of drones into modern warfare has far-reaching consequences:

- durability and continuity of work — unmanned aerial vehicles can potentially operate for a long time, providing continuous reconnaissance or other tasks;
- high efficiency — the emergence of deadly drone swarms controlled by artificial intelligence will have a dominant presence in future military operations, creating new complexities and challenges for the enemy;
- autonomy and independence — modern technologies ensure the autonomous operation of drones, allowing them to independently perform a wide range of tasks and provide a clear advantage in the implementation of any combat scenario;
- universality of application — the use of drones at all levels of military operations, from tactical to strategic, as well as in conditions that are unfavorable for the use of manned aviation.

**Conclusions.** According to the authors, the russian-Ukrainian armed conflict of 2014 became a key moment in the use of unmanned aerial vehicles in countering russian armed aggression. At the beginning of the Anti-Terrorist Operation, the majority of tasks performed by unmanned aerial vehicles related to surveillance and reconnaissance. Most of the drones were equipped with sensors for collecting photo and video data, which allowed Ukrainian forces to find out the location of important enemy military facilities, monitor troop maneuvers and adjust the accuracy of artillery and mortar fire. Nevertheless, the evolution of combat experience accelerated the change in the views of the military command on the use of unmanned aerial vehicles in operational conditions. Subsequently, starting in late 2017, drones began

to perform additional tasks, including providing support for targeted strikes and direct participation in offensive operations. The mass use of unmanned aviation in combat actions took place much later, in February 2022, during the large-scale invasion of the Russian occupation forces on the territory of Ukraine.

Although unmanned aerial vehicles were used in Anti-Terrorist Operations not for the first time, as evidenced by previous armed conflicts, significant changes in the tactics of their use took place in the period of 2014–2018:

- the scale of use of unmanned equipment has increased;
- there was an impetus in the investigation of drone designs and their technical specifications;

- the range of tasks performed by unmanned aviation during the Anti-Terrorist Operation has significantly expanded;
- rich combat experience was accumulated regarding the tactics of their use in various military operations;
- there was a transition from the purely reconnaissance activity of drones to their use as a strike force.

So, during the Anti-Terrorist Operation, there were changes in the views of the military leadership on the use of unmanned aerial vehicles in the modern realities of hostilities, which brought the latter to the forefront of the struggle. Gradually, unmanned aircraft from scouts and gunners turned into a powerful strike force, which was clearly demonstrated by the further analysis of events in 2022.

## REFERENCES

Cherviakov, O.I., Yevtushenko, I.V., Bukriev, O.I. & Bilous, V.V. (2023). *Bezpilotni povitriani zasoby urazhennia syl vtorhnennia Rosiiskoi Federatsii* [Unmanned aerial means of defeating the invading forces of the Russian Federation]. Kharkiv: Instytut pidhotovky yurydychnykh kadrov dlia Sluzhby bezpeky Ukrainy Natsionalnoho yurydychnoho universytetu imeni Yaroslava Mudroho, 212 s. [in Ukrainian].

Danyk, Yu.H. (2008). *Bezpilotni litalni aparaty: oznachennia, klasyfikatsiia, stan ta perspektyvy rozvytku i vykorystannia* [Unmanned aerial vehicles: definition, classification, state and prospects of development and use]. *Kosmichna nauka i tekhnolohiia*. Vol. 14, № 1, s. 30–43. [in Ukrainian].

Ganin, S.M., Karpenko, A.V., Kolnogorov, V.V. & Petrov G.F. (1999). *Bespilotnye letatelnye apparaty* [Unmanned aerial vehicles]. SPb.: “Nevskij Bastion”, 160 s. [in Russian].

Koltsov, R., Vaniiev, P. & Indutnyi, D. (2019). *Analiz stanu zabezpechennia bezpilotnykh litalnykh aparativ, yaki byly stvoreni za chas provedennia antyterorystychnoi operatsii na Skhodi Ukrainy* [Analysis of the state of provision of unmanned aerial vehicles, which were created during the anti-terrorist operation in Eastern Ukraine]. *Zbirnyk naukovykh prats Viiskovoho instytutu Kyivskoho natsionalnoho universytetu imeni Tarasa Shevchenka*. № 66, 132 s. [in Ukrainian].

Korshets, O.A. & Horbenko V.M. (2023). *Uroky zastosuvannia bezpilotnykh litalnykh aparativ u rosiisko-ukrainskii viini* [Lessons from the use of unmanned aerial vehicles in the Russian-Ukrainian war]. *Povitriana mits Ukrainy*. № 1 (4), s. 9–17. [in Ukrainian].

Kostiuk, B. (2016). *U NATO dyvuiutsia nashym uspikham — odyz iz zasnovnykiv «Aerorozvidky» ZSU* [NATO is surprised by our success — one of the founders of “Aero-reconnaissance” of the Armed Forces of Ukraine]. URL: <https://www.radiosvoboda.org/a/28153223.html> [Accessed: 03.12.2016]. [in Ukrainian].

Mahda, Ye. V. (2015). *Hibrydna viina: vyzhyty i peremohty* [Hybrid warfare: survive and win]. Kharkiv: Vivat, 304 s. [in Ukrainian].

*Na terytorii arsenalu v Ichni vyiavleno bezpilotnyk — Henshtab ZSU*. (2018). [A drone was discovered on the territory of the arsenal in Ichna — the General Staff of the Armed Forces of Ukraine]. URL: <https://gordonua.com/ukr/news/localnews/-na-teritoriji-arsenalu-v-ichni-vijavlenij-bezpilotnik-genshtab-zsu-502519.html> [Accessed: 13.11.2018]. [in Ukrainian].

Oleksenko, O., Avramenko, O., Fedorov, A., Snitsarenko, V. & Chernavina, O. (2022). *Zastosuvannia bezpilotnykh litalnykh aparativ zbroinomy sylamy Rosiiskoi Federatsii u viini proty Ukrainy* [The use of unmanned aerial vehicles by the armed forces of the Russian Federation in the war against Ukraine]. *Nauka i tekhnika Povitrianykh Syl Zbroinykh Syl Ukrainy*. № 4 (49), s. 37–42. [in Ukrainian].

*Pro naroshchuvannia spromozhnosti syl oborony* [On increasing the capabilities of the defense forces]: Ukaz Prezydenta Ukrainy vid 06.02.2024 r. № 51. (2024). *Ofitsiyni visnyk Ukrainy*. № 19, Art. 1221. [in Ukrainian].



Volkov, A.F., Hurtovenko, V.V., Korsunov, S.I., Oboronov, M.I., Oriekhov, S.V. & Fedchenko, S.I. (2021). Transformatsiia zavdan bezpilotnoi aviatsii: vid stvorennia do zastosuvannia u voiennykh konfliktakh suchasnosti [Transformation of the tasks of unmanned aviation: from creation to application in modern military conflicts]. *Nauka i tekhnika Povitrianykh Syl Zbroinykh Syl Ukrainy*. № 3 (44), s. 66–81. [in Ukrainian].

Z pochatku viiny ZSU provely 270 vyprobuvan novoho ozbroiennia — Henshtab. (2018). [Since the beginning of the war, the Armed Forces of Ukraine conducted 270 tests of new weapons — the General Staff]. URL: <https://www.ukrinform.ua/rubric-society/2461024-z-pochatku-vijni-zsu-proveli-270-viprobuvan-novogo-ozbroenna-genstab.html> [Accessed: 15.05.2018]. [in Ukrainian].

### **Олександр НАШИВОЧНИКОВ**

кандидат історичних наук

Національний університет оборони України  
(Київ, Україна)

ORCID: <https://orcid.org/0000-0003-4197-6408>

### **Сергій РЕЧИЧ**

кандидат історичних наук, старший науковий  
співробітник

Національний університет оборони України  
(Київ, Україна)

ORCID: <https://orcid.org/0000-0002-6156-8121>

## **ЗАСТОСУВАННЯ БЕЗПЛОТНОЇ АВІАЦІЇ У СУЧАСНИХ ЗБРОЙНИХ КОНФЛІКТАХ ЯК ЧИННИК ЗАБЕЗПЕЧЕННЯ ПЕРЕВАГИ НАД ПРОТИВНИКОМ (ЗА ВІЙСЬКОВО-ІСТОРИЧНИМ ДОСВІДОМ АНТИТЕРОРИСТИЧНОЇ ОПЕРАЦІЇ 2014–2018 РОКІВ)**

*Стаття присвячена вивченню бойового досвіду, отриманого військовими частинами та підрозділами Збройних Сил України в антитерористичній операції, зокрема в частині, що стосується застосування безпілотної авіації, використанню безпілотної літальної апаратури у сучасних збройних конфліктах і війнах, насамперед російсько-українській. На основі вивчення низки документів та архівних матеріалів автори виявили головні тактичні прийоми використання дронів та розглянули зміни у тактиці їх застосування під час ведення бойових дій.*

*З'ясовано, яким чином обмеження у використанні зброї сприяли бурхливому розвитку застосування дронів на театрі воєнних дій, а також удосконаленню їх технічних характеристик та можливостей. Поруч із цим розглянуто можливості, завдання та переваги застосування безпілотної авіаційних комплексів в умовах російської збройної агресії.*

*Проведений військово-історичний аналіз досвіду застосування безпілотної літальної апаратури в умовах російсько-української війни свідчить про те, що сьогодні відбувається революція у сфері застосування роботизованої техніки, формується нова структура відповідних підрозділів і тактика їх дій, що спонукає до зміни поглядів на характер майбутніх війн.*

*Зроблено висновок, що, незважаючи на значну кількість праць, присвячених застосуванню безпілотної літальної апаратури, дослідження саме досвіду застосування БпЛА в українській історичній науці має певні наукові прогалини. Оскільки у сучасних реаліях сфера використання безпілотної авіації не є достатньо розвинутою.*

**Ключові слова:** безпілотної літальної апаратури, антитерористична операція, дрон, Збройні Сили України, збройний конфлікт.