



# Guided Chaos: How Russian Bombs Destroy Civilians And Infrastructure in Ukraine

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## Brief overview

The systematic use of guided aerial bombs for targeted attacks in Ukraine began in 2023, a year after the full-scale invasion by the Russian Federation Armed Forces. These attacks have covered both the frontline and rear areas, resulting in massive destruction of homes, hospitals, schools and other critical infrastructure. Since March 2024, the Truth Hounds team has documented more than 950 such incidents, resulting in the deaths of more than 250 civilians and injuries to more than 1,300. There were 23 cases when the number of victims of one such strike exceeded 10 people. The actual number of crimes involving the use of guided aerial bombs by the Russian army is much higher, as Truth Hounds' monitoring covers only a limited period.

The intensity of events at the front and the unpredictable development of hostilities forced the authors of the study to limit its timeframe to the period from the beginning of Russia's full-scale invasion of Ukraine until 30 September 2024, with particular attention to the dynamics of aerial bombing strikes over the past six months. At the same time, the Truth Hounds' monitoring team continues to monitor and document Russian air attacks on a daily basis, including those involving various types of aircraft bombs used by Russian tactical aviation.

The majority of guided aerial bomb attacks are conducted by Su-34 aircraft based at Russian airfields. The study revealed that approximately 70 of these aircraft were deployed by the Russian Aerospace Forces to strike Ukraine between 2023 and 2024. The Truth Hounds team concentrated on a comprehensive examination of these attacks, considering both the circumstances of the incidents and their evaluation from the standpoint of international humanitarian law (IHL). The investigators conducted an in-depth analysis of 30 satellite images, which led to the identification of 39 aircraft that were involved in the bombings.

The principal objective of the study is to examine the attacks with the usage of guided aerial bombs on populated areas of Ukraine, evaluate their legitimacy under international humanitarian law, and illustrate the rising incidence of war crimes and civilian casualties resulting from such actions. The objective is to illustrate the extent and severity of these attacks, thereby establishing a foundation for further international pressure on Russia to cease the utilisation of these tactics. Furthermore, the research aims to create the preconditions for bringing to individual responsibility those who directly carried out or ordered such attacks.

Truth Hounds investigators and documenters have thoroughly investigated a series of attacks on Kharkiv and Kherson and found that these attacks exhibit characteristics indicative of war crimes. A data analysis and interviews with witnesses revealed that the Russian military is actively using various types of guided aerial bombs with an error radius of exceeding 200 metres, which leads to significant destruction of civilian infrastructure and numerous human casualties. Truth Hounds' lawyers argued that the use of such bombs in densely populated areas is a grave breach of international humanitarian law. These attacks contravene the principle of distinction between military and civilian objects, are indiscriminate and indicate an intent to terrorise the civilian population as the primary target.

**NB**

The investigation into the attacks with guided aerial bombs is presented in two versions. The public version is presented below. The version containing additional information on the identified Russian Air Force aircraft, their affiliation with specific units, and the methods used to establish this data has been passed to Ukrainian law enforcement agencies. This decision was made in order not to impede the process of collecting evidence of the involvement of mentioned individuals in war crimes and the restoration of justice in general.

## Methodology

The data used in this study was collected through interviews with witnesses and victims, an analysis of publicly available data, open-source investigations, and a review of international humanitarian and criminal law. To ensure a high-quality and consistent documentation process, the Truth Hounds team strictly adhered to the developed methodology, relying on the manual for documenting war crimes<sup>1</sup> and the code of ethics<sup>2</sup> for working with witnesses and victims. The manual contains a description of violations of IHL and international crimes as set out in the Geneva Conventions, Additional Protocols and the Rome Statute of the International Criminal Court. It also provides a description of the elements of war crimes, instructions on how to properly collect different types of evidence and conduct interviews with witnesses and victims. All interviews were conducted in compliance with the principle of «no harm» and with due regard for the traumas of the interviewees.

In order to obtain information from primary sources and record the immediate aftermath of the attacks at the site of the hits, Truth Hounds organised two field missions to Kherson and Kharkiv. During these missions, documenters conducted interviews with nine witnesses to the events and took photographs and videos of the destruction and damage. The data obtained constituted an important component of the investigation, contributing to the formation of a comprehensive and more reliable account of the attacks and their consequences, and added to the arguments in proving the illegality of such actions in the context of IHL.

In light of the study's objective and the particulars of its design, the main basis of the organisation's investigators' work was open-source data. To obtain and analyse the data, a variety of tools were employed for the purposes of searching, identifying and verifying the information. In particular, the tactical and technical characteristics of the range of guided aerial bombs and aircraft in service with the Russian Armed Forces were analysed, as well as data on the movement of aviation units. In addition, satellite images from Planet, Maxar and Google Earth were used. This enabled the circumstances of the incidents to be established and confirmed, the type of weapons and their carriers to be determined, their likely locations to be geolocated, and the units that carried out the attacks to be identified. In addition, the personnel of the majority of aviation units involved in the use of guided aircraft against Ukraine were identified.

# **I. Russian tactical aviation in the war against Ukraine**

After the retreat of Russian troops from Kyiv, Chernihiv and Sumy regions in March 2022, Russian aviation changed its tactics. The displacement of their forces from Ukrainian airspace has forced Russian aircraft to carry out strikes from safe distances, beyond the reach of Ukrainian air defence systems.<sup>3</sup> As of 2023-2024, Russian aircraft are using Su-34 and Su-35,<sup>4</sup> armed with medium-range guided air-to-air missiles (X-59)<sup>5</sup> and guided air bombs, to strike remote targets.<sup>6</sup>

The aircraft in question are employed in a variety of roles during sorties, with the objective of conducting attacks. The Su-35 provides a defensive escort and aerial cover for Su-34 fighter-bombers during the latter's strikes, and is also employed to protect other aircraft engaged in transport or radar reconnaissance (e.g. Il-22, A-50). In order to fulfil its role, the Su-35 is equipped with anti-radar weapons and air-to-air missiles to destroy both air defences and aircrafts.<sup>7</sup> At the same time, the Su-34 is mostly used to launch X-59 guided missiles,<sup>8</sup> as well as guided aerial bombs, such as the unified interspecific glide munition (UMPB) and bombs equipped with a universal planning and correction module (UMPK).<sup>9</sup>



# Su-35 multi-role fighter jet

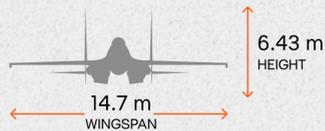


Designed to actively breach modern and airborne ground components of the enemy's air defence system, thereby enabling the destruction of priority ground and sea targets with powerful missile and bomb strikes.



**2 500 km/h**  
MAXIMUM SPEED

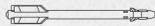
**3 400 km**  
MAXIMUM RANGE



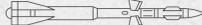
Combat load – 8 tonnes  
Empty weight of the aircraft – 18.4 tonnes  
Normal take-off weight – 25.3 tonnes  
Maximum weight – 34 tonnes  
Maximum operational overload + 9G

**12 POINTS OF SUSPENSION**  
**8 000 KG COMBAT PAYLOAD**

P-7EE – short-range guided missile



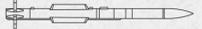
R-27 ER – medium-range guided missile



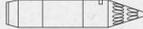
R-27 ET – medium-range guided missile



RVV-AE – medium-range guided missile



B-8M1 – S-8 unguided aircraft missile system



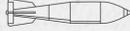
B-13L – S-13 unguided aircraft missile system



S-25 – unguided aircraft missile



FAB 500 M-62 – high-explosive aerial bomb, model 1962



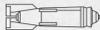
FAB 500 M-54 – high-explosive aerial bomb, model 1954



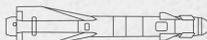
FAB 250 M-62 – high explosive aerial bomb, model 1962



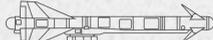
FAB 250 M-54 – high explosive aerial bomb, model 1954



X-29T – short-range air-to-ground precision missile



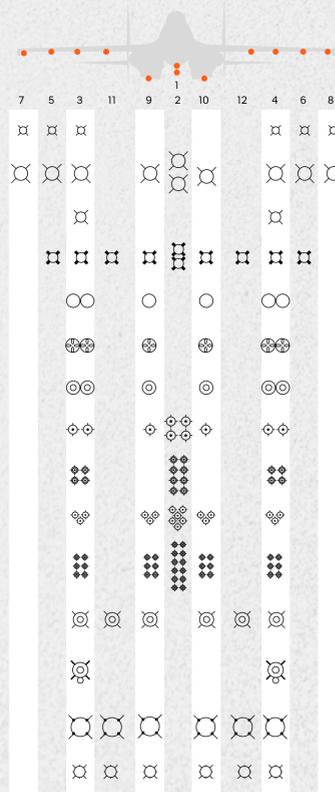
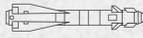
X-59 (Ovod M) – medium-range air-to-surface precision-guided missile



X-31 P – long- and medium-range anti-radar missile



KAB-500 Kr – corrected aircraft bomb with a television homing head



## **IMPORTANT**

It is a common practice among Ukrainian media outlets to refer to these bombs as «KABs». However, this designation is not entirely accurate. Although Russia does possess bombs called «KAB» in service, they differ significantly in terms of their characteristics. KABs represent a distinct category of laser-guided weaponry,<sup>10</sup> exhibiting a markedly reduced operational range in comparison to both UMPK bombs and UMPB munitions. KABs were extensively deployed by the Russian VKS during bombing operations in Syria. However, in Ukraine, these bombs are ineffective due to their limited range, which renders them unsuitable for use in circumstances of intense Ukrainian air defence activity. It is crucial to differentiate between authentic KABs and UMPK and UMPB bombs. In the context of contemporary military operations, the utility of KABs as a short-range weapon has diminished significantly. In this study, the term «guided aerial bomb» is used to refer to both UMPK and UMPB bombs, in accordance with the generally accepted definition.

It should be added that there are cases of use of the Su-57 fighter jet together with the X-69 missile upgraded for it. However, these missiles and carrier have not yet been widely used, so these aircraft remained outside the focus of the study.<sup>11</sup> Similarly, Truth Hounds investigators did not consider the use of short-range weapons by the Su-25 aircraft, nor did they consider the use of anti-radar weapons by the Su-30. This is due to the fact that these aircraft are not employed for guided bombing operations behind enemy lines,<sup>12</sup> as they are designed for other combat missions. The principal focus of this investigation is on the Su-34 aircraft, which are responsible for conducting the bombing operations, and the Su-35 aircraft, which, as previously stated, accompany the Su-34 during these operations.

Consequently, Truth Hounds investigators examined the aviation units comprising Su-34s and Su-35s as of mid-2024 to determine which aviation regiments were responsible for specific areas of the front line and bombing certain cities in Ukraine.

The initial objective of the Truth Hounds project was to ascertain the total number of Su-34s in active service with the Russian Federation at the time of the invasion. To do so, the researchers combined data from open Russian military registers and counted the number of Su-34s in the Russian Air Force as of February 2022. Subsequently, the number of aircraft delivered during the 2022-2024 period was added to the aforementioned total, while all confirmed losses occurring during this same period were subtracted.

According to open military registers,<sup>13</sup> the Russian Aerospace Forces (hereinafter referred to as the **RF VKS**) officially include four aviation regiments armed with Su-34, which are actively involved in the invasion of Ukraine (it should be noted that not all aircrafts from these regiments participated in the armed conflict at the same time):

- 2<sup>nd</sup> Mixed Aviation Regiment (**SAP**) ≈ 24 Su-34s;
- 47<sup>th</sup> Bomber Aviation Regiment (**BAP**) ≈ 24 Su-34;
- 277<sup>th</sup> Bomber Aviation Regiment (**BAP**) ≈ 24 Su-34;
- 559<sup>th</sup> Bomber Aviation Regiment (**BAP**) ≈ 36 Su-34.

In addition, the Russian VKS has two flight test centres, whose aircrafts were also involved in the invasion:

- The 968<sup>th</sup> Mixed Aviation Research and Instructional Regiment (**IISAP**) ≈ 12 Su-34;
- 929<sup>th</sup> State Flight Test Centre (**GLIT**) ≈ 4 Su-34.<sup>14</sup>

Thus, as of February 2022, the total number of Su-34s officially in service with all Russian units was approximately **124** aircraft.

It is also noteworthy that the Russian Federation has permanently deployed an aviation group comprising **four** Su-34s in Syria at the Khmeimim airbase.<sup>15</sup> Truth Hounds investigators identified three of the four Su-34s based in Syria during 2023. In general, the number of Su-34s at the Syrian airbase has been stable as of time of the investigation and amounts to four aircraft, which were also taken into account when counting the Su-34s used in the armed conflict against Ukraine.

As for the replenishment of the Russian VKS aircraft fleet, **23** new Su-34s were delivered to the aviation units of the Russian VKS during 2022-2024.<sup>16</sup>

At the same time, there are a number of verified losses of these fighters, and as of September 2024, the following loss figures have been established: **five** Su-34s from the 277<sup>th</sup> Bomber Aviation Regiment,<sup>17</sup> **four** Su-34s from the 2<sup>nd</sup> Mixed Aviation Regiment,<sup>18</sup> **eight** Su-34s from the 47<sup>th</sup> Bomber Aviation Regiment,<sup>19</sup> **four** from the 559<sup>th</sup> Bomber Aviation Regiment,<sup>20</sup> and **one** from the 968<sup>th</sup> Experimental Instructional Mixed Aviation Regiment.<sup>21</sup> In addition, **eleven** other Su-34s have been confirmed lost, but the extent of the damage to the aircrafts or the poor quality of the photos does not allow these losses to be linked to specific aviation regiments.<sup>22</sup>

Thus, at least **33** Su-34 aircraft were lost in the fighting from the beginning of the full-scale invasion until the end of September 2024, taking into account only visually confirmed cases.

### Confirmed losses of Su-34 aircrafts

277 <sup>th</sup> Bomber Aviation Regiment	 Red 31 RF-81251	 Red 01 RF-81707	 Red 51 RF-95890	 Red 20 RF-81726	 unknown			
2 <sup>nd</sup> Mixed Aviation Regiment	 Red 05 RF-81259	 Red 24 RF-81879	 Red 26 RF-81864	 Red 09 RF-81852				
599 <sup>th</sup> Bomber Aviation	 Red 35 RF-95010	 Red 43 RF-95858	 unknown	 unknown				
47 <sup>th</sup> Bomber Aviation Regiment	 Red 06 RF-95070	 Red 24 RF-95808	 Red 20 RF-95004	 Red 22 RF-95005	 Red 33 RF-?	 Red 05 RF-95806	 Red 21 RF-95002	 unknown
968 <sup>th</sup> Mixed Aviation Training and Instructional Regiment	 Red 12 RF-95843 (23.02.2023)							

### Confirmed losses, but not identified units

 20 April 2022	 11 September 2022	 24 September 2022	 6 October 2022	 2022	 8 February 2023	 3 March 2023	 23 December 2023	 27 July 2024
 2 August 2024	 22 August 2024							

It is thus possible to derive the final figures. It is known that as of February 2022, the Russian Aerospace Forces had **124** Su-34 combat aircrafts.<sup>23</sup> In consideration of the confirmed acquisitions (+23) and losses (-33), the total number of Su-34s at the disposal of the Russian Aerospace Forces on the territory of the Russian Federation (excluding the «Syrian» aircraft) estimated to be approximately **110**. It is important to note that not all of these aircraft is deployed against Ukraine in the full-scale invasion. A significant number of them may be decommissioned or in storage, which generally excludes their intended use. Moreover, a certain number of Su-34s are located in eastern Russia at their «home» airfields, which reduces the number of Su-34s that can be deployed on combat missions within Ukraine to a figure **below 110 aircraft**.

To determine the actual number of Su-34s used in combat operations against Ukraine, Truth Hounds investigators conducted a study of satellite images of operational airfields in the Russian Federation where Su-34s are currently based.

## Identification of aircraft

Before counting Russian VKS aircrafts at airfields, it is important to be able to distinguish their types with the help of satellite imagery. In order to accomplish this, it is essential to be aware of a set of distinctive identification features that are characteristic of each specific type of military aircraft, which can be discerned even in the context of medium-quality imagery. To exemplify this, we will examine the process of distinguishing between the Su-34, Su-30SM and Su-35S models in a close-up image of these aircraft, captured in 2020 at an airbase in the Moscow region.



Su-30SM, Su-35S, and Su-34 at the ARMY-2020 Russian military equipment exhibition in Moscow region.

Source: @Archer83Able, 19 February 2021<sup>24</sup>

At first glance, the aircrafts appear to be similar in design. However, to differentiate between them, it is necessary to consider the distinctive characteristics. One of them is the presence of forward horizontal winglets (PGO), which resemble small wings on either side of the cockpit. The Su-30SM (on the left) and Su-34 (on the right) have this feature.<sup>25</sup> The Su-35S (centre) is devoid of the aforementioned PGO, which can be employed as a means of distinguishing between the aircraft in satellite imagery.

It should be borne in mind that Su-27s also do not have PGO, which makes them easy to confuse with Su-35S on images. In such cases, it is advisable to look for additional confirmation of the type of aircraft at the airfields using open sources.

Another noteworthy characteristic is the colour of the camouflage. The Su-34 is painted in a distinctive turquoise-blue colour, which distinguishes it from other Russian VKS aircrafts.<sup>26</sup>

Until 2013, the Su-34 could also be fitted with black camouflage, but the Russian Ministry of Defence later abandoned this option.<sup>27</sup>



Su-34 in black camouflage.

Source: Vitaly V. Kuzmin, 27 January 2012<sup>28</sup>



The Su-34 is in typical blue camouflage.

Source: Sergey Chaikovsky, December 2019<sup>29</sup>

It is therefore straightforward to identify the presence of a specific type of aircraft at an airfield based on the aforementioned camouflage features, the location of the PGO and the shape of the aircraft in question. This information, as well as data on the number and type of aircraft at a particular location, makes it possible to track the location of military units and their aircraft at airfields in the Russian Federation.

## New Su-34s after the start of the full-scale invasion of Ukraine

Before analysing the Russian airfields where Su-34 units are based, it is reasonable to outline the known information about the renewal of units in the Russian VKS in more detail.

At the end of December 2022, the Russian VKS received three new Su-34s, one of which had the tail number «Blue 03».<sup>30</sup> Until now, no Su-34 in the Russian VKS has had a blue tail number. This may indicate the transfer of Su-34s to a new unit that did not previously have such aircraft, or the formation of a new squadron in an existing unit.<sup>31</sup>

As of August 2024, there are at least six Su-34 aircraft with a blue tail number:

-  Su-34M «Blue 01»,<sup>32</sup>
-  Su-34M «Blue 02»,<sup>33</sup>
-  Su-34M «Blue 03»,<sup>34</sup>
-  Su-34M «Blue 04»,<sup>35</sup>
-  Su-34M «Blue 05»,
-  Su-34M «Blue 06».<sup>36</sup>

Currently, there is no publicly available information on the airfield or unit of these aircrafts, so it is unknown whether they are involved in the full-scale Russian invasion of Ukraine.

## Analysis of the deployment points of military aviation units that include Su-34s

### CONTEXTUAL NOTE

According to media reports, at the end of May 2024, the Armed Forces of Ukraine received a limited permission to use US weapons on the territory of the Russian Federation a radius of 100 kilometres of the border with Ukraine.<sup>37</sup> On 31 May, Ukrainian troops launched HIMARS strikes against S-300/S-400 air-defence systems in the Belgorod region, thereby confirming the implementation of this permission.<sup>38</sup> In response, military experts and analysts posit that the Russian VKS opted to act without awaiting the lifting of the restriction on the use of long-range US missiles in full capacity.<sup>39</sup> In June, they relocated all Su-34 aircraft from the ATACMS missile strike zone to airfields situated as far away from such a threat as possible.<sup>40</sup> Given the lack of such permission from the allies and the ambiguity of their positions, Ukraine began using long-range drones to target Russian military air bases in Russia. Thus, in August 2024, five Russian airbases – Savasleyka, Borisoglebsk, Baltimore, Marinovka and Kursk – were hit, resulting in the destruction and damage of aircrafts, including Su-34s, ammunition depots, a radar station and ancillary buildings.<sup>41</sup> Regarding the permission to use long-range weapons, as of the end of September 2024, the Armed Forces of Ukraine still do not have the ability to use ATACMS missiles for HIMARS with a range of up to 300 km on the territory of the Russian Federation.<sup>42</sup>

Based on the analysis of information from open sources and a thorough study of 30 satellite images, Truth Hounds investigators identified the permanent or temporary locations of aviation regiments and/or individual aircraft from their composition that carry guided aircraft bombs. We analysed 11 airfields where Su-34s were stationed at different times. The focus of the study on these military airbases is explained by the fact that all of them are the base or temporary staging areas for military aircraft that directly carry out such strikes against Ukraine or provide technical support for them.

Investigators counted and identified Su-34 combat units of each aviation unit, as well as some Su-35s that serve as support during combat missions of bomb carriers. Data from open sources and satellite imagery made it possible to outline the area of responsibility of Russian aircraft involved in guided bomb attacks, as

well as to identify the routes, dynamics and possible reasons for the redeployment of Su-34 combat aircraft between different airfields.



A detailed study and description of each of these air bases is available in the appendix at the [link](#). As of the end of August, a summary of the Russian VKS airbases with Su-34 and Su-35 deployed there, which are part of the aviation units involved in bombing attacks in the respective areas, is presented in the table below.

AIRFIELD	TYPE OF AIRCRAFT	UNIT OF THE RUSSIAN VKS	AREA OF RESPONSIBILITY
<b>Baltimore</b> 51.620355, 39.153030	 Su-34  Su-35S	47th BAP, 159th IAP, 23rd IAP	«Sever», «Zapad»
<b>Lipetsk</b> 52.636959, 39.461911	 Su-34  Su-35S	968th IISAP	«Sever», «Zapad»
<b>Borisoglebsk</b> 51.363222, 42.185677 since summer 2024	 Su-34  Su-35S	47th BAP, 159th IAP, 23rd IAP	No information
<b>Morozovsk</b> 48.314668, 41.784293	 Su-34  Su-35S	559th BAP	«Tsentr», «Yug», «Vostok», «Dnepr»
<b>Marinovka</b> 48.638939, 43.786279	 Su-34  Su-35S	559th BAP, 277th BAP, 2nd SAP	No information
<b>Maikop</b> 44.680128, 40.032241	 Su-34  Su-35S	968th IISAP 277th BAP	«Zapad», «Tsentr», «Yug», «Vostok»
<b>Kushchevska</b> 46.534911, 39.550275 March – May 2024	 Su-34  Su-35S	968th IISAP, 277th BAP	«Zapad», «Tsentr», «Yug», «Vostok»

An analysis of the locations of Su-34 fighter-bombers carrying guided aerial bombs suggests that the same military airbases are used for staging and combat missions by different units capable of performing tasks in the areas of responsibility of several groups. Furthermore, it was determined that certain airfields from which the Su-34s departed are currently operating in a more restricted capacity, including «Baltimore», «Buturlinovka» and «Morozovsk». The reason for this is the active attacks by Ukrainian drones and the Russian VKS's fears of possible strikes by ATACMS ballistic missiles on airfields within their range.

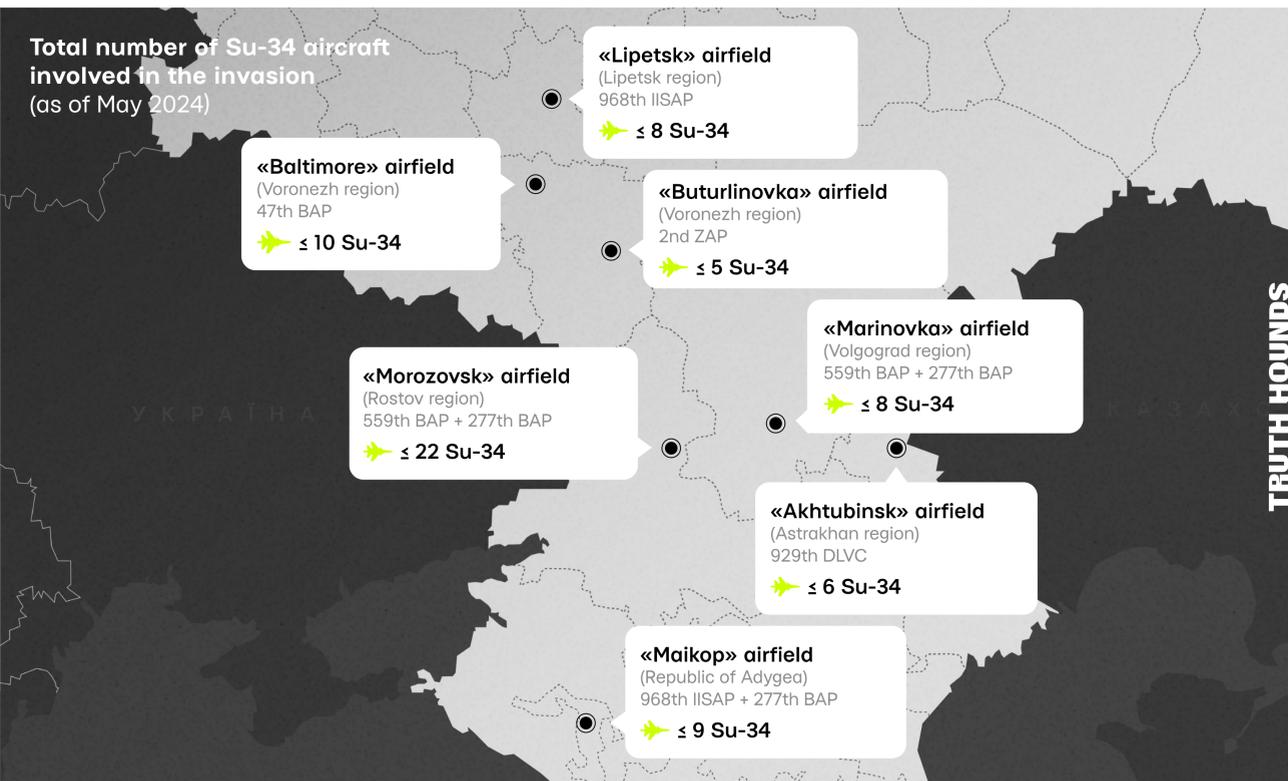
Thus, it can be concluded that individual Su-34 aircraft, regardless of unit or location, can be involved in combat missions within the areas of responsibility of various military groups of the Russian Armed Forces. Similarly, the aircraft are not tied to any particular grouping and can be used to perform tasks in all areas of the frontline. Therefore, when investigating individual incidents, it is necessary to carefully examine all the circumstances and take into account a range of factors to accurately identify those responsible for these attacks.

To establish the total number of Su-34s actively involved in combat missions, Truth Hounds investigators collected information as of the end of May 2024. This is due to the fact that after this period, due to alleged and real attacks on Russian airfields, there were frequent redeployments of the Russian VKS flight and technical personnel, which made it difficult to keep track.

As of May 2024, the number of Su-34s involved in combat missions at the main air bases was as follows:

- ✈ «Baltimore» airfield, Voronezh region (47<sup>th</sup> BAP) – at least 10 Su-34s.
- ✈ «Lipetsk» airfield, Lipetsk region (968<sup>th</sup> IISAP) – at least 8 Su-34s.
- ✈ «Buturlinovka» airfield, Voronezh region (2<sup>nd</sup> SAP) – at least 5 Su-34s.
- ✈ «Morozovsk» airfield, Rostov region (559<sup>th</sup> BAP + 277<sup>th</sup> BAP) – at least 22 Su-34s.
- ✈ «Marinovka» airfield, Volgograd region (559<sup>th</sup> BAP + 277<sup>th</sup> BAP) – at least 8 Su-34s.
- ✈ «Maikop» airfield, Adygea Republic (968<sup>th</sup> IISAP + 277<sup>th</sup> BAP) – at least 9 Su-34s.
- ✈ «Akhtubinsk» airfield, Astrakhan Territory (929<sup>th</sup> GLIT) – at least 6 Su-34s.

Thus, as of May-June 2024, the total number of Su-34s used by the Russian VKS against Ukraine constituted at least 68 aircraft.



According to information from Russian news channels, media, and thematic groups on social media, the situation has not changed significantly as of August-September 2024. During this period, Russia lost about four Su-34 aircrafts<sup>43</sup> but received three new ones,<sup>44</sup> so the total number of Su-34s in operation continues to fluctuate around 70.

This is consistent with Ukrainian military correspondents who report the use of around 70 Su-34s against Ukraine.<sup>45</sup>

Our calculations portray almost the same picture, but it is worth noting that they are based on satellite images that show the visible part of the location without taking into account the situation when the aircraft could be in the air, inside hangars or other locations. Therefore, the actual number of Su-34s is likely to be somewhat higher. However, according to Truth Hounds investigators, this difference is insignificant.

## **II. Modified aviation weapons (UMPB, UMPK, Grom-E)**

As of mid-2024, the Russian aviation actually has three main means of bombing strikes on the territory of Ukraine in its arsenal, namely:

- bombs with UMPK (250 kg, 500 kg, 1500 kg, 3000 kg),
- UMPB D-30SN ammunition (250 kg),
- «Grom-E» munition (315 kg to 480 kg, depending on the modification).

# Main means for missile and bomb strikes by Russian aviation

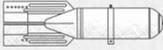
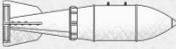
## Bombs from the UMPC

 The Universal Planning and Correction Module converts unguided bombs into gliding bombs, which are more accurate munitions with a whitened range.

Range: up to 80 km

Claimed circular error: up to 15 m

The weight of the warhead depends on the type of bomb:

250 kg					
	OFAB 250-270				
500 kg					
	FAB 500 M-62	FAB 500T	ODAB 500 OF	OFZAB 500	RBK 500
1500 kg					
	FAB 1500 M-54	ODAB 1500			
3000 kg					
	FAB 3000 M-54				

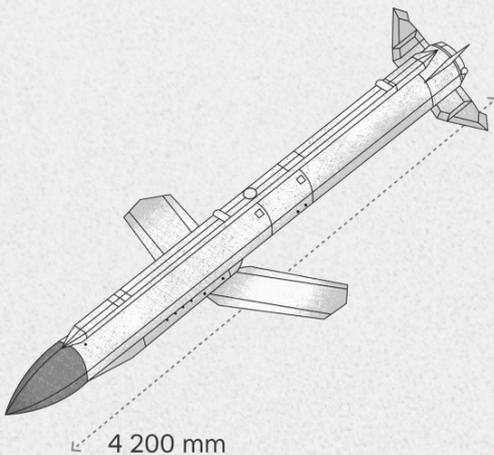
## Grom-E

A hybrid of a glide bomb and a missile

Range: 120 km

Warhead weight: 315-480 kg

Circular error: no information available



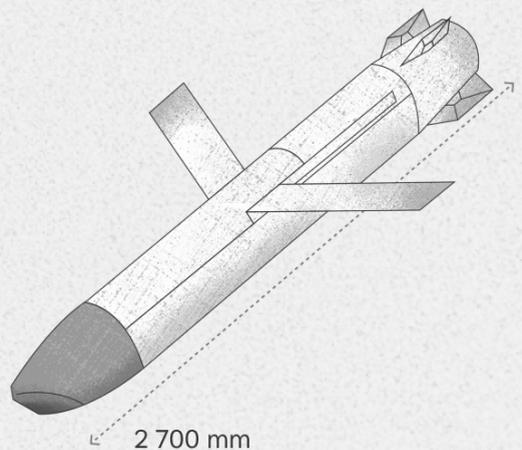
## UMPB D-30SN

Universal interspecific glide munition

Range: dock to 90 km

Weight of the warhead: 100 kg

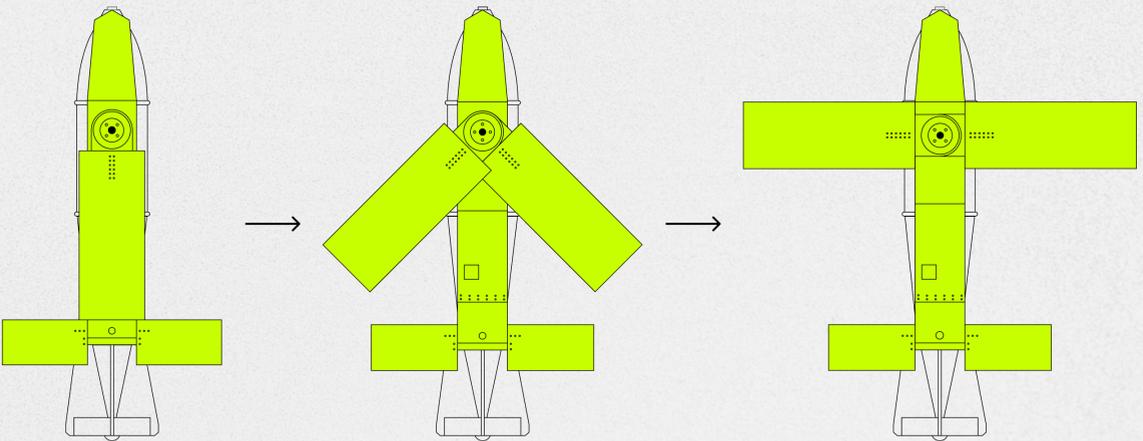
Circular error: up to 15 m



## Air bombs with UMPK

Russian aviation began using the first upgraded versions of cruise bombs in early 2023, in particular in Bakhmut.<sup>46</sup> The design feature of such an upgraded bomb is that it is attached to a **universal planning and correction module (UMPK)**, which, due to its folding wings, allows the munition to cover longer distances and increases the accuracy of the strike. This enables Russian tactical aviation to evade proximity to the front line and mitigates the risk of being intercepted by Ukrainian air defence systems.

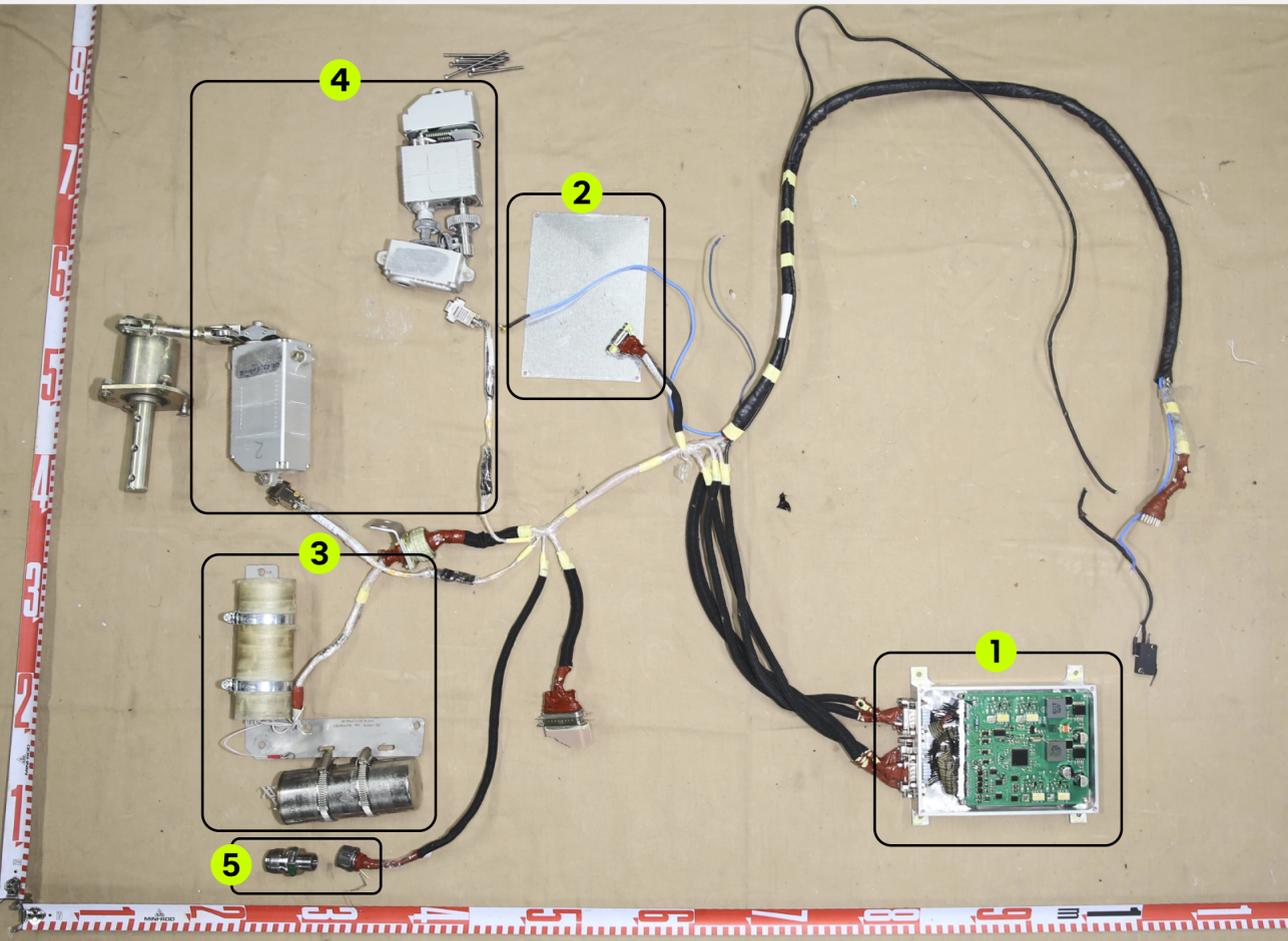
### Gradual opening of the wings on the UPCM module



According to the wreckage analysis conducted by Conflict Armament Research, the Universal Planning and Correction Module (UMPK) consists of the following components, as shown in the photo below: the SMART navigation module, the Kometa satellite navigation module, thermal batteries, servo motors, and a wing deploying squib.<sup>47</sup>

# UPCM module wreckage with part designations

Source: Conflict Armament Research



1 SMART module

4 Servo motors

2 Kometa satellite navigation module

5 Wing deployment squib

3 Thermal battery

UMPK module wreckage with part designations.

Source: Conflict Armament Research, December 2023<sup>48</sup>

The mechanism of dropping bombs with UMPK is demonstrated in the video below.



The process of dropping bombs with UMPK in the video of the Russian Ministry of Defence.

Source: @mod\_russia, 1 April 2024<sup>49</sup>

Within seconds after the bomb is dropped from the aircraft, a spring-loaded mechanism within the module is activated, causing the wings to be deployed, allowing the munition to adjust its direction. In addition to the wings, the UMPK module's navigation system, which is powered by thermal batteries, ensures a more accurate hit on the target.



A Ukrainian Armed Forces serviceman holds a universal planning and correction module (UMPK).

Source: @war\_home, 4 November 2023<sup>50</sup>

If the module is functioning properly, the range of the bomb can be increased to 70 kilometres. As mentioned above, this allows the aircraft to avoid frontline air defence systems and reduces the risk of being hit.<sup>51</sup> Previously, the use of such bombs by Russian aviation was confined to a distance of 0-10 km from the front line.<sup>52</sup> However, the introduction of bombs with the UMPK has enabled a significant expansion in range, with the capability to reach even Kharkiv (~80

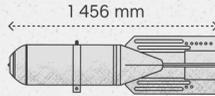
km).<sup>53</sup> Since the beginning of September 2024, Russian media have started publishing photos of an upgraded version of the UMPK, which allows the bomb to cover a distance of up to 80 km due to the increased length of the module and improved aerodynamics.<sup>54</sup> According to some sources, the accuracy of bombs with the UMPK (also called circular deflection or circular error) is up to 15 metres, provided that satellite guidance is stable.<sup>55</sup> Nevertheless, in the event of the UMPK becoming detached or the impact of electronic warfare, the accuracy of such bombs is significantly reduced. As for the weight of the warhead, it depends on the type of bomb.

Since the beginning of 2024, Russia has significantly increased the production of UMPKs, which has led to a significant increase in the number of bombs used daily.<sup>56</sup> It is important to note that these modules are produced for bombs of various types and nomenclatures. Following an analysis of video footage from multiple sources, investigators from Truth Hounds have identified nine distinct types of bombs for which the UMPK was developed (see illustration below).

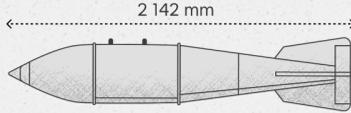


## Types of bombs of the Russian Armed Forces for which the UPCM was developed

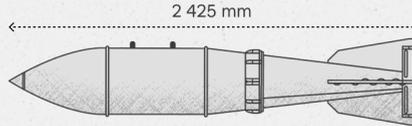
**OFAB 250-270**  
high-explosive  
fragmentation bomb



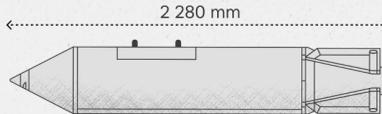
**FAB 500 M-62**  
high-explosive aerial bomb,  
model 1962



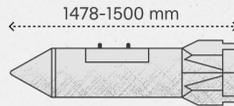
**FAB 500-T**  
high explosive  
aerial bomb



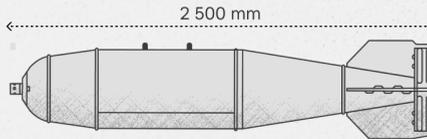
**ODAB 500-OF**  
high-explosive  
detonating bomb



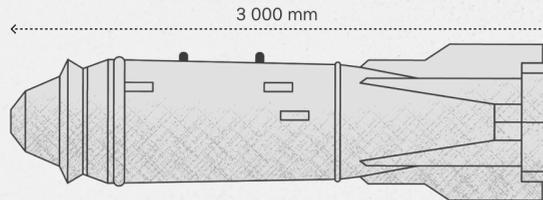
**RBK 500**  
one-time cluster  
bomb



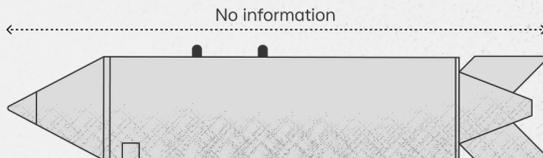
**OFZAB-500**  
high-explosive  
fragmentation incendiary  
aerial bomb



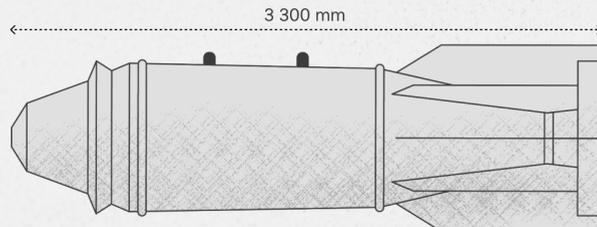
**FAB 1500 M-54**  
high-explosive aerial  
bomb, model 1954



**ODAB 1500**  
high-explosive  
detonating aerial bomb



**FAB 3000 M-54**  
high-explosive aerial  
bomb, model 1954



UMPK modules are typically classified into four principal categories based on the weight of the bombs to which they are attached: 250 kg,<sup>57</sup> 500 kg,<sup>58</sup> 1500 kg<sup>59</sup> and 3000 kg.<sup>60</sup> The most destructive bombs are those weighing 1,500 kg and 3,000 kg. One example of the use of the ODAB-1500 bomb was the bombing of the village of Velyka Pysarivka, Sumy region, in late March 2024.<sup>61</sup> Subsequently, the Russian Ministry of Defence showcased the FAB-3000 M-54 bomb on its official pages, publishing a video of its dropping on the positions of the Ukrainian military in the northern part of Kharkiv region.<sup>62</sup>



This is the inaugural instance of a FAB-3000 with an UMPK being documented on video.  
Source: @mod\_russia, 14 July 2024<sup>63</sup>



UMPK for FAB-250<sup>64</sup>



UMPK for FAB-500<sup>65</sup>



UMPK for FAB-1500<sup>66</sup>



UMPK for FAB-3000<sup>67</sup>

One of the most common types of ammunition used by Russian forces on the contact line is RBK-500 cluster bombs of various classes with UMPK.<sup>68</sup> Nevertheless, the deployment of such ammunition in major urban centres has not been documented so far.



UMPK for RBK-500 (in the air after being dropped from a Su-34 aircraft).  
Source: @war\_home, 18 March 2024.<sup>69</sup>

## UMPB D-30SN ammunition

In addition to guided aerial bombs based on the UMPK, the Russians have begun to use **the D-30SN universal interspecific glide munition (UMPB)**, which somewhat resembles a cruise missile.<sup>70</sup> The munition displays similarities to the UMPK bombs, yet it has been enhanced with the incorporation of a system comprising ailerons and rudders situated within the tail section of the UMPB. The munition is launched from the Su-34, although it can also be employed in a ground-to-ground configuration in ground launchers such as the Tornado-S.<sup>71</sup>

The UMPB is most commonly used in attacks on Kharkiv,<sup>72</sup> its range of up to 90 km exceeds that of the UMPK bomb. This enables Russian forces to evade air defence threats during the launching process.<sup>73</sup> In terms of circular deviation, the UMPB D-30SN, like the UMPK bombs, is equipped with satellite guidance, so the accuracy error is up to 15 metres in ideal conditions.<sup>74</sup> Nevertheless, the accuracy of this munition can be significantly compromised by electronic warfare equipment or technical malfunctions. This issue will be discussed in detail in the study based on specific examples of attacks on the city of Kharkiv.



UMPB D-30SN munition.

Source: @war\_home, 8 March 2024<sup>75</sup>

## «Grom-E» munition

The «**Grom-E**» munition is similar in function and has a range of up to 120 km.<sup>76</sup> It is also equipped with side and tail wings for increased manoeuvrability and satellite guidance. The warhead weighs 315 kilograms.<sup>77</sup> In terms of its characteristics, the «Grom-E» is more similar to the UMPB D-30SN than to the UMPK bomb. The weapon is typically deployed from the Su-35 aircraft. This munition is used less frequently,<sup>78</sup> as it is has been designed for alternative purposes.



«Grom-E» rocket-propelled munition.

Source: @war\_home, 26 April 2024<sup>79</sup>

## **The conclusion of the analysis of the Russian Federation's means for conducting air strikes on the territory of Ukraine**

UMPB bombs remain the most commonly used due to the large stockpile of conventional bombs from the Soviet era. This enables the Russian Federation to manufacture UMPB modules at a low cost, thereby reducing the expenditure incurred in the production of the munitions themselves.

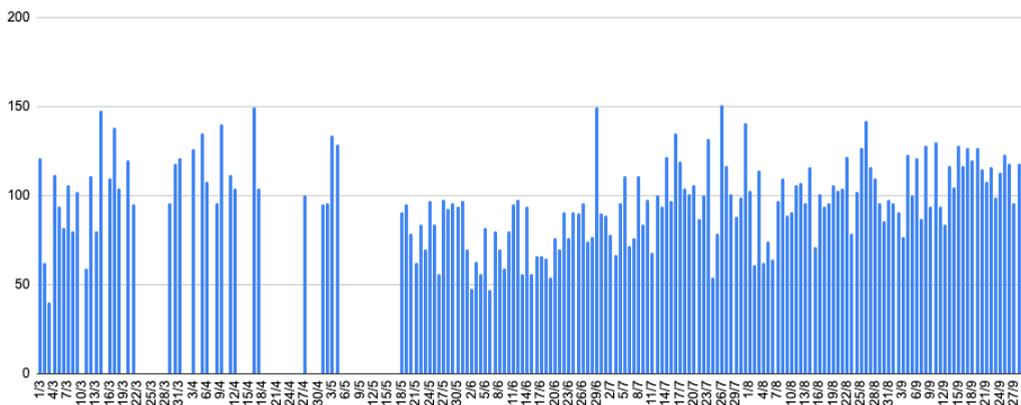
According to Ilya Yevlash, a spokesman for the Ukrainian Air Force, Russia currently has «an extremely large number» of aircraft bombs in its arsenal.<sup>80</sup> It should be noted that the mass production of conventional high explosive unguided aerial bombs began in 1954,<sup>81</sup> thereby enabling Russia to amass considerable stocks. These have served as the foundation for a relatively inexpensive modernisation process, which has broadened the scope for their utilisation, particularly in the context of the armed aggression against Ukraine.

At the same time, Russia is actively intensifying the production of bombs with UMPB D-30SN, as substantiated by the markings on the ammunition debris from the impact sites published by the «Soniashnyk» Telegram channel dedicated to the Ukrainian Air Force. The channel reports that in the winter of 2024, the aggressor country launched 110 such munitions, while in the spring this figure rose to 160 units and in the summer it reached over 600 per month.<sup>82</sup> These facts, in conjunction with the observed increase in the number of guided missile strikes, suggest that the Russian military leadership has the resources and capacity to carry out such attacks on a large scale and to increase their frequency in the future.

### **III. General pattern of attacks with guided aerial bombs**

As of September 2024, the Russian military used an average of 100 guided aerial bombs daily.<sup>83</sup> According to some sources, in August 2024, the Russian Federation used 2998 guided aerial bombs in Ukraine, and in September this number increased by 10% to 3342.<sup>84</sup> This data coincides with the information provided in the address of the President of Ukraine Volodymyr Zelensky in April 2024, where he announced the figure of 3000 guided aerial bombs that Russia used on the territory of Ukraine in March 2024.<sup>85</sup>

Guided bombs



Statistics on Russia’s use of guided aerial bombs from March to September 2024 in Ukraine.

Source: @M0nstas, 30 September 2024<sup>86</sup>

It seems plausible to suggest that the frequent use of these bombs is attributable to two factors: their relatively low cost and the favourable security situation for Russian bombers, which allows them to undertake such attacks with minimal risk to themselves.

It is important to note that the aforementioned figures encompass all instances of guided bomb attacks, including those launched against military positions along the front line. At the same time, a significant number of bombs were aimed at civilian objects located far from the areas of active hostilities, in particular in cities such as Kharkiv<sup>87</sup> and Sumy.<sup>88</sup>

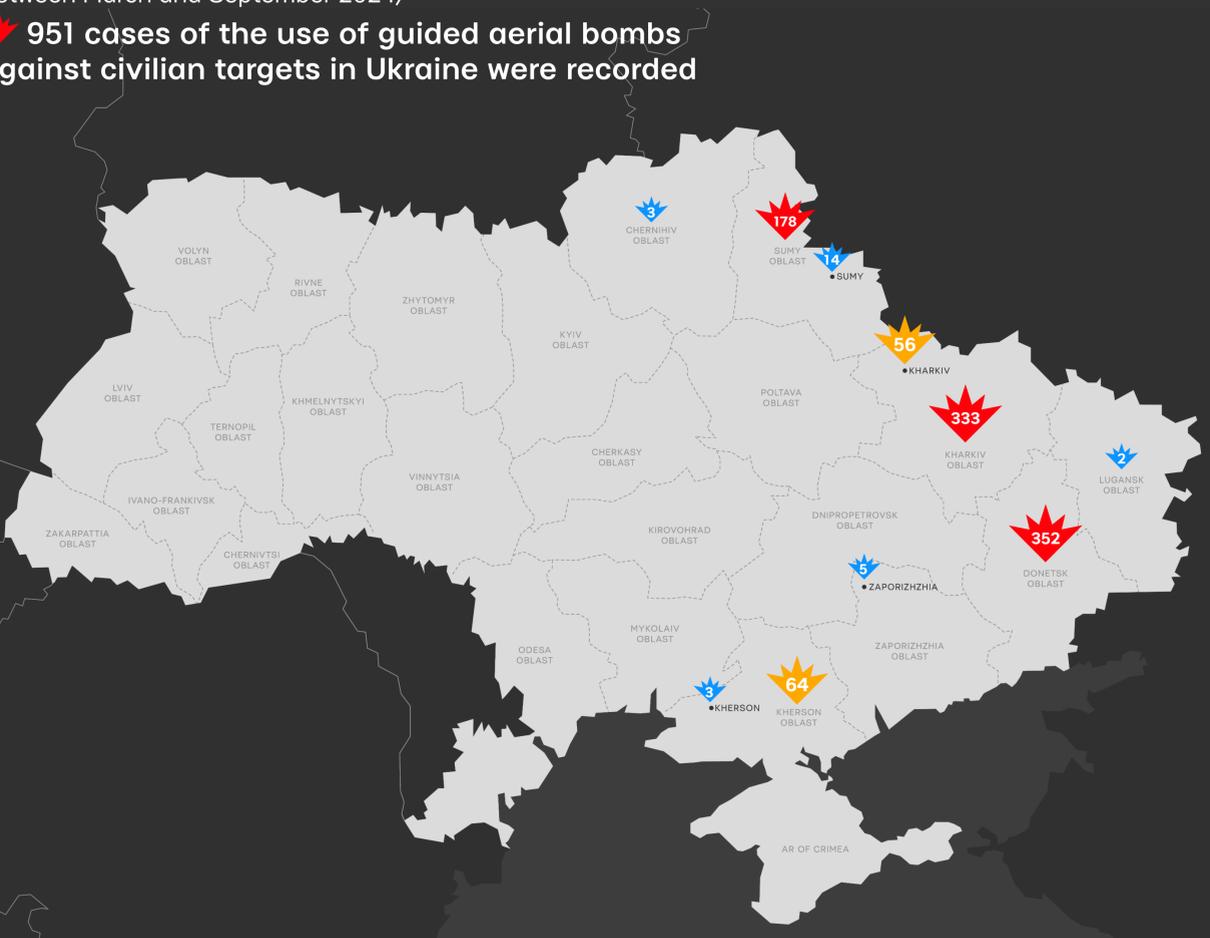
Conversely, a discernible pattern emerges: following each Ukrainian attack on Su-34 airfields, the number of guided aerial bombs launched in Ukraine decreases.<sup>89</sup> For example, as a result of an attack on the «Morozovsk» airfield on

3 August 2024,<sup>90</sup> according to media reports, between 100 and 500 different types of guided bombs were destroyed,<sup>91</sup> and a week later, on 9 August 2024, up to 700 such bombs were destroyed at the Lipetsk airfield.<sup>92</sup> This has significantly weakened the ability of Russian aviation to maintain a high rate of bombing on the territory of Ukraine for a certain period of time. Nevertheless, an examination of the aforementioned statistics on the utilisation of guided aerial bombs reveals that the impact of such attacks is predominantly short-term, with the effects typically lasting between several days and a week during periods of heightened activity.

This assumption is corroborated by data from Truth Hounds, a monitoring department that identified at least 951 cases of guided aerial bomb attacks against civilian objects from early March to late September 2024. These attacks resulted in the deaths of 250 people, including 16 children, and injuries to more than 1,300 people, including 58 children. It is important to emphasise that these figures reflect only documented incidents, and the actual number of casualties is likely to be much higher. In general, the geography and intensity of attacks across Ukraine during this period can be observed in the following illustration.

Between March and September 2024,

## 951 cases of the use of guided aerial bombs against civilian targets in Ukraine were recorded



A review of the data on attacks in Ukraine, both in terms of overall dynamics and in the regions most affected by guided bomb attacks, reveals a correlation with the aforementioned assertion regarding a temporary decline in attack intensity following the Ukrainian Defence Forces' strikes on Russian air bases and the destruction of aircrew and weapons.

### The use of guided aerial bombs in the Kharkiv region, 2024



TRUTH HOUNDS

### The use of guided aerial bombs in the Donetsk region, 2024



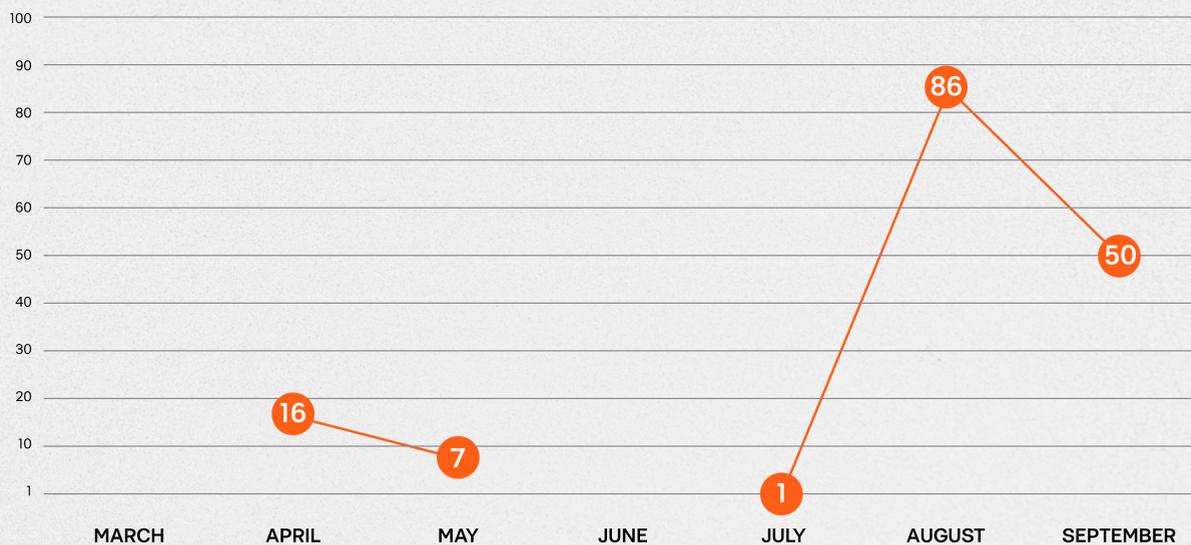
TRUTH HOUNDS

## The use of guided aerial bombs in the Kherson region, 2024



Concurrently, alternative patterns emerge. Firstly, following the attacks on Russian airbases in August, the intensity of attacks on regions that had not previously experienced such a density of attacks (for example, the Sumy and Kherson regions) increased several times. Secondly, the following month, a significant increase in the number of attacks was observed in all regions, which creates an exponential trend of attacks with bombs with UMPK in Ukraine as a whole. It is also noteworthy that Zaporizhzhia, which the Russian army began bombing in September 2024 due to the modification of the UMPK and the increase in the range of the bombs, merits particular attention. Until September 2024, Truth Hounds had not documented any such attacks before.

## The use of guided aerial bombs in the Sumy region, 2024



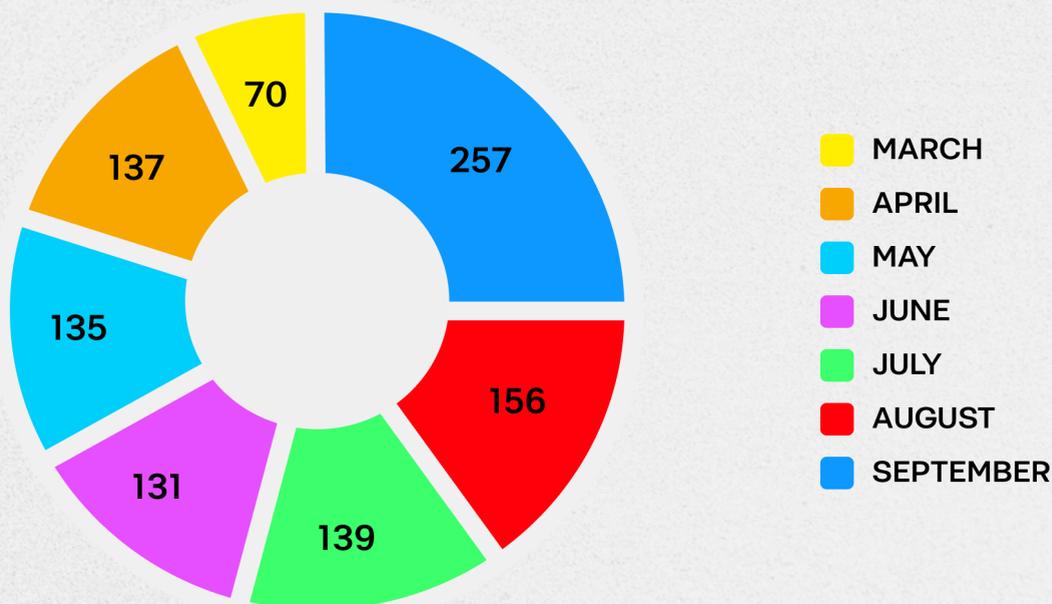
## Use of guided aerial bombs, 2024

● in Zaporizhzhia region

● in Zaporizhzhia



## The use of guided aerial bombs in Ukraine, 2024



During the period under review, large cities with populations of thousands, such as Sumy, Zaporizhzhia, Kharkiv and Kherson, were constantly subjected a high level of intense bombing, with 78 attacks in total. For a more detailed statistical overview and a concise description of the incidents, please refer to the following links – [Kharkiv](#), [Kherson](#), [Zaporizhzhia](#), [Sumy](#).

This is a clear indication that despite the successful attacks on the UMPK bomb storage arsenal, the decrease in attacks with this type of weapon is temporary and short-term (up to one week). Instead, over time, the RF VKS not only did not stop, but also increased the number of attacks with guided bombs with UMPK due to the increase in UMPK production capacity and significant stockpiles of

conventional bombs from the Soviet era. The practice of continuously conducting such air strikes on populated areas and their high intensity confirm the deliberate, targeted and systematic nature of these attacks. The deployment of low-accuracy weapons, such as the aforementioned aerial bombs, in densely populated areas by the Russian Armed Forces, despite the availability of more accurate ballistic and cruise missiles of the Iskander operational tactical missile system, indicates a deliberate policy of terror pursued by the Russian military command. In practice, the accuracy of Russian VKS guided aerial bombs is not as precise as claimed, due to a number of factors, including cheap components and the operation of electronic warfare in urban areas. As a result, the use of such weapons poses a risk to the civilian population.

To exemplify this pattern, investigators from Truth Hounds examined six incidents involving guided aerial bombs and civilian targets. Four of these occurred in Kharkiv, and two took place in Kherson. The following section presents a detailed examination of each incident, identifying the alleged perpetrators and outlining the legal framework applicable to such cases afterwards.

## **IV. Attacks on civilian infrastructure with guided aerial bombs in Kharkiv**

Since the end of March 2024, the Russian Aerospace Forces have been actively using guided aerial bombs to strike Kharkiv. This has resulted in a considerable number of civilian casualties and extensive damage to the city's infrastructure. Kharkiv has become the sole city with a population exceeding one million to experience persistent aerial bombardment utilising guided bombs. Truth Hounds investigators analysed four such attacks, determined the presence or absence of legitimate targets, and identified the units responsible for the bombing of the city of Kharkiv and the Kharkiv region.

### I. Kharkiv, 27 March 2024

On 27 March 2024,<sup>93</sup> at around 15:45, Russian aviation launched guided aerial bombs in the direction of Kharkiv for the first time. They hit the territory of Shevchenkivskyi district 9 minutes after the launch, at 15:54.<sup>94</sup>

One of the bombs hit a playground next to residential building at number 20, 23<sup>rd</sup> August Street, and another hit a school.<sup>95</sup> The incident killed one person and injured 19, including four children.<sup>96</sup> Additionally, 18 residential buildings sustained damage.<sup>97</sup> Witnesses who lived in a nearby building reported that the crater from the impact was very small. In their opinion, the bomb exploded in mid-air.<sup>98</sup>

In a statement released by the Kharkiv regional prosecutor's office, it was revealed that the bombs had been launched from the Belgorod region. According to Telegram channels that specialise in monitoring the airspace of Russia and Ukraine, the bombs were launched from the area of the city of Belgorod.<sup>99</sup>



The moment the bomb hit between the buildings in Kharkiv.

Source: @nakipelovo, 27 March 2024<sup>100</sup>



Impact between the buildings

Photo of the aftermath of the hit in Kharkiv between the houses at 20 and 22 b, 23rd August Street, overlaid on a map of the neighbourhood

National Police officers found shell fragments at the site of the hit.<sup>101</sup> In accordance with the preliminary data of the Police, the Russians used a UMPB D-30SN munition.<sup>102</sup> This marked the first documented instance of UMPBs being deployed in Kharkiv.

After comparing images of the UMPB D-30SN debris at the impact site on 27 March 2024 with images of debris from later attacks, Truth Hounds investigators also concluded that the Russians had used a UMPB D-30SN.



Debris from a munition that hit 23<sup>rd</sup> August Street in Kharkiv. Truth Hounds investigators compared the remnants of the weapon in this image with others (below). Different colours indicate certain types of debris, and identical debris in the images are highlighted in the same colour. Their configuration indicates the use of a UMPB D-30SN munition.

Source: @police\_kh\_region, 27 March 2024<sup>103</sup>



Debris from the UMPBM D-30SN at the site of another hit in Kharkiv on 2 May 2024

Source: @police\_kh\_region, 2 May 2024<sup>104</sup>



The wreckage of a UMPB D-30SN at the site of a hit in Kharkiv on 27 May 2024  
Source: @police\_kh\_region, 27 May 2024<sup>105</sup>

The highlighted elements in all three photos are identical, indicating that on 27 March 2024, the Russians used the UMPB D-30SN to attack Kharkiv. Most often, fragments of the missile's tail section (blue and orange) and parts connecting the warhead and missile section (bright green) can be found.

After identifying the type of munition, the Truth Hounds team immediately began searching for potential targets that could have been fired upon. The establishment of the target of the attack enables an evaluation of the accuracy of the UMPB D-30SN in real conditions. By means of supplementary OSINT and a documentation mission in Kharkiv, the Truth Hounds investigators and documenters were able to gather data on the probable targets of the Russian

Armed Forces for this strike. The analysis demonstrated that the potential targets of the Russian VKS were situated at an approximate distance of 200 metres from the point of impact. In any case, if the guided aerial bomb was flying at one of these sites, it is evident that it missed its intended target, as it hit at least 200 metres from each of them. Despite the claims of a small circular deviation of the UMPB (up to 15 m),<sup>106</sup> this case shows that the accuracy of such a munition in real conditions is much lower than the claimed accuracy when targeting these objects.

The first use of the UMPB D-30SN munition is significant, as most subsequent bombings with this weapon will follow the same attack pattern, demonstrating deliberate indiscriminate and disregard for the safety of civilians, as well as ignoring the presence of civilian objects only.

## II. Kharkiv, 14 May 2024

On 14 May, at 16:10, Russian aviation again carried out an air-bomb attack on residential neighbourhoods in the Shevchenkivskyi district of Kharkiv, resulting in 26 people sustaining injuries of varying severity.<sup>107</sup> The attack targeted the «Aksioma» residential complex located at 9D Nauky Avenue,<sup>108</sup> as well as residential buildings at 64 Peremohy Avenue.<sup>109</sup> A total of three bombs were used, one of which hit the Aksioma residential complex and the other two hit the buildings at 64 Peremohy Avenue.

The two impact points are about six kilometres apart.<sup>110</sup> All three bombs were launched from the same carrier, indicating a single-act attack with a programmed trajectory for one of the bombs to hit a separate target. As for the type of weapon used, according to local police, all three were UMPB D-30SN guided aerial bombs.<sup>111</sup>



Photo of the hits to the «Aksioma» residential complex.

Source: @StroyObzorKh, 14 May 2024<sup>112</sup>



Photo of hits to 64 Peremohy Avenue.

Source: @StroyObzorKh, 14 May 2024<sup>113</sup>

Most of the launches of guided aerial bombs with UMPK at Kharkiv come from the area of the city of Belgorod and nearby settlements in the Belgorod region and have a northeast approach direction. The video of the law enforcement drone flight shows that the bomb hit the «Aksioma» residential complex from the north-western side,<sup>114</sup> which appears anomalous when viewed in conjunction with the «standard» trajectory of the munitions, as it appears as if the bomb circled the building before hitting.

Below is the geolocated confirmation that the hit to the building of the «Aksioma» residential complex indeed occurred from the north-western side.



Drone footage of the damage to the «Aksioma» residential complex. In the background, a green line marks the road, and a red square marks the McDonald's sign.

Source: @prokuratura\_kharkiv, 14 May 2024.<sup>115</sup>



Confirmation of the bomb's trajectory using Google Earth imagery. Behind the house, we can see the road marked with a green line and the McDonald's sign in a red square. The lower right corner shows the direction to the north.

In this case, there are two possible versions of the incident can be postulated: firstly, that the munition was programmed to fly around the building from the west; secondly, that the bomb was launched from the western part of the Belgorod region of the Russian Federation.

The first assumption can be immediately rejected, as the UMPB D-30SN munitions lack the capacity for route correction,<sup>116</sup> rendering it implausible that such bomb could have circumvented the building and struck it from its western side. With regard to the second hypothesis, it is more probable, given that the first bombs hit the buildings at 64 Peremohy Avenue from the same north-western side. This indicates that they were flying on the same trajectory as the likely launch site in the western part of the Belgorod region.



Probable trajectory of the munitions with the marked locations of their impact on the buildings on Peremohy Avenue and the residential complex «Aksioma» in Kharkiv

As already noted, the Russian aviation usually launches UMPBs D-30SN from the area of the city of Belgorod, in particular, the launches were geolocated from the area of Gostyshchevo, Belgorod region.<sup>117</sup> However, this time a slightly different

location was chosen for the launch. This decision may be justified by the objective of the attack. To ascertain this information, Truth Hounds investigators conducted an analysis of the area surrounding the «Aksioma» residential complex.

According to satellite imagery, «Aksioma» is located in a densely built-up area. Near the building are the Semen Kuznets Kharkiv National University of Economics, a hospital, environmental and tax inspectorates, as well as the State Border Guard Service. The information about the absence of military facilities was confirmed by residents of the «Aksioma» residential complex interviewed by the Truth Hounds team during a documentary mission to Kharkiv.<sup>118</sup> The documenters also conducted an on-site examination of the area and did not identify any structures that could be utilized for military purposes, with the exception of the building of the «Eastern Regional Department of the State Border Guard Service of Ukraine» located 150 metres from the «Aksioma» residential complex. However, this building did not appear to be actively used.<sup>119</sup>

However, Russian troops did hit this facility, choosing it as a target for an attack on 6 August 2024, this time using a more accurate Iskander-M ballistic missile.<sup>120</sup> The missile hit the building of the «Eastern Regional Directorate of the State Border Guard Service of Ukraine»,<sup>121</sup> simultaneously damaging a higher education institution, a dormitory, and a hospital.<sup>122</sup> It seems probable that this facility was the intended target of the attack in May. This clearly proves that, despite having more accurate ballistic missiles in its arsenal, the Russian military deliberately chooses inaccurate aerial bombs for use in densely built-up areas.

As for the military targets in the area of 67 Peremohy Avenue, there were no other objects in the immediate vicinity of the impact site, apart from dense rows of apartment blocks and garages.



The place where a shell hit a residential area at 67 Peremohy Avenue

This attack again resulted in injuries and damage to civilian infrastructure due to the deliberate indiscriminate use of UMPB D-30SN munitions in a densely populated area of the city, once again demonstrating that imprecise munitions are a poor choice even for hitting legitimate military targets in dense civilian areas due to their significant circular deviation.<sup>123</sup>

### 🔥 III. Kharkiv, 25 May 2024

On 25 May 2024, at 16:02, three guided aerial bombs hit the «Epicentre» shopping hypermarket in Kharkiv, located at 9-A Heroiv Pratsi Street. At the time of the strike, the building was occupied by over 200 individuals, the majority of whom were civilians.<sup>124</sup> Following a four-day rescue and search operation, local authorities reported that 19 individuals had been killed and 54 injured, with varying degrees of severity.<sup>125</sup> The strike on the «Epicentre» resulted in considerable contamination of the air and land, as documented in the findings of

a study conducted by the State Environmental Inspectorate in Kharkiv Region.<sup>126</sup>  
Environmental damage is estimated at approximately UAH 860 million.<sup>127</sup>



Fire in the «Epicentre» shopping mall after two guided aerial bombs hit.  
Source: @nakipelovo, 25 May 2024<sup>128</sup>

At least three guided aerial munitions were launched at the «Epicentre», two of which hit the hypermarket, and the third unexploded munition was found 80 metres from the building. This renders it indisputable that the munitions employed were UMPB D-30SN.<sup>129</sup>



Photo of an unexploded munition near the «Epicentre».

Source: @prokuratura\_kharkiv, 27 May 2024<sup>130</sup>

Video footage from surveillance cameras located near the Epicentre shows the moment when two bombs hit the hypermarket directly.



The moment two UMPBMs D-30SN hit the Epicentre, as recorded by surveillance cameras.

Source: @prokuratura\_kharkiv, 25 May 2024<sup>131</sup>

The hypermarket as such is not a military target. Consequently, the Truth Hounds documenters concentrated their efforts on identifying potential military objectives in the vicinity of the «Epicentre» during an attack or military activities. During their stay in Kharkiv and their investigation of the areas surrounding the attack site, the team of documenters did not find any military facilities nearby. Witnesses interviewed confirmed that there were no military installations or concentrations of Ukrainian Armed Forces personnel around the «Epicentre»,<sup>132</sup> and that no military activities were taking place or planned inside or near the building.<sup>133</sup> Witnesses also noted that the attack had hit a part of the warehouse used to store plumbing and paint,<sup>134</sup> which excludes any military need to destroy such materials. In addition, the surveillance cameras inside the Epicentre also did not show any possible military objects that could have turned it into a military target.



The moment the bombs hit the «Epicentre», recorded from inside the building.  
Source: Sergei Bolvinov, 26 May 2024<sup>135</sup>

Similarly, no military object is visible in the video released by the Kharkiv Regional Prosecutor's Office.<sup>136</sup>

According to the chief of police in the Kharkiv region, the Russians knew about the presence of a large number of civilians and the absence of a military facility in the «Epicentre», as drones constantly fly over Kharkiv and record everything.<sup>137</sup> This again suggests that the Russians are deliberately targeting civilian infrastructure in Kharkiv.

#### 🔥 IV. Kharkiv, 22 June 2024

On 22 June 2024, at 15:18, Russian armed forces conducted an airstrike on the city of Kharkiv, launching four guided air bombs.<sup>138</sup> One of the guided air bombs struck a residential building at 21 Gagarina Avenue. In a statement released by the Kharkiv Regional State Administration it was reported that two individuals had lost their lives and at least 52 sustained injuries, including three children.<sup>139</sup> The remaining three bombs were directed at a manufacturing facility, resulting in the death of one individual and injuries to three others.<sup>140</sup> The launches were conducted from an area in the vicinity of Stroitel, Belgorod region.<sup>141</sup>



The aftermath of a hit on a residential building in Kharkiv, located at 21 Gagarina Avenue.

Source: @dsns\_telegram, 23 June 2024<sup>142</sup>

Video footage captured by residents of Kharkiv revealed the flight of three guided aerial bombs in the moments preceding their impact.



The video captures the moment when guided aerial bombs hit a target in Kharkiv.

Source: @kharkiv\_1654, 22 June 2024<sup>143</sup>

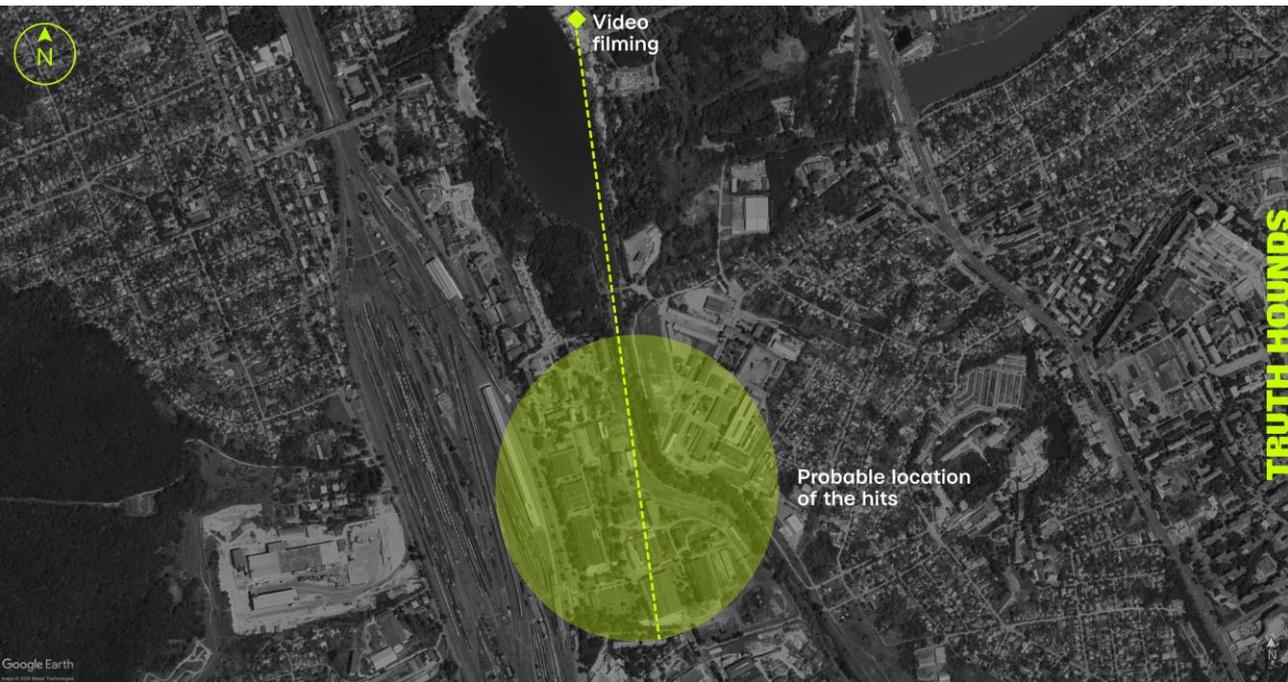
The video above probably shows hits on manufacturing facilities. These strikes were also filmed from a different angle by visitors to the «Arizona» recreation centre (pictured below).<sup>144</sup>



Freeze frame from a video showing smoke after a bomb hit.

Source: @kharkiv\_1654, 22 June 2024<sup>145</sup>

Truth Hounds investigators were able to geolocate the approximate location of the hit, which turned out to be the territory of production facilities in the area of Kharkiv Carriage District No. 1.



The Google Earth satellite image shows the probable impact zone of three of the four bombs used by Russian aircraft in the attack on Kharkiv on 22 June 2024. The dotted line shows the direction of the video filming, a still image from which is posted in the text above.

It seems probable that one of the guided aerial bombs deviated from its intended trajectory and struck a residential building at 21 Gagarina Avenue, as the other three munitions impacted within a relatively confined area. Nevertheless, it is conceivable that this was a distinct pre-programmed target, given the considerable distance of over six kilometres between the impacts of the first and the remaining three bombs.

The freeze frame from the video, which captures the moment the bomb hit the road near the house, clearly shows the type of munition used by the Russian VKS.



Freeze frame showing the moment the munition hit the road next to a residential building.

Source: @kharkiv\_1654, 22 June 2024<sup>146</sup>

It is asserted by law enforcement officials that the munition depicted in the freeze-frame is an UMPB D-30SN,<sup>147</sup> but Truth Hounds believes that Russian aviation used a new type of bomb in Kharkiv – a FAB with UMPK. The UMPB D-30SN exhibits a distinctive shape and a lateral rather than a tail fin on the munition body. To facilitate a comparison of the dimensions and configuration of the munitions, a freeze-frame of the moment when the UMPB D-30SN is detached from the carrier is provided below. This clearly illustrates the placement of the wings on the munition.



Four UMPBs D-30SN being dropped from a Su-34 aircraft.

Source: @warhistoryalconafter, 24 May 2024<sup>148</sup>

Most likely, during the attack on Kharkiv on 22 June 2024, the FAB-500 M-62 bomb was used for the first time in Kharkiv, as evidenced by the shape of the munition. For comparison, we can use a freeze frame from a video clip showing this type of bomb. Although the shape of the two munitions is the same, the Kharkiv munition lacks the guided module element. It is likely that the guided module (UMPK) detached from this bomb due to its high speed, which could have caused it to deviate significantly from its original target. This explains the six-kilometre discrepancy between the impact points. In this case, Russian troops used a low-quality munition, which led to an indiscriminate attack and numerous casualties.

Law enforcement agencies officially reported the use of these bombs on 27 June 2024, when the second attack with their use took place.<sup>149</sup> According to local authorities, the launch was carried out from the village of Maysky, Belgorod region of the Russian Federation.<sup>150</sup>



This is what a FAB-500 M-62 with a UMPK on a Su-34 suspension looks like.

Source: Fakty, 20 May 2024<sup>151</sup>

As in previous cases, Truth Hounds investigators analysed the presence of military facilities near the point of impact and interviewed witnesses to the attack in Kharkiv. No military installations were identified in the immediate vicinity of the building where the bomb hit. The hospital of the Main Department of the Ministry of Internal Affairs of Ukraine in Kharkiv region is located 120 metres to the east, as can be seen on any open maps.<sup>152</sup> However, hospitals are not military objectives or legitimate targets under international humanitarian law.<sup>153</sup> On the contrary, hospitals and clinics are afforded enhanced protection under IHL.<sup>154</sup> According to eyewitness testimony, the building adjacent to the site of the explosion had previously served as the headquarters of the Ukrainian Armed Forces. However, its activities had been suspended approximately one month prior to the strike.<sup>155</sup> Thus, at the time of the attack, the building at 21 Gagarina Street was no longer a military objective, nor were there any other legitimate targets nearby.

In general, the tactics of the Russian VKS's use of guided aerial bombs in Kharkiv indicate that Russia prefers inaccurate munitions to precision munitions such as Iskander-M ballistic missiles. In the four attacks on Kharkiv examined, the Russian military carried out strikes that killed at least 23 people and injured at least 154. None of the attacks hit an object that could be considered a legitimate target or within the circular error radius of the munition. This indicates that the ultimate goal of such strikes is to terrorise the civilian population rather than to achieve military objectives.

## Those responsible for the bombing of Kharkiv

In all four instances of the Kharkiv bombing that were subjected to analysis, the bombs were deployed by Su-34 aircraft, which are the most standard carriers of guided aerial bombs at the moment. The operational space of northern Ukraine is controlled by several Russian airfields where Su-34s are based: «Baltimore» (Voronezh region), «Buturlinovka» (Voronezh region), and «Lipetsk» (Lipetsk region).<sup>156</sup> The analysis of these airports is conducted as close as possible to the dates of all the attacks on Kharkiv with guided bombs described above.

### «Baltimore» airfield

As of March-May 2024, at least three aviation units were based at the Baltimore airfield in Voronezh region, namely:

- The 47<sup>th</sup> Bomber Aviation Regiment (Su-34), which belongs to the 6<sup>th</sup> Air Force and Air Defence Army,<sup>157</sup>
- 159<sup>th</sup> Fighter Aviation Regiment (Su-35S), which belongs to the 6<sup>th</sup> Air Force and Air Defence Army,<sup>158</sup>
- 23<sup>rd</sup> Fighter Aviation Regiment (Su-35S), which belongs to the 11<sup>th</sup> Air Force and Air Defence Army.<sup>159</sup>

In total, satellite images of the Baltimore airfield from 22 March 2022 (five days before the first strike by the UMPB D-30SN on Kharkiv) showed at least 15 Su-34s and 10 Su-35Ss.



The satellite image of the western part of «Baltimore» airfield shows at least five Su-34s and two Su-24s (marked with lines).

Source: Planet, 22 March 2024.



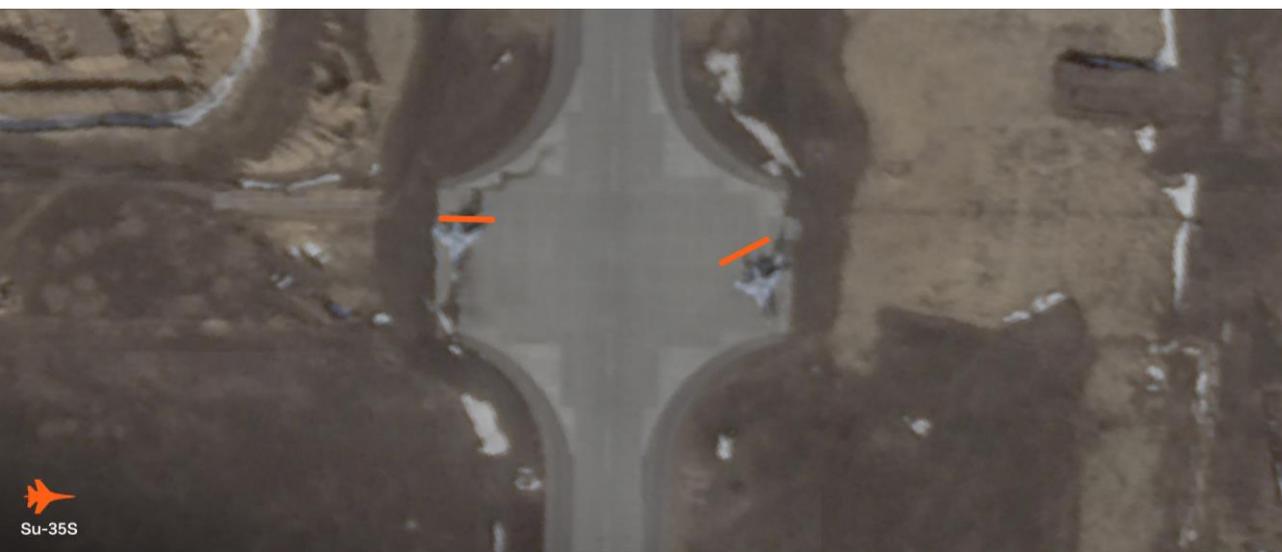
Satellite image of the eastern part of «Baltimore» airfield shows at least eight Su-35Ss and five Su-34s (marked with lines).

Source: Planet, 22 March 2024.



Satellite image of the northern part of the «Baltimore» airfield shows at least five Su-34s (marked with lines).

Source: Planet, 22 March 2024.



At least two Su-35Ss are visible on the satellite image of the central part of «Baltimore» airfield (marked with lines).

Source: Planet, 22 March 2024.

According to the Russian Ministry of Defence on its official pages, aircrafts from this airfield perform their tasks in the «Kupiansk direction»,<sup>160</sup> which is part of the area of responsibility of the Russian group «Zapad», which is also responsible for operations in the direction of Kharkiv.<sup>161</sup> Since mid-April 2024, the newly created Russian group, «Sever», has assumed operational control of the area in the direction of the city of Kharkiv.<sup>162</sup>

By analysing Russian media, Truth Hounds investigators were able to identify specific aircrafts involved in the dropping of bombs both on the contact line and on the civilian infrastructure of Kharkiv and other settlements in the region.

At least seven of the fifteen Su-34s based at this airfield have been identified. Also, one Su-30SM from the 14<sup>th</sup> Fighter Aviation Regiment, which is stationed at the «Khalino» airfield (Kursk region), was spotted at the airfield.<sup>163</sup> It is likely that the «Baltimore» airfield is one of its operational airfields.

The Russian military has been observed at the Baltimore airfield photographing UMPB D-30SN bombs suspended from pylons<sup>164</sup> and subsequently publishing videos of their drop in the direction of Kharkiv.<sup>165</sup>

At the same time, Su-35 aircraft are also deployed at the airfields to provide escort for the Su-34. As noted above, the Su-35s use anti-radar weapons and air-to-air missiles to guarantee the safety of the Su-34s during their flight to the designated drop zone for guided bombs. In fact, the Su-35 pilots may be found to be accomplices in war crimes, as their cover directly facilitates the criminal acts of the Su-34 pilots who bomb civilian cities.

Truth Hounds investigators identified nine Su-35Ss out of ten at “Baltimore” airfield.

### «Lipetsk» airfield

The Russian Aerospace Forces actively use Su-34s from the «Lipetsk» airfield for bombing strikes, including those against Kharkiv.<sup>166</sup> As of 25 April 2024, there were at least six Su-34s, two Su-35Ss, and seven Su-30SMs at the Lipetsk airfield.



A satellite image of the northern part of the «Lipetsk» airfield shows at least seven Su-30SMs, one MiG-31, five Su-34s and two Su-35Ss (marked with lines).  
Source: Planet, 25 April 2024.



The satellite image of the southern part of the «Lipetsk» airfield shows at least one Su-34 and six Su-24s (marked with lines).  
Source: Planet, 25 April 2024.

As indicated in the [appendix](#) to this study, the 968<sup>th</sup> Research and Instructional Mixed Aviation Regiment, which is part of the 4<sup>th</sup> Centre for Combat Use and Retraining of Aircrew of the Russian Ministry of Defence, is stationed at the «Lipetsk» airfield.<sup>167</sup>

As we have already noted, the regular number of Su-34s in the 968<sup>th</sup> Aviation Regiment is about ten, but only seven Su-34s can be seen on the satellite image. Although some of them could have been in hangars or on a combat mission at the time of the image being taken, it is more likely that some of the aircraft were redeployed to another airfield to carry out combat missions on the territory of Ukraine, as has happened before.<sup>168</sup>

In the majority of instances, the aircraft in question, took off either from «Baltimore» or «Lipetsk» airfields with the objective of carrying out a bombing raid on Kharkiv. The command and personnel of the aviation units were fully or partially identified with the help of the Main Intelligence Directorate and/or OSINT researchers. The following section presents the identified commanders and links to published lists of the remaining personnel of the air regiments that may have been involved in the air strikes on Kharkiv in March-May 2024.

### **Personnel of the 47<sup>th</sup> Bomber Aviation Regiment**

The regiment's commander is Loboda Aleksey Gennadievich (Loboda Aleksey Gennadievich).<sup>169</sup>

«Molfar» investigators have identified most of the servicemen who are likely to be members of the 47<sup>th</sup> Bomber Aviation Regiment.<sup>170</sup>

### **Personnel of the 159<sup>th</sup> Fighter Aviation Regiment**

The regiment's commander is Panchenko Ivan Aleksandrovych.<sup>171</sup>

### **Personnel of the 23<sup>rd</sup> Fighter Aviation Regiment**

The regiment's commander is Lobintsev Aleksandr Anatolievich (Lobintsev Alexander Anatolyevich).<sup>172</sup>

The personnel of this regiment were published by the Defence Intelligence of Ukraine in 2022.<sup>173</sup>

## «Buturlinovka» airfield

It should be noted that the airfields at «Baltimore» and «Lipetsk» are not the only airfields that could be used for bombing Kharkiv. Additionally, the «Buturlinovka» airfield in the Voronezh region is of note, as it was temporarily a home to the 2nd Mixed Aviation Regiment, which is equipped with Su-34 aircraft.<sup>174</sup>

Notwithstanding the statements of the Russian Ministry of Defence and Russian military correspondents that aircraft from this airfield perform tasks on the Krasnolimansky direction,<sup>175</sup> their use in the areas of responsibility of the «Zapad» and «Sever» groups cannot be ruled out. In particular, Ukrainian Telegram channels shared information indicating that a serviceman serving at the «Buturlinovka» airfield was responsible for the bombing of the Epicentre hypermarket in Kharkiv on 25 May 2024.<sup>176</sup> Based on information obtained from its own sources with access to monitoring of Russian and Ukrainian airspace, Truth Hounds has learned that the aircraft in question did, in fact, take off from the «Buturlinovka» airfield that day.

According to Ukrainian military correspondents, this airfield can accommodate up to six Su-34s.<sup>177</sup> According to a satellite image from 22 March 2024, there were at least five such aircrafts at the airfield.



The satellite image of «Buturlinovka» airfield shows at least five Su-34s and two Su-24s (marked with lines).

Source: Planet, 22 March 2024.

Truth Hounds investigators were able to identify most of the Su-34s at this airfield, in particular six Su-34.

### **Personnel of the 2<sup>nd</sup> Mixed Aviation Regiment**

The regiment's commander is Karnaukhov Dmitriy Yurievich.<sup>178</sup>

As for the personnel, as early as 2022, the list of the first squadron and the regiment's command was posted on the Internet.<sup>179</sup>

## **Conclusion of the analysis of air strikes on Kharkiv using UMPK bombs**

The analysis of satellite imagery and the operational situation in the northern part of Ukraine has led to the conclusion that at least five Russian aviation units, comprising three Su-34s and two Su-35s, may have been involved in the bombing of Kharkiv and the Kharkiv region. However, due to the inherent limitations of OSINT investigations, it is currently not feasible to ascertain with precision the specific airfield from which the aircrafts took off on a given day to strike Kharkiv, with the exception of the attack on «Epicentre». Consequently, the primary objective is to ascertain the identity of all potential responsible units. This will facilitate the presentation of evidence or additional information, which will in turn prove the involvement of a specific unit, including its commanding officer, in a particular incident. The identification of the aircraft's bort number will make it possible to establish the responsibility of specific pilots who carried out the attacks with guided bombs.

# **V. Attacks on civilian infrastructure with guided aerial bombs in Kherson**

In addition to Kharkiv, many other locations in Ukraine have also been targeted by guided aerial bomb attacks, most of which have war crimes implications. Truth Hounds investigators have analysed two attacks on Kherson and identified the Russian aviation units likely to have been involved in the attacks.

### 🚀 I. Kherson, 8 March 2024

On 8 March 2024, at around 21:33, a guided aerial bomb hit a residential building in the Korabelnyi district of Kherson. The impact destroyed the wall and part of the first floor of one of the entrances of the building<sup>180</sup> A seven-year-old child was injured.<sup>181</sup>

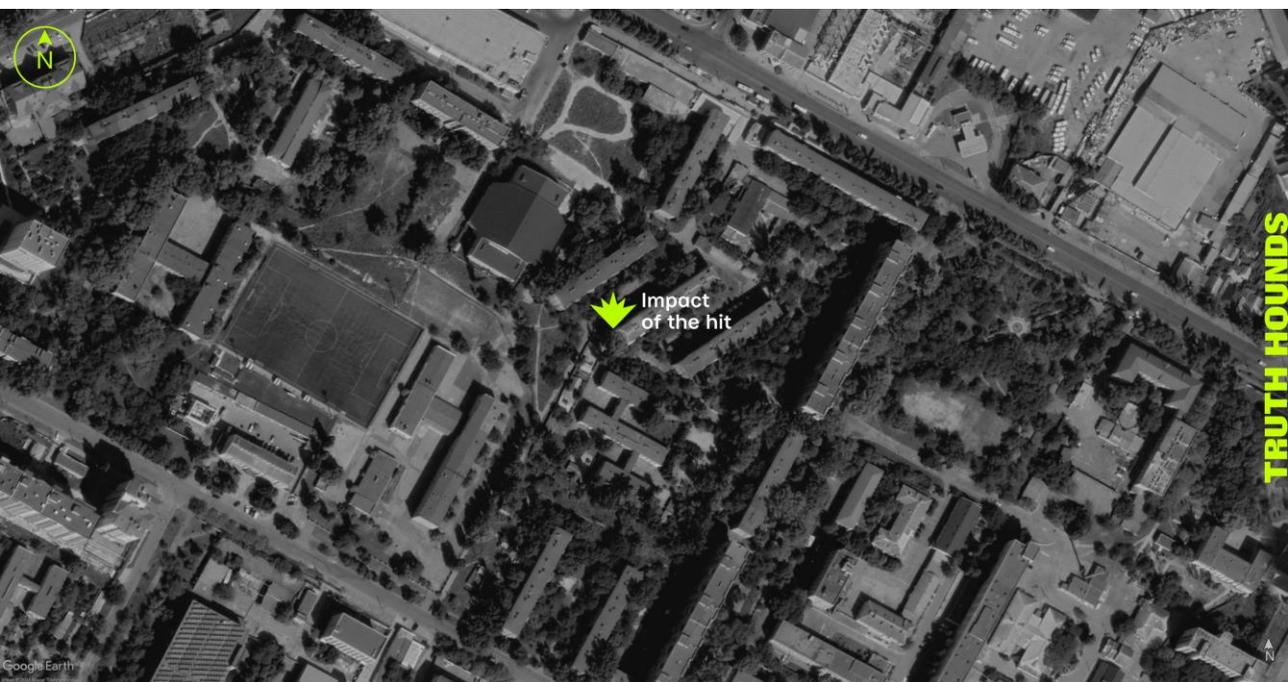


Photo of the impact site near a residential building in Kherson and the consequences of the destruction.

Source: IPC-South, 09 March 2024<sup>182</sup>

The photographic evidence of the aftermath indicates that the shell impacted in close proximity to the residence, resulting in the formation of a crater measuring approximately 7x5 metres and the complete destruction of the entrance. In light of the extensive damage, it seems probable that a FAB-500 bomb was used in the attack. In order to ascertain the circumstances surrounding the incident, a team of documenters from Truth Hounds conducted an investigation at the site of the impact.

After analysing satellite imagery, conducting interviews and examining the area, the investigators concluded that there was no legitimate target within 250 metres of the impact site. This is confirmed by numerous interviews with victims and witnesses of the strike.<sup>183</sup>



The location of the house in Kherson on Google Maps with the marking of the hit site

The satellite image above illustrates that the house is situated in close proximity to secondary school Nº47 and kindergarten Nº65, and is surrounded by other apartment blocks. Truth Hounds documenters conducted interviews with local residents and conducted an on-site examination of the area. As a consequence,

it was ascertained that the district police department is situated approximately 200 metres to the south, while a court that has remained inaccessible since the onset of the full-scale invasion is located 230 metres away. The Google Earth Pro satellite imagery reveals the presence of warehouses situated at a distance of 300 metres to the south.

It is crucial to acknowledge that police officers can only be regarded as legitimate military targets if they are part of the armed forces of a belligerent state or directly engaged in hostilities. In all other cases, police officers and other law enforcement officials are to be considered civilians.<sup>184</sup> Similarly, police stations that are not directly involved in an armed conflict regarded as civilian objects. Thus, a nearby district police station building cannot be considered a military objective in this context.

The satellite imagery, dated 30 March 2024, reveals that the area has been subjected to repeated shelling, as evidenced by the damage to the roof of the warehouse and the district police station building. Additionally, the photograph depicts the devastation wrought upon a residential building, which was struck by an aerial bomb on 8 March 2024. Nevertheless, the impact crater is obscured by shadows, rendering it barely discernible in the satellite image.



Satellite image showing the impact sites in Kherson.

Source: Planet, 30 March 2024.



Photo of the aftermath of a hit to a residential building on 8 March 2024, taken by documenters during a field mission to Kherson.

Source: Truth Hounds, 26 July 2024.

According to local residents, there were no military units in the area.<sup>185</sup> Given that police and court buildings are not legitimate targets, this attack bears the characteristics of a war crime in the form of an attack on civilian objects.

## 🔥 II. Kherson, 15 May 2024

At approximately 14:36 on 15 May 2024<sup>186</sup> at least three guided aerial bombs hit the central part of Kherson,<sup>187</sup> resulting in at least 19 individuals sustaining injuries of varying severity.<sup>188</sup> All of the individuals affected by the incident were civilians.<sup>189</sup>

The State Emergency Service reported at least two fires in apartment buildings had been caused by the attack.<sup>190</sup> According to the Kherson regional military administration, a total of eight multi-storey buildings, five private buildings, two educational establishments and a medical facility sustained damage.<sup>191</sup>



The aftermath of one of the shells hitting the roof of a building in Kherson.  
Source: IPC-South, 15 May 2024<sup>192</sup>

There are no publicly available photographs of the shell fragments that were used to hit Kherson. Ukrainian monitoring channels have reported the launch of guided aerial bombs in the direction of the Kherson region, although no details have been provided regarding the type of bomb used.<sup>193</sup>

Given the scale of the destruction, it is most likely that the Russian VKS used 250kg bombs with UMPK or UMPBs D-30SN that day. The crater and destruction from a 500kg bomb would have been much larger, as seen in the previous strike on 8 March 2024.



The aftermath of a hit on another multi-storey building in Kherson.

Source: @olexandrprokudin, 15 May 2024<sup>194</sup>

Given the comparatively limited damage caused by this attack in comparison to that of 8 March 2024, it seems unlikely that the same type of shell was used in the attack under investigation. A comparison of this attack with the attacks on Kharkiv indicates that the consequences are most consistent with the

characteristics of the UMPB D-30SN. In particular, the first strike by an UMPB D-30SN in Kharkiv on 27 March 2024 bears a striking resemblance to the damage caused by the same weapon in the current attack. The primary distinction between the two incidents is that in Kherson, the shell struck a building, whereas in Kharkiv, it detonated above ground. Nevertheless, the overall extent of the damage is consistent with that of a bomb with a 100-kilogram warhead (UMPB D-30SN), rather than the 200-kilogram warhead of a FAB-500 with UMPK.

It is likely that this type of weapon was used in Kherson on 15 May 2024.



Consequences of a hit near a multi-storey building in Kharkiv.

Source, Suspilne Kharkiv, 27 March 2024.<sup>195</sup>

Based on the testimonies of the eyewitnesses, the explosions occurred at intervals of between 30 and 60 seconds.<sup>196</sup> All three shells hit different addresses where there were no military facilities.



Places where three shells hit in Kherson on 15 May 2024

School №31, situated between the initial and secondary impact sites, served as the distribution point for humanitarian aid called «Centre of Invincibility».<sup>197</sup>

The third hit took place at 39 Ukrainka Street, in a private residence that was unoccupied at the time of the strike. Witness accounts indicate that the only civilians residing in the vicinity of the strike site were of advanced age.<sup>198</sup>

Truth Hounds documenters, having examined the area and interviewed witnesses, did not find any possible military objectives that could have been targeted by the Russian VKS.

The evidence suggests that both bombing strikes in Kherson were not directed at particular military objectives. The strikes hit civilian objects with no legitimate military targets in the vicinity that could justify such actions.

## Responsibility for the bombing of Kherson

Given the location of Kherson in the south of Ukraine, an analysis of the airfields from which aircraft undertake missions in a southerly direction (namely, the Zaporizhzhia and Kherson regions) is of significant importance. Based on data gathered from the monitoring of Ukrainian and Russian airspace via Telegram channels, it can be inferred that the Russian military utilises a minimum of three airfields for strikes on southern Ukraine: «Morozovsk»,<sup>199</sup> «Marinovka»<sup>200</sup> and «Kushchevska»<sup>201</sup>.

Truth Hounds does not have operational data on the take-offs from specific airfields for the attacks on Kherson on that day. Accordingly, we present data on all airfields from which aircraft could have been dispatched to drop bombs on Kherson.

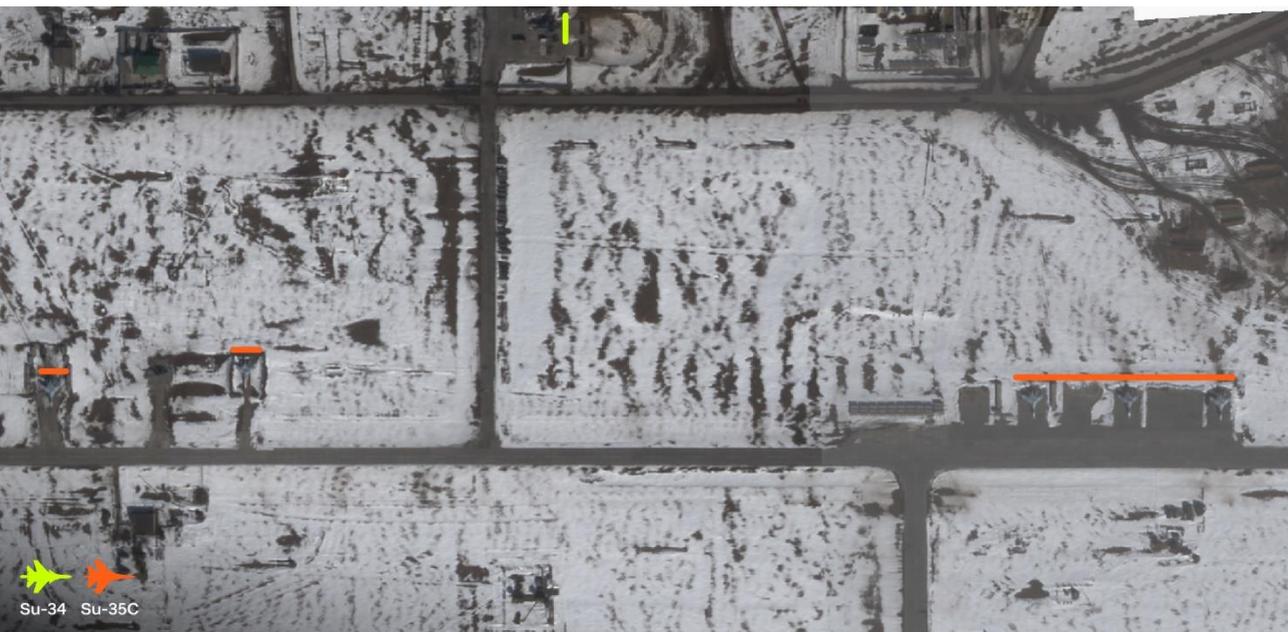
### «Morozovsk» airfield

According to satellite images from 2 March 2024, there were at least 15 Su-34s at the airfield. It seems probable that the majority of the Su-34s at the airfield belonged to the 559th Bomber Regiment, as at least three Su-34s are observed to be wearing black camouflage, which is characteristic only of the 559th and 47th (Voronezh) Aviation Regiments, the latter of which was then stationed at Baltimore airfield.<sup>202</sup>



A satellite image of the western part of the «Morozovsk» airfield illustrates at least 14 Su-34 aircrafts (parking areas are marked with lines).

Source: Planet, 02 March 2024.



A satellite image of the eastern part of the «Morozovsk» airfield illustrates at least one Su-24s and five Su-35Ss (marked with lines).

Source: Planet, 02 March 2024.

In 2023, the aircraft belonging to the 559th Regiment were observed at the aforementioned airfield.<sup>203</sup>

Furthermore, Truth Hounds identified a minimum of seven Su-34s affiliated with the 277th Bomber Regiment, stationed at the «Morozovsk» airfield. Initial publications with these aircraft emerged in early March 2024, suggesting their presence at the airfield since February 2024. Thus, the 277<sup>th</sup> Regiment may also be involved in the attack on Kherson on 8 March 2024.

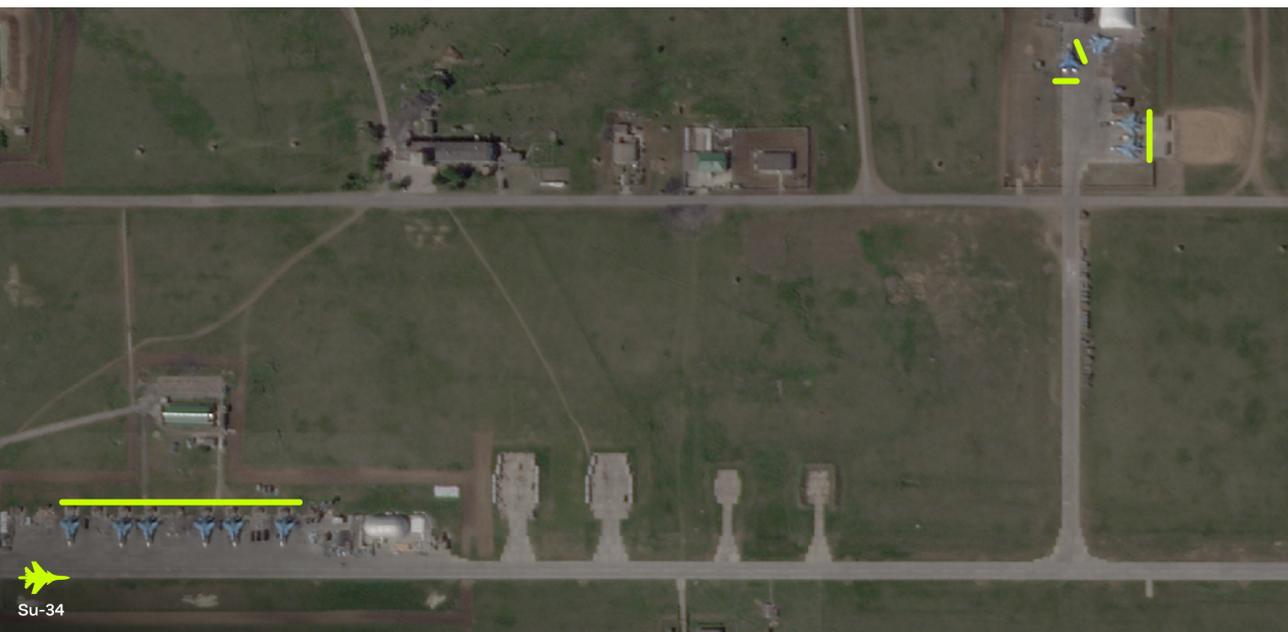
Thus, at least eight Su-34 aircraft belonging to the 277<sup>th</sup> Bomber Regiment were stationed at the «Morozovsk» airfield together with the aircraft of the 559<sup>th</sup> Bomber Regiment. Consequently, it is plausible that both units may have been involved in the attack on Kherson on 8 March 2024.

The satellite imagery of the airfield from 1 May 2024 indicates the presence of at least 20 Su-34s, thereby suggesting an increase in the number of aircraft at the airfield in comparison to March of that year. It seems plausible to suggest that between March and May, additional aircraft from the 277<sup>th</sup> Bomber Regiment were redeployed to «Morozovsk».



A satellite image of the western part of the «Morozovsk» airfield shows at least nine Su-34s (marked with lines).

Source: Planet, 01 April 2024.



A satellite image of the central part of the «Morozovsk» airfield shows at least ten Su-34s (marked with lines).

Source: Planet, 01 May 2024.



Satellite image of the eastern part of the «Morozovsk» airfield shows at least one Su-34 and five Su-35Ss (marked with lines).

Source: Planet, 01 May 2024.

The involvement of Su-34s from «Morozovsk» airfield in the attack on Kherson on 15 May 2024 remains unconfirmed. The use of a specific weapon, the UMPB D-30SN, is highly probable, yet traces of this weapon have not been identified at «Morozovsk». In particular, the images of the damaged ammunition depot at this airfield did not display any UMPB D-30SNs.<sup>204</sup> Instead, such shells were seen at the following airfields: «Lipetsk» (Lipetsk region),<sup>205</sup> «Baltimore» (Voronezh region),<sup>206</sup> «Buturlinovka» (Voronezh region)<sup>207</sup> and «Marinovka» (Volgograd region)<sup>208</sup>. Among these, only aircraft from the «Marinovka» airfield are engaged in operations in the south and east of Ukraine.<sup>209</sup> Consequently, it is plausible that they were responsible for this strike.

### ✈ «Marinovka» airfield

As noted in the [appendix](#) on airfields used by Russia in its war against Ukraine, the «Marinovka» airfield in the Volgograd region is currently used as a base for Su-34 aircraft during a full-scale invasion. The aircraft stationed there perform missions, among others, in the southern region of Ukraine.<sup>210</sup>

The presence of UMPBs at this airfield has been corroborated through the examination of photographic evidence captured by Russian pilots. In particular, photographs from the Russian Telegram channel «Kirill Fedorov/War History Weapons» frequently feature UMPB D-30SN bombs.<sup>211</sup> The presence of distinctive markings on the road and a metal structure in the background enables the geolocation of the aircraft depicted in the photographs, which are consistent with the location of the «Marinovka» airfield.



An Su-34 with a UMPB D-30SN at the «Marinovka» airfield . The identifying elements of the image have been highlighted for ease of reference.

Source: @warhistoryalconafter, 29 June 2024<sup>212</sup>



The satellite image of the western part of the «Marinovka» airfield shows the same elements as in the photo above.

Source: Maxar, 25 April 2024.

In the period between May and April, approximately eight Su-34s were observed at the «Marinovka» airfield,<sup>213</sup> as confirmed by satellite imagery. The lack of publicly available information about the Su-34s at this airfield makes it challenging to ascertain the identity of the aviation regiment that may be based there. It is, however, noteworthy that the video of the inaugural deployment of the UMPK from FAB-3000 was filmed at the «Marinovka» airfield.<sup>214</sup>

In the absence of accurate data on the aviation unit at the “Marinovka” airfield, Truth Hounds investigators resorted to analysing videos and photographs on the Internet. The geolocation of one of the photographs enabled the identification of both the unit to which the aircraft in the photograph belonged and the aircraft unit visible in the video.

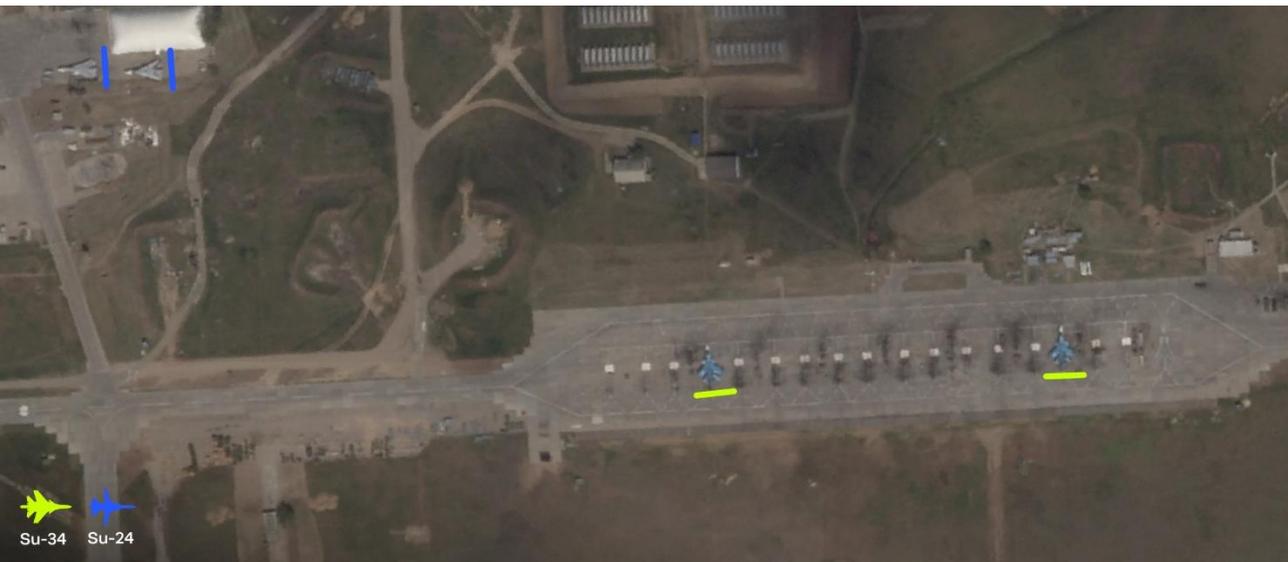
Having examined the evidence, the Truth Hounds investigators concluded that the aircraft belonged to the 559th Bombardment Regiment.

Furthermore, the airfield was utilised by aircraft belonging to the 277th Bombing Regiment in 2022, as evidenced by reports from Ukraine's Main Intelligence Directorate.<sup>215</sup>

At the same time, it is possible to confirm the redeployment of aircraft from the 2nd Mixed Regiment to this airfield.<sup>216</sup>

It can be reasonably deduced that the «Marinovka» airfield is utilised by a considerable number of Russian military units, as evidenced by the fact that nearly all Su-34 regiments have been stationed at this airfield at one point or another.

A review of the satellite image dated 18 May 2024 reveals the presence of only four Su-34s. It is reasonable to infer that the remainder of the aircraft were engaged in either combat or training exercises.



A satellite image of the western part of the «Marinovka» airfield shows at least two Su-34s and two Su-24s (marked with lines).  
Source: Planet, 18 May 2024.



At least two Su-34s and two Su-24s are visible on the satellite image of the eastern part of the «Marinovka» airfield (marked with lines).  
Source: Planet, 18 May 2024.

Images captured at the end of April indicate the presence of at least seven aircraft at the airfield, with the majority situated in the area where the pilots from «Kirill Fedorov/War History Weapons» channel typically take photographs.



A satellite image of the western part of the «Marinovka» airfield shows at least five Su-34s and six Su-24s (marked with lines).

Source: Maxar, 25 April 2024.



Satellite image of the eastern part of the «Marinovka» airfield shows at least two Su-34s and six Su-24s (marked with lines).

Source: Maxar, 25 April 2024.

It is highly probable that the attack on Kherson on 15 May 2024 was launched from the «Marinovka» airfield, as the UMPB D-30SN munitions from the Southern Operational Zone airfields were observed to be present only at this location. In this instance, the 559th and 277th Bomber Regiments, or the 2nd Mixed Aviation Regiment, are the most probable perpetrators of the attack, given that their presence at this airfield has been confirmed.

However, it is worth considering other possible airfields from which aircrafts could have taken off for the attacks on Kherson in March and May 2024.

### ✦ «Kushchevsk» airfield

Another airfield in the southern operational area in March-May 2024 was the «Kushchevsk» airfield. From March to May 2024, the airfield was home to Su-34 and Su-35 aircraft. There are confirmed cases of these aircrafts being used in the operations of the «Zapad», «Tsentr», «Yuh» and «Vostok» groups.<sup>217</sup>



A satellite image of the «Kushchevska» airfield shows at least eight Su-34s, eight Su-35Ss and four Su-27/35s (marked with lines).

Source: Planet, 19 March 2024.

As mentioned in the section on tactical aviation, the 277<sup>th</sup> Bomber Regiment (Su-34),<sup>218</sup> the 968<sup>th</sup> Experimental Instructor Mixed Aviation Regiment (Su-34),<sup>219</sup> and Su-35S aircraft from the 23<sup>rd</sup> Fighter Aviation Regiment are based at this airfield.<sup>220</sup>

The planes stationed at this airfield are situated in closer proximity to Kherson in comparison to the «Morozovsk» and «Marinovka» airfields. Consequently, if UMPK bombs were indeed employed in the attack on the city, it would be most logical to use this airfield. In regard to the attack on 15 May 2024, which is believed to have involved the use of UMPB, investigators from Truth Hounds were unable to ascertain any evidence indicating the involvement of aircraft from «Kushchevska» airfield.

Accordingly, there are three airfields from which Kherson could have been struck, as well as three Su-34 units stationed at these airfields:

-  «Morozovsk» – 559<sup>th</sup> and 277<sup>th</sup> bomber regiments;
-  «Marinovka» – 559<sup>th</sup> and an unknown regiment, probably the 277<sup>th</sup> or 2<sup>nd</sup>;
-  «Kushchevsk» – 277<sup>th</sup> bomber regiment and possibly the 968<sup>th</sup> mixed regiment.

The full personnel list of the 559<sup>th</sup> Bomber Regiment was published by the Main Intelligence Directorate of Ukraine in March 2022.<sup>221</sup> The commander is Shyshkin Vitaliy Andreevich.

The personnel of the 277<sup>th</sup> Bomber Regiment was published by the Main Intelligence Directorate of Ukraine in May 2022.<sup>222</sup> Commander – Grebenkov Denis Borisovich.

# **VI. Attacks by guided aerial bombs in the context of international law**

The conduct of any armed conflict (war) is regulated by a special branch of international law – international humanitarian law (IHL). It establishes rules aimed at minimising harm to civilians and objects, as well as protecting military personnel who have been discharged from service, prisoners of war, etc. Serious violations of IHL, such as targeted (intentional) attacks on civilians and civilian objects, indiscriminate or disproportionate attacks, should be prosecuted under international criminal law (ICL).

In our other study on the Russian missile attack on the «Ria Lounge» cafe in Kramatorsk, we noted<sup>223</sup> that while IHL and ICL do not take into account who started an armed conflict (they impose symmetrical requirements on the parties to the conflict), this «indifference» does not apply to international law in general. The UN Human Rights Committee has determined that any deprivation of life arising from an act of aggression by definition violates the International Covenant on Civil and Political Rights.<sup>224</sup> In other words, the aggressor state is responsible for all deaths related to the armed conflict it started.

Today, almost all states of the world recognise Russia as a party that has unprovokedly used armed force against Ukraine. This gives reasonable grounds to assert that Russia is responsible for the death of any person in connection with the armed conflict. In particular, this applies to Ukrainians who died as a result of attacks by the aggressor state with guided aerial bombs. Thus, the responsibility for the lost lives lies entirely with Russia through the very fact of aggression.

In any case, the above-analysed cases of the use of guided aerial bombs in Kharkiv and Kherson provide strong grounds to further believe that these attacks violate IHL and can be characterised as war crimes. Accordingly, the Russian military personnel involved in these unlawful attacks should be held criminally responsible.

## The principle of distinction in IHL

One of the fundamental principles of international humanitarian law is the principle of distinction. It requires that parties to an armed conflict distinguish between civilians and combatants, as well as between civilian objects and military objectives.<sup>225</sup> This principle stipulates that civilians and objects must be protected during hostilities, in particular, not be targeted. The only exceptions are cases where civilians are directly involved in hostilities or civilian objects are used for military purposes.<sup>226</sup>

*«The civilian population as such, as well as individual civilians, shall not be the object of attack» (Article 51(2) of IHL).*

*«Civilian objects shall not be the object of attack or of reprisals» (Article 52(1) of the IHL).*

Compliance with the principle of distinction is complicated when hostilities take place in large cities or densely populated areas.<sup>227</sup> Failure to comply with this principle and to establish the relevant intent of the suspects may qualify as a war crime.<sup>228</sup>

## Terrorising the civilian population

IHL also prohibits terrorisation of the civilian population. For example, Article 51(2) of AP I provides that in international armed conflicts, «acts or threats of violence the primary purpose of which is to spread terror among the civilian population are prohibited».<sup>229</sup> International criminal tribunals have also recognised terrorisation of civilians as a war crime.<sup>230</sup>

This provision prohibits not so much the fact of terror itself, but deliberate attacks on civilians with the aim of achieving such an effect. In real-life situations, civilians will experience fear and panic from the conduct of hostilities as such. However, without a specific intent, such actions will not qualify as a crime.

To establish a violation of the prohibition to terrorise the civilian population, a number of factors are taken into account, including indiscriminate attacks, intentional attacks on civilian objects, etc. In particular, in the case of Prlic et al. the Appeals Chamber of the ICTY held that:

*«The indiscriminate nature of the attack was a factor that the Trial Chamber reasonably took into account in determining the specific intent to spread terror. The Trial Chamber also considered, in particular, the deliberate targeting and destruction of ten mosques in eastern Mostar by the HVO. Finally, it explicitly linked shelling and sniper fire as contributing factors to the terrorisation of the population of eastern Mostar. The Appeals Chamber considers that any reasonable trier of fact could have concluded that the actions of the HVO were committed with the requisite specific intent to spread terror on this basis».*<sup>231</sup>

Among the examples of acts prohibited by this provision, the ICRC also mentions «indiscriminate and widespread shelling and regular Bomber of cities».<sup>232</sup>

The analysed cases of the use of guided aerial bombs by the Russian military and the statistics on the intensity of attacks in Kharkiv, Kherson and Zaporizhzhia show the indiscriminate, large-scale and systematic nature of attacks on densely populated areas of Ukrainian cities.

The report of the UN Human Rights Monitoring Mission in Ukraine states that “missile attacks throughout the country and the use of aerial bombs, especially in Kharkiv and Zaporizhzhia, resulted in a high number of casualties.”<sup>233</sup> In addition, the UN Human Rights Monitoring Mission in Ukraine noted that even some attacks on energy infrastructure as dual-use facilities may have been intended to intimidate and spread panic among civilians, weaken morale, or spread terror among the civilian population.<sup>234</sup> Such conclusions would be even more relevant in relation to targeted attacks on purely civilian objects, such as residential buildings or educational institutions for children.

Thus, both the individual attacks with guided aerial bombs and their cumulative effect, as well as the deadly consequences of these strikes, had the predictable result of terrorising the Ukrainian population.

## Aerial bombardment and indiscriminate attacks

Perhaps the first use of aerial bombs on the battlefield took place during the First World War. At that time, neither the Geneva Conventions nor their Additional Protocols existed. Only the Hague Conventions and Declarations of 1899 and 1907 were in force.<sup>235</sup> However, in 1923, the Commission of Lawyers of Different Nations developed the Hague Rules of Air Warfare. Although these rules were never formally adopted, they contained one of the first formulations of the illegality of certain aerial bombardment:

*«Article 24(3): The bombing of cities, towns, villages, dwellings or buildings not in the immediate vicinity of ground forces operations is prohibited. In cases where [military objectives] are located in such a way that their bombardment cannot be carried out without indiscriminate bombardment of the civilian population, aircraft shall refrain from bombing».*<sup>236</sup>

In other words, it was proposed to: (1) absolutely prohibit the bombing of those settlements located at a distance from the contact line, and (2) prohibit the bombing of any areas inhabited by civilians, if it is impossible to limit such bombing to military objectives only.

In modern IHL, the issue of bombing is regulated by paragraph (a) of Part 5 of Article 51 of the First Additional Protocol to the Geneva Conventions Relative to the Protection of Victims of International Armed Conflicts (AP I):

*«5. Among others, the following types of attacks are to be considered indiscriminate:*

*(a) an attack by bombardment, by any method or means, which treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other containing a similar concentration of civilians or civilian objects».*

This rule, although narrower in content, essentially repeats the second part of the aforementioned Article 24(3) of the Hague Rules of Air Warfare. It states that the bombing of several clearly separated and distinct military objectives is impossible without indiscriminate bombing of the civilian population or civilian objects located between or adjacent to these military objectives.

In addition, the AP I contains a number of provisions relating to indiscriminate attacks that may apply to cases of Russian attacks on Ukrainian cities with guided aerial bombs (Article 51(4) of the AP I):

*«4. Indiscriminate attacks are prohibited. Indiscriminate attacks are:  
(a) those which are not directed at a specific military objective;  
(b) those which employ a method or means of combat which cannot be directed at a specific military object; or  
(c) those which employ a method or means of combat whose effects cannot be limited as required by this Protocol and which, in each such case, therefore have the character of striking military objectives and civilians or civilian objects without distinction».*

The first aerial bombs were uncontrollable, which even then raised questions about the legality of their use in densely populated areas. At the same time, the advent of precision or guided weapons has led to the belief that air warfare has improved significantly, because instead of using hundreds of unguided bombs to hit a specific target, a single strike with precision weapons can effectively hit the same target while minimising collateral damage.<sup>237</sup> However, the reality of modern warfare – and the armed conflict in Ukraine in particular – demonstrates that even precision or guided weapons are not a panacea. The military still faces difficulties in applying the principle of distinction, often failing to provide sufficient protection to civilians.<sup>238</sup> This is especially true as some types of guided weapons have a significant margin of error, which can have critical consequences when used in densely populated areas.

Therefore, it is a mistake to assume that a guided bomb, even if it is aimed at a specific military target, automatically makes an attack lawful. It will depend on the circumstances of the attack and the specific characteristics of the weapon.

## Analysis of Russian attacks with guided aerial bombs in the context of IHL

There are a number of important criteria that help to determine the legality of an attack with a particular bomb or munition: **the radius of error, the time and place of the attack**. Below, we analyse whether Russian guided aerial bombs used against Ukrainian densely populated cities meet these criteria.

### ◉ Error radius

As we mentioned earlier, the error radius of Russian UMPK bombs and UMPB munitions is by definition quite large (up to 15 metres in ideal conditions) and can be increased many times over due to the influence of electronic warfare or technical malfunctions of the munitions themselves.

Defence Express, for example, noted that the Russian Federation was apparently inspired by the US GBU-39 SDB (Small Diameter Bomb) when designing its UMPB D-30SN.<sup>239</sup> «But while the latter has the appropriate accuracy, the Russian one currently only demonstrates strikes on residential areas», the publication notes.<sup>240</sup> And in general, the UMDB is not a classic guided missile in terms of its characteristics, as it cannot turn 180 degrees in flight like a guided missile, although it is capable of certain manoeuvring and trajectory correction.<sup>241</sup>

From the cases we analysed in Kharkiv and Kherson, the error of Russian guided aerial bombs usually ranged between 150-200 metres from the likely targets at which the Russian Armed Forces could have been aiming (see tables below). At times, however, there were no military objectives within a radius of more than 250 metres from the impact sites.

It is worth noting that the use of munitions with an error of 50-100 metres has already been classified as illegal in the case of the shelling of the city of Raqqa in northern Syria. At that time, Amnesty International noted that «given that standard artillery shells [...] have an average error of more than 100 metres, the launch of so many such shells at the city [...] posed an unacceptable risk to civilians»,<sup>242</sup> and that «in residential areas where houses are no more than a few metres apart, such inaccuracies would almost certainly cost civilian lives».<sup>243</sup>

Thus, due to the large error radius, Russian guided aerial bombs cannot be considered highly accurate and are not suitable for use in densely populated cities and towns. The use of such bombs in this situation may fall under the concept of indiscriminate attack, as defined in Article 51(4)(b) of AP I: «use [...] means of combat which cannot be directed against a specific military object».

A further analysis of Russian attacks with guided aerial bombs according to other criteria also shows the illegality of their use in densely populated Ukrainian settlements.

### **Time of attack**

The time of the attack also plays a role in determining its legality. For example, an attack on a military objective during the day may potentially be disproportionate or indiscriminate if a similar attack at night would result in fewer civilian casualties.<sup>244</sup>

It is telling that all four of the analysed attacks in Kharkiv occurred in the afternoon (between 3 and 4 pm), when the city is crowded with civilians on the streets. The victims were often children, who could have been on playgrounds or returning home from school. The attacks on Kherson also did not take place late at night, when a curfew is in place, but rather in the afternoon or evening (2 and 9 pm).

### **Location of the attack**

Finally, all six of the analysed attacks with Russian guided aerial bombs in the cities of Kharkiv and Kherson took place within dense civilian areas.

The location of the use of a particular weapon plays a crucial role in the context of the principle of distinction. Imprecise and large aerial bombs used during the day in fields on the contact line, where civilians are not present, are not likely to violate the principle of distinction. In contrast, even the use of a fairly accurate and small bomb at night, but in a densely populated area, could lead to a violation of the principle. Therefore, certain bombs can be used in open areas, but not in densely populated areas of cities and towns.

The importance of distinguishing where bombs are used was mentioned by correspondent Heidi Zhou-Castro in the context of the war in the Gaza Strip:

«These [BLU-109s] are large bombs that the US has used in the past in its wars in Afghanistan, Iraq and Syria, but mostly in open terrain. Now Israel is using these bombs in a very different environment in Gaza, in densely populated areas, in civilian areas».<sup>245</sup> While these bombs could have been used to target the tunnels that Hamas uses to move personnel and ammunition, questions still arise about the legality of their use. After all, the tunnels are located under densely populated urban areas, which means that the use of the bombs would lead to a much higher number of civilian casualties.<sup>246</sup> Therefore, IHL experts noted that «it is impossible to bomb underground tunnels with GBU-31 warheads without deliberately levelling densely populated areas with hundreds of civilians who will certainly die».<sup>247</sup>

In each case analysed, Truth Hounds researchers checked for the presence of military objectives in the vicinity of the strikes.

For example, in the case of both Kherson strikes analysed, it was found that there were no military objectives within 200-250 metres of the impact site that the Russian Armed Forces could have targeted.<sup>248</sup> Such tactics further demonstrate the illegality of Russian attacks, which would fall either under the concept of an attack on civilians or on a civilian object (Article 51(2) of IHL, Article 52(1) of IHL) or under the concept of an indiscriminate attack, as defined in Article 51(4)(a) of IHL: «those [attacks] which are not directed at a specific military object».

Below is a summary table containing information on the analysed cases of attacks in Kherson and the key criteria for determining the legality of such attacks.

## Table of the use of guided aerial bombs in Kherson according to the criteria for assessing the legality or illegality of the attack

DATE OF THE INCIDENT	PLACE OF IMPACT	CASUALTIES AND DAMAGE	TYPE OF GUIDED AERIAL BOMB	APPROXIMATE RADIUS OF ERROR (FROM THE NEAREST PROBABLE TARGET)
 08.03.2024  21:33	 a residential building located between kindergarten no. 65 and school no. 47	 a 7-year-old child was injured;  the wall and part of the first floor of the entrance of the residential building were destroyed	 FAB-500 500 kg	no military objects nearby (within 250 m)
 15.05.2024  14:36	 central part of Kherson: <ul style="list-style-type: none"> <li>• two residential buildings next to the school no. 31, which acted as the «Centre of Invincibility» for the distribution of humanitarian aid (2 bombs);</li> <li>• a private house (1 bomb)</li> </ul>	 19 people received injuries of varying severity;  at least 2 schools, a medical facility, 8 multi-storey and 5 private houses were damaged	   UMPB D-30SN 3 x 250 kg	no military objects nearby (within 200 m)

The analysed attacks on Kharkiv also revealed that in some cases, the Russian military appears to have deliberately targeted civilians or civilian objects. For example, on 25 May 2024, in Kharkiv, the Russian Armed Forces directed three aerial bombs at the «Epicentre» shopping mall, where there was no military equipment or military events.<sup>249</sup> This falls under the concept of an attack on a civilian object, as defined in Article 52(1) of AP I: civilian objects shall not be the object of attack or reprisals.

In the analysed attack of 22 June 2024, it was established that three aerial bombs hit a production facility (the nature of the activity is unknown, so the legality of the attack under IHL will depend on whether the facility was civilian or military at the time of the attack). In any case, one of the bombs hit a residential complex near a metro station, six kilometres from the manufacturing plant where the other three bombs hit. Such a significant error can only indicate that the Russian Armed Forces used means of combat that cannot be directed against a specific military object (Article 51(4)(b) of the IHL).

In the analysed attack on Kharkiv on 27 March 2024, it was found that the nearest possible targets at which the RF Armed Forces could have been aiming were 200 metres away from the impact site. During the attack of 14 May 2024, the closest possible target was 150 metres from the impact site (the building of the «Eastern Regional Directorate of the State Border Guard Service of Ukraine»).

While the circular deviation of a munition of about 150-200 metres can be considered acceptable when used on the front line itself, where there are simply no civilians or objects within this radius, the use of such munitions in dense civilian areas does not guarantee a precise hit and the achievement of any military advantage. At the same time, the chance of hitting a civilian object is much greater. As Kharkiv is a city with a fairly dense civilian population, almost every such strike can be questioned in terms of its compliance with IHL.

Also, in the context of the 14 May 2024 attack, it should be noted that the Russian Armed Forces later used the more precise «Iskander-M» to attack the area.<sup>250</sup> On 6 August 2024, a shell hit the building of the «Eastern Regional Directorate of the State Border Guard Service of Ukraine»,<sup>251</sup> simultaneously damaging a higher education institution, a dormitory and a hospital.<sup>252</sup> Officials have not commented on the hit on the border guard building.<sup>253</sup> Despite the availability of more precise weapons, the Russian Armed Forces deliberately chose inaccurate guided aerial bombs for the 14 May 2024 attack and directed them at densely populated areas of the city of one million people. This further demonstrates the intentional nature of the actions of the Russian Armed Forces and their awareness of the consequences of their actions, in particular the fact that UMPB projectiles are inaccurate and have a significant circular deviation in real conditions.

Below is a summary table containing information on the analysed cases of attacks in Kharkiv and the key criteria for determining the legality of such strikes.

## Table of the use of guided aerial bombs in Kharkiv according to the criteria for assessing the legality/illegality of the attack

DATE OF THE INCIDENT	PLACE OF IMPACT	CASUALTIES AND DAMAGE	TYPE OF GUIDED AERIAL BOMB	APPROXIMATE RADIUS OF ERROR (FROM THE NEAREST PROBABLE TARGET)
<ul style="list-style-type: none"> <li> 27.03.2024</li> <li> 15:54</li> </ul>	<ul style="list-style-type: none"> <li> a playground near residential buildings in a densely populated area of Kharkiv with a metro station</li> </ul>	<ul style="list-style-type: none"> <li> 1 person killed, 19 people injured, including 4 children;</li> <li> 18 residential buildings damaged</li> </ul>	<ul style="list-style-type: none"> <li></li> <li>UMPB D-30SN 250 kg</li> </ul>	+/- 200 m
<ul style="list-style-type: none"> <li> 14.05.2024</li> <li> 16:10</li> </ul>	<ul style="list-style-type: none"> <li> «Aksioma», a residential co-operative in a densely populated area of Kharkiv with a metro station</li> </ul>	<ul style="list-style-type: none"> <li> 26 people sustained injuries of varying severity;</li> <li> «Aksioma» residential complex and a housing co-operative were damaged</li> </ul>	<ul style="list-style-type: none"> <li></li> <li>UMPB D-30SN 3 x 250 kg</li> </ul>	150 metres away – the building of the Eastern Regional Department of the State Border Guard Service of Ukraine
<ul style="list-style-type: none"> <li> 25.05.2024</li> <li> 16:20</li> </ul>	<ul style="list-style-type: none"> <li> «Epicentre» shopping centre</li> </ul>	<ul style="list-style-type: none"> <li> 19 people killed, 54 people sustained injuries of varying severity;</li> <li> environmental damage – UAH 860 million</li> </ul>	<ul style="list-style-type: none"> <li></li> <li>UMPB D-30SN 3 x 250 kg</li> </ul>	no military facilities nearby
<ul style="list-style-type: none"> <li> 22.06.2024</li> <li> 15:18</li> </ul>	<ul style="list-style-type: none"> <li> a production facility (3 bombs);</li> <li> residential complex 6 km from the production facility and near a metro station (1 bomb)</li> </ul>	<ul style="list-style-type: none"> <li> 3 people killed, at least 55 people injured, including 3 children</li> </ul>	<ul style="list-style-type: none"> <li></li> <li>FAB-500, M-62 from UPCM 4 x 500 kg</li> </ul>	6 km to a production facility (nature of activity unknown)

## The war crime of attacking civilian objects and/or civilians

In order to prove not only that the attacks with guided aerial bombs by the RF Armed Forces are indiscriminate and in violation of IHL, but also that they constitute war crimes, it is necessary to further establish the criminal intent of the military personnel involved in these attacks.

In its judgement of 7 March 2014 in the case of Prosecutor v. Katanga, the International Criminal Court (ICC) stated:

*«The Chamber considers that the [war] crime of [intentionally directing attacks against the civilian population ..] can be established even if the military operation also targeted a legitimate military objective. It is important, however, to establish that the primary object of the attack was the civilian population or individual civilians. [...] It must be noted that indiscriminate attacks – proscribed by a rule of custom may qualify as intentional attacks against the civilian population or individual civilians, especially when the damage to civilians is so great that it appears to the Chamber that the perpetrator meant to target civilian objects. The use of weaponry that has indiscriminate effects may, inter alia, show that the attack was directed against the civilian population or individual civilians».*<sup>254</sup>

Finally, while the ICC has indicated that an indiscriminate attack does not automatically constitute an attack on the civilian population [as a war crime], as the subjective element is crucial in the latter case, the Court has outlined how such intent can be established:

*«That specific mental element [intent] may be inferred from various factors establishing that civilians not taking part in the hostilities were the object of the attack, such as the means and methods used during the attack, the number and status of victims, the discriminatory nature of the attack or, as the case may be, the nature of the act constituting the attack».*<sup>255</sup>

IHL experts have also noted the importance of such circumstances in establishing intent:

*«Harm to the civilian population would be expected, from an objective point of view, to be a disproportionately predominant result of the attack compared to secondary (incidental) effects on legitimate military objectives, as well as the predictability of the main result of the impact on the civilian population is so high that it is a virtual or absolute certainty, then this predominant effect of the attack on the civilian population and/or civilian objects can be said to fall within the concept of indirect intent [to direct an attack against civilians and/or civilian objects], for the simple reason that it is no longer "collateral/incidental" and, in addition, it is expected with certainty and appreciated by the attacking force».*<sup>256</sup>

Indeed, the damage to civilians and civilian objects in all six attacks analysed is significant, while damage to military objectives is generally not evident. Taking into account all the characteristics of guided aerial bombs as indiscriminate weapons, the circumstances of their use (time and place) and the consequences, it can be concluded that the RF Armed Forces probably intended to attack civilian objects.

The Russian Armed Forces were fully aware of the densely populated nature of the areas they were targeting, as well as the possible presence of a significant number of civilians, including children, during the daytime attacks. Therefore, the Russian military confidently expected that the attacks would have an overwhelming impact on civilians and/or civilian objects.

In addition, the Russian military is well aware of the wide margin of error of its guided aerial bombs and their ineffectiveness in Ukraine, particularly in Kherson and Kharkiv. Fighterbomber, one of the most famous Russian Telegram channels writing about aviation and aerial bombardment, has repeatedly acknowledged the inaccuracy of guided aerial bombs in its posts.<sup>[4]</sup> In particular, it was noted <sup>257</sup>:

*«The age of the UMPK with a cheap satellite guidance system is coming to an end. Electronic warfare is winning. Accuracy is falling. Perhaps, for some time, the accuracy can be compensated by the power and number of bombs in a salvo, by scaring the electronic warfare, but this is a road to nowhere («into the eye»).*<sup>258</sup>

The vulnerability of Russian guided aerial bombs to electronic warfare and the significant coverage of Ukrainian territories by electronic warfare was also emphasised:

*«And unlike the positions in Ukraine, the positions in the Kursk region are poorly covered by electronic warfare, mainly from FPV drones. That is, UP-CMs can hit them much more accurately».*<sup>259</sup>

It is clear that even before the strikes on Kharkiv and Kherson began, the pilots and their higher command were well aware of the significant inaccuracy of guided bombs based on numerous uses.

It is also important to highlight the consequences of using inaccurate bombs. For example, in the case of *Prosecutor v. Martić*, the International Criminal Tribunal for the former Yugoslavia noted that the consequences of the attack on Zagreb on 2 May 1995 using M-87 Orkan were well known to all those involved. The Tribunal also emphasised the continued importance of media evidence in proving intent:

*«Moreover, before the decision was taken on 3 May 1995 to use these weapons again in Zagreb, the full consequences of the use of such indiscriminate weapons were known beyond doubt through the extensive media coverage of the aftermath of the attack on Zagreb on 2 May 1995».*<sup>260</sup>

Therefore, the media coverage helps to establish that the suspects were aware of the consequences of the use of weapons in a particular environment, as well as the intent of specific individuals.

Finally, the circle of those responsible will include not only those who directly carried out<sup>261</sup> or ordered<sup>262</sup> the attacks on Kharkiv and Kherson. Both the Rome Statute<sup>263</sup> and the Criminal Code of Ukraine<sup>264</sup> establish that accomplices to a crime are also responsible – persons who facilitate the commission of a crime by aiding, abetting or otherwise, including by providing the means for the commission or attempted commission of a crime.<sup>265</sup> In general, international criminal law requires that the facilitation be «direct and substantial», meaning that the facilitation must facilitate the commission of the crime «in some significant way».<sup>266</sup>

Su-34 aircrafts that drop guided aerial bombs cannot effectively carry out combat missions without being escorted by Su-35 aircraft that cover them during the launch of guided aerial bombs. Su-35s are equipped with anti-radar weapons and air-to-air missiles, which allows them to neutralise threats from Ukrainian aviation and air defence. In this case, those responsible for providing such cover directly and significantly facilitate the war crime of directing attacks against civilian objects and/or civilians by Su-34 pilots and commanders.

Thus, by using guided aerial bombs in Ukraine, the Russian armed forces have repeatedly violated international humanitarian law. The low accuracy of the weapons, their use in densely populated areas during daylight hours, and the absence of visible military targets at the impact sites indicate indiscriminate attacks and the deliberate targeting of civilians. Such actions may qualify as war crimes.

# **Conclusions and prospects for the investigation**

This investigation provides detailed information on the number of Russian Su-34 aircrafts involved in hostilities against Ukraine, their bases and units responsible for bombing of the Ukrainian settlements. The data obtained will help identify specific pilots and commanders who carried out or gave orders for guided bomb attacks on civilian infrastructure. The study also confirms that Russia's use of guided aerial bombs in the war against Ukraine is a systemic war crime that has led to large-scale destruction of civilian infrastructure and numerous civilian casualties. The documented attacks, particularly in Kharkiv and Kherson, demonstrate a disregard for international humanitarian law, including the principles of distinction and proportionality. The evidence collected points to targeted attacks on civilian objects that have no military significance, indicating Russia's deliberate actions aimed at intimidation and terror.

The deliberate use of tactics of terrorising civilians is evidenced by the indiscriminate, large-scale and systematic nature of attacks on densely populated areas of Ukrainian cities and villages. Between March and October 2024 alone, the Russian army carried out 951 attacks on Ukrainian settlements with unguided aerial bombs, including 64 attacks on cities with thousands of inhabitants and dense civilian areas, such as Kharkiv, Kherson, Zaporizhzhia, and Sumy. According to international humanitarian law, such actions with the use of inaccurate weapons and their high intensity indicate a clear intention to sow fear and panic among the civilian population, undermine the morale of Ukrainians and create an atmosphere of constant threat, which together defines terror.

The study showed that up to 70 Su-34 fighter jets based at seven airfields, capable of conducting combat missions with high frequency and interchangeability, were involved in these attacks. The addition of a planning and correction module to the bomb itself has not only improved the accuracy of the strikes, but also made it possible to carry them out remotely, outside Ukrainian airspace, with minimal risk of being hit by air defence systems. With the ability to hit targets at a distance of up to 80 km, these modified munitions began to reach large cities that, before the active use of UPCMs, had remained outside the area of damage by aircraft bombs. The relative cheapness, ease of modification of projectiles into guided munitions, and the huge stockpiles of already produced aerial bombs allow the Russian army to use guided aerial bombs for strikes against Ukraine for a long time. The methods of warfare described in this report suggest that the number of indiscriminate attacks and civilian casualties will increase proportionately.

Despite the successful attacks by Ukrainian drones on Russian military airfields, which resulted in the destruction of ammunition and damage to aircrafts, the

intensity of strikes on Ukraine has not decreased. This suggests that these attacks did not have a significant impact on Russia's strategic decision to use aviation as a means of terror.

The study contains a list of identified military aircraft, evidence of their affiliation with specific aviation units, and information on their presence at the airports on the days of the attacks or on dates close to them. This information can be used in further investigations to identify those responsible for the attacks, from pilots of bomb carriers and support aircraft who may be involved in the crime of aiding and abetting to commanders of units subject to the principle of command responsibility. The pattern of attacks with guided aerial bombs – their intensity, indiscriminate nature, duration and wide coverage of these incidents in the media and at the level of official statements by top state officials – indicates the methodical implementation of this tactic as part of a military operation approved at the highest level of command. Therefore, it is impossible to imagine that such decisions were not approved at the level of the General Command of the Russian Aerospace Forces.

The Truth Hounds team is convinced that this material will form the basis for further investigations into war crimes related to the use of guided aerial bombs and Su-34 aircraft against Ukraine's civilian infrastructure. The study contains important information for law enforcement agencies, international actors and civil society organisations, contributing to a deeper study of specific cases of the use of guided aerial bombs by Russian Aerospace Forces aircraft against Ukraine that have signs of war crimes.

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# List of references

- [1] *Documentation Methodology*, (2014). Truth Hounds, URL: <https://truth-hounds.org/document/methodology/> (Accessed 31.08.2024).
- [2] *Documenters' Code of Ethics*, (2014). Truth Hounds, URL: <https://truth-hounds.org/document/code/> (Accessed 31.08.2024).
- [3] Butowski P., *Inside Russia's Failure To Control Ukrainian Airspace*, (2022). Aviation Week. URL: <https://aviationweek.com/defense-space/inside-russias-failure-control-ukrainian-airspace> (Accessed 31.08.2024); Riabiykh V., *Day 24th of Ukraine's Resistance: russia Failed to Control Ukrainian Airspace, Lost 3 Helicopters, Aircraft, 4 UAV's*, (2022); Defence Express. URL: [https://en.defence-ua.com/weapon\\_and\\_tech/day\\_24th\\_of\\_ukraines\\_resistance\\_russia\\_failed\\_to\\_control\\_ukrainian\\_airspace3\\_helicopters\\_aircraft\\_4\\_uavs-2329.html](https://en.defence-ua.com/weapon_and_tech/day_24th_of_ukraines_resistance_russia_failed_to_control_ukrainian_airspace3_helicopters_aircraft_4_uavs-2329.html) (Accessed 31.08.2024).
- [4] Su-35S. *Extremely dangerous*, (2024). Zvezda, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.htm/2024891521-dae8x.html> (Accessed 31.08.2024); Su-34. *Work in the area of the SVO*, (2024). Zvezda, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.htm/20248161233-ZZ6TR.html> (Accessed 31.08.2024); monitor / Su-34 leaves Crimea [@war\_monitor], (26.06.2024), Telegram, URL: [https://t.me/war\\_monitor/18249](https://t.me/war_monitor/18249) (Accessed 31.08.2024); monitor / Activity of tactical aviation in the South [@war\_monitor], (19.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16561](https://t.me/war_monitor/16561) (Accessed 31.08.2024); monitor / Activity of tactical aviation in the North-East [@war\_monitor], (31.03.2024), Telegram, URL: [https://t.me/war\\_monitor/15982](https://t.me/war_monitor/15982) (Accessed 31.08.2024); monitor / Report on the activities of enemy aviation and fleet for 28.12 - 30.12.23 according to monitor. [@war\_monitor], (30.12.2023), Telegram, URL: [https://t.me/war\\_monitor/13428](https://t.me/war_monitor/13428) (Accessed 31.08.2024); Kozatskyi S., *Russian Su-34 bomber: danger for Ukraine*, (2024). Military, URL: <https://mil.in.ua/uk/articles/rosijskiy-bombarduvalnyk-su-34-nebezpeka-dlya-ukraviny/> (Accessed 03.09.2024).
- [5] Volodymyr B., *X-59 'Ovod': a missile that is afraid of rain*, (2024). Military, URL: <https://mil.in.ua/uk/articles/zh-59-ovod-raketa-yakaboivstya-doshhu/> (Accessed 31.08.2024).
- [6] Badiuk O., *New threat to the frontline - modernised KABs of the Russian Federation: how to counteract*, (2024). Radio Liberty, URL: <https://www.radiosvoboda.org/a/novyny-pryzovoya-modernizovani-kabiny-nova-zahrzoza-dlya-fonu-yak-protydyiay/32860352.html> (Accessed 31.08.2024); Solonko O., *A view from the trench on Russian air bombs*, (2023). Military, URL: <https://mil.in.ua/uk/blogs/poglyad-z-okopu-na-rosijski-aviabombiy/> (Accessed 31.08.2024).
- [7] Zvizdets Mangustu / Review category 'different' [@zvizdecmanhustu], (16.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustu/1709> (Accessed 31.08.2024).
- [8] Aviahub / Su-35S of the Russian Aerospace Forces drives away NATO P-8 Poseidon reconnaissance aircraft [@Aviahub34], (28.06.2024), Telegram, URL: <https://t.me/Aviahub34/3245> (Accessed 31.08.2024); Guy Plopsy / A still image from a newly released Russian MoD video showing a Su-35S multirole fighter (B/N '51' Red) taxiing at Voronezh Baltimore air base [@GuyPlopsy], (16.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/180224518569201079> (Accessed 31.08.2024); Guy Plopsy / A photo posted on the Fighterbomber VK page today showing a Su-35S equipped [@GuyPlopsy], (07.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1799091570622570711> (Accessed 31.08.2024); Guy Plopsy / Worth adding that the loadout seen here is typical for such sorties [@GuyPlopsy], (18.05.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1791780314089693265> (Accessed 31.08.2024).
- [9] monitoring / Su-34 (from Akhtubinsk) in Voronezh region heading for Stary Oskil [@monitorwarr], (02.07.2024), Telegram, URL: <https://t.me/monitorwarr/2211> (Accessed 31.08.2024); monitoring / Report on hostile activity for the day 01.07.24 [@monitorwarr], (01.07.2024), Telegram, URL: <https://t.me/monitorwarr/22106> (Accessed 31.08.2024); monitoring / Report on hostile activity for the day 27.06.24 [@monitorwarr], (27.06.2024), Telegram, URL: <https://t.me/monitorwarr/22005> (Accessed 31.08.2024); monitoring / On the night of 27.06.2024, the enemy used [@monitorwarr], (27.06.2024), Telegram, URL: <https://t.me/monitorwarr/21993> (Accessed 31.08.2024).
- [10] monitor / Activity of tactical aviation in the South [@war\_monitor], (24.06.2024), Telegram, URL: [https://t.me/war\\_monitor/18217](https://t.me/war_monitor/18217) (Accessed 31.08.2024); monitor / Activity of tactical aviation along the front line in the South [@war\_monitor], (21.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16646](https://t.me/war_monitor/16646) (Accessed 31.08.2024); monitor / Activity of tactical aviation in the North-East [@war\_monitor], (13.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16416](https://t.me/war_monitor/16416) (Accessed 31.08.2024).
- [11] KAB-500Kr. Rosobronexport, URL: <http://roe.ru/catalog/vozdushno-kosmicheskie-sily/aviatsionnye-bomby/kab-500kr/> (Accessed 31.08.2024).
- [12] monitor / PMC 'Vostok': X-69 guided missile destroyed within Sineyny-kivskiy district, Dnipro region [@war\_monitor], (24.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16720](https://t.me/war_monitor/16720) (Accessed 31.08.2024); Colonel GS / Evacuation for destruction of the warhead of the X-69 cruise missile suppressed by the means of EW by the SES unit [@war\_home], (06.05.2024), Telegram, URL: [https://t.me/war\\_home/1247](https://t.me/war_home/1247) (Accessed 31.08.2024).
- [13] Su-30SM2. *Work in the area of the SVO*, (2024). Zvezda, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.htm/2024721633-LY3Z3.html> (Accessed 31.08.2024).
- [14] Military Database, URL: <https://scramble.nl/database/military/> (Accessed 31.08.2024); *Strengthening of Russian Su-34 air regiments with third squadrons: the threat from the air is growing*, URL: [https://defence-ua.com/army\\_and\\_war/posilennia-rosijskih-aviapolkv-su-34-tretimi-eskadrijami-zagroza-z-povtira-zrostaie-5631.html](https://defence-ua.com/army_and_war/posilennia-rosijskih-aviapolkv-su-34-tretimi-eskadrijami-zagroza-z-povtira-zrostaie-5631.html) (Accessed 31.08.2024).
- [15] Zvizdets Mangustu / To the beginning of the large-scale invasion of Russia in Ukraine [@zvizdecmanhustu], (26.12.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/1520> (Accessed 31.08.2024).
- [16] Dossier of the Spy / Regarding the crash of the Su-34 [@dosye\_spliona], (12.06.2024), Telegram, URL: [https://t.me/dosye\\_spliona/546](https://t.me/dosye_spliona/546) (Accessed 31.08.2024); JR2 / Su-34 [@JanR210], (02.03.2024), X (Twitter), URL: <https://x.com/JanR210/status/1763853366101254460> (Accessed 31.08.2024).
- [17] Guy Plopsy / 1/ The Russian MoD published new footage from Khmeimim AB in Syria. [@GuyPlopsy], (07.07.2023), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1677067261092450304> (Accessed 31.08.2024).
- [18] Guy Plopsy / 1/ The Russian MoD published new footage from Khmeimim AB in Syria. [@GuyPlopsy], (07.07.2023), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1677067261092450304> (Accessed 31.08.2024).
- [19] SAM/SU-34 [@SAMSyria0], (30.11.2023), X (Twitter), URL: <https://x.com/SAMSyria0/status/1729996125409546602> (Accessed 31.08.2024).
- [20] US AFCENT / On July 23, Russian military aircraft deployed flares, damaging a U.S. MQ-9 while conducting a defeat-ISIS mission [@USAFCENT], (25.07.2023), X (Twitter), URL: <https://x.com/USAFCENT/status/1683810712131483648> (Accessed 31.08.2024).
- [21] *The Russian VKS and the Syrian Air Force practised air strikes in the desert of SAR*, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024671014-b8OpO.html> (Accessed 31.08.2024).
- [22] Guy Plopsy / It's been a while since the Russian MoD last released footage of Khmeimim AB in Syria [@GuyPlopsy], (07.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1798985029596614881> (Accessed 31.08.2024).
- [23] Syngavivska S., *russia Boosts Su-34 Fleet Despite Production Questions*, (2024). Defence Express, URL: [https://en.defence-ua.com/industries/russia\\_boosts-su-34\\_fleet\\_despite\\_production\\_questions-10085.html](https://en.defence-ua.com/industries/russia_boosts-su-34_fleet_despite_production_questions-10085.html) (Accessed 31.08.2024); Guy Plopsy / 1/ UAC delivered a batch of new-production Su-34 NVO strike fighters to the Russian MoD (specifically, to the VKS) [@GuyPlopsy], (17.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1802596372824420674> (Accessed 31.08.2024); Guy Plopsy / 1/ UAC delivered a batch of new-production Su-34 NVO strike fighters to the Russian MoD (specifically, to the VKS) [@GuyPlopsy], (02.09.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1830474475919581406> (Accessed 02.09.2024).
- [24] a2 (01.03.2022), Postimage, URL: <https://postimg.cc/yWx6mmYB> (Accessed 31.08.2024); *Su-34 bomber crashes into residential building in Yeysk: death toll rises to 15*, (2022). BBC NEWS. Russian service. URL: <https://www.bbc.com/russian/news-63255779> (Accessed 31.08.2024); *T011-3x-su34-destr-22-12-23* (22.12.2023), Postimage, URL: <https://postimg.cc/3yW3FzXk> (Accessed 31.08.2024); Evergreen Intel/RF-95890 would also be called '51 RED' [@vcdgf555], (18.07.2024),

- X (Twitter), URL: <https://x.com/vcdgf555/status/1549018272447602689> (Accessed 31.08.2024); Necro Mancer / SU-34 squadron commander Senior Lieutenant Vladimir Nikolaevich Fetisov, born in 1995 in Zheleznogorsk, 'flew off' somewhere in Ukraine [ @666\_mancer ], (28.05.2022), X (Twitter), URL: [https://x.com/666\\_mancer/status/1530558007439933440](https://x.com/666_mancer/status/1530558007439933440) (Accessed 31.08.2024); Fedorov M., *Widow of the fallen pilot Fetisov: 'He was a real person'*, (2022). Argumenty Nedeli, URL: <https://argumenty.ru/society/2022/12/804281> (Accessed 31.08.2024).
- 125) a1 (03.03.2022), Postimage, URL: <https://postimg.cc/K31Zm2s4> (Accessed 31.08.2024); Sukhoi Su-34, (2022), Aviation Safety Network, URL: <https://aviation-safety.net/wikibase/276094> (Accessed 31.08.2024); b8 (05.03.2022), Postimage, URL: <https://postimg.cc/s14W5cxy> (Accessed 31.08.2024); Necro Mancer / The #Gat-tarov's Su-34 'RF-81864' aircraft itself [ @666\_mancer ], (26.06.2022), X (Twitter), URL: [https://x.com/666\\_mancer/status/1541155270419795968?lang=uk](https://x.com/666_mancer/status/1541155270419795968?lang=uk) (Accessed 31.08.2024); Video Military Portal, (2022). *Negotiations of Russian pilots*. YouTube, URL: <https://www.youtube.com/watch?v=JC0tMmYnVE> (Accessed 31.08.2024); Ukraine Weapons Tracker / #Ukraine: The previously unseen wreckage of a Russian Su-34 fighter-bomber (RF-81852, 09 Red) [ @UAWeapons ], (02.10.2022), X (Twitter), URL: <https://x.com/UAWeapons/status/1576565672838303745> (Accessed 31.08.2024).
- 126) 5gh (06.03.2022), Postimage, URL: <https://postimg.cc/lq65tpBK> (Accessed 31.08.2024); Necro Mancer / Izyum district, Kharkiv region, 21/04/22 [ @666\_mancer ], (24.03.2023), X (Twitter), URL: [https://x.com/666\\_mancer/status/1639153198677073923](https://x.com/666_mancer/status/1639153198677073923) (Accessed 31.08.2024); Ukraine Weapons Tracker / #Ukraine: A Su-34 fighter-bomber (20 'Red/RF-95004) [ @UAWeapons ], (11.09.2022), X (Twitter), URL: <https://x.com/UAWeapons/status/1568710616868704258> (Accessed 31.08.2024); Russians and OSINT researchers confirm loss of two Su-34s to Russian VKS, (2022). Military, URL: <https://mil.in.ua/uk/news/rosiyan-y-ta-osint-doslidnyky-pidverdly-vtratu-dvoh-su-34-pks-rf/> (Accessed 31.08.2024); MVA78UA, (2024). *Su-34 Kashtanov – Koptlyov 2022-09-24 RF-95005 (22 RED) Su-34*. YouTube, URL: <https://www.youtube.com/watch?v=xWXPjorJSSA> (Accessed 31.08.2024); Wreckage of a Russian Su-34 found near Bala-kliya, (2022). Military, URL: <https://mil.in.ua/uk/news/u-raioni-balakliyi-znajshly-ulamky-rosijskogo-su-34/> (Accessed 31.08.2024); Ukraine Weapons Tracker / One of the worst days ever for the Russian Air Force [ @UAWeapons ], (13.05.2023), X (Twitter), URL: <https://x.com/UAWeapons/status/1657368124788809728> (Accessed 31.08.2024); Duke BG / Known b/n's for 47 bad end on 31 [ @duke\_gar-land\_2 ], (17.05.2024), X (Twitter), URL: [https://x.com/duke\\_gar-land\\_2/status/1791505612129419430](https://x.com/duke_gar-land_2/status/1791505612129419430) (Accessed 31.08.2024); 31f6 (20.09.2023), Postimage, URL: <https://postimg.cc/3WPtRFk> (Accessed 31.08.2024); 1047 su34 destr 06 05 24(06.05.2024), Postimage, URL: <https://postimg.cc/VRfzbaYQ> (Accessed 31.08.2024); Fighterbomber / SU-34 crashed in Voronezh region [ @fighter\_bomber ], (20.09.2023), Telegram, URL: [https://t.me/fighter\\_bomber/14059](https://t.me/fighter_bomber/14059) (Accessed 31.08.2024); SU-34 plane crashed in Voronezh region, (2023). NEWS.RU, URL: <https://news.ru/amp/vlast/samolet-su-34-poterpel-krushenie-v-voronezhskoj-oblasti/> (Accessed 31.08.2024).
- 127) 790 (16.03.2022), Postimage, URL: <https://postimg.cc/2qvdc25N> (Accessed 31.08.2024); Ukraine Weapons Tracker / #Ukraine: Another Su-34 strike aircraft was shot down approx. 4-5 days ago in #Zaporizhzhia Oblast [ @UAWeapons ], (26.04.2022), X (Twitter), URL: <https://x.com/UAWeapons/status/1519020714937962497> (Accessed 31.08.2024); 1071-3x-su34-destr-22-12-23 (22.12.2023), Postimage, URL: <https://postimg.cc/3yW3FzKX> (Accessed 31 August 2024); 1096 su34 destr 11 06 24 (11 June 2024), Postimage, URL: <https://postimg.cc/9RmfJKY> (Accessed 31.08.2024).
- 128) Belgorod Informant / More photos of the plane [ @belgorod\_informant ], (23.02.2023), Telegram, URL: [https://t.me/belgorod\\_informant/3222](https://t.me/belgorod_informant/3222) (Accessed 31.08.2024).
- 129) Belarusian Hajun project / Russian Su-34 fighter crashed near Luninets, in the area of Kazhan-Haradok (Brest region, Belarus) [ @Hajun\_BY ], (20.04.2022), X (Twitter), URL: [https://x.com/Hajun\\_BY/status/1516815396552200200](https://x.com/Hajun_BY/status/1516815396552200200) (Accessed 31.08.2024); Military Informant / Wreckage of a Su-34 fighter-bomber of the Russian Aerospace Forces [ @milinfolive ], (12.09.2022), Telegram, URL: <https://t.me/milinfolive/90349> (Accessed 31.08.2024); Ukraine Weapons Tracker / #Ukraine: Ukrainian forces discovered the wreckage of a previously unseen Russian Su-34 strike aircraft [ @UAWeapons ], (04.12.2022), X (Twitter), URL: <https://x.com/UAWeapons/status/15991666796909510657> (Accessed 31.08.2024); Ukraine Weapons Tracker / #Ukraine: The remains of another Russian aircraft: this time a Su-34 fighter-bomber, presumably in #Kharkiv Oblast [ @UAWeapons ], (08.02.2023), X (Twitter), URL: <https://x.com/UAWeapons/status/1623377921065816111> (Accessed 31.08.2024); Status-6 (Military & Conflict News) / Photos from the crash site of a Russian Sukhoi Su-34 fighter-bomber [ @Archer83Able ], (03.03.2023), X (Twitter), URL: <https://x.com/Archer83Able/status/1631982339624321024> (Accessed 31.08.2024); 1059 Su-34 strike aircraft destr 06 10 22 (06.10.2022), Postimage, URL: <https://postimg.cc/SM2nQvxy> (Accessed 31.08.2024); 1006 su34 destr 27 07 24 (27.07.2024), Postimage, URL: <https://postimg.cc/awDpm03j> (Accessed 31 August 2024); 1037 su34 destr 02 08 24 (02 August 2024), Postimage, URL: <https://postimg.cc/BXhMRNqC> (Accessed 31 August 2024); 1026 su-34 destr 22 08 24 (22 August 2024), Postimage, URL: <https://postimg.cc/18zStW38> (Accessed 31.08.2024); 1071-3x-su34-destr-22-12-23(22.12.2023), Postimage, URL: <https://postimg.cc/3yW3FzKX> (accessed 31.08.2024); Russians and OSINT researchers confirmed the loss of two Su-34s to the Russian VKS, (2022). Military, URL: <https://mil.in.ua/uk/news/rosiyan-y-ta-osint-doslidnyky-pidverdly-vtratu-dvoh-su-34-pks-rf/> (Accessed 31.08.2024).
- 130) *How many combat aircraft does the Russian Federation have and what are the prospects for Russian military aviation*, (2021). Defense Express, URL: [https://defence-express.com/army\\_and\\_war/skiki\\_bojovih\\_litakiv\\_maie\\_rf\\_ta\\_jakimi\\_je\\_perspektivi\\_rosijskoji\\_viiskovoji-aviatsiji-5654.html](https://defence-express.com/army_and_war/skiki_bojovih_litakiv_maie_rf_ta_jakimi_je_perspektivi_rosijskoji_viiskovoji-aviatsiji-5654.html) (Accessed 31.08.2024).
- 131) Status-6 / Sukhoi family: Su-30SM, Su-35S and Su-34. ARMY-2020 expo. Patriot Park, Kubinka, Moscow Oblast. August 2020 [ @Archer83Able ], (19.02.2021), X (Twitter), URL: <https://web.archive.org/web/20230822135231/https://twitter.com/Archer83Able/status/1362561683806429189> (Accessed 31.08.2024).
- 132) Man's territory / Why does the Su-33 need small wings on the front?!, (06.07.2018), Zen, URL: <https://web.archive.org/web/20230822135746/https://dzen.ru/a/Wz9w5tFuACp7Bo> (Accessed 31.08.2024).
- 133) Su-34 'Utenok', (2018). YAPLAKAL, URL: <https://www.yaplakal.com/forum2/topic1735350.html> (Accessed 31.08.2024); uacrossia / Air camouflage: aircraft painting – when ensuring stealth takes on a symbolic meaning [ @uacrossia ], (16.06.2016), LiveJournal, URL: <https://uacrossia.livejournal.com/46032.html> (Accessed 31.08.2024).
- 134) *Modernisation of the Su-34 bomber in the 'NVO' and 'M' versions*, (2021). AviaSiyasi i ventilatsiya, URL: <https://aviavem1476.ru/%D0%BC%D0%BE%D0%B4%D0%B5%D1%80%D0%BD%D0%B8%D0%B7%D0%B0%D1%86%D0%B8%D1%8F-%D0%B7%D0%BE%D0%BC%D0%B1%D0%B0%D1%80%D0%B4%D0%B8%D1%80%D0%BE%D0%B2%D1%89%D0%B8%D0%BA%D0%B0-%D1%81%D1%83-%D0%B2-%D0%B2%D0%B5/> (Accessed: 31.08.2024).
- 135) Nazarov R., *Duck's Beak' for a bomber: an amazing feature of the Su-34*, (2024). Techinsider, URL: <https://www.techinsider.ru/weapon/1592657-zachem-su-34-nujen-uti-ny-klyuv-udivitel'naya-osobennost-rossijskogo-bombardirovshchika/> (Accessed 31.08.2024); *Frontline bomber Su-34*, (2016). AviaSiyasi Ros-sii, URL: <https://aviation21.ru/su-34/> (Accessed 31.08.2024).
- 136) *Russia – Air Force Sukhoi Su-34 Fullback RF-95847 Photo*, (2019). AIRFIGHTERS, URL: <https://airfighters.com/photo/271325/M/Russia-Air-Force/Sukhoi-Su-34-Fullback/RF-95847/> (Accessed 31.08.2024).
- 137) BMDP / Russian Air Force introduces permanent registration numbers for military aircraft? [ @bmdp ], (26.05.2011), LiveJournal, URL: <https://bmdp.livejournal.com/4448.html> (Accessed 31.08.2024); BMDP / Deliveries of combat aircraft to the Russian Armed Forces in 2022 [ @bmdp ], (11.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4642641.html> (Accessed 31.08.2024).
- 138) BMDP / Russian Air Force to introduce permanent registration numbers for military aircraft? [ @bmdp ], (26.05.2011), LiveJournal, URL: <https://bmdp.livejournal.com/4448.html> (Accessed 31.08.2024); BMDP / Deliveries of combat aircraft to the Russian Armed Forces in 2022 [ @bmdp ], (11.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4642641.html> (Accessed 31.08.2024).
- 139) BMDP / Russian Air Force to introduce permanent registration numbers for military aircraft? [ @bmdp ], (26.05.2011), LiveJournal, URL: <https://bmdp.livejournal.com/4448.html> (Accessed 31.08.2024); BMDP / Deliveries of combat aircraft to the Russian Armed Forces in 2022 [ @bmdp ], (11.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4642641.html> (Accessed 31.08.2024).
- 140) Military Database, URL: <https://scramble.nl/database/military/> (Accessed 31.08.2024).
- 141) BMDP / Russian VKS received three more Su-34M frontline bombers [ @bmdp ], (01.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4637843.html> (Accessed 31.08.2024).
- 142) BMDP / Russian VKS received three more Su-34M frontline bombers [ @bmdp ], (01.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4637843.html> (Accessed 31.08.2024).
- 143) BMDP / Russian VKS received three more Su-34M frontline bombers [ @bmdp ], (01.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4637843.html> (Accessed 31.08.2024).
- 144) BMDP / Russian VKS received three more Su-34M frontline bombers [ @bmdp ], (01.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4637843.html> (Accessed 31.08.2024).
- 145) BMDP / Russian VKS received three more Su-34M frontline bombers [ @bmdp ], (01.01.2023), LiveJournal, URL: <https://bmdp.livejournal.com/4637843.html> (Accessed 31.08.2024).

- [646] Massimo Frantarelli / JSC Novosibirsk Aircraft Production Association Plant Named after V.P. Chkalov. [@MrFrantarelli], (06.10.2023), X (Twitter), URL: <https://x.com/MrFrantarelli/status/1710175196701769856> (Accessed 31.08.2024).
- [647] Massimo Frantarelli / Sukhoi Su-34 fighter-bomber [@MrFrantarelli], (08.11.2023), X (Twitter), URL: <https://x.com/MrFrantarelli/status/172242588391137416> (Accessed 31.08.2024).
- [648] Fighterbomber / Meanwhile, the celebration is gaining momentum [fighter\_bomber], (12.08.2024), Telegram, URL: [https://t.me/fighter\\_bomber/17714](https://t.me/fighter_bomber/17714) (Accessed 31.08.2024).
- [649] Kirill Fedorov/War History Weapons / A novelty in the VKS arsenal – a high-explosive incendiary air bomb with UPCM [warhistoryalco-nafter/180074] (Accessed 31.08.2024).
- [650] Su-34. *Work in the area of SVO*, (2024). Zvezda, time: 35:16, URL: <https://tvzvezda.ru/video/programs/201412231323-1tpe.htm/20248161233-Z26Tr.html> (Accessed 31.08.2024).
- [651] BMPD / Russian VKS received the first Su-34M frontline bombers in 2022 [bmpd], (04.07.2022), LiveJournal, URL: <https://bmpd.livejournal.com/4550723.html> (Accessed 31.08.2024).
- [652] *Russia received at least 18 new combat aircraft in 2023, not counting Su-57*, (2024). Defence Express, URL: [https://defence-ua.com/army\\_and\\_war/rf\\_v\\_2023\\_rotsi\\_otrimala\\_minimum\\_18\\_novih\\_bo-iovih\\_litakiv\\_ne\\_rahujuchi\\_su\\_57-14405.html](https://defence-ua.com/army_and_war/rf_v_2023_rotsi_otrimala_minimum_18_novih_bo-iovih_litakiv_ne_rahujuchi_su_57-14405.html) (Accessed 31.08.2024).
- [653] Guy Plopsy / 1/ UAC delivered a batch of new-production Su-34 NVO strike fighters to the Russian MoD (specifically, to the VKS) [GuyPlopsy], (17.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1802596372824420674> (Accessed 31.08.2024); Guy Plopsy / 1/ UAC delivered a batch of new-production Su-34 NVO strike fighters to the Russian MoD (specifically, to the VKS) [GuyPlopsy], (02.09.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1830474475919581406> (Accessed 02.09.2024).
- [654] *Register of Su-34*, (2024) Aeronews, URL: <https://aer-news.alle.bg/pycn/peect-cy-34/> (Accessed 02.09.2024).
- [655] Kirill Fedorov/War History Weapons / A novelty in the VKS arsenal – a high-explosive incendiary air bomb with UPCM [warhistoryalco-nafter/180074] (Accessed 31.08.2024).
- [656] Kirill Fedorov / War History Weapons / A novelty in the VKS arsenal – a high-explosive incendiary air bomb with UPCM [warhistoryalco-nafter/180074] (Accessed 31.08.2024).
- [657] Gorbatenko S., *HIMARS without ATACMS (for now): where the US actually allowed to hit Russia with its weapons*, (2024). Radio Svoboda, URL: <https://www.radiosvoboda.org/a/zbroia-america-udary-rf-himars-atacms/33014089.html> (Accessed 31.08.2024).
- [658] *Russia. Hours Later, HIMARS Opened Fire*, (01.06.2024). Forbes, URL: <https://www.forbes.com/sites/davidaxe/2024/06/01/on-friday-ukraine-got-permission-to-launch-american-rockets-at-targets-inside-russia-hours-later-ukraines-himars-opened-fire/?sh=341e752c1104> (Accessed 31.08.2024).
- [659] *Russians Don't Wait for Western Approval: Valuable Military Assets Shifted Deeper into Russia*, (25.07.2024). Frontelligence Insight, URL: [https://frontelligence.substack.com/p/russians-dont-wait-for-western-approval?utm\\_source=substack&publication\\_id=1565454&post\\_id=146980654&utm\\_medium=email&utm\\_content=share&utm\\_campaign=email-share&triggerShare=true&isFreemail=false&r=7jcu&triedRedirect=true](https://frontelligence.substack.com/p/russians-dont-wait-for-western-approval?utm_source=substack&publication_id=1565454&post_id=146980654&utm_medium=email&utm_content=share&utm_campaign=email-share&triggerShare=true&isFreemail=false&r=7jcu&triedRedirect=true) (Accessed 31.08.2024); *Axe D., On Friday, Ukraine Had A Chance To Blow Up Russia's Best Warplanes On The Tarmac. The White House Said No-And Now It's Too Late*, (05.08.2024). Forbes, URL: <https://www.forbes.com/sites/davidaxe/2024/08/05/ukraine-had-a-chance-to-blow-up-russias-best-warplanes-on-the-tarmac-the-white-house-said-no-and-now-its-too-late/> (Accessed 31.08.2024).
- [660] Fornusek M., *Updated: Ukraine hits 4 Russian airbases in largest such attack, source says*, (14.08.2024). Kyiv Independent, URL: <https://kyiv-independent.com/ukraine-hit-4-russian-airbases/> (Accessed 31.08.2024); *Ukraine targets Russia's Marinovka air base: UK intelligence shows satellite images*, (09.09.2024). Espresso, URL: <https://global.espresso.tv/russia-ukraine-war-british-intelligence-releases-satellite-images-of-damage-from-ukraines-strike-on-marinovka-air-base-volgograd-region> (Accessed 31.08.2024).
- [661] Gorbatenko S., *HIMARS without ATACMS (so far): where the US actually allowed to hit Russia with its weapons*, (2024). Radio Svoboda, URL: <https://www.radiosvoboda.org/a/zbroia-america-udary-rf-himars-atacms/33014089.html> (Accessed 31.08.2024).
- [662] *1066 su34 destr 11 06 24* (11.06.2024), Postimage, URL: <https://postimg.cc/9RmfJKY> (Accessed 31 August 2024); *1066 su34 destr 27 07 24* (27 July 2024), Postimage, URL: <https://postimg.cc/qwDpm03j> (Accessed 31 August 2024); *1037 su34 destr 02 08 24* (02 August 2024), Postimage, URL: <https://postimg.cc/BXhMRNQC> (Accessed 31 August 2024); *1026 su-34 destr 22 08 24* (22 August 2024), Postimage, URL: <https://postimg.cc/18zStW38> (Accessed 31.08.2024).
- [663] Guy Plopsy / 1/ UAC delivered a batch of new-production Su-34 NVO strike fighters to the Russian MoD (specifically, to the VKS) [GuyPlopsy], (02.09.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1830474475919581406> (Accessed 02.09.2024).
- [664] Zvizdets Mangustu / To the beginning of the large-scale invasion of Russia in Ukraine [zvizdecmanhustu], (26.12.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/1520> (Accessed 31.08.2024).
- [665] *Ignat reported how many guided aerial bombs the Russian army uses per day*, (2023). Section, URL: <https://rubryka.com/2023/04/04/ignat-povidomyv-skillyi-kerovanyh-aviatsiynih-bomb-na-dobu-zastosovuye-armiya-rf/> (Accessed 31.08.2024); *Russia develops guidance modules for air-dropped munitions*, (2023). Conflict Armament Research, URL: <https://storymaps.arcgis.com/stories/e4f0a90dd74cd6b1d889704f6b2396> (accessed 31.08.2024); *Cheravaty: Russians use advanced FAB-500 bombs near Bakhmut*, (2023). Ukrinform, URL: <https://www.ukrinform.ua/rubric-ato/3692159-cerevatij-rosiani-vikoristovuu-na-bahmutskomu-naprмку-vdos-konaleni-aviabombi-fab500.html> (Accessed 31.08.2024).
- [666] *Russia develops guidance modules for air-dropped munitions*, (2023). Conflict Armament Research, URL: <https://storymaps.arcgis.com/stories/e4f0a90dd74cd6b1d889704f6b2396> (Accessed 31.08.2024).
- [667] *Russia develops guidance modules for air-dropped munitions*, (2023). Conflict Armament Research, URL: <https://storymaps.arcgis.com/stories/e4f0a90dd74cd6b1d889704f6b2396> (Accessed 31.08.2024).
- [668] Russian Ministry of Defence / Su-34 crews struck at enemy command post and manpower [mod\_russia], (01.04.2024), Telegram, URL: [https://t.me/mod\\_russia/37229](https://t.me/mod_russia/37229) (Accessed 31.08.2024).
- [669] Colonel GS / UPCM (universal planning and correction module) is now being installed on FAB-250 [war\_home], (04.11.2023), Telegram, URL: [https://t.me/war\\_home/317](https://t.me/war_home/317) (Accessed 31.08.2024).
- [670] *How many UPCMs does Russia produce: an estimate of Russian production capacities has appeared*, (2024). Defence Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/skikli\\_UPCM\\_virobljaje\\_rf\\_zjavilas\\_otsinka\\_po\\_tuzhnostei\\_rosijskogo\\_virobnitstva-14714.html](https://defence-ua.com/weapon_and_tech/skikli_UPCM_virobljaje_rf_zjavilas_otsinka_po_tuzhnostei_rosijskogo_virobnitstva-14714.html) (Accessed 31.08.2024).
- [671] *Flesh S., About the UPCM air bombs in exact figures*, (2023). Military, URL: <https://mil.in.ua/uk/blogs/pro-aviabombi-z-UPCM-u-tochny-tsyrfr/> (Accessed 31.08.2024).
- [672] *Kramarenko D., RF throws rare air bombs at Kharkiv. Where did FAB-500T come from and what is its danger*, (2024). RBC-Ukraine, URL: <https://www.rbc.ua/rus/news/rf-kidae-harkiv-ridikisni-aviabombi-zvidki-1719842241.html> (Accessed 31.08.2024).
- [673] *Mash / Updated Russian FABs enter service with the Russian Aerospace Forces* [gmash], (05.09.2024), Telegram, URL: <https://t.me/mash/57336> (Accessed 31.08.2024).
- [674] *Flesh S., About air bombs from UPCM in exact figures*, (2023). Military, URL: <https://mil.in.ua/uk/blogs/pro-aviabombi-z-UPCM-u-tochny-tsyrfr/> (Accessed 31.08.2024).
- [675] *Dzhepira A., Budanov: Russia has increased production of destruction means – KABs and Iskanders, otherwise no changes*, (15.09.2024). Liga.net, URL: <https://news.liga.net/ua/politics/news/budanov-rf-zbil-shyia-vyrobnystva-zasobiv-urazhennia-kabiv-ta-iskanderiv-v-inshomu-bez-zmin/> (Accessed 31.08.2024).
- [676] Colonel GS / UPCM for FAB-250, which did not reach and fell on the territory of the Russian Federation [gwar\_home], (06.11.2023), Telegram, URL: [https://t.me/war\\_home/323](https://t.me/war_home/323) (accessed 31.08.2024); *Guy Plopsy / To date, I have seen photos/videos of UPCM kits used with the following munitions* [GuyPlopsy], (03.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/179768015251972199> (Accessed 31.08.2024).
- [677] *Russian KABs now have more sophisticated electronics, and this speaks volumes*, (2023). Defence Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/v\\_rossijskih\\_kabah\\_teper\\_skladnisha\\_elektronika\\_i\\_tse\\_bagato\\_pro\\_scho\\_zvidchit-13883.html](https://defence-ua.com/weapon_and_tech/v_rossijskih_kabah_teper_skladnisha_elektronika_i_tse_bagato_pro_scho_zvidchit-13883.html) (accessed 31.08.2024); *Colonel GS / RBK-500 with UPCM module after descending from Su-34NVO and 180 flip (to overhead position)* [gwar\_home], (18.03.2024), Telegram, URL: [https://t.me/war\\_home/818](https://t.me/war_home/818) (accessed 31.08.2024); *Guy Plopsy / To date, I have seen photos/videos of UPCM kits used with the following munitions* [GuyPlopsy], (03.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/179768015251972199> (Accessed 31.08.2024).
- [678] *Colonel of the GS / FAB-1500 air bomb with a universal planning and correction module (UPCM) [gwar\_home]*, (12.01.2024), Telegram, URL: [https://t.me/war\\_home/452](https://t.me/war_home/452) (Accessed 31.08.2024); *Rob Lee / Russian FAB-1500M54 and ODAB-1500 with UPCM glide bomb kits [@RA-Lee85]*, (03.06.2024), X (Twitter), URL: <https://x.com/RALee85/status/1797397307232588173> (accessed 31.08.2024); *Guy Plopsy / To date, I have seen photos/videos of UPCM kits used with the following munitions* [GuyPlopsy], (03.06.2024), X (Twitter), URL:

- <https://x.com/GuyPlopsy/status/1797680152517972199> (Accessed 31.08.2024).
- [79] Ministry of Defence of Russia / 'The combat power of this bomb cannot be ignored' [mod\_russia], (14.07.2024), Telegram, URL: [https://t.me/mod\\_russia/41020](https://t.me/mod_russia/41020) (Accessed 31.08.2024).
- [80] Supernova+ / Velyka Pysarevka ... Sumy region ... arrival of ODAB-1500 ... [supernova\_plus], (28.03.2024), Telegram, URL: [https://t.me/supernova\\_plus/29857](https://t.me/supernova_plus/29857) (Accessed 31.08.2024); Grabovska V., *Arranged round-the-clock terror: what dangerous bomb the Russians used in Sumy region*, (2024). Channel 24, URL: [https://24tv.ua/rosiyani-udarili-odab-1500-po-sumskiy-oblasti-chomu-nebezpechnist\\_n524412](https://24tv.ua/rosiyani-udarili-odab-1500-po-sumskiy-oblasti-chomu-nebezpechnist_n524412) (Accessed 31.08.2024); Pohorila I., *Occupants first hit Sumy region with the most powerful bomb (video)*, (2024). UNIAN, URL: <https://www.unian.ua/war/odab-1500-okupanti-zastosuvali-naypotu-zhishu-bombu-po-sumskiy-oblasti-12587049.html> (Accessed 31.08.2024).
- [81] Ministry of Defence of Russia / 'The combat power of this bomb cannot be ignored' [mod\_russia], (14.07.2024), Telegram, URL: [https://t.me/mod\\_russia/41020](https://t.me/mod_russia/41020) (Accessed 31.08.2024); Brady Africk / A new video shows Russian forces dropping a 3000-kilogram glide bomb over Ukraine [bradyafr], (17.07.2024), X (Twitter), URL: <https://x.com/bradyafr/status/1813801892611858609> (Accessed 31.08.2024).
- [82] Ministry of Defence of Russia / 'The combat power of this bomb cannot be ignored' [mod\_russia], (14.07.2024), Telegram, URL: [https://t.me/mod\\_russia/41020](https://t.me/mod_russia/41020) (Accessed 31.08.2024).
- [83] Colonel GS / UPCM for the FAB-250 that did not reach and crashed on the territory of the Russian Federation [war\_home], (06.11.2023), Telegram, URL: [https://t.me/war\\_home/323](https://t.me/war_home/323) (Accessed 31.08.2024).
- [84] Russian KABs now have more sophisticated electronics, and this speaks volumes, (2023). Defence Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/v\\_rossijskih\\_kabah\\_teper\\_skladnisha\\_elektronika\\_i\\_tse\\_bagato\\_pro\\_scho\\_svidchit-13883.html](https://defence-ua.com/weapon_and_tech/v_rossijskih_kabah_teper_skladnisha_elektronika_i_tse_bagato_pro_scho_svidchit-13883.html) (Accessed 31.08.2024).
- [85] Colonel GS / FAB-1500 air bomb with a universal planning and correction module (UPCM) [war\_home], (12.01.2024), Telegram, URL: [https://t.me/war\\_home/452](https://t.me/war_home/452) (Accessed 31.08.2024).
- [86] Ministry of Defence of Russia / 'The combat power of this bomb cannot be ignored' [mod\_russia], (14.07.2024), Telegram, URL: [https://t.me/mod\\_russia/41020](https://t.me/mod_russia/41020) (Accessed 31.08.2024).
- [87] Colonel GS / RBK-500 with the UPCM module after dismounting from the Su-34NVO and turning 180 (to the overhead position) [war\_home], (18.03.2024), Telegram, URL: [https://t.me/war\\_home/818](https://t.me/war_home/818) (Accessed 31.08.2024).
- [88] Colonel GS / RBK-500 with the UPCM module after descending from the Su-34NVO and flipping 180 (to the overhead position) [war\_home], (18.03.2024), Telegram, URL: [https://t.me/war\\_home/818](https://t.me/war_home/818) (Accessed 31.08.2024).
- [89] Colonel GS / The enemy first used a new type of universal planning module for unguided bombs [war\_home], (08.03.2024), Telegram, URL: [https://t.me/war\\_home/734](https://t.me/war_home/734) (Accessed 31.08.2024).
- [90] Tsiomyk G., Hrebiniy D., *UMPB: what is this air bomb and why did the Russians start using it? Explanation of the expert to Defence Express*, (2024). Suspilne Kharkiv, URL: <https://suspilne.media/kharkiv/716242-umpb-so-ce-za-aviabomba-ta-comu-rosiani-pocali-zastosovuvati-il-poasnenna-eksperta-defense-express/> (Accessed 31.08.2024).
- [91] Suspilne Kharkiv, (2024). *Russia struck Kharkiv with an UMPB D-30 bomb: what are the consequences of the hit?* YouTube, URL: <https://www.youtube.com/watch?v=cr8uf-hhOek> (Accessed 31.08.2024); Suspilne Kharkiv, (2024). *Russians used a new munition to strike Kharkiv on 27 March, it could be a D-30 UMPB*. YouTube, URL: <https://www.youtube.com/watch?v=IT44hodv3LA> (Accessed 31.08.2024); Dumka, (2024). *The first strike on Kharkiv by UMPB D30*. YouTube, URL: <https://www.youtube.com/watch?v=S2ouaNRcHBg> (Accessed 31.08.2024).
- [92] Tsiomyk G., Hrebiniy D., *UMPB: what kind of bomb is it and why did the Russians start using it? Explanation of the expert to Defence Express*, (2024). Suspilne Kharkiv, URL: <https://suspilne.media/kharkiv/716242-umpb-so-ce-za-aviabomba-ta-comu-rosiani-pocali-zastosovuvati-il-poasnenna-eksperta-defense-express/> (Accessed 31.08.2024).
- [93] *Cheap and dangerous. What kind of UMPB bombs did Russia use in Kharkiv*, (2024). RBK-Ukraine, URL: <https://www.rbk.ua/ukr/news/des-hevi-ta-nebezpechni-shcho-tse-bombi-umpb-1711737977.html> (Accessed 31.08.2024).
- [94] *Fighterbomber / Khokhly appreciated our novelty on the battlefield [fighter\_bomber]*, (09.03.2024), Telegram, URL: [https://t.me/fighter\\_bomber/15936](https://t.me/fighter_bomber/15936) (Accessed 31.08.2024); Colonel GS / The enemy first used a new type of universal planning module for unguided aerial bombs [war\_home], (08.03.2024), Telegram, URL: [https://t.me/war\\_home/734](https://t.me/war_home/734) (Accessed 31.08.2024).
- [95] *The enemy has begun active use of guided aerial bombs: what is it, what areas are under threat and how to fight*, (2023). Defence Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/v-rog\\_pochav\\_aktivne\\_zastosuvannya\\_kerovanih\\_aviatsijnih\\_bomb\\_scho\\_tse\\_jaki\\_rajoni\\_pid\\_zagrozju\\_ta\\_jak\\_borotjsja-11061.html](https://defence-ua.com/weapon_and_tech/v-rog_pochav_aktivne_zastosuvannya_kerovanih_aviatsijnih_bomb_scho_tse_jaki_rajoni_pid_zagrozju_ta_jak_borotjsja-11061.html) (Accessed 31.08.2024); Colonel GS / Means of destruction from the enemy's missile and bomb weapons complex - Grom-E [war\_home], (26.04.2024), Telegram, URL: [https://t.me/war\\_home/1154](https://t.me/war_home/1154) (Accessed 31.08.2024).
- [96] Yavorskiy R., *What is Grom-1 – a Russian missile that causes the most damage not to the Armed Forces, but to the civilian population*, (2024). Espresso, URL: <https://espresso.tv/povysunemo-shcho-take-grom-1-rosijska-raketa-shcho-naybilishe-shkodi-zavdae-ne-zsu-a-tsvilnomu-naselennyu> (Accessed 31.08.2024).
- [97] *Russia struck Kharkiv for the first time with a Grom-E1 missile bomb – we remind you what kind of weapon it is*, (02.09.2024). Defence Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/rf\\_vpershe\\_vdarila\\_po\\_harkovu\\_raketo\\_bom-boju\\_grom\\_e1\\_nagadujemo\\_scho\\_tse\\_za\\_zbroja-16483.html](https://defence-ua.com/weapon_and_tech/rf_vpershe_vdarila_po_harkovu_raketo_bom-boju_grom_e1_nagadujemo_scho_tse_za_zbroja-16483.html) (Accessed 31.08.2024).
- [98] Colonel GS / Means of destruction from the enemy's missile and bomb weapons complex – Grom-E [war\_home], (26.04.2024), Telegram, URL: [https://t.me/war\\_home/1154](https://t.me/war_home/1154) (Accessed 31.08.2024).
- [99] Tykholzy O., *The Air Force told about the Russians' stockpiles of guided aerial bombs* (01.04.2024). Hronikers, URL: <https://hronikers.com/2024/04/01/u-povitrianykh-sylakh-rozpovaly-pro-zapasy-kerovanykh-aviabomb-u-rosiani/> (Accessed 31.08.2024).
- [100] *Russians have shown a 1500-kilogram guided bomb*, (2024). Military, URL: <https://mil.in.ua/en/news/russians-have-shown-a-1500-kilogram-guided-bomb/> (Accessed 31.08.2024);
- [101] Soniashnyk / Russia quadrupled D-30SN production in six months [soniah\_hub], (10.10.2024), Telegram, URL: [https://t.me/soniah\\_hub/6819](https://t.me/soniah_hub/6819) (Accessed 01.09.2024).
- [102] monitor / Summary of enemy shelling for August 2024 [war\_monitor], (01.09.2024), Telegram, URL: [https://t.me/war\\_monitor/20220](https://t.me/war_monitor/20220) (accessed 01.09.2024); monitor / For the day 03.04 – 04.04.24 as of 12:00 the enemy used to attack the territory of Ukraine [war\_monitor], (04.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16065](https://t.me/war_monitor/16065) (Accessed 01.09.2024); monitor / For the day 05.04 – 06.04.24 as of 12:00 the enemy used to attack the territory of Ukraine [war\_monitor], (06.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16169](https://t.me/war_monitor/16169) (Accessed 01.09.2024); monitor / For the day 09.04 – 10.04.24 as of 12:00 the enemy used to attack the territory of Ukraine [war\_monitor], (10.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16292](https://t.me/war_monitor/16292) (Accessed 01.09.2024); monitor / For the day 12.04 – 13.04.24 as of 12:00 the enemy used to attack the territory of Ukraine [war\_monitor], (13.04.2024), Telegram, URL: [https://t.me/war\\_monitor/16424](https://t.me/war_monitor/16424) (Accessed 01.09.2024).
- [103] Vitaly / September in numbers [MOnstas], (30.09.2024), X (Twitter), URL: <https://x.com/MOnstas/status/1840658805782200578> (Accessed 31.08.2024).
- [104] Zelensky / Official / Only in this March, Russian terrorists used more than 400 missiles of various types, more than 600 'shaheds' and more than 3 thousand guided bombs against Ukraine [V\_Zelenskij\_official], (03.04.2024), Telegram, URL: [https://t.me/V\\_Zelenskij\\_official/9965](https://t.me/V_Zelenskij_official/9965) (Accessed 01.09.2024).
- [105] Vitaly / September in numbers [MOnstas], (30.09.2024), X (Twitter), URL: <https://x.com/MOnstas/status/1840658805782200578> (Accessed 31.08.2024).
- [106] Menshukova E., *Russian KAB destroyed a multi-storey building in Saltivka in Kharkiv: the entrance was destroyed from the eighth to the third floor*, (25.09.2024). Suspilne Kharkiv, URL: <https://suspilne.media/kharkiv/843497-rossijskij-kab-zrujnuvav-bagatopoverhivku-na-saltivci-u-harkovi-pidizd-sklavsa-z-vosmogo-po-trejtj-poverh/> (Accessed 31.08.2024); *Five KABs around the city: the consequences of the air strike on Kharkiv (photo evidence)*, (30.08.2024). Radio Liberty, URL: <https://www.radiosvoboda.org/a/pyatma-kabamy-po-mistu-nasidky-obstrilu-kharkova/33100053.html> (Accessed 31.08.2024).
- [107] Krakhmatova D., Gladenko K., Vorona K., *'Everything was fine until the Russians came'. What is known about the attack on the nursing home in Sumy*, (19.09.2024). Suspilne Sumy, URL: <https://suspilne.media/sumy/840243-vse-dobre-bulo-poki-rosiani-ne-prisli-so-vidomopro-udar-po-budinku-dla-litnih-ludej-u-sumah/> (Accessed 31.08.2024).
- [108] *Ischenko V., AFU strikes at airfields in Russia: Is it an effective solution against air bombs?* (15.08.2024). Donbas News, URL: <https://novosti.dn.ua/article/9207-zsu-b-yut-po-aerodromah-u-rosiyi-tse-efektyvne-rishennya-proty-aviabomb> (Accessed 31.08.2024).
- [109] Dossier of the Spy / Regarding the strike on the Morozovsk airfield [dosye\_shpiona], (04.09.2024), Telegram, URL: [https://t.me/dosye\\_shpiona/578](https://t.me/dosye_shpiona/578) (Accessed 01.09.2024); Dossier of the Spy / Contents of the Morozovsk airfield warehouse [dosye\_shpiona],

- (04.09.2024), Telegram, URL: [https://t.me/dosye\\_shpiona/580](https://t.me/dosye_shpiona/580) (Accessed 01.09.2024).
- [110] Ishchenko V., *AFU strikes at airfields in Russia: Is it an effective solution against air bombs?* (15.08.2024). Donbas News, URL: <https://novosti.dn.ua/article/9207-zsu-b-yut-po-aerodromah-u-rosiyi-tse-efektyvne-rishennya-proty-aviabomb> (Accessed 31.08.2024).
- [111] Ishchenko V., *AFU strikes at airfields in Russia: Is it an effective solution against air bombs?* (15.08.2024). Donbas News, URL: <https://novosti.dn.ua/article/9207-zsu-b-yut-po-aerodromah-u-rosiyi-tse-efektyvne-rishennya-proty-aviabomb> (Accessed 31.08.2024).
- [112] Total Betrayal / Kharkiv. Strikes on a residential area in apartment buildings, Shevchenkivskyi district [totalizrada], (27.03.2024), Telegram, URL: <https://t.me/totalizrada/22746> (Accessed 31.08.2024).
- [113] Ihor Terekhov / It's loud in Kharkiv! [@ihor\_terekhov], (27.03.2024), Telegram, URL: [https://t.me/ihor\\_terekhov/1146](https://t.me/ihor_terekhov/1146) (Accessed 31.08.2024).
- [114] *Russia struck Kharkiv with the D-30SN UMPB: what kind of bomb is it and is it possible to fight it*, (2024). Defense Express, URL: [https://defense-ua.com/weapon\\_and\\_tech/rf\\_vdarlia\\_po\\_harkovu\\_umpb\\_d\\_30sn\\_scho\\_tse\\_za\\_bomba\\_ta\\_chi\\_mozhilivo\\_z\\_neju\\_borotis-14869.html](https://defense-ua.com/weapon_and_tech/rf_vdarlia_po_harkovu_umpb_d_30sn_scho_tse_za_bomba_ta_chi_mozhilivo_z_neju_borotis-14869.html) (Accessed 31.08.2024).
- [115] Police of Kharkiv region / one man killed, 19 citizens wounded: police document the consequences of the Russian air strike [@police\_kh\_region], (27.03.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/25852](https://t.me/police_kh_region/25852) (Accessed 31.08.2024); Media Group Naky pilo. Kharkiv / Consequences of the daytime strike on Kharkiv [@nakipelovo], (27.03.2024), Telegram, URL: <https://t.me/nakipelovo/33355> (Accessed 31.08.2024).
- [116] Media group Naky pilo. Kharkiv / Consequences of the daytime strike on Kharkiv [@nakipelovo], (27.03.2024), Telegram, URL: <https://t.me/nakipelovo/33355> (Accessed 31.08.2024).
- [117] Witness Kh-01
- [118] Kharkiv Regional Prosecutor's Office / Head of the Kharkiv Regional Prosecutor's Office Oleksandr Filchakov on the consequences of the shelling of the Shevchenkivskyi district of Kharkiv [@prokuratura\_kharkiv], (14.05.2024), Telegram, URL: [https://t.me/prokuratura\\_kharkiv/14865](https://t.me/prokuratura_kharkiv/14865) (Accessed 31.08.2024); Total Betrayal / Kharkiv. Strikes on a residential neighbourhood in apartment buildings, Shevchenkivskyi district [totalizrada], (27.03.2024), Telegram, URL: <https://t.me/totalizrada/22746> (Accessed 31.08.2024).
- [119] Media group Naky pilo. Kharkiv / The number of wounded after the shelling of Kharkiv increased to 19 people [@nakipelovo], (27.03.2024), Telegram, URL: <https://t.me/nakipelovo/33353> (Accessed 31.08.2024).
- [120] Police of Kharkiv region / one man killed, 19 citizens injured [@police\_kh\_region], (27.03.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/25853](https://t.me/police_kh_region/25853) (Accessed 31.08.2024).
- [121] Police of Kharkiv region / one man killed, 19 citizens injured [@police\_kh\_region], (27.03.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/25853](https://t.me/police_kh_region/25853) (Accessed 31.08.2024).
- [122] Police of Kharkiv region / one man killed, 19 citizens injured [@police\_kh\_region], (27.03.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/25853](https://t.me/police_kh_region/25853) (Accessed 31.08.2024).
- [123] Police of Kharkiv region / Four people were killed, 11 more injured [@police\_kh\_region], (02.05.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/27075](https://t.me/police_kh_region/27075) (Accessed 31.08.2024).
- [124] Police of Kharkiv region / Occupants shelled Kharkiv, a woman was killed, 11 more people were injured [@police\_kh\_region], (27.05.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/28097](https://t.me/police_kh_region/28097) (Accessed 31.08.2024).
- [125] *Cheap and dangerous. What are these UMPB bombs that Russia hit Kharkiv with*, (2024). RBC-Ukraine, URL: <https://www.rbc.ua/ukr/news/deshevi-ta-nebezpechni-shcho-tse-bombi-upmb-1711737977.html> (Accessed 31.08.2024); *New universal interspecies planning munition*, (13.06.2024). Sdelanounas, URL: <https://sdelanounas.ru/blogs/160481/> (Accessed 31.08.2024).
- [126] Media group Naky pilo. Kharkiv / The number of victims has increased to 26 [@nakipelovo], (15.05.2024), Telegram, URL: <https://t.me/nakipelovo/34578> (Accessed 31.08.2024).
- [127] Media group Naky pilo. Kharkiv / This is what a mutilated high-rise building in the central part of Kharkiv looks like [@nakipelovo], (14.05.2024), Telegram, URL: <https://t.me/nakipelovo/34550> (Accessed 31.08.2024).
- [128] StroyObzor Kharkiv / Consequences of the arrival in Alekseevka [@StroyObzorKh], (14.05.2024), Telegram, URL: <https://t.me/StroyObzorKh/11080> (Accessed 31.08.2024).
- [129] Kharkiv Regional Prosecutor's Office / Consequences of the shelling of the Shevchenkivskyi district of Kharkiv [@prokuratura\_kharkiv], (14.05.2024), Telegram, URL: [https://t.me/prokuratura\\_kharkiv/16011](https://t.me/prokuratura_kharkiv/16011) (Accessed 31.08.2024); Kharkiv Regional Prosecutor's Office / Video from a copter: consequences of the shelling of the Shevchenkivskyi district of Kharkiv [@prokuratura\_kharkiv], (14.05.2024), Telegram, URL: [https://t.me/prokuratura\\_kharkiv/16012](https://t.me/prokuratura_kharkiv/16012) (Accessed 31.08.2024).
- [130] Police of Kharkiv region / As a result of shelling in Kharkiv, 21 people were injured, including three children [@police\_kh\_region], (14.05.2024), Telegram, URL: [https://t.me/police\\_kh\\_region/27536](https://t.me/police_kh_region/27536) (Accessed 31.08.2024).
- [131] StroyObzor Kharkiv / Axioma on Naukova Street was damaged [@StroyObzorKh], (14.05.2024), Telegram, URL: <https://t.me/StroyObzorKh/11074> (Accessed 31.08.2024).
- [132] StroyObzor Kharkiv / Consequences of the arrival on Alekseevka [@StroyObzorKh], (14.05.2024), Telegram, URL: <https://t.me/StroyObzorKh/11080> (Accessed 31.08.2024).
- [133] Kharkiv Regional Prosecutor's Office / Video from a copter: the consequences of hits on the Shevchenkivskyi district of Kharkiv [@prokuratura\_kharkiv], (14.05.2024), Telegram, URL: [https://t.me/prokuratura\\_kharkiv/16012](https://t.me/prokuratura_kharkiv/16012) (Accessed 31.08.2024).
- [134] Kharkiv Regional Prosecutor's Office / Video from a copter: the consequences of hits on the Shevchenkivskyi district of Kharkiv [@prokuratura\_kharkiv], (14.05.2024), Telegram, URL: [https://t.me/prokuratura\\_kharkiv/16012](https://t.me/prokuratura_kharkiv/16012) (Accessed 31.08.2024).
- [135] Kirill Fedorov / War History Weapons / Unique and exclusive video of the use of the latest Russian UMPB bombs! [@warhistoryalconafter/165139] (accessed 31.08.2024); Colonel GS / Photo from inside the tail section, it is 'deaf' and there are only rudder drives, so there is really no engine there [@war\_home], (22.05.2024), Telegram, URL: [https://t.me/war\\_home/1409](https://t.me/war_home/1409) (Accessed 31.08.2024).
- [136] Dnipro | OSINT with Garbuz / Katsaps' Su-34 drops 4 UMPB bombs over Gostysheve near Belgorod [DniproOfficial], (24.05.2024), Telegram, URL: <https://t.me/DniproOfficial/3548> (Accessed 31.08.2024).
- [137] Witness Kh-02
- [138] Witness Kh-02
- [139] Media group Naky pilo. Kharkiv / Preliminary, Russians hit Kharkiv with a missile from the Iskander complex, Oleg Sinegubov [@nakipelovo] reported, (06.08.2024), Telegram, URL: <https://t.me/nakipelovo/36513> (Accessed 31.08.2024); Babel / In Kharkiv, at least 5 people were injured by the morning shelling by Russians [@babel], (06.08.2024), Telegram, URL: <https://t.me/babel/54579> (Accessed 31.08.2024).
- [140] Where in Kharkiv | Kharkiv / Kursk region. They write about the grey zone [@place\_kharkiv], (06.08.2024), Telegram, URL: [https://t.me/place\\_kharkiv/79019](https://t.me/place_kharkiv/79019) (Accessed 31.08.2024); StroyObzor Kharkiv / Third hit in this area [@StroyObzorKh], (06.08.2024), Telegram, URL: <https://t.me/StroyObzorKh/11828> (Accessed 31.08.2024).
- [141] Media group Naky pilo. Kharkiv / In Kharkiv, dozens of residential buildings, administrative buildings were damaged, dozens of civilian cars were destroyed [@nakipelovo], (06.08.2024), Telegram, URL: <https://t.me/nakipelovo/36514> (Accessed 31.08.2024).
- [142] *Russia struck Kharkiv with the UMPB D-30SN: what kind of bomb is it and is it possible to fight it*, (2024). Defense Express, URL: [https://defense-ua.com/weapon\\_and\\_tech/rf\\_vdarlia\\_po\\_harkovu\\_umpb\\_d\\_30sn\\_scho\\_tse\\_za\\_bomba\\_ta\\_chi\\_mozhilivo\\_z\\_neju\\_borotis-14869.html](https://defense-ua.com/weapon_and_tech/rf_vdarlia_po_harkovu_umpb_d_30sn_scho_tse_za_bomba_ta_chi_mozhilivo_z_neju_borotis-14869.html) (Accessed 31.08.2024); Larin Y., *What is UMPB-30D: How Putin's Army Turned Kharkiv into a Testing Ground*, (2024). DUMKA, URL: <https://dumka.media/ukr/war/1714982693-shcho-take-umpb-30d-yak-armiya-putina-peretvorila-harkiv-na-viprobuvainiy-poligon> (Accessed 31.08.2024).
- [143] Media group Naky pilo. Kharkiv / What is known about the hit to the construction supermarket at this minute [@nakipelovo], (25.05.2024), Telegram, URL: <https://t.me/nakipelovo/34936> (Accessed 31.08.2024).
- [144] *Russian strike on the Epicentre in Kharkiv: 19 people were killed, search and rescue operations are over*, (2024). Espresso, URL: <https://espresso.tv/vivna-z-rosiyevu-u-kharkovi-vrantsi-25-travnja-pronunali-vibukhi> (accessed 31.08.2024); Oleg Synegubov, Head of Kharkiv Regional State Administration / Terrorist Russian shelling of a hypermarket [@synegubov], (29.05.2024), Telegram, URL: <https://t.me/synegubov/9795> (Accessed 31.08.2024).
- [145] State Ecological Inspectorate in Kharkiv region / Terrible consequences of the missile attack on Epicentre [@ecoinsp.khark], (24.06.2024), Facebook, URL: <https://www.facebook.com/ecoinsp.khark/posts/pfbid0A2iTCeaaEYwP2o7aaUyRX4gTuU47Rjmd8iUd6FjGxqsapYihx9WzEEk0tBzI> (Accessed 31.08.2024).
- [146] State Ecological Inspectorate in Kharkiv Region / Terrible consequences of the missile attack on the Epicentre [@ecoinsp.khark], (24.06.2024), Facebook, URL: <https://www.facebook.com/ecoinsp.khark/posts/pfbid0A2iTCeaaEYwP2o7aaUyRX4gTuU47Rjmd8iUd6FjGxqsapYihx9WzEEk0tBzI> (Accessed 31.08.2024).
- [147] Media group Naky pilo. Kharkiv / What is known about the hit to the construction supermarket at this moment [@nakipelovo], (25.05.2024), Telegram, URL: <https://t.me/nakipelovo/34936> (Accessed 31.08.2024).



- Two additional stills from the same video [GuyPlopsy], (15.11.2023), X (Twitter), URL: <https://twitter.com/GuyPlopsy/status/173557588836866398> (Accessed 31.08.2024); Ministry of Defence of Russia / Su-34 fighter-bombers struck at enemy positions in the Kupyansk direction [mod\_russia], (15.12.2023), Telegram, URL: [https://t.me/mod\\_russia/33565](https://t.me/mod_russia/33565) (Accessed 31.08.2024); Ministry of Defence of Russia / Controlling the airspace: combat operation of Su-34 aircraft of the Russian VKS [mod\_russia], (15.11.2023), Telegram, URL: [https://t.me/mod\\_russia/32491](https://t.me/mod_russia/32491) (Accessed 31.08.2024).
- [188] Ministry of Defence of Russia / Su-35S fighters of the Russian Aerospace Forces are on duty in the airspace in the Avdiivka direction [mod\_russia], (02.03.2024), Telegram, URL: [https://t.me/mod\\_russia/36207](https://t.me/mod_russia/36207) (accessed 31.08.2024).
- [189] Kirill Fedorov / War History Weapons / Unique and exclusive video of the use of the latest Russian UMPB air bombs! [warhistoryalconafter], (22.05.2024), Telegram, URL: <https://t.me/warhistoryalconafter/165139> (Accessed 31.08.2024).
- [190] Aviahub / UMPB is flying to punish terrorists and supporters of the criminal regime [Aviahub34], (24.05.2024), Telegram, URL: <https://t.me/Aviahub34/2755> (Accessed 31.08.2024); Dnipro / OSINT with Garbus / Katsaps' Su-34 drops 4 UMB bombs over Gostyshcheve near Belgorod [DniproOfficial], (24.05.2024), Telegram, URL: <https://t.me/DniproOfficial/3548> (Accessed 31.08.2024).
- [191] Guy Plopsy / A segment from a newly released Russian MoD video showing a VKS Su-35S multirole fighter (B/N '21' Red) departing on a combined CAP/SEAD sortie from Voronezh Baltimor AB [GuyPlopsy], (18.05.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/179175352173581887> (Accessed 31.08.2024).
- [192] Guy Plopsy / 1/A still from a newly released Russian MoD video showing Su-35S '23' Red(RF-81763) of the 159th IAP taxiing at Voronezh Baltimor AB past a Su-34 from the 47th BAP [GuyPlopsy], (04.01.2024), X (Twitter), URL: <https://twitter.com/GuyPlopsy/status/1742832657455800554> (Accessed 31.08.2024).
- [193] Su-35S. Extremely dangerous, (2024). Zvezda, time: 8:40, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.htm/2024891521-dae8x.html> (Accessed 31.08.2024).
- [194] Su-35S of the Russian Aerospace Forces do not allow the Ukrainian aviation to take off from the airfields in the Avdiivka direction, (2023). Zvezda, URL: <https://tvzvezda.ru/news/2024321037-2D421.html> (Accessed 31.08.2024); Ministry of Defence of Russia / Su-35S crews accompany our bombers in the zone of the Southern Military District [mod\_russia], (24.02.2024), Telegram, URL: [https://t.me/mod\\_russia/35989](https://t.me/mod_russia/35989) (Accessed 31.08.2024).
- [195] Su-35S of the RF VKS do not allow the AFU aviation to take off from airfields in the Avdiivka direction, (2023). Zvezda, URL: <https://tvzvezda.ru/news/2024321037-2D421.html> (Accessed 31.08.2024); Guy Plopsy / A still from a newly released Russian MoD clip that shows a Su-35S multirole fighter at Voronezh-Baltimor AB before departing on a combined CAP/SEAD sortie [GuyPlopsy], (04.11.2023), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1731608423526187346> (accessed 31.08.2024).
- [196] Ministry of Defence of Russia / Su-35S fighters of the Russian VKS are on combat duty in the sky over the special operation zone [mod\_russia], (02.02.2024), Telegram, URL: [https://t.me/mod\\_russia/35283](https://t.me/mod_russia/35283) (accessed 31.08.2024).
- [197] Ministry of Defence of Russia / Controlling the airspace: combat operation of Su-34 aircraft of the Russian VKS [mod\_russia], (15.11.2023), Telegram, URL: [https://t.me/mod\\_russia/32491](https://t.me/mod_russia/32491) (accessed 31.08.2024).
- [198] Su-35S. Extremely dangerous, (2024). Zvezda, time: 15:35, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.htm/2024891521-dae8x.html> (Accessed 31.08.2024).
- [199] The Su-35 crew covered the actions of the aviation during the strikes on the Ukrainian Armed Forces, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024623445-QOVIn.html> (Accessed 31.08.2024).
- [200] Zvizdets Mangustu / To the beginning of the large-scale invasion of Russia in Ukraine [zvizdecmanhustu], (26.12.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/1520> (Accessed 31.08.2024); Zvizdets Mangustu / As promised, today 'About Air' [zvizdecmanhustu], (05.03.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/552> (Accessed 31.08.2024).
- [201] State Order of Lenin Red Banner Centre for Aviation Personnel Training and Military Testing of the Ministry of Defence of the Russian Federation named after V.P. Chkalov (Lipetsk Aviation Centre), (19.04.2013). Ministry of Defence of the Russian Federation, URL: <https://structure.mil.ru/structure/forces/air/fac/history/his.htm> (Accessed 31.08.2024); BMPD / Deliveries of combat aircraft to the Russian Armed Forces in 2022 [bmpd], (11.01.2023), LiveJournal, URL: <https://bmpd.livejournal.com/4642641.html> (Accessed 31.08.2024).
- [202] Military Database, URL: <https://scramble.nl/database/military/> (Accessed 31.08.2024).
- [203] Zvizdets Mangustu / Category air + sea and a little 'for the Avdiivka direction' [zvizdecmanhustu], (03.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustu/1675> (Accessed 31.08.2024); Zvizdets Mangustu / Review category "different" [zvizdecmanhustu], (16.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustu/1709> (Accessed 31.08.2024).
- [204] Loboda Aleksey Gennadievich, (2022). Russian Torturers, URL: <https://russian-torturers.com/ru/profile/710> (Accessed 31.08.2024).
- [205] Who is shelling Kharkiv? 'Molfar' identified 55 Russian military, (2024). Molfar, URL: [https://molfar.com/blog/hto-obstrilyuyue-harkiv?utm\\_source=telegram&utm\\_medium=native&utm\\_campaign=hto-obstrilyuyue-harkiv](https://molfar.com/blog/hto-obstrilyuyue-harkiv?utm_source=telegram&utm_medium=native&utm_campaign=hto-obstrilyuyue-harkiv) (Accessed 31.08.2024).
- [206] Panchenko Ivan Alexandrovich, (2024). Peacemaker, URL: <https://myrotvorets.center/criminal/panchenko-ivan-aleksandrovych/> (Accessed 31.08.2024); Vesti Karelia, (2021). Pilots of the 159<sup>th</sup> Fighter Aviation Regiment conducted tactical exercises. YouTube, URL: [https://web.archive.org/web/20230822143811/https://www.youtube.com/watch?v=FhSC\\_Uo-Lhw](https://web.archive.org/web/20230822143811/https://www.youtube.com/watch?v=FhSC_Uo-Lhw) (Accessed 31.08.2024).
- [207] Military unit 77984, (2024). Interactive portal of the Committee for Labour and Employment of the Population of the Government of Khabarovsk Territory, URL: <https://sz27.ru/employer/detail/?companyId=6ad0aa71-75e3-11e6-8852-000c2973da2c> (Accessed 31.08.2024); Lobintsev Alexander Anatolyevich, (2023). Russian Torturers, URL: <https://russian-torturers.com/ru/profile/1854> (Accessed 31.08.2024).
- [208] The Defence Intelligence of Ukraine publishes lists of personnel of 18 shap and 23 vap 303 sad of the 1<sup>st</sup> Army of the Air Force and Air Defence of the RF Armed Forces, (2022). The Defence Intelligence of Ukraine, URL: <https://gur.gov.ua/content/hur-mo-ukrainy-opryludniule-spytsky-osobovo-ho-skladu-18-shap-ta-23-vap-303-sad-1-armii-vps-y-ppo-zs-rf.html> (Accessed 31.08.2024); Personnel of 23 VAPs of the Russian Aerospace Forces, which bomb Ukraine and kill civilians, (2022). Main Intelligence Directorate, URL: <https://gur.gov.ua/content/osoboviy-sklad-23-vap-vks-rf.html> (Accessed 31.08.2024).
- [209] Guy Plopsy / Su-34 (from: GuyPlopsy) [GuyPlopsy], (03.08.2024), X (Twitter), URL: [https://twitter.com/search?q=Su-34%20\(from%3AGuyPlopsy\)&src=typed\\_query&f=live](https://twitter.com/search?q=Su-34%20(from%3AGuyPlopsy)&src=typed_query&f=live) (Accessed 31.08.2024).
- [210] Ministry of Defence of Russia / Retribution from the Heavens: combat work of the crews of Su-34 fighter-bombers of the Russian VKS [mod\_russia], (25.09.2023), Telegram, URL: [https://t.me/mod\\_russia/30804](https://t.me/mod_russia/30804) (Accessed 31.08.2024); Su-34 destroyed an enemy stronghold in the Krasnolimansky direction, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024332110-AUdov.html> (Accessed 31.08.2024).
- [211] TLK News / Meet. Gnida. Scum. Bastard. Katsap. [@tlknewsua], (23.06.2024), Telegram, URL: <https://t.me/tlknewsua/21339> (Accessed 31.08.2024).
- [212] Zvizdets Mangustu / To the beginning of the large-scale invasion of Russia in Ukraine [zvizdecmanhustu], (26.12.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/1520> (Accessed 31.08.2024); Zvizdets Mangustu / As promised, today 'About Air' [zvizdecmanhustu], (05.03.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/552> (Accessed 31.08.2024).
- [213] Guy Plopsy / Took several better quality still images (from a video published on the Russian MoD site) [GuyPlopsy], (09.01.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1744742389049344456> (Accessed 31.08.2024); Su-34 destroyed an enemy stronghold in the Krasnolimansky direction, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024332110-AUdov.html> (Accessed 31.08.2024).
- [214] Ministry of Defence of Russia / Retribution from the Heavens: combat work of the crews of Su-34 fighter-bombers of the Russian VKS [mod\_russia], (25.09.2023), Telegram, URL: [https://t.me/mod\\_russia/30804](https://t.me/mod_russia/30804) (Accessed 31.08.2024).
- [215] Zvezdanews / Su-34s dropped FAB-500 bombs with a universal planning and correction module - directly on the militants' stronghold in the Avdiivka sector [zvezdanews], (08.03.2024), Telegram, URL: <https://t.me/zvezdanews/139385> (Accessed 31.08.2024); Polite (2024); Polite People / Army / Russia / SVO / Frontline bomber Su-34 (s/n 23 'red') from the 277th BAP of the Russian Air Force with stars signifying 590 combat sorties [@vegchel\_u], (22.10.2023), VKontakte, URL: [https://vk.com/wall-79798470\\_2546016](https://vk.com/wall-79798470_2546016) (Accessed 31.08.2024).
- [216] The crew of Su-34 destroyed the fortified positions of the Ukrainian Armed Forces in the Kherson direction, (2023). Zvezda, URL: <https://tvzvezda.ru/news/20231031241-i8Ua.html> (Accessed 31.08.2024).
- [217] Su-34s hit the command and observation posts of the Ukrainian Armed Forces in the Krasnolimansky direction, (2023). Zvezda, URL: <https://tvzvezda.ru/news/202312201023-ciKc.html> (Accessed 31.08.2024).
- [218] Kirill Fedorov / War History of Weapons / Russian UMPB D-30SN planning bomb on the Su-34, whose pilots also take revenge and eliminate

- terrorists. [warhistoryalconafter], (25.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/170919> (Accessed 31.08.2024).
- [219] Defence Intelligence of Ukraine / List of war criminals of the 2<sup>nd</sup> Mixed Aviation Regiment of the 21<sup>st</sup> Mixed Aviation Division of the VKS of the RF Armed Forces (Shagol airfield, Chelyabinsk) [DefenceIntelligenceofUkraine], (08.03.2022), Facebook, URL: [https://www.facebook.com/photo.php?fbid=266326199012141&set=a.23015752628986&type=3&ref=embed\\_post](https://www.facebook.com/photo.php?fbid=266326199012141&set=a.23015752628986&type=3&ref=embed_post) (Accessed 31.08.2024).
- [220] MilitaryAviationInUA / Personnel of the aviation squadron of the 2nd mixed aviation regiment Su-34 [MilAviaUA], (06.03.2022), X (Twitter), URL: <https://x.com/MilAviaUA/status/1500242633804947457> (Accessed 31.08.2024); Defence Intelligence of Ukraine / List of war criminals of the 2nd Mixed Aviation Regiment of the 21st Mixed Aviation Division of the VKS of the RF Armed Forces (Shagol airfield, Chelyabinsk) [DefenceIntelligenceofUkraine], (08.03.2022), Facebook, URL: [https://www.facebook.com/photo.php?fbid=266326199012141&set=a.23015752628986&type=3&ref=embed\\_post](https://www.facebook.com/photo.php?fbid=266326199012141&set=a.23015752628986&type=3&ref=embed_post) (Accessed 31.08.2024).
- [221] KHERSON: War Without Fakes / Around 21:30, residents of the Korabelnyi district of Kherson reported a powerful explosion [@kher-non\_fake], (08.03.2024), Telegram, URL: [https://t.me/kher-non\\_fake/13754](https://t.me/kher-non_fake/13754) (Accessed 31.08.2024); Prokudin Oleksandr – Official page / Operational information from 06:00 08.03.2024 to 06:00 09.03.2024 [@olexandrprokudin], (09.03.2024), Telegram, URL: <https://t.me/olexandrprokudin/2926> (Accessed 31.08.2024); Vgoru.Kherson, (2024). *The Russian military dropped an unexploded ordnance on a five-storey building in Kherson. The story of a resident of the house.* YouTube, URL: <https://www.youtube.com/watch?v=rY29OzPfd8Q> (Accessed 31.08.2024); Supsline Kherson, (2024). *Russian military dropped a bomb on a residential neighbourhood in Kherson.* YouTube, URL: <https://www.youtube.com/watch?v=Bhgm3wvBek> (Accessed 31.08.2024).
- [222] Kherson Regional State Administration (RSA) / A child was injured due to shelling by the Russian occupiers [khersonskaODA], (08.03.2024), Telegram, URL: <https://t.me/khersonskaODA/16861> (Accessed 31.08.2024); Kherson Regional State Administration (RSA) / The photo shows a multi-storey building that was hit by an aircraft bomb a few hours ago by the Russian army [khersonskaODA], (08.03.2024), Telegram, URL: <https://t.me/khersonskaODA/16864> (Accessed 31.08.2024); Prokudin Alexander – Official page / Operational information from 06:00 08.03.2024 to 06:00 09.03.2024 [@olexandrprokudin], (09.03.2024), Telegram, URL: <https://t.me/olexandrprokudin/2926> (Accessed 31.08.2024).
- [223] *Consequences of the Russian shelling of Kherson (Photo report)*, (2024). IRS-South, URL: <https://ipc.org.ua/uk/2024/03/naslidky-ob-striuu-rosiyanamy-hersona-fotoreportazh/> (Accessed 31.08.2024).
- [224] Prokudin Oleksandr – Official page / A huge crater in the middle of the yard and a destroyed house – the consequences of the night attack on Kherson [@olexandrprokudin], (09.03.2024), Telegram, URL: <https://t.me/olexandrprokudin/2928> (Accessed 31.08.2024); Vgoru.Kherson, (2024). *The Russian military dropped an unexploded ordnance on a five-storey building in Kherson. The story of a resident of the house.* YouTube, time: 02:14, URL: <https://www.youtube.com/watch?v=rY29OzPfd8Q&t=134s> (Accessed 31.08.2024); Supsline Kherson, (2024). *Russian military dropped a bomb on a residential neighbourhood in Kherson.* YouTube, URL: <https://www.youtube.com/watch?v=Bhgm3wvBek> (Accessed 31.08.2024).
- [225] Sassoli M., (2003), *Legitimate Targets of Attacks under International Humanitarian Law*. International Humanitarian Law Research Initiative, p. 9, URL: <https://www.hpcrresearch.org/sites/default/files/publications/Session1.pdf>.
- [226] Witness Kh-09.
- [227] KHERSON: War Without Fakes / Around 14:36, powerful explosions were heard in Kherson [@kher-non\_fake], (15.05.2024), Telegram, URL: [https://t.me/kher-non\\_fake/14889](https://t.me/kher-non_fake/14889) (Accessed 31.08.2024); KHERSON: War Without Fakes / Information confirmed [@kher-non\_fake], (15.05.2024), Telegram, URL: [https://t.me/kher-non\\_fake/14890](https://t.me/kher-non_fake/14890) (Accessed 31.08.2024).
- [228] Total Betrayal / 3 bombs hit Kherson [@totalizrada], (15.05.2024), Telegram, URL: <https://t.me/totalizrada/24652> (Accessed 31.08.2024).
- [229] Roman Mrochko / Today, Russians attacked the centre of Kherson from the air [@roman\_mrochko], (15.05.2024), Telegram, URL: [https://t.me/roman\\_mrochko/8464](https://t.me/roman_mrochko/8464) (Accessed 31.08.2024).
- [230] Prokudin Oleksandr – Official page / In the afternoon, Russian troops attacked Kherson from the air. It hit the Central District [@olexandrprokudin], (15.05.2024), Telegram, URL: <https://t.me/olexandrprokudin/3422> (Accessed 31.08.2024); Prokudin Oleksandr – Official page / The number of victims of the air strike on Kherson increased to eleven [@olexandrprokudin], (15.05.2024), Telegram, URL: <https://t.me/olexandrprokudin/3428> (Accessed 31.08.2024); Prokudin Oleksandr – Official page / Centre of Kherson. In the middle of the day, three Russian air bombs hit a residential area [@olexandrprokudin], (15.05.2024), Telegram, URL: <https://t.me/olexandrprokudin/3429> (Accessed 31.08.2024).
- [231] SES of Ukraine / The enemy army attacked the central part of Kherson in broad daylight [@dSNS\_telegram], (15.05.2024), Telegram, URL: [https://t.me/dSNS\\_telegram/28163](https://t.me/dSNS_telegram/28163) (Accessed 31.08.2024).
- [232] Belyakova K., *‘Everything is destroyed – no windows, no doors, nothing’. What eyewitnesses told about the Russian air strike on Kherson*, (2024). Supsline Kherson, URL: <https://supsline.media/kherson/746681-so-rozpovili-ocovidici-pro-aviaudar-ri-po-hersonu/> (Accessed 31.08.2024).
- [233] *Russians conducted an air strike on the central district of Kherson. There are wounded.* (Updated), (2024). IRS-South, URL: <https://ipc.org.ua/uk/2024/05/rosiyanay-zavdaly-aviaudaru-po-czentrulnomu-rajonu-hersona-ve-postrazhdalli/> (Accessed 31.08.2024).
- [234] eRadar | Air Alert | Missile Danger / KABs to Kherson region [eRadarua], (15.05.2024), Telegram, URL: <https://t.me/eRadarua/16966> (Accessed 31.08.2024).
- [235] Prokudin Oleksandr – Official page / In the afternoon, Russian troops attacked Kherson from the air. It hit the Central District [@olexandrprokudin], (15.05.2024), Telegram, URL: <https://t.me/olexandrprokudin/3422> (Accessed 31.08.2024).
- [236] Supsline Kharkiv, (2024). *Russians used a new munition to strike Kharkiv on 27 March, it could be UMPB D-30.* YouTube, URL: <https://www.youtube.com/watch?v=IT44hodv3LA> (Accessed 31.08.2024).
- [237] Witness Kh-06; Witness Kh-07.
- [238] Witness Kh-06.
- [239] Witness Kh-08.
- [240] monitor / Report on the activities of enemy aircraft and fleet as of 12:00 23.12.23 [war\_monitor], (23.12.2023), Telegram, URL: [https://t.me/war\\_monitor/13168](https://t.me/war_monitor/13168) (Accessed 31.08.2024).
- [241] Zvzdets Mangustu / As promised, today ‘About Air’ [@zvizdecmanhustu], (05.03.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/552> (Accessed 31.08.2024); Kirill Fedorov / War History Weapons / Another shot, but from a different angle, of the arrival of four UMPB D-30SN planning bombs at the command post of the Ukrainian Armed Forces in the village of Dniprovsk [warhistoryalconafter], (06.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/167600> (Accessed 31.08.2024).
- [242] Zvzdets Mangustu / Review. [@zvizdecmanhustu], (03.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustu/1921> (Accessed 31.08.2024); Zvzdets Mangustu / Review category ‘different’ [@zvizdecmanhustu], (16.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustu/1709> (Accessed 31.08.2024).
- [243] Su-34 ‘Utenok’, (2018). YAPLAKAL, URL: <https://www.yaplakal.com/forum2/topic1735350.html> (Accessed 31.08.2024); uacrossia / Air camouflage: aircraft painting – when entering stealth takes on a symbolic meaning [uacrossia], (16.06.2016), LiveJournal, URL: <https://uacrossia.livejournal.com/46032.html> (Accessed 31.08.2024).
- [244] Guy Plopsy / Two photos, recently posted on the Fighterbomber VK page [GuyPlopsy], (19.06.2023), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1670830189448953856> (Accessed 31.08.2024).
- [245] Guy Plopsy / Two photos, recently posted on the Fighterbomber VK page [GuyPlopsy], (19.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1670830189448953856/photo/1> (Accessed 31.08.2024).
- [246] Guy Plopsy / Several stills from a newly released Russian MoD video showing a VKS Su-34 (B/N ‘02’ Red) [GuyPlopsy], (11.03.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/16767088322063802414> (Accessed 31.08.2024).
- [247] *Su-34s dropped FAB-500s on the command post in the South-Donetsk direction*, (2024). Zvezda, URL: <https://tvzvezda.ru/news/202441239-qXyQb.html> (Accessed 31.08.2024); *Su-34 crews destroyed a stronghold together with Ukrainian infantry*, (2024). Zvezda, URL: <https://tvzvezda.ru/news/20244251030-mK9Zj.html> (Accessed 31.08.2024); *Sukhoi Su-34 - Russia - Air Force*, (2023). Airliners, URL: <https://www.airliners.net/photo/Russia-Air-Force/Sukhoi-Su-34/7159929> (Accessed 31.08.2024).
- [248] *Su-34 crews levelled an enemy command post in the area of the SVO*, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024481025-46AV9.html> (Accessed 31.08.2024).
- [249] *Su-34 crews showed the destruction of the Ukrainian Armed Forces stronghold with the help of FAB*, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024422432-nGTex.html> (Accessed 31.08.2024); Ministry of Defence of Russia / Su-34 crews destroyed the enemy’s command post and manpower in the South-Donetsk direction [mod\_russia], (22.04.2024), Telegram, URL: [https://t.me/mod\\_russia/37819](https://t.me/mod_russia/37819) (Accessed 31.08.2024).

- [2501] Guy Plopsy / 1/ Upon reviewing the video again, it appears that the first two seconds & last four seconds of the clip below show two different Su-34s taxiing [ @GuyPlopsy ], (18.03.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1769742242388824257> (Accessed 31.08.2024); Russian Ministry of Defence / Su-34s of the Russian VKS destroy positions of Ukrainian militants in the special operation zone [ @mod\_russia ], (05.09.2023), Telegram, URL: [https://t.me/mod\\_russia/310617](https://t.me/mod_russia/310617) (accessed 31.08.2024); Zvezdanews / Su-34s drop FAB-500 on the heads of militants in the South Donetsk direction [ @zvezdanews ], (18.03.2024), Telegram, URL: <https://t.me/zvezdanews/139817> (Accessed 31.08.2024).
- [251] Ministry of Defence of Russia / Su-34 crews destroyed an enemy stronghold and manpower in the area of responsibility of the Vostok troop group [ @mod\_russia ], (20.05.2024), Telegram, URL: [https://t.me/mod\\_russia/38907](https://t.me/mod_russia/38907) (Accessed 31.08.2024).
- [252] Su-34 crews punished Ukrainian infantry with air bombs, (2024). Zvezda, URL: <https://tvzvezda.ru/news/20244151030-hZSyt.html> (Accessed 31.08.2024).
- [253] Su-34s destroyed Ukrainian militants with UPCM bombs, (2024). Zvezda, URL: <https://tvzvezda.ru/news/2024641014-1pnhS.html> (Accessed 31.08.2024); Guy Plopsy / 1/ A segment from a newly released Russian MoD video on Su-34 operations out of Morozovsk AB in Rostov Oblast [ @GuyPlopsy ], (04.06.2024), X (Twitter), URL: <https://x.com/GuyPlopsy/status/1798029868862726435> (Accessed 31.08.2024); Su-34. Work in the area of the SVO, (2024). Zvezda, time: 36:36, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.html> (Accessed 31.08.2024).
- [254] Russian Ministry of Defence / Su-34 crews destroyed an enemy stronghold and manpower in the area of responsibility of the Vostok troop group [ @mod\_russia ], (17.05.2024), Telegram, URL: [https://t.me/mod\\_russia/38838](https://t.me/mod_russia/38838) (Accessed 31.08.2024); Russian Ministry of Defence / Su-34 crews deliver crushing strikes on the enemy [ @mod\_russia ], (14.05.2024), Telegram, URL: [https://t.me/mod\\_russia/38738](https://t.me/mod_russia/38738) (Accessed 31.08.2024); Russian Ministry of Defence / Su-34 crews destroyed the enemy command post and manpower in the South Donetsk direction [ @mod\_russia ], (22.04.2024), Telegram, URL: [https://t.me/mod\\_russia/37819](https://t.me/mod_russia/37819) (Accessed 31.08.2024).
- [255] Su-34. Work in the area of the Eastern European Airspace, (2024). Zvezda, time: 36:42, URL: <https://tvzvezda.ru/video/programs/201412231323-1cpc.html> (Accessed 31.08.2024).
- [256] Ministry of Defence of Russia / Su-34 crews deliver crushing strikes on the enemy [ @mod\_russia ], (14.05.2024), Telegram, URL: [https://t.me/mod\\_russia/38738](https://t.me/mod_russia/38738) (Accessed 31.08.2024); Russian Ministry of Defence / Su-34 crews destroyed the enemy command post and manpower in the South Donetsk direction [ @mod\_russia ], (22.04.2024), Telegram, URL: [https://t.me/mod\\_russia/37819](https://t.me/mod_russia/37819) (Accessed 31.08.2024); Bomb load of Su-34. Aviaziya Rossii. Means to work with unprepared aerodrome. Koreajob, URL: <https://korea-job.ru/bombovaya-nagruzka-su-34-aviaciya-rossii-sredstva-dlya-raboty-s/> (Accessed 31.08.2024); Military Database, URL: <https://scramble.nl/database/military/> (accessed 31.08.2024).
- [257] Bomb load of the Su 34. Aviaziya Rossii. Means for working with unprepared airfields. Koreajob, URL: <https://koreajob.ru/bombovaya-nagruzka-su-34-aviaciya-rossii-sredstva-dlya-raboty-s/> (Accessed 31.08.2024).
- [258] Ministry of Defence of Russia / Russian Su-34s drop FAB-500s on the heads of militants [ @mod\_russia ], (12.05.2024), Telegram, URL: [https://t.me/mod\\_russia/38693](https://t.me/mod_russia/38693) (Accessed 31.08.2024).
- [259] Ministry of Defence of Russia / Su-34 crews destroyed an enemy stronghold and manpower in the area of responsibility of the Vostok troop group [ @mod\_russia ], (20.05.2024), Telegram, URL: [https://t.me/mod\\_russia/38907](https://t.me/mod_russia/38907) (Accessed 31.08.2024).
- [260] Su-34 crews punished Ukrainian infantry with air bombs, (2024). Zvezda, URL: <https://tvzvezda.ru/news/20244151030-hZSyt.html> (Accessed 31.08.2024).
- [261] Shrike News / Morozovsk airfield. Photos with captions, what exploded there [ ShrikeNews ], (06.08.2024), Telegram, URL: <https://t.me/Shrike-News/16062> (Accessed 31.08.2024); Dossier of the Spy / Contents of the Morozovsk airfield warehouse [ @dosye\_shpiona ], (06.08.2024), Telegram, URL: [https://t.me/dosye\\_shpiona/580](https://t.me/dosye_shpiona/580) (Accessed 31.08.2024); Colonel GS / Detailed photos of the destruction means of the destroyed radioactive waste warehouse at Morozovsk airfield [ @war\_home ], (06.08.2024), Telegram, URL: [https://t.me/war\\_home/2167](https://t.me/war_home/2167) (accessed 31.08.2024).
- [262] REVERSE SIDE OF THE MEDAL / For the Hot Dog [ @rsotmdivision ], (26.05.2024), Telegram, URL: <https://t.me/rsotmdivision/16499> (Accessed 31.08.2024).
- [263] Kirill Fedorov / War History Weapons / Unique and exclusive video of the use of the latest Russian UMPB bombs! [ @warhistoryalconafter ], (22.05.2024), Telegram, URL: <https://t.me/warhistoryalconafter/165139> (Accessed 31.08.2024); Aviahub / Dropping four UMPB D-30SN on the heads of the crested terrorists [ @Aviahub34 ], (07.06.2023), Telegram, URL: <https://t.me/Aviahub34/3003> (accessed 31.08.2024); Dnipro | OSINT with Garbuz / Katsaps' Su-34 drops 4 UMB bombs over Gostyshcheve near Belgorod [ @DniproOfficial ], (24.05.2024), Telegram, URL: <https://t.me/DniproOfficial/3548> (accessed 31.08.2024).
- [264] The attack on the Epicentre in Kharkiv with the UMPB D-30SN was carried out by a Su-34 aircraft that took off from 'Buturlinovka' airfield: TLK News / Znakomitsya. Nit. Scum. Bastard. Katsap. [ @tknewsua ], (23.06.2024), Telegram, URL: <https://t.me/tknewsua/21339> (Accessed 31.08.2024).
- [265] Kirill Fedorov / War History Arms / New help has come to Russia's tactical aviation! [ @warhistoryalconafter ], (05.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/167421> (Accessed 31.08.2024); Kirill Fedorov / War History Weapons / Personalised planning bomb or revenge for a fallen comrade! [ @warhistoryalconafter ], (29.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/171575> (Accessed 31.08.2024).
- [266] Kirill Fedorov / War History Weapons / UMPB arrivals at the positions of 'Khokhly' in the village of Bogatyr [ @warhistoryalconafter ], (05.07.2024), Telegram, URL: <https://t.me/warhistoryalconafter/172419> (Accessed 31.08.2024); Kirill Fedorov / War History Weapons / One more shot, but from a different angle, of the arrival of four UMPB D-30SN planning bombs at the command post of the Ukrainian Armed Forces in the village of Dniprovsk [ @warhistoryalconafter ], (07.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/167600> (Accessed 31.08.2024).
- [267] Kirill Fedorov / War History Weapons / Another shot, but from a different angle, of the arrival of four UMPB D-30SN planning bombs at the command post of the Ukrainian Armed Forces in the village of Dniprovsk [ @warhistoryalconafter ], (06.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/167600> (Accessed 31.08.2024).
- [268] Kirill Fedorov / War History Weapons / [ @warhistoryalconafter ], Telegram, URL: <https://t.me/warhistoryalconafter> (Accessed 31.08.2024).
- [269] Kirill Fedorov / War History Weapons / Personalised planning bomb or revenge for a fallen comrade! [ @warhistoryalconafter ], (29.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/171575> (Accessed 31.08.2024); Kirill Fedorov / War History of Weapons / Unique and exclusive video of the use of the latest Russian UMPB bombs! [ @warhistoryalconafter ], (22.05.2024), Telegram, URL: <https://t.me/warhistoryalconafter/165139> (Accessed 31.08.2024); same airfield - Kirill Fedorov / War History of Weapons / Russian UMPB D-30SN planning bombs on a Su-34 frontline bomber [ @warhistoryalconafter ], (31.05.2024), Telegram, URL: <https://t.me/warhistoryalconafter/166549> (Accessed: 31.08.2024); Kirill Fedorov / War History Weapons / The crew of the Su-34 frontline bomber congratulates Ukrainian servicemen on the Day of Russia! [ @warhistoryalconafter ], (12.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/168546> (Accessed 31.08.2024).
- [270] Zvizdets Mangustu / To the beginning of the large-scale invasion of Russia in Ukraine [ @zvizdecmanhustu ], (26.12.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/1520> (Accessed 31.08.2024); Zvizdets Mangustu / As promised, today 'About Air' [ @zvizdecmanhustu ], (05.03.2023), Telegram, URL: <https://t.me/zvizdecmanhustu/552> (Accessed 31.08.2024).
- [271] Massimo Frantarelli / Sukhoi Su-34 fighter-bomber [ @MrFrantarelli ], (14.07.2024), X (Twitter), URL: <https://x.com/MrFrantarelli/status/1812543730530091051> (Accessed 31.08.2024).
- [272] Kirill Fedorov / War History Arms / The crew of the Su-34 frontline bomber congratulates Ukrainian servicemen on the Day of Russia! [ @warhistoryalconafter ], (12.06.2024), Telegram, URL: <https://t.me/warhistoryalconafter/168546> (Accessed 31.08.2024).
- [273] 790, (16.03.2022), Postimage, URL: <https://postimg.cc/2qvdC25N> (Accessed 31.08.2024).
- [274] Kirill Fedorov / War History Arms / Su-34 'Thunderbolt' in action! [ @warhistoryalconafter ], (28.07.2024), Telegram, URL: <https://t.me/warhistoryalconafter/176180> (Accessed 31.08.2024).
- [275] Kirill Fedorov / War History Weapons / Su-34 Thunderbolt in action! [ @warhistoryalconafter ], (28.07.2024), Telegram, URL: <https://t.me/warhistoryalconafter/176180> (Accessed 31.08.2024).
- [276] Russian occupiers are trying to hide participation in hostilities, (2022). Main Intelligence Directorate, URL: <https://gur.gov.ua/content/rosiiskii-okupanty-namahaiutsia-prykhovaty-uchast-u-boiivkykh-diyakh.html> (Accessed 31.08.2024).
- [277] Kirill Fedorov / War History Weapons / We have sent thousands of tools, but here is an exclusive video on why we need wrenches/screwdrivers and other joys... [ @warhistoryalconafter ], (18.08.2024), Telegram, URL: <https://t.me/warhistoryalconafter/180097> (Accessed 31.08.2024).
- [278] Kirill Fedorov / War History Weapons / Russian one-and-a-half-year-olds who plan to kill many Ukrainian terrorists [ @warhistoryalconafter ], (12.08.2024), Telegram, URL: <https://t.me/warhistoryalconafter/178955> (Accessed 31.08.2024).

- [279] Zvizdets Mangustu / Category air + sea and a little 'for the Avdiivka direction' (@zvizdecmanhustul), (03.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustul/1675> (Accessed 31.08.2024); Zvizdets Mangustu / Review category 'different' (@zvizdecmanhustul), (16.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustul/1709> (Accessed 31.08.2024); Su-34 destroyed a temporary deployment point of the Ukrainian Armed Forces with high-explosive bombs, (2024), Zvezda, URL: <https://tvzvezda.ru/news/20247161020-fJLxe.html> (accessed 31.08.2024); Su-34s dropped air bombs from the UPCM on the Ukrainian Armed Forces' deployment point, (2024), Zvezda, URL: <https://tvzvezda.ru/news/20247241053-4dVnU.html> (Accessed 31.08.2024).
- [280] Su-34s destroyed Ukrainian militants with UPCM bombs, (2024), Zvezda, URL: <https://tvzvezda.ru/news/20247121148-NLfqX.html> (Accessed 31.08.2024).
- [281] Su-34 destroyed a temporary deployment point of the Ukrainian Armed Forces with high-explosive bombs, (2024), Zvezda, URL: <https://tvzvezda.ru/news/20247161020-fJLxe.html> (Accessed 31.08.2024); Su-34s dropped aerial bombs from the UPCM on the Ukrainian Armed Forces' deployment point, (2024), Zvezda, URL: <https://tvzvezda.ru/news/20247241053-4dVnU.html> (Accessed 31.08.2024); Su-34 destroyed Ukrainian militants with UPCM bombs, (2024), Zvezda, URL: <https://tvzvezda.ru/news/20247121148-NLfqX.html> (Accessed 31.08.2024); Russian Ministry of Defence / Su-34 crews struck at a temporary deployment point of the Ukrainian Armed Forces in the area of responsibility of the 'West' troop group (@mod\_russia), (29.07.2024), Telegram, URL: [https://t.me/mod\\_russia/41520](https://t.me/mod_russia/41520) (Accessed 31.08.2024); Zvizdec Mangustu / Category air + sea and a little 'for the Avdiivka direction' (@zvizdecmanhustul), (03.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustul/1675> (Accessed 31.08.2024).
- [282] Zvizdets Mangustu / Review category 'different' (@zvizdecmanhustul), (16.03.2024), Telegram, URL: <https://t.me/zvizdecmanhustul/1709> (Accessed 31.08.2024).
- [283] The war criminals are servicemen of the 559<sup>th</sup> bomber aviation regiment (military unit 75392) in Morozovsk, Rostov region. Morozovsk, Rostov region, who carried out bombing attacks on civilians and cities of Ukraine, (2022). Main Intelligence Directorate, URL: <https://gur.gov.ua/content/voennosluzhachyie-559-bombardirovочnohno-avyatsyonnoh-polka.html> (Accessed 31.08.2024).
- [284] Russian occupants are trying to hide participation in hostilities, (2022). Main Intelligence Directorate, URL: <https://gur.gov.ua/content/rosiiskii-okupanty-namahaiutsia-prykhoivaty-uchast-u-boiovykh-dliakh.html> (Accessed 31.08.2024).
- [285] Truth Hounds, (2023). *You'll be paying. Identification of those responsible for the missile strike on Kramatorsk and Bilenke on 27 June 2023*. Truth Hounds, URL: <https://truth-hounds.org/cases/kramatorsk/#:-:text=%D0%A5%D0%BE%D1%87%D0%B0%20%D0%9C%D0%83%D0%9F%20%D1%82%D0%B0.Lounge%E2%80%9D%20%D0%BE%20%D0%9A%D1%80%D0%B0%20%BC%D0%B0%D1%82%D0%BE%D1%80%D1%81%D1%8C%D0%BA%D1%83> (Accessed: 31.08.2024).
- [286] *International Covenant on Civil and Political Rights. General comment No. 36*, (2019). Human Rights Committee. Par. 70, URL: <https://docstore.ohchr.org/Self-Services/FilesHandler.ashx?enc=6QkG1d%2FPPRICAqgKb7yhsrdBOH15979OVGGB%2BWPAXhN19e0rX3cJlmWwe%2FGLmVrGmT01On6KBQggmxPNjrlLDe-fuuOjIN19BqOr%2FS93rKPWbCbg0J4dRqDoh%2FXgwn>.
- [287] Art. 48 of the AP I.
- [288] Art. 51(2) of the AP I; Art. 52(1) of the AP I.
- [289] Melzer N., (2014). *The Principle of Distinction Between Civilians and Combatants*. In A. Clapham & P. Gaeta (Eds.), *The Oxford Handbook of International Law in Armed Conflict*, p. 298.
- [290] Rome Statute, Art. 8(2)(b)(i), Art. 8(2)(b)(ii).
- [291] Article 51(2) of AP I.
- [292] Galic, IT-98-29-T, paras. 132-33; Prosecutor v. Milosevic, IT-98-29/1-A, Judgement and Opinion, Appeals Chamber, 12 November 2009; see also Statute of the International Criminal Tribunal for Rwanda, adopted by the UN Security Council, Resolution 955, 8 November 1994.
- [293] International Criminal Tribunal for the former Yugoslavia, *The Prosecutor v. Prlić et al*, No. IT-04-74-A, 29.11.2017, Hague, Netherlands, vol. 1, para. 562.
- [294] Benchbook on the Adjudication of International Crimes under Ukrainian Domestic Law, p. 383.
- [295] *Attacks on Ukraine's energy infrastructure: Harm to civilians*, (September 2024), UN Human Rights Monitoring Mission in Ukraine, URL: [https://ukraine.ohchr.org/sites/default/files/2024-10/Ukraine%20-%20protection%20of%20civilians%20in%20armed%20conflict%20%28September%202024%29\\_UKR.pdf](https://ukraine.ohchr.org/sites/default/files/2024-10/Ukraine%20-%20protection%20of%20civilians%20in%20armed%20conflict%20%28September%202024%29_UKR.pdf) (Accessed: 31.08.2024).
- [296] *Attacks on Ukraine's energy infrastructure: Harm to civilians*, (September 2024), UN Human Rights Monitoring Mission in Ukraine, URL: [https://ukraine.ohchr.org/sites/default/files/2024-10/Ukraine%20-%20protection%20of%20civilians%20in%20armed%20conflict%20%28September%202024%29\\_UKR.pdf](https://ukraine.ohchr.org/sites/default/files/2024-10/Ukraine%20-%20protection%20of%20civilians%20in%20armed%20conflict%20%28September%202024%29_UKR.pdf) (Accessed: 31.08.2024), p. 11.
- [297] Desaussure, Col. H., (1971). *The Laws of Air Warfare: Are There Any?* The International Lawyer, Vol. 5, no. 3, pp. 529-548. URL: <https://web.archive.org/web/20190429002949id/https://scholar.smu.edu/cgi/viewcontent.cgi?article=4246&context=il>.
- [298] Cohen A., Zlotogorski D., (2021). *Proportionality in International Humanitarian Law: Consequences, Precautions, and Procedures*. Oxford University Press, 2021, pp. 25-26.
- [299] Vos A., (2023). *Precision-Guided Munitions and the Principle of Distinction: The tactical challenges that military forces face in applying the principle of distinction in urban warfare environments despite the use of precision-guided munitions*. Universiteit Leiden. p. 3, URL: <https://studenttheses.universiteitleiden.nl/access/item%3A3715467/view>, citing Kaag & Kreps, 2012, *Congressional Research Service*, 2021, p. 2.
- [300] Vos A., (2023). *Precision-Guided Munitions and the Principle of Distinction: The tactical challenges that military forces face in applying the principle of distinction in urban warfare environments despite the use of precision-guided munitions*. Universiteit Leiden. p. 3-4, URL: <https://studenttheses.universiteitleiden.nl/access/item%3A3715467/view>, citing Andresen, (2017).
- [301] *RF struck Kharkiv with the UMPB D-30SN: what kind of bomb is it and is it possible to fight it*, (2024). Defense Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/rf\\_vdarila\\_po\\_harkovu\\_umpb\\_d\\_30sn\\_scho\\_t\\_se\\_zh\\_bomba\\_ta\\_chi\\_mozhilivo\\_z\\_neju\\_borotis-14869.html](https://defence-ua.com/weapon_and_tech/rf_vdarila_po_harkovu_umpb_d_30sn_scho_t_se_zh_bomba_ta_chi_mozhilivo_z_neju_borotis-14869.html) (Accessed 31.08.2024).
- [302] *RF struck Kharkiv with the UMBM D-30SN: what kind of bomb is it and is it possible to deal with it*, (2024). Defense Express, URL: [https://defence-ua.com/weapon\\_and\\_tech/rf\\_vdarila\\_po\\_harkovu\\_umpb\\_d\\_30sn\\_scho\\_t\\_se\\_zh\\_bomba\\_ta\\_chi\\_mozhilivo\\_z\\_neju\\_borotis-14869.html](https://defence-ua.com/weapon_and_tech/rf_vdarila_po_harkovu_umpb_d_30sn_scho_t_se_zh_bomba_ta_chi_mozhilivo_z_neju_borotis-14869.html) (Accessed 31.08.2024); see 'Western weapons are much more accurate,' aviation expert Kostiantyn Kryvolap explains to UP', Buderatskyi Y., *War of guided aerial bombs. Why Ukraine is talking about its own production of guided bombs*, (2024). Ukrainska Pravda, URL: <https://www.pravda.com.ua/eng/articles/2024/06/12/7460320/> (Accessed 31.08.2024).
- [303] Kramarenko D., Shkarlat K., *Cheap and dangerous. What are UMPB bombs that Russia struck Kharkiv with*, (2024). RBC-Ukraine, URL: <https://newsukraine.rbc.ua/news/cheap-and-dangerous-what-are-these-umpb-bombs-1711744305.html> (Accessed 31.08.2024).
- [304] Amnesty International, (2018). *'War of annihilation': Devastating toll on civilians, Raqqa - Syria*. Amnesty.org, p. 8, URL: <https://www.amnesty.org/en/documents/mde24/8367/2018/en/>.
- [305] Amnesty International, (2018). *'War of annihilation': Devastating toll on civilians, Raqqa - Syria*. Amnesty.org, p. 15, URL: <https://www.amnesty.org/en/documents/mde24/8367/2018/en/>.
- [306] P.Cohen A., Zlotogorski D., (2021). *Proportionality in International Humanitarian Law: Consequences, Precautions, and Procedures*. Oxford University Press, 2021, p. 31, citing Shany Y., (2009). *The Principle of Proportionality under International Law*, pp. 86-103, at 69.
- [307] *US sends 'bunker buster' bombs to Israel for war on Gaza, report says*, (2023). ALJAZEERA, URL: <https://www.aljazeera.com/news/2023/12/2/us-gives-bunker-buster-bombs-to-israel-for-war-on-gaza-report> (Accessed 31.08.2024).
- [308] *US sends 'bunker buster' bombs to Israel for war on Gaza, report says*, (2023). ALJAZEERA, URL: <https://www.aljazeera.com/news/2023/12/2/us-gives-bunker-buster-bombs-to-israel-for-war-on-gaza-report> (Accessed 31.08.2024).
- [309] Daniele L., *A lethal misconception, in Gaza and beyond: disguising indiscriminate attacks as potentially proportionate in discourses on the laws of war*, (2023). EJIL:Talk!, URL: <https://www.ejiltalk.org/a-lethal-misconception-in-gaza-and-beyond-disguising-indiscriminate-attacks-as-potentially-proportionate-in-discourses-on-the-laws-of-war/> (Accessed 31.08.2024).
- [310] For example, see the attacks of 8 March 2024 and 15 May 2024 in Kherson.
- [311] See the attack of 25 May 2024 in Kharkiv.
- [312] Media group Nakypilo. Kharkiv / Preliminary, Russians fired a missile from the Iskander complex at Kharkiv, Oleg Sinegubov (@nakipilov) reported, (06.08.2024), Telegram, URL: <https://t.me/nakipilov/36513> (Accessed 31.08.2024); Babel / In Kharkiv, at least 5 people were injured by the morning shelling by Russians (@babel), (06.08.2024), Telegram, URL: <https://t.me/babel/54579> (Accessed 31.08.2024).
- [313] Where in Kharkiv | Kharkiv / Kursk region. They write about the grey zone (@place.kharkiv), (06.08.2024), Telegram, URL:

- [https://t.me/place\\_kharkiv/79019](https://t.me/place_kharkiv/79019) (Accessed 31.08.2024); StroyObzor Kharkiv / Third arrival in this area [@StroyObzorKh], (06.08.2024), Telegram, URL: <https://t.me/StroyObzorKh/11828> (Accessed 31.08.2024).
- [314] Media group Nakypilo. Kharkiv / In Kharkiv, dozens of residential buildings, administrative buildings were damaged, dozens of civilian cars were destroyed [@nakipelovo], (06.08.2024), Telegram, URL: <https://t.me/nakipelovo/36514> (Accessed 31.08.2024).
- [315] Kharkiv 1654 | Hero City / Preliminary - the centre of Kharkiv was hit by Iskander [@kharkiv\_1654], (06.08.2024), Telegram, URL: [https://t.me/kharkiv\\_1654/97828](https://t.me/kharkiv_1654/97828) (Accessed 31.08.2024); Kharkiv 1654 | Hero City / Commentary by Dmytro Chubenko, spokesperson for the Kharkiv Regional Prosecutor's Office, on the shelling of the Shevchenkivskiy district of Kharkiv [@kharkiv\_1654], (06.08.2024), Telegram, URL: [https://t.me/kharkiv\\_1654/97832](https://t.me/kharkiv_1654/97832) (Accessed 31.08.2024).
- [316] International Criminal Court, (2014). *Situation in the Democratic Republic of the Congo in the Case of the Prosecutor v. Germain Katanga*, (07.03.2014), para 802, URL: <https://www.legal-tools.org/doc/f74b4f/pdf>.
- [317] International Criminal Court, (2014). *Situation in the Democratic Republic of the Congo in the Case of the Prosecutor v. Germain Katanga*, (07.03.2014), para 807, URL: <https://www.legal-tools.org/doc/f74b4f/pdf>.
- [318] Daniele L., *A lethal misconception, in Gaza and beyond: disguising indiscriminate attacks as potentially proportionate in discourses on the laws of war*, (2023). EJIL:Talk!, URL: <https://www.ejiltalk.org/a-lethal-misconception-in-gaza-and-beyond-disguising-indiscriminate-attacks-as-potentially-proportionate-in-discourses-on-the-laws-of-war/> (Accessed 31.08.2024).
- [319] Fighterbomber / Infantry complains about a large ping in the work of aviation [@fighter\_bomber], (13.08.2024), Telegram, URL: [https://t.me/fighter\\_bomber/17724](https://t.me/fighter_bomber/17724) (Accessed 31.08.2024); Fighterbomber / Good news. It's a pity that that it's bullshit [@fighter\_bomber], (04.07.2024), Telegram, URL: [https://t.me/fighter\\_bomber/17249](https://t.me/fighter_bomber/17249) (Accessed 31.08.2024); Fighterbomber / Insight from Liptsy, which were honoured to become a testing ground for the FAB-3000 M-54 UPCM [@fighter\_bomber], (21.06.2024), Telegram, URL: [https://t.me/fighter\\_bomber/17118](https://t.me/fighter_bomber/17118) (Accessed 31.08.2024).
- [320] Fighterbomber / Insight from Liptsy, which were honoured to become a test site for the FAB-3000 M-54 UPCM [@fighter\_bomber], (21.06.2024), Telegram, URL: [https://t.me/fighter\\_bomber/17118](https://t.me/fighter_bomber/17118) (Accessed 31.08.2024).
- [321] Fighterbomber / Infantry complains about a big ping in the work of aviation [@fighter\_bomber], (13.08.2024), Telegram, URL: [https://t.me/fighter\\_bomber/17724](https://t.me/fighter_bomber/17724) (Accessed 31.08.2024).
- [322] United Nations, (2007). *Prosecutor v. Milan Martić*, (12.06.2007), para 463, URL: <https://www.icty.org/x/cases/martic/tiua/en/070612.pdf>.
- [323] Article 25(3)(a) of the Rome Statute.
- [324] Article 25(3)(b) of the Rome Statute.
- [325] Article 25(3)(c) of the Rome Statute.
- [326] Article 27(5) of the Criminal Code of Ukraine.
- [327] Article 25(3)(c) of the Rome Statute.
- [328] Kai Ambos, Article 25 in: Triffterer/Ambos, *The Rome Statute of the ICC*, 3rd edition 2016, page 1003.



**The systematic use of guided aerial bombs for targeted attacks in Ukraine** began in 2023, a year after the full-scale invasion by the Russian Federation Armed Forces. These attacks have covered both the frontline and rear areas, resulting in massive destruction of homes, hospitals, schools and other critical infrastructure. Since March 2024, the Truth Hounds team has documented more than 950 such incidents, resulting in the deaths of more than 250 civilians and injuries to more than 1,300. There were 23 cases when the number of victims of one such strike exceeded 10 people. The actual number of crimes involving the use of guided aerial bombs by the Russian army is much higher, as Truth Hounds' monitoring covers only a limited period.

The principal objective of the study is to examine the attacks with the usage of guided aerial bombs on populated areas of Ukraine, evaluate their legitimacy under international humanitarian law, and illustrate the rising incidence of war crimes and civilian casualties resulting from such actions. The objective is to illustrate the extent and severity of these attacks, thereby establishing a foundation for further international pressure on Russia to cease the utilisation of these tactics. Furthermore, the research aims to create the preconditions for bringing to individual responsibility those who directly carried out or ordered such attacks.