

Glide Bombs: Russia Revives 'Old' weapons in War with Ukraine



In-Depth Report

July 18, 2023

News outlets and social media users started this April to report the emergence of a new type of weapon in Russia, one that it has allegedly been using in the war with Ukraine. The evidence of the potential usage consists of various photos and videos of glide devices. These glide bombs have a direct impact on Russia's increasing air superiority, as the glide bombs can be launched from its own territory without entering the conflict zone, and cannot be intercepted by air defense missiles. [The Ukrainian side also confirmed the threat glide bombs pose.](#)

World News Monitors team studied various open-source materials to shed light on these devices Russia has begun to use.

Russia currently has the following types of glide bombs. All of them have different combat characteristics and are produced by different companies or plants:

- FAB-500 and its variants
- FAB-1500
- UPAB-1500
- UPAB-500
- KAB-500
- KAB-250

With UPAB being originally a guided and glide bomb, the use of FAB bombs implies the installation of a module on them, which includes wings that unfold in flight and a system for correcting wind drift. It was these two types of bombs that were most often seen.

UPAB

UPAB (Upravlayemiya Planiruyushchaya Avia Bomba, 'guided gliding aviation bomb') is produced by the state scientific and production enterprise "[Region](#)".

Region's website lists some of the missiles mentioned in the report. These are UPAB-1500B-E (index K029BE).



АО
"ГНПП "РЕГИОН"

Управляемая планирующая
авиационная бомба
УПАБ-1500Б-Э (индекс К029БЭ)



АВИАЦИОННЫЕ
БОМБЫ

Управляемая планирующая авиационная бомба К029БЭ предназначена для поражения наземных и надводных малоразмерных прочных и особопрочных объектов.

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- приемник спутниковой навигации;
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- фугасная бетонобойная боевая часть;
- авиационное взрывательное устройство.

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ОСНОВНЫЕ ТАКТИКО-ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

Масса, кг (общая/БЧ)	1525/1010
Габаритные размеры, м длина диаметр	5,050 0,4
Высота сброса, км	до 15
Дальность сброса, км	до 50
Точность (Екво), м	до 10
Система наведения	инерциально-спутниковая
Боевая часть	фугасная бетонобойная
Тип взрывательного устройства	контактный с тремя видами замедления

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bastion-karpenko.ru/index ВТС "БАСТИОН" МАКС-2019

Figure 1: Brochure of the organization "Region" with information about UPAB bombs (Source: [MAKS-2019/Bastion Karpenko](http://MAKS-2019/Bastion-Karpenko))

According to the enterprise's information, this product has 'a unique design that allows it to be dropped at distances of up to 50 km from the target'.

In addition, the [patent](#) of the Region enterprise from 2021 is available in open source media. The objective of the invention is to increase the range of the UPAB. The patent is called 'the aerodynamic layout of a guided glide bomb and is a set of two drop-down wings'. The creators of the invention claim that the range of a bomb with a new layout can reach more than 110 km. Not much information is given about the invention, however, it helps to establish that Region has been working on gliding module analogs for its bombs.

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FOR INTELLECTUAL PROPERTY

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(12) **ABSTRACT OF INVENTION**

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(54) **AERODYNAMIC LAYOUT OF A CONTROLLED GLIDING AERIAL BOMB**

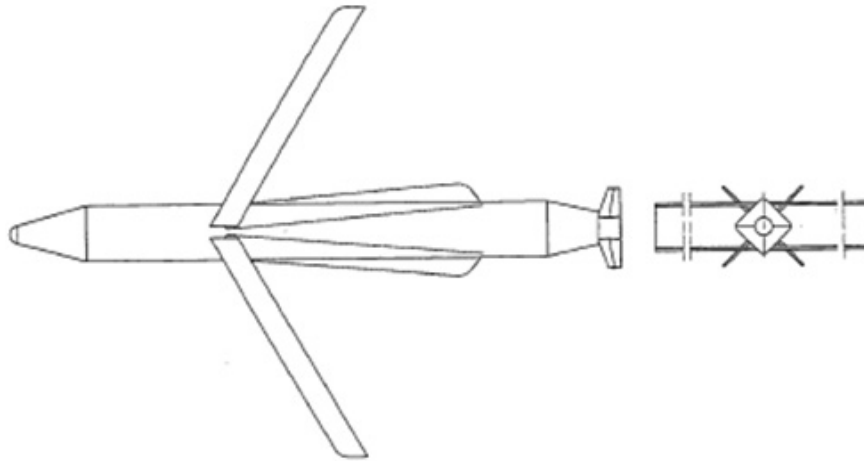
(57) Abstract:

FIELD: aviation technology.

SUBSTANCE: invention relates to aviation technology, in particular to guided aerial bombs. A guided gliding aircraft bomb (GGAB) contains a hull that consists of sequentially connected bow, center and aft parts. The bow of the body at the base has a square shape with a square side of length l and passes into a sphere at the top of the bow. The central part is made square in cross-section with the side of the square length l . The aft part has a square shape with the side of a square with a length of l at a larger base, smoothly turning into a smaller base of circular cross section,

while the side of the square with a length of l is located at an angle of $\varphi=45^\circ$ relative to the vertical plane of symmetry. Body length $Lf=14,4l$. In the central part of the body, there are vehicle suspension elements and the wing made using the biplane aerodynamic scheme consisting of four consoles with magnitude equal to $Lk=11,1l$ and $Lk=2,25a$, respectively, for the expanded and retracted position of the wing, with angles of sweep on the leading edge of $\chi_0=30^\circ$ and $\chi_0=84,5^\circ$, respectively, for the expanded and retracted position of the wing with a chord of the wing equal to $b=0,67a$, with a curved double convex profile, the relative

Стр.: 3



Фиг. 1

Figures 2,3: Patent of Aerodynamic layout of a controlled gliding aerial bomb registered by “Region”
(Source: [Yandex Patent](#))

Information about the use of the bomb appeared on 5 March on the Russian [“Military Review” website](#). According to the article, Russian planes used the UPAB ammunition against positions of the Ukrainian military in Avdiivka. Also, the bombs have been used several times during the war with Ukraine, including on the territory of Azovstal in Mariupol. The website promotes Russia’s position in this conflict, which can be understood from the terms used: the author refers to the war as a “special operation” and focuses on the Azov regiment as a terrorist organization. However, dissatisfaction is already flaring up among the users of this website, the audience of which is supposed to be loyal to the government. Users opine that the Russian army no longer has UPAB bombs, as they are quite expensive and rarely featured in military media chronicles.

According to this hypothesis, Russia started to use modified FAB-500 bombs.

FAB

FAB-500 bombs are old Soviet air bombs with explosive charges, adopted in 1954. First models of FAB-500 were created in 1934. Since then, these bombs have undergone numerous modifications. In 1962, a modification of FAB-500 M62 was created, which was designed to be transported on external suspensions. It is this modification that is used with the special module in the war (MPK – modul planirovaniya i korrektsii, ‘gliding and correction module’). Information about this module appears in many sources, including Ukrainian [analytical](#) and media articles.

The first mentions of development of such modules go back to 2003 when Vladimir Korenkov, director-general of [FSUE “SRPE “Bazalt”](#), [told](#) one of lead Russian news company “Interfax.” He stated that “Bazalt” developed a guidance and correction module for air bombs. He explained that it was an air-mechanical module that can be complemented with additional systems to transform an air bomb to a guided and corrected one.

Korenkov said in 2003: “This means that it will be possible to work with free-fall bombs without entering the enemy’s air defense coverage area. The module gives a new quality to air bombs. It makes them more perfect, taking into account the tactics that will be used in the next 10 years.”

As an example, he named the FAB-500M62 bomb that can be used after the installation of the module. He stated that efficiency of its launch is 6.4-15 km from 200-5,000 m altitude with the speed of the aircraft of 800-1,100 km/h. The maximum radius of damage for lightly vulnerable vehicles is 110-180 meters and for lightly armored vehicles is 55 meters.

Later, at Aero India 2009, Bazalt also presented the newly developed MPK, according to the February 2009 issue of Take-off magazine. Bazalt modified the MPK to a special “commonised set of gliding and control kits” which can be added to free-fall and cluster bombs. Kits consist of folding wings and guidance, navigation, and satellite update packages. The main feature of the technology is that it can be assembled right at the airfield.

The model of the bomb FAB-500M-62 with MPK was shown at the expo in 2009. This bomb is said to be the most mass-produced Russian bomb and still remains in the possession of many countries even outside Russia.



Figure 4: FAB-500M62 bomb with MPK model (Source: "Take-off", Feb. 2009, photo by Yevgeny Yerokhin)

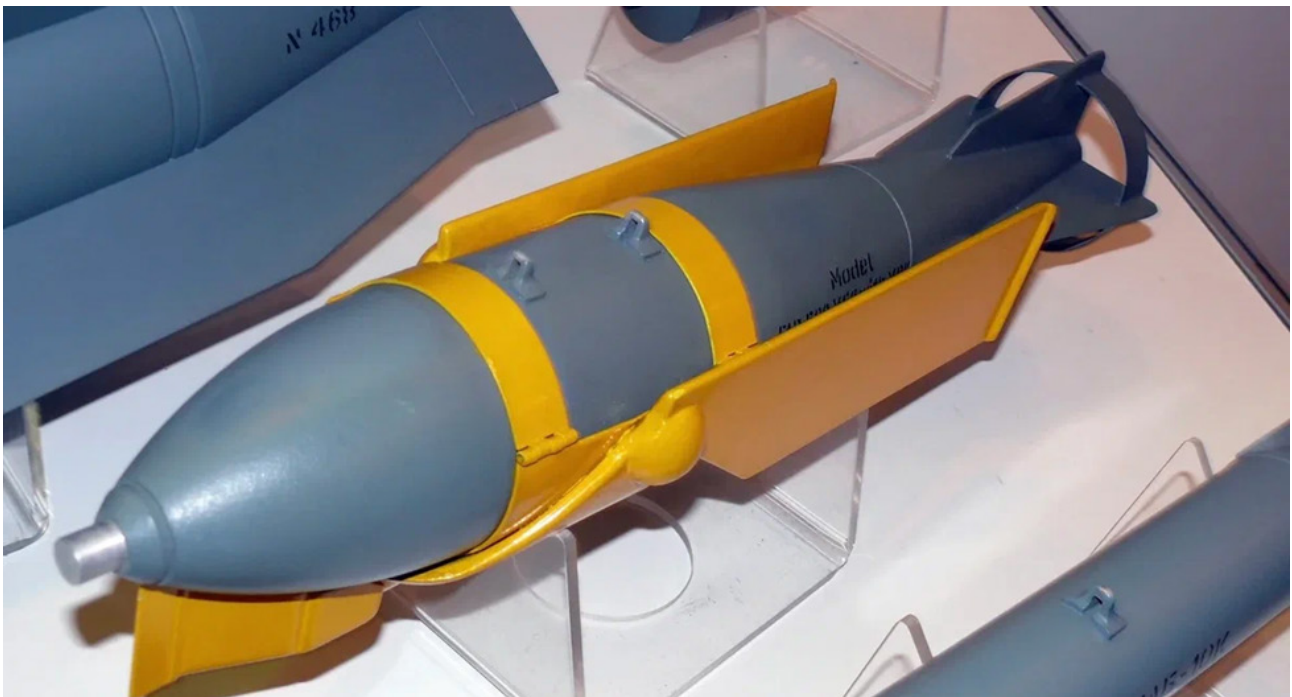


Figure 5: FAB-500M62 bomb with MPK model with closed wings

The MPK kit can be upgraded to four different configurations, according to the same brochure:

Option 1 provides an aerodynamic solution with no electronic devices on it, allowing the bomb to self-stabilize and offset the wind. This configuration can be used at a range of 6-8 km from the altitude of 50-100 m.

Option 2 uses the MPK and INS (inertial navigation system) unit, which allows to guide a bomb to the target location. The range of this configuration is 12-15 km.

Option 3 provides GPS/GLONASS receiver for INS module from the previous kit. This solution increases the range to 40-60 km depending on aircraft's speed and flight mode.

Option 4 kit functions with an added pulsed ramjet engine, which provides the 80-100 km range.

The upgraded bombs are 400 mm in diameter, 645-2,000 mm in wingspan, and 3,000 mm in length. They weigh up to 540 kg with a 300 kg warhead.



Figure 6: Bazalt's advertisement in Take-off magazine with the FAB-500M-62 with MPK model

The image of the FAB-500 with a gliding and correction module was already featured on the Bazalt's corporate calendar from 2006. This item was discovered on [Russian marketplace 'Meshok'](#).



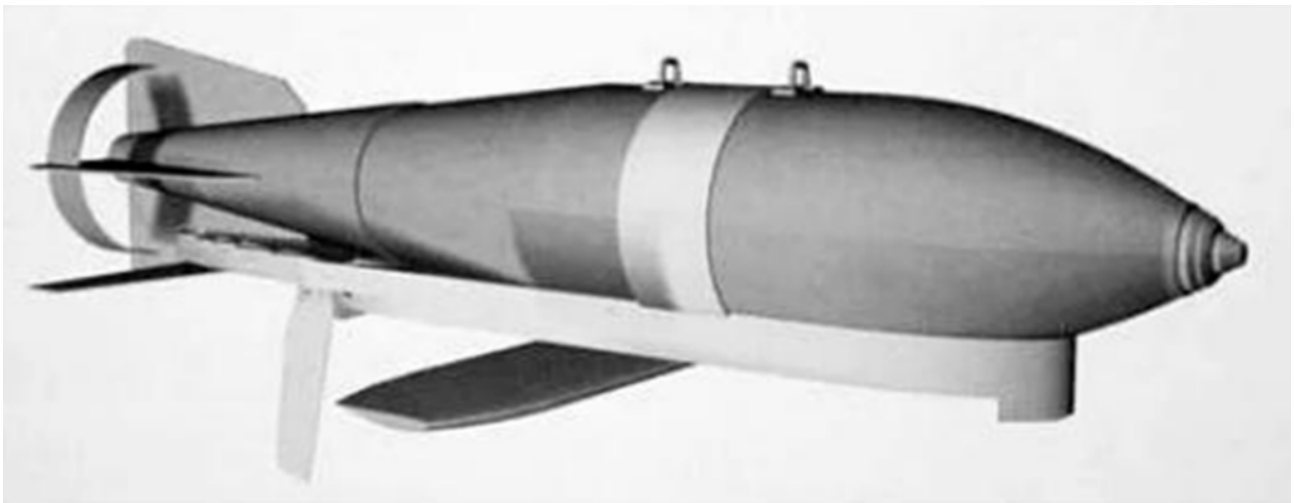
Figure 7: Bazalt's corporate calendar from 2006 showing renders of a FAB-500 with MPK (Source: [Meshok](#))

The picture shows the 3D render of a different gliding module, which likely means the previously shown MPK wasn't the only device under development by Bazalt.

Following is the higher resolution image of the second module:



It is noteworthy that the bomb is displayed upside down, as hangers are located in the lower part of the bomb. Thus, the device should be presented as follows:



Figures 8,9: FAB-500 bomb with a different MPK model image

The calendar also reveals the other Bazalt products, for example ODAB-500PM an explosive device with parachute stated to be as destructive as a tactical nuclear weapon. It is actively being used by Russia in Syria. Contact WNM for more insights on Bazalt's ammunition.

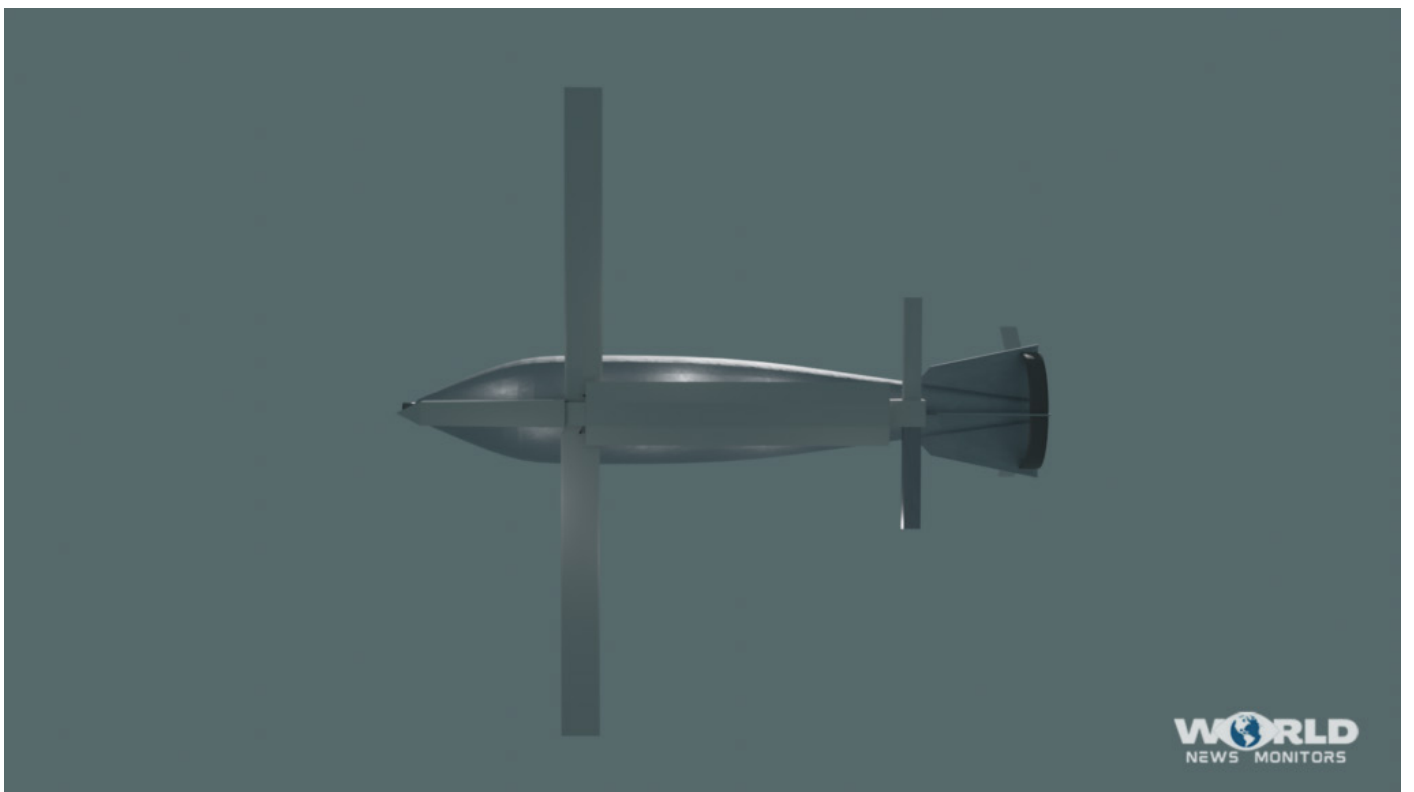
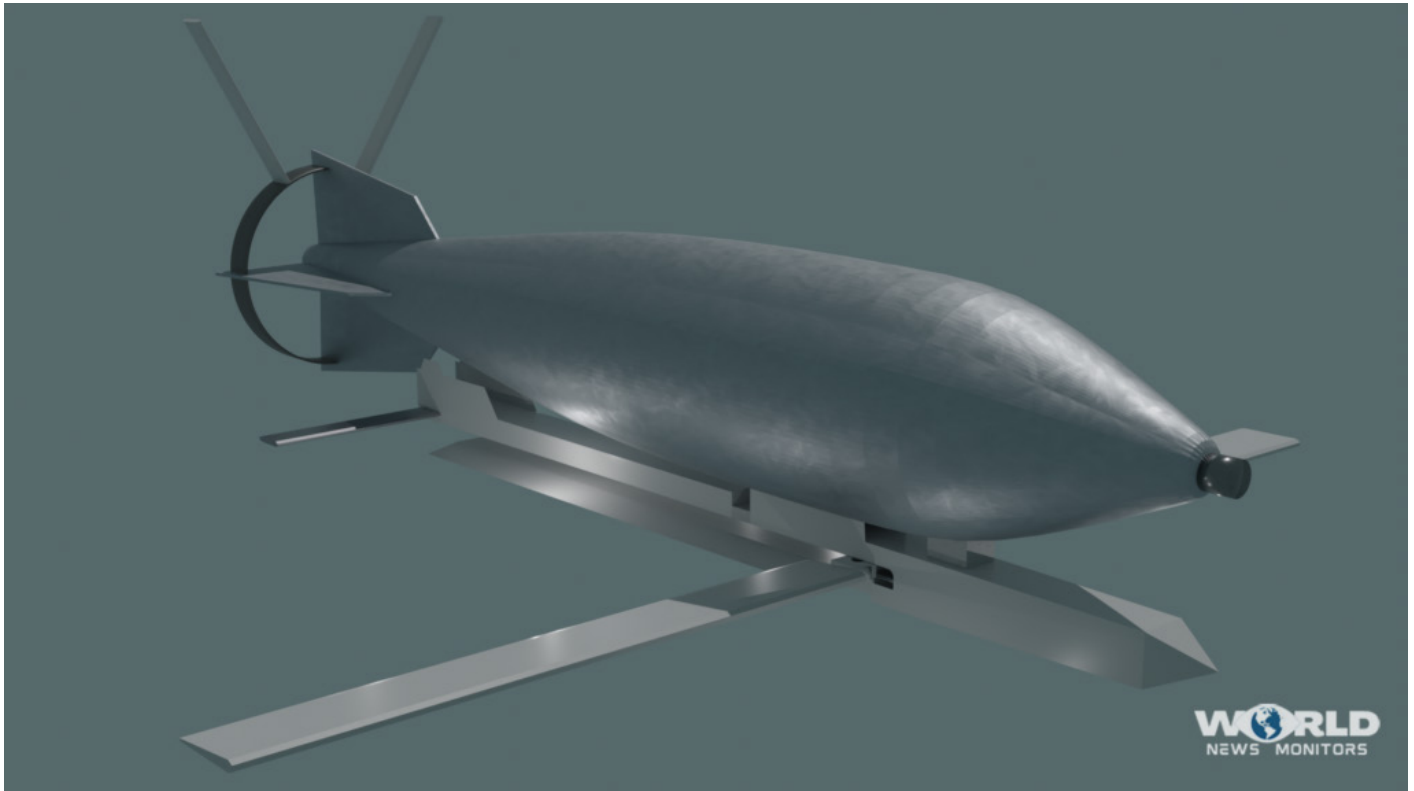
A similar gliding device was captured in a recent picture circulating online. The image displays an aero bomb with 'mysterious set of wings'. Journalists and social media users erroneously call the ammunition TGAF-5M; however, TGAF is the name of the explosive used in the bomb. This explosive is an alloy of RDX, TNT, and aluminum powder. The bomb



Figure 10: Recent picture of a FAB-500 with a gliding device

This picture provides a closer look at the module used. Since no other picture or images of the module could be found, we recreated the MPK in 3D to better demonstrate the nature and work of the module.





Figures 11, 12, 13: 3D renders of FAB-500 with MPK module created by WNM

The differences between the early 2000s Bazalt development module and the module currently used on the FAB-500 MP bomb are clearly visible. Defense Express shared pictures of debris from one of the bombs fallen in Sumy Oblast and Donetsk in March 2023. The fragments of missiles clearly match the above module.

Сумська область, 24 березня 2023 р.

Донецьк, 12 березня 2023 р.



Figure 14: Pictures of a destroyed gliding device matching the modeled module (Source: Defense Express)

The wing mounting details match the mounting details on the photo.

Сумська область, 24 березня 2023 р.



Figure 15: Closeup comparison of the mounting screws

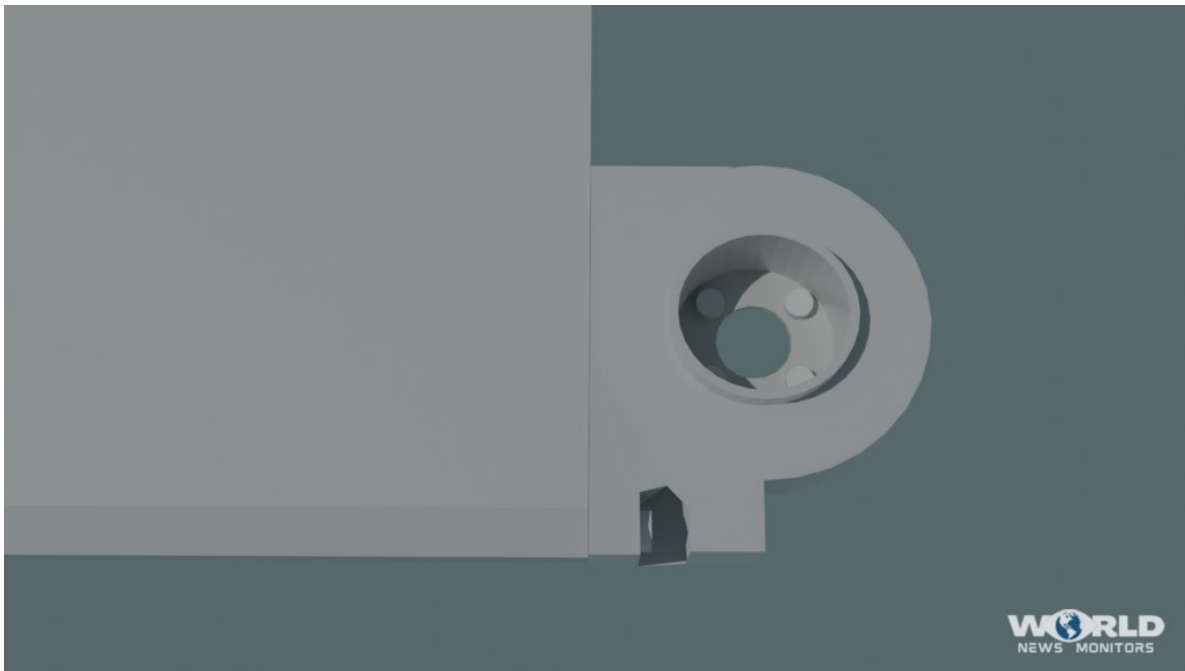


Figure 16: 3D render of the detail by WNM

FAB bombs [appear](#) in an article by Kommersant dated 12 August 2017, where they are called “special items with 500 kg caliber.” The article talks about the Dzerzhinsky plant named after Sverdlov, which launched the production of high-explosive bombs. This plant is said to be the only automated production line of such ammunition in Russia. The article states that this type of ammunition proved to be successful in Syria. It is stated in the article that Russian pilots, taking into account the ‘technologies and the work of our designers’, have learned to work in such a way that the product is actually not inferior to high-precision weapons. It is possible that the talk about the technology and the work of designers hints at the use of planning modules.

The Ukrainian media calls this plant a [factory of death](#); it is engaged in the production of FAB bombs of various calibers and is also the only manufacturer of energy-rich materials – HMX and RDX (information from the VK group [[FKP Plant named after Y.M. Sverdlov](#)]).

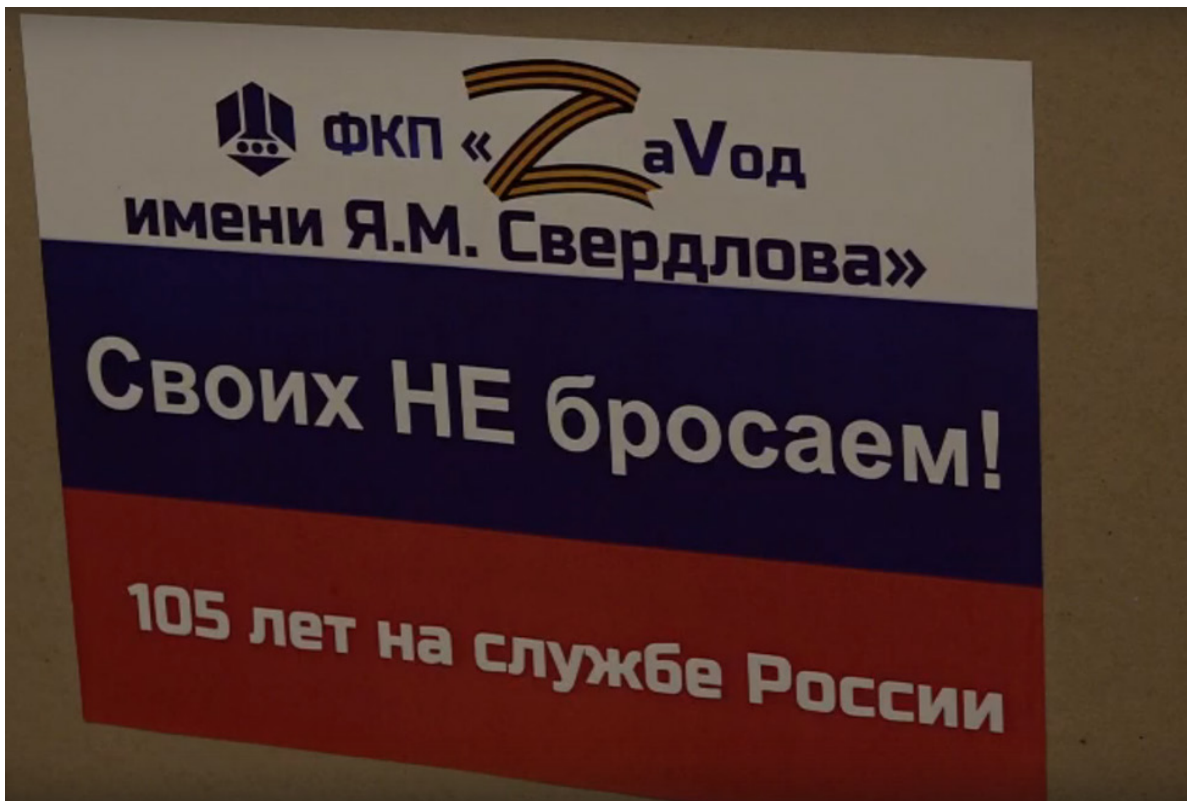


Figure 17: Image from VK group of the factory: “State Owned Enterprise Ya. M. Sverdlov Plant”, “We don’t leave ours behind!”, “Serving Russia for 105 years.” The Russian word Zavod (‘plant’) is pictured with “Z” and “V” symbols absent from the Russian alphabet. Those symbols are actively used by Russian regime supporters.

However, the origin and context of the picture displaying the bomb with a gliding device remains unclear. A picture of the same bomb with the similar painted shark is found in one of the news [articles](#) from 2017 devoted to the opening of the FAB-500 production line at the abovementioned factory.



Figure 18: Rambler/TK Zvezda photo of FAB-500 M62 with painted shark and TGAФ-5M markings.

TK Zvezda (Russian state-owned TV network run by the Ministry of Defense) says that the picture was taken by a pilot of the MiG-31 fighter-interceptor. According to Zvezda, he was active on Instagram around 2015 – 2017. The account has now been deleted or renamed. Zvezda [reports](#) that the author serves in the 98th Separate Guards Red Banner Vislensky Order of Kutuzov mixed aviation regiment stationed in Monchegorsk, Murmansk region, Russia. However, it is unknown if the Instagram account was the original source of the picture.

The Monchegorsk regiment is armed with MiG-31, Su-24, and since 2015, Su-34 aircraft, FAB-500 bomber.



Figure 19: FAB-500 displayed at the open house event of the Monchegorsk regiment in 2016 (Source: [Youtube](#))

These bombs, as well as other products of the Bazalt enterprise, were repeatedly used by Russian air force in Syria. In addition, already during the hostilities between Russia and Ukraine, Russian bombers unplannedly dropped bombs on Russian territory, some of which exploded, causing damage to buildings and injuring civilians.

World News Monitors team continues to research Russian weapons used in war with Ukraine.

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