

Shelling of Kievskiy District, Donetsk, using Grad MLRS on August 14, 2014*PUBLIC INVESTIGATION**Donetsk 04.02.2023**Authors: Ivan Aleksandrovich Kopyl
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ABBREVIATIONS

BTG - Battalion Tactical Group

UAF - Ukrainian Armed Forces

DPR - Donetsk People's Republic

IMBr - Independent Mechanized Brigade

RAB - Rocket Artillery Battalion

MLRS - Multiple Launch Rocket System

MP - missile part of the projectile

UAF - Ukrainian Armed Formations

PREAMBLE

During the summer of 2014, Donetsk was under siege. Clashes took place between the DPR militia and Ukrainian armed formations in the area of Donetsk airport¹.

At the turn of July-August, the UAF managed to take control of Avdeyevka and gain a foothold on the outskirts of Donetsk near the airport. However, they failed to develop the offensive further. Attempts to immediately take Yasinovataya², to begin the encirclement of Horlivka did not lead to success³.

At the same time, densely populated areas of the cities of Donbass were subjected to regular artillery shelling. Thus, on August 14, 2014, the UAF exposed the city of Donetsk to dense artillery fire throughout the day. As a result of six⁴ shellings, 11 civilians were killed and at least 8 obtained injuries of varying severity. Significant damage was caused to civilian infrastructure and housing stock, material damage due to the destruction of personal belongings of the affected citizens, several trucks were damaged, in addition, the following objects were affected: Central Municipal Clinical Hospital No. 1, *Green Plaza* shopping and entertainment center, educational buildings of the Donetsk National Technical University, the building of the city prosecutor's office, *Yunost* Palace of Youth.

This investigation will examine the shelling of the densely populated **Kievskiy District of Donetsk**, which occurred on **August 14, 2014** at approximately **16:00** and was performed using the Grad MLRS.

During the shelling, residential buildings were damaged located at Vanda Vasilieva St., Kotsyubinskiy St., Pokryshev Lane, Lepeshinskiy Lane.

¹ Donetsk Airport Story of courage and betrayal (published on 20.10.2014) LiveJournal Online Journal Service. URL: <https://werewolf0001.livejournal.com/2119016.html> (accessed on 03.02.2022)

² Battles for Yasinuwata (published on 16.08.2016) "Wikipedia" Internet Encyclopedia [Ukrainian version]. URL: https://uk.wikipedia.org/wiki/Бої_за_Ясинувату (accessed on 03.02.2022)

³ Strana.ua: War of 2014. The path to the Ilovaik trap (published on 26.08.2016) Ukraine.ru URL: <https://ukraina.ru/digest/20160826/1017336687.html> (accessed on 03.02.2022)

⁴ The Donetsk City Council published a list of buildings affected by shelling on August 14 (published on 15.08.2014) Donetsk 62.ua Website. <https://www.62.ua/news/598596/doneckij-gorsoviet-obnarodoval-spisok-postradavsih-ot-artobstrela-14-avgusta-zdanij> (accessed on 03.02.2022)

Four civilians died: Irina Nikolenko born in 1972, Vadim Nikolenko born in 1964⁵, a woman whose identity is unknown and a minor Artur Babenko born in 1999 года рождения. The adults died on the spot, and the teenager received fragmentation wounds to both legs and chest⁶. In the Regional Traumatological Center of Donetsk (now the Republican Traumatological Center), the boy underwent an operation, but he died the next day without regaining consciousness.

⁵ Shelling of 15 Levitskiy St. with Grad Two fatal casualties (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/0HkFH30MEAs> (accessed on 04.02.2023).

⁶ Artur Vitaliiovych Babenko. Book of Memory Website. URL: <https://remember.wiki/ru/people/babenko-artur-vitaliiovych/> (accessed on 04.02.2023).

INCIDENT LOCATION

After analyzing the eyewitnesses' testimony, the photo and video materials, and having used Google Earth Engine, we were able to identify **nine** shell hits (see Fig. 1).

Shell hit 1 (see Fig. 2, Fig. 3). The shell hit occurred in the private sector at 12, Kotsyubinskiy St., a projectile hit the backhouse, this is clearly visible in the satellite image dated September 3, 2014, as a result of which it damaged the roof of the building and set it on fire⁷.

Shell hit 2 (see Fig. 4, Fig. 5, Fig. 6). The shell hit affected the asphalt pavement near the residential building at 19, Levitskiy St. At the site of detonation, a part of the MLRS rocket projectile MP remained in the crater, and next to it, a fragment characteristic of the Grad MLRS projectile stabilizer block was found. It is known about two fatal casualties.

According to eyewitnesses of the shelling, there were two explosions in the immediate vicinity of the residential building at 19, Levitskiy St. The first of them landed and detonated 10 meters from Irina Nikolenko, born in 1972, and Vadim Nikolenko, born in 1964, who were passing by at that moment. The second shell hit a tree near the *Belochka* kindergarten and detonated, killing Irina and Vadim on the spot. Also, according to eyewitnesses, another woman was killed, but her personal details are unknown.

Shell hit 3 (see Fig. 7). The shell hit occurred in the territory of the private residence at the address 5, Lepeshinsky Lane, damaging the roof, and destroying a garage and a barn. In addition, the same explosion damaged the roof of the house at 6/6, Pokrysheva Lane⁷. The satellite image dated September 3, 2014 clearly shows the corresponding destructions.

⁷ Destruction in Donetsk on August 14 (list by districts) (published on 15.08.2014) News of Luhansk and the region. News of Ukraine today. Skhid.info URL: https://cxid.info/116063_razrusheniya-v-donecke-avgusta-spisok-po-raionam.html (accessed on 03.02.2022)

Shell hit 4 (see Fig. 8, Fig. 9, Fig. 10). The shell hit occurred at 15, Vanda Vasilieva St. The shell hit damaged 48 square meters of roof. In addition, the residential building at 17, Vanda Vasilieva St., was completely destroyed by fire⁸.

Shell hit 5 (see Fig. 11, Fig. 12). The shell hit occurred northwest of the Donetsk Museum of Local Lore, five meters from a private house at 70 Baidukov St. The well-known Soviet writer Boris Gorbатов lived in this house in 1950-1951, just at that time he was working on the novel “*Donbass*”⁹. The projectile hit the ground surface and damaged the underground gas pipeline, as a result of which the gas supply was disrupted. The recovery team of Donetskgorgaz PJSC arrived at the emergency site and using an excavator, found fragments of a jet propulsion system of a MLRS projectile at the depth of the pipe.

Shell hit 6 (see Fig. 13, Fig. 14). The shell hit occurred at the intersection of Chelyuskintsev St. and Baidukov St., 20 meters away from the northeast corner of the residential building at 206, Chelyuskintsev Str¹⁰. The projectile damaged the curb near the tram tracks, and the tram rails. Three meters away from the point of the projectile contact, closer to the asphalt surface of Chelyuskintsev, a part of the tail was found, and identified as the remains of the missile part (hereinafter MP) of the MLRS rocket projectile.

Shell hit 7 (see Fig. 15). The shell hit occurred on the asphalt surface of the road 24 meters away from the southeast corner of the residential building at 206, Chelyuskintsev St^{11 12}.

Shell hit 8 (see Fig. 16, Fig. 17, Fig. 18). The shell hit occurred in the ground surface, a few meters west of the pavilions selling flowers at 189A/1,

⁸ The shelling of the Donetsk-Gladkovka district on August 14. #donetsk #gladkovka (published on 19.11.2014) VKontakte Social Network. URL: https://vk.com/video-70675874_170570646 (accessed on 03.02.2022)

⁹ They were drinking beer and eating crayfish: The house of a classic of Soviet literature is being saved in Donetsk (published on 04.08.2018) Ukraine.ru URL: <https://ukraina.ru/20180804/1020742218.html> (accessed on 03.02.2022)

¹⁰ 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (3) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/9dvRE6QpIMI> (accessed on 02.02.2022)

¹¹ 14.08.2014. Donetsk, 202-210, Chelyuskintsev Str. The result of the shelling at the day time. (1 part) (published on 14.08.2014) VKontakte Social Network. URL: https://vk.com/wall-75214346_419 (accessed on 10.02.2022)

¹² 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (2) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/wzt9L8o-7YU> (accessed on 02.02.2022)

Chelyuskintsev St¹³. The fragments damaged the facade and glazing of the trade counters. There is a blood stain near one of the flower stores¹⁴. According to witnesses, it was here that under-age Artur Babenko was wounded. He subsequently died from wounds¹⁵.

Shell hit 9 (see Fig. 19, Fig. 20, Fig. 21, Fig. 22). The shell hit occurred in the ground surface¹⁶ 40 meters north of the Palace of Youth building, which is located at 189, Chelyuskintsev St. As a result of the shell hit, the façade windows of the building were knocked out by the blast wave,¹⁴ the metal fence was damaged and the vegetation caught fire.

¹³ 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (1) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/m5L49xRmN3o> (accessed on 02.02.2022)

¹⁴ Donetsk, Gladkovka, shelling on August 14 (published on 15.08.2014) Odnoklassniki Social Network. URL: <https://ok.ru/video/5746984210> (accessed on 03.02.2022)

¹⁵ More than 70 children killed during the military conflict in Donbass (published on 15.12.2015) Administration of the city of Donetsk | Official website. URL: <http://gorod-donetsk.com/novosti/4098-za-vremya-voennogo-konflikta-na-donbasse-pogiblo-bolee-70-detej> (accessed on 03.02.2022)

¹⁶ New. Donetsk, Chelyuskintsev St. Shelling effects. 15.08.2014 (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/bRd5KXED0oY> (accessed on 02.02.2022)

WEAPON TYPE

Projectile debris

Remains of rocket MP were found at shell hits 5 and 6 (see Fig. 12, Fig. 14).

At the beginning of the war in Donbass, only three types of MLRS were used: Grad, Uragan and Smerch. In the case of shell hit 2, the discovered debris of the nozzle unit of the jet propulsion system has a symmetrical shape, characteristic of the Grad MLRS RF projectiles (see Fig. 25), in contrast to the Uragan and Smerch MLRS jet propulsion nozzle units. The latter have, firstly, a different cone angle of the nozzle part on the side of the rocket and on the side of the jet exit (see Fig. 26, Fig. 27), and secondly, they have a much larger size that can even be distinguished visually.

At the site of shell hit 2, the video recorded the detonation of one of the shells, and its fragment (see Fig. 5), identified by us as the rear cone of the Grad MLRS projectile stabilizer unit. This is indicated directly by the shape, the presence of deformed spring and blade, and holes for adjusting screws.

Let us consider shell hit 5. In the description below the video, representatives of Donetskgorgaz PJSC claim that during the repair work at the site where the projectile hit the ground surface, the repair team managed to find a tube from a Grad MLRS rocket. The diameter of the underground gas pipeline is 108 mm, the body of the rocket pierces it perpendicularly (see Fig. 28). This makes it possible to measure the diameter of the rocket and compare it with the diameter of the gas pipeline. With the help of a forensic ruler, we determined the width of the Grad MLRS projectile MP and the gas pipeline with an error of 10%. In our case, the width of the projectile MP was approximately 13 cm, and the width of the gas pipeline was approximately 11.5 cm (see Fig. 29). Regarding the error and possible deformation of the projectile MP and the gas pipeline, we were able to prove that the diameter of the Grad MLRS rocket is 122 mm.

All of the above facts allow us to assert that **on August 14, 2014, the densely-populated Kievskiy district underwent artillery fire with the Grad MLRS.**

BM-21 Grad MLRS

The 122-mm BM-21 Grad multiple launch rocket system is intended to destroy open and sheltered manpower, unarmored vehicles and armored personnel carriers in the area of concentration of artillery and mortar batteries, command posts and other targets.

The BM-21 combat vehicle was developed according to the classical scheme with the placement of an artillery unit in the stern of an automobile chassis. The artillery unit is a package of 40 tubular rails mounted on a swivel base with the possibility of guidance in vertical and horizontal planes. The guides are 3 meters long, the inner diameter of the smooth bore is 122.4 mm. The guide rails are arranged in four rows of ten tubes each, thus forming a package. Guidance mechanisms make it possible to direct the package of rails in a vertical plane in the range of angles from 0 to +55 degrees. The horizontal firing angle is 172 degrees (102 degrees to the left of the vehicle and 70 degrees to the right).

The fire control system allows firing both single shots and in a volley. The duration of a full salvo is 20 seconds. Firing can be carried out in a wide temperature range from -40° C to + 50° C. Transferring the system from traveling to combat modes takes 3.5 minutes¹⁷.

The projectile for firing from 9K51 Grad MLRS consists of a fuze, head and rocket parts. As a result of contact with an obstacle, the detonator initiates an explosion of the shell head, which scatters into fragments. The rocket often remains more or less intact, though deformed. It is usually found either inside the shell crater, or in the immediate vicinity of it. For clarity, we present the design and technical

¹⁷ BM21 Grad Multiple Launch Rocket System The background information (published on 13.08.2008) RIA News website. URL: <https://ria.ru/20080813/150330804.html> (accessed on 03.02.2023)

characteristics of the most common projectile used for firing from the Grad MLRS (see Fig. 23, Fig. 24).

According to its technical characteristics, the M-21OF projectile has three maximum ranges (depending on the use of various brake rings), which are 12,000, 16,000 and 20,400 meters.

PROBABLE SECTOR OF SHELLING

Direction

In case of shell hit 5, the projectile hit the ground surface and damaged the underground gas pipeline. Note that the gas pipeline runs parallel to the road surface along Baidukov St., which intersects Chelyuskintsev Street. The body of the rocket pierced the underground gas pipeline perpendicularly at an angle from the northwest side.

At the site of shell hit 7, the ammunition detonated at the moment of impact on the asphalt pavement in Chelyuskintsev Street. The left part of the photo in Fig. 30 shows directly the place of contact of the projectile with the surface (the crater center), to the right of which fragmentation grooves are visible on the asphalt surface. After studying the physical traces formed by the projectile explosion, we came to the conclusion that the crater belongs to the second type. We also determined the shelling direction by the method of fragmentation grooves (see Fig. 31). It can be argued that the projectile was fired along a trajectory parallel to the road, i.e., from northwest to southeast along an azimuth of approximately 320 degrees (see Fig. 32).

It should be noted that when firing from rifled artillery, the impact sites of projectiles fired from one gun can usually be inscribed in an ellipse stretched along the direction of flying projectiles. This is an additional sign that allows for determining the shelling direction. In the case under consideration, all shell hits can also be inscribed in an ellipse stretched along the 320 degrees azimuth that we have determined (see Fig. 33).

Thus, it can be asserted that the **shells were fired from the northwest to the southeast along an azimuth of 320 degrees.**

Firing range

The firing range of the Grad MLRS is from 5 to 20.4 km, depending on the use of various brake rings.

Based on the map of hostilities on August 10-25, 2014, created by the blogger KOT-IVANOV¹⁸, considering the minimum and maximum firing ranges, the azimuth of the shelling direction (320 degrees, regarding the error of ± 15 degrees), we can map the line of demarcation, and the sector, from which shelling of the Kievskiy district of Donetsk was carried out on August 14, 2014 (see Fig. 34 – The sector from which the shelling was carried out on August 14, 2014. Fig. 34).

Proceeding from the scheme drawn up, it can be argued that the shelling was carried out from the territory controlled by the Ukrainian armed formations. This sector covers the settlements of Veseloye - Opytnoye - Vodyanoye - Severnoye - Tonenkoye - Lastochkino - Orlovka, controlled by the Ukrainian armed formations.

It is worth noting that Grad MLRS are usually placed no closer than 3-4 km from the contact line so that it does not become an easy target for the opposite side.

¹⁸ Maps of hostilities on August 10-25, 2014 (published on 25.08.2014] LiveJournal Online Journal Service. URL: <https://kot-ivanov.livejournal.com/2014/08/25/> (accessed on 01.02.2023)

MILITARY PRESENCE

In June-July 2014, the 2nd BTGr of the 93rd Motorized Brigade was located in the contact line section from Avdeyevka to Karlovka (see Fig. 35). In June 2014, two Grad MLRSs were also observed in the vicinity of Karlovka (see. Fig. 36). Noteworthy, the 93rd IMBr includes a rocket artillery battalion, armed with Grad MLRS¹⁹. Appropriate ammunition can be seen in one of the photos taken in July 2014 (see Fig. 37).

Also, after analyzing the losses among members of the Ukrainian armed formations, we could find out that from June to November 2014, mainly servicemen of the 93rd Independent Mechanized Brigade were dying near the settlements Tonenkoye, Vodyanoye, Opytnoye, Veseloye, Karlovka and Avdeyevka.

In July 2014, the 2nd Battalion tactical group of the 93rd IMBr attacked and took control of the settlements of Peski and Avdeyevka.

In addition, open sources also report the presence of the Grad MLRS, as of the end of July 2014 in the sector under consideration, namely in Orlovka²⁰.

Based on the foregoing, it can be argued that in August the sector from which the shelling of the Kievskiy district of Donetsk was carried out was under the control of the UAF, and artillery positions were equipped in small settlements, including to support the UAF units located at Donetsk airport.

Moreover, the commander of the brigade artillery group, Oleg Martynenko, with the call sign “Meteor”, said that the artillery of the 93rd IMBr “fought in small settlements, where were villages, fields, etc.²¹»

¹⁹ The 93rd Mechanized Brigade of the UAF fighting in Donbass (published on 23.10.2017] LiveJournal Online Journal Service. URL: <https://colonelcassad.livejournal.com/3759796.html> (accessed on 03.02.2023)

²⁰ Retrospective review. Donetsk in the summer of 2014. Part two (published on 03.08.2015) LiveJournal Online Journal Service URL: <https://chervonec-001.livejournal.com/764746.html> (accessed on 03.02.2023)

²¹ "93: a battle for Ukraine": Diary of Battles for Donetsk Airport and Approaches to It (published on 14.10.2020) YouTube Video hosting. URL: <https://youtu.be/Cmr-sDDi5XA> (accessed on 02.02.2023).

Unfortunately, we could not find out who was the RAB commander. However, we have a photo of the military personnel of the battalion of interest to us (see Fig. 38). In addition, there is a lot of information about the commander of the 93rd IMBr, who is responsible for the actions of his subordinates.

Colonel of the Armed Forces of Ukraine Oleg Mikats was the commander of the 93rd IMBr in 2014²² (see Fig. 39). He became known as one of the leaders of the attack on Donetsk airport.

In the early parliamentary elections in 2014, O.M. Mikats was number three in the list of the Ukrainian Nationalist Party “Right Sector”.

He was removed from command of the brigade due to an incident during which Mikats beat badly several people.²³

²² 93rd Independent Kholodnyi Yar Mechanized Brigade (Ukraine) (published on 02.07.2019) Wikipedia Free Encyclopaedia (Ukrainian version). URL: https://uk.wikipedia.org/wiki/93-тя_окрема_механізована_бригада_«Холодний_Яр» (published on 03.02.2023)

²³ The “Right Sector” unveiled the top ten list, Yarosh is on the majority vote. 112.Ua website. URL: <https://112.ua/politika/pravyi-sektor-obnarodoval-pervuyu-desyatku-spiska-yarosh-idet-po-mazhoritarke-115140.html> (published on 15.09.2014)

CONCLUSIONS

It follows from the above that on August 14, 2014, at about 16:00, the Kievskiy District of Donetsk underwent artillery fire from the Grad MLRS. The shells flew in a direction from north-west to south-east (azimuth 320 degrees, error making ± 15 degrees).

The shelling sector was entirely controlled by the UAF.

All shell hits fell on densely populated residential areas of the city and led to damage to civilian objects, death and injury to civilians. Thus, the principles of selectivity and proportionality were violated.

As a result of the analysis of news videos and information from the Internet, it was found that the Rocket Artillery Battery of the Armed Forces of Ukraine could be located in the sector from which the shelling was carried out. This unit is part of the 93rd Independent Mechanized Brigade of the UGF under the command of Colonel Oleg Mikhaylovich Mikats.

LEGAL QUALIFICATIONS

Indiscriminate shelling of a densely populated residential area in the town of Makeyevka, in which civilians were killed and injured, is a crime for which responsibility is provided by the norms of national legislation of Ukraine and by the norms of international law.

In compliance with **Art. 438 of the Criminal Code of Ukraine**, for “... use of methods of the warfare prohibited by international instruments, or any other violations of rules of the warfare recognized by international instruments consented to be binding by the Verkhovna Rada (Parliament) of Ukraine, and also giving an order to commit any such actions”, shall be punishable by imprisonment for a term of eight to twelve years., and if he same acts accompanied with an intended murder, shall be punishable by imprisonment for a term of ten to fifteen years, or life imprisonment.

In compliance with **Art. 13 of Additional Protocol II to the Geneva Conventions of 12 August 1949**, concerning the protection of victims of armed conflicts of a non-international character, dated 8 June 1977: “The civilian population as such, as well as individual civilians, shall not be the object of attack. Acts or threats of violence the primary purpose of which is to spread terror among the civilian population are prohibited”.

In compliance with **Rule 71 of Customary International Humanitarian Law** (Volume 1, ICRC, 2006): “States must never make civilians the object of attack and must consequently never use weapons that are incapable of distinguishing between civilian and military targets” “The use of weapons which are by nature indiscriminate is prohibited”.

In compliance with **Art. 3 common to all Geneva Conventions of August 12, 1949**, , extending its effect to non-international armed conflicts, “persons taking no active part in the hostilities, including members of armed forces who have laid down their arms and those placed ‘hors de combat’ by sickness, wounds, detention, or any other cause, shall in all circumstances be treated humanely, without any

adverse distinction founded on race, color, religion or faith, sex, birth or wealth, or any other similar criteria”.

To this end, violence to life and person, in particular murder of all kinds and mutilation, are prohibited inter alia with respect to the above-mentioned persons.

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25. Shelling of 15 Levitskiy St. with Grad Two fatal casualties (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/0HkFH30MEAs> (accessed on 03.02.2023)

26. Shelling of 15 Levitskiy St. with Grad Two fatal casualties (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/0HkFH30MEAs> (accessed on 03.02.2023)

27. The shelling of the Donetsk-Gladkovka district on August 14. #donetsk #gladkovka (published on 19.11.2014] VKontakte Social Network. URL: https://vk.com/video-70675874_170570646 (accessed on 03.02.2022)

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31. 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (3) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/9dvRE6QpIMI> (accessed on 02.02.2022)

32. 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (3) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/9dvRE6QpIMI> (accessed on 02.02.2022)

33. 14.08.2014. Donetsk, 202-210, Chelyuskintsev Str. The result of the shelling at the day time. (1 part) (published on 14.08.2014) VKontakte Social Network. URL: https://vk.com/wall-75214346_419 (accessed on 10.02.2022)

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35. Donetsk - the shelling of the university and the central districts of the city. The result (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/qb5GObnMMWI> (accessed on 03.02.2023)

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37. New. Donetsk, Chelyuskintsev St. Shelling effects. 15.08.2014 (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/bRd5KXED0oY> (accessed on 02.02.2022)
38. Shelling of Donetsk center/ Kievskiy District, *Yunost* Palace of Youth (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/GsS6KI05wEg> (accessed on 03.02.2023)
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44. 220-mm 9M27F rocket projectile with a 9N128F high-explosive warhead. *Ammunition* Online reference book. URL: http://soviet-ammo.ucoz.ru/index/220_9m27f/0-255 (accessed on 04.02.2023).
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ANNEXES

Annex 1

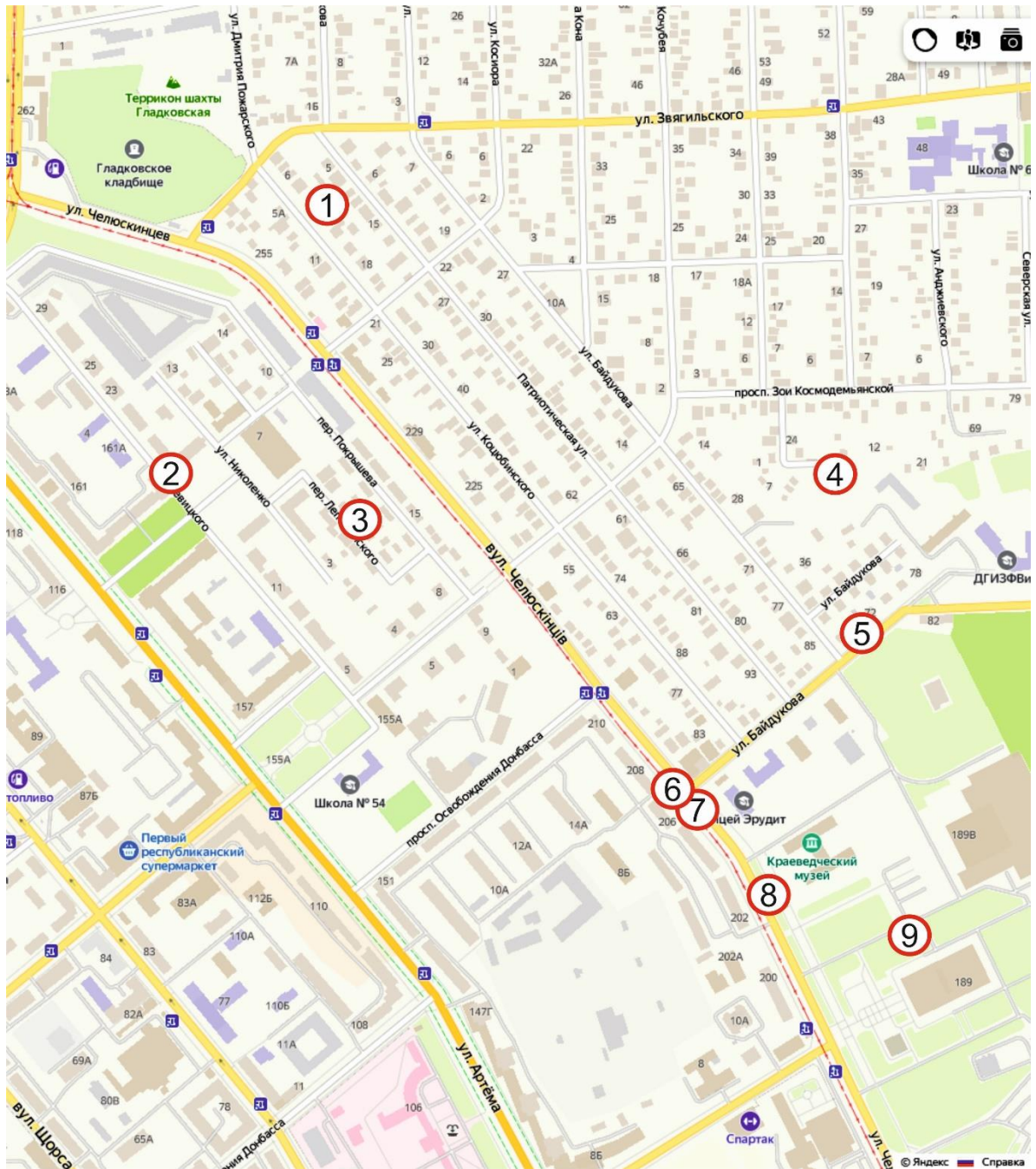


Fig. 1 – The scheme of shelling on August 14, 2014 in the Kievsky district of Donetsk, during which residential buildings were damaged in Vanda Vasileva St., Kotsyubinskiy St., Pokryshev Lane, and Lepeshynskiy Lane.

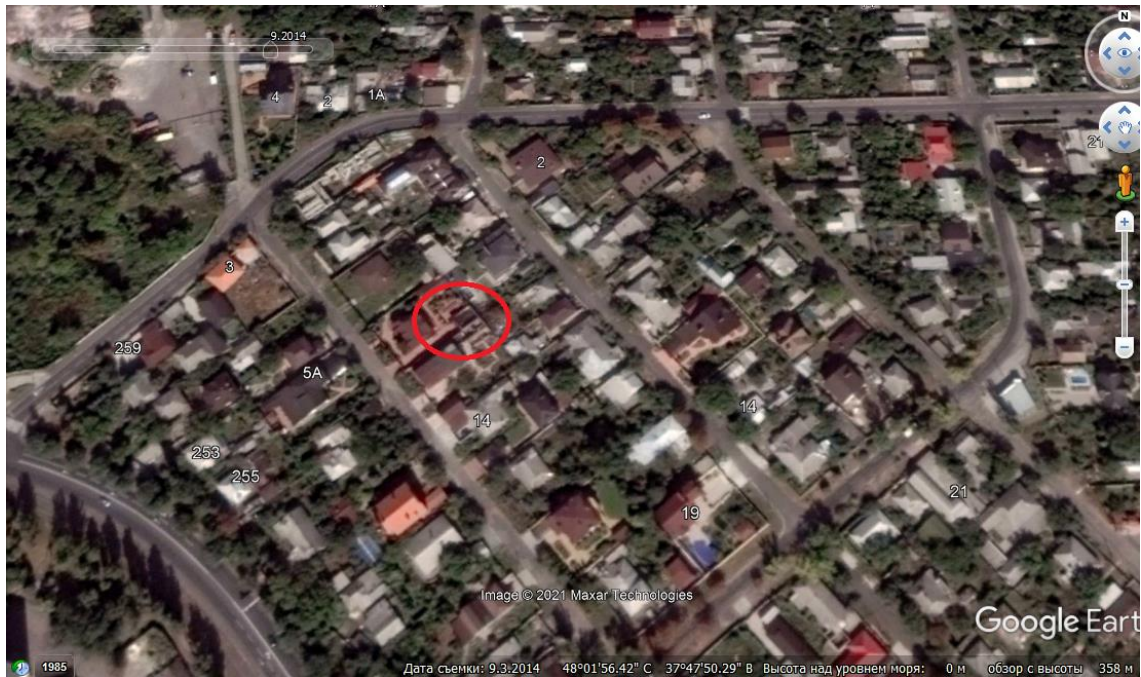


Fig. 2 – The consequences of hitting at 12, Kotsyubinskiy St., visible in a satellite image dated 03.09.2014



Fig. 3 – The consequences of hitting at 12, Kotsyubinskiy St., where the roof was damaged and the backhouse burned down²⁴.

²⁴ Donetsk, Gladkovka, as a result of shelling on August 14, several residential buildings burned down (published on 15.08.2014) YouTube Video hosting. URL: https://youtu.be/H7KC_nOnU5s (accessed on 03.02.2022)



Fig. 4 – A shell hit nearby the residential building at 19, Levitskiy St.²⁵.



Fig. 5 - Remains of a MLRS projectile missile part at 19, Levitskiy St.²⁵.

²⁵ Shelling of 15 Levitskiy St. with Grad Two fatal casualties (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/OHkFH30MEAs> (accessed on 03.02.2023)



Fig. 6 – Bodies of civilians killed at 19, Levitskiy St.²⁶.

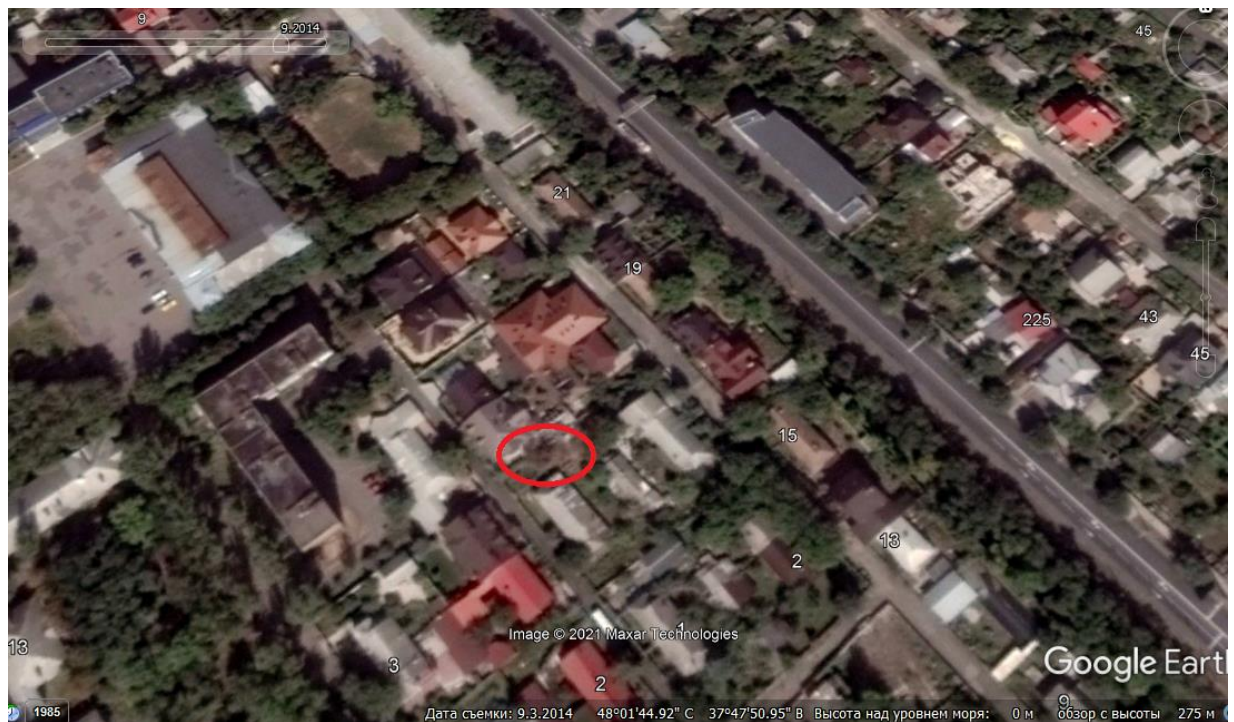


Fig. 7 – The consequence of the shell hit in the territory of the private residence at 5, Lepeshinsky Lane, visible in a satellite image dated 03.09.2014.

²⁶ Shelling of 15, Levitskiy St. with Grad Two fatal casualties (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/OHkFH30MEAs> (accessed on 03.02.2023)

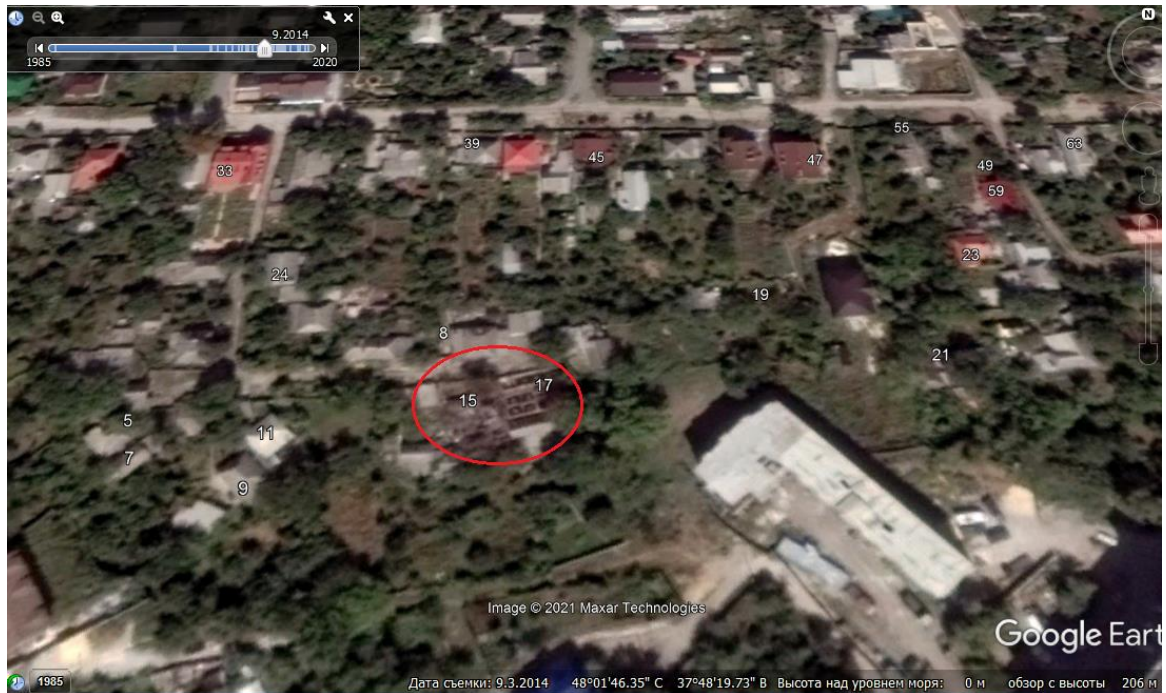


Fig. 8 – The consequence of the shell hit at 15 Vanda Vasilieva St., visible in a satellite image dated 03.09.2014



Fig. 9 – The consequence of the shell hit at 17, Vanda Vasilieva St.,²⁷.

²⁷ The shelling of the Donetsk-Gladkovka district on August 14. #donetsk #gladkovka (published on 19.11.2014) VKontakte Social Network. URL: https://vk.com/video-70675874_170570646 (accessed on 03.02.2022)



Fig. 10 – The consequence of the shell hit at 15, Vanda Vasileva St.²⁸.



Fig. 11 – The shell hit in an underground gas pipeline 5 meters away from a private house at 70, Baidukov St.²⁹.

²⁸ The shelling of the Donetsk-Gladkovka district on August 14. #donetsk #gladkovka (published on 19.11.2014] VKontakte Social Network. URL: https://vk.com/video-70675874_170570646 (accessed on 03.02.2022)

²⁹ Donetsk, Gladkovka, as a result of shelling on August 14, several residential buildings burned down (published on 15.08.2014) YouTube Video hosting. URL: https://youtu.be/H7KC_nOnU5s (accessed on 03.02.2022)



Fig. 12 – Debris of the MLRS projectile MP in an underground gas pipeline 5 meters away from a private house at 70, Baidukov St³⁰.

³⁰ “Grad” in the underground gas pipeline 14.08.2014 (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/D51Jaus8ZUg> (accessed on 02.02.2022)



Fig. 13 – The shell hit in the intersection of Chelyuskintsev St. and Baidukov St., 20 meters away from the northeast corner of the residential building at 206, Chelyuskintsev St.³¹.



Fig. 14 – Debris of the MLRS projectile MP three meters away from the point of the projectile contact, closer to the asphalt surface of Chelyuskintsev Street³².

³¹ 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (3) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/9dvRE6QpIMI> (accessed on 02.02.2022)

³² 14.08.2014. Donetsk, Chelyuskintsev Street. The result of the shelling. (3) (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/9dvRE6QpIMI> (accessed on 02.02.2022)



Fig. 15 – The shell hit on the asphalt surface of the road 24 meters away from the southeast corner of the residential building at 206, Chelyuskintsev St.³³.

³³ 14.08.2014. Donetsk, 202-210, Chelyuskintsev Str. The result of the shelling at the day time. (1 part) (published on 14.08.2014) VKontakte Social Network. URL: https://vk.com/wall-75214346_419 (accessed on 10.02.2022)



Fig. 16 – The shell hit in the ground surface, a few meters west of the pavilions selling flowers at 189A/1, Chelyuskintsev St³⁴.

³⁴ 14.08.2014. Donetsk, 202-210, Chelyuskintsev Str. The result of the shelling at the day time. (1 part) (published on 14.08.2014) VKontakte Social Network. URL: https://vk.com/wall-75214346_419 (accessed on 10.02.2022)



Fig. 17 – Debris of the MLRS projectile MP at shell hit a few meters away from the pavilions selling flowers at 189A/1, Chelyuskintsev St³⁵.



Fig. 18 – Blood stains next to the shell hit near the pavilions selling flowers at 189A/1, Chelyuskintsev St³⁶.

³⁵ Donetsk - the shelling of the university and the central districts of the city. The result (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/qb5GObnMMWI> (accessed on 03.02.2023)

³⁶ Donetsk, Gladkovka, as a result of shelling on August 14, several residential buildings burned down (published on 15.08.2014) YouTube Video hosting. URL: https://youtu.be/H7KC_nOnU5s (accessed on 03.02.2022)



Fig. 19 – The shell hit in the ground surface 40 meters north of the Palace of Youth building, which is located at 189, Chelyuskintsev St.³⁷.



Fig. 20 – Damaged glazing of the building of the Youth Palace, which is located at 189, Chelyuskintsev St.³⁸.

³⁷ New. Donetsk, Chelyuskintsev St. Shelling effects. 15.08.2014 (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/bRd5KXED0oY> (accessed on 02.02.2022)

³⁸ Shelling of Donetsk center. Kievskiy District, Yunost Palace of Youth (published on 14.08.2014) YouTube Video hosting. URL: <https://youtu.be/GsS6KI05wEg> (accessed on 03.02.2023)



Fig. 21 – Damaged fence 40 meters north of the Palace of Youth located at 189, Chelyuskintsev Str.³⁹.



Fig. 22 – Vegetation burning 40 meters north of the Palace of Youth located at 189, Chelyuskintsev St.⁴⁰.

³⁹ New. Donetsk, Chelyuskintsev St. Shelling effects. 15.08.2014 (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/bRd5KXED0oY> (accessed on 02.02.2022)

⁴⁰ Donetsk, Gladkovka, shelling on August 14 (published on 15.08.2014) Odnoklassniki Social Network. URL: <https://ok.ru/video/5746984210> (accessed on 03.02.2022)

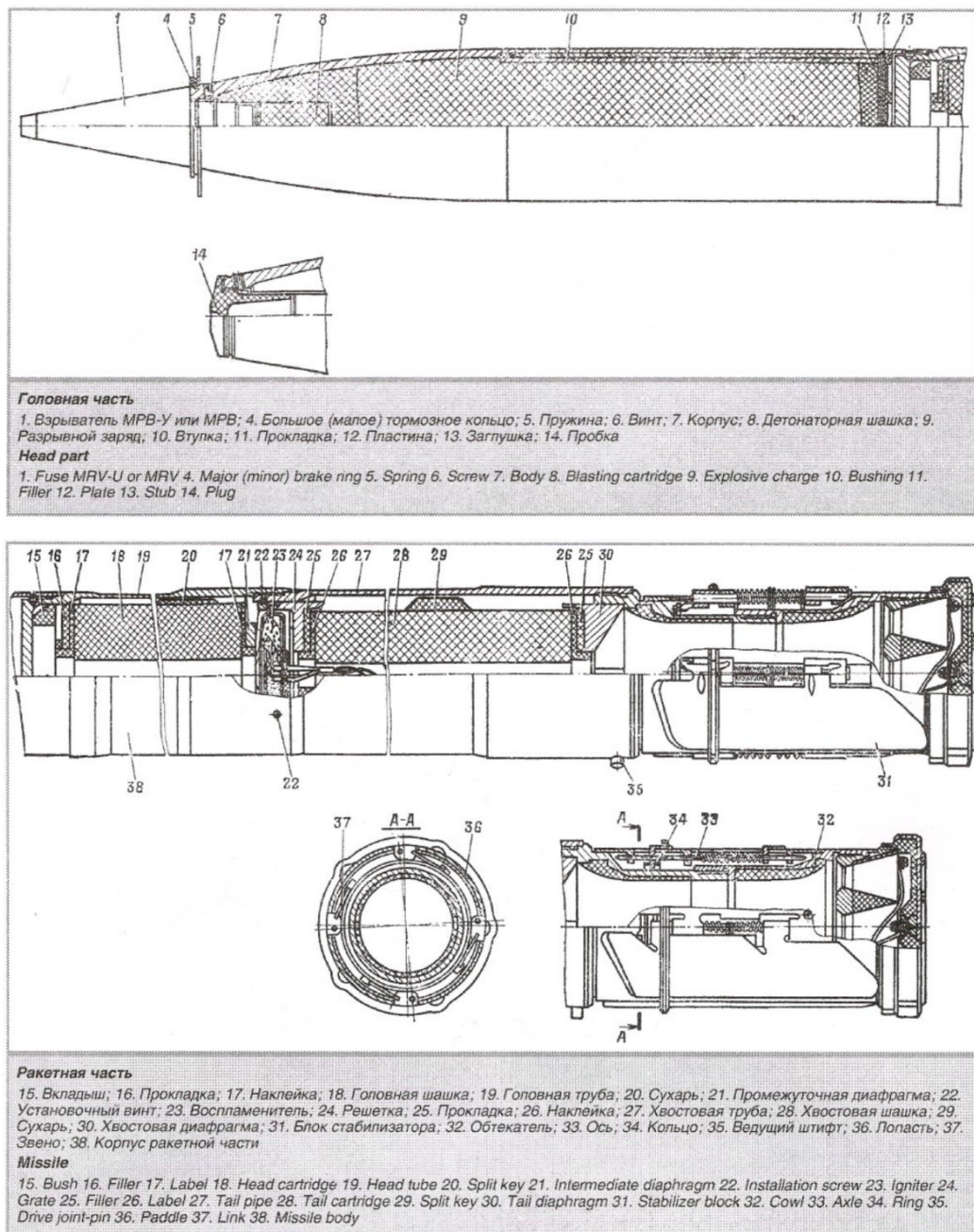


Fig. 23 – M-210F projectile design (a high explosive fragmentation projectile, used for firing from 9K51 Grad MLRS)⁴¹.

⁴¹ Gun in Russia – BM-21 GRAD. Russian motor books 2002. 37.

Калибр, мм	122
Длина снаряда со взрывателем, мм	2870
Тип головной части	осколочно-фугасная
Вес, кг:	
- окончательно снаряженного снаряда	66
- снаряда в укупорке	100
- головной части	18.4
- взрывчатого вещества в головной части	6.4
- порохового заряда	20.45
Наибольшая скорость снаряда при нормальных условиях, м/с	690
Дальность стрельбы, м:	
- максимальная	20400
- с большим тормозным кольцом	до 12000
- с малым тормозным кольцом	от 12000 до 16000
Температурный диапазон применения снаряда, °С	-40 – +50
Габаритные размеры укупорки, мм	2810x290x254

Fig. 24 – Technical characteristics of the unguided M-21OF rocket projectile M-21OΦ⁴².

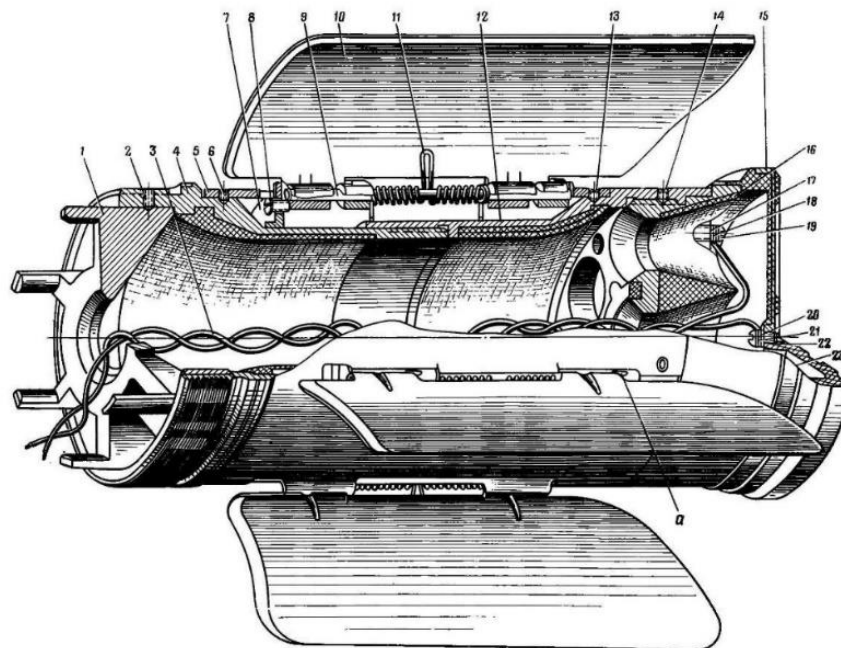


Рис. 101. Блок стабилизатора:
 1 – двослойная диафрагма; 2 – установочный винт; 3 – провод; 4 – передний конус; 5 – обтекатель; 6 – установочный винт; 7 – кольцо; 8 – винт; 9 – ось; 10 – лопасть стабилизатора; 11 – пружина; 12 – задний конус; 13 – установочный винт; 14 – установочный винт; 15 – контактный сектор; 16 – крышка-сопло; 17 – шайба; 18 – втулочная шайба; 19 – контактный винт; 20 – шайба; 21 – пружинная шайба; 22 – контактный винт; 23 – контактная крышка; а – паз

Fig. 25 – The drawing of the 9K51 Grad MLRS projectile stabilizer unit from the book BM-21 GRAD⁴³.

⁴² Mechanized combat vehicle BM-21. Technical description. Book 1. Moscow: Voenizdat, 1971. Pp. 7, 8, 91; Mechanized combat vehicle BM-21. Technical description and operating instructions manual. 3rd edn., stereotyped. Moscow: Armament. Politics. Conversion, 2002. Pp. 5-6.

⁴³ Gun in Russia – BM-21 GRAD. Russian motor books 2002. 37.

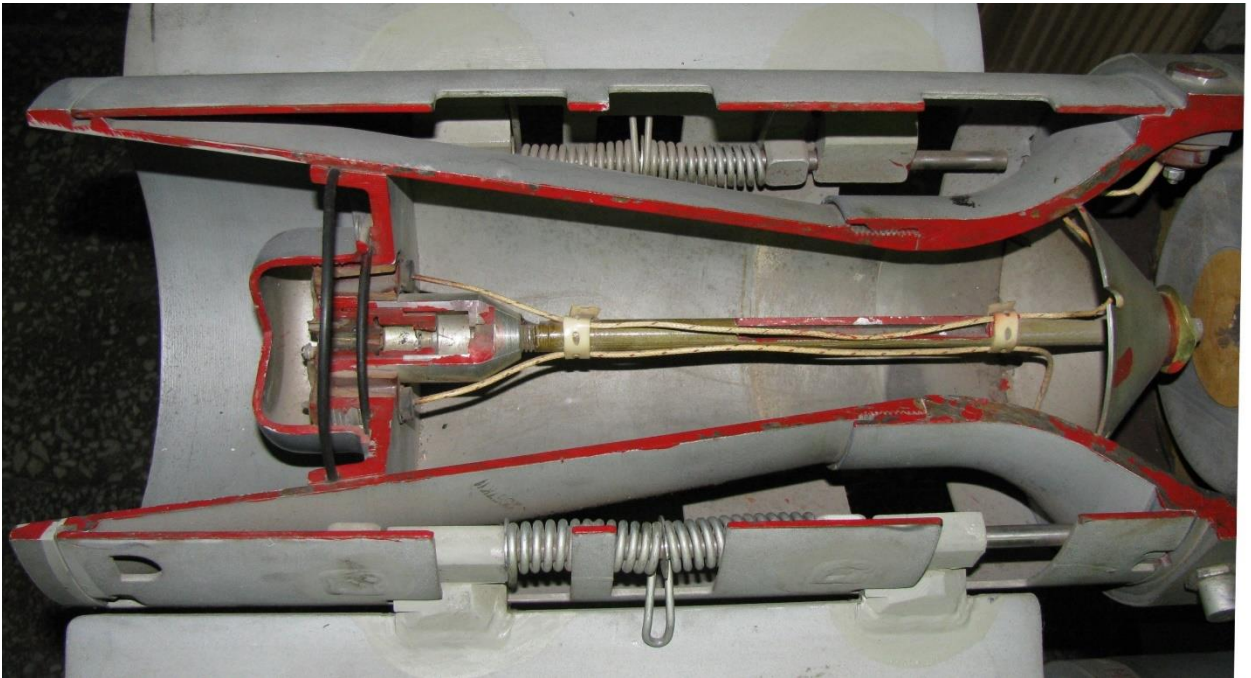


Fig. 26 – A stabilizer control unit for the Uragan MLRS projectile⁴⁴.

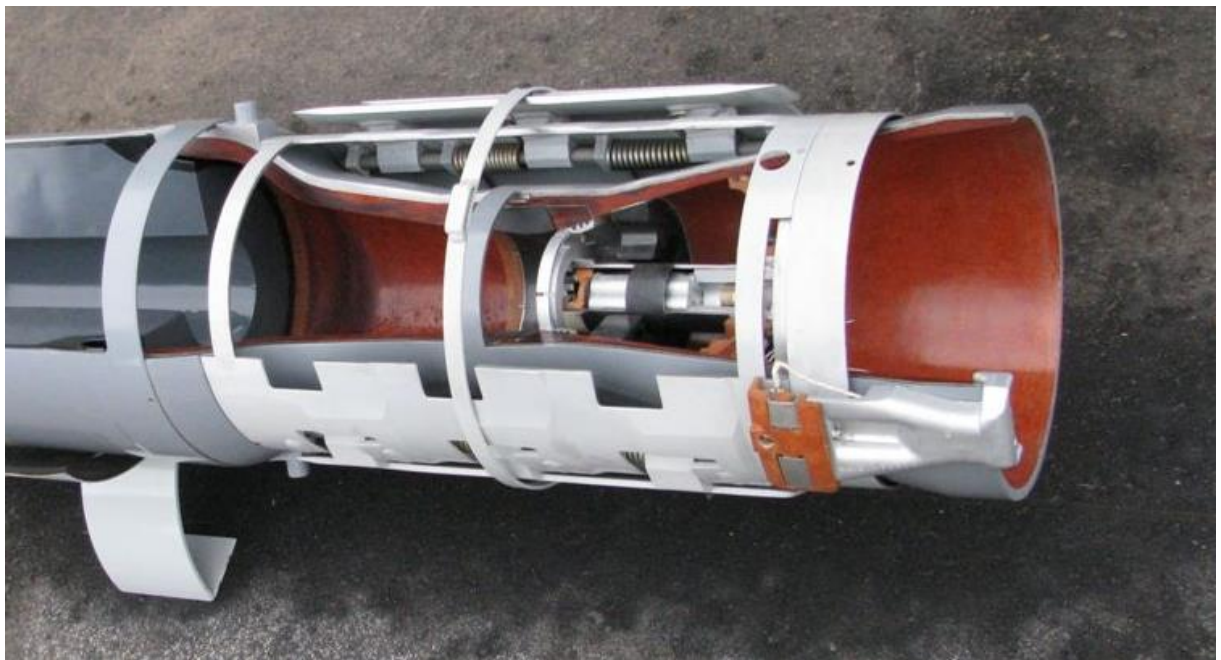



Fig. 27 – A stabilizer control unit for the Smerch MLRS projectile⁴⁵.

⁴⁴ 220-mm 9M27F rocket projectile with a 9N128F high-explosive warhead. Ammunition Online reference book. URL: http://soviet-ammo.ucoz.ru/index/220_9m27f/0-255 (accessed on 04.02.2023).

⁴⁵ Missilery at the exhibition dedicated to the 300th anniversary of the beginning of the arms business in the city of Tula. Missilery info website. URL: <https://missilery.info/gallery/raketnaya-tehnika-na-vystavke-posvyashchennoy-300-letiyu-nachala-oruzheynogo-dela-v-gorode> (accessed on 04.02.2023).

YouTube Введите запрос



"Град" в подземном газопроводе_14.08.2014

ГК Донбассгаз
403 подписчика

Подписаться

1 1

Поделиться

1 851 просмотр 15 авг. 2014 г.
15 августа, сапёры обезвредили застрявший в газовой трубе снаряд от «Града»

14 августа, во время артобстрела один из снарядов установки «Град» влетел в землю и пробил подземный газопровод, расположенный в 5м от частного дома №70 по ул. Байдукова, недалеко от Донецкого областного краеведческого музея.

Жители района сообщили диспетчеру аварийной службы «104» о запахе газа после артобстрела. На аварийный участок газопровода была перекрыта подача газа. Как только ковш экскаватора углубился на глубину залегания газопровода, слесарь заметил застрявший в трубе снаряд. Вызванные на место аварии сапёры извлекли из газовой трубы диаметром 108 мм смертоносный «Град». После этого ремонтно-восстановительная бригада ПАО «Донецкгоргаз» заменила повреждённый участок трубы и пустила газ.

На видео фрагмент боевого снаряда «Град» в подземном газопроводе диаметром 108 мм.

Справка Википедия: РСЗО 9К51 «Град» – советская реактивная система залпового огня (РСЗО) калибра 122 мм. Предназначена для поражения открытой и укрытой живой силы, небронированной техники и бронетранспортеров в районе сосредоточения, артиллерийских и минометных батарей, командных пунктов и других целей, решения других задач в различных условиях боевой обстановки.

Свернуть

Fig. 28 – Screenshot of the description under the video of representatives of Donetskorgas PJSC about the shell hit in an underground gas pipeline at 70, Baidukov St.⁴⁶.

⁴⁶ "Grad" in the underground gas pipeline 14.08.2014 (published on 15.08.2014) YouTube Video hosting. URL: <https://youtu.be/D51Jaus8ZUg> (accessed on 02.02.2022)



Fig. 29 – Measurements using a forensic ruler – shell hit 5 located five meters away from a private house at 70, Baidukov St.

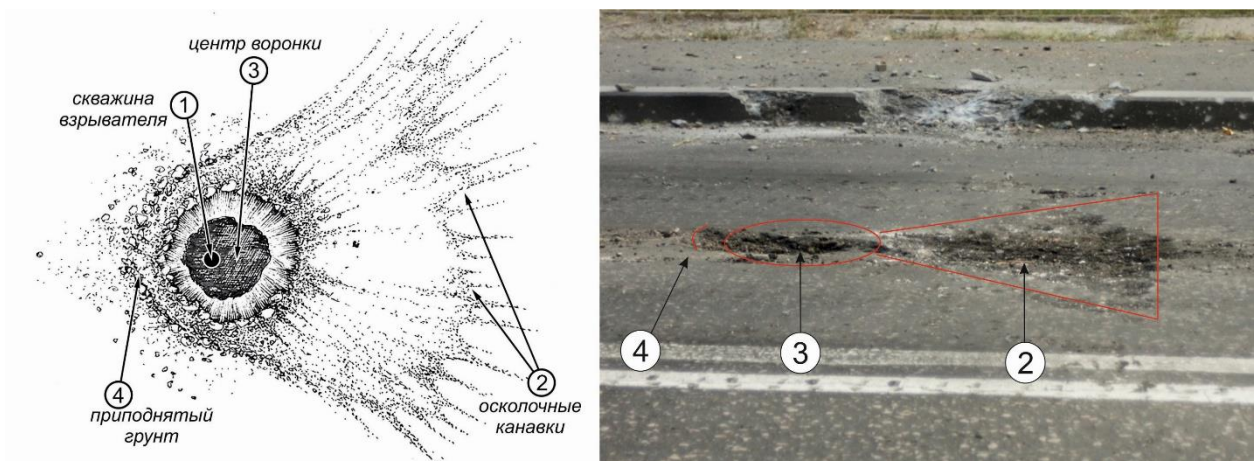


Fig. 30 – Left: Scheme of the second type of crater⁴⁷; right: Identification of a crater at the site of shell hit 6.

⁴⁷ High-explosive fragmentation shell crater analysis. "Fair Defense" Public Organization. URL: https://oosz.su/sites/default/files/inline-files/МЕТОДИЧЕСКИЕ%20УКАЗАНИЯ_0.pdf (accessed on 03.02.2022)



Fig. 31 – Determination of the shelling direction by the controlled fragmentation method.



Fig. 32 – Azimuth determination at the site of shell hit 6.

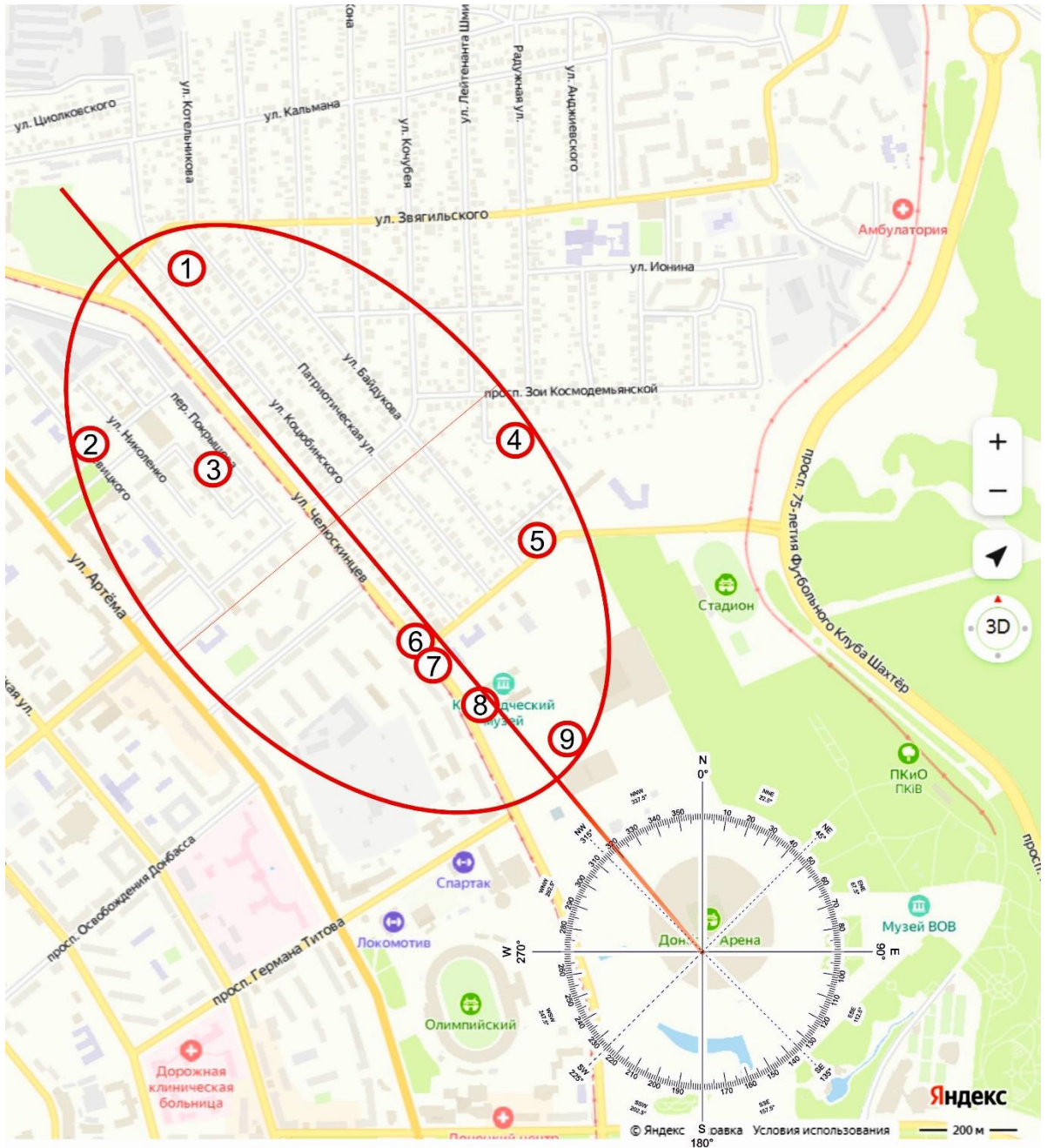


Fig. 33 – Shelling direction determination by the totality of shell hits.

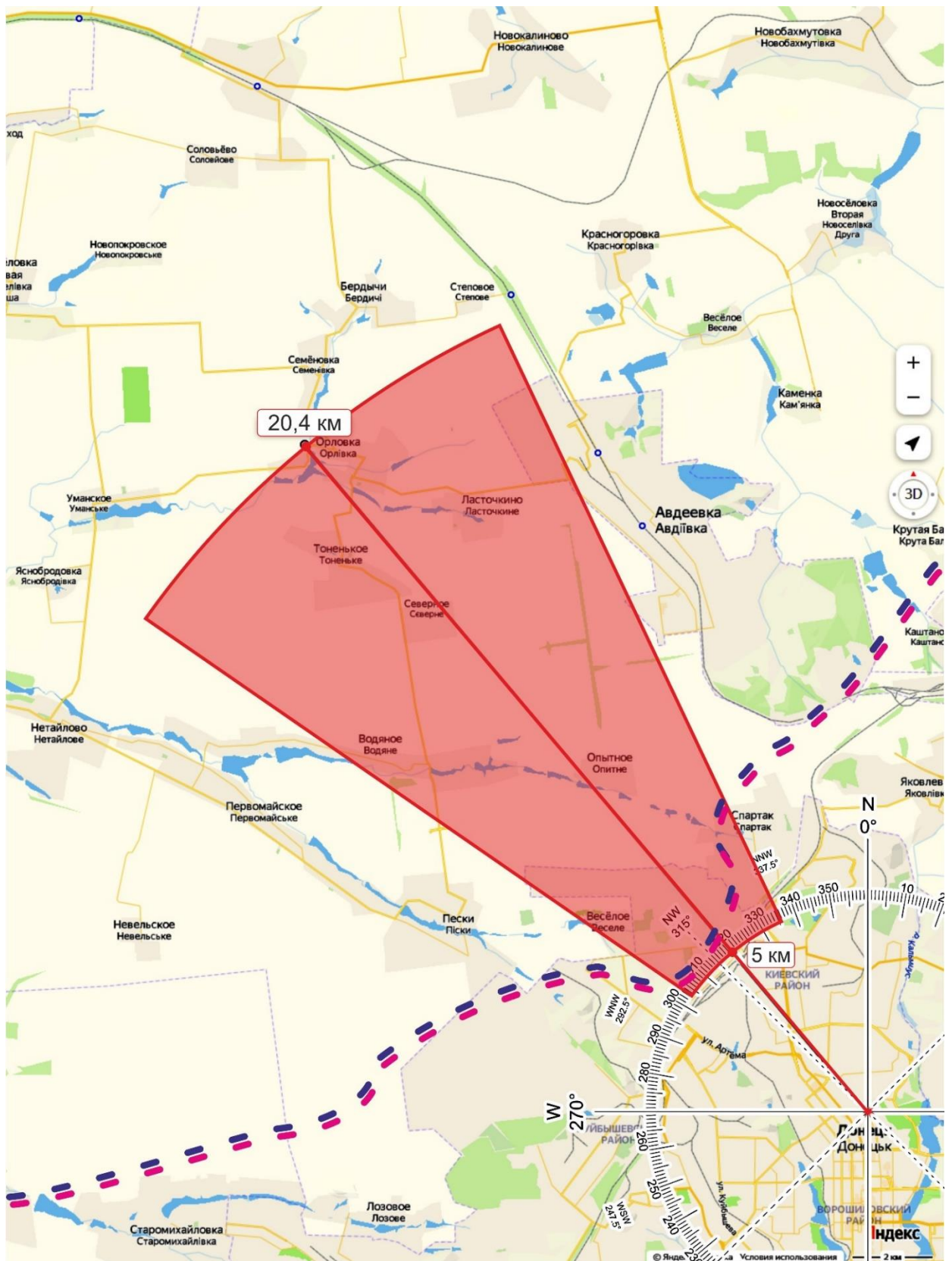


Fig. 34 – The sector from which the shelling was carried out on August 14, 2014.



Fig. 35 – The scheme of movement of the 2nd BTGr in the direction of the settlements of Karlovka and Avdeyevka (A segment of the documentary film “93: Battle for Ukraine”⁴⁸).



Fig. 36 – Grad MLRS in the vicinity of Karlovka (a segment of the documentary film “93: Battle for Ukraine”⁴⁹).

⁴⁸ “93: a battle for Ukraine” part 1: The first days of the Russian-Ukrainian War (published on 07.09.2018) YouTube Video hosting. URL: <https://youtu.be/XcdiLz4KUPw> (accessed on 02.02.2023).

⁴⁹ “93: a battle for Ukraine” part 1: The first days of the Russian-Ukrainian War (published on 07.09.2018) YouTube Video hosting. URL: <https://youtu.be/XcdiLz4KUPw> (accessed on 02.02.2023)



Fig. 37 – A soldier of the 2nd BTGr of the 93rd IMBr with Grad MLRS ammunition⁵⁰.



Fig. 38 – The military personnel of the Rocket Artillery Battalion, 93rd IMBr⁵¹.

⁵⁰ The 93rd Independent Mechanized Brigade in 2014 (published on 06.01.2019) BMP VSU website. URL: <https://www.bmpvsu.ru/026.php> (accessed on 03.02.2023)

⁵¹ Brothers of Grad. Guardsmen of the reactive division of the 93rd IMBr (published on 03.03.2016) Tyzhden E-Journal. URL: <https://tyzhden.ua/Society/159974> (accessed on 02.02.2023)



Fig. 39 – Commander of the 93rd IMBr Colonel O.M Mikats (a segment of the documentary film “93: Battle for Ukraine”⁵².

⁵² "93: a battle for Ukraine" part 1: The first days of the Russian-Ukrainian War. (published on 07.09.2018) YouTube Video hosting. URL: <https://youtu.be/XcdLz4KUPw> (accessed on 02.02.2023)