

INCREASING THE DEFENCE CAPABILITIES THROUGH THE UTILIZATION OF LOITERING MUNITIONS

KONSTANTIN M. DIMITROV

*National Military University Vasil Vevski, Veliko Tarnovo, Bulgaria
e-mail: constantine.dimitrov1@gmail.com*

Abstract. During the Second Karabakh War, we saw how UAVs have become an important piece of technology for modern defense. Loitering munitions are the newest variant of UAVs that are becoming a new trend on the modern battlefield, and in this paper, I am going to show why they are suitable for increasing defense capabilities.

Keywords: Loitering munition, unmanned aerial vehicle, defense, weapon, Nagorno-Karabakh war, Russia-Ukraine war.

1. INTRODUCTION

We have found many ways to kill each other from prehistoric times until the modern age [1] by creating all sorts of weapons. From the creation of the bow and arrow in the Prehistoric Ages to the introduction of catapults and trebuchets in the Middle Ages. Later on, the utilization of weapons powered by gunpowder, such as the muskets in the 17th century. To the creation of the so-called “Vergeltungswaffen” (V-1 and V-2) [2] during the Second World War. All of these led to the creation of our modern conventional weapons utilized on today’s battlefield as means to either attack our adversaries or defend ourselves from them.

Every country around the world is trying to increase its defense and attack capabilities by developing and adapting new weapons, technologies, tactics, and strategies in its army. Drones or Unmanned Aerial Vehicles (UAVs) [3] are one of these new technologies, and as we saw in the Second Karabakh War [4] and the Russia-Ukraine war, UAVs are playing a crucial role in modern defense.

In this paper, I am focusing on drone technology or, more accurately, on the so-called Loitering munitions (LMs) [5], also known as “kamikaze drones,” and why they are crucial for modern defense by pointing out the opportunities and the potential benefits of LMs and where such systems were utilized during war conflicts.

2. OPPORTUNITIES AND POTENTIAL BENEFITS OF LOITERING MUNITIONS

- The loitering ability of these systems allows operators to conduct ISR and track potential targets for an extended period of time before the strike.
- They are relatively low-cost and easy to manufacture, making them suitable for mass production. Current manufacturers are making LMs for use on different levels – tactical, operational, and strategic.
- The LMs can be deployed from a safe location and distance by a person with a ground-based catapult system, a launch vehicle, or dropped from a plane and operate for hours,
- Unlike other conventional weapons, such as missiles designed to search and destroy radar systems that could be misled by decoys, LMs can be pointed directly at the given target, thanks to the ability to be steered. Also, LMs can replace artillery and other anti-tank systems with limited effective range and accuracy.
- Various loitering munitions have a “wave off” feature that allows the operator to cancel an attack in mid-air, unlike traditional rockets and missiles.
- Some anti-tank LMs are cheaper than conventional anti-tank munitions, a Javelin replacement missile costs around \$78,000 [6], while an AeroVironment Switchblade LM costs around \$6,000 [7].

3. LOITERING MUNITIONS IN THE SECOND KARABAKH WAR AND IN THE RUSSIA-UKRAINE WAR

3.1 In 2020 Nagorno-Karabakh war

During the second Karabakh war, it was reported that Azerbaijanian forces utilized Israeli-made Elbit systems Sky-Striker, IAI HAROP, Orbiter 1K [8] [9], and Turkish-made STM Kargu [10] loitering munitions, which proved to be effective against the Armenian armored forces, rendering tanks vulnerable. Therefore, suggesting the need for changes in the armored warfare doctrine [11].

3.2 In Russia-Ukraine war

Since the beginning of the Russia-Ukraine war, we have seen how many countries from NATO have supported Ukraine with military equipment. Some of that equipment was the AeroVironment Switchblade 300 and Switchblade 600 LMs as a part of \$300 million in military assistance [12].

Ukraine also has companies developing LMs that have been publicly displaying their progress since 2019. The first one is the Company of Defence and Electronic Technologies LLC (CDET LLC) with their RAM II loitering munition, which has similar to the Switchblade 600 capabilities, with anti-tank and thermobaric warheads.

The second company is the Athlon Avia with their loitering munition – Silent Thunder SM-35. They claim to have successful tests with their systems.

Russia has also introduced LMs of its own – the Kalashnikov Group KUB-BLA, which has been confirmed to be used by the Russian forces against the Ukrainian forces [13] [14].

4. CONCLUSION

By the analyzed and presented information in this paper, the conclusion is the following. Loitering munitions have their benefits and are riveling other weapon systems with some of their capabilities; they are also much cheaper than some conventional anti-tank systems. Therefore, these are suitable systems to be utilized as a way to increase the defense capabilities of countries with small armies or with the insufficient number of weapon systems and ISR technologies.

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