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THE USE OF FALSE TARGETS AS A WAY TO INCREASE THE SURVIVABILITY OF THE AIR DEFENSE SYSTEM AGAINST THE USE OF UNMANNED AND MANNED AIRCRAFT

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ABSTRACT

Currently, with the advent of medium and small unmanned aerial vehicles, the tasks of their use against anti-aircraft missile systems of air defense (air defense) during military conflicts in recent years have been significantly updated. Military experts realized that the use of a massive UAV raid on air defense systems leads to a rapid exhaustion of their combat resource and, as a result, the subsequent inability of these complexes to solve tasks for their intended purpose.

KEYWORDS: *Unmanned Aerial Vehicle, Air Defense, Air Defense, Counteraction To Unmanned Aerial Vehicles, Anti-Aircraft Missile System, Anti-Aircraft Missile And Cannon Complex, Anti-Aircraft Artillery Complex, Combat Effectiveness, Combat Survivability.*

INTRODUCTION

One of the main reasons for the low effectiveness of the actions of the air defense forces in all recent local wars was the weak survivability of the elements of the air defense systems from a massive raid by an unmanned aerial vehicle, on the anti-aircraft missile system and strikes with high-precision “air-to-surface” weapons. This problem is complex; it was and remains one of the key for the air defense weapons systems [1].

It should be borne in mind that in the first phase of air offensive operations in all local wars, the enemy set the task of first destroying and suppressing the air defense system and its elements.

And as the experience of local wars shows, only a complex of protective measures, moreover non-standard and always unexpected for the enemy, can ensure the survivability of the Air Defense, leaving the words of the Great Russian commander A.V. Suvorov: "Whoever surprised, won".

For example: During the military conflict in Nagorno-Karabakh in the period 2018-2020. Azerbaijan's aviation, represented by unmanned aerial vehicles (UAVs), has a huge impact on the ground forces of the Nagorno-Karabakh Republic (NKR). Military equipment, weapons depots are methodically destroyed from the air, military units of the NKR Air Defense Forces failed to cope with the task of countering UAVs, and Armenia, for one reason or another, does not use the most modern air defense systems available to it, for example, anti-aircraft missile systems (AMS) "Tor-M2KM". Accordingly, first of all, the question arises of increasing the survivability of ground forces in conditions of air supremacy of enemy aviation [2].

THE MAIN FINDINGS AND RESULTS

The Azerbaijani side widely circulated in the media the videos of high-precision drone strikes on Armenian positions. The main targets of the strikes are, first of all, air defense systems, then - armored columns on the March, tanks and artillery in positions, less often - warehouses, storage facilities and barracks [3].

The massive use of Bayraktar TB2 UAVs, together with the Sky Striker, Harop and Orbiter, kamikaze UAVs resulted in the almost complete destruction of the Armenian "Osa" and Strela-10 air defense systems deployed in Nagorno-Karabakh in the early days of the conflict. Already on the first day of the war, a prepared strike was delivered against the positions of these air defense systems, which deprived the defense of Nagorno-Karabakh, according to experts, up to 80% of the air defense systems - 6 "Osa" air defense systems and 3 "Strela-10" air defense systems with losses of 4 UAVs [3]. Thus, due to the massiveness and surprise of use, ensuring the exchange of 2.25 air defense missile systems for 1 UAV, the conquest of air superiority made it possible for Azerbaijan with the help of UAVs continuously, around the clock; and freely attack the Armenian motorized rifle and mechanized units, inflicting significant losses on them even before they entered the battle with the forces of Azerbaijan. This greatly facilitated the offensive of the Azerbaijani army and made it possible to achieve significant tactical successes.

One of the main reasons why the Armenian Armed Forces suffered heavy losses are: neglect of the basics of camouflage.

In this connection, the issue of active use of camouflage and false targets against manned and unmanned aircraft is relevant. This is because the use of decoys forces the enemy to spend more time identifying targets, which reduces the intensity of strikes. In addition, camouflage of real targets in combination with the use of decoys leads to an increased consumption of guided munitions while reducing losses of the attacked side.

One of the most effective ways to create false targets is to deploy inflatable dummies that simulate military equipment (Fig. 1).



Figure 1. Inflatable models of military equipment

It is difficult to distinguish an inflatable mock-up from a real target in a combat situation. Inflatable dummies can be equipped with heating systems to simulate engine operation, rotating elements that simulate radar and microwave magnetron transmitters. Inflatable models must be placed separately from real positions, but then the enemy can calculate them by the lack of movement of personnel near them (or it is necessary to imitate it). Also, inflatable dummies can be placed next to the positions of real weapons. For example, real tanks and their inflatable mock-ups can be located in one position, and both must be equally covered with camouflage nets and relief elements. Accordingly, there is a fairly high probability that the enemy will not recognize the real target from the UAV and will release expensive guided munitions at the “rubber” tank. Often, even modern detection systems cannot distinguish between real tanks and their inflatable counterparts, either in visible, thermal or radar wavelength ranges. No less, it will be difficult for the enemy to distinguish real warehouses or power plants from their inflatable counterparts (Fig. 2.).



Figure 2. Inflatable power plant

An even simpler solution could be to use 3D images. Of course, they cannot come close to replacing the above false targets, but in any case, they will distract the enemy for a while. You

shouldn't expect the enemy to spend high-precision ammunition on the “picture”, but he will spend additional time on image recognition (Fig 3.)



Figure 3. 3D images of objects

3D images can mislead the enemy, forcing him to spend additional time recognizing and finding real targets. The main advantages of 3D images are their minimal cost and ease of production. Basically, the image data can be applied to something like a banner stretched over a wire frame. Several dozen of these banners can fit in one truck. By moving them, you can pretty much load enemy reconnaissance with work, which will have to analyze photographs of satellite or aerial reconnaissance in an attempt to distinguish real aircraft and operational-tactical missile systems (OTRK) from their flat counterparts with a drawn shadow. You can draw images and “stationary”, periodically covering them with banners with the underlying surface texture (Fig 4.).



Figure 4. Model of aerodrome images

High-quality 3D images may well mislead the enemy when shooting from a great height or from space.

CONCLUSION

The article presents the result of the analysis of the experience of the combat use of UAV groups in the military conflict in Nagorno-Karabakh in the period 2018-2020. The analysis made it possible to reveal the main shortcomings of modern air defense systems and a method was proposed to increase their survivability by using camouflage and decoys.

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