

Use of an unmanned aerial vehicle in order to increase the intelligence capabilities of divisions

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ABSTRACT

This article deals with topical issues of increasing the capabilities, modernizing the combat potential, forces and means of intelligence by introducing unmanned aerial vehicles. Examples of tactically and technically effective models of unmanned aerial vehicles, their advantages and calculations of increasing the probability of detecting an enemy object are given.

Key words : Forces and means of intelligence, technical means of intelligence, unmanned aerial vehicle, aerial reconnaissance, enemy object.

1. INTRODUCTION

The military-political situation in the world is characterized by high dynamics and unpredictability of development, increased confrontation between world and regional "powers" for spheres of influence in the world, as well as the increasing role of military force in resolving inter-state and intra-state contradictions. The combination of the armed forces, other troops and military formations, state bodies and organizations, and the military-industrial complex, whose joint activities are aimed at ensuring military security and defense of the country indicates the effectiveness of the military organization of the state. Intensive development of information technologies and the digital market allows increasing the combat and strategic potential of weapons[1]. Against the background of a sharp increase in the combat effectiveness of weapons, especially high-precision weapons, increasing the speed and dynamism of modern combat and operations, there is a need to develop the quality parameters of

the army, combat characteristics of equipment and weapons, organizational and staff structure, training of headquarters and troops, the use of modern intelligence tools to timely identify the intentions of a likely enemy both in the initial period of military operations and during their conduct [2].

One of the solutions to this problem is the introduction of unmanned aerial vehicles(UAVs), advanced information technologies in the process of conducting intelligence, which will allow commanders of land forces formations at all levels to more clearly present the overall picture of the fighting, which will provide a better understanding of the current situation at all levels.

Unmanned aerial vehicles have become an integral part of modern warfare. They are used for conducting reconnaissance, targeting high-precision weapons, electronic warfare, and can themselves be shock weapons.

Currently, the armed forces of 41 countries operate about 80 models of UAVs.

What is the UAV complex? The UAV complex is a set of interconnected UAVs and ground-based technical means that ensure its combat use in the air and technical operation on the ground. Its composition can vary widely depending on the tasks to be solved, the objects of action, the conditions of use, the size of the UAV, etc. In General , this is a transport launcher designed to deliver the UAV to the starting position and launch it; transport and charging machine that picks up the UAV after landing, delivering it to the technical position and the starting unit; technological machine

to prepare the UAV for use. Depending on the intended purpose, the complex can be supplemented with other technical means for shock purposes, intelligence - ground means of checking various onboard equipment, as well as receiving and processing information [5].

The analysis of the achieved level of development of UAVs, as well as the experience of their combat use, allowed us to identify the strengths of UAVs:

compact and lightweight, which allows you to carry complexes with UAVS directly by members of the reconnaissance group as a combat duffel bag;

low cost compared to manned aircraft;

the ability to stay over a given area for a long time, collecting information about the enemy and transmitting it in a time scale close to real, both to ground control centers, and indirectly to the crews of aircraft and helicopters of strike aircraft in the air, the ability to conduct surveillance at low altitude from different directions, which allows you to get a detailed image of objects in various angles and their shadows depending on the sun's illumination;

high mobility of UAV complexes, which can be quickly transferred to any region in special containers, and mobile control points can be placed in advance in points of forward basing in the immediate vicinity of the areas of their combat use;

cross-border operation of UAVs due to their ability to penetrate deep into the territory;

elimination of losses of crews of manned aircraft with greater efficiency of performing tasks by UAVs than by manned aviation, since UAVs can perform tasks in the deep rear of the enemy to investigate and defeat well-protected objects, which it is considered a difficult task for manned aircraft [6].

The "UAV" factor excludes not only human losses, but also reduces the weight of the aircraft and its size, increases the share of the payload.

The absence of a crew on Board the aircraft allows you to plan more complex and more risky combat tasks, during which you have to approach the object at a minimum distance, and sometimes even make a RAM.

These features of complexes with UAVs make it necessary to implement them and equip them with reconnaissance units and formations to solve a wide range of tasks, including for conducting all types of aerial reconnaissance and electronic warfare [7].

For example, we can consider the most widely distributed mini-UAV aircraft scheme, which includes the UAV RQ-11 "Raven" (Fig.1) and RQ-14 "DragonEye" (Fig.2).



Figure 1: RQ-11 «Raven»



Figure 2: RQ-14 «DragonEye»

These UAVs equipped with a television and / or thermal imaging camera can be included in the regular weapons of tactical units (from the company and below). If necessary, the flight commander, using UAVs of this category, will be able to quickly get information about the enemy and the situation, which is most critical when conducting a battle in difficult conditions, such as in populated areas. This will allow you to effectively manage the actions of the unit and reduce losses [8].

The UAV's tactical and technical characteristics play an important role in achieving effective results. Information on the considered instances of "UAVs" is shown in table 1.

Table 1: Tactical and technical characteristics of the UAV RQ-11 «Raven» and RQ-14 «Dragon Eye»

Name	«Raven»	«DragonEye»
Weight, kg:		
maximum take-off speed	2,3	1,8
payload	0,18	0,1
The radius of action, km	10	10
Maximum flight speed, km / h	64	73
The flight duration, min.	90	40
The geometric dimensions, m:		
wingspan	L33	0,95
the length of the fuselage	0,9	1,1

Another project that deserves attention is the unmanned system based on the RQ-16 mini-UAV vertical takeoff and landing

"T-Hawk" by Honeywell. It is considered as a means of intelligence support for the actions of units in the platoon/company link. The device, made according to the "screw in the ring" scheme, as well as a compact ground control station are placed in special containers and can be carried by a single soldier (Fig.3 and Fig. 4).

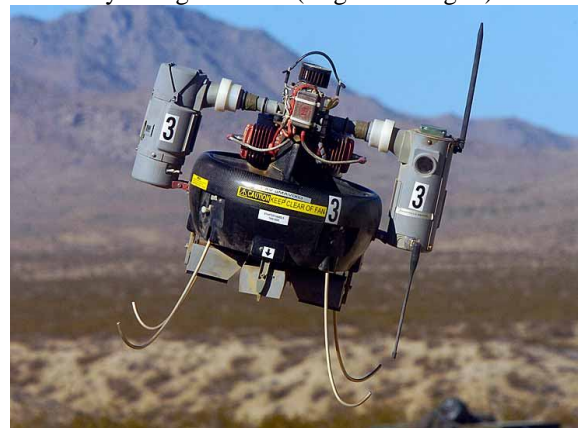


Figure 3: RQ-16 «T-Hawk»



Figure 4: -UAV station RQ-16 «T-Hawk»

The onboard equipment of the UAV, which is placed in two cylindrical fairings, includes the control system of the device, the NAVSTAR KRNS receiver, television and infrared cameras, as well as equipment for transmitting intelligence information at a range of up to 10 km.

The system passed successful military tests on the territory of the United States, during which, in particular, the possibility of transmitting video images from the UAV to the an-64 Apache attack helicopter was tested. Due to the high level of automation, the machine is easy to operate, and the operator training time for its operation is about 16 hours. [8, p. 50] the Main tactical and technical characteristics of the RQ-16 "T-Hawk" UAV are shown in table 2.

Table 2: Tactical and technical characteristics of the UAV RQ-16 «T-Hawk»

Name	indicators
Maximum take-off weight, kg	8,4
Maximum range, km	8
Maximum flight duration, min	45
Geometric dimensions, mm:	
Outer diameter of the case	350
The diameter of the screw height	280
	560

Operators of helicopter weapons equipped with unified control equipment for army drones will be able to set the UAV flight route, the mode of operation of intelligence systems, and in the future - to issue target designation and commands for the use of their onboard weapons.

In order to ensure that intelligence from unmanned vehicles can be transmitted directly to strike vehicles and ground unit commanders, remote video information reception terminals are being developed. In General, the analysis of the experience of using unmanned systems of various classes by the armed forces of different countries confirms the high efficiency of this type of weapon in the conditions of modern military operations of any intensity. According to military experts, the number of UAVs in the troops, as well as the range of tasks they solve, will steadily increase.

The inclusion of unmanned systems in the composition of intelligence units and formations will significantly increase

the effectiveness of intelligence and provide the commander and staff with more extensive intelligence information. Using the formula for calculating the probability of opening an enemy object with the addition of an additional intelligence Agency (UAV), you can check the increase in the probability of enemy objects:

$$P = 1 - ((1 - P1) * (1 - P2) * (1 - RZ) * (1 - P4)).$$

Where:

- P1 is the probability of opening of ORD;
- P2-probability of opening the BRD;
- RZ-probability of opening the inventory item;
- P4-probability of opening the UAV.

$$P = 1 - ((1 - 0,5) * (1 - 0,5) * (1 - 0,3) * (1 - 1)).$$

$$P = 1.$$

5. CONCLUSION

Thus, with the introduction of UAV units into the intelligence units, the capabilities of the forces and means of intelligence significantly increase, which, in turn, allows the commander and staff to have more extensive information, to organize air reconnaissance in real time in the interests of combined arms units. Received information from the UAV in real time 6-8 minutes, this helps the commander to make a timely decision on fire damage, as well as planning other events.

Analyzing the tasks that can be implemented through the introduction of unmanned aerial vehicles into the number of forces and means of reconnaissance, a high potential of this direction is observed. Based on the requirements of the Military doctrine of the Republic of Kazakhstan, defining the main directions of state activity in military-political, military-strategic and military-economic sphere, for mobilization training of the state, as well as the basic measures for the development of the military organization of the Republic of Kazakhstan, implementation of upgrades in the form of a UAV does not contravene them.

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