

## THE CAPABILITIES OF RECONNAISSANCE COMPLEX WHEN USING UNMANNED AERIAL VEHICLES

Savin Evgeniy Vladimirovich

Lecturer at the Military Training Center of the National University of Uzbekistan, Tashkent City

### ANNOTATION

The article considers a wide range of capabilities provided by the reconnaissance complex when using unmanned aerial vehicles (UAVs). In particular, it emphasizes operational surveillance, reconnaissance and intelligence missions, operational support, monitoring and control, as well as data analysis and processing. Special attention is given to the advantages of UAVs in various fields, from military to civilian security. This work provides an overview of UAV capabilities in the context of reconnaissance complexes, which can be useful for specialists in defense, security, and intelligence.

**Keywords:** UAVs, reconnaissance complex, enemy reconnaissance, reconnaissance technology, combat effectiveness, military confrontation, reconnaissance missions, reconnaissance information.

### АННОТАЦИЯ

Статья рассматривает широкий спектр возможностей, предоставляемых комплексом разведки при использовании беспилотных летательных аппаратов (БЛА). В частности, подчеркивается оперативное наблюдение, разведка и разведывательные миссии, поддержка операций, мониторинг и контроль, а также анализ и обработка данных. Особое внимание уделяется преимуществам БЛА в различных областях, от военной до гражданской безопасности. Эта работа предоставляет обзорную информацию о возможностях БЛА в контексте комплексов разведки, что может быть полезным для специалистов в области обороны, безопасности и разведки.

**КЛЮЧЕВЫЕ СЛОВА:** БПЛА, комплекс разведки, разведка противника, технические средства разведки, боевая эффективность, военное противостояние, разведывательные миссии, разведывательная информация.

The invention relates to remotely controlled air-ground-based group complexes designed for reconnaissance and fire destruction of enemy objects. The basis of the air segment of the complex consists of aircraft-type UAVs without aerodrome basing, equipped with means of reconnaissance, fire damage and retransmission. The on-board equipment of the UAV includes systems for receiving / transmitting information and navigation. The main components of the ground segment are a remote control point (remote control), individual radio communication modules and navigation modules of military personnel of reconnaissance units, UAV units and remote control units, wearable personal computers of unit commanders, ground radio control stations of UAV operators of UAV units, wearable technical means of reconnaissance of scouts and gunners of UAV reconnaissance units, wearable modules of direct radio communication with shock UAV gunners UAVs, wearable radio modems of UAV commanders and gunners. The

remote control is equipped with portable automated workstations for commanders and specialists of the point. Combat effectiveness increases.

### **The formula of the invention**

A complex of reconnaissance and fire destruction of targets based on unmanned aerial vehicles (UAVs), containing a group of remotely controlled self-propelled platforms equipped with an information reception/ transmission system and a navigation system, and a remote control point, while the platforms are equipped with the possibility of completing reconnaissance and fire destruction of the target, installed depending on the planned combat mission, characterized in that the platforms of the complex are carried out in the form of aircraft-type UAVS without aerodrome basing. The complex contains a UAV equipped with a repeater of transmitted information, individual radio communication modules and individual navigation modules for all categories of military personnel of reconnaissance units, UAV units and remote control point, wearable personal computers for unit commanders, portable automated workstations for commanders and specialists of the remote control point, ground-based UAV radio control stations for operators of UAV units, wearable technical means of reconnaissance for scouts and gunners of UAVs of reconnaissance units, wearable direct radio communication modules with shock UAVs equipped with an on-board means of target destruction, for gunners of UAVs of reconnaissance units, portable external radio communication stations for radiotelegraphists of UAV units, wearable radio modems for commanders and gunners of UAVs of reconnaissance units. At the same time, individual radio communication modules are carried out with the possibility of providing radio exchange of speech messages and data between military personnel within the units and the remote control point.<sup>1</sup> Ground-based UAV radio control stations are equipped with the ability to provide reception / transmission of service, control and intelligence information via a radio communication channel with on-board systems for receiving /transmitting information of attack UAVs and reconnaissance UAVs equipped with an on-board reconnaissance vehicle, and a radio communication channel via a repeater with radio modems of commanders and gunners of UAV reconnaissance units. Wearable technical means of reconnaissance are carried out with the ability to provide detection, sighting and determination of the coordinates of the target.<sup>2</sup> Wearable modules of direct radio communication with shock UAVs are carried out with the possibility of providing direct guidance of shock UAVs in emergency cases. Automated workstations of the remote control point are carried out with the possibility of providing control of the elements of the complex, receiving service and intelligence information via a radio communication channel through a repeater with radio modems of commanders of reconnaissance units and ground radio control stations of reconnaissance UAVs and transmitting control information via a radio communication channel through a repeater with ground radio control stations of shock UAVs and radio modems of commanders and gunners of UAVs of reconnaissance units. Wearable personal computers are carried out with the possibility of providing commanders with coordination of actions of a subordinate unit and primary processing of information about enemy objects.

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<sup>1</sup> Strike unmanned aerial vehicles and air defense - problems and prospects of confrontation. Rastopchin V.V.

<sup>2</sup> Intelligence, control and communication complex "Strelets" and "Strelets-M" for "Warrior".

## Description

The invention relates to remotely controlled air-ground-based group complexes designed for reconnaissance and fire destruction of high-priority enemy objects. The complex is formed as part of a permanent (division, brigade, regiment) or temporary (battalion tactical group) tactical formation of the Armed Forces.

A reconnaissance and strike complex containing air and ground segments of technical means is known. The air segment, which is being built on the basis of an unmanned aerial vehicle (UAV), provides reconnaissance, targeting, target illumination and control of their fire damage on the front line and the tactical depth of the enemy's defense.<sup>3</sup> The barrel artillery, using correctable ammunition, is responsible for the fire damage of targets. In various versions, the complex uses small aircraft-type UAVs "Aileron-3", "Orlan-10", "Outpost". The Orlan-30 UAV, completed in development and put into mass production, is proposed as the most promising.

An automated combat system based on a UAV [2] has a similar purpose and composition, where the Katran UAV is used as an aerial carrier of reconnaissance and target designation means. A feature of the system is the use of homing artillery shells and mines capable of hitting targets with the first shot without targeting, as well as integration with a ground-based complex of automated fire control tools.

The advantage of both complexes is the elimination, through the use of UAVs, of the discrepancy between the firing range of artillery (20-25 km) and the capabilities for the range of reconnaissance and targeting of ground-based artillery reconnaissance (5-7 km).

The disadvantages of the complexes are the lack of the ability to work as part of a group of UAVs, limited capabilities for the controllability of the complex, as well as the separation of the functions of reconnaissance and fire destruction of targets between the air and ground segments.

The principles and variants of group (pack) use of shock UAVs with an ordered or disordered order of battle, autonomous or controlled (connected) by a single center, homogeneous or heterogeneous in functional purpose are known. The disadvantage of the source of information is the formulation of proposals in a general form and, as a result, the lack of concrete practical solutions to create a single complex of forces and means combining the technical components of the air and ground segments with the military units and military command bodies involved.

The closest to the claimed invention is a multifunctional combat support complex containing a group of remotely controlled self-propelled platforms, each of which is equipped with an information reception/transmission system and a navigation system, a remote control point and additional equipment. The platforms are equipped with a means of reconnaissance and a means of fire destruction of the target, depending on the planned combat mission. In addition to these means, the platforms can be equipped with a transport module for the delivery of payload to the destination and evacuation of the wounded from the battlefield. The remote control point provides simultaneous or sequential control of a group of platforms. Additional equipment in the form of a car with a van body is used to deliver completed platforms and remote control equipment to the place of application.

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<sup>3</sup> Orlan-30 is the best friend of artillery. - Access mode: <https://zvezdaweekly.ru/news/20206251815-uqqk7.html>.

To achieve the set goal in the complex of reconnaissance and fire destruction of targets, containing a group of remotely controlled self-propelled platforms equipped with a system for receiving/transmitting information and a navigation system, and a remote control point, while the platforms are equipped with the possibility of completing reconnaissance and target destruction equipment, installed depending on the planned combat mission. The platforms of the complex are made in the form of an aerodrome-based aircraft-type UAV, the complex contains a UAV equipped with a repeater of transmitted information, individual radio communication modules and individual navigation modules for all categories of military personnel of intelligence units, UAV units and remote control point, wearable personal computers for unit commanders, portable automated workstations for commanders and specialists of the remote control point, ground-based UAV radio control stations for UAV unit operators, wearable technical means of reconnaissance for scouts and gunners of UAVs of reconnaissance units, wearable direct radio communication modules with shock UAVs equipped with an on-board means of target destruction, for gunners of UAVs of reconnaissance units, portable external radio communication stations for radiotelegraphists of UAV units, wearable radio modems for commanders and gunners of UAVs of reconnaissance units. At the same time, individual radio communication modules are carried out with the possibility of providing radio exchange of speech messages and data between military personnel within the units and the remote control point. Ground-based UAV radio control stations are performed with the ability to provide reception/transmission of service, control and intelligence information via a radio communication channel with on-board systems for receiving / transmitting information of shock UAVs and reconnaissance UAVs equipped with an on-board reconnaissance vehicle, and a radio communication channel via a repeater with radio modems of commanders and gunners of UAV reconnaissance units, wearable technical intelligence equipment is performed with the ability to provide detection, sighting and determination of the coordinates of the target. Wearable modules of direct radio communication with shock UAVs are performed with the possibility of providing direct guidance of shock UAVs in emergency cases, automated workstations of the remote control point are performed with the possibility of providing control of the elements of the complex, reception of service and intelligence information via a radio communication channel through a repeater with radio modems of commanders of reconnaissance units and ground stations of radio control of reconnaissance UAVs and transmission of control information via a radio communication channel through a repeater with ground stations of radio control of shock UAVs and radio modems of commanders and gunners of UAVs of reconnaissance units, wearable personal computers are performed with the ability to provide commanders with coordination of actions of subordinate units and primary processing information about enemy objects.

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