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The role of Unmanned Aerial Vehicles in modern military conflicts.

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Abstract: the article discusses research - based on the latest data, making a modern overview of the role of UAVs in modern military conflicts.

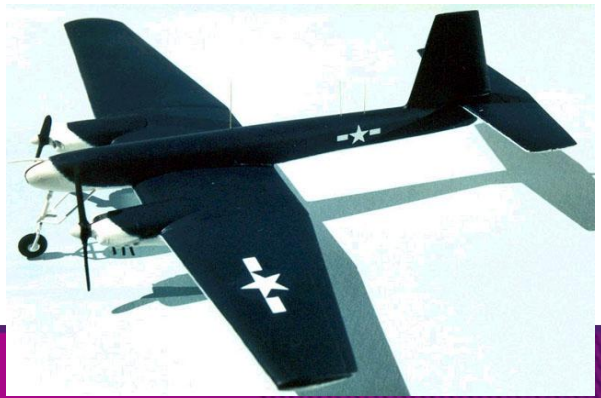
Keywords: quadcopter, drone, UAV, kamikaze drones, reconnaissance robots.

We have lived in such a time that in modern military conflicts, combatants on both sides very actively use various types of drones. A controlled drone is the hard worker of modern warfare: drones perform reconnaissance, adjust artillery fire, carry dropped ammunition, and are even guided missiles themselves. Speaking about drones, it should be remembered that until recently, most military experts did not consider these devices at all as something serious. As a last resort, there was a reconnaissance niche for drones , and mass purchase of drones for the troops was not planned.

How can one not recall a well-known historical fact: at the dawn of aviation, none of the military seriously considered airplanes as a means of gaining air superiority or as a means of accurately delivering ammunition to a specified address. Airplanes were assigned a modest role as front-line reconnaissance aircraft. The brace shelves turned into powerful, high-speed, adequately armed vehicles, and the massive use of attack, bomber and fighter aircraft forever changed the idea of modern warfare - aviation became of decisive importance on the battlefield. The same thing, but with minor amendments, can be said about unmanned aircraft.

1912 by Sperry Corporation "the first gyroscopic autopilot was presented - the technology provided automatic flight course retention and roll stabilization. In the 1930s, autopilots were already installed on civilian aircraft, and in 1947, a US Air Force C-54 made a transatlantic flight entirely under autopilot control, including takeoff and landing. In 1930, Russian scientist Pavel Aleksandrovich Molchanov launched the world's first radiosonde - an unmanned balloon with a radio transmitter, which made it possible to release the balloon into independent flight and receive data without returning to the ground. Sensors were attached to the ball to monitor the state of the atmosphere. The balloon operated at an altitude of about 8 km. Nowadays, weather balloons are used to study the atmosphere at altitudes of up to 40 kilometers and above.

By the way, unmanned balloons are considered one of the main reasons for UFO sightings. The definition of " drone " was first used by Delmar Farney , who led the US Navy's radio-controlled aircraft project in 1936. The designation soon stuck and was used as an alternative to the term unmanned aerial vehicles. During World War II, drones became weapons of warring countries.



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The Interstate TDR-1 unmanned attack torpedo bomber in service with the US Army, the German V-1 projectile aircraft and the V-2 ballistic missile are symbols of drones in the mid-40s of the 20th century. After the war, the TDR-1 and V-1 projects were virtually abandoned, and the V-2 technology became the basis of the US space program. In the second half of the 20th century, development of unmanned military aircraft continued. And by the beginning of the 80s, the USSR became a leader in this area. The Tu-143 "Flight" and Tu-141 "Strizh" aircraft were considered the most equipped devices of that time. The Tu-143 “Flight” was designed to conduct reconnaissance in the front-line zone, as well as monitor the radiation situation along the route. At the end of the flight, the plane turned around and returned to the base, and then landed using a parachute-jet system and landing gear. In the 1970s and 1980s, 950 UAVs were produced, several of which are still in service.

Tu-141 "Strizh" was designed for reconnaissance at transonic speeds. The device was equipped with photo and infrared reconnaissance equipment , which made it possible to use it in any weather conditions and at any time of the day.

The drone was in service with the USSR Air Force from 1979 to 1989. In 1996, a drone entered service with the US Army. Predator _ The device is still used to this day in reconnaissance and destruction of enemy targets [1]. In modern armed conflicts, the massive use of drones can sometimes change the course of a battle. Massive attacks by kamikaze drones, as practice has shown, are capable, for example, of permanently disabling an enemy airfield. You should also compare the difference in the cost of a homemade kamikaze drone and the price of an aircraft destroyed or damaged by a drone.

Drones are actively used to support infantry and artillery. They replaced combat aircraft, the use of which in the conflict declined due to fear of losses, notes Louis Neve, a journalist for the French publication “Futura”.

He emphasizes that drones are easier to fly, inexpensive by military standards and also stealthier. According to the Russian Ministry of Defense, at the time of the start of the special operation, the Ukrainian army had 36 unmanned aerial vehicles on its balance sheet, while the military department’s reports stated that 2,256 unmanned aerial vehicles had already been destroyed since the beginning of the Northern Military District [2]. For clarity, you can review the systems that are currently used in a special military operation. The Ukrainian Army uses the following drones: - Bayraktar TB2 (used for reconnaissance and strikes at targets) - Puma (drone used for reconnaissance, time in the air - up to 3 hours) - Quantix Recon (used for reconnaissance, time in the air up to 45 minutes) - Switchblade (kamikaze drones , for destroying armored vehicles, range of action: 10 km or 20 km) - MQ-9 Reaper (attack drone , time in the air - 24 hours) - FlyEye - H10 Poseidon II - “Furia” and “Leleka-100” (produced in Ukraine).

During the SVO, the Russian military uses the following UAVs: - Orlan-10 (used for reconnaissance purposes, runs on gasoline) - Eleron (used for reconnaissance runs on

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electricity) - KUBBLA (kamikaze drone) - Lancet
"(kamikaze drone) - "Pacer" (strike drone , time in the air - 24 hours) -
"Forpost-R" (strike drone) - "Geran-2" (kamikaze drone). It should be noted that in the interests of carrying out reconnaissance missions on both sides of the conflict, civilian drones such as DJI and homemade UAVs that are structurally similar to them are used.

There are so-called mini-companies that produce drones. The main players in the mini-company market are the following: DJI (China), Parrot (France), 3D Robotics, UVify, Autel Robotics (USA), Yuneec, Power Vision, Hubsan, Walkera (China). Brief technical characteristics for the above drones for using them as reconnaissance aircraft: Autel EVO II (time up to 40 minutes, distance up to 9 km); Hubsan Zino 2 (time up to 40 minutes, distance up to 8 km); FIMI X8 SE 2020 (time up to 35 minutes, distance up to 8 km); DJI Mavic Air 2 (time up to 34 minutes, distance up to 10 km); DJI Mavic 2 (time up to 31 minutes, distance up to 10 km); DJI Mini 2 (time up to 31 minutes, distance up to 10 km); DJI Phantom 4 Pro V2.0 (time 30 minutes, distance up to 10 km); Autel Robotics EVO (time up to 30 minutes, distance up to 7 km); DJI Mavic Pro (Platinum) (time 27/30 minutes (Pro / Pro Platinum), distance up to 7 km); DJI Inspire 2 (time up to 27 minutes, distance up to 7 km).

At the moment, taking into account the demands of the army and civil services, consortia are developing very dynamically in Russia - modern ecosystems for the production, maintenance and sale of UAVs in Russia. The main direction
of development is the production of UAVs of our own design, repair, modification and modernization of drones already in service, as well as training users in the management, repair and maintenance of military and civilian drones. The tasks
of consortia also include preparing qualified personnel and the creation
of educational programs.

Currently, the consortium is developing mobile robotic systems with machine vision units, collaborative manipulation platforms for performing technological and educational tasks, as well as infrastructure solutions based
on unmanned aerial vehicles. The rapid development of unmanned aerial vehicle technologies in the world, as well as the growing demand for their technologies
in the civil and commercial spheres of the world and Russia, require additional research on the possibilities of their dual use with the development of the civilian market.

Trends in the development and improvement of unmanned aerial vehicles are closely related to the continuation of industrial restructuring processes, national priorities for the development of science and technology, and world market conditions. The prerequisites for these changes are the globalization of the economy, processes of mergers and relationships in the industry, and the development of information technology [3].

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Conclusion: Since in modern conflicts unmanned aerial vehicles have proven themselves to be reliable attack and reconnaissance vehicles that inflict significant damage on the enemy with minimal risk to military personnel, this area should be comprehensively developed and developments in this promising area should be encouraged.

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