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ANALYSIS OF THE APPLICATION AND DEVELOPMENT OF UNMANNED AIRCRAFT VEHICLES

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Abstract. *This article analyzes the development and application of unmanned aerial vehicles from the early years of their development to World War II. During this period, the development of unmanned aerial vehicles was mainly observed in the developed countries of that era, in particular, Great Britain, the USA and the former Soviet Union. The article analyzes the needs and attempts to develop unmanned aerial vehicles in these countries.*

Keywords*: unmanned aviation, unmanned aerial vehicle, military-purpose unmanned aerial vehicle, guided missile, air target.*

Аннотация*. В данной статье рассматривается развитие беспилотной авиации с первых лет ее развития до Второй мировой войны и анализируются возможности ее использования. В это время развитие беспилотных летательных аппаратов наблюдалось в основном в развитых странах того времени, в частности, Великобритании, США и бывшем Советском Союзе. В статье представлен анализ необходимости и попыток разработки дронов в этих странах.*

Ключевые слова: *беспилотная авиация, беспилотный летательный аппарат, военный дрон, управляемый снаряд, воздушная мишень.*

The introduction of modern technologies today increases opportunities in all areas and simplifies complex processes performed by humans. In particular, in the military sphere, the introduction of the latest weapons, modern equipment and technologies, and innovative approaches ensures the safety of personnel and reduces casualties, achieving a high level of efficiency. Especially in armed conflicts of the last decade, including in the Middle East, Nagorno-Karabakh and the Russian-Ukrainian conflicts, the use of the latest technologies such as unmanned aerial vehicles, electronic warfare devices, and guided cruise missiles, along with increasing the survivability of troops in combat situations and the ability to inflict more casualties, is a clear example of a fundamental shift in the theater of military art. In particular, the widespread use of unmanned aerial vehicles for various purposes in the above-mentioned armed conflicts is one of the directly decisive factors in achieving the intended goal in military operations. So, let's first look at the concept of a drone.

Article 2 of the Regulation “On the Procedure for the Use and Storage of Unmanned Aerial Vehicles in Civil and State Aviation of the Republic of Uzbekistan” states: “Unmanned aerial vehicle (UAV) is an aircraft that performs unmanned flight or is completely remotely controlled or programmed from another location and is fully autonomous in flight (with the exception of aircraft models and toy aircraft models)” [1].

Today, large enterprises in leading countries of the world are investing heavily in the design and production of UUAs for various purposes, attracting specialists with extensive experience and knowledge in this field. The development of UUAs can be divided into the following stages based on the research conducted and achievements made to date [6]:

I. From 1849 to the beginning of the 20th century - during this period, the first attempts and experimental experiments to create UUA were carried out, the work of scientists included the

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formation of the theoretical foundations of aerodynamics, the theory of flight and aircraft calculations were studied from a theoretical perspective.
II. The beginning of the 20th century - 1945 - during this period, the development of the first military unmanned aerial vehicles (rocket aircraft with short range and flight duration) took place.
III. 1945-1960 – There was an expansion of the classification of UAVs by purpose and it was a period of their creation primarily for reconnaissance operations.
IV. From the 1960s to the present day, there has been an expansion and improvement of the classification of UUAs, which began to be used for mass use to solve problems in non-military areas.
From the above steps, it can be said that UUAs were originally developed for military purposes and continue to be relevant today.
Military-oriented UUAs were originally developed in the United Kingdom in the 1930s and were used as aerial targets for training military pilots and anti-aircraft gun operators (Figure 1) [5].

Figure 1. The first multi-role flying target, the de Havilland DH.82B Queen Bee

Unlike Great Britain, Germany used UUAs as guided missiles to strike enemy industrial and economic facilities.
In the 1930s and 1940s, the United States made significant progress in the development of UUAs. Like the United Kingdom, the United States developed the Radioplane QQ-2 flying target (Figure 2). During the two world wars, Radioplane supplied more than 15,000 UUAs to the United States Air Force. Their use increased the effectiveness of anti-aircraft artillery crews in repelling enemy air attacks [6].

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Figure 2. Radioplane QQ-2 flying target (USA)

During World War II, not a single UUA was put into service in the USSR. At the same time, it was planned to use the TB-3 heavy bomber as an unmanned aircraft to destroy enemy communications. So, during the Rzhev-Vyazemsk operation in 1942, the TB-3 aircraft (Fig. 3) took to the air under the control of the pilot, who had to set the aircraft on the calculated course (section 1) and then leave it. In the air, control and guidance of the aircraft to the target were to be carried out telemechanically from the DB-3 aircraft by radio (section 2). It was planned to use bombs and blow up the aircraft (section 3) by radio. However, in practice, it was not possible to fulfill the combat mission. When approaching the target, the DB-3 aircraft's antenna was damaged by artillery shells, and the TB-3 crashed behind the front of the fascist troops [6].

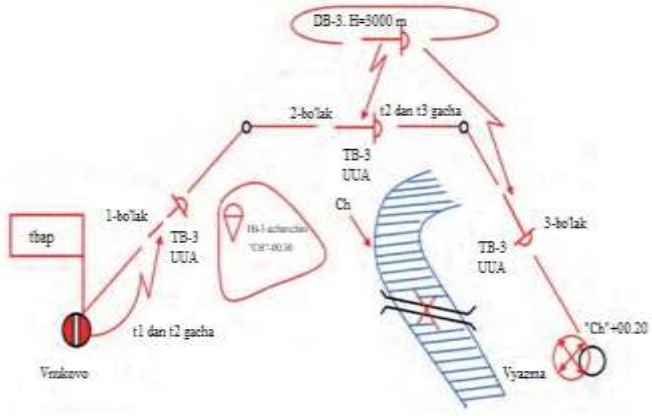

Figure 3. Drawing of a strike plan using TB-3

This information can be generalized and compared with the purpose of the UUAs developed before World War II, and a comparative analysis is presented in Table 1.

Table 1

UUA, developed in the period leading up to World War II

t/r	Name	Country of manufacture	Purpose	Application effect
1.	de Havil and DH.82B Queen Bee	Great Britain	Air target	Used in the training of military pilots and anti-aircraft gun operators
2.	Radioplane QQ-2	USA	Air target	Widely used in training military pilots during World War II
3.	TB-3	USSR	To strike	Failed to complete the task

Above cited from the data this conclusion to do It is possible that this in the period UUA those working exit according to initial attempts mainly science developed in the countries observed . Drone aviation tools , including UUA s initially military for the purpose working This is a . UUA s initial in years air badges as used , air in the battle used and directly military pilots , anti - aircraft missileers qualifications to increase service did . II world war during and personal the content to disappear level reduce , to the enemy more loss to deliver for the purpose UUA from mainly blow

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to give for the purpose used . This for , above seeing passed in examples also as mentioned , mainly controllable aviation bombs and from airplanes used . As a result today's of the day winged missiles , ballistic rockets and blow giver UUA those to create was initial steps thrown away .

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