

Oleksandr BLISKUN

National Defense University of Ukraine named after Ivan Cherniakhovskyi, Kyiv, Ukraine

MANNED-UNMANNED AIRCRAFTS' COMBAT FORMATIONS IN ACHIEVING AIR SUPERIORITY

Air control helps to isolate the combat area and conduct operations at a specific place and time without interference from the enemy air, while providing cover for their own forces. Gaining control of the airspace is not a main objective, and is useful only when used as a tool to achieve a more meaningful goal. Once airspace control has been achieved, air power provides the ability to design (demonstrate and apply) military power where and when required; however, dominance in the air is not a permanent state, and it must be constantly fought for after its establishment. There are two levels of air control: air superiority and air supremacy.

The air superiority is the degree of dominance in the air battle of one air force over another, which allows the former to conduct air operations, as well as relevant operations by land, sea and other forces at certain times and places without significant resistance from enemy's air forces.

Therefore, in order to gain air superiority to provide cover for own' forces and in the interests of the land and sea component, the Air Force must use fighter aircraft to destroy enemy air means in air battles and on the ground during an air operation. And to provide safety conditions to operating fighter aviation in the air should be destroyed all air defense systems by strikes before operation began.

Analysis of the state of aircraft and forecasting the possibility of its operation shows that the existing fleet will decrease every year. Also, the vision of the leadership of the Air Force and the national state to change the fleet to new models of aircraft is obvious. By 2035, it is planned to completely replace all existing aircraft with new ones. But in the most difficult transition years of 2025-2030, there may be a problem when existing aircraft will be disarmed and new ones will not be purchased due to their high cost. Therefore, it is necessary to look for a cheaper, but no less effective way to solve this issue today.

My research on this issue has led me to the need to look for options for the joint application of manned and unmanned aircrafts. First, it was necessary to choose among all possible UAVs that can perform tasks to strike ground targets and destroy the enemy's air means. Then compare their flight and technical characteristics with the existing fleet of manned fighter aircraft to understand whether they can perform combat missions in similar conditions. Finally, compare the financial side of this issue.

The best solution is the UAV XQ-58 "Valkyrie". UAV XQ-58 "Valkyrie" belongs to the program of low-cost aviation technology (Low Cost Attritable Aircraft Technology LCAAT), which significantly affects the choice of this UAV. It was also designed for use in joint combat with fighters. XQ-58 can carry on to one ton of combat load in the internal compartments. There is also a possibility that, analogous to the loading option of the F-35 aircraft, it will also be possible to suspend the aircraft at the external suspension points in the Valkyrie UAV.

To perform the task of misleading the enemy can be used combat formation, which will consist of the UAV XQ-58 flight, which will simulate a Su-27. Such two flights can simulate the flight of a pair of fighters to detect the positions of the enemy's air defenses, or give them the wrong direction of attack. To do this, you only need to take a standard combat formation for fighter aviation. This group of UAVs will be flown from a double-sit fighter jet. The operator will assign tactical tasks to UAV groups not control them remotely. The distance from the fighter aircraft to the UAV will be selected in accordance with the means of anti-aircraft defense, the ability to detect air targets by the enemy and the technical characteristics of the weapons system of own fighters.

Along with the low cost of the UAV itself and operating costs, the XQ-58 "Valkyrie" will be able to perform the functions of a carrier of weapons and consumables in case of danger to the pilot of the aircraft. The use of LCAAT UAVs significantly reduces the risks for manned aircraft. It can be at a safe distance from enemy air defense facilities and solve combat tasks with the help of UAVs.

And the main tasks of air defense breakthrough and destruction of ground objects and the struggle for air superiority will be performed by mixed units, including a fourth or fifth generation manned fighter and a number of UAVs.

In this Flight, UAVs will be able to take on the roles of reconnaissance and weapons. The manned aircraft will become a kind of command post with the ability to track the situation and the use of weapons. And the pilot will take on the role of operator, who, having the appropriate level of tactical and operational-tactical training, skillfully assessing the situation, will appoint subordinate UAVs to perform tasks without spending precious time in combat.

References

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NAMED AFTER IVAN CHERNIAKHOVSKYI**

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PhD Student of aviation department,
Aviation and Air Defense Institute
Lt. Col. Oleksandr Blyskun

The National Defence University of Ukraine

AIR SUPERIORITY. MEANING. TASKS.

Since the German attack on Poland in 1939, no country has ever won a war in the face of enemy air superiority; no major offensive has succeeded against an opponent who controlled the air, and no defense has sustained itself against an enemy who had air superiority. Conversely, no state has lost a war while it maintained air superiority, and attainment of air superiority consistently has been a prelude to military victory.

Colonel John A. Warden III
The Air Campaign: Planning for Combat

AIR SUPERIORITY

- defeat enemies' aircraft in the air
- destroy enemies' aircraft on the airfields
- neutralize enemy air defense system

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The vision of the Air Force of the Armed Forces of Ukraine 2035

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Flight & technical characteristics of fighter jets and UAVs

	MiG-29	Su-27	C-30 "Thunder"	AG-89 "Hellgram"	Boeing Stearman S-41B (Pilot)
Length	17,32m	21,9m	16m	8,8m	11,93m
Wingspan	11,5m	14,1m	18m	6,7m	18,53m
Height	4,75m	5,8m	1,8m	1,8m	3,5m
Velocity	2200km/h	2500 km/h	1000km/h	1400 km/h	-
Max. alt. (km)	18 000m	18 000m	18 000m	12 700m	12 100m
R	700km	1000km	2000km	2000km	1000km
R _{max}	10	10	10	10	10
Price	\$12 mil	\$19 mil	\$12 mil	\$2 mil	\$1,4 m

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COMBAT FORMATIONS FOR TACTICAL GROUPS

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MIXED MANNED-UNMANNED TEAM

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