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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

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13 July 1973

MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT (USSR): Support of Transport Aircraft During Airborne Operations

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought." The article states that airborne operations are likely to fail without special measures to protect transport aircraft from air defense missiles and fighters. Special measures suggested are the creation of a corridor through missile defenses by air and missile strikes, and the destruction of fighter aircraft on the ground. The MIG-21 is said to have low combat effectiveness against enemy fighters. As replacements for it, two new fighters are recommended, a light one to escort transports in the forward area and a heavy fighter to provide cover to a depth of 1000 kilometers. This article appeared in Issue No. 1 (89) for 1970.

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies.

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W. E. Colby
Deputy Director for Operations

[redacted]

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SUBJECT

MILITARY THOUGHT (USSR): Combat with Enemy Air Defense Means to Support Flights by Military-Transport Aviation to Drop Troops

SOURCE Documentary

Summary

The following report is a translation from Russian of an article which appeared in Issue No. 1 (89) for 1970 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought." The authors of this article are General-Leytenant of Aviation I. Taranenko, Lieutenant Colonel A. Borisov (Candidate of Military Sciences) and Engineer Lieutenant Colonel G. Rastorguyev (Candidate of Technical Sciences). The article states that airborne operations are likely to fail without special measures to protect transport aircraft from air defense missiles and fighters. Special measures suggested are the creation of a corridor through missile defenses by air and missile strikes, and the destruction of fighter aircraft on the ground. The MIG-21 is said to have low combat effectiveness against enemy fighters. As replacements for it, two new fighters are recommended, a light one to escort transports in the forward area and a heavy fighter to provide cover to a depth of 1000 kilometers. It is also recommended that transports be equipped with electronic countermeasures and air-to-surface missiles. A table of the quantities of enemy air defense weapons to be faced is included.

End of Summary

Comment:

General-Leytenant I. A. Taranenko was identified by Krasnaya Zvezda in 1968 as First Deputy Commander of Military-Transport Aviation. Lieutenant Colonel A. Borisov was identified by Krasnaya Zvezda in 1970 as commander of a missile battalion. He

authored an article appearing in Issue No. 2 (84) for 1968 of the Collection of Articles of the Journal "Military Thought" titled "The Overcoming of Enemy Air Defenses by Military-Transport Aviation" . There is no information in available reference materials which can be firmly associated with the other author. Military Thought has been published by the USSR Ministry of Defense in three versions in the past--TOP SECRET, SECRET, and RESTRICTED. There is no information as to whether or not the TOP SECRET version continues to be published. The SECRET version is published three times annually and is distributed down to the level of division commander.

Combat with Enemy Air Defense Means to Support Flights by Military-Transport Aviation to Drop Troops

by
General-Leytenant of Aviation I. Taranenko
Lieutenant Colonel A. Borisov, Candidate of Military Sciences
Engineer Lieutenant Colonel G. Rastorguyev,
Candidate of Technical Sciences

The fulfilment by military-transport aviation of the tasks of landing troops inevitably involves overcoming enemy air defense countermeasures. To appreciate the difficulties which may be encountered by military-transport aviation in overcoming enemy air defenses, let us examine certain aspects in the conduct of airborne landing operations as they apply to the conditions in the Western Theater of Military Operations.

First of all, let us note that, regardless of the nature of the war (whether nuclear or non-nuclear), the fulfilment of operational-strategic missions in this theater of military operations will require large-scale airborne landings. Air drops (landings) are carried out, as a rule, successively or simultaneously in the shortest possible time at a depth of 200 to 800 kilometers from the front line. In addition, the methods used in carrying out airborne landing operations are those worked out by military-transport aviation large units in peacetime.

During operational training and in exercises a landing in one flight of an understrength airborne division usually entailed the use of three to four large units of military-transport aviation, i.e., 300 to 400 AN-12B aircraft, of which approximately 270 to 340 comprise the parachute group and the rest the landing group. A landing flight of military-transport aviation large units is planned along three or four routes in a zone 60 to 80 kilometers wide with intervals of 10 to 20 kilometers between the routes. The flight profiles selected for it are usually variable: medium and high altitudes (6000 to 8000 meters) over our own territory, and low altitudes (200 to 300 meters) over enemy territory.

Results of exercises show that, when military-transport aviation large units fly along three routes and make a simultaneous drop of a landing force onto six landing sites, the time needed for a parachute landing of an airborne division at night, or during

the day under adverse weather conditions, is seventy to eighty minutes. Flying in single file at a cruising speed of 500 to 550 kilometers per hour three or four large units of military-transport aviation will have an operational disposition depth of 500 to 550 kilometers (regiments of division in two echelons) and a width of 40 to 60 kilometers. Depending on the depth of the landing, the number of aircraft and, also, the operational disposition of military-transport aviation large units (landing group), the military-transport aircraft flight may be under attack by enemy air defense means and forces for three to eight hours.

An analysis of enemy air defense in the Western Theater of Military Operations shows that 50 to 100 kilometers before the front line the military-transport aircraft will be subjected to attacks by single enemy fighter-interceptor aircraft whose efforts will be directed primarily at disorganizing the battle formations of military-transport aviation large units and also at destroying the transport aircraft before they reach the SAM operational zone. Two hundred to two hundred fifty kilometers beyond the front line, the main countermeasures the military-transport aircraft will face will be the "Hawk," "Chaparral" and "Red Eye" SAM and light antiaircraft artillery.* In this zone they may also be attacked by enemy fighter-interceptors and tactical fighters. In the operational depth the most serious countermeasures will be from air defense all-weather aircraft, while in certain areas the countermeasures from these aircraft may be augmented considerably by SAM and light antiaircraft artillery fire. The chart below shows the approximate strength of air defense forces and means which the military-transport aircraft will face during the flight to and from the landing area, as it applies to the Western Theater of Military Operations. [See chart on page 7.]

Calculations conducted on the basis of the data shown in this chart show that, if special measures are not taken to support their actions, losses to transport aircraft during the flight to the landing area may be so heavy that the landing operation would fail.

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*The "Nike-Hercules" SAM are not considered, as they are not capable of destroying any air targets below 1000 meters.

The Amount of Enemy Forces and Means Capable of Countermeasures Against Military-Transport Aviation Within Its Flight Zone

Type of air defense means	Strength of air defense forces and means	
	During non-nuclear period of war on the 4th or 5th day after it began (depth of landing 200 to 300 km)	The 2nd or 3rd day after massive use of nuclear weapons (depth of landing 600 to 800 km)
Air defense fighters	60-80	60-100
Tactical fighters	100-140	80-100
"Hawk" SAM launchers	30-40	50-60
"Chaparral" SAM launchers	40-50	30-40
"Vulcan" antiaircraft artillery	40-50	30-40
"Red Eye" crews	140-170	70-80

Note: 1. The above figures are based on preliminary neutralization of the air defense system: thirty to forty percent in a non-nuclear war; fifty to sixty percent in a nuclear war.

2. The enemy has at his disposal up to fifteen guidance and control command posts for control of the above air defense forces and means.

Which air defense means inflict the most damage on military-transport aircraft?

It is known that a high density of fire can be created by using surface-to-air missiles. Thus, in the tactical zone of a theater of military operations they completely cover the air space above the troops and installations of the probable enemy. Along certain axes the depth of the dense SAM cover also extends over the operational zone (up to 300 kilometers). Calculations show that in a round-trip flight to the landing area without the use of special protective measures, the losses suffered by military-transport aircraft from SAM alone would amount to over one third of their total losses.

Taking into account that in their own zones SAM can cover the entire range of altitudes used by transport aircraft and under all weather conditions, one of the main problems arising in a landing operation is the problem of protecting military-transport aircraft from enemy SAM. The solution of this problem must be based on the fact that the SAM are primarily static air defense means and when neutralized in various areas, the restoration of enemy air defense combat effectiveness will take considerably longer than will the flight by military-transport aircraft over these areas.

Thus, the successful landing of airborne troops is not possible without the creation of corridors for military-transport aircraft through the SAM zone. This will necessitate the assistance of the forces and means of the front, primarily the strike aviation and rocket troops.

In the depth of the enemy defense, SAM batteries cover only certain individual areas which, in most cases, can be bypassed by the military-transport aircraft by selecting appropriate flight routes. It must also be noted that the SAM countermeasures during the flight by military-transport aircraft through the area can be reduced to a certain extent by having the transport aircraft use radioelectronic countermeasure means and, also, by reducing the altitude at which aviation large units fly.

Another air defense means which is no less dangerous to military-transport aircraft than SAM is the all-weather fighter. These are the aircraft that will concentrate their efforts against

military-transport aircraft in specific areas, and, first of all, in the corridors carved through the SAM zone.

The fighter-interceptors used by the probable enemy can, from their own airfields, intercept military-transport aircraft within the boundaries of the entire front zone.* Most of them are capable of carrying out multiple approach angle attack against military-transport aircraft under any weather conditions, both day and night, as well as against the background of the earth's surface. As a rule, they are armed with four to six "air-to-air" missiles of the "Sparrow," "Falcon" or "Sidewinder" class, and some of them are armed with guns (six-barreled Vulcan). The effectiveness of interceptors against individual targets even now does not really yield to the SAM in effectiveness, in addition to which the size of their zone of operation is considerably greater than the SAM kill zone.

From the above it is evident that fighter aviation is capable of maintaining constant combat readiness and combat effectiveness of enemy air defense, especially during the fluidity of combat actions. It is true, of course, that modern fighters still depend to a considerable degree on the support of ground guidance systems and cannot use their weapons fully at low altitudes. But it is expected that in the nearest future there will be all-weather fighters with variable geometry wings and the latest sight-navigational autonomous systems (without ground support). It follows that another important problem of airborne troop landings is the protection of transport aircraft from enemy fighter attack.

Overcoming the countermeasures of air defense fighter aircraft is considerably more complicated than defending against SAM. Thus, while it is still possible to overcome enemy SAM systems by partially bypassing areas covered by them, or by destroying them in a comparatively narrow zone (80 to 100 kilometers), it is practically impossible to prevent attacks by enemy fighters in this manner. Air defense fighters can also be guided against military-transport aviation battle formations from airfields

*At the present time the basic types of air defense fighters in Europe are the "F-102," "F-104," the "Lightning," and the "Mirage IIIC." By 1973 a massive addition can be expected in the NATO air defense of fighters of the "F-4C, E, D" types and, possibly, the "F-111."

situated at considerable distances (up to 350 kilometers) from the flight zone of military-transport aircraft. Therefore, air defense fighters can be encountered along the entire flight route over enemy territory.

In the Western Theater of Military Operations, taking into account the preliminary neutralization of aircraft on airfields, when landing airborne troops during a non-nuclear period of war at a depth of 200 to 300 kilometers, countermeasures may be expected from 100 to 130 fighters (including tactical ones) during the day and 50 to 70 at night. During a nuclear period of war, in an airborne landing at a depth of 600 to 800 kilometers, countermeasures can be expected from 60 to 90 fighters during the day and 30 to 50 at night. With this number of combat-ready aircraft, even assuming that only half of them will attack military-transport aircraft (the rest will have to be used for combat with long-range and fighter-bomber aircraft), the losses to military-transport aircraft during the flight to the landing area during the day under adverse weather conditions, or at night, will be twenty-five to thirty percent. During the day, under favorable weather conditions, the effectiveness of enemy fighters would naturally be even higher. In addition, military-transport aircraft will suffer some losses on their return flight.

Research indicates that the most efficient way of solving the problem of protecting military-transport aviation from enemy fighter aviation is the destruction and neutralization of the latter on the ground. During the nuclear period of a war the mission of destroying fighter aviation on the ground will be the responsibility of front rocket troops, long-range aviation, and front aviation (fighter-bomber aviation and bomber aviation). During the non-nuclear period of war, because of the extremely limited capabilities of the rocket troops, it can be solved only by aviation.

Calculations show that, to create conditions in which military-transport aviation will be able to fulfil its troop landing missions (losses will not exceed ten to fifteen percent), it will be necessary to use large contingents of supporting forces and means, the main mission of which will be to neutralize and destroy enemy air defense installations. Thus, the destruction on the ground of three to four air defense fighter squadrons, five to seven tactical fighter squadrons and four or five control points

will require 40 to 50 sorties by long-range aviation and 140 to 200 sorties by front aviation. Besides, while providing support for landing operations during the non-nuclear period of war, front aviation will have to operate against a very powerful air defense system in the theater of military operations and will itself suffer considerable losses. In addition, it will not always be possible to assign the necessary amount of front aviation in support of military-transport aviation operations and, therefore, counter-measures by enemy air defense means, especially his fighter aircraft, will remain quite strong.

Consequently, in most cases the neutralization of fighter aviation on the ground alone will not be enough to reduce military-transport aviation losses sufficiently to ensure the success of its operations. Therefore, another necessary measure for combatting enemy air defense fighter aviation is to have our own fighter aircraft escort the battle formation of military-transport aviation of large units to the entire depth of its flight to the landing area. It should be noted, however, that some military specialists at the present time are of the opinion that fighter cover of military-transport aviation aircraft in flight is not very effective. Let us see how much this opinion corresponds with reality.

Considering the tactical-technical characteristics of our existing and future fighter aircraft and the methods of their combat use, it is possible to specify three typical zones of front fighter aviation operations in support of military-transport aviation: (1) forward edge, (2) tactical zone, and (3) operational zone.*

Fighter aircraft can support the flight of military-transport aviation in the forward edge in a conventional manner, just as they do when providing support for front troops and installations, i.e., by intercepting enemy fighters on duty on the ground or in the air, by escorting military-transport aviation flights, or by covering its flight zone by autonomous actions. Control of the fighters in this zone is carried out by the existing centralized system of front aviation command posts.

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*The forward edge may be considered those areas above our own territory and above the territory of the enemy to a depth of 50 kilometers from the front line: the tactical zone, to a depth of 250 to 300 kilometers; and the operational zone, from 250 to 300 to 500 to 1000 kilometers.

In the tactical and operational zones the front fighters will not be able to cover military-transport aircraft by conventional methods; it will be necessary to organize special patrol escorts for military-transport aircraft.

It should be noted that the existing types of front fighter aircraft are capable of escorting military-transport aircraft to a depth of 250 to 300 kilometers beyond the front line. They are not quite suitable for autonomous actions, mainly because of the characteristics of their equipment and armament. Apart from their radar, MIG-21 fighters can organize coordination in the air between themselves and the military-transport aircraft only under simple weather conditions. Besides, their effectiveness in combat with enemy fighters is low.

However, the above-mentioned limitations in providing cover for military-transport aircraft during an airborne troop landing flight can, in principle, be overcome. An analysis of the present-day level of development of science and technology shows that all the necessary technical prerequisites exist for the creation in the very near future of the types of front fighter aircraft which will be capable of effectively supporting military-transport aviation operations.

To resolve the many tasks levied on front fighter aviation, it would be advisable for it to have two types of fighters: light and heavy. They will differ from each other in the unit of fire and flight range. The light fighter will be capable of operating at a depth of up to 300 to 350 kilometers from the front line, and the heavy fighter up to 800 to 1000 kilometers. It is assumed that the light fighter aircraft will be more numerous and will comprise seventy to eighty percent of the entire fleet of front fighter aviation. This will considerably increase the operational autonomy of both types of fighter aircraft and will enable them to intercept enemy fighters while escorting military-transport aircraft with, on the average, a probability of 0.5 to 0.6, while their unit of fire will allow them to carry out up to three attacks.

Support of military-transport aviation operations by the above types of front fighter aircraft should be organized as follows. In the forward edge the cover for the military-transport aircraft is carried out by the light front fighters employing the usually front air defense methods. In the tactical zone these fighters provide patrol escort for military-transport aircraft.

In the operational zone military-transport aircraft are covered by a patrol escort of heavy front fighters. In addition, in those areas along the flight route where very strong countermeasures by enemy fighters are possible, military-transport aircraft cover can be reinforced by directing a flight of light front fighters to these areas along the optimum routes.

Thus, in conducting an airborne landing operation, combat with enemy air defense means, especially his fighters, is one of the more complicated problems, the solution of which requires the adoption of a complex of operational-tactical and technical measures. By technical measures we mean the equipping of military-transport aircraft with onboard weapons and with means for radio-electronic countermeasures.

Research shows that, if military-transport aircraft are equipped with onboard fire means, including scanning/sight equipment and gun installations with a mixed unit of fire (shells with radar, infrared, and contact heads), their losses from enemy air defense means (mainly from his fighters) can be lowered by ten to fifteen percent. In airborne landing flights it is advisable that military-transport aircraft also have "air-to-surface" missiles for the destruction of ground radar stations of the enemy air defense means (primarily of the "Hawk" SAM batteries).

Radioelectronic countermeasure means of military-transport aircraft include devices for the creation of active and passive jamming and also equipment for using radar and infrared decoys.

The overall evaluation of the effectiveness of the protective means examined above indicates that their employment will permit a thirty to forty percent reduction in military-transport aviation losses from enemy air defense means.

Thus, an analysis of the conditions of combat use of military-transport aviation for airborne landings in the Western Theater of Military Operations shows that, if special measures are not taken for the support of their operations, their losses in aircraft from enemy SAM and fighter aviation can be very high. To successfully perform airborne landing operations in this theater of military operations it is necessary to carry out preliminary neutralization of air defense installations in the flight zone of military-transport aviation, to cover their operational formations with front fighter aircraft, and to equip military-transport aircraft with onboard means of protection.