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CENTRAL INTELLIGENCE AGENCY

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MEMORANDUM FOR: The Director of Central Intelligence

FROM : John N. McMahon
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Some Problems
in the Development and Combat Employment
of Military Transport Aviation

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". This article points out the necessity and discusses ways to increase the capabilities of military transport aviation. Until V/STOL models become a reality, aircraft must be adapted or designed for shorter takeoff, longer ranges, and higher speeds; some must accommodate larger and heavier cargoes; and their self-defense needs improvement. Some modifications of civilian aircraft for possible military use are also mentioned. This article appeared in Issue No. 5 (66) for 1962.

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. For ease of reference, reports from this publication have been assigned

JOHN N. MCMAHON

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Intelligence Information Special Report

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SUBJECT

MILITARY THOUGHT (USSR): Some Problems in the Development
and Combat Employment of Military Transport Aviation

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 5 (66) for 1962 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article, by Lieutenant Colonel L. Semeyko and Engineer Lieutenant Colonel L. Sokolov-Sokolenok, points out the necessity and discusses ways to increase the capabilities of military transport aviation. Until V/STOL models become a reality, aircraft must be adapted or designed for shorter takeoff, longer ranges, and higher speeds; some must accommodate larger and heavier cargoes; and their self-defense needs improvement. Some modifications of civilian aircraft for possible military use are also mentioned.

End of Summary

[Redacted] Comment:

Colonel Semeyko also wrote "The Essence of Limited Forces and Special Features of Their Combat Actions" in Issue No. 3 (82) for 1967 [Redacted]

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Some Problems in the Development and Combat
Employment of Military Transport Aviation

by

Lieutenant Colonel L. SEMEYKO
Engineer Lieutenant Colonel L. SOKOLOV-SOKOLENOK

The large scope of future offensive operations, the massive destruction, and the radioactive contamination of terrain will all inevitably hinder the execution of troop regroupings in short times. Under such conditions, military transport aviation will be an important means of strategic and operational maneuver of troops and of supplying them. Naturally the problems of its development and combat employment attract the attention of our military science community more and more every year.

Up to the present time, military transport aviation has been envisioned for use basically to drop (land) airborne landing forces and to deliver supply cargoes. The transfer of motorized rifle units and large units by air from the interior of the country to active fronts in an inter-front maneuver is also being worked out in theory and tested in practice in exercises and maneuvers. But so far there has been no examination and validation of the use of military transport aviation for the purpose of the intra-front maneuver of troops, even of those operating on the main axis.

It is clear that the present-day military transport aviation cannot carry out the massive transfer of the units and large units of a front even on the main operations axes. However, the necessity for such transfers during offensive operations will doubtlessly arise. It is for this reason that the Minister of Defense, Marshal of the Soviet Union R. Ya. MALINOVSKIY, at the Army-wide Conference of Secretaries of the Primary Party Organizations in May 1960, indicated that "aviation must become the main means of executing maneuvers on all levels."

Researching the objectives and volume of troop airlifts and on this basis determining the requirements for military transport aviation is, in our opinion, one of the important tasks of military theoretical thought. The long-range prospects for



carrying out massive troop airlifts depend on how correctly we manage now to determine the direction of development of military transport aviation for the next few years.

As the basis of the demands on military transport aviation used in the front, it is advisable to take airlift support of combined-arms large units. It is well known that the operational maneuvering of troops is undertaken in order to have a favorable effect on the course and outcome of an operation, i.e., to achieve a definite operational result. As theoretical research and the experience of exercises show, to obtain such a result, commitment to the engagement of fresh forces in the strength of not less than a motorized rifle (tank) division and some part of the front special-purpose reserves is necessary.

A motorized rifle division is the most cumbersome thing for an airlift. The weight and dimension specifications of its armament and combat equipment are also characteristic of the large units of other branch arms. Therefore, if air transport is adapted to lift a motorized rifle division, it means that the question about the possibility of airlifting the large units and units of all branch arms of the ground forces is solved.

It is obvious that airlifting a motorized rifle division located in the front reserve is necessary only in case other reserves located nearby cannot be committed to the engagement in time, whether as a consequence of their loss of combat effectiveness or by virtue of the impossibility of moving forward in time under their own power.

Under the conditions of massed employment of nuclear weapons, the most serious obstacle to the maneuvering of troops will be zones of radioactive contamination. In the US Army, as we know, much attention is devoted to establishing so-called "nuclear barriers" in the operational rear of the enemy. In one of our command-staff exercises in 1961, "West", endeavoring to delay the movement of the strategic reserves of "East", delivered 68 ground nuclear strikes on the line of the Oder and Neisse rivers and the Sudeten Mountains. As a result, a zone of radioactive contamination developed involving an enormous territory, up to 700 kilometers across the front and 200 kilometers in depth, which drastically complicated the movement of two fronts.



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In a number of postwar exercises, the NATO command has also worked out the problems of creating zones of flooding. The possibilities for this in the Western Theater of Military Operations are very great. In the foreign part of this theater there are hundreds of reservoirs with a volume of over five million cubic meters, and in the near future, according to some data, their capacity may double. Negotiation of water obstacles in a period of flood will be extremely difficult and sometimes even impossible. It is known, for instance, that as a result of the demolition of a dam on the Ruhr River in February 1945, the troops of the American 1st and 9th Armies were held up for 12 days.

By using nuclear weapons, the enemy can in short times effect considerable damage on transportation lines, knock out their most important links, and thus drastically limit the possibilities of the timely movement of troops under their own power. In one of the command-staff exercises, the "enemy" managed to destroy 30 motor road bridges over the Oder and Elbe rivers and knock out 50 major road junctions.

It is also possible for the enemy to create combination zones of obstacles, in which the destruction or flooding of important areas will be linked with radioactive and chemical contamination of them.

Consequently, there is no ruling out such conditions where military transport aviation is the only means with whose help the troops will be able to carry out a regrouping at decisive moments of operations in short times without loss of combat effectiveness.

Calculations show that the movement of troops under their own power does not by any means always ensure their timely commitment to an engagement. Even with movement at rates of 250 to 300 kilometers per day, the operational reserves of a front may be committed to the engagement during a successfully developing offensive operation only two days after the setting of a task. With reduction of the length of a day's march to 200 or 150 kilometers, the commitment of reserves becomes possible only after 2.5 to five days.

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The commitment time of operational reserves to the engagement can be shortened by bringing them closer to the line of armed contact of the troops, but in this case a definite overcrowding of the first echelon of the front's operational disposition will occur and losses will increase.

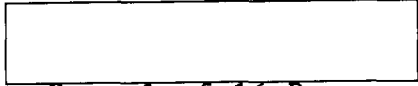
But what effect can be expected in case of the use of air transport to transfer troops during a front operation? Calculations show that even in the case where one or two days (counting the concentration of military transport aviation) are spent on an airlift of troops, the gain in time is still about twice as great as is achieved with the movement of troops under their own power.

However, it must unfortunately be noted that the present-day military transport aviation does not come close to ensuring the realization of such attractive prospects. The existing planes and helicopters in service are not capable of transporting cargo over 13.5 tons in weight, the dimensions of the cargo compartments of the aircraft do not permit loading a considerable part of the basic heavy armament and combat equipment in them, and the flight range of helicopters does not correspond to the distances of troop airlifts.

The use of military transport planes to carry out the intra-front maneuver of troops may also be extremely limited because the preparation of a front airfield network during an offensive operation is a task complicated to the highest degree.

Undoubtedly, not all airfields will be destroyed or damaged. But the small number of airfields preserved will, as a rule, be occupied by combat aviation, and there will clearly not be enough of them for the basing of military transport planes in the depth of the disposition of troops of the first operational echelon. With the allocation for the transfer of a motorized rifle division of around 700 AN-8 and AN-12 planes, i.e., six military transport divisions, 24 airfields will be required for their basing in the departure area and the same number in the unloading area of the division. With an airlift in two trips, the number of airfields is reduced by half, but in this case the airlift time increases. In addition, the scattering of airfields will drastically hinder the timely arrival of troops for loading up and their concentration after unloading.

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Nor does the duration of the preparation of new class II and III dirt airfields (two to 2.5 days) conform to the highly maneuverable character of modern offensive operations. Even if the construction of airfields is begun immediately after the occupation of a territory by troops, by the time they are ready the troops will have moved 200 to 250 kilometers forward and the airfields will be at a considerable distance from the troops of the first operational echelon. Under these conditions, the airlifting of front reserves makes no sense. It is also necessary to take into consideration the considerable takeoff (landing) time of military transport planes and the impossibility of prolonged use of dirt runways.

The carrying capacity and the dimensions of the cargo compartments of present-day aircraft provide the shipment of only 45 to 50 percent of the armament and combat equipment of a motorized rifle division, with basically the heavy combat equipment, without which the combat effectiveness of the division drops considerably, being untransportable.

The flight range of present-day helicopters (up to 450 kilometers) does not ensure their return to the departure area to make a second sortie without additional fueling. Therefore, there arises a necessity to have, in the disposition of the troops of the first operational echelon, means of refueling helicopters. In addition, refueling takes considerable time, to say nothing of the complexity of organizing it for a large number of helicopters.

What then, in connection with what has been set forth, are the prospects for the development and combat employment of military transport aviation?

The future, undoubtedly, belongs to military transport aviation without need for airfields, which is capable of transporting all types of armament and combat equipment for considerable distances.

The appearance of the first helicopters signaled the beginning of aviation without need for airfields. In the area of helicopter construction, great successes have already been achieved, especially in our country; the MI-6 and MI-10, in carrying capacity, are the best medium-class helicopters in the





world.

The development of military transport aviation without need for airfields in the next years must, in our opinion, proceed along the line of developing new models of multiple-rotor helicopters and also of rotary-wing aircraft having a great carrying capacity and flight range. Piston engines must give way to turboprop and jet engines.

Helicopters and rotary-wing aircraft will be the basic means of air transport, suitable for supporting the maneuver of troops during front (army) operations. And rotary-wing aircraft have greater development prospects in comparison with helicopters, inasmuch as their aerodynamic pattern makes it considerably easier to achieve an increase in the range and speed of flight.

In the area of building more promising military transport planes with vertical takeoff and landing, which, in technical flight characteristics, should be superior to helicopters and rotary-wing aircraft, it is still not possible to speak of great practical success.

The building of vertical-takeoff-and-landing (VTOL) military transport planes is bound up with serious technical difficulties; however, it is fully possible. At the Paris Air Show of 1961, more than 15 designs of combat and transport planes of this type were demonstrated in different stages of development in the USA, England, France, and West Germany. In the USA, a special technical committee has been created to promote the development of VTOL transport planes, and tactical technical specifications for them have also been published. In conformity with these specifications, a number of firms are going to design five versions of such transport planes with the engines mounted on a tilting wing.

A very interesting trend is the modification of already existing planes for the purpose of drastically improving their takeoff and landing characteristics. Research in this area is being conducted both here and abroad. In particular, British firms are planning to refit conventional planes for vertical takeoff by mounting pods under the wings with light turbojet engines which permit the planes to lift into the air without a





run or with a short run.

However, the building of VTOL military transport planes is a thing of the distant future. Envisioned in the immediate future is the construction of transport planes with a short takeoff and landing run. In the USA, where this task is now considered a first priority, some results have already been achieved. In particular, the length of the run of the C-130B (airborne weight over 45 tons) has been reduced to 250 meters by the installation of two supplementary engine-driven compressors specially designed to control the flow around the wings.

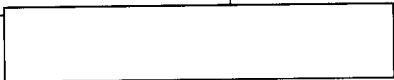
In our country serious attention is also being devoted to improving the takeoff and landing characteristics of the current domestic military transport planes. For the purpose of the fastest accomplishment of this task, it is necessary to take steps for use on planes of takeoff boosters, reverse thrust of propellers, combination wheel-ski landing gear, and also for the use of landing gear based on the "air cushion" principle.

The cargo capacity and dimensions of the cargo compartments of aircraft must provide transportation of both existing and future types of armament, combat equipment, and cargo of the ground forces. Analysis of some data on the future armament and combat equipment shows that approximately 80 percent of the items for shipment that may be in a motorized rifle division will have a weight up to 10 tons, about seven percent will be up to 20 tons, and 13 percent will be up to 40 tons. A similar ratio exists also in the other branch arms. Hence it follows that to airlift them it is advisable to have three basic types of aircraft with the following cargo capacity: heavy -- 40 tons, medium -- 12 to 20 tons, and light -- three to 10 tons.

Aircraft with a cargo capacity of 40 to 50 tons are already being projected and, apparently, the building of the first experimental models can be expected in a short time. With the appearance of such transport means, the airlifting of troops will be more realistic, inasmuch as tanks, missile launchers, and other heavy combat equipment will become transportable.

A medium-class aircraft with a carrying capacity of 20 tons having a cargo compartment not less than 20 meters long could become very promising. It could carry two transport units





weighing eight to 10 tons. The production of such an aircraft will allow reducing the number of means of air transport necessary in troop airlifts to about half. Planes and helicopters of such a type are being developed at the present time.

To support the intra-front maneuver of troops, the main type of aircraft may be a helicopter (rotary-wing craft) with a carrying capacity of 10 tons (the greater part of armament and combat equipment does not exceed this weight).

The MI-6 helicopter now in production and the now constructed MI-10 flying crane, in view of their insignificant flying range, can be extensively used mainly in army operations. It is advisable merely to increase the height of the cargo compartment of the MI-6 to 3.2 meters, which will permit transporting special trucks.

MI-8 helicopters, with a carrying capacity of up to three tons, will be able to be used extensively to transport personnel and light combat equipment, and also to carry out auxiliary tasks (reconnaissance, surveillance, communications, artillery spotting, etc.).

Thus, it is necessary to revise the classification of aircraft so that it corresponds in a greater degree to the weight characteristics of the transportable cargoes of the ground forces, and also to develop new types of aircraft.

We should specially emphasize the extreme necessity of mutually coordinated work of all the organizations responsible for designing the different models of armament and combat equipment. It is necessary to get the dimensions and weight of projected models of combat equipment of all the branch arms and branches of the armed forces to correspond to the dimensions of cargo compartments and the carrying capacity of the projected aircraft.

The flight range of planes and helicopters (rotary-wing craft) must guarantee the fulfilment of tasks to airlift troops and cargoes over considerable distances. In the future, to our way of thinking, there must be military transport planes with a flying range of 4,000 to 6,000 kilometers. This will permit





airlifting troops and cargoes over great distances, in particular from the regions of Siberia, where it is possible to build up strategic reserves in relatively greater safety from enemy nuclear strikes.

The conditions for the use of large airborne landing forces and the airlift of troops into the areas captured by them require an increase in the flying range of military transport planes. Obviously, already at the present time the question of the advisability of the greater removal of the departure areas for operational (strategic) airborne forces (up to 1,000 kilometers or more) should be examined. This will permit preparing the drop of large airborne forces with greater concealment and will decrease the danger of their being hit by an enemy nuclear strike.

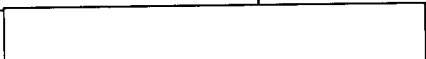
The problem of increasing the flying range of military transport planes is completely solvable. It is necessary to build economical low-altitude engines, modernize current engines with the use of automatic regulation in relation to the temperature and pressure of the surrounding air, and also to use in-flight fueling of planes. Refueling military transport planes in the air allows, in addition, increasing the landing payload by reducing the quantity of fuel during takeoff, and it shortens flight time. Obviously, it will be advisable to build a general-purpose refueling plane on the basis of the AN-12.

The flying range of helicopters with a carrying capacity of 10 to 40 tons should, in our opinion, be brought up at first to 600 or 800 kilometers, and subsequently to 1,000 kilometers.

The necessity of increasing the flying speed of military transport planes follows directly from the conditions of conducting a modern war, in which the time factor plays an exceptional role. From the technical point of view, the increase of the flying speeds of military transport planes must proceed along the lines of obtaining both maximum economically advisable cruising speeds within the limits of Mach 0.7 to 0.8 as well as higher supersonic speeds in the area of Mach 2.5 to 3.

With the development of supersonic military transport planes, the time to airlift troops over the great distances characteristic of our country can be reduced by a factor of five





or more. Thus, whereas the AN-12 plane covers a distance of 9,000 to 10,000 kilometers, with landings, in 25 to 30 hours, a supersonic plane with a speed of Mach 3 covers this distance in approximately three to four hours, and with one landing to fuel up, in five to six hours. Obviously, the appearance of such a plane can be expected in the more distant future, but it is advisable to set about developing it already now.

Also important is the question of the defensive armament of military transport planes and helicopters.

It is well known that fighter aviation, which at the present time constitutes the basic air defense means of the European member countries of NATO, can inflict serious losses on a landing force during a landing. By the end of 1960, over three-quarters of the air defense fighters of the US Air Force had air-to-air guided missiles in their armament, and in eight to ten years around 90 percent of all air defense tasks will be accomplished with missiles.

Only an extremely limited quantity of fighter aviation can be allocated for air support of landing forces. This brings up the problem of self-defense of the landing force in flight. Its solution is possible with the use on military transport aircraft of guided missiles which will support combat with both the missiles and planes of the enemy. The weight of the defensive armament, which it is advisable to have removeable, must be relatively light so as not to substantially reduce the payload of the aircraft.

Also very promising is the arming of helicopters with rockets to combat ground targets. Successful tests of the accuracy of fire of rockets at ground targets from the MI-4 helicopter were conducted in 1961. Six pods having 16 rockets each were mounted on the helicopter. The tests showed high effectiveness in the conduct of fire on immovable area targets. At the present time, the question of firing the FALANGA antitank guided missile from the MI-1 helicopter is being studied.

As for the autonomy of military transport aircraft, it is to be noted that, without the installation on them of autonomous engine-starting systems, extensive maneuver of military transport aviation with the use of unprepared takeoff and landing sites



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will be impossible, which in turn will rule out the timely maneuver of troops by air. It is also necessary in the very near future to develop and install on all aircraft autonomous equipment which ensures arrival at an assigned point, determination of the average wind speed by altitudes, and inter-aircraft navigation.

The civil air fleet should constitute a strong reserve for military transport aviation. However, a very close examination of the combat readiness of the civil air fleet shows that it still has a considerable number of defects, of which the main ones are its incapability of landing troops and dropping parachute cargoes. What measures are necessary, in our opinion, to increase the combat readiness of the civil air fleet?

First, it is necessary in the shortest times to prepare production-line sets of landing force transport equipment and to concentrate them at bases of the civil air fleet for their immediate use in case of war. This equipment (folding paratroop seats, supplementary oxygen equipment, conveyers, stretchers and supports for fastening them down, medical equipment, etc.) must be maximally standardized for installation on any type of plane by the forces of its technical crews.

Second, at production plants and repair bases, it is advisable, in our opinion, to carry out slight design modifications of the planes of the civil air fleet to provide for them to parachute-drop landing forces and small-dimensional containers.

Right now, not one plane of the civil air fleet is adapted for the parachute landing of combat equipment and materiel, and the dropping of airborne troops is possible from only two planes, the AN-10 and the AN-24; the AN-10 -- the only domestic plane allowing the dropping of landing forces in two streams -- has been taken out of production. Obviously, it is necessary to equip, by way of experiment, the existing planes of the civil air fleet with airtight hatches in the floor and then in practice test the possibility of a parachute landing from these planes. Besides that, it is possible to carry out a certain modification of the wings of passenger planes for the purpose of providing for the suspension from them of streamlined capsules of the P-90 and P-110K types to carry and land light combat equipment.

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By not carrying out these measures, we are in advance restricting the capabilities of the civil air fleet, which will be able to provide only the transportation of personnel by the landing method and also the transportation of small-dimensional light cargoes.

As for the projected passenger planes of the civil air fleet, besides the above-mentioned design modifications, it is necessary to provide for constructing cargo hatches in them not less than two by two meters and for reinforcing the floor up to a unit load strength of 400 kg/m² or more. This will increase the list of transportable cargoes and speed up the process of loading and unloading.

Also very urgent is the development of general tactical technical specifications for the military transport and ambulance versions of passenger planes, the availability of which will permit systematizing and legislating specifications for the future construction of the civil air fleet in the interests of its combat use.

The further development of military transport aviation must meet modern demands and proceed primarily from the principles of its use on two levels, the operational-tactical and the strategic. This clear-cut division is not made at the present time, and as a result the existing military transport aviation does not correspond to the new principles of its use at the operational level and only partly meets the requirements for airlifts to be carried out according to plans of the Supreme High Command.

Modern military transport aviation is a means of the Supreme High Command. It will be called on mainly to drop operational airborne forces exploiting the results of powerful nuclear strikes of the rocket troops and aviation of the front, and also to ship missiles and other urgent cargoes. Military transport aviation allocated to airlift an operational airborne force will often fulfil this task under the direction of the front commander, being in operational subordination to him only for a certain time.

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At the present time there can be no question of establishing a front military transport aviation, in view of the extremely limited size of its inventory and the design shortcomings of the means of air transport. This situation will obviously continue in the immediate future. Preliminary research shows that, to carry out operational airlifts of troops, it is necessary to have in a front not less than a thousand aircraft of different classes. It is obvious that equipping fronts with such a number of expensive aircraft, mainly helicopters and rotary-wing craft, is impossible for now. However, with the growth of the economic capabilities of the country, it will become a perfectly realistic task to provide organic or attached military transport aviation for at least one or two fronts operating on the most important strategic axes.

The concentration of large units (formations) of military transport aviation in the most important theaters of military operations will permit carrying out the maneuver in short times of the most modern type of transport between fronts for the purpose of airlifting troops on decisive axes. This military transport aviation, by virtue of the nature of tasks to be fulfilled, is front aviation, although it may not belong to the T/O&E of a definite front. The establishment of front military transport aviation will considerably increase the maneuver capabilities of troops, bringing these into greater conformity with their enormous fire capabilities.

The main thing right now is to determine what types of transport aircraft will be needed for troop airlifts, for it takes years to develop and produce them in sufficient numbers.

The theoretical working out of a number of complex questions connected with the use of front military transport aviation is also a task for the present day. It is only the careful analysis of all the methods of troop regroupings that will, in a future war, ensure the correct solution of the question of the integrated use of different types of transport in support of the strategic and operational maneuver of troops.

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