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MEMORANDUM FOR: The Director of Central Intelligence

FROM : John N. McMahon
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Air Defense of European NATO Countries

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 indicates Soviet perceptions of the overall organization of the NATO air defense system established in December 1960. Discussed here are the organization of control and the functions and responsibilities of the air defense commanders, listings of the specific air defense zones and regions in Europe and the forces and means located in them, as well as the capabilities of these forces and means, particularly fighter aviation and surface-to-air missiles. This article appeared in Issue No. 1 (71) for 1964.

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

for John N. McMahon

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Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 1 (71) for 1964 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is Colonel I. Marenin. This article provides a description of the overall organization of the allied air defense system of NATO, which was established in December 1960. Discussed here are the organization of control and the functions and responsibilities of the air defense commanders, listings of the specific air defense zones and regions in Europe and the forces and means located in them, as well as the capabilities of these forces and means, particularly fighter aviation and surface-to-air missiles, to successfully carry out air defense measures.

End of Summary

[redacted] Comment:

The author also co-authored "Air Defense of the North American Continent" in Issue No. 2 (63) for 1962

[redacted]

[redacted]

Air Defense of European NATO Countries
by
Colonel I. MARENIN

The NATO command considers that at the present time the development of the means of attack of the potential enemy surpasses the development of the means of air defense. For this reason, the NATO command has concluded that with the present balance of forces it is not possible to establish in Western Europe an absolutely reliable air defense, not to mention antimissile defense, since NATO still does not have active means for combating ballistic missiles and will not have them for several years.

In the opinion of the NATO command, in addition to ballistic missiles, for an extended period of time, the probable enemy will employ modern aerodynamic means of air attack for the delivery of nuclear and conventional weapons to targets. These means can be countered only by a well-organized air defense system of the European countries. For this purpose in December 1960 the permanent council of NATO, under United States pressure, decided to establish an allied air defense system of the NATO countries of Europe and suggested that their governments subordinate a large part of their air defense forces to the Supreme Commander of the Allied Armed Forces of NATO in Europe. Such a system is established at present within the European Theater of War.

This system was assigned the following tasks:

-- ensure the timely warning of possible enemy attack by observing the airspace over the approaches to the borders of the European countries and by obtaining reliable reconnaissance data on his forces and means;
-- prevent enemy aerial reconnaissance in areas near the borders by organizing patrolling by fighter-interceptors in the airspace in peacetime;
-- cover from the air the nuclear strike forces, areas of concentration of troops, equipment, weapons, military-strategic, military-political, and administrative installations;

-- maintain in a state of constant combat readiness the number of forces and means necessary to cause the enemy to refrain from attacking;

-- be prepared to destroy the maximum amount of enemy air attack means in the event of war.

It is believed that the fulfilment of these tasks is possible if the actions of the forces carrying out air defense tasks are coordinated with other operations conducted in the air, at sea, and on the ground. For this reason, in working out individual air defense problems it is recommended that it be taken into account that they are a part of the overall strategic plan.

The actions of all the air defense means are supposed to be carried out such that the combat capabilities of each component of the air defense system will be fully exploited and maximum losses will be inflicted on enemy attack means before they reach their targets. This can be achieved by a comparatively uniform allocation of air defense forces and means in repelling the enemy air attack, the maximum utilization of radioelectronic countermeasures, and camouflage. Moreover, in a few years they intend to introduce an automated system of ground control of air defense means, which will considerably improve the weapons systems and provide the capability to operate air defense means under conditions of active and passive enemy radioelectronic countermeasures.

The NATO command considers that, in 1964, there are over 1,800 important targets in the European NATO countries, and that they are distributed as follows: eight percent in the Western European Theater of Military Operations, 55 percent in the Central European Theater, 24 percent in the Southern European Theater, and 13 percent in Great Britain.

It is assumed that the enemy will first deliver strikes against the strategic nuclear forces of the Western countries, the bases and means supporting the actions of these forces (bombing-support navigational means, early-warning radars, aviation control centers, communications means, important military and civilian control centers), as well as against certain large administrative and industrial centers.

Control organs. The Supreme Commander of the Allied Armed Forces of NATO is responsible for the air defense of the European countries of NATO. He is entrusted with the planning, allocation, and effective use of the means placed under his command both in peacetime and in wartime. The supreme commander coordinates the plans of the active air defense with the plans of measures for passive defense developed by the government organs of the NATO countries. His deputy for the air forces, the commander-in-chief of the allied air forces of NATO, is directly responsible for the status of the air defense and the command of it.

The operational control of the air defense system is conducted from the command post of the Supreme Commander of the Allied Armed Forces of NATO in Europe through the air defense operations centers in the theater of military operations. These centers are the command posts of the air defense commander in the theater of military operations (in the air defense zone) and are component elements of the air combat operations control centers in the theater of military operations. The operational control of the air defense system is likewise implemented through the control and warning centers, which are subordinate to the air defense operations centers.

The commander of the air forces in the theater of military operations and his deputy, who is the commander of the air defense zone, are responsible for the operational control of all air defense means within the zone both in peacetime and in wartime. They devise the methods of controlling the active air defense means, organize the joint training of air defense personnel, consult with national authorities on air defense matters, and report to the supreme commander or national authorities their recommendations regarding the required number of air defense forces and means. In addition, the commander of the air defense zone is responsible for drawing up the plans for conducting air defense combat operations and plans for the disposition and operational employment of the air defense units and large units. He devises jointly with the naval command the plans and measures for coordinating actions of air defense means based on land, on ships and in ports, establishes the appropriate communications with the national authorities for support of civilian and military air traffic control, and coordinates all air defense matters with the commanders of the adjacent air defense zones.

In each zone the appropriate number of operations centers of the air defense areas are organized for controlling the air defense forces and means.

The regional air defense operations center of the ATAF (Allied Tactical Air Force) is an integral part of the air combat control center of the ATAF, based in the particular region. It is located with the allied joint operations center of the ATAF or TAF (Tactical Air Force). When there is a general alert, or when combat actions begin, all the air defense forces and means of the air forces, naval forces, and ground forces that are deployed in the particular area are transferred to the operational subordination of the regional air defense commander.

As a rule, the regional air defense operations center is already up to full strength in peacetime, and is ready for action at any time of day or night. The air defense department of the army group staff operates jointly with it.

The regional air defense operations center exercises operational control over all air defense forces and means through the operations centers of the sectors: it warns the levels concerned about the threat of attack and, if necessary, declares an alert; it determines the degree of combat readiness of the active air defense means; it organizes cooperation and maintains communications with the adjacent regional air defense operations centers and with the appropriate commands and organs; and maintains the map-board on which are plotted all the aerodynamic air attack means which may violate, or have violated, the national boundaries or the boundaries of air defense recognition zones, and all unidentified aircraft, as well as combat aircraft and aircraft carrying out special tasks.

In addition, the regional air defense operations center cooperates with appropriate organs in carrying out measures concerning air traffic control, blackout, electromagnetic emissions, and civil defense; it conducts peacetime training throughout the air defense area, works out the necessary instructions, and trains the operators of the air defense control and reporting centers.

The air defense sector operations center is the command post from which direct control of all air defense means in the sector

is exercised. This center monitors the actions of the air defense sector organs, the execution of operational air defense tasks and direct control of the available air defense forces and means in support of combat against means of air attack; it compiles data on the air situation and reports it to the levels concerned; it allocates the fighter-interceptors to fulfil air defense tasks and determines the functions for controlling the fighter-interceptors of the appropriate control and reporting centers and posts; it tracks targets by radar and warns all levels concerned of enemy air attacks; it determines the type and number of weapons that must be used against a particular air target; approves the procedure for repulsing an enemy air attack; allocates targets to be destroyed among the fighter-interceptor subunits, surface-to-air missiles, and antiaircraft artillery, and organizes and conducts radioelectronic countermeasures.

The control and reporting center is the main organ for controlling the combat actions of air defense means for the destruction of enemy air targets. This center performs the following functions: monitors the work of subordinate radar stations, conducts long-range detection and identification of air targets; transmits data to the sector operations center and other levels concerned regarding the air situation and combat readiness of the air defense forces and means, the operational suitability of airfields and of the weather conditions, organizes cooperation with adjacent and subordinate control and reporting centers and posts, as well as with the observation and warning posts and maintains continuous communications with them.

A control and reporting post detects and identifies air targets and transmits data on the air situation within its area to the appropriate control and reporting centers or directly to the sector operations center, as well as to other levels concerned, controls the actions of the fighter-interceptors against targets indicated to them and reports the results of their actions to the appropriate control and reporting centers, and organizes repair and restoration work in accordance with instructions received.

A guidance post engages only in the guidance of fighter-interceptors to enemy air targets. The detection and identification of air targets is not part of its responsibility.

The observation and warning post is a separate radar station (it can be mobile) whose main peacetime task is to provide early warning. In the event that war breaks out the use of these posts increases the reliability of the detection of the air enemy, both by increasing the number of radar detection stations and the number of operating frequencies, which is particularly important under conditions of radioelectronic countermeasures. Such a post compiles and transmits aerial reconnaissance data to the appropriate control and reporting centers and posts.

Organization of the allied air defense system of NATO. The allied European air defense system includes the territory of the eleven NATO member countries.

In support of cooperation and the organization of a centralized system of control of the air defense forces and means, the territory of the European countries of NATO is divided into four air defense zones:

-- Northern (Norway, Denmark);
-- English (Great Britain);
-- Central (West Germany, France, Belgium, The Netherlands, Luxembourg);
-- Southern (Italy, Greece, Turkey).

The territorial division is based on the principle of organizing air defense in the theater of military operations, whereby, at the insistence of the English, the territory of Great Britain was set off as a separate zone.

Each zone is divided into regions, the majority of which in turn are subdivided into air defense sectors. In all there are 11 regions in the four zones made up of 22 air defense sectors.

The Northern Air Defense Zone (operations center of the zone at Kolsaas) consists of three air defense regions: Norwegian Air Defense Region of Tactical Air Force North, Norwegian Air Defense Region of Tactical Air Force South, and the Danish Air Defense Region.

The Air Defense Region of Tactical Air Force North [sic] (operations center Bodø) covers the northern part of Norway. The area consists of one air defense sector, "North Norway".

The Air Defense Region of Tactical Air Force South [sic] (operations center Holmenkollen) consists of three air defense sectors: Trondelag, Westland, and Eastland, with sector operations centers in Graakalen, Menig [sic], and Kongsvinger, respectively.

The Danish Air Defense Region (operations center Karup) is important in the overall system of air defense of the Northern European Theater of Military Operations which in cooperation with the Norwegian Air Defense Region of Tactical Air Force South, covers the Skagerrak, Kattegat, Øresund, Great Belt and Little Belt, which connect the Baltic and North seas, as well as the main railroad and road networks required for the deployment and maneuvering of troops.

The Northern Air Defense Zone is covered by eight air defense interceptor squadrons, having 145 fighter-interceptors, and two Nike surface-to-air missile battalions with more than 70 launchers.

Radar coverage is provided by seven control and reporting centers and 12 control and reporting posts, as well as 13 observation and warning posts.

The air defense of the northern zone does not provide reliable coverage of all the important military and military-industrial installations against modern means of air attack. Towards the beginning of 1964 a reinforcement of the air defense zone is planned through the formation of new SAM battalions and partial implementation of an automated system of control of air defense forces and means.

The English Air Defense Zone (operations center of the zone at Stanmore) consists of two areas: air defense region of the 11th Fighter Air Group and the air defense region of the 12th Fighter Air Group.

The Air Defense Region of the 11th Fighter Air Group (operations center Leconfield) covers the northern part of Great Britain. It is divided into three air defense sectors with operations centers at Buchan, Boulmer, and Patrington.

The Air Defense Region of the 12th Fighter Air Group (operations center Horsham-Saint-Faith) covers the southern and central parts of Great Britain. The area is divided into three air defense sectors with operations centers at Trimmingham, Bawdsey, and Wortling [sic].

In all, the English Air Defense Zone is covered by nine air defense fighter squadrons having 125 fighter-interceptors and twelve SAM battalions with about 360 launchers.

Radar coverage is provided by more than twenty control and reporting centers and posts.

With the formation of the allied air defense system of the European NATO countries the operational-strategic situation for the air defense of Great Britain changed somewhat. The British command at the beginning of 1961 conducted a reassessment of the air axes of operations and decided to change the organizational structure of the air defense system and the grouping of its forces and means.

Because the southern and southeastern axes of operation (Berlin, Brussels, London) are covered with sufficient density by the forces and means of the central NATO air defense zone, which includes the fighter units of Great Britain, deployed in the Federal Republic of Germany, the British command decided to concentrate its air defense forces on the eastern and northern axes of operations, expecting from there the greatest threat of an air invasion of the territory of Great Britain.

The main air defense means of Great Britain at the present time remains as before, fighter aviation.

In addition to the main air defense squadrons, the fighter command also has four squadrons which are part of operational training units which conduct the training of flight personnel and formation of crews in the final stage of instruction. It must be assumed that these squadrons, with their well-trained flight instructors, may be used for the air defense of the English zone.

The air defense fighter aircraft fleet consists of 70 percent all-weather and night fighters and 30 percent day

fighters. The flight and technical characteristics of the aircraft and the level of training of the flight personnel provide the capability of intercepting modern subsonic and supersonic manned bombers under any weather conditions, day or night, at altitudes of 18 to 20 thousand meters.

However, the effectiveness of the fighter cover of the territory against flights of modern supersonic manned aircraft is considerably reduced because of the lack of a sufficient number of supersonic fighter-interceptors.

The capabilities of the fighter aircraft in the air defense system of Great Britain are limited by the capabilities of the radar net for detection and control. As a result of the specific peculiarities of Great Britain as an island nation, the placement of radar control and warning centers and posts on distant approaches to the territory of the country is out of the question. Radar detection and guidance posts in the air defense system of Great Britain are located primarily along the eastern and southern shores. Their range for the detection of enemy aircraft and guidance of fighters is 350 to 500 kilometers beyond the coastline.

As the experience of exercises has shown, with the speeds of modern means of air attack close to the speed of sound, air defense fighter aviation ensures interception of aircraft flying at great altitudes no farther than 200 kilometers from the coast of the country, and of low-flying aircraft only inside the coastline. Such a distance of the actual lines of interception allows, with successful guidance, only one attack to be carried out. However, the buildup of fighter forces by moving aircraft into the interior of the country is practically out of the question in the greater part of Great Britain. For this reason, in order to ensure the reliability of attack, all the fighter aircraft in the air defense system are equipped with combined armament including guns and missiles, which allows them to attack from any position and at long ranges from the target. The most effective weapons are the Firestreak air-to-air guided missiles.

The presence on various types of aircraft (Lightning) of modern radar intercept and fire control systems considerably increases their capabilities for interception and reliability in conducting successful attacks.

In view of the difficulties of interception by air defense fighter aviation, particularly under adverse weather conditions, and the impossibility of building up air defense forces throughout the depth because of the limited ranges of the lines of interception, the British have put into service the Bloodhound surface-to-air missile, which, to a considerable degree, compensates for the shortcomings of the air defense fighters.

At the present time surface-to-air guided missiles, because of their limited effective range (65 kilometers) are short-range weapons, and establish the second line of interception on the way to those areas where the main important targets are concentrated.

The modernization of the air defense system is continuing. The British command intends to improve the existing air defense system of Great Britain by introducing into it the most modern models of long-range and short-range weapons and a closer cooperation of the British air defense system with the systems of the other European countries.

Moreover, we have noticed an improvement in the control and warning organs by the introduction of an automatic system of controlling all the air defense forces and means, the construction of which began in 1960 and is expected to be put into service in 1964.

The radiotechnical support of the British zone does not satisfy all the requirements of tracking and detecting modern means of air attack. New equipment, primarily for the radar warning system, is planned for the next one and a half to two years. Up until now the main equipment of the radar sites has been a radar that will guarantee a range of detection of up to 500 kilometers. Radars which determine the altitude of air targets have a range limit of 270 kilometers against air targets.

Central Air Defense Zone (operations center Fontainebleau) consists organizationally of the air defense regions of the 2nd and 4th ATAF and two air defense regions in France, the northern and southern.

Air Defense Region of the 2nd ATAF (operations center Monchen-Gladbach) covers the northern part of West Germany, the territory of Belgium and The Netherlands and the coastal zones

that adjoin them. The area consists of two air defense sectors, the Brockzetel and Uedem sectors, with sector operations centers in Brockzetel and Uedem.

Air Defense Region of the 4th ATAF (operations center Kindsbach) covers the southern part of the territory of West Germany and the eastern part of France. It consists of two air defense sectors, the Langer Kopf and Drachenbronn sectors, with operations centers at Langer Kopf and Drachenbronn.

Northern France Air Defense Region (operations center Creil) covers the northern part of France.

Southern France Air Defense Region (operations center Aix-en-Provence) covers the southern part of France.

The territory of France (except the eastern part which is assigned to the Drachenbronn sector) is the center of transportation of the Central European Theater and is covered by the forces and means of the French national air defense.

The entire central air defense zone is covered by 38 air defense fighter squadrons with 740 fighter-interceptors, and 29 SAM battalions armed with approximately 930 launchers.

Sixty control, warning and guidance centers and posts provide radar coverage for the zone.

Southern Air Defense Zone (operations center Naples) consists of the air defense regions of the 5th and 6th ATAF, which include the territories of Italy, Greece, Turkey and the entire Mediterranean Sea basin.

Air Defense Region of the 5th ATAF (operations center Borgo-Piave) includes the entire territory of Italy and consists of three air defense sectors (1st, 2nd, 3rd) with operations centers at Monte Venda, Monte Cavo, and Martina Franca.

Air Defense Region of the 6th ATAF (operations center Izmir) takes in the territory of Greece and Turkey and consists of four sectors, one Greek and three Turkish (western, central, and eastern), with operations centers at Larissa, Eskisehir, Etimesgut, and Malatya.

The entire southern zone is covered by 15 air defense fighter squadrons armed with 320 fighter-interceptors, and six SAM battalions armed with about 170 launchers. Radar coverage is provided by approximately 75 control (observation) and reporting centers and posts.

Air defense means and their employment. The NATO command has developed a general policy on the combat employment of air defense means, in accordance with which effective air defense can be ensured only with maximum exploitation of the combat capabilities of all available air defense means. For this reason it is necessary that the detection, identification, and destruction of air targets be accomplished at the maximum possible distance from the defended area and that the continuous commitment to battle of the air defense means and conduct of fire against the approaching targets be continued until the targets are completely destroyed.

The NATO command thinks that in all cases the selection of the type of weapon for the destruction of targets will depend on the timely warning of the appearance of the enemy and on the method of action employed by him, whereby it is assumed that the chiefs of the operations centers of the sectors will exercise maximum flexibility in the selection and employment of air defense means at their disposal to successfully repel an enemy attack.

Having sufficient freedom of action in selecting and employing air defense means, the command of the air defense sector organizes the direct control of these means so that the destruction of targets will be ensured with the smallest expenditure of means. The priority for the destruction of targets will depend on the importance of the targets. The utilization of air defense means based on variants which were worked out in advance will be permitted only when direct control becomes impossible. The sequence for the employment of various air defense means depends on their combat capabilities and on the location of the target, but may be changed depending on the situation.

The priority for employing air defense means will be as follows for the destruction of targets at high altitudes: fighter-interceptors, Nike-Ajax surface-to-air guided missiles,

Hawk surface-to-air guided missiles. For the destruction of targets at low altitudes the procedure for employing air defense means will be somewhat different: Hawk surface-to-air guided missiles, fighter-interceptors, Nike-Ajax surface-to-air guided missiles, and Nike-Hercules surface-to-air guided missiles.

The NATO command thinks that, at the present stage of development of air attack means, the main air defense means should be surface-to-air missiles and fighter-interceptors. Conventional antiaircraft artillery has lost its importance and thus may be used only within an air defense system for troops. However, the economic and technical difficulties do not allow putting the main burden for air defense on the surface-to-air missile units, whose numbers are insufficient, and the available types of missiles do not completely satisfy the increasing demands. As a result the primary means of the allied air defense system of NATO will remain, as before fighter aviation, and the surface-to-air missile units will supplement their efforts. According to the calculations of the NATO command, this policy will not be subject to change for some five to eight years.

Fighter aviation. The main fighter aircraft in the air defense forces are the all-weather short- and long-range fighter-interceptors and the day fighters.

The fighter-interceptors have a maximum speed of 1,200 to 2,400 kilometers per hour, a service ceiling of 15 to 20 kilometers and maximum flight range of 2,000 to 4,000 kilometers. On certain aircraft additional liquid-propellant rocket engines have been installed which provide the capability of increasing these altitudes and flight speeds for a short period of time. The majority of them are single-seaters, and only on some of them is there, in addition to the pilot, a second crew member who operates the radar for target interception and aiming.

At the present time the primary weapons of air defense fighters are guided missiles. Fighter-interceptors, as a rule, can carry from two to six missiles. Gun armament and free rockets are auxiliary weapons.

The majority of the guided missiles can deliver fire against air targets at any angle of approach within the rear hemisphere, and some of them that have radar homing heads can be fired even

in the forward hemisphere. The maneuverability of the missiles allows them to deliver fire against air targets flying above the fighter-interceptor.

Recently there has been a trend towards developing for each type of missile modifications with different homing heads so that the pilot, depending on the specific situation, weather conditions and nature of the radioelectronic countermeasures, can fire one missile or another at a target. The fighters of this class are equipped with integrated control systems, which enable the aircraft to be led out into the target area from the ground automatically, and to detect and track the target with the help of onboard interception and aiming radar.

The onboard interception and aiming radars operate in the 3-centimeter waveband and ensure a 32- to 55-kilometer range of detection of air targets and automatic tracking at ranges of up to 25 to 37 kilometers.

In the development of new air defense means the NATO command takes into account the fact that the probable enemy is capable of employing, in addition to missiles, manned aircraft, primarily delivery vehicles of air-to-ground guided missiles, and cruise missiles. The defense against such air targets is expected to be provided by the use of manned fighter aircraft and surface-to-air guided missiles, whereby the role of manned aircraft in the overall air defense system will gradually be reduced, and that of the surface-to-air guided missiles increased.

Modern air defense fighter aviation capable of high speeds, with increased rate of climb and service ceiling, and powerful weapons, can operate under any weather conditions, day or night. The NATO command thinks that the employment of fighter-interceptors along with surface-to-air guided missiles may increase the effectiveness of air defense. In their opinion, the fighter-interceptors, both in peacetime and in war, should be used only for air defense purposes.

During wartime the fighter-interceptors can be used also for other purposes, but only with the permission of the ATAF command or that of some other higher NATO level, and with the agreement of one or another member country of NATO.

The fighter-interceptors are considered by the NATO command as a weapon for action against a target at medium and long ranges and useable in zones removed as far as possible from the borders of the defended territory. Fighter-interceptors should disorganize the enemy who is carrying out massed air attacks by acting continuously against him with built-up forces until the enemy is destroyed or until they enter the combat zone of the surface-to-air missiles.

Surface-to-air guided missiles. At the present time a number of surface-to-air guided missile weapons systems have been developed, primarily by the Americans and the British, the main ones of which are: Nike-Ajax, Nike-Hercules, Bloodhound, Thunderbird, and Hawk.

The further development of the surface-to-air guided missile is being directed toward the development, for the air defense troops, of lightweight systems of surface-to-air guided missiles for the destruction of aircraft and cruise missiles at low altitudes.

The NATO command is taking measures to improve existing weapons.

The improvement of the systems is aimed at increasing the accuracy and range of fire and the effective range of interception altitudes (by improving the design of the missiles, increasing the efficiency of the engines, and improving the guidance systems), at providing the capability of firing against both air and ground targets, at increasing the effectiveness of the warheads, and at using heavier charges of conventional explosives, as well as developing nuclear warheads. At the present time the Hawk and Nike-Hercules missiles can be equipped with nuclear warheads. With this we see a trend toward making nuclear and conventional warheads interchangeable.