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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

6 April 1978

MEMORANDUM FOR: The Director of Central Intelligence
FROM : John N. McMahon
Deputy Director for Operations
SUBJECT : MILITARY THOUGHT (USSR): Air Defense
of the North American Continent

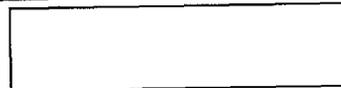
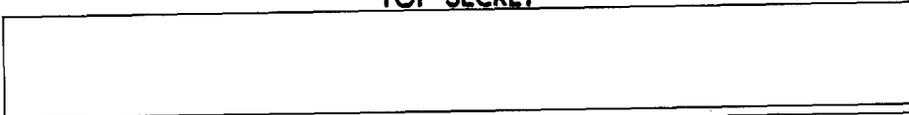
1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article is a general description of the organization of the air defense system of North America, its combat strength, the radar lines, and the training of personnel, as well as an indication of future trends and combat readiness, which is described as "adequately high". This article appeared in Issue No. 2 (63) 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

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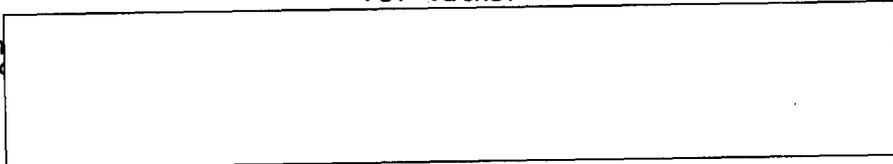
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Intelligence Information Special Report

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COUNTRY USSR



DATE OF INFO. Early 1962

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SUBJECT

MILITARY THOUGHT (USSR): Air Defense of the North American Continent

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (63) for 1962 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 S. Kholoptsev and Colonel N. Marenin. This article is a general description of the organization of the air defense system of North America, its combat strength, the radar lines, and the training of personnel, as well as an indication of future trends and combat readiness, which is described as "adequately high".

End of Summary

Comment:

After 1962 the SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970.



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Air Defense of the North American Continent

by

General-Leytenant of Aviation S. KHOLOPTSEV
Colonel N. MARENIN

The military command of the US recognizes that should a new world war be unleashed, the industrial centers constituting the military-economic base of the US and other NATO countries will be the major targets of enemy nuclear strikes.

Therefore, together with the development of modern means of air attack, the American military command is devoting great attention to the organization of air defense. The construction of the reliable defense of its territory against air strikes by manned and unmanned means is regarded as a task of paramount importance.

It is believed that in a future war two types of strikes may be delivered against the territory of the US. The first type refers to simultaneous massed aviation and missile weapon strikes against a large number of targets. It is assumed that the enemy will employ this method if the air operations of US strategic aviation aimed at neutralizing the enemy's means of air attack have not been carried out or have not achieved their purpose.

The second type refers to strikes delivered by a small number of bombers and missiles against individual, more important military-industrial centers and strategic aviation air bases. In the opinion of the Americans, this method will be employed if the preemptive strikes of their strategic aviation succeed in inflicting considerable losses on the enemy's air attack forces and means.

In the past, the air defense system was established based on the principle of defending individual installations and small areas. At present, this system is considered to be ineffective, since it has a number of substantial deficiencies, namely, that it does not create an adequate depth of defense and also does not ensure the close operational cooperation of the air defense forces and means; it impedes their control and limits their capabilities. That is why the Americans consider it necessary to set

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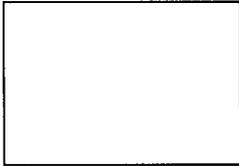
up a deeply echeloned air defense system that provides the entire territory of their country with a continuous zone of defense. But, taking into account the vastness of the territory of the North American continent and its uneven development in the industrial-economic aspect, the air defense forces and means are also disposed unevenly over the country. The major numbers of these forces are grouped on the axes covering the most important areas. The Americans believe that the probable axes of air attack are the western, northern, and eastern; as a result of this, the principal air defense forces are disposed on the Atlantic and Pacific coasts of the continental US and along the Canadian-American border.

The Americans also believe that when an enemy attacks the US employing modern aviation means of air attack, he will inevitably cross the airspace of the European countries of NATO. That is why the Pentagon is also striving to create a unified, organized air defense of the European member states of NATO, one that is organically tied in with the air defense system of the North American continent, considering it to be the first distant line of its own air defense.

A modern air defense must satisfy the following requirements: it must possess powerful means of combat featuring a great range of action, it must have high speed and a high degree of lethality, and it must operate at all altitudes over an extended period of time and on the distant approaches to the borders of the US or to the principal installations being defended. That is why the American command has disposed all air defense forces and means in a system of echeloned rings taking into account the characteristics and combat capabilities of these forces and means.

In the air defense system, special importance is attached to the organization of the control system for the air defense forces and means. This system must ensure the rapid processing of data on the enemy, correctly assess the situation, and work out the most rational variant of using air defense means to repel an enemy air attack.

To direct the continent's air defense system, in August 1957 a combined American-Canadian Air Defense Command (NORAD) was established. This command plans and implements all measures for the air defense of the North American continent. It is charged with developing the plans and methods of repelling attacks on the continent through the use of appropriate forces and means and also with the training of these forces and means.



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The establishment of this command has led to de facto Pentagon control over Canadian territory and use of it in the interests of the air defense of the US. Despite this, the Americans believe that under modern conditions, it is not expedient to control the combat actions of air defense means from a single center. It is acknowledged as more suitable to have air defense means controlled directly by the commands of small geographic areas which cooperate operationally with each other but are subordinate to a single command.

For the purpose of continuously observing the aerospace expanse, the American command anticipates having a widely ramified network of radar means and other radiotechnical means of observation and control throughout the entire territory of the country and on the approaches to it, including the combined air defense system of NATO in Europe.

With the aim of creating a highly effective air defense, great importance is attached to the automation of control.

The first phase of such a control system combining all air defense means into a single whole was the semiautomatic SAGE system, which began to be put into operation in 1958. The creation of this system was called for by the growth in the speeds of modern air attack means and defense means, which required the rapid assessment of the air situation and rapid adoption of a decision concerning the repelling of an enemy attack. When the SAGE system made its appearance, it became necessary to reorganize the air defense system, and first of all its structure and control organs. In view of this, by the beginning of 1961 the air defense air armies were disbanded, the number of air divisions was reduced, and the boundaries of the air defense areas and sectors were revised.

In the air defense system of the North American continent, instead of the eleven former regions, at present eight command regions have been established: the 25th, 26th, 28th, 29th, 30th, 32nd, Alaskan, and Northern. These regions basically take up the territory of the continental part of the US and correspond to the numbers of the air defense air divisions that are subordinate to the Air Force air defense.

An air defense region is a specific sector of the country's territory in which the air defense task is accomplished according to a common operational plan. The commanders of the air defense air divisions are at the same time the officers in charge of the air defense regions of the North American continent.

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The air defense air division -- the basic large unit of an Air Force Air Defense Command -- has the function of providing for the air defense of one of the regions of the continental US. The composition of an air division is variable and depends on the nature of the region and the importance of the installations covered by it. It may include several fighter squadrons, squadrons of Bomarc surface-to-air guided missiles, radar squadrons, and auxiliary and service units and subunits. The 25th Air Defense Air Division is the largest, the one charged with the responsibility of covering the key northeastern area.

Air defense regions are made up of air defense sectors. On the territory of the North American continent there are a total of 26 sectors, 22 of them on US territory and four on Canadian territory. By the beginning of 1962 the construction of the SAGE system in the continental part of the US was completed. This system has 21 centers in the US; one center on Canadian territory will become operational by the end of 1962.

Each air defense sector in US territory, with the exception of the Oklahoma Air Defense Sector, will have one SAGE center, known as the guidance center. The officer in charge of the sector is responsible for the air defense of the installations located within the boundaries of the sector. He plans the combat employment of all air defense forces and means of the sector, determines the disposition locations of the fighter aircraft, surface-to-air guided missiles, and radiotechnical subunits in accordance with the concept on how to defeat air raids; organizes cooperation among their means, and directly supervises the combat actions of air defense means when repelling air raids.

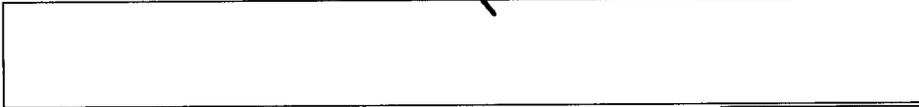
The SAGE control centers, disposed in the location areas of the staffs of the air defense air divisions (excepting the 28th and 32nd Air Divisions), exercise control over the air defense forces and means of the regions. Each division (control center) exercises supervision and coordinates the actions of the three or more air defense sectors.

In total, in the territory of the United States of America, as we have already mentioned, there are 22 air defense sectors. Their centers are:
1 -- Bangor, 2 -- Boston, 3 -- Syracuse, 4 -- Washington, 5 -- New York,
6 -- Detroit, 7 -- Chicago, 8 -- Duluth, 9 -- Sault Sainte Marie,
10 -- Sioux City, 11 -- Grand Forks, 12 -- Minot, 13 -- Great Falls,
14 -- Seattle, 15 -- Spokane, 16 -- Portland, 17 -- Los Angeles,
18 -- San Francisco, 19 -- Phoenix, 20 -- Reno, 21 -- Oklahoma,
22 -- Montgomery. The Salt Lake City-Denver region, which does not have

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air defense forces and means, does not constitute an independent air defense sector (see diagram, page 18).

The portion of Canadian territory that was previously a part of the US northeastern zone is at the present time the Goose Bay Air Defense Sector, forming a part of NORAD's Northern Air Defense Region. In all, the Northern region has four air defense sectors -- Fredericton, Montreal, Ottawa, and Goose Bay.

In view of the presence of an antimissile defense post in Clear and of a number of DEW Line posts, the role of the Alaskan Region in the North American continent air defense system has been enhanced. In this region a combined air defense center was recently established. The SAGE system was put into operation in it to control the air defense forces and means.

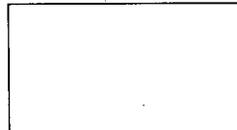
The air defense of Iceland is being carried out by the 62nd Air Division, which at present forms a part of the 25th NORAD Air Defense Area.

The commander-in-chief of the combined Air Defense Command of the North American continent has been charged with overall direction of the air defenses of the North American continent through his staff located at Ent Air Force Base (Colorado Springs, Colorado).

The commander-in-chief is subordinate to the US Joint Chiefs of Staff and the Joint Chiefs of Staff of Canada. The deputy commander-in-chief is the commander of the Air Defense Command of the Canadian Air Force.

The commander-in-chief exercises operational command over the air defense forces and means of all branches of the armed forces through the air defense commanders of the air force, navy, and ground forces of the USA and Canada. The latter are in turn deputies of the commander-in-chief of the Air Defense Command for matters concerning the operational utilization of the air defense forces and means at their disposal in the interests of the air defense of the country as well as direct executors of the instructions and orders of the chiefs of staff of the corresponding branches of the armed forces for matters concerning the activation of air defense units and subunits, the full-strength manning and training of personnel, supply, and the organization of combat training of subordinate troops.

Overall, the combined North American Air Defense Command has been given the task of developing the plans and measures for building up the air defense of the North American continent, of determining the requirements



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for air defense forces and means as well as their disposition by areas, of maintaining the entire air defense in a state of high combat readiness, of developing unified combat training programs for the air defense troops, of conducting combined air defense exercises according to the plans of the Joint Chiefs of Staff, and of organizing cooperation with neighboring air defense commands.

The above-indicated tasks are accomplished by the Air Defense Command of the US Air Force together with the ground army, navy, and air force of Canada.

The Air Defense Command of the US Air Force is one of the main commands in the combined Air Defense Command of the continental US and the combined Air Defense Command of the North American continent. The forces and means which this command allocates constitute over 70 percent of all of the air defense forces and means of the North American continent.

Subordinate to the commander of the Air Defense Command of the US Air Force are the air defense fighter aviation, Bomarc surface-to-air guided missiles, radar squadrons, control and warning squadrons, and also the means that have the antimissile and antispace defense function.

Organizationally, the Air Defense Command of the US Air Force consists of six air defense air divisions, two separate air divisions, one special weapons separate air defense division, and two long-range detection air wings.

In total, by the beginning of 1962, the Air Defense Command of the Air Force numbered 44 squadrons of fighter-interceptors, including 14 squadrons having F-106 aircraft in service, 17 squadrons with F-101B aircraft, 13 squadrons with F-102A aircraft, five squadrons with Bomarc-A surface-to-air guided missiles, and three squadrons with Bomarc-B surface-to-air guided missiles.

In addition to this, the Air National Guard has 23 air defense fighter squadrons, of which four squadrons have F-102A aircraft, six squadrons have F-86 aircraft, five squadrons have F-94 aircraft, five squadrons have F-89 aircraft, and three squadrons have F-100 aircraft.

Consequently, the Air Defense Command of the Air Force, together with the air defense subunits of the Air National Guard, has 1,560 fighter-interceptors, 168 Bomarc-A surface-to-air guided missile launchers, and 84 Bomarc-B surface-to-air guided missile launchers.

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The US air defense forces and means in Iceland (one squadron, 25 F-84 aircraft) and Greenland (one squadron, 25 F-102A aircraft) are also operationally subordinate to the Air Defense Command of the Air Force.

Rather large air defense forces and means are also available in the Ground Forces Air Defense Command, which organizationally consists of five regional air defense commands, the boundaries of these commands basically coinciding with the air defense regions of the air divisions. These commands administratively control the surface-to-air guided missile units in their regions of responsibility. The composition of the regional commands and the boundaries of their regions of responsibility are variable and depend on the number and importance of the installations in the territories of the army areas.

At the beginning of 1962, in its complement in the continental US, the Air Defense Command of the US ground forces had 64 Nike surface-to-air guided missile battalions (60 Nike Hercules surface-to-air guided missile battalions and four Nike Ajax battalions) and five Hawk surface-to-air guided missile battalions.

In an extraordinary situation the Ground Forces Air Defense Command can call upon 30 surface-to-air guided missile battalions of the US National Guard for air defense.

In all, the Ground Forces Air Defense Command numbers over 3,000 Nike and Hawk surface-to-air guided missile launchers in the continental US.

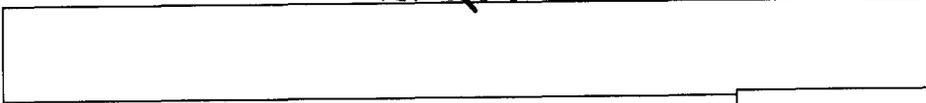
Included in the combined Air Defense Command of the continental US from the complement of naval forces are the air defense forces and means of ships, shore bases, and Marines. These forces are either directly or indirectly called upon to carry out tasks for the air defense of the country and the entire continent.

The principal tasks of naval air defense forces and means are to cover major naval installations and to ensure the detection of enemy air, surface, and submarine forces on the Atlantic and Pacific Ocean approaches to the continent, and to notify air defense organs of the threat of air and missile attack.

At the beginning of 1962, in the complement of US naval forces in the combined Air Defense Command of the continent there were 30 F-4D-2 aircraft (one fighter squadron), 20 radar picket escort ships, 16 floating radar

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posts, and five long-range radar picket squadrons equipped with 108 WV2 long-range detection aircraft.

To accomplish these tasks, and depending on the situation, they can call upon carrier fighter aviation based on 15 navy and marine bases and numbering approximately 500 aircraft.

The Alaskan Air Defense Command has in its complement one fighter squadron equipped with 40 F-102A aircraft and two Nike Hercules surface-to-air guided missile battalions that have 96 combat-ready launchers.

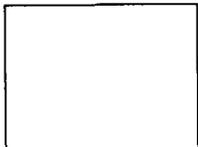
The Air Defense Command of the Canadian Air Force exercises command over the air defense fighter aviation and radiotechnical squadrons, and also over operationally subordinate air defense forces and means of the Canadian ground forces and several US air defense subunits located in Canada. The Canadian Air Defense Command has in its complement five fighter squadrons equipped with CF-100 aircraft.

Thus, to conduct air defense, the combined Air Defense Command of North America has at its disposal 54 fighter-interceptor squadrons (approximately 1,120 aircraft), eight Bomarc surface-to-air guided missile squadrons (252 launchers), 67 Nike surface-to-air guided missile battalions (approximately 3,200 launchers), and five Hawk surface-to-air guided missile battalions (120 launchers).

In an initial period of war, in the interests of the air defense of the North American continent, it is possible to call upon the fighter aviation of the National Guard (675 aircraft), aircraft of technical aviation (approximately 800), and also fighter aviation of the navy (approximately 500 aircraft).

The air defense of the continent can be reinforced by using National Guard surface-to-air guided missile units, which number 30 Nike surface-to-air guided missile battalions (318 launchers).

Thus, it is not difficult to arrive at the conclusion that at the present time fighter aviation is the primary means of the air defense of the USA. However, measures are already being taken so that the development of air defense means will proceed by way of employing surface-to-air guided missile systems. Americans believe that in approximately eight to ten years around 90 percent of all air defense tasks will be accomplished with the help of these systems. The latter recommendation has been made based on





the fact that fighter aviation is utterly unsuited to combating missile weapons, because it cannot intercept jet bombers that have a high ceiling and a high speed of flight, and because its operations are limited in adverse weather conditions and at night.

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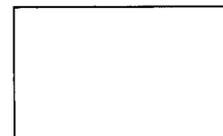
The availability of large numbers of units and subunits and of combat equipment and weapons is not the principal criterion of the combat readiness of an air defense system. The combat readiness level of an air defense system depends primarily on the training of the individual crews of the units and on precise, smooth cooperation. Therefore, an air defense is considered ready if the air defense units and large units are capable of conducting joint and effective combat actions against an air enemy under any conditions of a combat situation.

To ensure the high combat readiness of the air defense system, the American-Canadian command systematically trains air defense troops for combat, the purpose of this being to improve the skill of the personnel, to develop such combat qualities as rapidity of action and the ability to conduct prolonged combat actions under great pressure and under any meteorological conditions, both day and night. Combat training under this system is conducted constantly throughout the entire year.

A major requirement imposed on combat training is sequencing of training, which provides for strict adherence to the principle of going from the simple to the complex, that is, the successive working out of air defense tasks on the part of flight crews, combat crews, subunits, units, large units, and the separate branch arms of the air defense. After this, air defense troops conduct joint exercises with other branches of the armed forces and also conduct maneuvers and exercises with the armed forces of allied countries.

The main purpose of the combat training of air defense fighter aviation is for this aviation to achieve and maintain a high level of combat readiness.

The combat training of flight personnel is a combination of ground and flight training. Very great importance is attached to ground training and a large number of hours are allotted to it.





For the purpose of preventing accidents while in flight, training periods on safety rules are held every week with the personnel. In these, flight accidents by air defense fighter aircraft are discussed. Officers from the ground control and warning posts are brought in to the training periods as are also personnel performing the duties of controlling aircraft in flight.

In addition, the ground training plan includes studying the characteristics of and the operating rules for the communications means and radar equipment of all types of modern air navigation instruments and computing devices.

Each pilot is allocated in the course of a year a total of approximately 300 hours of flying time in combat and training aircraft. Unit commanders have been granted the right to allocate to each crew an additional number of flying hours in excess of the established norm.

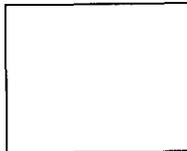
Special importance is attached to the training of air defense fighter aviation flight personnel in actions under complex meteorological conditions, at night, and at high altitudes; in the guidance of fighter-interceptors to targets with reliable means of control, in the interception of targets with the help of the aircraft-mounted radar sets under conditions of radiotechnical jamming, and in firing with cannon, rockets, and guided missiles.

For instrument flying there is an annual allocation of 36 flying hours, of which no less than 50 percent are performed in combat aircraft.

During combat training great attention is devoted to the working out of interceptions under conditions of active and passive radiotechnical jamming. For this purpose, each crew completes a minimum of one aircraft sortie per month, which is necessary in order to maintain a particular training level.

Recently they have begun to intensify the working out of the problems of the cooperation of fighter aviation with surface-to-air guided missiles and with radiotechnical subunits when using the semiautomatic SAGE system.

The concluding phase of the entire combat training of air defense units and subunits is the yearly conduct of a two-sided exercise involving the air defense of the North American continent.



A typical exercise for 1961 was the SKY SHIELD-2 exercise, conducted from 2000 hours 14 October until 0800 hours 15 October over US and Canadian territory. Up to 1,800 air defense fighters of the US and Canada and 270 surface-to-air guided missile and anti-aircraft artillery batteries participated in the exercise.

To detect enemy aircraft in the air, the radar systems were activated: the early warning line going across Alaska, Canada, Greenland, and Iceland -- the "DEW" line; the radar line across the middle of Canada -- the "Mid-Canada" line; and the radar line across the northern border of the US -- the "Pine Tree" line. Extensive use was made of the radar coverage system for the Atlantic area, including the so-called "Texas Towers" as well as radar picket ships and aircraft.

The US Strategic Air Command and Great Britain's Bomber Command acted as the attacking side. Although approximately 150 aircraft of strategic aviation participated in the exercise, nevertheless they represented the combat actions of approximately 1,200 aircraft.

The exercise pursued the aim of checking the readiness of the air defense of the North American continent to repel the massed strikes of a potential air enemy.

In the exercise the Strategic Air Command was assigned the tasks of delivering nuclear strikes against military, industrial-economic, and administrative-political centers with negotiation of the current air defense system on a broad front.

During the exercise, US strategic aviation based at British, Spanish, and North African air bases, carried out raids against the North American continent: along a northern route across Greenland and Hudson Bay; along a northeastern route across Spain and Newfoundland; and along a central (eastern) route across the Azores and Bermuda islands.

In addition, bomber aircraft operated from US bases located in the northeastern and southeastern states. In the interests of training the air defense means, aircraft from these bases went out to the area of Davis Strait and delivered strikes against installations located in the central and northern parts of the US.

A ballistic missile strike preceded the strategic aviation strikes against US territory. According to incomplete data, 23 nuclear strikes were noted.

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The actions of both sides in the exercise were carried out exactly according to plan. Strategic aviation carried out its air raids in echelon, in three assault waves with intervals of from one to 2.5 hours between waves.

Forty percent of the bombers operated in the first echelon, 30 percent in the second echelon, and 30 percent in the third echelon.

The principal targets against which the strategic aviation delivered strikes were: missile bases, strategic aviation bases, and military-industrial installations.

The strategic bombers had a one-time aerial refuelling in the Thule (Greenland) and Davis Strait areas, in the course of which one KC-135 tanker refueled in the air one B-52 bomber or two B-17 bombers.

In the estimation of the American command, exercise SKY SHIELD-2 was the largest exercise in the air defense of the North American continent that had been held in the postwar period. The actions of US and Canadian Air Force personnel were given a particularly high rating. The personnel performed over 6,000 aircraft sorties to repel the enemy bomber raids which followed the ballistic missile nuclear strikes against targets on the North American continent.

Thus, at the present time the air defense of the North American continent has been basically completed and possesses adequately high combat qualities.

At the same time, Americans believe that the problems of air defense cannot be fully solved solely by air defense forces, even with the availability of modern antimissile means. In their opinion, an enemy possessing modern means of attack will be able to penetrate any air defense, no matter how strong and organized it is, and will be able to deliver nuclear weapon strikes. In this connection, they admit that it is necessary to solve the problems of continental air defense by means of the close strategic and operational cooperation of air defense means and attack means. Based on this, the American military command believes that the massed employment of strategic aviation and ballistic missiles against the enemy's key means of air attack, in order to deprive him of the capability of delivering strikes against targets on US territory, is one of the principal methods of carrying out the air defense task.

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In connection with the availability in the present-day arsenal of new strategic attack weapons -- ballistic missiles with different ranges -- Americans have arrived at the conclusion that the term "air defense" which has existed up to now does not reflect the essence of the matter. Therefore, taking into account missile construction achievements as well as the successes attained in mastering space, they have started to subdivide air defense into strictly air, antimissile, and antispace defense.

We are not able to set forth in detail in this article the questions of antimissile and antispace defense; however, we consider it expedient to touch upon it, if only in a general manner.

An antimissile defense as such does not yet exist because the US at present does not possess active antimissile defense means. The only Nike Zeus site of the antimissile defense system is in an experimental stage and, according to data of the Americans themselves, it will become operational no earlier than 1963-1964. At the present time, the antimissile defense has only the array of means for the detection and early warning of intercontinental ballistic missile flights.

Work in the field of designing means to detect intercontinental ballistic missiles was initiated in the US in 1964; but in actuality, the US began to develop a radar system for the early warning of ballistic missile launchings as far back as in 1958.

This is the very same time when they began to develop antimissile missiles, to construct firing positions and control and guidance means in order to fully test them in the Pacific Ocean, and also to produce the Midas artificial earth satellites to give early warning of the launchings of intercontinental ballistic missiles.

Also included among these measures is the construction of ground radiotechnical stations to reconnoiter the remote radio control and guidance of the probable enemy's intercontinental ballistic missiles and the establishment of an antimissile defense communications network that is up to modern requirements.

Of all of the above-mentioned measures, at the present time they have completed the construction of only two of the long-range detection radar posts of the "BMEWS" (Ballistic Missile Early Warning System) antimissile defense; one at Thule Air Base (Greenland), and the other in Clear (in the Fairbanks, Alaska, area). These posts can give the troops 15-minute warning of an enemy missile attack.

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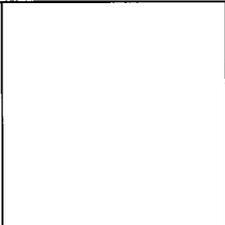
As intermediate posts to determine missile trajectories, in addition to the two above-mentioned early warning posts, they can use the AN/PPS-17 long-range radar stations which are located on the island of Shemya (Aleutian Islands), at Laredo Air Base (state of Texas), at Fort Churchill (Canada), and in Turkey.

In addition to these stations, the Air Force and Navy have AN/PPS-16 radar stations at various test ranges which in case of need can be used to support the antimissile defense.

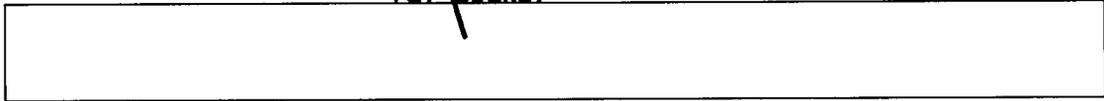
The antispace defense of the US is in a rudimentary state. Initial steps have already been taken to develop it. In 1960, the experimental "Spaceur" satellite detection, identification, and tracking system which belonged to the US Navy, and the "Insect" coordination center of the system for the monitoring and observation of space, which was a part of the Air Force Research and Development Command, were placed in operational subordination to the combined North American Air Defense Command.

The "Insect" coordination center collects and processes data on the number of space objects that are in orbit, determines the orbital characteristics of the space means, and passes this information to all interested authorities. It is anticipated that in the future it will send out data to special fighter-satellites for the purpose of having antispace defense means carry out interceptions.

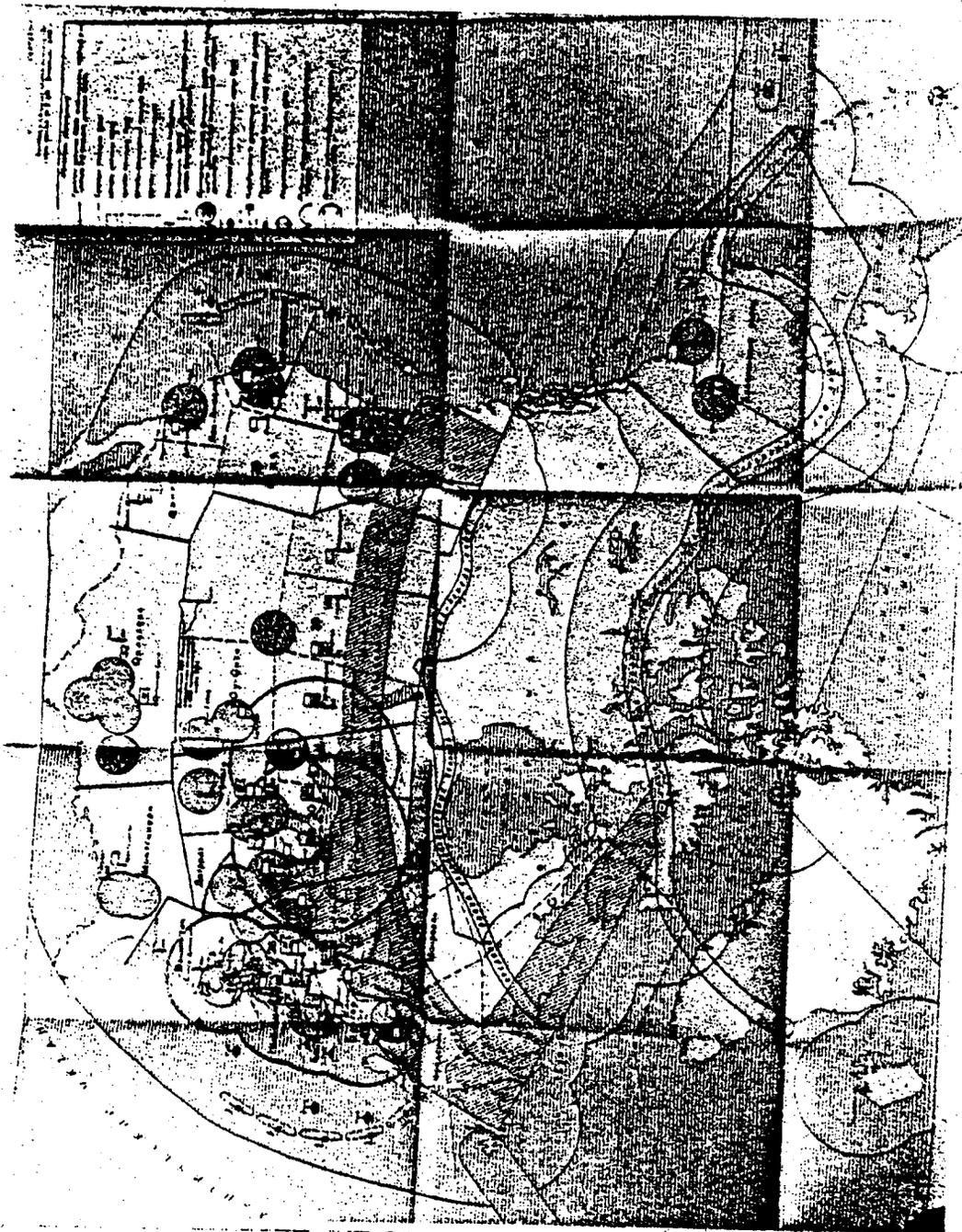
Recently the "Insect" center and "Spaceur" were merged into a single "Spadats" system, which is subordinate to the first squadron for monitoring and observation of the aerospace expanse, activated in 1961, and forms a part of the 9th Air Defense Air Division. This division serves as the basis for the formation of other antimissile and antispace defense units and subunits.



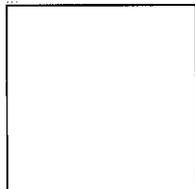
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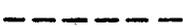
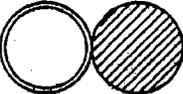
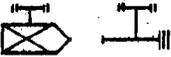
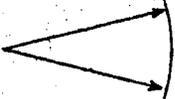


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LEGEND

-  Boundaries of air defense regions of NORAD (by air defense division number)
-  Boundaries of air defense sectors
-  Headquarters of air defense regions
-  Headquarters of air defense sectors
-  Headquarters of air defense wings
-  Headquarters of [aviation groups]
-  Fighter squadrons
-  Bomarc surface-to-air missile squadrons ([TWO WORDS ILLEGIBLE] Bomarc surface-to-air missile bases)
-  Approximate areas of coverage by Nike Hercules and Bomarc surface-to-air guided missiles (surface range)
-  Floating air defense radar posts
-  Ship and aircraft radar patrols
-  Radar posts at sea (Texas towers)
-  Antimissile radar units
-  Detection boundaries of radar means
-  Sectors of operation of air defense radar stations

