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CENTRAL INTELLIGENCE AGENCY  
WASHINGTON, D.C. 20505

25 January 1978

MEMORANDUM FOR: The Director of Central Intelligence  
FROM : John N. McMahon  
Deputy Director for Operations  
SUBJECT : MILITARY THOUGHT (USSR): Some Problems in  
Organizing Control of the Means of Air Defense  
Troops

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of the article is of the firm opinion that the entire system of organizing and controlling air defense in a front and army should be subordinate to the timely and proper use of surface-to-air missiles. In criticizing an air defense article which had appeared in a previous issue of the same journal, he states his reasons as to how and why surface-to-air missiles should take precedence over deployment of fighter aircraft against an attacking "air enemy." 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

John N. McMahon

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# Intelligence Information Special Report

Page 3 of 15 Pages

COUNTRY USSR

[Redacted]

DATE OF INFO. Early 1962

DATE 25 January 1978

SUBJECT

MILITARY THOUGHT (USSR): Some Problems in Organizing Control of the Means of Air Defense Troops

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 author of this article, General-Leytenant of Artillery B. Vysotskiy, is of the firm opinion that the entire system of organizing and controlling air defense in a front and army should be subordinate to the timely and proper use of surface-to-air missiles. In criticizing an air defense article which had appeared in a previous issue of the same journal, he states his reasons as to how and why surface-to-air missiles should take precedence over deployment of fighter aircraft against an attacking "air enemy."

End of Summary

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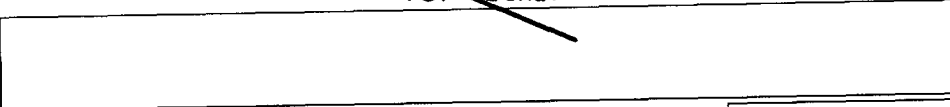
Comment:

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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Some Problems in Organizing Control of the  
Means of Air Defense Troops

by

General-Leytenant of Artillery B. VYSOTSKIY

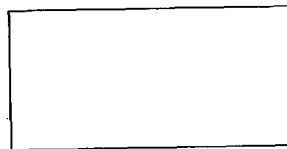
In the article "Aviation Operations in an Initial Front Offensive Operation"\*, the authors made a number of extremely controversial observations, on which we would like to express our own point of view.

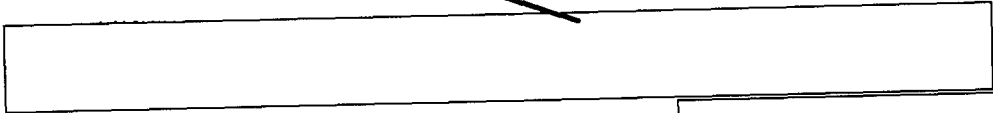
An analysis of the status and the prospects of developing the means of air attack and also the capabilities of air defense show conclusively that at present the main and most effective means for destroying air targets are surface-to-air guided missiles which are capable of very reliably destroying the cruise missiles, aircraft and operational-tactical missiles of the enemy. The entire system of organizing and controlling air defense in a front and army should be subordinate to the proper and timely employment of this most promising weapon. The results of much research attests to the fact that the capabilities of two regiments of modern fighters to implement the interception and destruction of the air enemy from a position of being "on airfield alert" are considerably lower than the capabilities of a single surface-to-air missile regiment, especially when combating the enemy at altitudes exceeding five kilometers and densities of attack of more than one aircraft per minute in the area of repulsion. Moreover, the majority of targets, intercepted by fighters from a position of being "on airfield alert", will be destroyed while in the depth of the disposition of our troops.

The speed of our fighter-interceptors is not much different from that of American tactical fighters. For example, the MIG-21F has a maximum speed of 2,500 kilometers per hour, and the F-104C tactical fighter, which entered the service of the US Air Force in 1958, has a maximum speed of 2,250 kilometers per hour. Therefore, from a position of being "on airfield alert" MIG-21F fighters can intercept only subsonic aircraft up to the front line when their flight altitude exceeds 3,000 meters. The interception of high-speed air targets, moving at medium and high altitudes, can be conducted by modern fighters only at 40 to 100

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\* Collection of Articles of the Journal "Military Thought", 1961, No. 5 (60).





kilometers from the front line over their own territory.

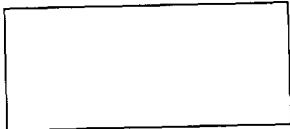
The experience of research attests to the fact that the combat capabilities of fighter aviation depend to a considerable degree on the number of guidance channels being used and the altitude and density of the attack, while the capabilities of surface-to-air missile units do not depend on the altitude and depend very little on the density of attack of the enemy targets. Therefore, in our opinion, we must regard surface-to-air guided missiles as the main fire means for combating the air enemy.

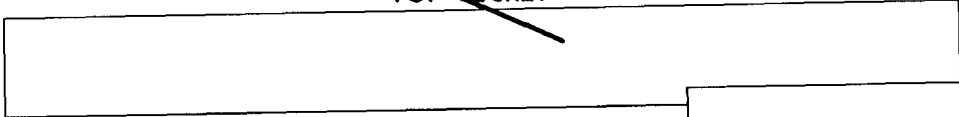
In accordance with this evaluation of the capabilities of surface-to-air missile units and fighter aviation, it is necessary to organize their combat employment in the operational depth of the front.

In the article under consideration, the authors proceed from the need to ensure the interception and destruction of the delivery aircraft for nuclear weapons of the enemy on the distant approaches to the troops and installations of the rear services of the front which are being covered. They indicate fighter aviation as the means capable of successfully fulfilling this task. Hence, they recommend that zones for combat actions of fighters be designated in front of the impact zones of the surface-to-air missiles. In the opinion of the authors of the article, fighters, operating in pairs from a position of being "on airborne alert", will be able to conduct successful combat against the air enemy within their own zones by making use of the available ground radiotechnical means and free search.

Stemming from an evaluation allowing the capabilities of ground radiotechnical means of detection, let us examine the capabilities of modern fighters to conduct combat against enemy targets during actions from a position of being "on airborne alert".

It is well known that the capabilities of modern radiotechnical means of detection depend on a number of factors and primarily on the altitude of flight of the air enemy and the distance of his base airfields from the forward edge. For example, the system of radar reconnaissance ensures detection of the air enemy at altitudes of four to five kilometers -- at a range of about 100 kilometers, at altitudes of eight to ten



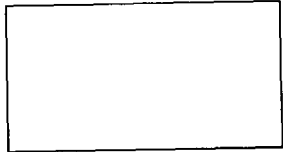


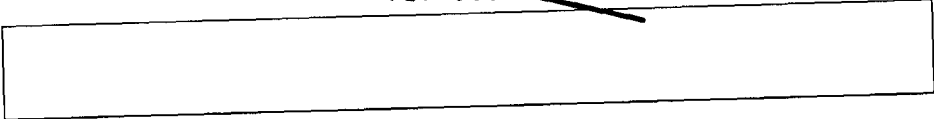
kilometers -- at a range of 200 kilometers, and at altitudes of 12 to 14 kilometers -- at a range of 250 kilometers.

A limited range of detection leads to a situation where the interception of enemy aircraft on the approaches to the covered troops from a position of being "on airborne alert" can be ensured only when the target is at an altitude exceeding five kilometers. Otherwise, the targets will be intercepted only in the depth of the disposition of their own troops. The probable enemy sets up a grouping of his means of air attack with due regard for these circumstances. For example, in the Central European Theater of Military Operations, tactical fighters (including delivery aircraft) and cruise missiles comprise the main strike force of the enemy's air force for operations against our ground troops and their installations (70 percent). Squadrons of cruise missiles, capable of conducting more than 200 launches in the course of four hours, are also concentrated in this theater.

In our opinion, under conditions of combat operations by ground troops and when the enemy achieves tactical surprise of attack, fighter aviation will not be able to effectively combat low flying targets, which are the most numerous and dangerous for the troops. Meanwhile, in exercises of the US Air Force and NATO which were conducted last year, up to 40 percent of the tactical fighters and two-thirds of the cruise missiles operated from low altitudes (300 to 350 meters).

If we keep in mind the dimensions of space needed for a fighter to fulfil its task, the flight speed and the turning radius of modern supersonic fighters, and also the location of possible lines of interception, then it becomes completely obvious that it is inexpedient to designate zones of combat operations of fighters in front of the zones of the surface-to-air missile units. Apparently, General-Leytenant of Aviation N. OSTROUMOV and General-Mayor of Aviation M. KOZHEVNIKOV did not take into account that the boundary of the zone of combat operations of surface-to-air missile units is not the boundary of the impact zone, but the external boundary of the missile launch zone, which can be 1.5 to two times greater than the impact zone.



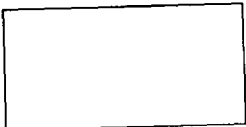


If we consider that when the enemy has a flight altitude of eight to ten kilometers, the line of interception of targets by fighters cannot be farther than 30 to 40 kilometers from the covered troops, then it becomes clear that in this case the fighters will have to operate in the zones of combat operations of surface-to-air missiles, since the distance of the external boundary of the missile launch zone is approximately 50 kilometers. The operations of surface-to-air guided missiles and fighter aviation in one zone are greatly hampered given the existing means of control and warning.

The safety of our fighters in these conditions can only be ensured by prohibiting the firing of surface-to-air guided missiles, and this will adversely affect the effectiveness of the entire system of air defense rather quickly, inasmuch as the combat capabilities of the surface-to-air guided missiles will be paralyzed.

Undeniably, fighter operations on the approaches are advisable and necessary when there are no surface-to-air missile units in the first echelon of the front (army), when the system of fire of surface-to-air guided missiles is disrupted, when the surface-to-air missile troop units are relocated, when surface-to-air guided missiles are neutralized by jamming, and also when there are no missiles. However, in these cases the actions of our fighters over the battle dispositions of enemy troops in the fire area of his surface-to-air guided missiles must be supported by the timely neutralization of the enemy's air defense system.

We must also add that the actions of the main mass of fighters are limited in light of their dependence on the weather and time of day. The fact that an aircraft can be in the air for only a short period of time and that in the course of a day it is capable of conducting no more than three flights means that in contrast to the ground means of air defense, a fighter can only be employed intermittently, and this does not ensure uninterrupted cover of the troops. While taking into account the prospects for the development of the probable enemy's means of air attack, it is also necessary to keep in mind the constant increase of the relative proportion of ballistic missiles, against which fighters are powerless to conduct combat.



Consequently, under conditions of operations by ground troops, surface-to-air missiles are the main means for combating the air enemy, i.e., aircraft, cruise missiles, and, in the future, even operational-tactical ballistic missiles. However, fighter aviation remains the most mobile means of air defense and its proper use within the overall system of air defense can, to a considerable degree, raise the effectiveness of repulsing strikes of the enemy's manned means of air attack. When there is a limited number of surface-to-air missile troops, fighter aviation fulfils the main role in air defense. In these cases, when surface-to-air missiles create a continuous area under fire over the covered troops, they carry out the main tasks of air defense.

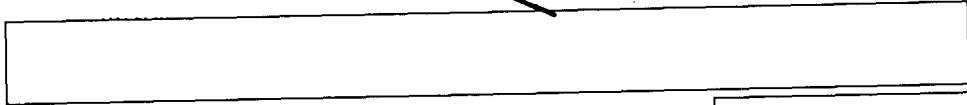
While recognizing the advisability of uniting all forces and means of air defense of the front under a single command and the need for strong centralization of control of the means of air defense, the authors of the article being reviewed oppose the proposal of Colonel P. LOZIK to set up an air defense formation in the front (of the type of an army of the air defense of the country), in whose composition there will be surface-to-air guided missiles and fighter aviation.\* They feel it is necessary to effectively subordinate front surface-to-air missile units and large units to the commander of the air army.

We do not share the opinions of Colonel P. LOZIK, but we do feel that carrying out the proposals of comrades OSTROUMOV and KOZHEVNIKOV will not provide positive results: the air army will be entrusted with a task which is uncharacteristic for it and it will be changed into an army of air defense.

We must mention that the proposal of comrades OSTROUMOV and KOZHEVNIKOV is not a new one. To a certain extent, a similar system was already instituted in the US Army. This was a result of the fact that the American command, regarding the Air Force as the decisive means of armed combat, incorrectly evaluated the role of the ground troops and the importance of their air defense in a future war.

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\* "Some Problems of Air Defense of the Ground Troops."  
Collection of Articles of the Journal "Military Thought." 1961,  
No. 1 (56).





The experience of the war in Korea and a number of subsequent events have required the American command to reexamine its military doctrine and, in particular, to reevaluate the role of the Air Force in a war. With the appearance of surface-to-air guided missiles and automated guidance systems of the "Sage" and "Missile Monitor" types, the role of the Air Force has also changed within the system of air defense. Thus, recently the American command abandoned the air armies of air defense on the continent and proceeded to form an air defense command. In a theater of military operations, it is specified that a joint air defense command of the theater of military operations be created with all forces and means of air defense subordinate to it, and also that air defense divisions be set up. Hence, we must take into consideration that the organization of a single system of air defense in a theater of military operations for the command of NATO entails a number of difficulties, which are the results of the competition and discord among the NATO member countries. However, in spite of this, the NATO command devotes a great deal of attention to seeking new organizational forms for air defense.

The experience of World War II (on the example of the army of Fascist Germany) shows conclusively that subordinating the ground means of air defense to the air forces does not ensure reliable air defense of troops, and only leads to a lag in the development of ground means of combating the air enemy.

Does it make any sense to transfer obsolete principles of organizing the air defense troops to our army?

Subordinating front surface-to-air missile units to the formation commander of the air army can lead to a serious disruption of the symmetry and unity of control of air defense and, in addition, deprive the commander of the air army of the capabilities to carry out his main task of controlling reconnaissance, bomber, and fighter-bomber aviation, and also front cruise missiles.

It is also necessary to keep in mind that front means of air defense can frequently operate on behalf of armies by reinforcing their air defense (commitment to an engagement, the approach of armies to the depths, cover of strike groupings and missile/nuclear means). In addition to this, army and even division means of air defense can be enlisted for carrying out



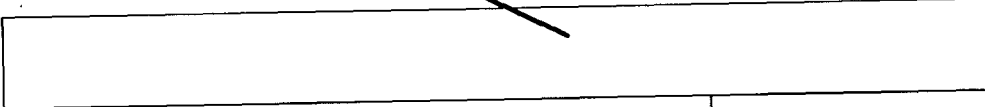
front tasks (regrouping of troops of the front, covering crossings and installations of operational importance, and others). Armies of the second echelon and also reserve divisions are deployed in the front rear area during a specified time period, and therefore, their means of air defense can and must be used in the overall system of air defense of the front.

All this requires flexibility and absolute centralization of control from top to bottom within the framework of a single well-proportioned system. In our opinion, carrying out the proposal of comrades OSTROUMOV and KOZHEVNIKOV will lead to a split in the system of air defense of the front into two isolated parts, it will disrupt the unity of control of air defense, result in uncoordinated actions of various means of air defense, and disorganize logistical support and, most important, the supplying of missiles. This will sharply lower the reliability of air defense on the whole. Such a split cannot be permitted, especially since combat against the air enemy in a future war will consist mainly in destroying missiles in flight, that is, anti-missile defense.

In order to ensure the effective employment of active means of air defense, first of all of surface-to-air missiles and fighter aviation, it is necessary to set up a system of control, under which the combat capabilities of each means of air defense would be exploited most fully.

These conditions were not created when the first attack of the "air enemy" against the troops of the front was repulsed in one of the command-staff exercises which was conducted. Surface-to-air missile units and fighter aviation operated in the very same airspace, hence the use of fighter aviation in the first echelon was foreseen. The order of flight of our reconnaissance, bomber and fighter-bomber aviation through the impact zones of surface-to-air missile had not been precisely specified.

The withdrawal of our aircraft from under the possible strike was begun 10 to 20 minutes before the first echelons of the "air enemy" entered the zone of radar detection. In all, about 1,500 of our aircraft had been put into the air. Upon the initial detection of the first echelons of the "air enemy", bomber and fighter-bomber aviation which was already in the air

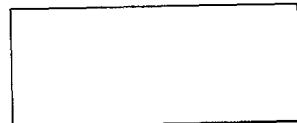


received the task to act according to the plan of a meeting strike. The front line was being intersected by our aviation on the western axis and by the aviation of the "enemy" on the eastern axis almost simultaneously, and the intersection coincided with the boundaries of the missile launch zone and the area under fire of surface-to-air missile units. An extremely complex situation was created for actions of the means of air defense, inasmuch as there were about 2,500 of our own and "enemy" aircraft in the air almost simultaneously. Under these conditions, it was impossible to understand where our own and where the foreign aircraft were, since there were more than 1,500 aircraft in the zone of detection of a single radar station, about 100 aircraft in the area under fire of one surface-to-air missile regiment, up to 250 aircraft in the area under fire of one surface-to-air missile regiment, and about 500 aircraft in its missile launch zone.

Under actual conditions this would have led to a situation where the screens of radar stations for detecting and guiding missiles would have been so jammed with the approaching aircraft and cruise missiles of the enemy and with our own aircraft going to intercept them and to bomb enemy installations, and with those aircraft being rebased to other airfields, that the entire system of radar reconnaissance would be disoriented, and the surface-to-air missile units, which are the main means for destroying the enemy, would be paralyzed.

This example clearly shows that when surface-to-air missile units and fighters are employed simultaneously in the same air-space, the effectiveness of air defense is sharply lowered and the danger of destroying our own aircraft is increased.

We support the opinion that surface-to-air missiles and fighters must operate in different zones, and that when this is done the surface-to-air missile units should be in the first echelon. This is supported even by the results of a special calculation of the combat capabilities of surface-to-air missile units and fighter aviation, which shows that on the approaches to the covered troops the former are capable of destroying 50 to 60 percent of the targets, and the latter are capable of destroying only 40 percent. Consequently, it is better to locate the missile launching areas of surface-to-air missile units in close proximity to the front line, creating a sufficiently deep zone of



combat actions for surface-to-air guided missiles. Fighter interceptors, ensuring cover of the flanks and rear areas of the front can operate with great effectiveness outside of these zones.

In the course of an operation it is most advisable to use fighter aviation for reinforcing the air defense troops when surface-to-air missile units are being relocated (regrouped). In connection with this, any relocation of surface-to-air missile units must be accompanied by putting the necessary forces of fighters into the air and moving them to zones of alert on the appropriate axes. These matters must be carefully coordinated in planning an operation.

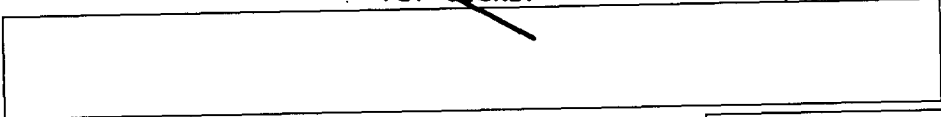
Until low-altitude surface-to-air missile systems enter service, it is advisable to set up fire lines of small caliber antiaircraft artillery in the zone of combat actions of surface-to-air missile units of the first echelon on the axes of probable attacks of enemy cruise missiles, using front (army) antiaircraft artillery units and also antiaircraft artillery of motorized rifle and tank divisions for this.

Appropriate zones of cover can be set up by surface-to-air missile units and antiaircraft artillery for direct air defense of the most important installations in the rear areas.

Control of air defense comprises one of the most complex tasks. Now it is already completely obvious that the system of control must be fully prepared for action even in peacetime, supporting the full centralization of control the moment aggressive operations of ground troops are being developed.

We feel that control of the entire system of air defense should be implemented by the chief of air defense troops from the main command post of air defense of the front, and in case individual levels of the front system of control are put out of action, then it must be implemented from the army command posts of air defense.

The system of control of air defense unquestionably must be closely linked to the combined-arms system. Otherwise, it will be very difficult to ensure uninterrupted air defense in the operations of the ground troops.



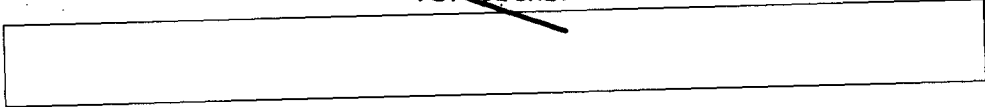
In our opinion, control of air defense means was incorrectly organized in the command-staff exercise mentioned above. Besides the chief of air defense troops, the commander of the air army was in the command post of the air defense of the front. He attempted simultaneously to control the combat actions of fighter aviation which was repulsing the "enemy" attack and the actions of reconnaissance, bomber and fighter-bomber aviation which were carrying out tasks set by the commander of the front. The operating communications lines of air defense of the front were occupied by him, which led to the untimely setting of tasks for surface-to-air missile units. The main command post of the air army was virtually inactive.

As would be expected, in the course of exercises the commander of the air army was unable to simultaneously control all types of aviation and, moreover, the missile means of air defense. In repulsing the first attack of the "air enemy", he controlled only fighter aviation. Control of reconnaissance, bomber and fighter-bomber aviation on his part amounted to supplying the order for takeoff. From the initiation of offensive actions of the front, all the attention of the commander of the air army was concentrated on controlling and supporting the actions of bombers and fighter-bombers, which were supporting the troops of the front. During this period, fighter aviation was virtually without control.

We think that in order to ensure a reliable system of air defense of troops of the front, allowing the full and effective utilization of the fire power of surface-to-air missiles and antiaircraft artillery, as well as the capabilities of fighter-interceptors, it is advisable to broaden the rights of the chief of the air defense troops of the front and concentrate in his hands control of all means of air defense (having effectively subordinated fighter aviation to him). Air defense command posts at all levels must be supported with means for accurately displaying the air situation, and automated means for evaluating it, selecting weapons and allocating targets.

At present combat control of front surface-to-air missile means and radiotechnical units of front subordination is conducted from the command post of air defense of the front. Cooperation between the command posts of formations of air defense of the country and adjacent fronts is also carried out



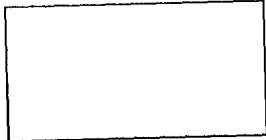


through it. In the command post of air defense of a front a large number of links are closed on which intense exchange of radar information is conducted, combat tasks are set, mutual warning is carried out, etc. As a result of this, questions regarding both the operational control of the entire system of air defense and the tactical tasks for direct control of individual means of air defense are decided in the command post of air defense of the front.

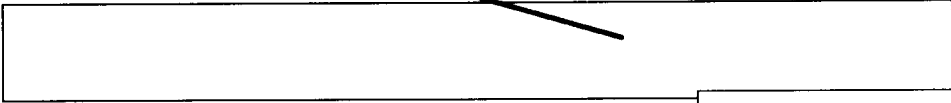
Front means of air defense customarily fulfil tasks in air defense of installations and troops in the rear area of the front. Therefore, in the course of an operation, when the distance between the command post of air defense of the front and these means reaches 300 to 400 kilometers and more, control is considerably more difficult, and, at times, becomes impossible.

All these circumstances make it necessary to strengthen individual front units of air defense by having existing surface-to-air regiments and radiotechnical units of front subordination report to the large units of air defense. This will enable us to considerably improve the control of means of air defense in the rear area of the front, ensure dispersal of control posts, which, in turn, will raise the vital activity and flexibility of the system of control. The chief of air defense troops of the front will be able to control the combat operations of the entire system of air defense, while carrying out operational control through the command posts of air defense of the armies and the command posts of front air defense large units. Cooperation between air defense of the country and fighter aviation will be substantially improved. Conditions will be created for combining the command posts of surface-to-air missile units and anti-aircraft artillery with radiotechnical units, which will cut the time for passing warnings in half, since a given air situation will reach the command posts of air defense large units and surface-to-air regiments from the same radar posts simultaneously.

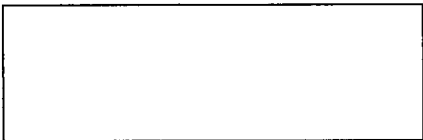
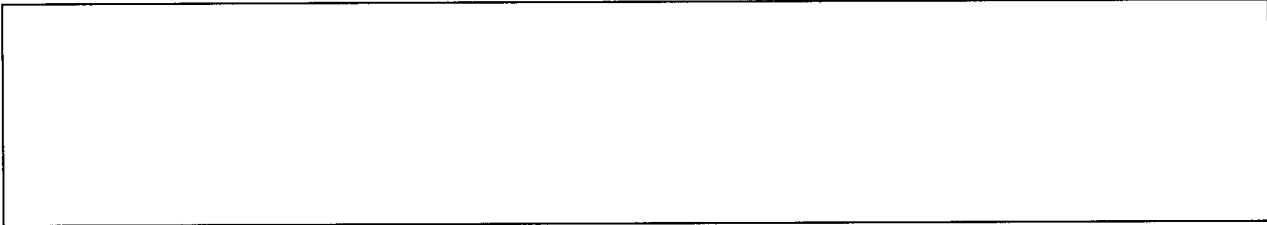
This structure for control, in our opinion, will ensure centralized control of combat operations of active means of air defense both in organizing a battle, and in repulsing fighters of the air enemy, and also close connection with the combined-arms system of control.



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