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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

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30 November 1973

MEMORANDUM FOR: The Director of Central Intelligence
SUBJECT : MILITARY THOUGHT (USSR): Combat Readiness
of Ground Forces Air Defense

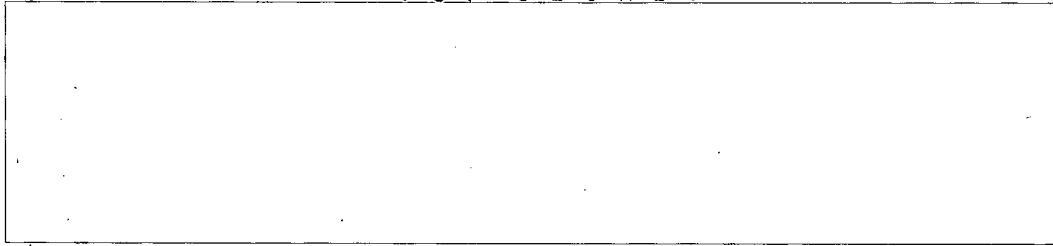
1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article discusses factors affecting field air defense performance, citing some lessons of the 1967 Near East war. Major points made by the author concern the necessity of moving radar and weapons often without disrupting the continuity of cover, careful selection of sites, and the strain exerted on personnel and equipment when they are kept in combat-ready status. This article appeared in Issue No. 3 (85) for 1968.

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.


William E. Nelson
Deputy Director for Operations


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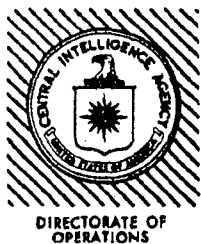


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Intelligence Information Special Report

COUNTRY USSR

DATE OF INFO. Late 1968

DATE 30 November 73

SUBJECT

MILITARY THOUGHT (USSR): Combat Readiness of
Ground Forces Air Defense Troops

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 3 (85) for 1968 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is General-Major of Artillery V. Gatsolayev. This article discusses factors affecting field air defense performance, citing some lessons of the 1967 Near East war. Major points made by the author concern the necessity of moving radar and weapons often without disrupting the continuity of cover, careful selection of sites, and the strain exerted on personnel and equipment when they are kept in combat-ready status.

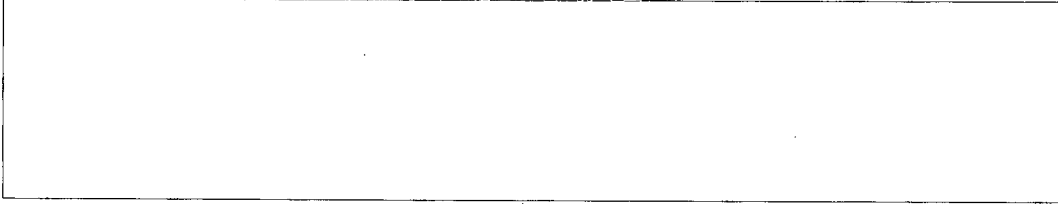
End of Summary

Comment:

General-Major V. Gatsolayev wrote two articles on air defense in Military Herald, No. 2, 1968 and No. 5, 1966. He was identified as a lieutenant-general in 1970. Military Thought has been published by the USSR Ministry of Defense in three versions in the past -- TOP SECRET, SECRET, and RESTRICTED. There is no information as to whether or not the TOP SECRET version continues to be published. The SECRET version is published three times annually and is distributed down to the level of division commander.

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Combat Readiness of Ground
Forces Air Defense Troops

by

General-Major of Artillery V. Gatsolayev

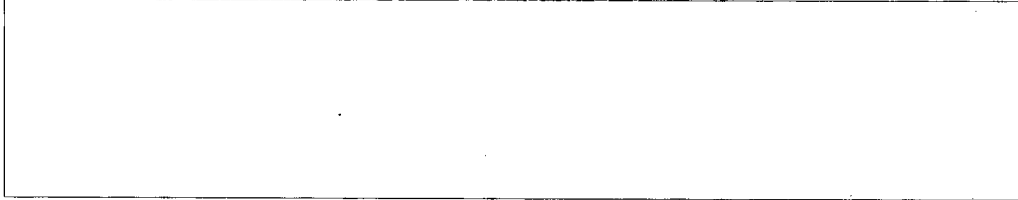
As is known, an important role in repelling enemy air attacks is allotted to ground forces air defense troops. In order to fulfill this role, they must be at the necessary degree of combat readiness.

The best course (from the viewpoint of timely commitment of air defense means to battle) would be to maintain them at the highest degree of readiness. However, this is a very complicated and expensive way of resolving the problem. To maintain all the means of air defense troops permanently at the highest degree of readiness means, first of all, that all of the radio-electronic equipment of antiaircraft guided missiles and antiaircraft artillery must operate continuously, that part of the missiles must be kept in a state of constant readiness, and that personnel must constantly be in a duty status. But this would lead to rapid deterioration of the combat equipment. Combat duty status by even limited forces entails large materiel expenditures (technical equipment wears out and has to be replaced or repaired, missiles become inoperative, etc.) and utmost physical strain on personnel. Accordingly, during peacetime, those air defense means which are subject to combat duty are brought to the highest degree of readiness by special order each time there is danger of foreign aircraft violating the borders of the air defense zone.

The antiaircraft missile units of air defense troops and fighter aircraft of the military districts stand combat duty jointly with the forces and means of Air Defense of the Country, in groupings created in advance during peacetime.

We consider that further improvement in the grouping of air defense means for the repulse of an initial enemy air





attack must be accomplished through the deployment of new air defense means (taking into account the weak features of the existing methods of grouping) as well as by pre-planned movements by part of the air defense forces. At the same time it must be kept in mind that the simultaneous maneuvering of all or most of the air defense forces is inadmissible, because there may be an enemy strike during this period.

In a threatening period, maximum increase in the viability and effectiveness of air defense groupings can be achieved by continuous maneuvering of mobile antiaircraft missile and artillery complexes. These complexes are capable (in accord with a previously developed plan) of changing their positions several times during a 24-hour period. These measures must be carried out, above all, to increase the effectiveness of the air defense grouping in combat with targets at low and extremely low altitudes when providing cover for the main troop groupings and the most important objectives.

At the same time, with antiaircraft guided missiles and antiaircraft artillery on duty alternately to cover certain designated objectives, it is necessary that continuity be maintained in the coverage of the main objectives and, as much as possible, in the coordination of fire between adjacent duty subunits. Antiaircraft artillery and machinegun subunits must, as a rule, cover their own units and subunits in their fixed positions. In some cases, subunits of an antiaircraft artillery regiment (battalion) of a motorized rifle division (tank division) may be called upon to cover other objectives. However, the detaching of these subunits from their divisions can be allowed only when the time needed for their return (in case of a sudden outbreak of war) will not exceed the amount of time required to deploy the divisions, so that they will be able to participate in covering the divisions. Therefore, time limits and routes must be established for antiaircraft artillery units, covering objectives away from their own divisions, to rejoin their units.

Radiotechnical units must provide uninterrupted 24-hour reconnaissance of enemy air activity within their zone of responsibility through regular operation of radar sites (companies). In a threatening period (or, if there is none, with the start of military operations), the range of



operating radar stations must be increased rapidly, first of all at low altitudes, by moving radar companies and making corresponding changes in their disposition.

The wars in Vietnam and the Near East have shown that correct selection and equipping of main and alternate positions for air defense forces and means play an important role in detecting and destroying air targets.

Actual practice shows that if a grouping of air defense means and the objectives being covered remain in the same location for a prolonged time, the enemy will pinpoint them with sufficient precision and reliability to enable him to carefully plan the most effective way to strike each one, taking account of its air defense system, and to work out the delivery of the strikes by practicing on equivalent terrain. Therefore, in preparing air defense troops to repulse an initial enemy strike, special significance must be attached to the selection of positions for all air defense subunits.

A launching (fire) position is selected on the basis of detailed consideration of the methods of attack used by enemy aircraft against the target being defended; the position must provide for the maximum effectiveness of combat at low altitudes from the most dangerous axes. The placing of guns (launchers) and equipment at a fire position must enable guns and platoons to conduct extremely-low-altitude fire within their respective sectors. In order to protect crews from the fire of adjacent guns, positioning stops must be installed on all guns.

It is important to prepare alternate positions, especially in open terrain. Syrian antiaircraft artillery, which fought well against Israeli aviation, suffered considerable losses from enemy fire (after its grouping was exposed) because it did not have fortified alternate positions, and thus lacked mobility.

No less crucial are the choice of positions for radar reconnaissance of enemy air activity and the establishment of radar coverage at low altitudes. The key point here is that radar stations at seemingly equivalent positions usually differ sharply from each other in their actual field of view. Because of this, the most correct approach would be to select positions by determining the fields of view

with actual flights by friendly aircraft (at the lowest possible altitudes) from all dangerous axes and by then comparing the blind spots that would exist from the possible positions for radar stations of a given type. This method is feasible only when selecting positions at a definite distance from the national border. To determine fields of view close to the national border, it is necessary (in addition to aircraft flights within the borders) to make a thorough topographic analysis of the terrain from the national border to the line of enemy airfields.

To assure uninterrupted reconnaissance of enemy air activity at low altitudes, it is advisable while still at peace to make a topographic evaluation of possible positions for radar companies on the territory of the probable enemy, determine the fields of view from them, and use this information to develop a plan for moving up air defense radiotechnical units.

We dwell on these details because ground forces air defense units, as training exercises show, often occupy positions from the march without due evaluation of combat conditions at low altitudes. This, in turn, leads to a weakening of the fire plan and of air defense reconnaissance capabilities.

All personnel (especially commanders and the operators of all radar stations) must know the most dangerous routes by which enemy aircraft may approach objectives within their limits of responsibility; the possible flight altitudes and ranges of detection; the most advantageous axes for attacking these objectives; and the possible ways in which aircraft delivering strikes may maneuver within their own firing radius in order to evade antiaircraft fire. However, the most effective measure in training air defense troops to repel an initial strike is the organizing of actual flights by friendly aircraft against the objectives to be covered (at the altitudes, and using the methods, which are most probable considering the nature of the objective being defended, and the presence and capabilities of the air defense means). In our opinion, we must devote considerable attention to providing this sort of practical training to ground forces air defense troops.

At the present time, as is well known, if aircraft are transiting the operating zone of an enemy antiaircraft

complex but are not in the zone for a "strike" on a protected objective, there will be "target firing", as antiaircraft gunners call it, against these "passing" targets. Under these conditions, personnel do not face an actual attacking enemy, which could sharply complicate the work of the gun crews by taking evasive action. We consider that, regardless of the scope and nature of the exercises for training ground forces air defense troops with aviation, each aircraft must, in the final analysis, attack either an air defense position or the objective being defended, their methods and parameters of attacking being determined by the size of the target and by the air defense system.

An important factor in determining the combat readiness of troops is the condition of their combat equipment. It is well known that the antiaircraft, missile and artillery complexes, radar stations, and automatic control systems consist of many tens of thousands of electronic components. During their operation, these complexes periodically stop working because of component failure or maladjustments in the systems. In order to keep this intricate equipment in a condition of combat effectiveness, personnel must be given advanced technical training. Sometimes a malfunction must be found and eliminated within a few seconds, or the combat mission may not be fulfilled.

To maintain equipment in good working condition, it is not enough that personnel have the necessary technical training. Subunits, units, and workshops must have spare parts, tools and accessories at all times, replenishing them in good time.

The task of supplying large units and units with missiles occupies a special position in the preparation of air defense troops to repulse an initial massed strike. An antiaircraft missile brigade repulsing an intensive air attack may exhaust its missile reserve on wheels in twenty to thirty minutes.

What, then, are the practical capabilities for replenishment? Existing technical subunits require several entire days to prepare this many missiles and are consequently unable to supply a brigade with missiles after the brigade has repulsed an initial massive air attack.

It follows from this that the main reserves of missiles must be brought as close as possible to the missile-launching positions of missile battalions and batteries while we are still at peace, and the number of missiles to be prepared for launching must be determined on the basis of repulsing at least an initial massed strike (according to preliminary estimates this will amount to about four or five units of fire for medium- and short-range systems). The important problem of dispersing missile reserves is being resolved at the same time. In actual practice, however, the expenditure of missiles will vary for different large units and units. Therefore, in planning the supplying of missiles to antiaircraft missile forces for repulsing an initial strike, we must allow for broad mobility of the missiles located at each launching position.

It must be kept in mind, however, that maintaining such a quantity of missiles fueled and armed (because of the sharp reduction of their service life when they are stored in this condition) represents considerable materiel outlay. It is therefore an urgent problem of our missile producers to substantially increase the length of time missiles remain operative when maintained at launch readiness.

Control of ground forces air defense troops is one of the most complex processes affecting their combat readiness and effectiveness. This is explained by the sharp changes and lack of clarity in the air situation during the extremely fast-moving process of combat, by the participation of both fighter aircraft and different systems of various subordinations in repelling strikes, by the constant presence of friendly strike and reconnaissance aircraft in the detection and fire zone of antiaircraft missile systems, by the rapid expenditure of ammunition, etc.

The most successful resolution of the problems of controlling ground forces air defense troops may be expected through the wide adoption of automation. However, it is a comparatively lengthy process to develop automatic means of control and to equip the troops with them, while the need for constant readiness of air defense troops compels us to search for ways of improving control through already available means. The principal method is obviously to increase coordination at air defense command posts of all levels (by means of systematic training) and to increase

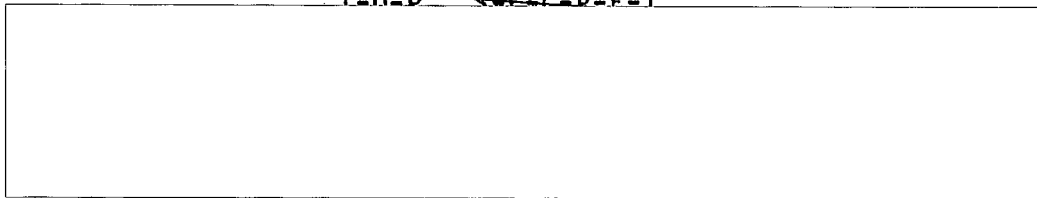
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the viability of control by transferring command to the command posts of large units and units. Serious attention must be given to the readiness of communications and their ability to operate despite jamming.

Special research has indicated that under identical conditions, centralized control of air defense troops increases the effectiveness of a given grouping by 20 to 25 percent in repelling an air attack. In other words, optimal control of air defense means is equivalent to increasing combat means by one-fifth to one-fourth. It is quite obvious that the cost of creating the most farsighted means of control (not to mention the creation of staffs for the commanders of air defense troops, the necessity for which has long been felt) will be considerably less than the cost of the additional fire means indicated above. However, doubts have recently been expressed as to the necessity for centralized fire control when enemy aircraft are operating at low altitudes. The authors of this opinion justly point to the limitation of the capabilities of senior chiefs to intervene in the fire operations of units and subunits under the given conditions.

In our opinion such an approach is one-sided. It is primarily air defense power at given altitudes which (in addition to aircraft capabilities) determines the altitude at which air operations take place. At the present time, air defense has, on the whole, unsatisfactory tube artillery for combat with aircraft at low altitudes, while effective missiles are available for combat at high and medium altitudes. But as air defenses become completely equipped with effective and modern means for low-altitude combat, aircraft will be forced to operate at other altitudes as well.

Indeed, tactical aviation carries out as many missions in operational depth as in tactical. And what guarantee is there that the enemy, moving into our operational depth, will cross the dense zone of first-echelon air defense fire at low altitudes if the fire at higher altitudes is substantially weaker? There is no such guarantee. For this reason, Marshal of the Soviet Union A. A. Grechko, Minister of Defense of the USSR, demands that aircraft and air defenses be capable of combat with the enemy at both low and high altitudes.



Without centralized control, air defenses in the field cannot resolve such a crucial and complex problem as coordination with front aviation and protection of their combat operations.

Morale-psychological training of personnel is also of considerable significance in maintaining air defense troops at constant combat readiness.

Since air defense troops are equipped with team weapons, an error in the work of one person can in most cases nullify the excellent work of an entire crew or subunit. In order to prevent this, the personnel to be assigned to air defense teams and crews must be carefully selected and trained for the role they are to play in the successful fulfillment of their subunit's mission.

Of their entire period of service in the army, soldiers and sergeants of antiaircraft missile and artillery units spend between one-third and two-thirds of the time in combat duty status; in many radio-electronic units the operators and combat teams of command posts are in duty status every other day throughout their entire army service. The majority of battery and platoon commanders of antiaircraft artillery regiments of motorized rifle divisions (tank divisions) which are in a status of permanent readiness are separated from their families for six to ten months each year (including two practice sessions on a firing range). A single plotter at the command post of a radiotechnical unit receives up to 35,000 figures per duty shift and lays out routes on a plotting board up to 200 meters long. Radio operators at a receiving center, in tracking five targets simultaneously, must take down number groups continuously at a rate of two to three numbers per second. We could cite many other indicators of the strenuous "mute" military duty of air defense personnel in peacetime. As time passes, this tense, monotonous situation begins to dull the vigilance of personnel. To prevent this, and to prevent the development of indifference to the performance of duty--this is the foremost task of morale-psychological training in maintaining the combat readiness of air defense troops. All of this activity must be carried out under the slogan "combat duty status of air defense troops means the fulfillment of a top-priority national objective". Major attention must be given to monitoring duty performance by practical testing of the condition of combat equipment. For



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this reason, all senior commanders and chiefs of air defense troops must be able themselves to test those parameters of antiaircraft systems from which the readiness of equipment can be judged. We cannot tolerate even the slightest infraction in the performance of combat duty; every detail is significant.

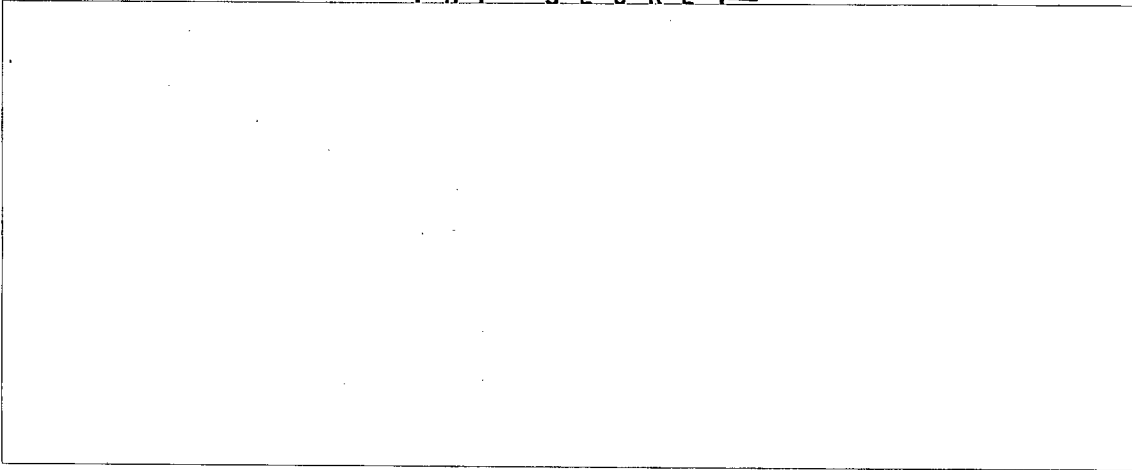
Air defense troops must continue fighting, even if the enemy uses nuclear weapons, while other forces can, upon command, take cover. To be able to sit in the operations room before a control panel or display unit and coolly, with a jeweler's precision, carry out combat work, knowing that a nuclear bomb will soon be, or has already been, launched--this is what antiaircraft gunners must be prepared for by ideological training. And such self-control is by no means a common trait.

The personal example set by commanders must play a considerable role in the stability of morale in subunits, as well as their self-control and their ability to carry out their combat mission under any conditions. The fastest possible breaking-in of inexperienced replacements, and the advance preparation of experienced personnel to take over the main duties in gun crews, are of considerable importance in maintaining the constant readiness of units and subunits in combat duty status. Many years of experience in training troops show that when commanders make each young soldier fully aware of his specific duties, they will succeed in the preparation of their troops.

When each soldier understands what is required of him as a specialist, considerably less time is needed to organize subunits.

Ground forces air defense, like any other type of defense, is based on a system of antiaircraft missile and antiaircraft artillery fire. It can be effective in repulsing enemy strikes only if its organization at lower levels is absolutely efficient. For this reason, the purpose of this article has been to examine those "details" which are essential for air defense troops to achieve a high degree of readiness on an operational scale.

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