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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

8 April 1976

MEMORANDUM FOR: The Director of Central Intelligence

FROM : David H. Blee
Acting Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): The Use of Mathematical Methods by Staffs in the Process of Preparing the Decision for an Operation

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 describes the steps taken in making an operational-tactical calculation as the basis for a decision, and defines the division of responsibility within staffs for the performance of various types of calculations. The enclosed tables list sample criteria used, and present a diagram of the performance of such calculations. This article appeared in Issue No. 3 (88) for 1969. [redacted]

[redacted]

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 [redacted]

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David H. Blee

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Page 1 of 17 Pages

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SUBJECT

MILITARY THOUGHT (USSR): The Use of Mathematical Methods by Staffs in the Process of Preparing the Decision for an Operation

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 3 (88) for 1969 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought". The author of this article is Engineer Colonel A. Tatarchenko, Candidate of Military Sciences. This article describes the steps taken in making an operational-tactical calculation as the basis for a decision: defining its purpose, selecting criteria, establishing standards, determining the variant on which to base the calculation, selecting the method and equipment to be used, preparing the initial data, performing the calculation itself, and analyzing, evaluating and reporting the results. The author defines the division of responsibility within staffs for the performance of various types of calculations and the prior preparation required to ensure efficiency and accuracy. The enclosed tables list sample criteria used in such a system, and present a diagram of the performance of calculations by a front field headquarters.

End of Summary

[redacted] Comment:

The author is known to be interested in operations research and has written technical articles for Red Star and Vestnik Vozdushnogo Flota. He was associated with the Institute of Applied Cybernetics of the Strategic Rocket Forces in the early 1960's. An earlier article, "The Use of Mathematical Research Methods in Military Matters", appeared in Issue No. 2 (69) for 1963 of Military Thought [redacted]

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The Use of Mathematical Methods by Staffs in the Process of Preparing the Decision for an Operation

by
Engineer Colonel A. Tatarchenko,
Candidate of Military Sciences

Preparing a decision, which must be done in the minimum amount of time, is a complex process wherein many organs and individual executors of a field headquarters (staff) participate, working in cooperation with each other under the overall direction of the commander and the chief of staff. When the decision is being prepared, we can observe three principal types of activity in the work of each of them and also in the work of the field headquarters (staff) as a whole: the information gathering, the computational, and the logical-analytical. These activities are interwoven in complex cause-and-effect and time relationships.

Analysis shows that when the decision for an operation is being prepared, the information gathering process takes up 65 to 75 percent* of the overall work expenditure, the computational process 20 to 25 percent, and the logical-analytical process five to 15 percent. However, for specifically assigned individuals the relative proportion of a particular type of activity may vary considerably from average indices. Thus, for a commander, most of the work expenditure is made up of logical-analytical activity, while for an axis officer it is information gathering activity.

Despite the relatively short overall time a staff spends on logical-analytical activity, this activity is very important since it constitutes the foundation of the creative process, a process carried out by the commander and other responsible generals and officers. As for the information gathering and computational processes, their roles are auxiliary; they are called upon to provide, in a timely manner, the logical-analytical activity of the command with all of the adequately reliable data required to amplify the task, draw conclusions based on an evaluation of the situation, and define the concept. In every staff there are considerable reserves whose use will enable the information gathering and computational processes to be speeded up, and their quality to be improved.

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*Including the drawing up of combat documentation.

From the point of view of speeding up and improving the quality of the computational processes when preparing a decision, there are great possibilities in the use of modern mathematical methods. For this purpose operational staffs have not only such very simple means as tables, graphs, nomograms, special rulers, and devices, but also a considerable amount of high-speed calculating equipment (keyboard calculators, punchcard calculators, and electronic computers). During games and exercises military district (army) staffs can use mobile computer posts and also the fixed electronic computers of scientific research institutes and military academies. In the near future all military district staffs will have their own computer centers and posts.

Furthermore, it is possible to extensively use the numerous (several hundred) methods for calculations found in the libraries of algorithms and programs belonging to the Ministry of Defense, the main staffs of the branches of the armed forces, and the military district, fleet and army staffs. These methods are also found in various handbooks on how to make calculations on punchcard and keyboard calculators and in collections of examples of operational-tactical calculations.

Thus, an adequate base has already been established for the general introduction of mathematical methods into the work of staffs. Therefore, it is time to assign the task of using these methods more actively and fully. Naturally, there are still quite a few difficulties involved. In particular, it seems to us that the efficient use of mathematical methods by staffs in preparing the decision for an operation depends to a considerable degree on the accomplishment of a number of scientific-methodological and organizational tasks, which are also a subject of further examination in application to the field headquarters of a front (army).

As is well known, the decision must correctly take into consideration the combat capabilities of one's own troops and of the enemy, and also the actual balance of forces which is developing on one axis or another. Drastic and frequent changes in the situation require timely amplification of the decisions adopted, the plans worked out on the basis of the decisions, and the tasks assigned to the troops. Because of this, when preparing, carrying out and supporting an operation it is necessary to make a detailed evaluation and calculation of the qualitative and quantitative changes inherent in combat actions.

The results of operational-strategic, operational-tactical, operational-rear services, engineer-operational, technical, and other

calculations based on modern mathematical methods serve as one of the principal sources of the quantitative characteristics of the processes of combat actions. The numbers or system of numbers obtained in the total, if correctly selected and determined, aid in making logical-analytical activity objective and are of direct practical value. Evaluations and conclusions arrived at without preliminary calculations can lead to a loss of contact with reality, to incorrect conclusions and subjective (i.e. not guaranteed against error) decisions. Therefore, an important duty of all troop control organs is to make calculations in the process of preparing a decision, and also when subsequently planning an operation based on the adopted decision.

Each operational-tactical calculation involves: defining the purpose of the calculation; selecting the primary and secondary criteria; setting the standards; determining the variants of the calculations; selecting the methods of calculation and the corresponding computational methodology; preparing the initial data; transmitting these data to the computer posts;* making the actual calculation; issuing the results of the calculation to the requestor;* and analyzing, evaluating, and drawing up the computational data obtained and reporting them to the command.

When preparing the decision for an operation, the main purpose of the calculations can be to obtain adequately reliable quantitative characteristics in order to: estimate the time required for the conduct of various preparatory, combat, and support actions; determine the combat capabilities of one's own and enemy troop groupings, units of fire, and individual means and determine the ratio, which is developing or has developed, of some of the forces and means required to accomplish the assigned tasks; select the optimum variants of combat actions and regroupings of the troops; forecast possible casualties, the radiation and chemical situation, and zones of flooding, destruction and fires; and also to solve other problems which are of paramount importance to the successful control of combat actions.

Many of these calculations should also be performed concerning the enemy, making the assumption that he is rational to a maximum degree and endeavoring to determine his most probable methods of action.

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*In those cases when the calculation is done directly at the working positions of generals and officers, this phase, naturally, is omitted.

Calculations should be made in particular detail when dealing with the initial massed nuclear strike, the conduct of combat actions during the first day of an operation, and also with the fulfilment of the immediate task by a front (army). When preparing the decision for an operation only approximate calculations relative to the conduct of combat actions by a front (army) fulfilling a subsequent task can be made because of the inexactness of the initial data.

Criterion is the name given to the index used when making calculations; by its numerical value the command and staff can judge to what extent the expected outcome of a particular course of combat actions will conform to the goals set. The criteria by which a calculation is to be made are established by the commander or chief who assigned the task of performing the calculation.

At present we are putting together an entire study of the system of criteria which are to be used in operational calculations. This system is being established because of the need, first of all, to have available for calculations those indices which, taking into account the elements of uncertainty and chance inherent in combat actions, most objectively characterize the goal of each type of combat action; and secondly, to standardize the indices used by the various control organs and executors. This system's most frequently used criteria are shown in Table 1.

Depending on the conditions of the situation and the nature of the tasks being accomplished, one of the criteria chosen for the calculation may be primary and another (or others) may be secondary. Based on the results of the calculations, we choose (or obtain automatically in the course of calculations on a computer) that variant of the actions wherein the value of the primary criterion equals the optimum or prescribed value, and the value of the secondary criterion does not exceed the limits of permissible values.

Standards used during operational calculations are those numerical values of criteria which would ensure the achievement of the prescribed results in the actions being undertaken. Standards, just like criteria, are established by the commander or chief who issued the instruction to make the calculation. The generalized experience of previous operations and combat actions, or experience from exercises which have been carried out, serves as the basis for the establishment of standards; in so doing the situation that is developing undoubtedly is taken into consideration.

We will cite as possible variants the typical average values of several standards. The required computational probability of destroying the principal element of a point target is approximately 70 percent. This probability increases to 90 percent if the target includes means of attack. We base calculations on the destruction of sizeable* targets on a mathematical expectation of damage of: up to 30 percent (neutralization), 30 to 70 percent (put out of action), and more than 70 percent (destruction).

Since the destruction of each specific target can be achieved in various ways, a chief issuing instructions to make a calculation must not only specify the criteria and standards, but also the principal element to be destroyed. The correct choice of such an element, depending on the specific conditions of the situation, is conducive to the most rapid achievement of the goal of the combat actions and to an economical expenditure of forces and means.

Furthermore, when setting the level of destruction (standard) for the principal element to be destroyed, we must not fail to take into account the fact that when delivering nuclear strikes against targets we not only hit the principal element, but also a number of other elements which are needed for the target to function. For example, if, when using nuclear weapons against tank troops on the move, we destroy 20 to 25 percent of the tanks (selected as the principal element to be destroyed), then we may have simultaneously destroyed: 50 percent of the tank crews, 45 percent of the ground and nuclear artillery guns, 70 percent of the armored personnel carriers and antiaircraft artillery guns, 75 percent of the personnel in armored personnel carriers, and 100 percent of the vehicular radio sets, staff buses, and personnel in the open, etc.

In a number of cases, a calculation of these circumstances will prevent us from setting excessively high standards in respect to the principal element to be destroyed in order to achieve the assigned goal. Setting excessively high standards is a feature which is still observed and one which leads to an unnecessary expenditure of the number and yield of warheads planned for the destruction of the targets.

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*Targets are sizeable if the radius of a circle drawn around them is greater than 0.1 of the radius of destruction of a given warhead. Sizeable targets in turn are subdivided into circular and linear.

Variants of a calculation are what we call calculations carried out using the same methodology but differing from each other in the initial data employed. A staff must prepare calculations in many variants which correspond to the commander's concept.

The decision adopted concerning the method for performing calculations depends on the nature of the calculations, computational methods available, time available, computer equipment at the disposal of the staff, and also on the completeness of the initial data which the staff has. We should keep in mind that in many cases calculations can be speeded up by using the means at hand, such as slide rules of various types, graphs, tables, and nomograms. In this case adequate accuracy is also ensured since, as a rule, these very simple means are prepared on the basis of data obtained from electronic computers and keyboard calculators.

Preparing the necessary initial data is a vital phase of calculations; the practical value of the results obtained depends greatly on the degree of completeness and reliability of these data. Therefore, the collection, classification, updating, and checking of the reliability of initial data for the calculations is an important component part of the information gathering activity of persons assigned to the field headquarters (staff).

A thorough analysis of the results obtained constitutes the culminating phase of the calculation. A component part of the analysis is a comparison of the numerical value of a criterion obtained by calculation with the standards established by the commander for the specific conditions of the situation.

Good organization in the performance of calculations is achieved through effective supervision of this work by the chief of staff. In accordance with the instructions of the commander, the chief of staff determines the volume and time periods of the calculations; organizes cooperation among directorates, departments, and services as they perform the calculations; monitors the correct utilization in the calculations of the initial data, criteria, and standards established by the commander; determines the order of priority for the use of the computer; analyzes and collates the final results of the calculations and ensures they are reported to the commander in a timely manner; implements suggestions for improving computational methods; and poses new tasks (for the development of methods and their implementation) based on the requirements of the staff.

Chiefs of directorates (departments) of the staff and also chiefs of the branch arms, special troops, and services organize the performance of calculations within the scope of their responsibilities; determine the sources and sequence of obtaining initial information, monitor the quality of the calculations and the correctness in drawing up the results; analyze the results of the calculations and draw conclusions from them; submit the collated results of the calculations to the chief of staff for a report to the commander; and summarize suggestions for improving present computational methods and for developing new ones.

The following are included among the duties of generals and officers of staff directorates (departments) and of the staffs (departments) of the branch arms, special troops, and services who execute the calculations: to thoroughly study the methods of performing those calculations within the scope of their responsibilities; to systematically train to perform calculations; to prepare and update the necessary initial data in advance; to correctly fill out the request forms for the solution of problems on a computer, and to fill out the initial data sections in the calculation programs for keyboard calculators; to personally know how to perform calculations on keyboard calculators according to formulas, tables, graphs, and nomograms with the aid of slide rules and devices; and to analyze and draw up the results of the calculations and report them to their immediate superiors.

Efficiency and accuracy in performing calculations can be ensured only through the thorough prior preparation of the staff, which must include: determining the type of calculations to be carried out during specific phases of staff work under various conditions of the situation; drawing up and having the commander approve a list of computational methods to be used by the staff; designating the key directorates, departments, and services, and in them, the responsible executors for each type of calculation; training generals and officers to perform calculations; preparing the personnel and technical means of the computer centers and posts; establishing the procedure for conveying starting data for the calculations to the executors and for transmitting initial data to the computer centers (posts), and upon receiving the solution results from them, drawing up and reporting the results of the calculations to the commander and other assigned personnel concerned with them; and determining the type of cooperation needed among directorates, departments, and services when they are preparing initial data and also when analyzing and collating the results of the solution. These matters are to be regulated in organizational instructions concerning the performance of calculations; it is advisable for each staff to work out such instructions. It would also

be useful in these instructions to take into account special features in the performance of calculations when preparing a decision in a limited period of time. For these reasons it is necessary to stipulate that calculations be performed in advance for the most probable situations and that the calculation sheets be put on index cards from which it would be possible, after a newly received task is clarified, to adopt a ready standard variant as a base and then to perform specific calculations which are only refinements. The preparation of network graphs for the principal types of calculations can play a large role in speeding up the work. These graphs would depict the phases of the calculation, the time, and the type of cooperation between executors.

Table 2 depicts an enlarged variant of a diagram of the performance of calculations by a front field headquarters when it is preparing the decision for an operation.

An essential feature of the calculations performed in a field headquarters is their interdependence. For example, to determine the capabilities of one's own troops to combat enemy nuclear means requires knowledge of the status of both one's own air defense and the enemy air defense; but the time required cannot be calculated and methods for regrouping (moving) troops cannot be chosen if we have not evaluated the expected results of enemy strikes against our lines of communication and if we have not forecast the radiation and chemical situation in the zone of advance.

We shall cite an example of a possible variant of the work of a field headquarters in performing, on an electronic computer, the calculations required when adopting the decision to deliver the front's initial nuclear strike.

In the performance of these calculations the operations directorate is foremost, and within it the operations department which works in close cooperation with the intelligence directorate, the staff of the rocket troops and artillery, and the staff of the air army in accomplishing this task.

The commander, having evaluated the situation in accordance with the task assigned by the directive, determines: the list of installations and targets to be destroyed; the order of priority for destruction; the principal elements to be destroyed; the levels of destruction required; the total number of means assigned to the initial strike; the preliminary allocation of targets among the means of destruction; and the time of the

strike.

Initial information is prepared by the intelligence directorate (it establishes a common numbering system for the enemy targets, their coordinates, dimensions in frontage and depth, and combat readiness), by the staff of the rocket troops and artillery (it determines the number of means delivering the strike, their coordinates, the availability of nuclear warheads, and their combat readiness), and by the staff of the air army (it indicates the number of delivery aircraft, the coordinates of the airfields, the availability of nuclear warheads, combat readiness, and the amount of protection of enemy targets by air defense means). Problems of the optimum allocation of the assigned means of destruction among enemy targets, and problems of the determination of the level of destruction to be inflicted on the targets are solved by the operations department either with the aid of special tables or on a computer; in the latter case a request form is filled out and sent to the computer.

The calculation results obtained on the computer and drawn up in the operations department are evaluated by the chief of staff and the chief of the operations directorate together with the chief of rocket troops and artillery and the commander of the air army. When necessary, refinements are introduced into the calculations. Corrected sections of the answer form are checked with the aid of an LRP rule, a PES-M device, and tables, following which the results are reported to the commander. If these results are confirmed as the decision for the initial strike, the data obtained is used as the basis for planning the strike and assigning tasks to the troops.

The example cited shows that when computers or tables are used we cannot draw a sharp distinction between logical and mathematical methods in adopting a decision. It is necessary to skilfully combine them, guided by the creative activity of the commander. The notion that electronic computers will someday be able to make decisions in the area of troop control is fundamentally incorrect. Evaluating the situation, defining the concept and tasks for the troops, planning combat actions, and other processes will always be complex and involve the creative activity of officers and generals who apply both logical-analytical and mathematical methods. Man will always provide the fundamental initial data and variants of operational-tactical calculations, critically analyze and correct the results obtained and, most importantly, decide the questions of accepting or rejecting these results.

When fulfilling each new task, the diagram of the work of the front field headquarters may require reorganization and changes in the procedure for cooperation among directorates, departments, and services; this creates considerable difficulties in the speedy resolution of all problems which arise, if these problems have not been worked out beforehand in all details. The best solution for the difficulties which arise lies in introducing integrated, automated troop control systems, in working out methods of solving complex information-computational problems with the use of mobile electronic computers, and in providing control organs with automated communications and each responsible executor with an automated working position.

Table 1

Elements of the System of Criteria Used in Calculations When Preparing the Decision for an Operation

Sequence	Purpose of the calculation	Criterion
1	To evaluate how the time available corresponds to the time required	Time reserve as the positive difference between available and required times. Time deficit as the negative difference between available and required time.
2	To determine the damage inflicted on individual targets	Probability of striking the target. Mathematical expectation of the damage inflicted on the target. Damage inflicted on the target at the prescribed probability. Probability of inflicting no less than the prescribed damage on the target.
3	To determine the damage inflicted on a system of targets*	Number of targets on which damage no less than that prescribed is to be inflicted. Mathematical expectation of the total damage inflicted on the system.
4	To determine the forces and means required to destroy the targets and systems of targets	Expenditure of delivery vehicles (warheads) to inflict the prescribed degree of destruction, taking into account enemy countermeasures (with prescribed or optimum target allocation).
5	To determine the combat capabilities of forces and means	Time needed to fulfil the combat task. Probability of striking the targets, taking countermeasures into account. Damage inflicted on the targets and systems of targets, taking into account enemy countermeasures (with prescribed or optimum allocation).
6	To evaluate the ratio of forces and means**	Ratio of the combat capabilities of the forces and means being compared. Ratio of the total TNT equivalents which both sides are capable of using. Ratio of the number of warhead delivery vehicles (by types) which can be used by both sides. Ratio of the number of ground forces (including tank) large units. Ratio of the number of aircraft, tanks, and artillery (by types).

* System of targets means the aggregate of individual targets which jointly carry out a certain function.

** The ratio of forces is determined for the operation's most characteristic time periods, axes, elements of the operational disposition, and lines (before and after the initial strike, at the end of the first day of the operation, at completion of the fulfilment of the immediate task, when accomplishing intermediate tasks; on the axis of the main strike, on other axes, separately for the first echelons, and throughout the entire depth of the operational disposition; on the principal defensive lines, and so forth).

Table 1
(Cont)

Sequence	Purpose of the calculation	Criterion
7	To allocate forces and means among the targets to be destroyed	Time needed to fulfil the combat task. Expenditure of forces and means required to destroy the preplanned targets to the prescribed level.*** Damage inflicted on enemy targets with the prescribed expenditure of forces and means.****
8	To determine the capabilities of negotiating enemy defensive systems	Mathematical expectation of the number (percent) of attack means engaged in negotiating the enemy defense (by axes, lines, and zones). Probability that a number of attack means no less than that prescribed will negotiate the enemy defense.
9	To determine the capabilities of defensive systems to repulse enemy attacks	Mathematical expectation of the number (percent) of enemy means of attack to be destroyed (by axes, lines, and zones). Probability of destroying no less than the prescribed number (quota) of enemy means of attack. Amount of damage prevented at defended targets.
10	To forecast the radiation situation and the possible after-effects of radiation contamination	Areas (amount) of moderate, strong and dangerous radiation. Radiation dosage received in a given time. Radiation level at a given moment of time. Number (percent) of personnel (population) put out of action at a given moment of time (killed and missing, and medical casualties). Amount (percent) of equipment requiring decontamination. Time during which it is impossible to remain in given terrain without protective means.
11	To forecast the chemical situation and the possible after-effects of contamination from toxic chemical agents	Area of contaminated sectors (areas). Depth of dissemination and time of effect of the primary and secondary clouds of aerial contamination. Number (percent) of personnel (population) put out of action at a given moment of time. Amount (percent) of equipment requiring decontamination.

*** In this calculation the expenditure of forces and means, as a rule, is minimized.

**** In this case the damage usually is maximized.

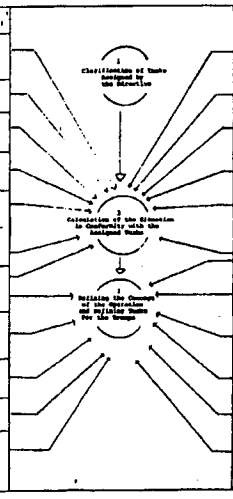
Table 1
(Cont)

Sequence	Purpose of the calculation	Criterion
		Time during which it is impossible to remain in given terrain without protective means.
12	To determine the possibilities of reconnaissance and search of enemy targets	Probability of the timely detection of a target in the prescribed area (on the prescribed line). Probability of identifying the detected target***** Probability of continuously (or with established frequency) tracking the detected (identified) target during the prescribed period. Probability that the target indication can be issued. Time needed to transmit reconnaissance information to the command post.
13	To determine indices for the regrouping (advance) of troops by their own means and on transport of all types	Time required for a troop regrouping from one area to another by prescribed transport means and routes. Number of troops which can be regrouped in a set amount of time with the assigned transport means. Amount of transport means necessary to regroup a prescribed number of troops in a set amount of time. Losses of regrouping (advancing) troops from enemy strikes, and while negotiating contaminated zones.

***** Identifying means establishing the affiliation, type, dimensions, conditions, coordinates, direction, speed, and other features of the detected target that are of interest to the command.

Table 3
Diagram of the Performance of Calculations When Preparing a Decision for an Operation

Calculating equipment	Types of Calculations	Key Directorates (Staffs, Departments)
Electronic computers; keyboard calculators; tables, graphs, and nomograms; slide rules and devices	Calculation of the needed to prepare for the operation, deliver the initial strike, and accomplish the immediate and subsequent tasks as well as intermediate specific tasks	Operations
Punchboard calculators	Analysis and grouping of enemy targets by categories, degrees of readiness, location, and other factors or a combination of them	Intelligence
Electronic computers; tables, graphs and nomograms; slide rules and devices	Evaluation of the combat capabilities of enemy groupings regarding the use of nuclear, chemical and conventional weapons.	Intelligence
Electronic computers	Evaluation of the possible variants for the distribution of enemy missiles and aircraft in the initial nuclear strike (by area, groupings, and targets).	Intelligence
Electronic computers; keyboard calculators; tables, graphs, and nomograms	Evaluation of the march capabilities of enemy groupings.	Intelligence
Electronic computers; tables, graphs, and nomograms; slide rules; and devices	Evaluation of the expected results of enemy strikes against the troops and rear installations of a front (depending on the variants of their delivery).	Operations
Electronic computers; keyboard calculators; tables, graphs, and nomograms	Evaluation of the capabilities of delivery vehicles to reach the targets of the initial strike, taking into account enemy countermeasures.	Staffs of the Rocket Troops and Artillery and of the Air Army
Electronic computers; keyboard calculators; tables, graphs, nomograms; slide rules; and devices	Distribution of nuclear, chemical, and conventional warheads (in the initial strike; according to operational tasks, and among formations and large units).	Operations
Electronic computers; tables, graphs, nomograms; slide rules; and devices	Evaluation of the expected results of our own strikes against enemy troops and rear installations.	Operations
Electronic computers, slide rules, and devices	Forecast of radiation and chemical conditions in the front's zone and of the expected dosses of radiation and contamination levels of personnel.	Operations
Electronic computers; keyboard calculators; punchboard calculators; tables, graphs, and nomograms	Operational-rear calculations.	Rear Staff



Key Directorates (Staffs, Departments)	Types of Calculations	Calculating equipment
Operations	Evaluation of the combat capabilities of one's own troop groupings in the use of nuclear, chemical, and conventional weapons.	Electronic equipment; tables, graphs, nomograms; slide rules; and devices
Directorate of the Chief of Air Defense Troops	Evaluation of the level of protection of area, groupings, and targets against enemy missile and aircraft strikes.	Electronic computers; keyboard calculators; tables, graphs, and nomograms
Operations	Determination of the capabilities of the troops to combat enemy nuclear mass.	Electronic computers; tables, graphs, nomograms; slide rules; and devices
Operations	Determination of the capabilities of the troops to negotiate enemy defensive systems.	Electronic computers; keyboard calculators; tables, graphs, nomograms; slide rules, and devices
Operations	Evaluation of the march capabilities of our troop groupings.	Electronic computers; keyboard calculators; tables, graphs and nomograms
Operations	Determination of the quantitative and qualitative ratio of forces and means at the beginning of the operation and possible changes in this ratio during the operation.	Electronic computers, and keyboard calculators
Directorate of the Chief of Air Defense Troops	Evaluation of the variants of the disposition and numbers of air defense.	Electronic computers; keyboard calculators; tables, graphs, and nomograms
Operations	Calculations concerning the landing (drop) of airborne and amphibious landing forces and their support.	Electronic computers; keyboard calculators; tables, graphs, and nomograms
Operations	Selection of the methods of moving and deploying troops using various types of transport.	Electronic computers; keyboard calculators; tables, graphs, and nomograms
5th Department	Calculations associated with the organization of radiomicrobiotic countermeasures.	Electronic computers; and keyboard calculators
Directorate of the Chief of Engineer Troops	Calculations of the engineer support for the operation.	Electronic computers; keyboard calculators; tables, graphs, and nomograms