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WASHINGTON, D.C. 20505

25 May 1976

MEMORANDUM FOR: The Director of Central Intelligence

FROM : William W. Wells
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Some Results of the Use of the PLATFORMA Mobile Computer Post

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 reviews Odessa Military District experience in setting up and using the PLATFORMA mobile computer post, based on the RAZDAN-2 computer, in a front command-staff war game on maps. Among the shortcomings revealed were that the programs of problems were insufficiently developed for operational application, which led to erroneous or inadequate computer solutions, and that the format of the input data cards was inconvenient and delayed input of information. The individual problems, such as allocation of weapons, calculation of requirements and assessment of capabilities and results, are analyzed and their deficiencies noted. The authors recommend programming 14 additional problems and modifying the post for operation under adverse conditions. This article appeared in Issue No. 2 (81) for 1967.

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

William W. Wells

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[redacted]

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SUBJECT

MILITARY THOUGHT (USSR): Some Results of the Use of the PLATFORMA Mobile Computer Post

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (81) for 1967 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought". The authors of this article are Colonel V. Popov and Lieutenant Colonel I. Apanovich. This article reviews Odessa Military District experience in setting up and using the PLATFORMA mobile computer post, based on the RAZDAN-2 computer, in a front command-staff war game on maps. Among the shortcomings revealed were that the programs of problems were insufficiently developed for operational application, which led to erroneous or inadequate computer solutions, and that the format of the input data cards was inconvenient and delayed input of information. The individual problems, such as allocation of weapons, calculation of requirements and assessment of capabilities and results, are analyzed and their deficiencies noted, with a table provided for illustration of the time required to solve each one. On the basis of working with the PLATFORMA, the authors recommend that 14 additional problems be programmed, and that the post be modified to operate under adverse temperature and other conditions.

End of Summary

[redacted] Comment:

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. [redacted]

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SOME RESULTS OF THE USE OF THE PLATFORMA MOBILE COMPUTER POST (Based on the experience of a front command-staff war game)

by
Colonel V. Popov
Lieutenant Colonel I. Apanovich

The basis of any radical improvement in the entire system of troop control is the equipping of operational staffs, as well as staffs of large units and units, with integrated systems of automated control. The nucleus of this system, as is known, must be small, mobile, multi-purpose electronic computers and new communications means with automatic secure communications equipment.

One type of computer device is the PLATFORMA mobile computer post developed on the basis of the RAZDAN-2 electronic computer. The system is mounted in two motor vehicles with trailers and has in its library 16 standard operational computer problems designed to meet the requirements of the field headquarters of a front in matters of planning the employment of nuclear weapons and determining the effectiveness of nuclear strikes; assessing and predicting radiation doses sustained by personnel; assessing the combat capabilities of an air defense system; planning a regrouping of troops and establishing the balance of forces and means in an operation; performing bomber and engineer-navigator calculations for basic types of aircraft.

Experience gained by the staff of the Odessa Military District during a front two-level command-staff war game on maps using a mobile computer post enables us to draw certain preliminary conclusions about its advantages and disadvantages.

In order to utilize to the fullest all the capabilities of the PLATFORMA mobile computer post and to study questions of employing it when preparing and conducting a front offensive operation, a great deal of preparatory work was carried out in the district. A group of officers was allocated in advance, selected according to the nature of the problems to be solved on the electronic computer. The groups consisted of representatives from the operations and intelligence directorates and of the chiefs of the rocket troops and artillery, air defense troops, chemical troops, and the staff of the air army.

All the problems to be solved by the computer were assigned in advance to specific operations officers, specialists, and engineers of the computer post, which ensured purposeful preparation for the fulfilment of duties in the war game and a more complete working out of the problems, including the study of new questions related to the operation of electronic computer equipment.

During the war game a front command post was not set up. All the generals and officers worked in their directorates and departments. The mobile computer post was positioned near the operations directorate.

The person in charge of the group was an operator with no duties other than that of solving problems on electronic computers for the operations directorate. The other officers worked in the directorates and, to the extent necessary, came to the computer post to perform calculations. The officers allocated to the mobile computer post, together with the engineers of the post, were located at a site allotted especially for this purpose. This arrangement enabled the officers of the computational group to maintain the necessary contact between the mobile computer post and the directorates and departments.

Most of the calculations were performed in order to make direct use of data when making decisions appropriate to the initial and developing situations. The remaining calculations were performed by way of monitoring, as it is done by the staff of a directing body.

The experience of using a computer complex in a war game led to the discovery of certain general shortcomings in the preparation of problems for solution at the PLATFORMA mobile computer post.

First it was learned that problems concerning matters of regrouping troops, determining the balance of forces and means, assessing the combat capabilities of a front air defense system and the effectiveness of the employment of chemical weapons by rocket troops, artillery, and aviation, and certain other problems, lack sufficient operational application and are based on obsolete initial data. As a result the calculations obtained do not fully meet the needs of a front field headquarters.

In the problems that were developed, no consideration was given to the special features of front troop actions on a coastal axis and calculations were not planned for amphibious and airborne landings or assault crossings of sea straits and other water obstacles. The computer cannot even regularly produce information that would take into account the nature of

the grouping of our own ground forces, naval forces and means, or of enemy groupings deployed in the Southwest Theater of Military Operations. For certain branch arms and services no problems were developed at all, despite the fact that during the operation and when preparing for it they must perform many computations.

The input data cards used at the mobile computing post are cumbersome and contain part of the data that could be stored in the computer's memory. For example, the dimensions of standard targets by width and depth, the numerical composition of our troops and those of potential enemies, technical data on the means of employing nuclear, chemical, and conventional weapons, etc. The absence of frequently used data results in a loss of time when filling in the input data cards. For example, the input into the computer of new constant information on the organization of certain foreign armies and the organization of troops adopted in the district took 23 hours in the war game and delayed by more than a day the solution of the problem of determining the balance of forces and means in the operation. Moreover, it is desirable to reduce as much as possible the number of columns on the input data cards. All this will greatly simplify the preparatory process.

The input data cards for problems to be solved must be modified in content and form so as to approximate the combat documents developed by the field headquarters of the front. The operators find them unsatisfactory, since filling them out takes a great deal of time, in some cases several times as much as the solution itself. In any technical modification of the system it would be desirable to develop an alpha-numeric printer that immediately produces data based on the prescribed terminology and the forms of the combat documents.

It seems to us that the computer post has not as yet been fully perfected from the configuration standpoint. The input unit is attached to the computer, whereas it would be better to operate it remotely. For the purposes of the field headquarters of the front it would be desirable to place the alpha-numeric printer as well in the same vehicle as the input unit. This would make it possible to place the input and output units in the front command post system as near as possible to the operations directorate, which should greatly reduce the time required to obtain the response to a problem. In this case, those electronic computers with power supply units that make noise and hinder the work of the command post personnel could be placed a sufficient distance away from the work areas of the command post.

Of the 16 standard problems normally executed by the PLATFORMA mobile computer post, the situational conditions in the war game required the solution of only nine. At the same time the need often arose to perform other operational calculations, but they could not be executed since appropriate programs had not been developed.

The amount of time required to solve the problems, the labor expended, and the frequency of resorting to the computer for assistance are shown in the Table.

To make this data more meaningful we must point out that the duration of the war game, from the moment of the delivery of the operational directive to the stand down, was 69 hours. The computer was in operating status for 54 hours and idle for 15. Of the 15 hours, eight were spent moving and setting up the complex, while for seven hours the computer stood idle due to overheating of the semiconductor units, when the outside air temperature rose to 30 degrees centigrade in the shade.

From the table it may be seen that the breakdown of the total number of problems solved was as follows: for the operations directorate -- 10, for the chief of rocket troops and artillery -- seven, the chief of the air defense troops -- three, the chief of chemical troops -- four, the air army staff -- four. The need to solve the different problems during the war game arose as follows: No. 1 -- two times, No. 2 -- two times, No. 3 -- three times, No. 4 -- three times, No. 6 -- two times, No. 8 -- four times, No. 9 -- one time, No. 12 -- three times, No. 15 -- one time.

The total amount of labor time expended that was directly related to the solution of problems came to 22 hours, 53 minutes, broken down as follows: filling in the input data cards -- nine hours (39.3 percent), feeding in the information -- nine hours, seven minutes (39.4 percent), solving problems on the electronic computer -- three hours, 18 minutes (14.4 percent), and filling in the output data card -- one hour, 28 minutes (6.7 percent). Thus the bulk of the time (79 percent) was spent filling in the input data cards and feeding in information.

A positive feature of the use of the mobile computer post is the high degree of accuracy in its responses, since the electronic computer makes it possible to take account of a very large number of factors and to compute an enormous number of variants (at the war game 4,128 variants were computed). Moreover, the elimination of shortcomings in the preparatory cycle will greatly reduce the amount of time needed to perform complex calculations and will free officers for creative work in troop control.

In the practical solution of standard problems on the theme "Preparation and Conduct of a Front Offensive Operation on a Coastal Axis" the following shortcomings were discovered, which were due mainly to inadequacies in the programs and the methodological formulation of the problems.

Problem No. 1. Allocation of nuclear means against enemy targets based on their relative importance.

The program for the solution to this problem makes no provision for the temperature of fuel components before launching. Therefore, when targets must be struck from maximum distances and a sharp deviation from normal occurs in the average fuel temperature, the computer's response is incorrect. Nor does the program provide for any calculations of the probability of hitting point targets.

Problem No. 2. Assessment of the results of nuclear strikes delivered against our troops and those planned against the enemy in a front operation.

In time required for the solution and the preparation of input documentation, the problem on the whole meets the requirements of the operations directorate and the chief of the rocket troops and artillery of a front. But to obtain more precise firing indices we must introduce not average probable deviations as is done now, but the actual deviations for each target.

Problem No. 3. Calculation of anticipated doses of radiation to personnel from enemy nuclear strikes.

It would be preferable to begin the calculation of radiation doses to personnel negotiating an area of radioactive fallout, from a distance closer to the center of the burst (500 to 1,000 meters) and to produce data not only for the head of the column, but also taking into account the depth of the march formation.

Problem No. 4. Assessment by the computer of the combat capabilities of the air defense system of a front. In accordance with a program that has been worked out, the computer calculates the capabilities of surface-to-air missile units and fighter aviation, which does not exhaust all the capabilities of the air defense system. Combat against the air enemy is, as is known, conducted in addition by antiaircraft artillery, antiaircraft machineguns, and radiotechnical units. Data are fed into the

computer which permit the solution of a problem only if there is a strictly established allocation of the efforts of surface-to-air missile units and fighter aviation according to altitude. It would be desirable to expand the range of altitudes and also provide for the possibility of performing calculations during operations by surface-to-air missile units and fighter aviation in one zone. Furthermore, the problem takes no account of probable losses of front air defense means and does not permit an assessment of the capabilities of individual means as, for example, fighter aviation or surface-to-air missile units.

Problem No. 5. Assessment of the effectiveness of the employment of chemical weapons by rocket troops, artillery, and aviation.

The basic shortcoming of this problem is the fact that it deals with only one type of toxic agent -- sarin -- and does not take account of other types of chemical weapons.

Problem No. 6. Calculations of the balance of forces and means in tanks and artillery.

These calculations must be performed in all cases where the front commander adopts a decision for an initial or radically altered situation. Unfortunately, the program does not consider, besides tanks, artillery, and missile launchers, other indices that are no less important for the adoption of the decision: nuclear warheads, aviation, and air defense means. A major shortcoming of the program is the fact that the level of manning and equipping in terms of personnel, armament, and combat equipment is assumed to be equal for all similar large units, whereas losses during an operation vary, both in operating divisions and in the means of destruction of the same large unit or unit. A single coefficient of losses leads to gross errors in the computation. The problem gives a more or less accurate picture of the balance of forces and means only in the initial situation.

Problem No. 8. Calculation of the requirements in nuclear means for the destruction of enemy targets.

The program for the problem takes no account of the use of the medium-range strategic rocket forces or the nuclear means of a cooperating fleet, whereas the resource of these means for a front operation usually is allocated and taken into account by the front troop commander. In particular, in the front offensive zone at the war game the employment of nuclear warheads of the medium-range strategic rocket forces, as well

as those of the fleet forces, was planned for the first nuclear strike.

For the destruction of enemy targets that have been detected, the warheads requirement for the initial nuclear strike was found to be 54 using a manual method, and 47 using the computer. The difference in the number of warheads is due to the fact that front means, for technical reasons, were unable to destroy with their own forces all the designated enemy targets at one time. For this reason the computer, on the basis of the relative importance of the targets, eliminated seven targets from the strike.

Problem No. 9. Determination of the overall capabilities of a front in the employment of chemical weapons by rocket troops, artillery, and aviation.

The program for this problem suffers from the same shortcomings as those in Problem No. 5. There must be constant data put into the computer for calculating the capabilities of aviation in employing all types of chemical warheads and for performing calculations of the total area, measured in hectares, contaminated with toxic agents by rocket troops, aviation, and by tube and rocket artillery.

Problem No. 12. Bombing calculations.

This problem does not meet the requirements of an air army, since the calculations are made only for bombs and do not take into account all types of armament on modern aircraft.

Problem No. 15. Calculation of the materiel requirements of an air army for an operation.

At the war game, the only requirement of an air army that was computed was for ammunition of all types. The computer's solution to the problem showed that the input data card is inconvenient and that the percentage of individual types of ammunition relative to the total amount cannot be determined. The latter is the most time-consuming operation when doing the computation by the manual method.

As experience in working with the PLATFORMA mobile computer post showed, it would be desirable to program the following additional problems: 1) the calculation of forces and means for the landing of an amphibious force, separately for the forces of a motorized rifle regiment and motorized rifle division, as well as the drop of an airborne landing force

made up of a reinforced motorized rifle battalion, a motorized rifle regiment, and an airborne division; 2) the calculation of assault crossing means for the assault crossing of sea straits of a set width by forces of a motorized rifle regiment, motorized rifle division, and a tank division; 3) the allocation of nuclear and chemical warheads according to the tasks of the operation, armies, and front units; 4) the determination of the amount of ground artillery ammunition required in a front operation and the allocation of it according to armies, large units, and the tasks of the operation; 5) the determination of the requirements for air defense means in an operation; 6) the determination of the necessary amount of ammunition for air defense means for an operation and the allocation of them according to tasks and units; 7) the determination of the optimum detail of air army forces and means for the fulfilment of tasks in the initial nuclear strike of a front; 8) the anticipated result of the employment of nuclear and chemical warheads by an air army against enemy targets; 9) the capabilities of an air army for repulsing a massed attack by an air enemy; 10) the combat capabilities of a fighter aviation division for repulsing an attack by enemy aviation and unmanned means; 11) the combat capabilities of a fighter-bomber regiment for destroying enemy targets with the employment of nuclear and chemical weapons and conventional means of destruction; 12) the determination of the probability of an aircraft penetrating an enemy air defense system that includes fighter aviation and surface-to-air guided missiles; 13) the calculation of the probability of detecting small-size targets located in open and rugged terrain when using various types of aircraft at different altitudes; 14) the calculation of requirements for materiel and transport in an operation, taking all types of supply into account.

In future undertakings it will be very important to make the input and output data cards for the problems closer in form and content to the combat documents worked out by a front field headquarters, and also to provide the electronic computers with autonomous input and output units.

In modifying the PLATFORMA mobile computer post and developing new calculating machines for military use, the possibility must be considered that the equipment will be operated in both high and low temperatures and that it will have to be transported at a higher speed over various types of terrain and in various seasons of the year and weather conditions.

The experience of using the mobile computer post in the war game showed that the electronic computer does not eliminate the need to perform certain calculations on means of minor mechanization. The use of these means adds considerably to the solution of problems by computer and in a

number of cases makes it possible to perform calculations independently. The choice of one means or another to solve a problem will depend on the specific situation that has developed.

It would be desirable for the appropriate scientific organizations using computer equipment to develop more convenient tables, rules, nomograms, and other aids that will facilitate the performance of simple calculations by operational staffs and other organs of a front field headquarters.

But on the whole electronic calculating systems unquestionably facilitate and expedite the performance of numerous operational calculations and enable us to make sounder decisions on the use of forces and means in an operation. A thorough mastery of this equipment by staffs will exert a positive influence on its further improvement and development.

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TABLE

List of Problems Solved

Directorate or Department for Whom Problem Was Solved	Problem Number	Time in Minutes: Filling in of Input Data Card	Feeding in of Information	Solution of the Problem on the Computer	Filling in of Output Data Card	Number of Variants
Operations Directorate	6	8	2	1	4	1
Chief of Rocket Troops and Artillery	8	45	20	2	5	1
Chemical Department	9	4	2	4	4	14
Chief of Air Defense Troops	4	45	20	4	5	4
Chief of Rocket Troops	8	30	20	2	7	1
and Artillery,	8	10	10	2	6	1
Operations Directorate	8	20	10	2	6	1
Chemical Department, Operations Directorate	3	15	10	30	2	16
Air Army	15	15	15	12	8	1
Chief of Rocket Troops	2	18	18	2	2	90
and Artillery	1	20	15	35	2	410
Chemical Department, Operations Directorate	3	7	5	15	2	9
Operations Directorate	6	20	20	4	4	3
Chief of Rocket Troops and Artillery	1	20	15	30	1	410
Air Army	12	3	3	15	6	150
Chief of Rocket Troops and Artillery	2	10	7	1	1	48
Chemical Department, Operations Directorate	3	8	8	15	2	8
Chief of Air Defense Troops	4	25	25	3	2	9
Chief of Air Defense Troops	4	40	30	10	2	11
Air Army	12	90	150	3	8	1,900
Air Army	12	90	150	6	8	1,040
Total		9 hours	9 hours 7 minutes	3 hours 18 minutes	1 hour 27 minutes	4,128

Note: Numbering of problems is as per General Staff Directive No. 179892 (1966)

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