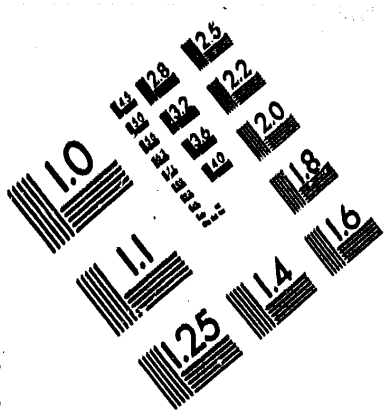
APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000100040016-9



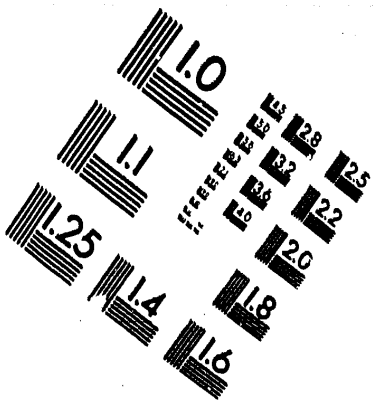
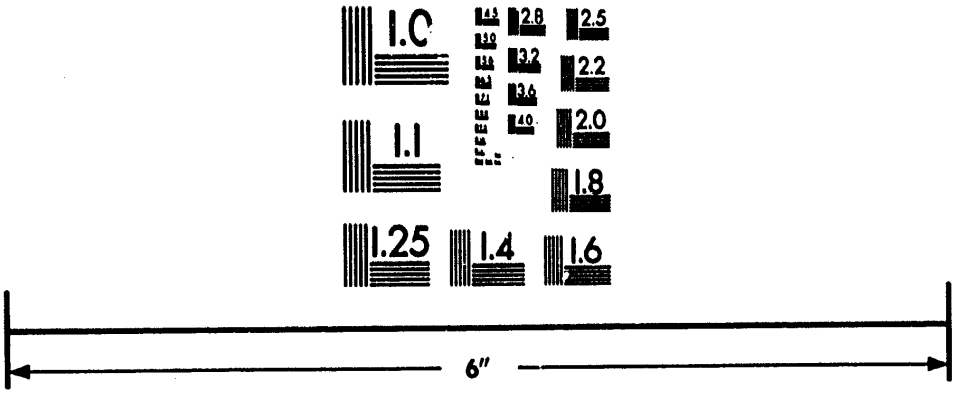
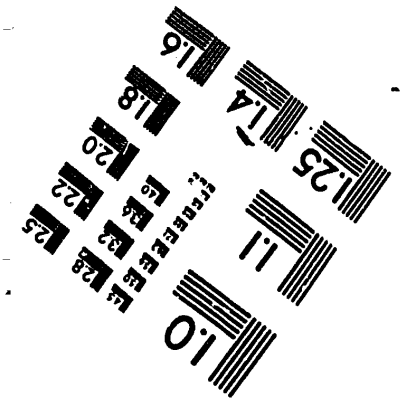
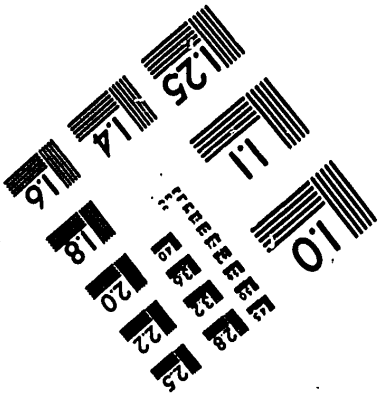


IMAGE EVALUATION TEST TARGET (MT-3)







Photographic Sciences

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000100040016-9

FOR OFFICIAL USE ONLY

JPRS L/8380

6 April 1979

[redacted]

USSR

[redacted]

[redacted]

FUNDAMENTALS OF TROOP CONTROL IN COMBAT

By

D.A. Ivanov, V.P. Savel'yev and P.V. Shemanskiy

U. S. JOINT PUBLICATIONS RESEARCH SERVICE

[redacted]

FOR OFFICIAL USE ONLY

APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000100040016-9

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000100040016-9

JPRS L/8380

6 April 1979

FUNDAMENTALS OF TROOP CONTROL IN COMBAT

Moscow OSNOVY UPRAVLENIYA VOYSKAMI V BOYU in Russian 1977 signed to press 15 Sep 77 pp 1-391

[Book by D.A. Ivanov, V.P. Savel'yev and P.V. Shemanskiy, Voyenizdat, second revised and supplemented edition, 25,000 copies]

CONTENTS PAGE

CONTENTS (Continued)

CONTENTS (Continued)

PUBLICATION DATA

English title	:	FUNDAMENTALS OF TROOP CONTROL IN COMBAT
Russian title	:	OSNOVY UPRAVLENIYA VOYSKAMI V BOYU
Author (s)	:	D. A. Ivanov, V. P. Savel'yev, P. V. Shemanski
Editor (s)	:	
Publishing House	:	Voyenizdat
Place of Publication	:	Moscow
Date of Publication	:	1977
Signed to press	:	15 Sep 77
Copies	:	25,000
COPYRIGHT	:	Voyenizdat, 1977

UDC 355.42

FUNDAMENTALS OF TROOP CONTROL IN COMBAT

[Book by D. A. Ivanov, V. P. Savel'yev and P. V. Shemanskiy entitled "Osnovy Upravleniya Voyskami v Boyu" second edition, revised and supplemented, Voyenizdat, Moscow, 1977, 2500 copies, 391 pages, signed to press 15 September 1977]

Introduction

The first edition of this work was prepared for printing at the end of 1969. On publication, the work received a broad response and approval from the military community. It was translated and published in the languages of the German Democratic Republic, the Hungarian People's Republic, the People's Republic of Bulgaria and Czechoslovakia. After publication, many noteworthy events took place in our country and its Armed Forces which had a direct or indirect effect and continue to have a large effect on the development of the theory and practice of troop control. The most important among these events unconditionally is the adoption of the resolutions for further improvement of control in all areas of social life by the 24th and 25th CPSU Congresses and the plenary sessions of the CPSU Central Committee.

In accordance with these resolutions by the party, scientific research work has been done on a broad scale in the country to develop the science of control founded by V. I. Lenin, as a result of which in recent years many major works, textbooks, brochures and articles have been published on the problems of troop management and control, the authors of which are famous Soviet scientists and experienced administrators.

Measures have been taken with respect to basic improvement of the selection, deployment and training of management on all levels for the national economy. Economic reform has been developed. New means of mechanization and automation of administrative and control work have been developed and introduced into practice. Entire automated control systems are being built. The structure of the control elements is being improved, and their functions are being more precisely defined. The most effective mathematical economic methods are being found for production planning based on the use of computers and other control equipment and also the theoretical principles of the scientific organization of labor.

In evaluating the significance of these measures, at the 25th CPSU Congress L. I. Brezhnev made the following statement: "...the measures to improve the management of the economy should be, must be, considered as the most important reserve, the use of which will help successfully to fulfill the Tenth Five-Year Plan and produce a lasting effect in the future."[1]

The resolutions of the 24th and 25th CPSU Congresses and the plenary sessions of the CPSU Central Committee with respect to the problems of control of the national economy undoubtedly also pertain to the management of the troops of our Armed Forces who constitute a component part of the socialist society. The measures taken on the basis of the party resolutions throughout the country to improve the control of the economy are an unprecedented form of scientific approach for the military personnel to the solution of the problems of troop control arising in connection with scientific and technical progress and with the revolution in military affairs taking place on the basis of it.

The fulfillment of these party resolutions will promote improvement of the combat readiness of our troops and, in the final analysis successful fulfillment of one of the primary missions stated by the 24th and reaffirmed by the 25th CPSU Congress: "Everything that has been created by the people must be successfully defended. To strengthen the Soviet state means to strengthen its Armed Forces and improve the defensive capacity of our homeland in every way possible."[2]

The important significance of the state of the art of troop control for maintaining high combat readiness has been confirmed by the entire history of military science over many centuries. The experience of past wars and, especially, World War II, gives us many examples where artfully controlled troops have won brilliant victories over superior numbers of the enemy. However, there have also been cases where well-armed troops have suffered destruction only because they lacked scientific, firm, consistent control on the part of the commanders and staff. In order for this not to happen in the future, it is necessary to make constant improvements in troop management and control and remember the behest of V. I. Lenin that "any battle includes the abstract possibility of defeat, and there is no other means of diminishing this possibility than organized preparation for battle."[3]

In addition, history confirms that the state of the art of practicing troop control depends to a decisive degree on the depth of the theoretical resolution of the control problems in the general military science system.

1. Materialy XXV S"yezda KPSS (Materials of the 25th Congress of the CPSU), Moscow, 1976, pp 60-62.
2. Materialy XXIV S"yezda KPSS (Materials of the 24th CPSU Congress), Moscow, 1971, p 81.
3. V. I. Lenin, Poln. Sobr. Soch. [Complete Collected Works], Vol 6, p 137.

This relation is especially acutely manifested at the present time when new means and methods of armed combat have imposed new, higher requirements on control, the practical satisfaction of which is unthinkable without a scientific theory of troop control.

The purpose of the second edition of this book is to analyze the theoretical principles of troop control in modern combat on the basis of the resolutions of the party and government with respect to the control problems and also the experience of past wars, military teachings and changes in the means and methods of armed combat, and to demonstrate the possible means of improving troop control planned in the armies of the most developed countries in technical respects. Inasmuch as it does not appear possible to consider troop control in all the elements and various forms of their activity (when carrying out combat and political training, when doing internal service, and so on) in a single work, the authors have limited themselves to the analysis of the control process only under combat conditions, which has found its reflection in the new, somewhat more precise title of the book "Osnovy Upravleniya Voyskami V Boyu" [Fundamentals of Troop Control in Combat] instead of the former title "Osnovy Upravleniya Voyskami" [Fundamentals of Troop Control].

In order to reduce the folume of the work and avoid excess repetition, the so-called functional attribute is used as the basis for its structure: each of the basic functions of control (gathering and processing of data on the situation, decision making and planning of combat operations, and so on) is considered in a separate chapter or section both for training and during combat. This structure is taken as the basis in connection with the fact that troop control, just as any other control, is always of a clearly expressed cyclic nature--the majority of the troop control functions during training and during the course of combat operations are unavoidable and are repeated again and again. Only their specific content and conditions of execution change, which the authors have taken into account in discussing each chapter.

When preparing the second edition, the critical comments of the readers of the first edition were also taken into account. The authors express their sincere appreciation for these comments.

CHAPTER 1. CONTENT, ESSENCE AND PROCEDURAL PRINCIPLES OF TROOP CONTROL

1. General Concept of Control

In any science, the well-founded nature of the theoretical conclusions and the value of the practical recommendations with respect to the solution of one special problem or another are directly dependent on the proper understanding by the researcher of the phenomena and the processes which are of a more general nature with respect to the given problem and also the methodology of the investigation, the point of view and general scientific principles. Attaching important significance to the specific nature of control, V. I. Lenin also warned: "...he who takes on special problems without first solving the general problems, will at each step unconsciously 'encounter' these general problems. And to encounter them blindly in each special case means to be doomed to a policy that is more vacillating and more unfounded."[1] V. I. Lenin taught that the general is a "step towards understanding the specific."[2]

The given procedural principles obligate us to consider the general concept of control and the principles on which the construction and functioning of all control systems without exception are based before we talk about the special and specific problems of troop control in combat.

A proper, united interpretation of the terms that we have used has important significance for theory and practice. The experience of many sciences shows that otherwise no theory can be successfully developed, and there will be various misunderstandings, disputes, and even disorganization of work both in the research collectives and in the control agencies. In order for this not to occur, another well-known French scientist, Descartes, in his time advised: "Define the meaning of the words precisely and you will save mankind half of his confusion." The validity of this opinion for the topic that we have investigated will become more obvious if we consider that there is a difference in approach between our Soviet press and the

1. V. I. Lenin, Complete Collected Works, Vol 15, p 368.
2. Ibid, Vol 29, p 252.

foreign press when defining and interpreting certain terms and general concepts of control. Philosophy usually characterizes control as one of the properties of material systems, and cybernetics is the process of the movement of information, ordering or converting a system from one state to another. Mathematicians are primarily interested in the possibilities of formalization, algorithmization, quantitative description and simulation of control processes in order to create the mathematical basis for their automation. The sociologists and jurists most frequently emphasize the social and legal aspects which develop in control systems, and economists, the economic aspects of control.

There are no theoretical errors in any of these interpretations. However, they characterize control only from one or several points of view without giving an integral representation of it.

The essence of troop control in combat and operations is in need of clear definition. Some of the definitions encountered in the literature reduce the essence of troop control to direction of the troops on the part of the commanders and staff. This cannot be considered satisfactory, for the word "direction" also needs explanation.

An inadequate definition of the essence of troop control is also presented in such authoritative works as the "Malaya Sovetskaya Entsiklopediya" [Small Soviet Encyclopedia]. It says: "Troop control (combat and operation control) is the preparation, conduct and support of combat operations by the commander with the help of the staff and other control elements." The inexactness of this definition at least includes the statement that the commander conducts combat operations with the help of the staff and other agencies. Indeed, the combat operations are conducted by none other than the troops who are the object of control for the commander, staff and the other agencies. In addition, in the given definition the term "troop and operation control" is used. This term is of a more figurative than scientific nature. Indeed, both combat and operation are two-way processes in which both our own troops and the enemy participate with explicitly opposing (enemy) goals. Under these conditions, in order to control the combat (operation) it is necessary to control not only our own troops but also the enemy. In the literal sense of the word "control" the latter is theoretically impossible at least because the commander cannot require reports from the enemy or give the enemy troops orders, assign missions and so on, and without doing this there is no control. It is possible and necessary to influence the enemy actively by the fire and the attack of his own troops, reception camouflage and other measures in order to force the enemy to act where, when, and how it is advantageous to have him act. This reflexive aspect of control is often emphasized by certain authors in using the term "combat and operation control."

From what has been stated it is obvious that there is an urgent necessity for giving a clear, scientifically based definition of the concepts of "control" in general, and then "troop control in combat," in particular.

In order that this definition be understandable and, the main thing, that it have practical significance, in our opinion, it must at least answer the following questions: who (what) is controlling, who (what) is being controlled, what is the control based on, for what purpose and how is the control specifically exercised?

It is possible to solve the given problem only by basing our solution solidly on the methodology of Marxist-Leninist materialistic science. Without touching on all of the conclusions of this science, first of all let us consider the principle that by the essence of any process, including any control, we must understand its deepest, general, stable and constantly repeating internal aspects. Here the essence is not obvious on the surface of the investigated process inasmuch as it does not coincide with the external phenomena.

The latest achievements in such sciences taking into account the various aspects of control such as sociology, military science, cybernetics, psychology and so on can be of great assistance in solving the problem with which we are faced. The complex approach, that is, the approach considering the conclusions of all sciences, investigating certain aspects of control, has great procedural significance. Here the initial base for the investigation can be only practice, inasmuch as it is impossible to think up any scientific theory or formulation. It can be extracted only from the material world surrounding us, from actually, objectively existing facts. "The point of view of life and practice," V. I. Lenin noted, "must be the first and the basic point of view of the theory of knowledge."[1]

What do practice and the objective world offer us with respect to the problems of control if we approach theiry analysis from the above-discussed procedural points of view?

Above all, they indicate that control is not a phenomenon that is thought up or occurs in a "vacuum," but is one of the general and objectively required properties and conditions of the existence and development of the material world. Control occurs in all forms of the movement of matter: mechanical, physical, chemical, biological, and also in social life. Without control no machine can operate properly, a current cannot travel over a wire, there can be no life, including our own organism, an industrial enterprise cannot function, the kolkhoz and the government as a whole cannot function and no troop formation (subunit, unit, and so on) can wage battle.

Beginning with this fact, in modern science control is divided (classified) into the following three large types:

1) Control in inanimate nature, including machines and complexes of machines;

1. V. I. Lenin, Complete Collected Works, Vol 18, p 145.

2) Control in animate organisms (biological systems);

3) Control in human society, in collectives of people in their social life, including the conduct of armed combat (social control).

There is a significant difference with respect to nature and purpose among these types of control, as we shall see below. It would be a gross error to place an equal sign, for example, between a live cell and a tank regiment. However, on the basis of dialectic unity of the material world, all forms of control are characterized by identical formal attributes, general principles and laws which are studied by the comparatively young science of cybernetics, and the knowledge of which has great theoretical and practical significance. The first such attribute of any control is the presence of a defined structure or organization. Indeed, the term "control" itself presupposes in Russian that there is a subject or object which controls and together with this, there is the subject or object which is controlled. The former is called the control agent and the latter, the object of control or the target.

We are convinced on the significance of the term "control" when we talk about the actions of an object which cannot and must not take place randomly without organization when some guiding or organizing effect on the part of the control agent is required. However, in order that the effect be realizable, there must be some communication between the control agent and object.

Such words as "direction," "correction," "management" and so on are identical with respect to meaning (synonyms) with the word "control." These words are usually used where we wish to attach some shade of meaning to the control process. Thus, the word "direction" is used, as a rule, when we are talking about control on the part of the higher government, party and military organs and duty personnel, and when this control is of a more general coordinating and guidance nature, it combines not only economic or military-statistical functions but also social-political and educational functions, the selection and deployment of personnel, coordination of their activity, and so on. For example, we say the "CPSU directs (not controls) the building of communism in our country," "the Ministry of Defense directs the Armed Forces," and so on.

The words "guidance," "regulation," "correction" and others are used instead of the word "control" as a rule, when we are talking about control during the course of the process, in its dynamic state.

Thus, when analyzing the process of control from the point of view of form in any material environment, we must understand this process to be the activity of the control organ consisting in the required guidance activity via the communications channels on the object of control.

The set of these three elements--the control agent or organ with the technical means and methods of operation characteristic of it, the object of the control and the communications channels between them--is called the control system[1] (see Figure 1).

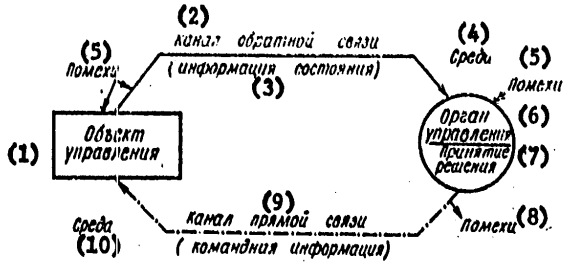


Figure 1. Schematic Diagram of the Structure and the Operations of the Control System (the Closed Control Loop).

Key:
1. Object of control;
2. Feedback channel;
3. (Information of state);
4. Environment;
5. Interference;
6. Control organ or agent;
7. Decision making;
8. Interference;
9. Direct communications channel (command information);
10. Environment.

In this general system the control agent sometimes is called the controlling system (or subsystem), and the object of control or target is sometimes called the controlled system (subsystem). The authors who exclude the object of control or target from the concept of the "control system" permit a gross procedural error inasmuch as such a system theoretically cannot function without the object of control (something to control). For realization of the control process all of its material carriers are needed--both the "producers" and the "consumers," that is, a closed loop.

Consequently, the control system forms an internal structure, the material base for any control process. Without the system, without material

1. In general in science a system is considered to be an organized, closed unit of regularly connected elements capable of interaction (objects, subjects, opinions, and so on). Here the properties of the system as a whole are identical to the properties of each element or group of elements taken individually.

structure, there can be no control and vice-versa. The system nature is a universal property of all matter and an objectively necessary condition for any control process. The world surrounding us is literally "put together" from various sytems. "Now," F. Engels wrote in his "Dialectics of Nature," "all nature is spread out before us as a system of relations and processes."

The objective nature of the existence of the control systems does not mean, however, that they remain unchanged. On the contrary, they are constantly developing and are improving together with the development of material life.

Certain attributes of control are observed in the most primitive ("nucleated") form in the systems of inorganic nature.[1] During the prolonged course of historic evolution on the basis of these elementary systems more complex and organized biological control systems arose, beginning with the live cell and ending with the most complex and highly organized system--the human organism. As a result of self control (autoregulation) in such systems, blood pressure that is permissible for life, temperature, sugar content in the blood are maintained, and the products of processing food are eliminated, protection from harmful external effects if provided, and many other processes take place.

However, the development of control systems in nature did not end with this. The genius of man, his intelligence and labor have created various technical control systems (machines). The steam engine, the automobile, the computer, spacecraft, tank, antiaircraft missile complex, and so on--all of these are control systems that were created by man. Here man himself always appears as the basic control agent. The so-called "man-machine" system is formed. Man uses various levers, instruments and automatic control devices which operate by a program compiled by him as aids. The object of control or the target is either a machine (complex of machines) as a whole or individual elements of it. The communication channels between man, the control instruments and the machine can also be different: visual, auditory, mechanical, electromagnetic, chemical, document, and so on. Thus, a still more complex "man-automaton (instrument)-machine" system is formed (see Figure 2).

Here, if the system is capable of operating without the direct participation of the man (but by his programs), then it is said to be automatic, and with the participation of man, automated.

1. For more details on control in inanimate nature see L. A. Petrushenko, "Printsip Obratnoy Svyazi" [Feedback Principle], Moscow, 1967. The author indicates the inconsistency of the views which refute the presence of the attributes of control in inanimate nature without the participation of man inasmuch as they contradict materialistic dialectics.

Simultaneously with the technical systems, as the division and cooperation of human labor increases, various social control systems have been created inasmuch as man has lived and worked not alone but in collectives. "Any directly social or joint labor realized on a comparatively large scale," wrote K. Marx, "needs control to a greater or lesser degree, which establishes the coordination between the individual operations and performs general functions occurring from the movement of the entire production organism in contrast to the movement of its independent elements. The individual violin controls itself, the orchestra needs a conductor."[1]

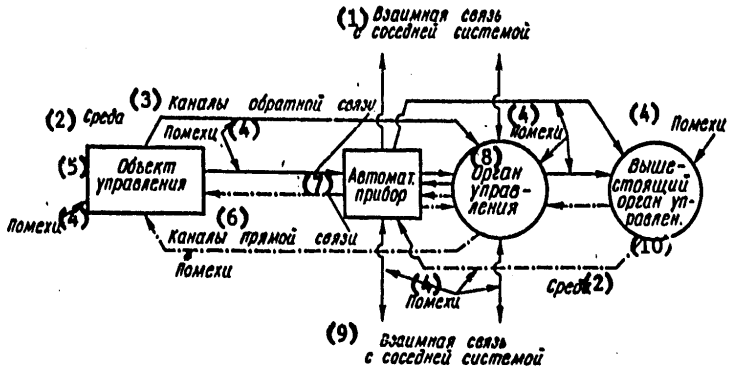


Figure 2. Construction of the Control System Using the Means (Devices) of Automation.

Key:
1. Mutual coupling to adjacent system;
2. Environment;
3. Feedback channels;
4. Interference;
5. Object of control;
6. Direct communications channels;
7. Automatic instrument;
8. Control organ or agent;
9. Mutual coupling to the adjacent system;
10. Superior control organ or agent.

With respect to purpose, the social systems, just as the technical systems, are varied: the shop, the industrial enterprise, the brigade, the kolkhoz, the school, the scientific research institute, the symphony orchestra, theater, industrial association, branch of the national economy, government as a whole, and also the company, the battalion, the regiment, and so on. Here either a man taken individually or a collective of people who

1. K. Marx and F. Engels, Soch. [Collected Works], Vol 23, p 342.

have different assignments are taken as the control agent or organ: the chief, the director (the board of directors), the brigade leader, the chairman (the board), the chancellor, the conductor, the minister (the board), the council of ministers, the commander, the staff, and so on. The object (subject) of control in such systems always is people using the corresponding equipment. Various channels beginning with visual and audio channels and ending with complex radio electronic devices making up the automated control systems are used for the coupling between the agents and objects of control.

The social control system, consequently, by comparison with the technical systems, is distinguished by great complexity and is in the form of a multifaceted combination of the "man-automaton (instrument)-man-machine."

Running somewhat ahead, let us note that the proper understanding of the essence and structure of control systems has not only great cognitive-procedural significance, but also great practical significance. In the light of the resolutions of the 24th and 25th CPSU Congresses in particular, it obligates us when finding means of improving troop control to use the so-called systems or complex approach requiring improvement of the various aspects of control on the basis of the achievements of a number of sciences simultaneously, not only certain individual elements, but also the system as a whole, that is, both the control agents or organs and their functions, and the control objects and the communication channels with them. Only in this way can the desired result be achieved.

Considering the external form, let us now proceed to the analysis of the internal content of control by which we usually mean the set of interconnected functions realized by the control agents in order to operate in the necessary way on the objects of control and achieve the final purpose. The control function, in turn, is considered to be the special form of administrative labor of the control agent or organ which leads to the achievement of the special (intermediate) goal on the path to the common, final goal. The rank of control function therefore cannot include every elementary measure of the control organ. A function is a more independent, general and consolidated concept than any separately taken measure. It includes the stable group of measures that are uniform with respect to nature, the realization of which permits achievement of the special purpose and an approach to the performance of the succeeding functions although in practice sometimes there is a change in role and some intertwining, a superimposing of one function on another with respect to their time of implementation, which we shall see below. In the functions, the interrelations and the set, consequences, content, technology and dynamics of the entire control process are manifested. Their manifestation arises from the separation and specialization of the control and administrative work.

In accordance with the functions, the structure of the control agents or organs is constructed, and for the fulfillment of each of them usually the distribution of rights, obligations and responsibility among the component parts (for example, the duty personnel) of these agents, their special

knowledge and skills, the application of the corresponding technical control means and also the sequence of methods and procedures for action are required. The clearcut definition of the functions consequently has great significance.

In order correctly to define the control functions characteristic of any control organ or agent, it is necessary again to analyze the practice of the actions taken by the latter. In this analysis we can comparatively easily establish above all the fact that the control process on the part of any control organ occurs not in itself, but is the consequence of a cause, a reaction to certain changes in the object of control or in the environment. Thus, the leaf of a tree when it is heated in the sun begins to curl in order to decrease the heating surface and curtail the evaporation of moisture. The chameleon, sensing danger, changes his color. On detecting a turn in the road to the right, the driver of a motor vehicle turns the wheel in that direction. On receiving information about an approaching enemy aircraft from a radar or by personal observation, the commander of an antiaircraft battery gives the command to open fire. Measuring the corresponding parameters of motion of the aircraft, the automatic pilot takes action on the controls and changes the heading and flight altitude. It is possible to present an infinite number of such examples.

What has been stated indicates quite obviously that the primary (initial) function of any control agent is to obtain information on the state and the actions of the object of control or target and its environment via the feedback channel (see Figures 1 and 2). This information is called the information of state in cybernetics. Without this information, successful control on the part of any agent is theoretically impossible, for this unavoidably (sooner or later) enters into contradiction with objective reality and leads to destruction of the system. Moreover, obtaining such information is always a specific and complex form of activity of the control agent requiring special rights, knowledge and the application of the corresponding means and methods of operation. By these arguments, it is entirely correct to consider it a control function, and not an auxiliary measure. This especially pertains to the modern social control systems where the information flows are growing every year. Therefore it is no accident that the resolutions of the party and the government provide for the creation in our country of an all-union automated system for gathering and processing information, and special attention is always given to the gathering and study of data on the situation in the practice of tactical troop control.

The reaction of the control agent to the received information of state varies. In highly developed systems, the control agent not only receives but also perceives, stores, studies and converts the information of state, it compares it with the given state, and if necessary, converts the system to a theoretically new state corresponding to the altered conditions. At the same time the control agent actively influences the object of control. This active reaction of the system becomes possible as a result of the fact that the basis for its construction is the feedback principle. This principle necessarily presupposes not only receiving information of

state but also the subsequent function of the control agent--planning of the actions of the object of control, the most important and objectively necessary act of which is decision-making. Without the decision of the control agent, no purposeful action of the object of control is theoretically possible.

The essence of making any decision and planning as a whole consists in the control agent's determination of the goals of the actions taken by the object of control, its specific mission, the sequence, the forces, the means, methods and times of their execution and also the measures in support of these actions on the basis of the analysis and evaluation of the information of state and also the laws in the given medium.

In cybernetics, the decision making process usually is defined as conversion of information of state to command information (or control information) by the control agent, that is, conversion of the information of state to information by means of which the goals of the object of control are stated and at the same time its actions and the functioning of the system as a whole are assigned a purposeful nature. It is perfectly obvious that the purposeless random action on the part of any object cannot be considered controlled, inasmuch as they contradict the means of the word "control." Any control is realized not for the sake of itself, but so that the controlled object can achieve some purpose. The purposefulness, consequently, is also a mandatory and a primary attribute of any type of control, independently of where it is realized (in machines, live organism or in a collective of people).

With respect to its nature, the goals of the control can be highly varied. They depend entirely on the purpose of the system and the conditions of its functioning. The determination of the goal by the control agent takes place differently in systems. In the systems functioning without the participation of man, for example, of the organisms of animals, the goal is formed on the basis of the unconditioned and conditioned reflexes acquired during many hundreds and thousands of years, adaptation to the environment and also the generated instincts. The control goals are defined theoretically differently in the systems with the participation of man. Here the basis for this determination is a higher form of reflection of objective activity--thought--the conscious goal setting aimed at satisfaction of the needs of man. Here man is capable of acting on nature, ideally foreseeing the final results of the actions taken by the object of control. Accordingly, K. Marx wrote: "...the poorest architect is distinguished from the best bee from the very beginning in that before the wax cell can be constructed, it is already being constructed in his head. At the end of the labor process, a result is obtained which at the beginning of this process already existed in the imagination of the man, that is, ideally."[1] In another place he noted that "in nature... one blind, unconscious force acts on another, in the interaction of which the general laws are exhibited. There is no

1. K. Marx and F. Engels, Collected Works, Vol 23, p 189.

conscious, desired goal here...on the contrary, in the history of society people who take action are those who are gifted with consciousness, approaching defined goals carefully or passionately. Nothing is done here without conscious intent, without a desired goal."[1] When controlling collectives of people in social life the goal is not only defined, but it is achieved by man. Here administrative labor is a version of mental labor, and the relations in the control system take on the form of social relations among people with their purely human qualities (ideology, moral outlooks, attitude toward labor, knowledge and skills, adaptations, habits, and so on). The purpose of control here has a deeply classical nature.

After making a decision, the planning process continues when necessary and when possible, and it is completed. Here the control organ specifies and details the problems, procedures, sequence, means used and the times of action by the control objects, the order of their interaction with each other and the environment, and so on.

In strict accordance with the decision and the plan of operations that have been made by the control agent, the following control functions are realized--statement of the goals for the object of control (giving him an order, giving a command, a signal, and so on), the organization of interaction and relations to it and the environment and also comprehensive support of its actions. Out of these functions, the statement of the goals for the object of control is objectively necessary and the most important, for without it, its purposeful actions also are theoretically unthinkable.

When realizing the mentioned functions, the control agent is dealing not with the information of state, but with the material objects and input to them by transmission of command (control) information to them. The implementation of the decision and the plan of operations is achieved organizationally. For these reasons, some authors combine the given group of control functions into one larger function of organization which, in our opinion, can be considered valid, but with the stipulation that there is no sharp boundary between the functions: this boundary is highly provisional and mobile. This stipulation is confirmed by the fact that without obtaining information of state and decision making, no proper organization is possible and, on the contrary, the gathering of information, the decision making and all the other functions are in need of organization. Organization, consequently, permeates the entire process of the control and operation of the system itself.

All of the enumerated functions constitute a type of preparatory step in the activity of the control agent and the system as a whole (the static control). After their implementation, a new, executive step occurs in which the control functions are realized during the course of action taken by the objects with respect to satisfaction of the stated goals, that is, the dynamic control. The given functions of the control organ are often

1. K. Marx and F. Engels, Collected Works, Vol 21, pp 305-306.

generalized and called regulation, correction or operative control. With respect to content and essence they in many cases are similar to the preceding (preparatory) functions.

In order to confirm what has been said let us again return to the practical application. During the course of action of any object of control when fulfilling its mission, the control organ again receives information over the feedback channel about its state and environment, it compares it with the previously made plan, in case of a deviation (noncomparison) it introduces the corresponding corrections into the plan or makes a theoretically new decision (with sharp changes in conditions), and then sends the corrected or new problem over the direct communications channel to the object of control, that is, transmits the command information.

These operations are repeated until the object of control completely carries out its mission and the final goal of the action of the system as a whole is achieved. The entire control process consequently is of a clearly expressed cyclic nature.

Finally, it is necessary briefly to discuss another control function--monitoring. The given function is mentioned in the papers of a number of authors. However, the isolation of monitoring as an independent function can be justified to some degree only by the great significance which it has in the general control process, especially in tactical troop control. It is for these reasons that in the present work the monitoring by the commander and the staff of the readiness and the actions of the troops in combat is considered in a separate chapter.

If we approach the given problem from the point of view of maintenance, then the separation of monitoring into an independent control function cannot be considered justified. We are easily convinced of this by practice. When monitoring both statically and dynamically, the control agent merely performs functions already investigated by us: namely, it gathers data on the availability, the actual state and the actions of the objects of control, it compares these data with the decision made and the action plan, and in case of a divergence it determines the necessary corrections (it more precisely defines the previous decision or makes a new one), and it gives the corresponding instructions to the object of control (it states a refined or new problem for it). Consequently, the basis for monitoring is the principle of feedback between the organ and object of control.

Thus, the analysis performed by us from the point of view of materialistic dialectics and cybernetics on any control process makes it possible to state that independently of where this process is realized (in a computer, in a live organism, a collective of people or in the society as a whole) its common features are the following:

The mandatory presence of a control system made up of the control agent (objects) of control and the direct communications and feedback channels connecting them;

The existence of a cause and effect relation between the elements of the control system;

Purposefulness of the actions taken by the system and the presence of a controlling parameter;

The dynamic nature of the system, its capacity to convert from one state to another and in so doing undergo large loads from the external input without disturbance of its structure and properties.

With respect to form, the control in any system is the process of purposeful input from the control organ to the object of control, and with respect to content, both in the static and in the dynamic situation it includes different functions of the main, mandatory and stable ones persistently repeating in each cycle are the following: obtaining information of state over the feedback channel, decision making on the basis of this information and the delivery of command information to the object over the direct communications channel, that is, stating its goal. Without these three functions, no control is theoretically possible. It is worthwhile to exclude at least one of them as the control process sooner or later is disturbed or stops. They permeate all the remaining functions, they are closely intertwined with them and thus characterize the deep features of the entire control process. Therefore they fully fit the philosophical category of essence and permit us to give the following definition to the general concept of control: any control is a process of input from the control agent to the object of control based on the objective laws of the given environment by obtaining information about the state of the object of control, making a decision on the basis of this information and statement of the mission of the object. The given definition corresponds to all of the questions imposed on it; for what is the control, who (what) controls, who (what) is controlled, on the basis of what does the control take place and how does it take place.

2. Specific Nature of Troop Control in Combat and the Requirements Imposed On It

The general cybernetic concept of control investigated by us in the preceding section as a process occurring in any material environment pertains fully to the tactical troop control.

However, such a general concept of control alone is entirely inadequate for the practical activity of the officers when managing troops in combat. In order to understand the subject more deeply, V. I. Lenin taught that "it is necessary to encompass, to study all sides of the subject, all the relations and 'intermediate concepts.'"[1] As applied to our topic, the given procedural requirement means that in addition to the general concept of control it is necessary for the officers to have a deep understanding of

1. V. I. Lenin, Complete Collected Works, Vol 42, p 290.

the specific nature of troop control on various levels, keeping in mind that this specific nature occupies the dominant position and is of a dual nature. First, in the case of troop control in combat, the officers must be guided by the general laws of social development and government control inasmuch as any war is a social phenomenon, and the armed forces are a component part of society and the weapons of the state. Secondly, they must know and skillfully use the laws and principles of direct combat art following from the basic purpose and structure of the troops as an object of control and also from the conditions of armed combat which differ significantly from the conditions of any other phenomenon of social life.

In order to discover the specific nature of troop control in combat, we again use the methodology of the theory of knowledge and we perform a systems analysis of the organizational structure of the troops and the process of their combat activities.

Organization of Modern Troop Control Systems

With respect to their organizational structure and the nature of the troop operations it is possible with complete grounds to refer to the so-called large self-controlled systems inasmuch as they are characterized by all of the basic features characteristic of these systems: a comparatively large number of component elements, complexity of structure, variety of relations and interaction among the elements and the external environment, complexity of the problems solved, high dynamic nature of the system and its capacity to solve new (previously not provided for) problems, the presence of several criteria for estimating the results of the operations of the system.

These features are especially clearly manifested in the control systems for combined-arms subunits, units and combined units of infantry of all modern armies. Therefore we shall take them as the basis for the investigation.

If we consider these troops as a system and the combined-arms battle and armed combat as a whole as its operations, then, in spite of their complexity, it is possible to establish the following components (see Figure 3).

The first one of these is the subunits of the combat arms, the soldiers of which conduct battle with the enemy directly by the application of the available means of destruction, they destroy his manpower and materiel by fire and attack. In the infantry of modern armies, such troops include the motorized rifle troops (infantry, motorized infantry, mechanized), the tank troops, missile troops, artillery and antiaircraft defense troops.

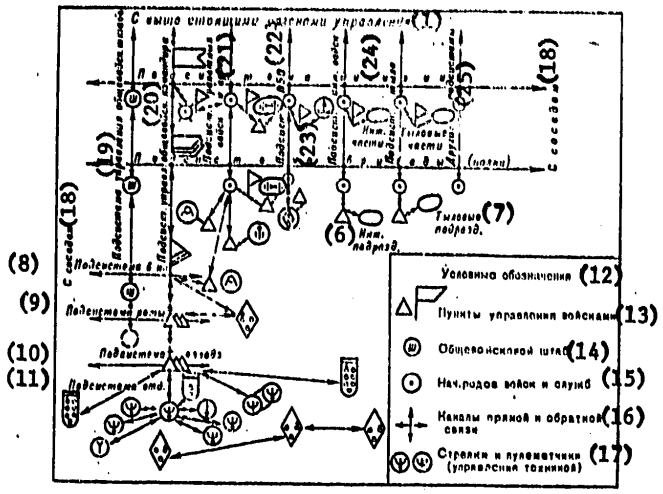


Figure 3. Schematic Diagram of the Modern Combined-Arms Unit as a Complex Self-Controlled System (according to the data of the foreign press).

Key:
1. With the superior control organs or agents;
2. Division subsystems;
3. Brigade subsystem (regiment);
4. Engineering units;
5. Rear services units;
6. Engineer subunit;
7. Rear services subunit;
8. Battalion subsystem;
9. Company subsystem;
10. Platoon subsystem;
11. Squad subsystem;
12. Provisional notation;
13. Troop control posts;
14. Combined-arms headquarters;
15. Chief of types of troops and services;
16. Direct communications and feedback channels;
17. Rifles and machine guns (materiel control);
18. With the neighbor;
19. Combined-arms headquarters control subsystem;
20. Combined-arms commander control system;
21. Missile troops and artillery subsystem;
22. Antiaircraft defense subsystem;
23. Engineering troops subsystem;
24. Rear services and supply subsystem;
25. Other subsystems.

The second component of this system are the subunits of special troops and rear services, the soldiers of which enter into open combat with the enemy only in the extreme necessity for this. The basic purpose is comprehensive support of the combat operations of the above-enumerated combat arms. For this purpose, they conduct reconnaissance with the help of the corresponding equipment, they build roads, they organize communications, they haul fuel and ammunition, they treat the wounded, and so on. These subunits include the radio technical, engineering, communications, motor pool, road, medical and other subunits.

A third component of the system of each given element in all of the modern armies are the commanders and the various control agents. They are designed so as to control the first two components of the system, that is, the subordinate subunits of the combat arms, the special troops and rear services, which make up the objects of control for them. The successful operations of the latter are unthinkable without control, especially in the case where they are solving the general problem in the presence of active enemy counteraction. Under such conditions, the absence of control, the coordination of the operations with respect to the target, time and location unavoidably will doom them to certain destruction by the enemy.

It must be noted that in the distant past, especially during the period of comparatively small armies and limited battlefields, the subunit, unit and combined unit commanders and even the commanders-in-chief of the armies not only controlled the troops but were also direct participants in the battle. They were located directly in the combat formations of the subordinate troops and personally led them into battle, executing the administrative functions and the functions of a warrior, that is, they participated in the destruction of the manpower and equipment of the enemy by the application of their own physical strength and weapons.

At the present time, and in connection with the appearance of mass armies and a significant increase in the space and time scale of the combat operations, the situation has gone through a fundamental shift. The control functions, initially for the commander-in-chief, and then the commanders of the combined units, the unit, and even the subunit, gradually became not only the main thing but the only thing.

For execution of this function, the commanders have at their disposal the necessary agents and technical means of control, and, as a rule, they are at the corresponding control points located in the combat formations of the subordinate troops. Usually the commanders and officers of the control units do not participate in the direct destruction of the enemy by personal application of the means of destruction in modern warfare. The only exception is the commanders of the small tactical subunit (the squad leader, the crew chief, the platoon leader or company commander) and the senior officers in cases where they are forced to set a personal example in the attack or replace a soldier at a weapon or in a tank, and so on. At all other times, the most important and even the only mission is the control of the

subordinate troops, giving them directions required for successful fulfillment of the combat mission.

The unit and combined unit control systems are set up in accordance with the given structure of the modern infantry troops. First of all the widely developed hierarchy by which we mean the previously established order of subordination of the subordinate units and duty personnel to the superior ones with respect to strictly defined levels (the hierarchical ladder) is characteristic of them.

These levels are as follows (Figure 3): soldier-squad (combat crew, detail)--platoon--company (battery)--battalion (artillery battalion). In many armies the superior levels include the following: brigade (regiment)--division--corps--army (army group)--infantry troops as a whole. Two adjacent intermediate levels (for example, the platoon-squad; company-platoon, and so on) form a control link (closed loop) conjugate to the superior, subordinate and adjacent levels.

This stepped nature of the structure of the troop control systems permits the information flows to be brought into order, achievement of organization in the troop operations, and the matching of the number of objects of control at each level with the capabilities of the commander and the control units or organs.

"The initial cells" of the general rroop control system are the soldiers who directly control the corresponding materiel (weapons) and who destroy the enemy with its help by fire and strike. In the final analysis, any troop control system is "closed" by them. The success of the operations of the entire control system depends on the ideological tempering, their moral spirit, combat training and all other purely human qualities. The combination of the soldier with materiel in the general case makes up a "man-weapon" subsystem. Its peculiarity consists in the fact that the object of control here is not the man, but the equipment. Therefore the given subsystem will more correctly belong to the category not of troop control but of equipment and weapons control with all of its characteristic features. In the process of this control, the soldier evaluates the target, prepares or more precisely defines the initial data for firing, lays the weapon on the target, and fires. Here the control can be realized manually, by mechanical means, semiautomatically or automatically. Depending on the control procedure in the given system different channels and technical means of direct communications and feedback are used: visual, mechanical, wire, radio, and so on. In addition to the development of the program of operations of the control devices, the man comprehensively prepares the entire complex of combat materiel for application, he has them available at the required place and at the required time, he controls the operation of the instrument and is in constant readiness to assume their functions in the case of failure or for other reasons. These causes can be changes in the situation and noncorrespondence of the previously given program to it, the necessity to deceive the enemy, especially if the program for operation of our devices

has become known to him. Therefore in the given echelon, the proper combination of intellectual possibilities of man with the possibilities of the equipment acquires especially important significance.

The direct troop control, that is, control of the people equipped with the materiel and reduced organizationally to the corresponding troop collective, begins with such a primary subunit as the squad, the combat weapons crew and launching cres, the tank crew, and so on. Here a system is generated in which people are the control unit and the object of control, that is, the squad leader (crew chief) and the soldier subordinate to him. As a rule, visual, auditory and sometimes technical direct and feedback channels are used for communications among them. Thus, the attributes characteristic of the troop control system, that is, the control system for armed people, are manifested.

The squad (combat crew) is organizationally a subsystem in the system of the superior subunit--platoon--where the functions of the control organ are performed by the commander, but his control input usually is referred directly not to the soldier equipped with the weapon, but to the squad leaders. The squad leaders consequently: perform the functions of the control agent with respect to the subordinate soldiers and are simultaneously the object (subject) of control on the part of the platoon leader. For the formation of the direct and feedback channels here, in addition to auditory and visual signals, various technical means can be widely used (radio, telephone, and so on). At the same time a still more complicated system than that in the squad is formed in the platoon--the system made up of man (platoon leader)--equipment (radio, telephone)--man (squad leader) with all the attributes characteristic of troop control systems. These attributes are again reinforced and broadened in the subsequent steps of the "hierarchical ladder" where the commanders control the subordinate not only personally but with the help of specially created control units and also the most varied technical means. Thus, the motorized company commander has a deputy with respect to the political section, a first sergeant, an engineer, a sanitation instructor and an armored personnel carrier driver. In addition, in the company there can be a staff or plenipotentiary control section (cell) providing for observation of the battlefield, communications with the subunit and equipment of them. In the American Army, for example, this section includes the executive officers, the communications sergeant, the supply sergeant, the company clerk and three radio operators.

In the battalion control system, in addition to the commander, there is his deputy for the political section and a body such as the headquarters. In the American Army, this headquarters staff includes the chief of staff, the officers in charge of personnel, reconnaissance, operations, combat training, rear echelon services, communications, and also the chemical officer and other people. In order to create the direct and feedback channels and also to provide for the operations of the control system, the staff of the battalion has special communications, reconnaissance and observation units. The executive body of the battalion is, consequently, a highly complex organism.

The objects of control in the battalion control system are the motorized rifle (motorized infantry) companies, antitank, mortar and other subunits and also the subunits attached to the battalion for the period of its execution of the stated goal (artillery, tank, engineers, and so on). Each of these assigned subunits, being the object of control, at the same time has its own control unit with its technical means and specific methods of control. The control units of these subunits, in addition to the fact that they are part of the control system of the battalion, can be considered as component levels (subsystems) of the control of combat arms or special troops.

The controlling system of the battalion realizes its functions, as a rule, through the company commanders with their deputies and also the commanders of the other subunits directly subordinate to the battalion commander. The battalion commander states the missions for them, he receives the basic part of the information about the situation that has developed in their operation zone from them, and he demands the execution of the stated missions of these commanders. Thus, he acts on the personnel and controls the efforts of the subunits for the fulfillment of the missions through the company commanders subordinate to him, and the latter in turn have control over the platoon leaders.

In the brigade (regiment) and higher the basic control unit in all the armies is considered to be the combined-arms headquarters. In addition to the headquarters, here there are political units, the chiefs of the corresponding combat arms, special troops and services (artillery, engineering service, and so on).[1] The "hierarchical ladder" at the same time will receive its development not only vertically but horizontally, also forming the control subsystems for the combat arms, the special troops and services (see Figure 3). Here the right to make the combat decisions as a whole in all of the units is granted only to the commander. The most important principle of the construction of the control systems, is, consequently, the one-man command of the commander. All of the remaining duty personnel of the control units and the troops themselves operate in strict accordance with his decision.

For the realization of their administrative functions, the commanders and the officers of the control units use the methods of operation characteristic of them, they have at their disposal the corresponding control points, and they use specially designated control means.

Thus, in the general structure of the troops when carrying out combat operations the troop control is with respect to form (external appearance) other than the activity of the commander, the staff, the political units, the chiefs of the combat arms and services. The component elements of the troop control system in each echelon are the following:

1. See the internal service regulations of the Armed Forces of the USSR.

a) The commanders and the control units or organs (where they exist) of the given level located at the corresponding control points and using various technical means and methods of operation characteristic of them;

b) The commanders and the control units of the subordinate subunits and units (control objects) of the combat arms (motorized rifle, tank, missile, artillery, antiaircraft defense troops, and so on) and also the special troops and rear services and supply (communications, engineering, medical, and so on);

c) The control system between the first two elements with the direct and feedback channels and means of automation of control.

Inasmuch as the troops have a hierarchical structure, the control input to the soldiers of the subordinate subunits on the part of the commander of each echelon, beginning with the platoon, is usually realized not directly but through the subordinate commanders. The latter, consequently, are the control unit with respect to their subordinates and the object (subject) of control for the superior commander and control unit. With respect to form and structural schematic, the combat troop control consequently is basically similar to the control in any other area, for example, enterprise control. However, with respect to purpose, functions (content) and the conditions of their execution it has a more theoretical difference, the consideration of which has important theoretical and practical significance.

Goals of Combat Troop Control, Its Content and Essence

The Soviet Armed Forces are charged with the reliable protection of the peaceful labor of the Soviet people building communism and, in the fulfillment of the agreement obligation, also protection of the interests of other socialist countries from the aggressive efforts of the imperialist powers. The strengthening of their combat power, as the 25th CPSU Congress pointed out, remains one of the primary problems. It follows from this that the primary goal of the control of the troops of our army on the part of the commanders and staffs at all levels both in peacetime and in case an aggressor unleashes a war is constant maintenance of high level combat readiness, including the high political-moral condition of the subunits subordinate to them (see Figure 4).

It must be noted that in certain official and unofficial sources the maintenance of high combat readiness of the troops was interpreted until recently not as the goal but as the individual measure of the commanders and staffs equivalent to other measures (the gathering of data on the situation, the planning of the combat operations, and so on). This opinion is in need of refinement inasmuch as it far from completely corresponds to reality, it constricts and reduces the essence of the combat readiness of the troops without justification and, in addition, it contradicts the requirements of logic, precluding the placement of the equal sign between the whole and its parts and arrangement of them in a series.

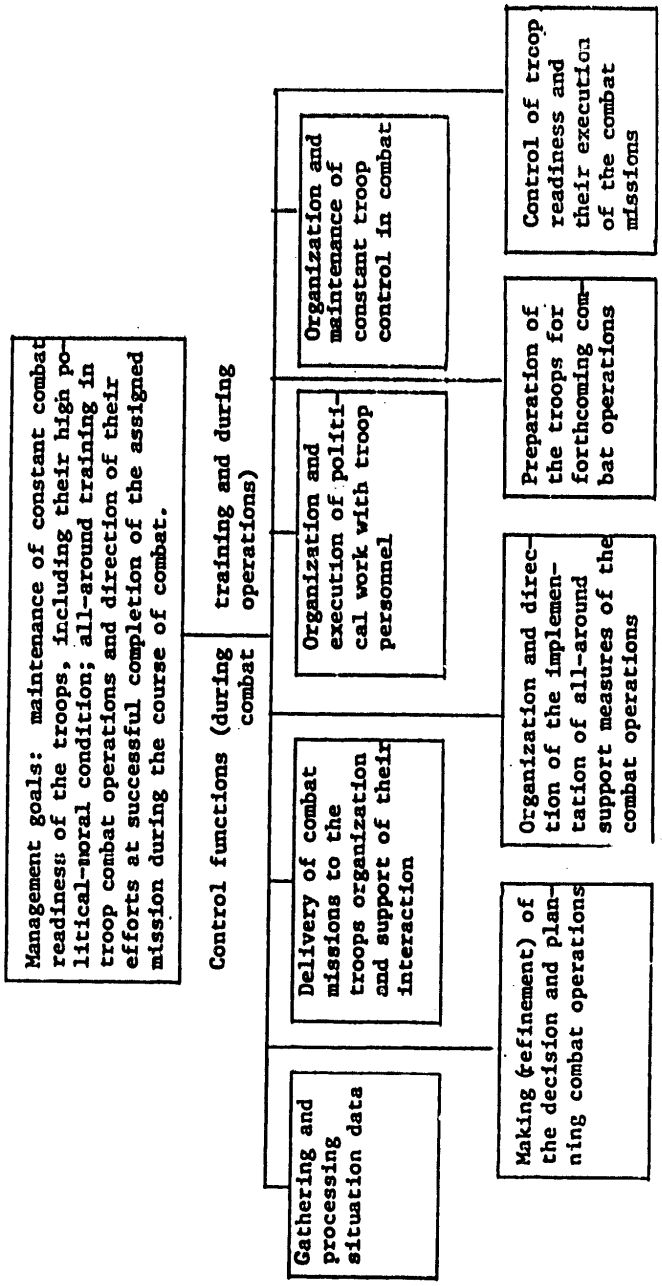


Figure 4. Content of the Combat Troop Control Process

In order to eliminate this theoretical deficiency, intervention of the party and government leaders has been required. Thus, L. I. Brezhnev noted the following on receiving the graduates of the military academies on 5 July 1967: "...enormous efforts and material expenditures of the people on equipment of the army, consciousness, combat training and discipline of all of the military servicemen, the art of the command personnel in troop control and a great deal else are concentrated in the combat readiness of the troops as a focal point. This, in the final analysis, is the crown of the combat mastery of the troops in peacetime and the key to victory in war."

In more specifically defining the given position, Marshal of the Soviet Army A. A. Grechko gave a definition in his book "Armed Forces of the Soviet State" (p 109) that by combat readiness of the troops we must understand to mean their capability at any time and under the most complicated conditions of repelling and destroying aggression, wherever it may come from and whatever means and methods are used, including nuclear weapons. He pointed out that the basic components of the combat readiness of our Armed Forces are the following: high moral-combat qualities of all the personnel, training, discipline, organization and physical hardening; equipment of the troops with weapons and materiel, the maintenance of these weapons and materiel in proper working condition; the high level of combat and specialized training of the command personnel, their capacity to take on the command of the troops, skillful direction of their operations, organization of continuous supply with materiel; readiness of the political units, the party organizations, and all communists by word and personal example to inspire the troops to fulfill the combat missions.[1]

Thus, the high combat readiness of the troops, being one of the principal goals of their control on the part of the officers on all levels is achieved as a result of the realization of the large complex of interconnected measures, including the measures with respect to command and control. The latter are a component part, one of the important conditions of achievement of troop combat readiness. The troops cannot be considered combat ready if the commanders and staffs do not know the situation, do not know how to make a substantiated combat decision, to organize the interaction and support of the troops with everything that is necessary to achieve success of the combat operations, and so on.

A second goal of the troop control, also arising for the commanders and the control units of all stages under combat conditions and with the assignment of a specific combat mission, consists in the fact that in any complex situation comprehensive preparation of the combat operations and during the course of their conduct insurance of the effective application

1. The work of the commanders and the control units with respect to maintenance of high combat readiness of the troops in peacetime and wartime is in need of special investigation in detail, and therefore it is not considered in this book.

by the subordinate subunit of the available means of destruction and direction of their efforts at the successful fulfillment of the combat mission, that is, the rout of the opposing enemy in the minimum time, with least losses for themselves, least expenditures of materiel and also the capture or holding of a defined section (area, line) of the terrain.

The given goal follows from the very essence of combat operations and, of course, is absent in any other area. The combat troop control is realized not for the sake of control itself, but for the sake of achieving the indicated goal, the performance of the assigned combat mission. By the results of the assigned combat mission, that is, the effectiveness of the utilization of the forces and means of destruction, especially with respect to the number of enemy losses and losses of our own troops, it is possible and above all necessary to estimate the effectiveness of troop control on the part of any commander or control unit. These are the main criteria for evaluation not only of the troop operations but also the activity of the commanders and staffs. It is quite obvious that it is impossible to consider troop control successful if the subordinate subunits and units have not carried out their combat mission or they have carried it out with great, unjustifiable losses and have achieved the planned combat goal at too great a price.

All of the remaining special criteria and effectiveness indexes of control such as for example, the operativeness (speed) of the system with respect to taking each control measure, its stability with respect to nuclear strikes, radio interference and enemy fire, rhythmicity and continuity of effect, secrecy, carrying capacity of communications channels, precision of the data received and the calculations performed, the qualification of the officers, intensity, efficiency and conditions of their labor, the equipment with the control means, completeness and reliability of information, the quantity, quality and times of development of the documents, the economic expenditures on the maintenance of the entire system and so on can be considered only as auxiliary to the above-indicated main criteria, especially the size of the losses of our troops, inasmuch as for us the people are the most valuable "capital," and preservation of their lives is the highest standard of the price of victory and, consequently, the quality of troop control.

This is the specific nature of combat troop control by comparison with control in any other area.

The content of troop control, that is, the functions which the commanders and the control units perform both in preparation and during the course of combat operations to achieve the enumerated goals--maintenance of high combat readiness of the troops and their successful execution of the assigned combat mission--differ significantly in combat by comparison with other conditions. Here certain functions characteristic of other units, although they keep their names, have a different internal meaning, and part of them are auxiliary, characteristic only of troop control. In addition, it is important to note that the volume of operations of the commanders and

the control units of all of the echelons when performing each function in modern combat by comparison with the past has increased significantly, and the time for this has been reduced sharply, which was the consequence of the appearance among the troops of new combat materiel, an increase in the spatial dimensions and the rates of the combat operations and also a reduction of the time for combat preparations. In contrast to the past, the commanders and staffs now must solve, for example, such new and complex problems as the organization of control in the presence of means of nuclear attack by the enemy, the effective use of the results of the nuclear strikes of our own troops, the organization and conduct of combat operations with the application of different destruction means, the restoration of the combat readiness of the troops after nuclear strikes by the enemy, the organization of the negotiation of contamination and destruction zones by the troops and many other problems.

In order to confirm what has been stated, let us consider how any commander or control controls the troops in combat, and what functions are performed (see Figure 4).

The first of their functions always is the gathering and processing of data on the situation. In other areas, the analogous function, as we have already seen, is called obtaining information of state by the control unit or organ. The process of troop control on the part of any commander or headquarters staff begins with it. Whatever the general or the special goal they have when preparing for combat operations and during the course of the combat operations (improvement of the combat readiness of the troops, ensurance of this successful performance of the stated mission, the organization of interaction of the troops, reconnaissance, treatment of the wounded, and so on), their practical activity always and everywhere begins with obtaining and receiving data on the objective, actually developing combat situation. Without this, they cannot take even one step along the path to the planned goal, or if this is done, then gross errors and subjectivism are unavoidably permitted.

It is important to note that in a number of sources the given control function is called not gathering (receiving), but obtaining the situation data. This designation also cannot be considered correct inasmuch as it does not correspond to reality, it leads to confusion in theory and practice of troop control. The commanders and the staff officers, especially for the lower echelons, themselves procure the situation data only by personal observation of the battlefield, performing reconnaissance functions in this case. All of the remaining data they gather (receive) from various sources which procure this data. Thus, the data about the enemy are procured by the forces and means of reconnaissance. They reveal his targets, they determine their composition, location, and so on. The data on the radiation situation and the weather are determined by the corresponding instruments, on air targets, by radar, and so on. The function of the commander and the staff consists in timely gathering (receiving) and studying of all of these data from the corresponding sources and skillful use of them for achievement of the combat mission. If they are completely invested

with the function of procurement of the data, then such concepts as the "troop control," "control system" and so on are expanded to boundless limits in theory and practice.

However, this is a matter not only of the name and significance of the given function. The main thing consists in its specific content which is characterized by the large volume, variety and contradictory nature of the data which the commander and the control units need when controlling the troops in modern combat.

For successful troop control, any commander or control unit requires data on the following factors which are called the situation elements: the enemy, his troops, neighbors, terrain, radiation situation, hydrometeorological conditions, time of year and day, economic condition of the combat operations zone and social-political composition of the population. In the American Army, the individual element of the situation is considered to be the content of the mission received from the senior officer.

The commanders and headquarters staffs need to collect data on all of the enumerated elements of the situation in modern combat from a much greater area than previously, inasmuch as the width of the combat operations zones and the depth of the missions performed by the troops are much greater. Many of the situation data will quickly become obsolete at the modern rates of combat operations, and some of them, especially the data on the enemy, will be incomplete, contradictory and even false, for the enemy will try to use all measures to hide his grouping from us, deceive and introduce confusion. A number of important pieces of information are still difficult and even impossible to measure precisely quantitatively. This information, for example, includes the data on the political-moral and psychological state of the personnel, the degree of combat training, the national characteristics, the resistance in the presence of fatal danger, the mental, organizational and volitional qualities of the commanders, and so. This characteristic of the information, in the opinion of foreign specialists, is especially important to consider not only when making the combat decision and planning combat operations but also when solving the problems of automating the troop control processes.[1]

The sources and means by which the commander and the troop control units obtain combat situation data are distinguished by great variety, which has been taken into account in the fourth chapter of this book.

The next troop control function is the combat decision-making and combat operations planning by the commander.

The essence of any decision consists in determining the goal of the operations and selecting the forces, materiel, procedures and time for achievement of it; in any control system with the participation of man, the

1. See the L'ARMEE journal, 1968, October, pp 46-49.

decision is the result of his knowledge, creativity, experience and will. Without refuting the role of the latter, it is still necessary to point out that the will must be based on deep knowledge of the laws operating in the given environment, proper estimation of the objectively developed situation, the available forces and materiel. Subjectivism and voluntarism are unavoidable otherwise. The volitional impulse of man is useful when it is a reflection of the objective world. This is especially important when the commander makes a combat decision dealing with the application of nuclear weapons, inasmuch as not only the success of the performance of the combat mission by the troops depends on his scientific judgment and correspondence to the combat situation, but also the life of the subordinate personnel, and on an operative-strategic scale, the fate of the country as a whole, its social and political structure. This arises from the fact that combat theoretically differs from any other social phenomenon. Any combat is a component part of a two-way process of armed combat in which the enemy also strives to destroy our troops. Here the modern troops have not only missiles, tanks, guns and other combat weapons, but primarily the people using them are organizationally reduced to the various subunits and constantly subjected to mortal danger. They are always characterized by a sense of fear and self preservation. The combat decision of the commander under these conditions is to combine them into a united whole, to ensure clear interactions with respect to target, time and location between them, to subordinate their operations to the single will of the commander. Therefore in our army the decision is correctly considered to be the base for the troop control, and making it is considered the most important creative function and personal act of the one-man-command commander. All remaining measures with respect to control and also the operations of the troops themselves with respect to the execution of the combat mission are realized in strict accordance with the decision.

Considering what has been stated, it is possible to give the following definition of the essence of any commander's combat decision: a combat decision is the result of the creative thought and will of the commander determining the goal of the combat operations, forces, materiel, procedures and times for achievement of it and also the mission of the subordinates based on the laws and principles of military science, proper explanation of the combat mission and evaluation of the situation.

The most important requirements of the combat decision are its scientific substantiation, that is, the correspondence to the developed and expected situation, the assigned mission, the intention of the senior officer, the laws and principles of the conduct of combat operations reinforced in the rules and regulations. Only in this case can the decision be a reliable basis for control. It is especially important that the decision be unexpected (a surprise) for the enemy, that it be substantiated by the corresponding calculations of the combat capabilities of the troops on both sides and ensure the best (optimal) application of the means of destruction by our own troops, give the greatest effect, impose maximum losses on the enemy and reduce the losses of our troops to a minimum. The decision made by "intuition" not corresponding to the situation leads either to statement of

unrealistic (unfulfillable) missions for the troops or incomplete utilization of their combat capabilities. In the past, these errors let themselves be known gradually, and they could be eliminated during the course of the combat operations. In modern warfare, especially when conducting combat operations with the application of nuclear weapons, they can be felt instantaneously and be fraught with much more serious, at times irreconcilable consequences than before, including the knocking out of entire elements of the combat structure of the troops and unjustified losses of personnel. It is also necessary to note that the erroneous combat decision has a negative influence on the moral-psychological state of the subordinate troops, it destroys their faith in the capacity of their commander and the possibility of achieving success.

In addition to substantiation, even the decision for combat must be a spontaneous one, it must permit the troops to prepare carefully for its execution, to prevent the enemy from opening fire and also be as clear as possible for the subordinates, excluding different understandings of it.

The satisfaction of the enumerated requirements on the decision, especially its optimalness and the timeliness of making the decision is complicated significantly under modern conditions by the fact that in contrast to the past, the time for preparation of combat operations has been reduced sharply, and the volume of control measures has increased.

In addition to the increased significance of optimalness (substantiation) and timeliness, the combat decision differs from the decisions in other areas by the fact that its quality is impossible to check in practice for known reasons (impossible to rehearse), before the beginning of combat operations under conditions that are absolutely similar to them. This peculiarity of the commander's decision has been figuratively described by K. Simonov in his book "Soldiers Are Not Born." One of the heroes of this book says: "There are no rehearsals in war in which it is possible to make a dry run--it is not that way, but later it is as it must be. There are no script writers who can edit and rewrite the script in war. Here everything is written in blood, everything from beginning to end, from a to z..."

The given deficiency can be compensated for to a known degree by the mathematical simulation of the decision for the forthcoming combat operations and checking (playing) it by computer. This method, as is known, has been widely used at the present time in decision making and production planning. Its introduction is a characteristic feature of the modern science of control. However, when making a decision for combined-arms combat, it is accompanied by significant difficulties which consist in the following.

First, the series of situation data which are initial to the mathematical simulation, especially the data on the condition of the personnel on both sides, are not subject to exact quantitative measurement, but nevertheless have important, at times even decisive significance for decision making and achieving success in combat. When waging the aggressive war in Vietnam,

the American generals and officers, as it appeared to them, had calculated everything and hoped for an easy, fast victory. However, they lost the war, for they did not take and could not take into account the high moral spirit and strength of the Vietnamese.

Secondly, each new battle is never an exact copy of the preceding one inasmuch as the same situation does not arise under which the decision is made.

Thirdly, a large number of subunits of the combat arms and special troops, differing sharply from each other in purpose, organization, arms, capability and methods of operation, participate in the modern combined-arms combat.

Fourthly, the substantiation of the combat decision made must be evaluated not by any criterion but immediately by several indexes differing as follows: the expected loss of the enemy, prevented or possible losses of our own troops, the consumption of materiel and time for carrying out the combat mission, the capture (holding) of territory and also the social-political consequences of the forthcoming combat operations.

Fifthly, in the combat situation the greatest success can often be achieved by the commander who makes a less substantiated but unexpected decision for the enemy from the purely mathematical point of view. A. V. Suvorov also wrote: "Surprise is victory," and this aphorism has profound meaning also under modern conditions. Combat is above all a battle of minds, the struggle of intellects. Behind the bare figures and any formula, every commander must see live people, his own troops and the enemy opposing them, intelligent and strong, knowing the tactics and the "algorithm" for decision making and waging war.

Thus, when making the combat decision it is necessary for the commander to deal with many contradictions, the basic of which are the contradictions between the necessity for having a scientifically substantiated decision and the difficulty of obtaining all of the data necessary for the situation and to create a mathematical model of the forthcoming combat; between the necessity for reducing the decision making time and the growing volume of initial information required for this, for gathering, processing and the study of which it is necessary to spend a significant amount of time; between the requirement of simplicity, clarity and brevity of the solution and the large volume of command information which must be provided on the basis of the decision to the subordinates; between the number of possible losses of the enemy and our own troops and the consumption of materiel and time for this; between the capture (holding)of territory and the social-political consequences of the combat operations which are to be conducted when carrying out the decision; between the objective and subjective factors influencing the content of this decision.

Practice and theoretical studies indicate that for successful resolution of all of these and other contradictions during combat decision making,

primarily it is necessary to have a close combination of logical and mathematical methods and also profound knowledge and experience of the commander, his skills and creative thinking, courage, decisiveness, strong will, developed intuition, prediction of the course of the forthcoming combat operations, ingenuity, the capacity to take a substantiated risk and to take on the responsibility for its consequences. The ideological-political, philosophical, mathematical and purely military knowledge and also the experience, art and subjective moral-volitional qualities of the commander which often play an important role in achievement of combat success are concentrated in the commander's decision as at a focal point. Mathematics and computer engineering are only a powerful tool which improves the creative possibilities, the art of the officers with respect to making a substantiated decision.

The making of a combat decision by the commander is continuously connected with a concept such as the planning of the combat operations of the troops. This, both from the logical and from the technical points of view, is a united, continuous process. Theoretically the opinion encountered in print that initially the commander makes a combat decision and only then does the headquarters staff begin to plan the combat operations is erroneous. This opinion does correspond to reality and in practice it unavoidably leads to procrastination, time loss, red tape, and the abundance of unnecessary documents, and so on.

The essence of the planning of the combat operations consists in determining the sequence, the methods and times for the fulfillment of the assigned mission and also the number and grouping of the troops required for this, the procedure for their interaction, their comprehensive support and control. It follows from this that when the commander makes a combat decision, that is, he plans the operations, the combat missions for the subordinate troops with determination of what enemy, where and when they must be routed, where to apply the main strike, how to construct the combat formation, how to support the interaction with respect to missions, lines (objects) and time, then at the same time he does none other than plan the combat operations. He carries out the basic planning missions. Therefore the solution is the basis for the planning.

After decision making, the planning process does not begin, but it continues and is completed. Here the staff and the chiefs of the combat arms and services under the leadership of the commander make the individual elements of the decision more specific and give it more detail, especially those which pertain to the procedures and the times of operations of the troops, the procedure for their interaction and support. They are substantiated by the necessary calculations and additional situation data. If there is no possibility for this (for example, in the absence of time), they are limited only by decision making. For these arguments, the "combat planning and operations" term frequently is used only when we are talking about the work of the commanders and the control units of the higher echelons, beginning with the division. However, this does not mean that the company, battalion and regimental commanders do not have their own combat plans. Their combat decisions fixed in memory or depicted on the map (diagram) and

playing out in detail with subordinates on the terrain--these are the plans, the models of the forthcoming combat operations.

The planning of the combat operations of the troops, just as their interaction and the control of them, is an objective necessity, the law for the preparation and conduct of any battle. It follows from the effect of the law of dialectic interrelation and interdependence existing in nature and society, especially where the collective of people is in operation, even the very smallest (the squad, the combat crew and so on). No commander can ignore the given law just as any other law. Their role can consist only in profound understanding and skillful use of each law. The proper understanding of the objective and subjective aspects of troop control is the most important procedural initial point in the solution of all of the control problems, and above all the combat decision making and planning of combat operations.

The sharp line between combat decision making and planning of combat operations cannot never be drawn. The difference lies only in the degree of detailing of certain problems: in the decision they usually are reflected in more general form than during further planning.

The combat decision made by the commander will become the law for the subordinates after it has become known to them. Therefore the functions under the commander and the control units following the decision making and combat planning are the conveying of the combat missions to the troops and the organization of their interaction. Both of these functions are essentially also constantly connected with each other. Giving the combat order to the subordinate troops and indicating to them what enemy, where and when they must attack, at the same time the commander to a known degree coordinates their efforts and operations with respect to target, time and location, which is the essence of the organization of the interaction. However, as the experience of World War II has demonstrated, the statement of the missions for the troops alone is insufficient to achieve their close, continuous interaction. In addition, it is useful to give them further instructions on how they must act when carrying out their missions in order to give each other mutual aid and by coordinated efforts successfully carry out the common combat mission.

During World War II these instructions were usually given after the subordinate commanders received the missions, made their decisions and reported them to the senior officer. In modern combat, as a result of the sharp reduction in time for preparation, this working sequence will not always be possible. Most frequently the commander, for example the battalion commander, is forced to give the subordinates instruction on the interaction immediately after delivery of the combat missions to them. Both of these functions therefore are closely connected not only with respect to their sense, but also with respect to the execution.

The next control function when preparing for combat is the organization of the comprehensive support of the combat operations. The purpose of

this function is that the subunits of the combat arms create the necessary conditions for successful execution by them of their combat missions with respect to routing the enemy. The object of control on implementation of it is basically the special troops and rear services subunits. The given function also differs from the analogous function in other spheres of the control of the variety and complexity. With respect to the opinions regarding the commanding of modern armies, the basic types of support of combat operations in any control element, including the battalion, are the following: reconnaissance, protection against nuclear weapons, security, camouflage, engineering, rear services and supply (including medicine) and technical support. In the American Army, in addition, a great deal of attention is given to the type of support, such as radio and radar support. In the higher echelons of a number of armies, hydrometeorological and topogeodetic support of combat operations is specially organized. In our opinion, it is expedient to include the commandant service in these types of support inasmuch as it will pursue the goal of supporting organizational displacement and operation of the troops and also the procedures for their deployment.

It is especially important to consider that for the organization of each of the enumerated types of support it is objectively necessary to have additional (special) data on the situation, on the basis of the general intention of the commander for the battle to determine the missions with respect to the given type of support and convey the missions to those responsible for accomplishing them.

An exceptionally important function of combat troop control which permeates all the remaining functions is the organization and performance of the political work with the personnel. Its specific mission in combat (by comparison with other conditions) is to ensure the formation of a strong moral spirit in each officer, sergeant and soldier, their deep understanding and implementation of the policy of the CPSU and the Soviet government, maintenance of high combat readiness of the troops, knowledge by the personnel of the target and the nature of the war being waged and their specific mission, the strengthening of the psychological state, certainty of success, courage and offensive impetus. It is charged with inculcating in the troops loyalty to their oath, hate for the enemy, vigilance, a sense of collectivism and mutual aid, strengthening of one-man command and discipline, popularization of heroism, skillful use of equipment, an effort to carry out the mission, in spite of any difficulties, to the point of self-sacrifice. The purpose of the political work is concern for the support of the personnel with everything required for combat and life. A component part of the political work is the struggle against bourgeois ideology, education of the personnel in the spirit of nationalism, and combat cooperation with the armies of other socialist countries.

It is especially necessary to discuss the specific function of combat control such as the preparation of the troops for the combat operations. The experience of World War II has demonstrated that in addition to the statement of the goals for the troops it is very important to conduct exercises with the commanders, the staff and the subunits of the troops and

special troops and training with respect to their execution under conditions that approach the conditions of the forthcoming combat operations to the maximum. Of course, for modern times, the possibilities for such exercises and training will be highly limited as a result of insufficient time, but they cannot be forgotten or completely excluded.

The commanders and the control units must make use of the most important possibility to achieve solid knowledge of the combat mission and the method of carrying it out by each officer, sergeant and soldier. A. V. Suvorov considered that every soldier must know his own maneuver. In accordance with this behest, the commanders and headquarters at all levels during World War II never begrudged time to train the personnel in the execution of the forthcoming combat mission under conditions approaching reality to the maximum. Thus, when training for the offensive with a river crossing, the commanders and the headquarters staffs of the units of the 72nd Rifle Division of the 42nd Army of the Leningrad Front worked out such problems with the personnel in January 1943 as the procedure for using the crossing equipment, the capture and reinforcement of a bridgehead on the opposite bank of a river, the organization and support of the interaction of the rifle subunits with the artillery and the engineering troops.[1]

In estimating the significance of such exercises and training, the commander of the Second Guards Army, analyzing the Silesian operation, noted the following: "Fifteen to 20 days before the beginning of operations, we began to perform joint training... Subsequently, during joint reconnaissance, the officers of the combat arms were very satisfied and they were plesantly surprised that those who trained together in the exercises would go into battle together. They knew each other, and real confidence and mutual understanding were developed. This was highly valuable for combat."

Of course, the training of the troops for combat is not limited to exercises and training sessions. It is closely connected with measures to support the troops with all that is needed for combat and life, and also their regrouping, occupation and equipment of the initial positions, and so on. The function of preparing the troops for combat, consequently, can have no bounds.

A function such as the organization of troop control itself has no less specific nature. When performing the given function under combat conditions, on the basis of the combat decision of the commander, usually the following basic measures are taken:

a) The corresponding system of control points is determined and created, their composition, technical equipment, locations and deployment

1. Arkhiv Mo SSSR [Archives of the USSR Ministry of Defense], f. 397, op. 9247, d. 12, l. 1-55.

time are established, the engineering equipment is installed, their security and defense are organized, the displacement procedure in the course of the combat operations and their recovery in case of failure of one point or another are planned;

b) The work of the duty personnel at the control points is organized with exact determination of who, what, where, when and how it must be done;

c) The relation to the subordinate troops, the higher headquarters, the neighbors and the interacting subunits and units and also classified message procedures for the troops (SUV) are organized.

Finally, an important control function is the monitoring of the readiness of the troops for combat operations with rendering of the necessary aid to them. Its primary goal consists in each soldier, sergeant and officer exactly knowing his mission in the forthcoming battle and in all respects being ready for successful fulfillment of this mission by the use of the equipment entrusted to him. With respect to content, the monitoring includes primarily the study of the actual state of affairs in the troops, the making of a decision on the basis of this study, to eliminate the discovered deficiencies and to convey the corresponding orders (missions) to the subordinates.

This is the basic content and specific nature of the troop control functions when preparing the combat operations.

Troop control during combat operations is really a direct continuation of the above-investigated control functions carried out when preparing for combat. The basis for it is the implementation of the adopted decision with the introduction of the required directions with respect to the measure of the variations of the situations specifically developed during the course of combat.

Thus, when controlling the troops during the course of combat operations, in order to maintain combat capacity at a high level or restore the lost combat capacity of the troops and achieve successful execution of the assigned combat mission by them, the commander and the control units do none other than continue the gathering and the study of the data on the actually developing situation; accordingly, they more precisely define the previously made decision, and with sharp changes in the situation, a new decision is made; the more precisely defined, or new missions, are conveyed to the subordinates, and continuous interaction of the troops is maintained; the realization of the measures with respect to support of the combat operations and political work is directed by them; they provide for continuity of the troop control and restore it in case of disruption; they monitor the course of the combat operations with indication of the required aid to the troops in the fulfillment of their missions. In addition, they study the experience of the combat operations in order to use this experience in the future to improve the combat readiness of their troops.

As is obvious with respect to their content (the name of the functions), during the course of combat operations troop control does not differ theoretically from the control when training the troops. Out of all the enumerated functions, the main, always mandatory, stable and in practice constantly repeating functions are the gathering and processing of the data on the situation, making a decision by this data and conveying the missions to the agents responsible for carrying it out. Whatever general or special purpose is pursued, both during preparation and during the course of combat operations, to achieve it, the commander and the control unit are objectively forced to have and study the corresponding data on the situation, make a decision and convey the missions to agents responsible for accomplishing them.

If all of the remaining functions and measures can be of a random nature and are somehow supporting, then exclusion from the control cycle of even one of the three mentioned main functions unavoidably leads to disruption of control and, consequently, to disruption of the execution of the mission.

These functions must be repeated especially frequently for the commanders of the lower tactical echelons. Let us take, for example, the battalion echelon. The battalion can perform its mission on the offensive in a comparatively short time, after which it receives a new mission. Consequently, during the days of combat operations, the battalion commander must evaluate the situation data several times, make a new decision and give the mission to the subordinates without elaborating a more precise definition of the decision during the course of the performance of each subsequent mission.

Thus, on the basis of the analysis of the structure of the system, the goals and the content of the troop control during preparations and during the course of combat operations it is possible to give the following definition of its essence: combat troop control is a purposeful activity of the commander, staffs, political agents, chiefs of the combat arms and services with respect to maintenance of high combat readiness of the subordinate subunits, preparation for their combat operations and direction of efforts at the external execution of the combat mission during the course of combat by effective application of the available forces and means based on the laws of armed combat and the principles of military science. Here, among the many control functions both during training and during the course of the combat operations, the most important are the following: the gathering and the study of the situation data, the making of the combat decision and more precise definition of it by the commander and the delivery of the missions to those responsible for accomplishing them.

The given definition of the essence of troop control does not contradict the formulations discussed in the official sources. It only specifies them and indicates, who, for whom, on the basis of what, for what purpose and in what wy the combat troops are controlled considering its specific nature. In addition, this determination completely corresponds to the philosophical and cybernetic understanding of the essence of any control as

an information process, including obtaining, storing, converting and disseminating the information. Its not only theoretical but also practical significance consists in the fact that it indicates to the officers all phases and to the scientific and engineering workers, the main, decisive element in the entire great chain of control measures. If by using the latest technical means (including automated means) the officers reach a point where they always know the actual situation, quickly make a substantiated decision and state the missions for those responsible for them in a timely fashion, then all of the main modern problems of troop control can be considered solved.

Modern Requirements of Troop Control[1]

The determination of the essence of combat troop control and its specific nature presented by us will become still better based if we, in addition to the targets and the content, consider the conditions of control and the basic requirements following from them, that is, its basic qualitative and quantitative characteristics indicating to what degree the commander and the control units are capable of orienting themselves confidently in the situation, to make a purposeful combat decision, to state the combat missions in a timely manner and understandably, to convey them to the subunits, organize the interaction, comprehensively support the troop actions, soundly and persistently implement the decision.

Of all the conditions determining the requirements on troop control, the means of destruction and the nature of combat operations used by the warring sides always have the greatest effect. It is quite obvious that the most complex conditions for control will occur during preparation and during the course of combat operations with the employment of the entire arsenal of weapons of destruction, including both nuclear and conventional weapons. We can take them for the basis of the investigation since if the control corresponds to the requirements imposed on it under such complicated conditions, then at the same time it will be successful during combat without the employment of nuclear weapons.

When preparing and conducting combat operations with the employment of nuclear weapons and modern conventional weapons the controlled troops can be placed in a very difficult position. As a result of the nuclear strikes of the enemy, they can in a short time (almost instantaneously) impose losses unheard of in past wars. It is not excluded that their organizational integrity and combat formation will be disrupted. After the nuclear strikes,

1. In the first edition of the book, the given question was investigated in Chapter II, "Development of the Theory and Practice of Troop Control," which has been excluded in this edition in connection with the publication of the book: N. N. Popel', V. P. Savel'yev, P. B. Shevmanskiy, "Upravleniye Voyskami v Gody Velikoy Otechestvennoy Voyny" (Troop Control During the Great Patriotic War), Moscow, Voyenizdat, 1974.

they, as a rule, will be attacked by a large mass of tanks, by motorized infantry on armored combat vehicles, by combat helicopters and other enemy equipment. Locally broad zones of radioactive contamination, destruction, flooding and fires can be formed. The personnel can receive large doses of radiation and be subjected to previously unheard of moral and psychological shock, especially at the beginning of the war when they still will not have experience in the conduct of combat operations with the actual employment of nuclear weapons.

Under such conditions the most important requirement on troop control is high combat readiness of all echelons in the entire control system. The essence of a given requirement consists in constant readiness of the commanders and the control units of all stages to assume control of the subordinate troops literally from the first minutes after receiving the combat alarm signal or a surprise attack of the aggressor, and to ensure successful fulfillment of the combat mission in any complex situation.

From the given definition it is obvious that the high combat readiness of the control system is one of the important factors of troop combat readiness as a whole. Here it must be noted that the readiness of the control and communications system must be achieved somewhat prior to the general readiness of the subunit, orecede it, be at a higher level and more mobile than it is. The satisfaction of this requirement can be achieved by timely and complete manning of the control units with efficient, highly qualified personnel; proper scientific organization of the work in the staff headquarters, skillful placement, distribution and careful camouflaging of the control points; comprehensive technical equipment of staff; effective utilization of the means of automation of troop control; ensurance of the flexibility and high vitality of the communications system and its noise protection; clear organization of the combat duties; training of the control units in performing functional peculiarities under complex conditions, in fast recovery of the disrupted interaction and troop control.

The above-presented conditions of the preparation and conduct of combat operations, and especially their acute, stressed and forced nature, again impose a requirement on troop control such as soundness by which we mean the capacity of all of the officers without exception, and above all, the commanders, to make a courageous decision, persistently implement it, retain control of the subordinates in their hands, preserve the organization and achieve fulfillment of the combat mission in any complex situation. For this purpose the officers must have, in addition to knowledge and skills, exceptional bravery, decisiveness, courage, great strength of will and persistence, the capacity to take a substantiated risk, properly and quickly to think under moral and psychological stress, and have a mobilizing, organizing effect on the people. Combat experience considers that the smallest fluctuations and indecisiveness, the frequent and unfounded change of the missions of the troops in difficult areas unavoidably get to the subordinates and have a negative effect on them. The strength of control, consequently, is characterized basically by the personal (subjective) qualities

of the officer, which can hardly be measured quantitatively, that is, it is hardly possible to introduce any stability coefficient of man, although such efforts have been made. Instead of these efforts, of course, it is better to concentrate the main efforts on education of high qualities in the officers in their training system.

However, the strength of control cannot be understood in a way that the commander must persistently, in spite of logic and common sense, adhere to a previously made decision. Modern combat is characterized by more frequent and sharp changes in situation than in the past wars. Under such conditions it is hardly possible to hope that the combat will automatically develop exactly in accordance with a previous plan. Unavoidably, it is necessary to introduce corrections and refinements. Therefore, the control must not only be strong but also flexible in this case. By flexibility of control we mean the capacity of the commander to more precisely define the previous decision in time, and if the situation has changed sharply, then to find the strength of will to drop it, make a new decision, rearrange the control system and the methods of its operation in accordance with conditions in the new situation. The requirement of flexibility of control, consequently, refers not only to the commander personally but also to the entire control system. For this purpose the commanders and the control units must have reliable communications with the troops, they must always feel the "pulse of the battle," constantly know the situation, react in a timely fashion to changes in the situation, lead them and prevent possible complications.

However, flexibility of control cannot be identified with indecisiveness of the commander leading to frequent and unfounded changes in the decision made and the orders given the troops. The latter, as wartime experience indicates, always has a harmful effect on troop control and the troops' performance of the combat mission.

In modern combat, the requirements on control consist of continuity or stability, assuring proper functioning of the control system and maintaining its capacity to ensure continuous communications with the troops, constant knowledge of the situation by the commander and the staff and the possibility on their side of exerting the required influence on the course of the combat operations by the available forces and materiel.

The significance of this requirement has increased in connection with the fact that in comparison with the past, the capabilities of the enemy with respect to the destruction of our control points by nuclear and conventional weapons have increased a great deal. In addition, the maintenance of continuous control is complicated by the increasing rapidity of modern combat operations, the prolonged movement of the control points and increased distances between them. Under such conditions, the continuity of control is ensured primarily by active reconnaissance, stability of communications, high viability and mobility of the control points.

The basic quantitative criterion of the continuity of control can be the time during which there is no communication with the troops, and therefore the commander and the staff cannot obtain data on the situation and convey the missions to the subordinates. Considering the speed of modern combat operations, at the battalion echelon an operation cannot exceed a few minutes, for otherwise the attacking subunits can penetrate to a distance such as to complicate the making of a decision by the commander, especially to fire on the enemy without the danger of destroying his own subunits.

In addition, the continuity of control can be characterized by the probability of failure of the control points as a result of the enemy's application of various means of destruction to them, the time for their restoration and the probability of disruption of the communications by radio interference.

The requirement of secrecy on control has no less significance in modern combat. The essence of the given requirement consists in the keeping from the enemy all of the measures performed with respect to control. Its violation with the modern means of enemy reconnaissance and attack also can lead to serious consequences. The basic criteria of secrecy of control are the probability of detection by the enemy of our control points, the interception and decoding of conversations and transmissions over the communications media.

In order to ensure secrecy of control, high vigilance of all personnel is required along with strict regimes and clear cut procedures for the use of communications media, especially when holding radio conversations, security measures for the people participating in the development of the combat planning documents, the careful storage of documents, secret location and movement of the control points and observation of camouflaging measures.

The efficiency and high quality of troop control depend to a significant degree on such requirements as efficiency in the work of the commanders and control units, which is understood in their capacity to perform all of their functions quickly, in anticipation of the enemy, completely and qualitatively. Above all, this pertains to the collection of information about the situation, the making of a decision concerning it and the conveying of instructions to subordinates in order to grant them as much time as possible for preparation of combat operations.

The given requirement arises from the nature of modern combat operations, which are distinguished from those of the past by their increased dynamic nature, more frequent, faster and sharper changes in the situation, and speed. In the last war, the troops attacked on the average at a rate of one to 2 km/hour and they moved on foot at a speed of 4 to 5 km/hr. Under such conditions, the delay, for example, of the situation data by 1 or 2 hours was to a known degree admissible even in tactical control echelons, inasmuch as usually during this time no sharp changes took place in the situation. In addition, the commanders at all stages to the frontline troop

commander could personally observe the course of the combat operations if not in the entire zone, then in the primary direction.

The situation is entirely different in this respect now when the volume of operations with respect to control has increased significantly, and the time for their execution has been sharply decreased. An effort to save and gain time, not only hours but minutes and even seconds during control has become an urgent requirement of combat activity, the primary problem of control. The time spent on implementing each control measure is one of the criteria for the capacity of the control units to deal with the complex mission of troop control in modern combat.

Especially high efficiency is required in the organization of the battle with newly detected nuclear missile systems and nuclear artillery of the enemy, inasmuch as the time for them to be in the launching (firing) positions will be reckoned in only a few minutes. Upon their detection by our reconnaissance group during deployment, in minutes the commander must receive data, evaluate, make a decision, and transmit instructions to his means of attack, and they in turn must be prepared to carry out the missions and strike against the enemy. In case of hesitation, the enemy could strike first and leave the occupied area.

Consequently, the basic quantitative criterion (index) of efficiency of control can be the time spent by the commander and echelon staff for one control cycle, that is, to obtain and study the situation data, to make a substantiated decision with respect to it and deliver the missions to those responsible. This time, of course, must be as short as possible in order to provide maximum time for preparation of the troops to carry out the mission, to ensure making the strike before the enemy, and effective application by our troops of the weapons of destruction. Its specific duration in each individual case and in each echelon must have its own limit, the exceeding of which (other conditions being equal) will lead to disruption or incomplete execution of the assigned mission. This maximum admissible duration of one cycle is called the critical control time.

It is natural that for the various combat arms the critical time will be different. It is one matter, for example, when controlling antiaircraft subunits during repulsion of an enemy air attack where the critical control time is measured in a few seconds, and another matter when controlling rear subunits, where several hours will often be admissible.

In any case, this time must not be reduced as a result of the control quality, especially as a result of the substantiation of the decision made and violation of secrecy. Hurrying and a superficial solution of the problems are not compatible with understanding the operational efficiency of control.

In order to achieve high operational efficiency of control without loss of quality, of primary significance are the high professional level of training of the commanders and officers of the control units, their organizational capacity, their skillful use of the latest means of mechanization

and automation of the control processes and also the application of exact calculations and the most effective methods of work.

The basic requirements on troop control determined by modern conditions of preparation and conduct of combat operations are these. They are all in close interrelation and dependence, and failure to satisfy even one of them can lead to interference with the fulfillment of the combat mission.

Characteristic Aspects of Troop Control in Combat

The goals, the content and the conditions of troop control in combat investigated by us indicate that it is of a multisided nature.

Of all aspects of troop control in combat, it is necessary to note first the ideological-political side, the essence of which consists in close combination of the purely military leadership with political, with the implementation of the ideology and policy which prevails in our country, the effect on the subordinate people not only by the administrative, but also political methods (propaganda, agitation, education, persuasion, and so on).

The given aspect of control has, of course, its place also in other areas of social life. "...Without the proper political approach to business," V. I. Lenin taught, "the given class will not remain in power and, consequently, it cannot solve its production problems."[1] However, during troop control in wartime this aspect acquires a special nature in connection with the fact that any war, by definition of the founders of scientific communism, is a continuation of the policy of the powers and various classes interested in it by other, namely powerful means, and the basic content and main method of achieving the political goals of any war or armed combat. This means that when controlling the troops in combat, the officer of any army will implement the policy of his class and the ruling party by the application of the forces and means of destruction and the developed methods of routing the troops of the opposite side afforded him. The basis for this control is always the principle of party nature, class and government approach to the solution of the practical problems. Any statement in the bourgeois press on their officers' being outside policy has nothing in common with reality. Any army is a weapon of the state. Each officer of the bourgeois army always defends the interests of the bourgeoisie, implements its ideology and policy aimed at suppressing the revolutionary movement inside their country and enslavement of the peoples of other countries. Any bourgeois control theory therefore is an inseparable component part of the bourgeois ideology and policy.

In the Soviet Army and in the armies of other socialist countries, the ideological-political aspect of troop control has a theoretically different nature. Here every officer is a conductor in the life of the ideology and policy of the Communist Party. All of this activity is aimed at protecting the peaceful labor of the Soviet people and the peoples of the other

1. V. I. Lenin, Complete Collected Works, Vol 42, p 279.

socialist countries from imperialist aggression and also the reinforcement of the fraternity and international friendship with the peoples of all countries. For this purpose he is obligated to study deeply Marxist-Leninist theory, know party policy and government policy, explain it to its subordinates, have the characteristics of the Leninist style of management such as high ideological nature and conviction in the creativeness of the business of communism, political maturity and feeling. The party nature of the Soviet officer, consequently, means that any matter, any step taken by him, and the operations of the subordinate officers, must be evaluated from the point of view of the interests of the CPSU, the Soviet government, the Soviet people. "...It is necessary," V. I. Lenin taught, "for all forces to achieve in the strictest degree the situation where party outlook will be not only words, but a reality."[1]

The practical embodiment of the given aspect of troop control in our country is ensured by the guiding role of the CPSU in the building of the armed forces and well-arranged party-political work.

A second aspect of troop control in combat is the moral-psychological aspect. It is closely connected with the ideological-political aspect, and is a continuation and supplement of it. The essence of the given aspect is that in troop control each Soviet officer, in addition to having the above-noted ideological nature and political maturity, must himself instill in his subordinates high moral-psychological qualities, especially those such as unlimited devotion to the homeland and hatred for its enemies, internationalism, the capacity strictly to bear all the difficulties and deprivations of combat life, high moral, psychological and physical strength, activity, mutual aid, foreseeing death, readiness to sacrifice his life in the name of saving others, belief in the power of the weapon entrusted to him and the capabilities of the commander. It is also important to achieve psychological compatibility of the troops in the military collectives with each other and with the materiel, considering the fact that the application of the majority of modern equipment in combat (weapons, tanks, launchers, and so on) is connected with the efforts of the collective and depends on the psychological stability of each troop.

On the whole, the given aspect of troop control obligates every officer always to remember the behest of V. I. Lenin regarding the decisive role of the moral spirit of the troops in the achievement of victory. In order to satisfy this behest the officer needs deep knowledge not only of Marxist-Leninist theory but also pedagogics, psychology and skill in the training and education of subordinates, consideration of the moral-psychological state when solving the practical problems of troop control.

A third aspect of troop control is the social-legal aspect. It arises from the fact that any troop collective (the squad, combat crew,

1. V. I. Lenin, Complete Collected Works, Vol 19, p 110.

platoon, company, battery, and so on) and the armed forces on the whole are an inseparable part, a cell of our socialist society, and every troop is a citizen of the Soviet Union. "The Soviet Army," said L. I. Brezhnev at the 24th CPSU Congress, "is a part of our people, living one life with them. Military service in our country is not just a school of combat mastery. This is at the same time a good school of ideological and physical tempering, discipline and organization."[1] The troop control system is therefore a social system by nature.

Accordingly, in order to improve troop control, the knowledge and creative application by the officers (considering the specific nature of military affairs) of the laws of social development and the measures which in the light of the resolutions of the party congress are taken in the country to improve control in other areas, have important significance. Marxist-Leninist theory and the science of the control of society are the procedural base for troop control theory. During the first years of Soviet Power V. I. Lenin wrote: "The experience which Soviet power has had in building the military cannot be considered an isolated experience... The building of our army could only lead to successful results because it was created in the spirit of the general building of the Soviet society..."[2]

The given conclusion of V. I. Lenin under modern conditions where the work with respect to improving the control of social life has developed on a broad front throughout the country has acquired increased significance. In the party resolutions each officer can find much that is valuable for his practical work with respect to troop control. The use in troop control of the latest achievements of the control science and engineering has especially important significance.

In addition, the given aspect of control binds each officer not only in peacetime but also in wartime to be a model and to educate his subordinates in the spirit of the strict observance of Soviet law, the rules of socialist living, the requirements of military regulations and the oath, the strengthening of discipline, organization, collectivism, remembering that it is in the collective that the personality of the troop is primarily sha ed as a defender of the government and the citizenry, and his above-noted ideological-political and moral-psychological qualities are formed. Even the smallest violation in combat of the requirements of the law, the regulations and orders of the senior office by a commander or his subordinates is inadmissible. The commander of the homeland is entrusted with the most valuable asset--the people, the life or death of whom determines the fate of their relatives and neighbors. Man, the soldier, is the essence of society; therefore the control of the soldier always is of a social nature

1. Materialy XXIV S"Yezda KPSS [Materials of the 24th CPSU Congress2, Moscow, 1971, p 81.

2. V. I. Lenin, Complete Collected Works, Vol 40, pp 76-77.

and presupposes the application of the corresponding social and legal norms and methods of influencing him.

It is also important to consider that the state of the art with respect to management and control to a great extent determines the mood of the people, their attitude toward their duty and the orders of the commander. L. I. Brezhnev noted at the 24th CPSU Congress that clearly formed administration permits the creation of a good, businesslike situation in the collectives and causes growth of initiative on the part of the people. On the other hand, "nothing cools people off more than the facts of poorly thought out decisions, stupid bungling or bureaucratic red tape on the part of individual workers..."[1]

Any requirement to carry out the law and the rules and regulations must be combined with the fatherly concern of the officer for his subordinates, polite intercourse with them, respect for their human worth. The administrative relations in society, including among the armed forces, are primarily relations among people with their purely human characteristics, and it is necessary always to be guided by these relations to have a useful effect on the people. Coarseness and an insulting attitude, "iron in the voice" on the part of the officer, have never promoted successful control, they have not strengthened, but on the contrary, have undermined his authority among his subordinates, which has unavoidably been felt in the outcome of the combat operation.

Finally, it is important to note that the social-legal aspect of troop control binds each officer when making a combat decision to consider the social-political consequences of carrying out this decision, what effect these consequences will have not only on his collective but also on social opinion, the attitude of the Soviet people and the peoples of other countries toward our army.

A fourth important aspect of troop control is the organizational-procedural aspect. It is also closely connected with the preceding and requires high organizational capacity in each officer, exactingness, mastery of advanced methods in work, skill in all measures with respect to control, quickly realized and at the same time realized with high quality and on the basis of the scientific organization of labor. The skill of the officer in working with people, in forging them into a fraternal combat collective, the creation of a healthy businesslike situation, mobilization of them to the successful fulfillment of the combat mission in spite of any difficulties or danger is especially important. "...For successful control," V. I. Lenin noted, "it is necessary, in addition to knowing how to convince... to know how to provide practical organization. This is the most difficult problem..."[2] At another place he emphasized that "any administrative work

1. Materials of the 24th CPSU Congress, Moscow, 1971, p 66.

2. V. I. Lenin, Complete Collected Works, Vol 36, p 173.

requires special characteristics. It is possible to be the most powerful revolutionary and agitator, yet an entirely unsuitable administrator."[1] It is also impossible to forget the physiological and esthetic aspects of control aimed at creating normal conditions for labor and rest, the preservation of the health of the people, and improvement of the culture of administrative labor.

Finally, the military engineering aspect of combat troop control has exceptionally important significance. Its essence consists in the firm mastery and skillful use by the officers of purely military knowledge which is made up of the laws of military science, the laws and principles of military art set down in the rules and regulations, the characteristics of the materiel and control equipment, the organization, combat capabilities and tactics of their troops and the enemy troops and also practical skills of the officers directly from the control area. It is necessary especially to discuss the important significance of the knowledge and skills of the officers in utilizing the latest technical control means which appear as a result of scientific and technical progress. Without them, successful control in modern combat is impossible. They, especially the radioelectronic devices, constitute the "nervous system" of modern troops.

All of the basic aspects of combat troop control that we have investigated are closely interrelated and constitute a dialectic unity. This requires of the officers profound, complex knowledge of various sciences investigating the corresponding aspects of control: scientific communism, philosophy, political economics, sociology, law, military science, mathematics, cybernetics, psychology, pedagogy, scientific organization of labor and also skillful combination of various methods of control: ideological-political, social, legal, administrative, logical and mathematical.

On the whole, modern troop control appears before us as the dialectic unity of science and art. The laws of armed combat and the principles of military art are exhibited not in themselves but through the creative activity of the officers. The opinion that existed in the past that military affairs are not so much mental as volitional is deeply erroneous. Without negating the important role of the volitional qualities of the commander, it is still necessary to remember that any will that he has must be based on a sober mind and deep knowledge. The statement of the well-known American, General M. Ridgeway, that "as a result of the variety of human characteristics, the different level of combat experience, troop control is more an art than a science"[2] is erroneous. The necessity of close combination of science and art during control with any depth has been proved by history and experience, which V. I. Lenin discussed scientifically. "...In order to control," V. I. Lenin taught, "it is necessary to be competent, it is necessary fully and exactly to know all the production conditions, it is

1. V. I. Lenin, Complete Collected Works, Vol 40, p 215.

2. United States Naval Institute Proceedings, November 1967, p 30.

necessary to know the production equipment on its modern level, it is necessary to have known scientific education."[1] The given behest of the leader pertains fully to officers. Their activity in modern combat control is highly similar to the activity of a scientist.

The enumerated aspects and conditions of troop control imposed high requirements on it, the satisfaction of which in all modern armies is considered a primary problem. For a successful solution of it various paths have been found, the basic ones of which are the following: the further development of troop control theory and the raising of the training level of the officers with respect to control problems on the basis of this; improvement of the structure of the control organs and the troop control system as a whole; equipment of the control units and control points with new, including automated technical control materiel; improvement of the style and methods of operation of the commanders and the control units when carrying out their functions on the basis of new technical facilities.

1. V. I. Lenin, Complete Collected Works, Vol 40, p 215.

CHAPTER 2. TROOP CONTROL UNITS, TECHNICAL MEANS AND CONTROL POINTS

1. Troop Control Units

The organizational structure of modern control units came about during the historical development of the armed forces under the effect of changes in the means and methods of combat, the number and organization of troops and also technical control equipment. During the course of this development, the requirements on troop control changed, the class of problems of the control units expanded, the volume of their work increased, and this in turn forced improvement of their organizational structure, bringing it into accordance with the new requirements and problems.

The process of improving the organizational structure of the control agents, just as the troops themselves, takes place continuously and is realized under the direct guidance of the CPSU. In 1918, in the resolution of the Party Central Committee it was determined that the "policy of the military department, just as all other departments and institutions, is conducted on the precise basis of the general directive issued by the party in the name of its Central Committee and under its direct control."[1]

Requirements Imposed on Control Units

Control units deal successfully with their growing problems only in cases when their regular organizational structure, the level of solidarity and preparation, the methods of operation and technical equipment correspond completely to the nature of modern combat. The control units turn out to be capable of ensuring reliable troop control in any situation if they correspond to the following requirements: they are constantly ready to direct subordinate troops; they are capable of carrying out the missions given them in a short time; they have a number of subordinates (duty personnel), control units, subunits) corresponding to the control norms; they are few, mobile and simple with respect to structure; they provide for deployment of the control point system; they have among them specialists with respect to

1. "V. I. Lenin i Sovetskiye Vooruzhennye Sily" (V. I. Lenin and the Soviet Armed Forces), Moscow, Voyenizdat, 1967, p 128.

combat arms and services; they maintain a justifiable ratio of the number of officers and sergeants (enlisted men).

Among these requirements, the maintenance of control units in constant readiness to direct subordinate troops has the greatest significance inasmuch as they make up the basic element of the control system. The given requirement was also imposed on the control units earlier. In all armies an effort has always been made in peacetime to have the organization of the control units differ as little as possible from the regular organizational structure in wartime. In this case, if a war occurs there is no need to adjust the control units: they could immediately go about reforming their missions. Under modern conditions when the significance of surprise attack has increased immeasurably, this requirement has acquired new significance. It reduces to the fact that the readiness of the control units and, consequently, the entire control system must be higher than the combat readiness of the troops. Only when observing a given condition are the commander and staff in a position to organize the forthcoming operations of their subordinate troops in a timely, high-quality manner.

The high combat readiness of troops, including control units, as the chief of the General Staff of the USSR Armed Forces has pointed out, means "their condition is such as to ensure the fulfillment of missions with respect to repulsion of an aggressor's attacks at any time and under the most complicated conditions, the fulfillment of rapid crushing counterattacks on the enemy and the successful conduct of subsequent operations."[1]

This readiness of these units as well as the control system as a whole is achieved by realization of a set of measures, among which the following have the most important significance: the maintenance of a high moral-political state of personnel; the outfitting of control units with trained officers and equipment with modern technical means of control and movement; high level of training of control units in the performance of their functional duties, the support of a high level of field training and solidarity; scientific organization of work at headquarters.

In connection with the development of armed combat equipment and an increase in scale and power of combat operations, the volume and content of troop control missions have increased and, together with this, the times of their execution have been cut short. Therefore the control units must be capable of solving all problems in the short periods of time alloted for the organization of combat operations.

In the solution of this problem, along with a high level of training of officers, the scientifically substantiated determination of the composition and structure of the control units has acquired important significance. When calculating them, the controllability norms have also been taken into account; that is, the admissible maximum number of subordinates (duty personnel, control units, subunits and units) which the commander and staff are

1. Kommunist Vooruzhennykh Sil (Armed Forces Communist), No 6, 1973, p 16.

in a position to control effectively. The given norm is not a united norm for all instances. It depends on the content and complexity of the missions to be carried out by subordinates, the degree of independence granted them, the locations of these people in combat, the presence of communications, and so on.

As a result of studies made in our country and abroad it has been established that in any control sphere, one chief (director) can effectively direct the activity of an average of five to 10 people directly subordinate to him.[1] An excessive increase in the number of people subordinate to one person creates a situation of "uncontrollability." The subordinate does not receive his tasks and instructions regarding the content of the work in time, and he remains outside the field of view of the commander (chief). Here it is necessary to consider that the commander, as a rule, has, in addition to constant communications, a significant number of temporary communications (control of the assigned and supporting subunits, maintenance of contact with the interacting subunits, control of reconnaissance units, and so on). All of this makes the commander busier and increases his load.

The well-substantiated determination of the controllability norm follows from calculating the possibilities of control units. The violation of this requirement leads to a reduction in control efficiency. For confirmation it is possible to present an example from World War II practice. At the end of 1941, the corps directorates were reduced: of all the remaining directorates only six were left. As a result of this reorganization, the total number of combined and individual units entering the army reached 16 to 18. The experience of offensive operations in the winter of 1941-1942 demonstrated serious difficulties in the control of troops in an army with this composition. The necessity arose for the restoration of the corps level of the administration, which was realized later.

Another requirement also acquires special significance--the requirement of having few, mobile control units. During the course of offensive operations in World War II, division headquarters were forced to move several times a day in order to be closer to the troops and insure continuous control of subordinate units. In modern combat when the offensive is carried out more rapidly, it is necessary for the commander to change locations significantly more frequently and be ready to control troops in movement and from short hauls.

It is unquestionable that under these conditions few and highly mobile units turn out to be the most suitable. Experience shows that the greater the composition of the control units, the more complex the organization of their movement and deployment, the greater the danger of detection and, consequently, destruction by the enemy. Here it is necessary to consider

1. See A. N. Kazhalin, "Nauchnaya Organizatsiya Upravlencheskogo Truda-orgproyektirovanaya" (Scientific Organization of Administrative Labor-Organizational Planning), Moscow, EKONOMIKA, 1973, p 241.

also the important fact of the interrelation between the component elements of the control unit structure in the operation process. Usually, the more people there are participating in an operation combined for a single goal, the more complex the organization of their activity becomes, and the more time the various types of coordination, discussion and mutual information take.

In theory and practice, certain duty personnel consider that the basic means of improving the efficiency of control is to increase the number of control units. Indeed the cause of a delay in execution of measures with respect to control and overload of individual executive units most frequently consists in insufficiently clear organization of the work of the units, low-efficiency use of technical control equipment and the application of obsolete methods of operation corresponding to modern requirements.

In addition to the enumerated requirements, the ensurance of stringent economy has important significance. V. I. Lenin considered it necessary to make the control apparatus as economical as possible, to remove any vestiges of excess from it. The basic areas for improving economy are simplification of structure and a decrease in the number of control units, and maximum reduction of service and support personnel. These measures can lead to a reduction in expenditures on direct maintenance of the administrative apparatus, its training and servicing and to a decrease in expenditures and transport and communication equipment.

However, reducing control units without scientifically substantiated calculations can do nothing but harm. Their composition depends on the scale of the troop organism and the volume of the operation. These principles, considering the other requirements, are used as the basis for determining the composition of the control units. For this purpose, the volume of work to be done under various situational conditions is established, the tested norms for the expenditures of time on each operation using advanced methods and available technical means are selected, and as a result of multiple calculations by different versions the composition of the control units is determined. The solution of a given problem is found using mathematical methods of analysis. The objective approach to determining the quantity of equipment and structure of control units is one of the conditions ensuring control efficiency.

The composition and structure of control units must ensure clear, continuous, highly qualified troop control in any situation. The justifiable principle of the separation of labor with respect to types of operations (specialties) with strict distribution of functions and goals among the duty personnel is taken as the basis for determining the structure. This approach to the structure of the control units permits exclusion of parallelism and duplication in the work, it clearly outlines the sphere of activity, and in addition facilitates the organization of troop control. It promotes improved efficiency in operation. The presence of various control units responsible for a defined type of operation has a positive effect on the information transmission rate. The large flow of information that pours

into the control system is split into branches and at the same time quick processing of it is ensured. Of course, in the absence of the required organization this solution can lead to parallelism, especially in gathering situation data, slowness and delays in the performance of certain operations which are participated in by the responsible agents from the different control units. However, if each control unit has its own specific missions and each duty personnel defined functional duties, there is no impassable wall in the interrelations within the control units, and the situation is improved by readiness of officers to carry out the duties of other responsible agents on an interchangeable basis.

Control units are one of the basic targets of action on the part of the enemy. The neutralization of any control echelon creates additional difficulties in maintaining stable troop management. One of the means of ensuring control reliability is a composition of control units which will ensure simultaneous deployment of the control point system and will permit their restoration in case of neutralization.

In connection with the fact that combat operations are conducted by the joint efforts of combat arms and they are supported by special troops and services, the control units must ensure their qualified direction. Within the combined-arms control units, the necessity arises for specialists with respect to combat arms, special troops and services.

According to the view of foreign armies, the so-called standardization of the organized structure of troops and control units and the limiting of their types is justified. Thus, in the basic armies of the NATO countries, all of the divisions--infantry, mechanized, armored tank and airborne--have identically organized control units.

It is impossible not to note the requirement imposed on control units such as the ensurance of a correct ratio of officers and non-com's (enlisted men). The clerk and the draftsman are irreplaceable aides of the staff officers. The quality of their work determines the level of efficiency in the formulation of combat documents and reduction of planning time for combat operations. In the control units where the proportion between officers and non-com's (enlisted men) has been upset, the officers are forced to spend a significant part of their time on technical work--preparation of telegrams for transmission, pasting together topographic maps, transfers of the situation from one map to another, reading printed text, preparing diagrams, and so on, while these operations could be successfully executed by non-com's and soldiers having special skills, experience and certain training. Therefore it is impossible to consider any reduction in service personnel as a new step along the path to the creation of small staffs and not see the negative consequences to which it will lead.

Role and Missions of the Commander in Troop Control

When creating the organizational structure of control units, the principle of one-man command is taken as the base. The central control

figure is the commander. This principle which has come about through the experience of long-term development of control units acquires specially great significance under modern conditions when the combat operations develop at exceptionally high rates; they are distinguished by great stress and sharp changes in the situation. Under these conditions only the single commander invested with great power is capable of ensuring centralized control and directing the efforts of his subordinates at successful completion of the stated mission. The Leninist instruction--that in military affairs more than anywhere else is it necessary to have the strictest unity of operations of large masses of people and subordination of their will to the will of one man--does not lose any of its significance here.

The commander realizes troop control and bears complete responsibility for their execution of stated missions. In his practical work he is supported by the staff and other control units. They help him to organize combat operations and constantly control the troops during the course of combat.

The commander makes the combat decision, he establishes the combat missions for the subordinates, he organizes the interaction and gives instructions with respect to the party-political work, the organization of control and the comprehensive support of combat operations. The degree to which the decision made by him corresponds to the developed situation is indicated by the results of the troops' execution of the missions. The skill and capacity to make substantiated decisions in a short time are the basic index of the operative-tactical maturity of the commander. Here, according to M. V. Frunze, skill must be exhibited among the "set of various methods and means of selecting that is most appropriate in each given case. Military theory cannot provide him with any standard decision; it can serve only as a guiding principle."[1]

Napoleon compared the gift of the military leader with a square in which the base is will, the height is mind. The square will be a square only under the condition that the base is equal to the height or, in other words, mind and will are equal. If will is superior to mind, the military leader will act decisively and courageously, but with little reason; otherwise, he will have good ideas and plans, but there will not be sufficient courage and decisiveness to execute them.

It is possible to state categorically that success in combat is brought about by will combined with professional mastery, the commander's sense of high personal responsibility for the fulfillment of the mission, a manifestation of creativity, a reasonable risk, with persistent search for methods leading to victory. It is impossible to expect voluntary, persistent action on the part of the commander in surmounting difficulties on the way to the combat goal if he knows his tactics and the combat capabilities of the weapons and equipment, but does not know the enemy well and does not have experience in leadership. "The modern leader," noted L. I.

1. M. V. Frunze, Selected Works, Moscow, Voyenizdat, 1965, pp 83-84.

Brezhnev at the 25th Party Congress, "must organically combine a party nature with deep confidence, discipline with initiative and a creative approach to affairs. In addition, in any section the leader is obligated to consider the social-political and educational aspects, to be sensitive to people, their needs and their requests, and to serve as an example in work and in his daily life."[1]

On the basis of the decision of the commander, the work of the control unit subordinate to him is to organize high-quality training of the troops to carry out the forthcoming mission.

Under modern conditions, in connection with equipping the troops with nuclear weapons and other means of destruction, the commanders of all degrees have received a significantly greater capability for influencing the course of combat, to impose his will on the enemy and create a situation which is advantageous for his troops. In addition, it must be considered that analogous possibilities have also appeared on the part of the enemy. Under these conditions, success will be on the side of the one who not only knows the developing situation, but also knows how to predict its development, is capable of quickly reacting to the events that have transpired and, at the same time, precede the enemy in operations. Any unjustifiable delay, passiveness of the commander, or fear of responsibility for decision making will unavoidably lead to destruction. Unquestionably, the commander is obligated to be prodent, but in addition, ready to take a reasonable risk. Marshal of the Soviet Union K. K. Rokossovskiy presents a convincing example in his book "Soldatskiy Dolg" [A Soldier's Duty] from the practice of troop control during the course of the Kursk battle: "At the beginning of the third day of the battle almost all of the frontline reserves were involved in combat, and the enemy continued to bring up more and more forces along his main strike direction... What was to stop him? I decided on a big risk: I sent my last reserve--the 9th Tank Corps of Gen S. I. Bogdanov, which was located in the vicinity of Kursk, covering the town from the south, on the main direction."[2]

The introduction of reserves into battle played an important role in its outcome. This risk is the index of the commander's maturity, his skill in soberly evaluating the situation at the critical moment, and selecting from all possible versions the one that will assure the greatest gain.

Taking a risk does not mean acting impulsively or making premature decisions without a deep analysis of the situation and calculations without solid faith in success. Any error of the commander in modern combat can lead to serious, at times unjustifiable consequences.

1. Materials of the 25th Congress of the CPSU, Moscow, 1976, p 70.
2. K. K. Rossovskiy, "Soldatskiy Dolg" (Soldier's Duty), Moscow, Voyenizdat, 1968, p 23.

During the course of the performance of the combat mission the troops can be in a serious situation. Under these conditions the commander must be found together with the subunits subordinate to him; he must personally influence the course of combat operations, and by his tenacity, the force of his will, his calm and reasonable persistence serve as an example for all personnel. If the troops do not achieve success, patience, courage and prudence are required of the commander. It is inadmissible for the commander, without analyzing the situation, and without establishing the true causes of a delay in the execution of the mission, to rush to blame his subordinates for all of the failures, make replacements of certain people for others, change his decision, rescind the former missions and state new missions for the subunits. This haste most frequently is of no use and generates further confusion in the work of the subordinates. A commander must exhibit persistence in achieving the stated goal, soberly evaluate the developing situation and make decisions without haste, but quickly and in a short span of time.

Planning based on sober consideration of time and the actual possibilities of the subordinate control units and troops has exceptional significance in the work of a commander. He must always clearly know what, when, and with what means something has to be done. Without this type of plan, the commander is in no position to work with the future, mentally leading the events. He will constantly fail to do what is necessary in time. The less time the commander has, the greater care he must take in approaching the selection of problems that are to be solved by him personally. Skill in distinguishing the primary from the secondary is an important characteristic of the commander. "You must, therefore," V. I. Lenin advised, "relieve yourself of turmoil and commotion, which is the undoing of all of us, you must ensure yourself the possibility of calmly thinking about the operation as a whole..."[1] To see the main thing does not mean to neglect what is secondary; otherwise, the "details" will become a significant brake on the operation. Accordingly, characteristics of the work style of the commander such as purposefulness, skill in finding the decisive level in the operation on which it is necessary to concentrate all of his basic efforts, acquire important significance. Here the necessity for the mastery of the Marxist-Leninist dialectic method of thinking is clearly manifested, making it possible to study the phenomenon not in isolation, but in interlation, and to find among the many phenomena the decisive one.

Life convinces us that however prepared and tactically competent a commander may be, he alone is in no position to lead his subordinate troops. The commander who tries to solve all of the problems, large and small, single-handedly, scatters his forces, loses time, and as a result does not do the main thing in time. This is especially true for modern conditions when the volume of operations with respect to troop control has increased greatly, and the time for execution has been sharply reduced. Under these

1. V. I. Lenin, Complete Collected Works, Vol 44, p 366.

conditions, the necessity for skillful use by the commander of the subordinate control units in the operation is exhibited with special force. Only by joint efforts is it possible in compressed time to evaluate the situation comprehensively, find the best means of using the available forces and equipment and at the same time ensure single-handed decision making. The skill of the commander in relying on his assistants, staff, and party and Komsomol organizations, and a capacity for mobilizing and organizing the people in the solution of stated problems is one of the most important qualities of the single commander. The principle of one-man command itself presupposes the high deals and party nature of the commander, his active personal participation in educational work, and strict demands placed on himself and his subordinates.

Hence, the skill of the commander in establishing the proper, business-like interrelations with subordinates acquires special significance. Unquestionably, in order to control people in combat, the commander needs a strong will and solid character. However, these useful qualities will become the opposite if they are exhibited in the form of coarseness, insulting actions and expressions, degrading the human worth of his subordinates. Swearing and shouting are not the index of exactingness and moral principles of the commander, but more evidence of his lack of education and culture.

Personnel respect the commander who, along with strict exactingness, exhibits concern for his subordinates, values their worth and their honor. Hero of the Soviet Union S. A. Neustroyev, the battalion commander who stormed the Reichstag, writes convincingly about this. "Nobility and respect for subordinates were felt in the behavior, the actions and habits of the division commander. We knew of no case where he was insulting or degraded the worth of a soldier or commander who failed in battle. He did not lose his self-control or tenacity in the most serious situation."[1]

For skillful troop control it is insufficient to know the combat experience of past wars; the commander's intuition does not always come to the rescue in approaching the solution of problems that may arise. A genuinely scientific approach based on the application of the objective laws of materialist dialectics considering the specific forms of their manifestation under the conditions of armed combat is required of every commander. The scientific approach of the commander to the troop management proposes deep and comprehensive substantiation of the decision made, skillful utilization of the achievements of science, the capabilities of the equipment, and advanced experience. The commander will be on the level of the modern requirements if he has a developed sense of the new, he knows how to discard the obsolete in time and skillfully support the advanced and the progressive, although only just generated.

1. S. A. Neustroyev, "Put' K Reykhstagu" (Path to the Reichstag), Moscow, Voyenizdat, 1961.

Of all the qualities of the commander, the basic one is his preparedness for skillful execution of the complete scope of his duties, for "no conscientiousness, no party authority will replace the basic essence of a given case: knowledge of what is going on..."[1]

V. I. Lenin especially values the "organizers, people with a sober mind and common sense, people combining devotion to socialism with skill in quietly (in spite of commotion and noise) forging the strong, fraternal joint work of a large collective people."[2]

Consequently, the commander can successfully deal with large, complex obligations if he serves as an example of high ideals and organization, he has profound knowledge with respect to military theory and combat needs, and he has mastered the modern methods of troop control.

Staff-Basic Control Unit

The commander controls subordinate troops proportionally and through the staff. The staff is charged with complex missions in modern combat. Among them one of the most significant roles is played by maintaining constant combat readiness of the troops and the control units to carry out the forthcoming mission. For its solution, the staff has cleared, checked out the data on the condition and the position of troops, their level of strength and support. They know their needs, what they are lacking and what must be done to improve their combat readiness. The staff receives this data not only from the reports of subordinate staffs but also by personal observation of the operations of the troops, by discussions with staff officers, with subunit commanders, and discussions with officers, non-com's and soldiers.

Analyzing this information in a timely manner, the staff is in a position, without waiting to obtain a specific combat mission, to plan effective measures to eliminate deficiencies which to one degree or another will reduce the combat readiness of the troops. The staff gives a great deal of attention to the maintenance of control points in constant combat readiness, the presence of communications, and knowledge of established signals by the duty personnel.

Active participation in the party-political work, the education of the personnel and the formation of high moral and combat qualities in them is the duty of the staff officers.

On receiving the combat mission, the staff performs a significant part of the work with respect to combat planning, and also provides for delivering

1. V. I. Lenin, Complete Collected Works, Vol 45, p 447.
2. V. I. Lenin, Complete Collected Works, Vol 36, p 193.

the missions to the responsible agents. In performing the operations with respect to combat planning and organization, the staff officers prepare the data and the calculations required by the commander for decision making; they participate in the organization of the interaction; they plan and implement the basic measures with respect to comprehensive support of the combat operations; they organize communications with the subordinate, interacting subunits, with neighboring and superior staffs; they more precisely define all the problems connected with the equipment, placement and movement of control points during the course of combat operations. Simultaneously, staff officers organize control of the work of subordinate staffs and the training of the troops to carry out the forthcoming mission.

For skillful troop control it is necessary above all to know clearly the true situation in which the troops find themselves when carrying out a stated mission. Considering that the situation changes rapidly, the staff is constantly concerned with the procurement, gathering, study and generalization of data on the enemy, their troops, neighbors, the nature of the terrain, the radiation situation, hydrometeorological conditions, economic condition of the combat zone and the social-political composition of the population.

On the basis of a deep generalization and analysis of a given situation the staff prepares solutions and proposals with respect to the use of available forces and equipment, and in accordance with the commander's decision realizes the planning of the combat operation and implements the planned measures with respect to the organization of combat. In addition, the staff officers, without waiting for requests, in accordance with the table of representation of urgent reports, and also in the presence of sharp, unexpected changes in situation, report the data to superior staffs, they inform other control units and their neighbors. In this case there is no necessity for superior staffs to request reports on the situation from subordinates.

The timely receipt of data and the quick reporting of assignments to the troops are impossible without stable communications. This is all the more so the case in that the enemy will take a number of measures to disorganize the control of our troops. Therefore, the skillful organization of communications, the taking of reliable measures to protect radioelectronic devices from enemy interference, and the improvement of the life expectancy of the communications system as a whole remain the constant concern of headquarters under any conditions.

During the period of preparation and conduct of combat operations one of the missions of headquarters is accounting for personnel, armament, materiel and transportation. Data on the completeness with which the troops are outfitted usually come to headquarters in the next reports and summaries. In cases where sharp changes have taken place unexpectedly in the composition of subunits, this is reported immediately. A new facet in the work of headquarters has become consideration of radioactive radiation doses.

Being the basic control unit of the troops, the staff ensures coordinated operation of all control units, directing their efforts at carrying out the commander's decision.

The successful execution by the staff officers of their missions depends on their professional training, experience, businesslike response to the commander and other duty personnel of the control units. As for their training and personal qualifications, high ideological conviction, party morality, the capacity to be guided in their actions by the interests of the party and government, honor, modesty, exactingness, proper understanding of criticism and self-criticism are advanced to the primary level. To the same degree the staff officer must be characterized by discipline, executive ability, capacity to exhibit independence and creativity. The role of the chief of staff, who is the first assistant commander, is exceptionally high in this area. At the battalion level he brings the commander's decision and his instructions to all of the administrative duty personnel, he involves them in the joint resolution of the most important problems and the measures with respect to organization and support of the combat operations. In turn, they report all of the basic data on the situation and the conditions of their subordinate subunits to the chief of staff and coordinate with him all of the plans with respect to their utilization in combat. Only under the closest coordinated work and healthy interrelation among all the duty personnel are normal conditions created for the functioning of the troop control system as a whole.

Therefore headquarters plays the role of the organizer of the work of the entire administration. The smooth, coordinated work of all of the control units and especially the staff depends on the training, experience and skill in directing the work of subordinates. The personal organization, the capacity to find at each point in time that link in the chain that will decide the success of the latter, to mobilize all forces to achieve a basic goal characterize the chief of staff as the leader of the collective.

During World War II, the chief of staff was invested with the responsibility for maintaining the high combat readiness of the troops and control units, the organization and support of continuous communications with subordinate and interacting troops, superior and neighboring staffs, reconnaissance, organization of the commandant's service, security and the realization of measures with respect to all of their types of support. Only the chief of staff was granted the right to give orders in the name of the commanders to all personnel subordinate to the commander, and in cases not allowing postponement to introduce changes independently in the decisions made by subordinate commanders. This right obligates the chief of staff to a great deal, and above all to meaningful knowledge not only of the commander's decision, but also his proposals, his plan of action in response to possible changes in the situation. The proper interrelations of the commander and the chief of staff, their responsiveness, understanding of each other--these constitute the most important conditions for creating a businesslike situation and organized operation of all control units.

In his memoirs about the war, Marshal of the Soviet Union S. S. Biryuzov writes the following about the chief of staff, "The commander must have faith in his chief of staff just as in himself. It is impossible to work without this. The chief of staff is not simply an executive agent. He is one of the closest assistants of the commander and, necessarily, with a creative mind and nature. The chief of staff, on the basis of the general intentions of the commander, goes through all of the details of the situation with his staff and prepares motivated proposals. The monitoring of the execution of orders and troop control are ensured by means of this."[1]

The high position held by the chief of staff in troop control obligates him always to know the goals stated for the subunits by the senior officer and the commander, the situation, the condition and capabilities of his subunits and the enemy, the quantitative and qualitative ratio of forces and equipment, the developing radiation situation and its effect on the fulfillment of the mission; to be ready at any point in time to draw conclusions from the evaluation of the situation, to make proposals with respect to the decision, they determine the measures with respect to the support of the combat operations and the organization of control.

In addition, the most important duty of the chief of staff is the direction of subordinate officers. He directs their work, he helps them, he teaches them how their missions must be carried out, he sees to their timely presentation of reports on combat activity.

In spite of the large amount of organizational work that he has, he himself carries out the most complex missions. During the planning process, the chief of staff works directly with the commander on the decision making, he calculates the time for the organization of combat operations, he develops the most important combat documents, which usually requires coordination among the various control units.

However well trained the chief of staff may be, he is in no position to carry out alone all the headquarters missions. He relies in his work on his aids--the staff officers. The degree of its preparation to carry out its duties determines the success of the work of the staff as a whole. Hence, the most important goal of the chief of staff is training and education of officers, the perfection of the methods of their operation, improvement of the smoothness of organization of the staff as the basic troop control unit. There is no doubt that only highly qualified, ideologically tempered, creatively thinking officers will deal successfully with the duties of the chief of staff, the activity of whom serves as an example of the communist attitude toward the performance of duty.

1. S. S. Biryuzov, "Kogda Gremeli Pushki" (When the Guns Roared), Moscow, Voyenizdat, 1962, p 147.

Senior Officers of Combat Arms and Services

In the units, in contrast to the battalion administration, in addition to the commander and the staff, there are senior officers of combat arms and services and also the party-political apparatus.[1] The deputy commanders of political and technical units, rear services, the artillery chiefs, the chiefs of antiaircraft defense, the engineering and technical service, the chief of the missile artillery armament service, the chiefs of the medical, financial, armored, mortar, food and clothing services, fuel and lubricating materials--each of them performs a defined type of work and bears responsibility for the combat readiness of the subunit subrodinate to him and for their performance of the mission. They carry out their duties based on the decision of the commander and coordinating their actions with the combined-arms headquarters. Within their authority and duties the senior officers of the combat arms and services prepare the calculations of the combat capabilities of the forces and materiel subordinate to them, the plan on the basis of the commander's decision, the actions of the subunit of the combat arms and special troops, they give the missions to the executive units and they direct the subordinate subunits and services.

The role of the party-political apparatus in troop control, in the education of high moral qualities in the personnel, discipline, organization and high responsibility for the performance of their duties in combat is exceptionally high. In the process of moral-political training, the Marxist-Leninist point of view, political maturity, dedication to the party and the homeland are shaped in the personnel. The high communist ideals and conviction are the basis for the moral stability of the troops, the spiritual source of our victories. The development of these qualities is at the center of attention of the party-political apparatus.

During the course of the preparation and conduct of battle the party-political apparatus works in closely with the commander and the staff. It has become a necessary rule when the deputy commanders of the political unit, the secretaries of the party organizations are present when the commander gives the combat orders and during organization of the interaction of the troops. When necessary they give instructions to the subunit commanders with respect to the organization of the party-political work, they explain the most important papers of the Control Committee of the CPSU and the Soviet government, the orders of the Supreme Command, the communications of the military council to the personnel, and they achieve a clear understanding of their combat missions on the part of all of the troops. If the situation in the subunit permits, they organize party and Komsomol meetings, they popularize the unselfish actions of the troops. The basic efforts of the political agency are concentrated in decisive sections on which the success of the battle depends.

1. See the Internal Service Regulations of the USSR Armed Forces.

The successful performance of the duties and missions by all of the control units depends to a great extent on the organization and clarity of their work, skill in any situation, and on remaining calm, maintaining their tenacity and exhibiting high moral principles and exactingness on the subunit personnel and the personnel of the subordinate staff. Under modern conditions all of their work must take place at high speed, with the expenditure of minimum time on each mission. The time has passed when the control units can spend days planning combat operations and developing a large quantity of awkward documents. Now new methods are needed in this work, and a different approach to the fulfillment of the stated missions.

The effective use of advanced methods in troop control is possible through a creative approach to the determination of the content and volume of the work, the scientific organization of labor, the skillful assimilation of combat experience, and systematic improvement of the officers' ideological-theoretical level.

The successful execution of the control missions is possible only on ensuring the closest interrelation in the activity of all the duty personnel and the control units. As never before, the quality of the control depends not only on the work of the commander and the staff, but on the entire collective of control officers.

The most important index of skillful activity of the control units is the performance of all of the operations with a high level of staff capability. Usually this concept includes the system of requirements on the level of training of the officers of the control units, the quality of the operations performed by them with respect to troop control which corresponds to the nature of modern combat. The staff capability includes not only the competent and accurate development of combat documents, but also deep knowledge by the officers of the problems of military art, a high level of professional training, skill in finding new methods of operation ensuring effective use of the available forces and materiel in combat.

Under any conditions, including the introduction of automated control systems, the role of the staff commander in leading the troops is in no way diminished. The latest technical means give them invaluable assistance, but they do not replace man, his creative thinking, his will, his logical analysis of the situation; as before the commander remains the central figure in the administration and control system, and the staff remains the basic troop control body.

2. Technical Control Means

The effectiveness of troop control depends to a great extent on the condition and the number of technical control means. These means must provide the following: fast gathering, processing and representation (output) of the situation data; the performance of various calculations required for decision making and planning of the combat operations in short periods of

time; timely formulation of the decision made by the commander, and delivery of the missions to the troops; high mobility of the control proposed; protection of the personnel of the control bodies from enemy fire and penetrating radiation, and also the creation of the necessary conditions for the work and rest of the officers. It is indisputable that satisfying these requirements is possible only by modern means.

The technical control means available at the present time in the armies of the different countries can be provisionally divided into five basic groups, beginning with their purpose and the nature of their operation: the communications media, the means of procuring information, information processing means and means of performing tactical calculations, documentation means and document reproduction means, and the headquarters command machines (see Figure 5).

Inasmuch as it does not appear possible to give a detailed characteristic of all of these means in this book, the basic data are presented below for only those that were used in the tactical echelon of both the Soviet Army and the armies of the most developed imperialist governments in technical respects. This will permit the readers to obtain a general representation of the possibilities of modern control equipment. For more detailed and deeper investigation, of course it is necessary to use other sources.[1]

Communications Means

Communications means play the leading role among other technical means. The stability of troop control depends first of all on their condition.

In the modern, most developed armies in technical respects, the communications means include the following: radio, radio relay, wire, portable and signal means.

1. One such source is the book by A. V. Prokof'yev, "Sredstva Mekhanizatsii i Avtomatizatsii v Shtabakh" [Mechanization and Automation Means in Headquarters], Moscow, Voyenizdat, 1976.

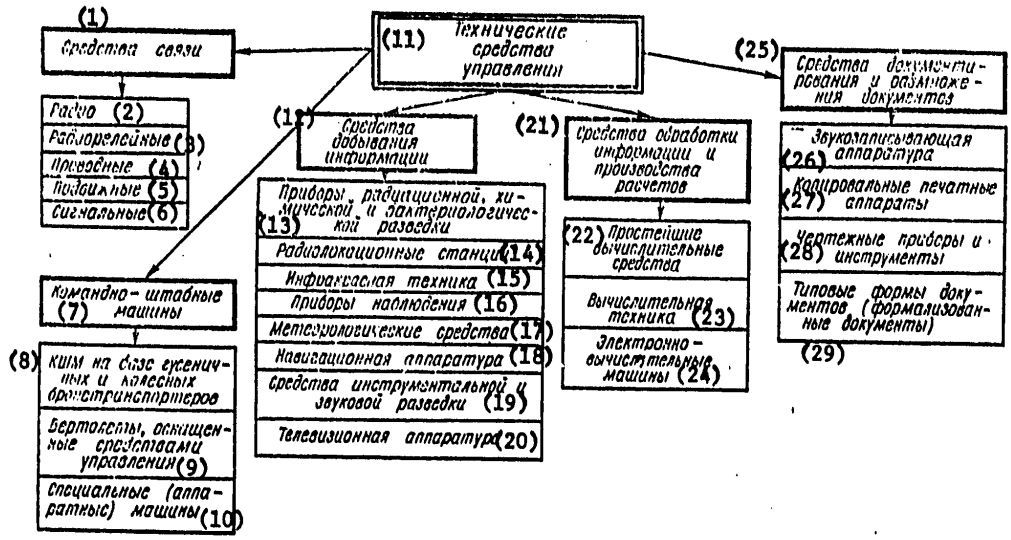


Figure 5. Classification of Modern Technical Control Means (from the point of view of foreign armies)

Key:
1. Communications equipment
2. Radio
3. Radio relay
4. Wire
5. Portable
6. Signal
7. Staff command vehicles
8. Staff command vehicles based on caterpillar and wheeled armored transports
9. Helicopters equipped with control equipment
10. Special (equipment) trucks
11. Technical equipment
12. Means of obtaining information
13. Radiation, chemical and bacteriological reconnaissance instruments
14. Radar
15. Infrared equipment
16. Observation instruments
17. Meteorological equipment
18. Navigational equipment
19. Means of instrument and sound reconnaissance
20. Television set

[Key to Figure 5 continued from preceding page]

21. Data processing and calculation equipment
22. Simplest computation equipment
23. Computer equipment
24. Computers
25. Documentation and document reproduction equipment
26. Sound recorder
27. Copiers
28. Drawing instruments and tools
29. Standard document forms (formalized documents).

In all armies radio is the basic communications medium. During World War II, especially in the spring of 1943 during the development of the offensive, radio became the basic means of communication in the tactical echelons. By the middle of 1944, the rifle division had 123 radios authorized. Of them the signal battalion had 10 (RBS, A-7A, A-7B), the signal platoons of the battalions had one each (RBS), the artillery units had 55, and the remaining subunits of the division had 25. The range of the radios in the telephone mode was as follows: 10-30 km for the RBM, 10-20 km for the A-7A and A-7B, and up to 4 km for the RBS.

The modern radios are capable of comparatively reliable group control under any conditions. Their indisputable advantages include the fact that they permit communications to be established quickly, in practice at any distance and in any terrain, they provide for information transmission simultaneously to a large number of correspondents. Nevertheless, radio communications have their weak points: secrecy of transmission is not ensured during operation; communications can be disrupted by interference; the enemy can by using radio direction finders determine the location of the transmitting radios, and by them, the position of the control points. These deficiencies significantly limit the possibilities of using radios.

In the tactical echelon of the basic foreign armies, primarily ultrashort-wave radios are used, which is seen in Table 1.

The modern short-wave and ultrashort-wave radiation media have almost no electron tubes. Integrated circuits, semiconductor devices and miniature parts find broad application in them. In the new radios, according to the estimates of foreign specialists, provision is made for reducing the weight and size, decreasing the intake power, the presence of a common frequency range for all types of troops, a reduction in scanning time and time required to establish communications.

Table 1. Basic Tactical-Technical Characteristics of the Radios of the Tactical Echelon*

Тип радиостанции (1)	Диапазон частот (Мгц) (2)	Количество фиксированных частот (3)	Мощность (вт) (4)	Дальность действия (км) (5)	Где применяется (6)
AN/PRC-88 (США) (7)	47—57	80	0,3 и 0,45 (8)	0,5 и 1,6 (8)	Солдат, отделение, взвод (9)
AN/PRC-25 (США) AN/VRC-53 AN/GRC-125 *(7)	30—76	920	1,5—2	В движении — 5—8. На стоянке — 25 (10)	Взвод, рота, батальон (11)
AN/VRC-12, -43** (США), -44, -45, -46, -47, -48, -49 (7)	30—76	920	Максим.—40 Минимальная —4 (12)	На стоянке —35 В движении —25 (13)	Батальон, бригада, дивизия (14)
AN/VRC-24 (США) (7)	225—400	1750	2—20	С самолетом на высоте 300 м —48, на высоте 3000 м — 160 (15)	Для связи с самолетами тактической авиации и приема разведданных с борта самолета (16)
SEM-25 (ФРГ) (17)	26—76	880	15	80	Танковые части и подразделения (18)
UK/PRC-350 (Англия) (19)	36—57	840	2	5	

(20)* Возимый вариант AN/PRC-25 радиостанции AN/VRC-53 устанавливается на танке, бронетранспортере а AN/GRC-125 — только на 1/4-т автомобиле.

** Радиостанции AN/VRC-43—49 отличаются от AN/VRC-12 комплектацией приемопередающей аппаратуры. (21)

Key:
1. Type of radio
2. Frequency band (megahertz)
3. Number of fixed frequencies
4. Power (watts)
5. Range (km)
6. Where used
7. (USA)
8. And
9. Soldier, squad, platoon
10. In movement, 5-8. At the halt, 35
11. Platoon, company, battalion
12. Maximum 40; minimum 4
13. At the halt 35, in motion 25
14. Battalion, brigade, division
15. With an aircraft at an altitude of 300 meters, 48; at an altitude of 3,000 meters, 160
16. For communications with tactical aircraft and for reception of reconnaissance from onboard aircraft
17. Federal Republic of Germany
18. Tank units and subunits
19. England
20. The portable version AN/PRC-25 of the AN/VRC-53 radio is installed on a tank or armored transport, and the AN/GRC-125, only on a quarter-ton motor vehicle.
21. The AN/VRC-43-49 radios differ from the AN/VRC-12 by the set of transceiving equipment.

*"Voyenniyy Vestnik [Military Herald], No 6, 1973, p 121.

Table 2. Tactical-Technical Characteristics of Radio Relay Communication Stations

Индекс станции (страна) (1)	Дальность связи, км (2)	Диапазон частот, Мгц (3)	Мощность излучения, вт (4)	Количество телефонных каналов (5)
AN/MRC-84 (6) (США)	40—50	600—1000; 1350—1850	8—20; 15—30	4; 12; 24
AN/MRC-69 (6) (США)	40—50	100—600	до (7) 120	4; 12; 24
AN/MRC-73 (6) (США)	40—50	600—1000; 1350—1850	8—20; 15—30	4; 12; 24
AN/TRC-90 (6) (США)	160	4400—5000	1000	24; 48
AN/TRC-132 (США)	до (7) 400	4400—5000	1000, 10000	24; 48; 60
C-50 (Англия (8))	до 80	225—400	10; 250	12
FM-200 (ФРГ) (9)	·	225—400; 610—960	до 20	4; 12; 24

Key:
1. Station index (country)
2. Communications range, km
3. Frequency band, megahertz
4. Radiation power, watts
5. Number of telephone channels
6. (United States)
7. To
8. (England)
9. (Federal Republic of Germany)

In a number of foreign armies, the adaptive short-wave radio communications systems have become widespread, in which adaptation of the radio channel automatically takes place considering maintenance of high transition quality under any conditions. In the near future the most advantageous operating frequency and transmitter power will be automatically selected on these channels.

In troop control of many armies broad use is made of radio relay communications. It is organized using a number of transceiving radio relay stations located at a distance ensuring stable communications between adjacent stations. The distance between them depends on the relief of the terrain, the wavelength, the parameters of the receiver and transmitter, and the meteorological conditions.

These stations permit duplex multichannel operation. They permit transmission of all forms of information and, in addition, they complicate the interception of the content of the transmissions, direction finding and location of the stations and radio interference by the enemy. The quality of communications depends little on the time of year, the time of day, and

atmospheric, or local interference. As a result of the fact that the radio relay stations operate in the ultrashort-wave band, comparatively simply designed directional antennas are used.

A significant advantage of the radio relay lines is also the fact that is is possible to create combined lines: in one section the communications are maintained over radio relay lines, and in another section, over wire lines. Telephone, telegraph, phototelegraph, video telephone and other communications can be realized over the radio relay lines (Table 2).

In addition, the radio relay means limit the possibility of establishing stable communications in motion; the interception of transmissions and creation of radio interference by the army are not excluded; the communications range depends to a high degree on the relief of the terrain; camouflaging of the antennas is difficult. In addition, a large number of service personnel are required at the terminal and intermediate stations.

One of the means of improving radio relay media, according to the opinion of foreign specialists, is to increase the power of the transmitters, to use higher frequency and also optical wave bands to create radio relay trunks with large carrying capacity, to modify the mast antennas, introduce remote control of the intermediate stations and automate the operation of the radio relay station equipment.

Under modern conditions wire communications have not completely lost their significance for troop control. Wire communications ensure high quality communications channels, convenience of holding conversations, good defense against atmospheric and electrical interference, speed and accuracy of transmission and, in addition, they limit the possibility for interception of the transmissions by the enemy.

However, wire communications are characterized by serious deficiencies which complicate their application in combat. They include high vulnerability of the lines from nuclear and fire strikes of the enemy, comparatively slow speed of laying the lines, large expenditures of forces and means and establishing communications, awkwardness of the equipment, impossibility of maintaining communications and motion.

The cable can be laid on the earth's surface with the speed of an automobile over the route along which the line is laid. When picking up the line, the speed of winding up the cable off the surface of the ground will be less.

Considering the peculiarities of wire communications, they are basically used only when the subunits are in place, in the waiting (buildup) area, on the defensive, during the offensive by the subunit in directions where nuclear weapons are not used, and also to provide internal communications at the control points.

Table 3. Basic Tactical-Technical Specifications of Radar*

Наименование РЛС (1)	Дальность действия (км) по обнаружению: (2)		Точность отсчетов (м) (5)	Транспортировка (6)	Масса (кг) (7)
	людей (3)	машин, танков (4)			
AN/PPS-10,15 (США) (8)	1,5	3		Вручную (9)	4,5; 6,3
MODEL P-2010 (США) (8)	5	10	±25	„	13,3
AN/PPS-25 (США) (8)	11	16	±42	На БТР или автомаш. (10)	1272
AN/PPS-5 (США) (8)	5	10	±20	Вручную (9)	43
AN/TPS-33 (США, ФРГ) (11)	3	18	±23	На БТР или автомаш. (12)	120
AN/PPS-9 (США, ФРГ) (11)	15	3	•	Вручную (9)	6
„RASURA" DRPT-2A (Франция, ФРГ, Дания) (13)	5—7	5—10	±25	Вручную или на автомаш. (14)	60
„RATAC" AN/TPS-58 (Франция, ФРГ) (15)	8—12	15—20	±10	На автомашине (16)	160
„OLIPHANT"-2 (Франция, Великобритания) (17)	1	2	±50	Вручную (18)	11
„RAPACE" (Франция) (19)	1,5	5	±25	На автомашине (20)	30—50
„RASIT"-72 „A", „B" (Франция) (19)	8	15—20	±20	Вручную или на автомашине (21)	70 „A" 50 „B"

*"Internation Defense Review", No 5, 1972.

Key:
1. Nomenclature of the radar
2. Range (km for detection of:
3. People
4. Motor vehicles, tanks
5. Reading precision (meters)
6. Transportation
7. Mass (kg)
8. (United States)
9. Manual
10. On armored carriers or motor vehicles
11. (United States, Federal Republic of Germany)
12. On armored carriers or motor vehicles
13. (France, Federal Republic of Germany, Denmark)
14. Manual or on a motor vehicle
15. France, Federal Republic of Germany
16. On a motor vehicle
17. France, Great Britain
18. Manual
19. (France)
20. On a motor vehicle
21. Manual or on a motor vehicle

However perfected the radio technical and wire communications means are, they do not exclude and they do not diminish the role of mobile communications means in troop control. Of the mobile means, the most maneuverable are the helicopters (aircraft) and also all-terrain vehicles equipped with communications media.

In the tactical echelons the various signal communications media have retained their significance as before for transmitting commands, reports, mutual recognition, target indication and warnings. For this purpose, visual,

sound, infrared and radiotechnical means are used. The signal rockets, lanterns, tracer bullets and shells, flags, markers and so on have found the broadest application.

The use of mobile and signal means for troop control, especially under conditions of strong radio interference and limited application of radio communications, significantly improves the stability of control.

Means of Obtaining Information

Various technical facilities are usually used to obtain information about our own troops, the enemy, the terrain, the radiation situation, the weather conditions and other data without which successful troop control is impossible. At the same time, these means permit combination ("joining") of the directly administrative functions of the control units with the operations of the reconnaissance forces and means. This combination is especially important when designing the automated control systems inasmuch as they theoretically cannot function without the means of obtaining initial information for control. The automated antiaircraft complex which cannot operate without air target detection means serves as an example of this.

According to the foreign press, the means of obtaining information include radar for different purposes, television, radiation reconnaissance instruments, meteorological media, observation instruments, infrared equipment, navigational equipment, means of instrument and sound reconnaissance, and so on.

Radar is designed for detection not only of air targets but also ground targets. It makes it possible to observe in any weather, at night, and under conditions of limited visibility. The principle of ensuring a continuous radar observation field of the entire tactical zone of the enemy is provided for in the location of the radar stations.

The troop radar with an operating range of more than 10 km has large dimensions and heavy weight. The medium (5-10 km) and short (less than 5 km) range radar with independent power supplies can be carried manually. At the battalion level in the U.S. Army there are six radars, the armament of the infantry troops includes nine types of radar. They are all equipped with remote control panels and are capable of automatically intercepting moving and stationary targets and measuring the distance to them.

The French Army has in its armament seven types of radar, which is also automated. The infantry troops of Great Britain, Italy, and Sweden have one type of radar each. The troops of the Federal Republic of Germany are basically equipped with American and French radar (Table 3).

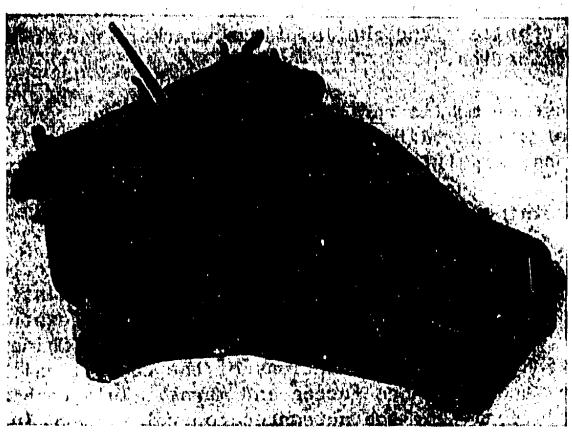


Figure 6. The wide-carriage SDM-133 9-key adding machine.

Television as a means of obtaining situation data still has comparatively limited application. By using television equipment, as is noted in foreign literature, it is possible to observe the battlefield, carry out reconnaissance of the enemy, roads and terrain, maintain communications, guide missiles to the target, monitor the operations of the troops, the results of firing, and so on.[1] The installation of television on helicopters which can continuously maneuver depending on the stated observation mission is considered more prospective; on detection of an interesting target, the helicopter slows its flight and hovers. The range of such equipment reaches 50 km or more.

The optical reconnaissance devices are designed for intercepting targets and determining their location in polar or rectangular coordinates. These instruments include the reconnaissance theodolites, range finders, aiming circles and other devices. Under nighttime conditions, along with the optical devices which are adapted for operation at night, night vision instruments and instruments for illuminating the terrain are used. Under favorable observation conditions, the instruments permit reconnaissance to a significant depth, ensuring fast and accurate interception of the targets.

Recently low-power lasers have begun to be used widely. On their basis, range finders designed for equipping tanks and controlling artillery

1. See V. I. Bykov, Ye. P. Gusev, I. M. Kokorin, V. A. Polyakov, "Televideniye v Voyennom Dele" [Television in Military Affairs], Moscow, Voyenizdat, 1969, pp 39-41.

fire, instruments for conducting air reconnaissance, guiding guided air bombs and missiles to the target, maintenance of communications, and so on have been built in a number of foreign armies.[1]

Various sound reconnaissance instruments, means of observing the battlefield and also radiation reconnaissance devices play an important role in obtaining situation data.

Tactical Calculation and Information Processing Means

The acceleration of the processing of incoming data and the performance of calculations can be achieved as a result of using computer engineering, various tables, nomograms, logarithmic and specialized calculation rules. The selection of the type of computational media depends on the volume, complexity and required accuracy of the calculations.

Various types of keyboard calculators can be used in the operating practice of the institutions of higher learning, echelon headquarters, beginning with the battalion. They can be used both for the solution of the standard problems by previously prepared procedures and for the solution of nonstandard problems by unprepared procedures.

The timely development of procedures in headquarters permits significant improvement of the operativeness in performance of the calculations and ensurance of effective use of the calculators. The procedural preparations usually include the following: the selection and the statement of the problem, its description, the development of the mathematical method, algorithm, program and instructions for using the procedure and also the development of the machine program for solution of the problem.

The calculation programs can be presented in universal form--a calculation form and calculation program for a specific type of calculator. The second program permits most complete utilization of the possibilities of the calculator. It provides for reducing the calculation times, but at the same time the preparation of the program is a comparatively tedious process.

With respect to the nature of operation and structural design, the calculators are usually divided into two groups--adding machines and calculators.

The adding machines basically perform the addition and subtraction operations. They include the SDM-107, the narrow-carriage SDM-107D and the wide-carriage SDM-133 (see Figure 6).

The calculators provide for the performance of all four arithmetic operations. With respect to operating principle they are divided into

1. "Aviation Week and Space Technology", November 1971.

mechanical (VK-1); electromechanical which, in turn, are semiautomatic (VK-2, VK-2, VK-2M, VMP-2) and automatic (VK-3, VMM-2, Bystritsa-2); electrorelay calculators (Vil'nyus and Vyatka); computers (Vega, EDBM); the small digital computers (Promin'-M, Nairi, Mir, Mir-1) and the all-purpose computers (Minsk-32, and so on).

On the semiautomatic VK-2 and VK-2M the multiplication operation is executed semiautomatically, and the division operation, automatically. In contrast to them, the VK-3 also performs the multiplication operation automatically.

The VMP-2 does not differ with respect to its operations from the VK-2M, but it is capable of performing some additional operations. The VMM-2 was built on the basis of this machine. It performs the multiplication and division operations automatically.

The Vil'nyus (Figure 7) and Vyatka electrorelay machines automatically perform all four arithmetic operations, raising to a power, obtaining the sum and difference of products, multiplication with addition and subtraction, finding the difference of the squares of two numbers. They can be connected to different printers and punch devices.

The Vega (Figure 8) and EDBM keyboard computers are fully automatic. Electronic circuits and semiconductor elements are used in their design. In addition to the operations performed by the electrorelay machines, they are capable of performing algebraic addition of products, extraction of the square root, conversion of integers and fractions from the decimal system to any other system, and so on. The Vega has dimensions of 510 x 450 x 250 and weighs 28.8 kg. It operates from the AC network.

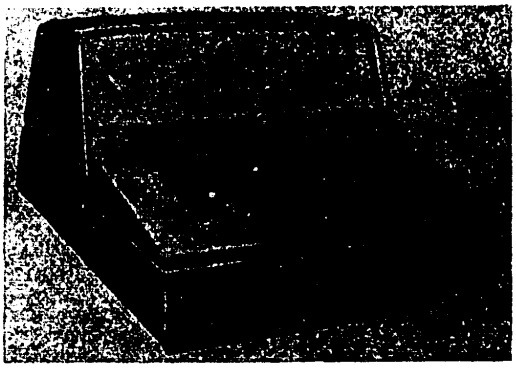


Figure 7. Vil'nyus Electrorelay Calculator.

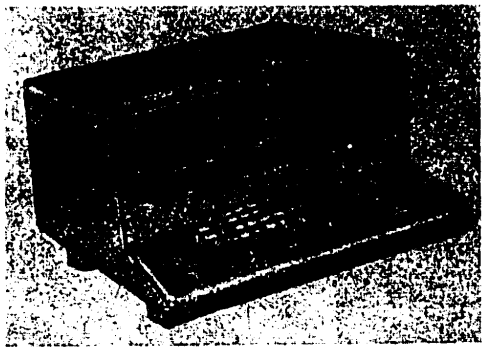


Figure 8. Vega Computer.

Table 4. Basic Specifications of Keyboard Calculators*

(1) Типы машин / (2) Показатели	Механическая скорость, ход/мин (об/мин, цикл/мин) (3)	Габариты (длина, ширина, высота), мм (4)	Масса, кг (5)	Мощность, вт (6)	Норматив повышения производительности труда, раз (7)
1. Машины суммирующие: (8)					
СДМ-107	140—150	435×245××190	11,8	30	1,5
СДМ-107 Д	140—150	445×250××310	18	30	1,5
СДМ-133	140—150	500×465××200	18,5	30	1,5
2. Вычислительные машины (9)					
а) полуавтоматические					
ВК-2	280	282×235××165	11,2	40	2,0
ВК-2 М	280	289×282××198	13,5	75	2,0
б) автоматические					
ВМП-2	460	440×350××270	18,1	30	2,0
ВММ-2	460—480	440×350××250	22	30	2,0
„Быстрица-2"	(10) 0,2 сек—время операции; (11)		3,5		2,0
в) электрорелейные					
„Вильнюс" (12)	от 300 до 1000	430×360××240	26	100	2,5
„Вятка" (11) (12)	от 300 до 1000	438×389××250	26	100	2,5

*See V. S. Akent'yev, I. S. Vinnik, A. Ye. Vodnev, I. I. Kandaurov, B. F. Kosenko, "Mekhanizatsiya Inzhenerno-Tekhnicheskogo i Upravlencheskogo Truda" (Mechanization of the Engineering-Technical and Administrative Labor), Lenizdat, 1973, pp 17, 39, 42, 50 and 57.

Key:
1. Types of machines
2. Indexes
3. Mechanical speed, stroke/minute (rpm, cycles/minute)
4. Overall dimensions (length, width, height), mm
5. Mass, kg
6. Power, watts
7. Normative for increasing the productivity of labor, times
8. Adding machines: SDM-107, SDM-107D, SDM-133
9. Calculators
   a. Semiautomatic - VK-2, VK-2M
   b. Automatic - VMP-2, VMM-2, Bystritsa-2
   c. Electrorelay - Vil'nyus, Vyatka
10. Sec-operation time
11. From
12. To.

The highest-output, small electronics calculators or computers are the Iskra-110, Iskra-11M, Iskra-121 and Elektronika-4-71B.

The Promin'-M, Nairi and Mir digital computers are simple with respect to structure. They do not require that the service personnel have special programming training. The Promin'-M (Figure 9) and Promin'-2 machines provide for the performance of a large number of calculations. They solve the systems of differential equations, they find roots, the values of defined integrals, and so on. They are analogous with respect to structure and basic parameters.

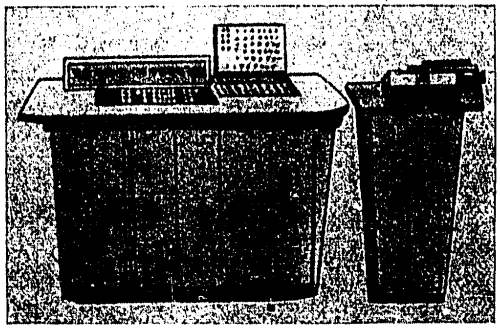


Figure 9. Promin'-M Computer

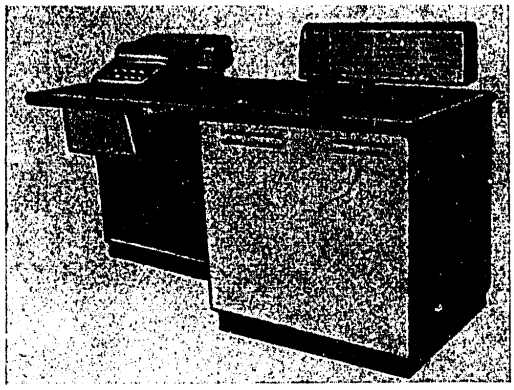


Figure 10. Mir-1 Computer.

The Nairi and Nairi-2 machines are designed for the performance of a broad volume of calculation problems. They permit the input of the problems in a language which is close to the mathematical language with further automatic programming of the solution. The Nairi-3 machine is constructed from integrated hybrid circuits.

Table 5. Basic Specifications of the Electronic Keyboard Calculators or Computers

Name of Machine	Operation performance time, sec	Weight, kg
Iskra-110	0.03-0.25	3.5
Iskra-111M	0.03-0.3	8
Iskra-121	0.02-0.25	12
Elektronika-4-71B	0.3	1.5

The Mir-1 machine (see Figure 10) is also designed for automation of calculations. The computation algorithm has input to the machine in the form of a word-formula description with simultaneous printout of it on an electric typewriter. The Mir-2 machine has a screen, "an electronic board," on which the operator sees the results of the calculations and can introduce the necessary corrections and explanations by using a "light pencil."

In order to perform the calculations and process the incoming information, tables, graphs, rules and other attachments can also be used. They find broad application for determination of the following: the radii of safe distance for personnel in case of a nuclear blast; the size of the contamination, destruction and fire zones on application of nuclear strikes; the depths of columns; the times of passage of columns across the initial line and the control lines and so on.

For the performance of calculations connected with input of the initial data obtained from numerous sources, punch machines are also used. With comparatively high output capacity these machines require the participation of a man for analysis of the intermediate results, transfer of the punch cards, adjustment and recommutation of the controlling units. In addition, the memory of the punch machine is awkward and requires space-taking storage for the punch cards.

Improving the efficiency of the application of computer engineering depends not only on the quantity and quality of the machines, but also the methods of using them. The best conditions occur when there is a computer station at headquarters. In this case the calculations are performed faster and with better quality using highly qualified computing experts. More favorable possibilities for technical servicing of the machines are ensured. In the presence of a small number of calculations, the decentralized procedure justifies itself where the calculating devices are located directly in the work areas of the headquarters officers. The combination of the two procedures is also possible.

Table 6. Basic Specifications of the Small Digital Computers

Показатели (1)	„Промінь-М" (2)	„Наїрі" (3)	„Мир" (4)	„Мир-1" (5)
Система счисления (6)	Двоично-десятичная (7)	Двоичная (8)	Десятичная (9)	
(10) Среднее быстродействие (операций, сек)	до 1000 (11)	1500—2000	200—250	200—250
(12) Емкость запоминающих устройств (слов): оперативного	160	1024	4096	4096
внешнего	—	16384	—	—
(13) Скорость ввода (знаков, сек)	—	7	7	7
(14) Потребляемая мощность (квт)	0,45	1,6	1,0	1,5
(15) Габариты (мм)	1270×908×780	2014×1100×1100	1810×750×1080	2350×1590×1065
(16) Масса (кг)	260	620	300	—

Key:
1. Indexes
2. Promin'-M
3. Nairi
4. Mir
5. Mir-1
6. Number system
7. Binary-decimal
8. Binary
9. Decimal
10. Average speed (operations, sec)
11. To
12. Memory size (words); ready-access, external
13. Input speed (characters, sec)
14. Intake power (kilowatts)
15. Overall dimensions (mm)
16. Weight (kg)

Documentation and Document Reproduction Facilities

The development of various combat documents is a necessary part of the troop control process. In order to reduce the expenditures of manual labor on the preparation, the copying and duplication of text and graphical combat documents at headquarters, the following are used: sound recording equipment (dictation machines, tape recorders), typewriters, copying machines, various drawing machines and devices, office machines, various rules, templets, patterns, sets of standard inscriptions, provisional symbols, notation, letters and numbers on a transparent film and also standard forms.

Among the second recording equipment, the P-180M dictation machine has become widespread. Its basic characteristics are as follows: tape speed 4.76 m/sec, recording and reproduction time 120 minutes, weight 9 kg. It permits recording of the orders given or the reports received under any conditions. When using the dictation machine in a number of cases there is no necessity for developing a written combat document. The recording on tape and supplemented by the necessary service data can serve as the document. When necessary, by reproducing the recording in a special mode it can be transcribed on a typewriter. In addition, the dictation machines (tape recorders) can also be used as storage for various reference data required by the staff officers during combat operations planning. For this purpose the officer reproduces the recording of the necessary data in advance when he has free time so that during the operating process he will not have to look through various references.

Typewriters are still irreplaceable in headquarters for copying documents. The typing output on an ordinary typewriter, depending on the qualifications of the typist, is one standard page every 8 or 10 minutes. On an electric typewriter one page can be typed in 5 minutes. On an electric typewriter the expenditures of labor are 16 times less than on an ordinary mechanical typewriter, and the printed text is smooth and accurate. The Ukraina PEK-46 electric typewriter (see Figure 11) prints at a speed of up to 100 characters per minute and produces 15 to 20 copies simultaneously. The automatic typewriters print out a paper punch tape from a role 2.5 times faster than the most qualified typist.

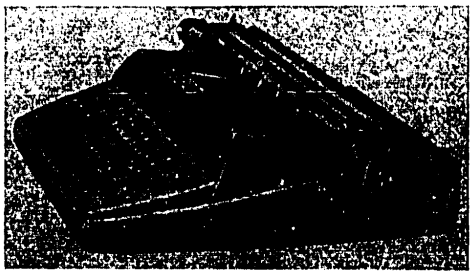


Figure 11. Ukraina PEK-46 Electric Typewriter.

Great possibilities are being opened up for the use of typewriters with punch attachments. They make it possible to punch out a text on a tape or a ounch card simultaneously with printing it. They are also used for reproduction of the encoded text on the punch tape in printed form.

In order to reproduce combat documents, especially at tactical headquarters, thermocopying machines can find application (see Figure 12) which permit us to obtain up to 20 copies. They are simple in structure and no special training is required to operate them. Typed texts or texts written in India ink or pencil but not aniline inks can be used as originals for

copying. The copy is obtained on a special thermally reactive paper. The copying process is simple. A deficiency of this type of copy is its subsequent darkening.

Table 7. Basic Specifications of Thermocopying Machines*

Indexes	Termokopir	Molniya	Teka
Largest copy format (mm)	210x297	210x297	210x297
Machine dimensions (mm)	490x375x225	500x394x190	430x330x135
Copy time (sec)	6-10	1.3-7	6
Weight (kg)	26	16	9

*See A. V. Prokof'yev, "Sredstva Mekhanizatsii i Avtomatizatsii v Shtabakh" (Mechanization and Automation Means in Headquarters), Voyenizdat, 1976, p 160.

The Era and Elektrofot type electrographic machines (see Figure 13) are also used for copying documents. Their structure and operation are distinguished by simplicity.

A typewritten text, manuscript, printed text, drawings, diagrams made in India ink or soft pencil can be used as the original.

Table 8. Basic Specifications of the Era nnd Elektrofot Machines*

Indexes	Era-2	Era-M	Elektrofot
Largest format of the original (mm)	594x841	594x842	210x297
Copies from one exposure	3	3	3
Average operating speed (copies per minute)	1.3	2	1-1.5
Weight (kg)	260	130	65

*See V. S. Akente'yev, I. S. Vinnik, A. Ye. Vodnev, I. I. Kandaurov, B. F. Kosenko, "Mekhanizatsiya Inzhenernotekhnicheskogo i Upravlencheskogo Truda" (Mechanization of Engineering-Technical and Administrative Labor), Lenizdat, 1973, pp 280, 290.

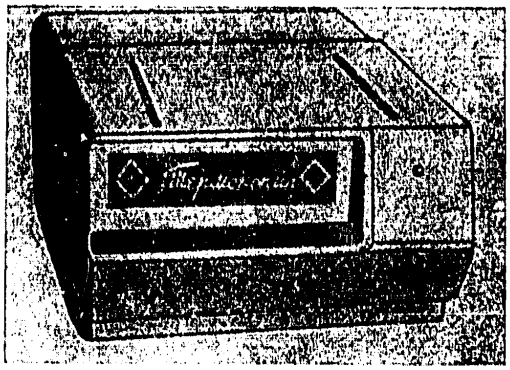


Figure 12. Termokopir Thermocopying Machine.

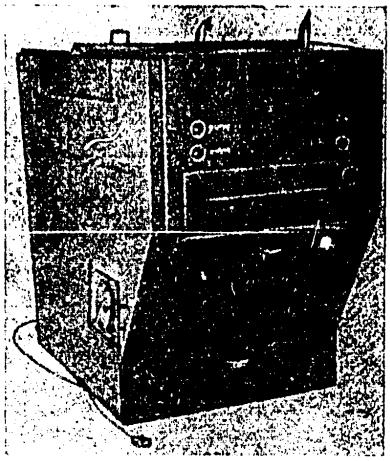


Figure 13. Elektrofot Electrographic Reproduction Machine.

Among the light copiers, the most advantageous for operation under field conditions are the table models SKN-2M (Figure 14) and SKN-22 machines.[1] The structural design of these machines is not complex and includes the following: an electric motor with reduction gear, a light copying unit and developer. The machine is serviced by one man.

1. See V. S. Akent'yev, I. S. Vinnik, A. Ye. Bodnev, I. I. Kandaurov, B. F. Kosenko, "Mekhanizatsiya Inzhenernotekhnicheskogo i Upravlenechesko Truda" (Mechanization of Engineering-Technical and Administrative Labor), Lenizdat, 1973, p 224.

Table 9. Basic Specifications of the Table Model Light Copiers

Indexes	SKN-2M	SKN-22
Width of copying zone, mm	940	360
Copy speed, m/hr	30-90	30-320
Overall dimensions, mm	1516x740x410	600x835x360
Weight, kg	120	70

A procedure such as photocopying of documents has obvious value. High quality of the image is achieved, and the possibility of recording the information with significant diminishing is provided. It finds application in the presence of time and the corresponding equipment. To make copies of maps and diagrams, the KP-8M copy frame can be used. Its dimensions are as follows: 840x630x150 mm, weight 40 kg.

For reproduction of the text documents and also diagrams, graphs and tables at headquarters, hectographs can find application. The industrially produced Yantar' hectograph permits more than 100 copies to be obtained from one printed form on ordinary typing paper 397x420 mm in size. By comparison with the typewriter method, the hectographic method is six to eight times more efficient. The machine weighs 36 kg.

The templet of conventional signs, logarithms and special slide rules, sets of various patterns and templets, drawing instruments, curvimeters, gauges, goniometers, folding magnifying glasses, a set of special colored pens and pencils are irreplaceable in the work of the staff officers when developing written and graphical combat documents.

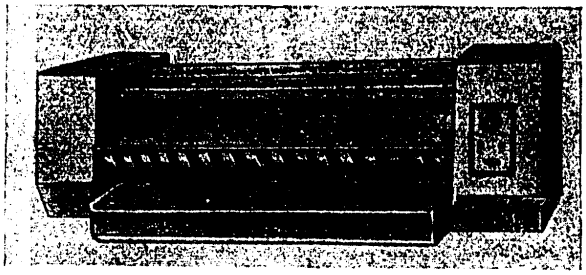


Figure 14. Table Model SKN-2M Light Copying Machine.

The following have found application at a number of headquarters:

a) Field sets of drawing accessories. They include templets, rules, India ink, pens, pencils and a pencil sharpener, watercolors and brushes,

drawing instruments, buttons, glue, adhesive tape, and a tool kit. The set is mounted in a metal box weighing 3 kg;

b) A set of stamps, provisional symbols and numbers. The set includes 50 stamps, three stamp pads and ink. It is placed in a box with special recesses 40x30x50 cm in size;

c) Sets of standard inscriptions, provisional symbols, notation, letters and numbers on a transparent film--overlay. It is also possible to include the headings of maps, inscriptions for tables and calculations, the signatures of duty personnel and also various provisional symbols, notation and numbers most frequently encountered when planning combat operations. In addition, the set can include self-adhesive transfer symbols--decals;

d) Sets of stamps of provisional symbols and inscriptions in special boxes. The size of the stamps is determined as applied to the scale of the map.

In order to preserve a map, especially when working in wet weather, protective coatings can be used. For this purpose industry produces the KS-229 carbinol laquer and clear special plastic films.

Various types of standard forms are also among the means for accelerating document production. Practice shows that the presence at headquarters of various previously prepared standard forms and blanks greatly facilitates the work of the officers, especially when planning combat operations. This is all the more true in that it is possible to represent not only the process of performing the operative-tactical calculations on a blank form, but also the content of all of the basic combat documents. In this case only the variables need be entered, which greatly reduces the time and accelerates the process of filling out the document.

In addition to the general-use automation and mechanization means with which the control units and points are equipped, every staff commander and officer must have the required accessories among his supplies for working under field conditions. These include a drawing board folder (field kit), compass, dividers, a gauge, a templet of conventional signs and slide rule, colored and ordinary pencils, ball (colored) pens, a penknife, an eraser, notebook, copy paper, magnifying glass, watch, electric flashlight, topographic map, documents for conversations over the technical communications means, reference materials, and an individual dosimeter. Depending on the missions performed by the officer, this set of accessories can vary.

Command Post Vehicles

Exceptionally high requirements are imposed on the command post vehicles. They must have high off-road capacity, they must have high fuel distance, protect the personnel from enemy fire and penetrating radiation, they must be reliable in operation and ensure convenience of operation for

the officers at the control post. The set of technical means mounted on the vehicle must provide for maintaining communications both in place and in motion and also the performance of work by the commander and the staff officers in accordance with their functional duties both at the command post and when visiting the troops.

In addition to communications media, such vehicles usually have navigational equipment and observation devices. Nuclear protection equipment and other devices are installed. The equipment is placed in the vehicle considering convenience of use of the communications media from each work space and the possibility of working with maps. When the officer is outside the vehicle, provision must be made for organization of remote control of the radios by a wire or radio.

Usually armored vehicles are used as command post vehicles. This improves the viability and stability of control to a significant degree, it ensures reliable protection of the personnel and the communications means not only from bullets and shrapnel, but also from a number of damaging factors of a nuclear blast. Their advantage also consists in the fact that with respect to external appearance they differ little from the ordinary combat vehicles, which facilitates camouflage and at the same time excludes the possibility of rapid detection, especially on the march or when completing a maneuver.

However, the application of armored vehicles to a known degree complicates the working conditions of the commander and the staff officers. The limited space in the vehicles complicates working with a map. Therefore, in a number of command post vehicles a tent is provided which is unfolded at the halts, thus increasing the usable area and working convenience of the officers.

Some models of armored command post vehicles are shown in Figures 15 and 16. The M577 command post vehicle was created on the basis of the M114 amphibious armored carrier. It is equipped with work spaces for five people.

The Sultan FV105 command post vehicle is in the production stage. Its basic indexes are as follows: combat weight 7.91 tons, 5 to 6 work spaces, length 4.99 meters, height 2.02 meters, width 2.18 meters, engine power 197.7 horsepower.

Helicopters are most widely used for troop control in foreign armies, which is indicated by the experience of the Vietnamese and the war in the Near East. They are used not only as the means of fast movement of the control points, but also for the performance of troop control missions. For this purpose the helicopters are equipped with communications means and observation equipment, and are fitted with work areas for the officers. In addition to the command post vehicles, the control point equipment includes various special communications vehicles, mobile communications means and also transport vehicles required for support and servicing of the operation of the control point.

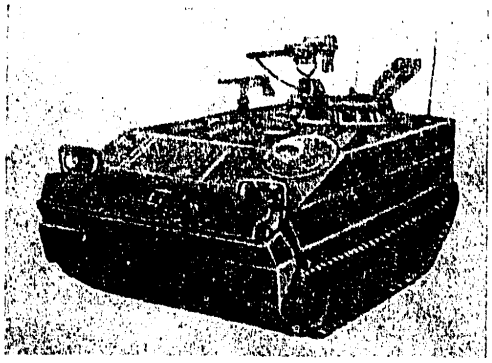


Figure 15. M577 Command Post Vehicle Equipped on the Basis of the M114 Caterpillar Amphibious Armored Carrier (U.S. Army).

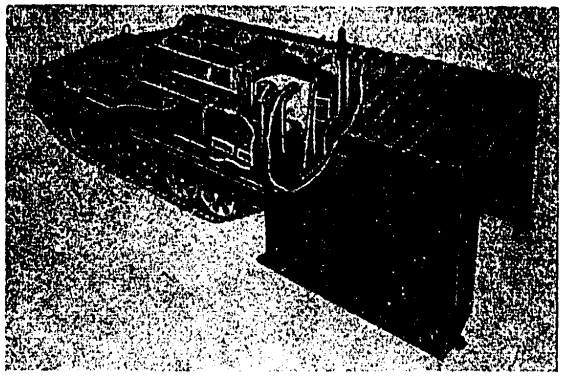


Figure 16. Sultan FV105 Command Post Vehicle (British Army).

Prospects for the Application of Automation Media for Troop Control[1]

The military and technical revolution that has taken place has had decisive influence on the maintenance, volume and methods of operation of the control units. The time factor has acquired definite significance in troop control. The success in the performance of stated missions by the troops will depend on the operational efficiency of control, the capacity of the commanders and the staffs to be ahead of the enemy in taking measures with respect to preparation and conduct of combat operations.

1. According to the viewpoint of foreign armies.

With the usual system for gathering data, the information from the subunit directly engaged in combat still goes to headquarters slowly. This limits the possibilities of influencing the course of combat on the part of the commanders, especially those who have powerful means of destruction at their disposal. Therefore the necessity arises for sharp acceleration of the transmission of information and improvement of the operational efficiency of its processing. Theoretically, the data gathering and processing system must be such that the data on the most important changes in the situation will reach headquarters when they occur on the battlefield.

In order to achieve a sharp reduction in the time for execution of all the basic operations with respect to troop control, it is insufficient simply to improve the methods of operation and make corrections in the organizational structure of the control unit; it is necessary, in addition, to introduce improved technical means. However, if out of all the technical communications means even the most improved are introduced, then in this case it is difficult to count on sharp improvement of troop control and the more so, on bringing it into accordance with the growing combat and maneuvering capabilities of the troops. This is explained by the fact that the communications media touch on only one process in troop control--the information transmission process which, although it is the most important, still carries comparatively little weight in the overall volume of all of the troop control operations. Therefore changes in the communications media alone do not lead to a sharp increase in operational efficiency in the work of the control units.

The basic path for the solution of this problem consists in the introduction among the troops of the entire set of theoretically new technical control means based on the latest achievements of radioelectronics. The necessity arises not only for facilitating the labor of the officers, but also for transfer of a number of their functions to the special automated devices and machines. Whereas in the first phase automation of individual troop control processes was provided, at the present time in a number of foreign armies work is being done on the creation and introduction of automated troop control systems (ASUV) which encompass the basic control processes in all echelons. The development of such systems is the most prospective area in the solution of the basic troop control problems. The transition to the automated system represents a qualitative jump in the development of the material base for control.

The automated system complex includes various technical means with respect to purpose and structure. The basic ones include the following: computers, automated data pickups of different types, automated transceiving devices, high speed automated communications media and other devices. The primary role among these devices is played by computers. In the modern computers available to foreign armies, a high degree of miniaturization has been achieved, the capacity of the storage elements has been increased, and the volume of information which can be processed by these machines has been increased by many times. The machines perform such highly important missions as the gathering and processing of information required for troop control,

the selection and output of the information to the subordinate and superior headquarters, the commander and officers of the control units in convenient form for reception; the performance of complex calculations, especially those required for the selection of the most effective means of destruction of various enemy targets. The specifics of the solved problems do not exclude, as foreign specialists note, the creation of an all-purpose computer capable of solving a broad range of problems. The problem of creating a single-type computer with different output capacity (considering the problem of processed information) is solved by connecting a different number of like modules. Thus, the basic version of one of the U.S. Army computers consists of modules: a central processer, input-output module, and two ready-access ferrite memory modules, the number of which can be increased, depending on the class of control body, to eight.

The information sensors are used for gathering, formating and transmitting data from the primary sources to the command level and for reception of commands from them in the form of signals. Some of the sensors operate automatically without operator assistance, and others have a manual data input device. The transceivers provide for reception and automatic relaying of the data transmitted from the primary source to the computer.

The most important role in the complex system is assigned to the communications media. They must provide for automatic information exchange and ensure functioning of the system under any conditions.

The structure and the functional diagram of the automated system depend on its purpose and the missions which it is to carry out, the degree of technical equipment, the scale and organization of the control link and the volume of incoming information.

Each troop instance is characterized by its own problems, operating characteristics, the information content and degree of automation inherent in it. Therefore any automated control system provides for the solution of a defined class of control problems arising from the purpose of the system. The quality of the solution of these problems is estimated by the corresponding indexes which are the characteristics of the automated control system.

It is possible to include in them such things as adaptability of the system to the solution of the problems at any point in time, efficiency (speed), accuracy of solving the stated problems, high carrying capacity, noiseproof capability, sufficient capacity, viability, mobility, economy, and so on.

The application of the automated system unconditionally introduces sharp changes in the methods of operation and the organizational structure of the control units. The automation of the data gathering processes releases part of the officers performing this labor consuming work. Here the data obtained can be more exact and reliable, for the greater part of these data will be gathered automatically. There is no necessity for developing and sending written reports and surveys to the superior level.

Significant changes occur in the methods of generalization and processing of the data obtained. The processing of the most important information will be done by computer. This information is capable of automatic recognition, analysis, generalization and selection of the necessary data for transmission to the corresponding control level. The staff will be in a position by the previously developed program to solve a number of calculation problems connected with the application of fire weapons, the advancement of the troops, regrouping, calculation of the relation of the forces and means, and so on. The necessity for internal information disappears, for all of the data reaching the computer after processing can be output to all of the interested people and echelons to remote devices.

As a result, parallelism and duplication in the collection of the situation data are eliminated, the necessary conditions are created for equal fulfillment by the officers of their obligations. All of this indisputably will improve the efficiency of control.

When making a decision, the commander can, by interrogation, obtain all of the necessary calculation and reference data by using the remote device of the computer.

With the appearance of automated systems, as before, the most important document remains the working map of the commander. The map which is projected on a screen or electromechanical plotting board permits clear viewing of the entire situation. By the signals from the computer, the latest changes in the situation can be depicted on it immediately. If the necessity arises, then the situation in any section of the map is schematically isolated on a large scale on the screen of a cathode ray tube. Different colors can be used to designate our own troops and the enemy troops. Here the great advantages are that along with the commander, the staff officers can also observe the situation on the screen at the same time.

The automation of the data gathering and processing and the solution of the numerous problems of a calculational-reference nature facilitate the labor of the staff officers and reduce the time required to plan the combat operations. The decisions made will to a high degree correspond to the developed conditions of the situation, for the basis for them will be the latest data reflecting the true situation and the condition of our own troops and the enemy troops and also the exact calculations and the data on all other factors influencing the content of the decision.

Here the output devices of the ASUV provide for input and retrieval of information, printout, clear representation of the data, documentation, and reproduction of the documents. The construction of the image in the form of a screen, a display, and various plotting boards permits us to obtain the latest situation data at any time.

For all large changes which occur in the methods of operation of the control units, the role of the map does not diminish. It will be irreplaceable in decision-making by the commander, the planning of combat

operations, the statement of missions for subordinates, the realization of control of the execution of the stated missions by the troops. Therefore the introduction of the ASUV in no way lowers the requirements on the staff qualifications of the officer or in turn, his skill in working with the map.

The introduction of a new system undoubtedly brings about not only redistribution of the functions among the duty personnel, but also leads to a change in the organizational structure of the control units. Considering that a number of functions of staff officers will be transferred to automated devices, it is possible to expect some reduction in the administrative personnel. In addition, new specialists will appear at headquarters for the maintenance and servicing of the automation means.

However, it is impossible not to see the new problems with which the officers will be faced on the introduction of the automated troop control systems. For the solution of the operative-tactical problems, the complete mathematical description of the combat operations will be required of them, which is of great complexity and is connected with the expenditure of significant effort by the specialists. The full value program entered in the computer memory cannot be created without solving this problem.

Here the operative-tactical description of the problem can be made by well-trained officers who comprehensively know its content and the procedure for carrying out this mission, clearly representing the volume and nature of the activity of all of the control units, and also familiar with the peculiarities of the conversion of the description to the language of mathematics. In the description process the proper establishment of the approximate quantitative relations between the combat indexes (the rates and width of the offensive zone, the depth of the mission and the time for fulfillment of it, and so on) and the combat possibilities of the sides, the procedures for the troop operations considering the situation conditions and also the given skills and combat experience has great significance.

With this approach to the operative-tactical description of the mission, the process of algorithmization and programming of the mission for the computer is significantly facilitated. This process is a no less responsible phase of the operations which must be carried out when using the automated troop control system.

Whatever the difficulties in the way of building the ASUV, there is unquestionably a future for it. Whereas in the first phase the computers were used to facilitate the individual tedious operations, at the present time in foreign armies operations are being successfully carried out with respect to the creation of systems which provide for automation of many of the control processes simultaneously at several staff command levels. The creation of such systems will permit a sharp improvement in the control efficiency.

3. Organization of Communications and Control Points

Requirements on Control Points

The control point is a collective of duty personnel trained and organized for work and a complex of technical means and the personnel to service them, deployed at a defined location or in movement, and directly planned for troop control during training and during the course of combat operations. In order to provide for normal operations of the control point, usually, in addition, the required forces and means for security and service are isolated; they are located separately from the control point.

The basic purpose of the control points is to ensure solid, flexible, continuous and secret troop control under situation conditions. In order to correspond to this purpose, they must be highly mobile, be of small composition, equipped with modern technical control means, protected against the means of destruction of the enemy, and create normal conditions for the work and rest of the personnel.

The degree of mobility of the control points is directly dependent on the quality of the machines with which they are equipped. Practice shows that the control points must have the best machines with high speed and high off-road capability over any terrain and in any weather, which with respect to external appearance and protection do not differ significantly from the machines used to arm troops. When observing the given requirements, mobility is increased and viability improved. In addition, the mobility of the control points depends to a great extent also on their position. Awkward control points require a great deal of time to set up and move, which lowers their mobility. On the contrary, the smaller the control points with respect to composition, the easier it is to ensure proper order and organization at them, and the more mobile and maneuverable they are.

The equipment of the control points with modern technical means and, above all, communications media, has decisive significance in ensuring stable troop management. They must be reliable in operation, simple to service, and ensure uninterrupted control in a fast-changing situation, powerful radio interference, frequent changes in location of the control points and also in movement and when at great mutual distance.

The equipment of the control points can correspond to modern requirements only when they are stable and protected against the means of destruction of the enemy, primarily against nuclear weapons. In modern combat it is impossible to ensure continuity of troop control if the necessary concern is not shown for the defense of the personnel of the control units against the means of destruction. In addition to the general measures taken in the interest of the protection of the troops, in the opinion of foreign specialists, it is considered necessary to equip the control point machines with collective means of protection against radioactive contamination, means of improving the defensive properties of the machines with respect to light emission and the effect of a shockwave, and to equip the personnel with

reliable individual protection means. Here favorable conditions for the normal activities of the officers obviously can be created only in the presence of sealed machines equipped with filtered ventilation units. In particular, these requirements are imposed on the Sultan FV105 command post vehicle in the British Army (Figure 16).

Here it is necessary to consider the possibility of the creation at the control points of normal conditions for the fruitful work and rest of duty personnel. In particular, convenient work areas must be set up with communications means close by, places to rest, to eat, for giving medical aid, and so on.

Control Point Composition and System

The purpose, the scale of the troop units and the situation have decisive significance in determining the number and composition of the control points.

In the battalion one control point is set up--the observation command post (OCP). This arises from the fact that the battalion operates in a completely limited part of the terrain (on the offensive up to 2 km and on the defensive up to 5 km[1]), it has a small number of subordinate subunits and correspondingly has at its disposal control equipment which is designed for only one control point. In case of failure of the observation command post its functions can be temporarily taken over by one of the company commanders previously trained to carry out these duties.

In the units of foreign armies, in view of the complexity of troop control and for purposes of distributing the control units, usually the command post and the rear services control point are created. The command post realizes direct control of subordinate troops conducting combat operations. It includes the greater part of the control units headed by the commander. The rear services control point is designed for management of the rear. It has officers who see to the equipment, repair, support and reinforcement of the troops. The creation of two control points not only brings the management closer to the objects of control, but it ensures the solution of the problem of the viability of the control points and the improvement of the stability of troop control as a whole.

The expediency of creating, in addition to the command posts, a second point designed basically for control of rear services and supply was confirmed during the last war. Accordingly, the control personnel usually are divided into two echelons. Thus, for example, the first echelon of

1. See G. I. Garbuz, D. F. Loza, I. F. Sazonov, "Motostrelkovyy Batal'on v Voyu" [Motorized Rifle Battalion in Combat], Moscow, Voyenizdat, 1972, pp 93, 215.

division control during the war years included the following: the commander, the deputy commanders of political and combat units, the chief of staff, the operative and reconnaissance squads, the signal squad, one or two political section instructors, the chiefs of combat arms and services, and also the required signal and service subunits. The second echelon has the following: rear services, the line squad, the administrative-management unit, the political section, the judge advocate's office, the military court and staff transportation. The first echelon was the command post from, which the observation post was isolated. This division of the control agents made it possible to bring control closer to the troops and to have small posts within the firing range of the enemy capable of ensuring reliable control, secret location in the terrain and comparatively fast movement to new locations.

In the view of the Foreign Office, the necessity for echeloning the control units under modern conditions has increased significantly. This is dictated by the requirement of ensuring stability and continuity of control on application of nuclear strikes by the enemy on the control point locations. Therefore, in addition to the command posts and rear control points, in the units and combined units of the basic foreign armies at the present time provision is made for the creation of a reserve (auxiliary, advance, reserve) command post. It is organized simultaneously with the command post and is designed for assuming control in case of neutralization of the command post. In cases where this post is located ahead of the command post in direct proximity to the subordinate troops, the commander can execute control from it during combat operations.

In the presence of small control points echeloned along the front and in depth, the probability of simultaneous neutralization of them decreases. Where one or several points are neutralized by nuclear strikes, control is transferred to the remaining interchangeable points.

Considering that the creation of a second (reserve) control point is an objective necessity, some foreign researchers proposed having a small special unit designed for operation at the second point on the staff.

In the presence of a control point system higher requirements are imposed on the communications media. They must make the conversations of officers over the technical communications media as close as possible to personal intercourse. In particular, the use of television, phototelegraph and other latest communications means for this type of communications deserves close attention. The application of high speed control means will permit the officers of the second control point to be kept up with the situation and all basic operations performed at the control point.

The composition and equipment of each control point are determined ahead of time. For this purpose the chief of staff prepares a special account of personnel, control and mobile means which are included in their

composition. He specifies the duties of each duty officer, defines the measures, times and procedures for executing of these duties under various combat conditions. This account must be corrected after defined time intervals taking into consideration not only the movement of the officers in the service, but also the advanced experience accummulated during exercises in solving troop control problems.

In the presence of several points, the question can arise as to which of them must be considered basic? In our opinion, the basic one remains the one where the commander is located, with the necessary control means, and where the most important control measures are taken. This confirmation follows from the fact that only the commander is granted the right to make decisions, and he bears personal responsibility for the execution of the stated mission by the troops.

The location of the commander in battle is determined in each case by the specifically developed situation. Combat practice has convincingly confirmed one of the basic control principles; where the fate of the battle is decided--that is where the commander is. Personally observing the development of events on the battlefield, he is in a position in a short time to act by his forces and means to change the situation, to have a moral-psychological influence on his subordinates, achieving direction in their efforts for successful execution of the stated mission.

Placement of Control Points During Combat

The location of the control point is determined depending on the purpose and conditions. According to experience in the last war, a rear point, for example, will be located near the subordinate rear subunit. The selection of the location for the command post is more complicated. A general trend has been to locate the control point closer to the troops. Usually on the offensive the command posts are located on the average the following distances from the forward edge: for the regiment 1.5 to 2 km, 2 to 4 km for a division, 3 to 6 km for a corps; the observation posts are 0.5 to 1.5 km away. This corresponds completely to the nature of combat and the condition of the combat and technical control means. The wartime experience has shown that neutralization of an entire control point from air and artillery strikes has been rare. Usually after fire strikes the control point has remained in operation, it has only required replacement of individual officers, or of communications media that have failed. It must be considered that the control points, as a rule, are located in reliable shelters.

Under modern combat conditions, close location of the command posts to the troop contact line presents definite difficulties in the placement and operation of duty personnel. In order to decrease or exclude losses of officers from artillery fire and mortars, to create the necessary conditions for them to work, in a number of cases it is necessary to provide engineering equipment at the control point locations. It must be considered that a

poor choice of location for the control point can lead to undesirable consequences. The smallest fluctuations of the front line in the direction of the control point location force its removal in a stressed situation when the commander and staff must be constantly in contact with the combat operations.

The possibility of maintaining continuous communications with subordinate headquarters, neighbors and superior headquarters and in the subunits and units and, in addition, observation of the battlefield decisively influences the distance of the command post from the front line.

On the average the basic command posts are at the following distances from the forward edge:[1]

Table 10

Control link	On the offensive		On the defensive	
	In the U.S. Army	In the West German Army	In the U.S. Army	In the West German Army
Battalion	1.5-2	1.5-2	2-3	2-3
Brigade	4-6	3-4	8-10	7-12
Division	8-12	10-15	10-20	to 25

The remaining posts are placed beginning with the missions which they carry out, and in the interest of supporting communications with the command posts. The spacing of the posts must be so as to exclude the possibility of damaging two posts by one medium-power nuclear weapon.

In the interest of improving the viability of the control points, in the opinions of foreign armies, it is considered expedient to locate them to the side of the targets which are the most probable for enemy nuclear attacks, to use the protective properties of the terrain and also to use prefabricated engineering structures. In order to protect the control point when in place, it is recommended that maximum use be made of natural cover--forests, ravines, canyons, mines, and so on, which reduce the damage from nuclear weapons and create the best conditions for camouflage. However, if there is time, especially on the defensive, for concealment of personnel, control means and transportation, engineering structures can be set up. The finished prefabricated and collapsible structures find broad application for equipping the shelters.

1. See: S. V. Grishin, P. A. Zhukov, Sh. I. Kitoshvili, "Taktika (Po Inostrannym Vzglyadam)" [Tactics (According to Foreign Views)], Moscow, Voyenizdat, 1972, pp 80-83.

The dimensions of the area over which the control point is set up depend on its composition, the condition of the terrain, the enemy activity, the distance from the forward edge, the time in one location and other conditions (Figure 17).

When selecting the area for location of the control point it is also necessary to consider the working convenience of the officers, the possibilities of personal intercourse among them when carrying out their missions. The selection of the terrain where the point can be hidden, and great expendigures of forces and means on engineering equipment of the area, does not acquire special significance. This is especially the case in that the possibilities for engineering equipment of the control points, especially during the development of the offensive, will be extremely limited. Measures such as maximum reduction of the time the control point is in one place, fast changing of areas by the control points, careful camouflaging against ground and air enemy attacks, and reliable cover by antiaircraft means are completely justified. In order to ensure more organized placement and deployment of the control point, it is important that the personnel clearly recognize the signals, the locations of the machines in the column, the packing up and deployment for operations. It is expedient, along with the signals of a threat of nuclear attack and air attack, danger of airborne attack, tanks and motorized infantry, to provide signals which define the different degrees of preparedness of the control point for movement. If the signal is given in time to prepare for movement (by which the volume of measures taken is clearly determined), then on arrival of another signal after some time, there is a possibility for organized designation of the march by the control point column.

In modern combat the control points are the most important targets for the enemy; therefore they cannot remain in one place for a long time, and they must leave well before a planned enemy strike. They must change location even where the combat formations of the troops are still in position.

A sharp increase in rates of combat operations has significantly complicated the maintenance of stable troop control. Under these conditions, the control points must be capable of operating on the move. With respect to the possibilities of the equipment, the solution of this problem now gives rise to no great difficulties, inasmuch as in all of the most developed armies the control points are equipped with vehicles with high off-road capacity and new communications means capable of operating underway. However, the given problem depends to a great extent also on the possibilities of the man--the commander and staff officer. Indeed, troop control does not consist solely in maintenance of communications with the troops. Even in the presence of uninterrupted communications, the staff officers who are in motion and in various vehicles find it quite difficult to gather and generalize data on the situation, report to their commanders, make the final decision and deliver the missions to the troops.

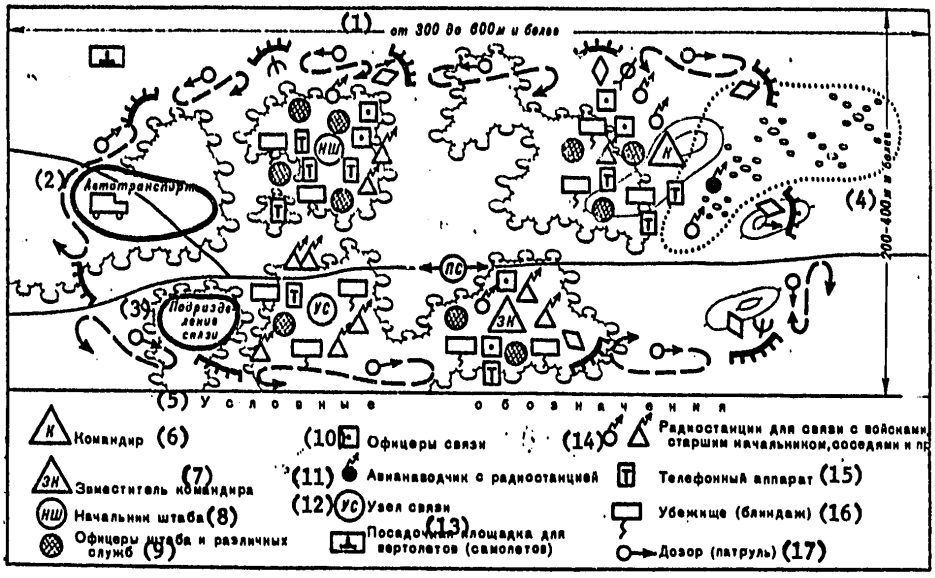


Figure 17. Schematic Diagram of the Location of the Control Point of a Combined-Arms Unit (U.S. Army)

Key:
1. From 300 to 600 meters or more
2. Motor transportation
3. Signal subunit
4. 200-400 meters and more
5. Provisional notation
6. Commander
7. Deputy commander
8. Chief of staff
9. Staff officers and officers of the various services
10. Signal officers
11. Antiaircraft gunner with radio
12. Signal center
13. Landing area for helicopters (aircraft)
14. Radios for communications with the troops, the senior officer, neighbors, and so on
15. Telephone
16. Shelter (dugout)
17. Patrol

In order to overcome this difficulty, sometimes an effort is made to have frequent halts of the control points without deconcentration and camouflage. As wartime experience has demonstrated, these measures have low effectiveness; moreover, they increase the vulnerability of the control points to enemy air attacks and fire.

War has demonstrated that it is more expedient to move the control points equipped with radios, at maximum possible speed, and to increase the length of the halts as a result of the speed of movement, providing cover for points, for deconcentration and camouflage. This organization of control when moving the points increases their viability and creates more favorable

conditions for the work of the officers. Of course, in extreme necessity when slowing down even for a few minutes can have serious effects on the course of events, the commander is justified in halting the command post column for a short time in order more precisely to determine unclear problems, making decisions and pass the decisions on to the executive units.

The shortest time for moving the points and maintaining stable communications during their period, in the opinion of foreign armies, can be achieved with helicopters equipped with radios. Their advantages are especially perceptible where control points are covering broad radioactive areas, areas of destruction, and wide water obstacles, and on development of the offensive in terrain with a limited number of roads, and on long marches.

Among the many conditions for improving the viability of the control points is the skillful deception of the enemy as to their true location. In the last war, the following procedures were widely used: the creation of false control points and simulation of their operation, the location of medium and high powered radios at some distance from the command posts, the replacement of the operating radios of the commanders by other stations, the transmission of false information about the locations of the control points, radio silence, and so on. All of this undoubtedly divided the attention of the enemy and at times led to strikes on false targets. Under modern conditions, the possibilities for deception of the enemy have increased greatly. With their skillful use the viability of the control points can be significantly increased.

The most important mission of the staff is organization of the security and defense of the control points. In addition to their being concealed in the terrain and carefully camouflaged against ground and air observation, provision is made for antiaircraft cover, the organization of security and defense and also the commandant's service. The well-thought-out warning system against the threat of enemy attack, constant monitoring of the service of the subunit designated for security and defense of the control points have important significance.

Restoration of Control Points

In spite of all the measures provided by headquarters with respect to maintaining viability of control points, it is necessary to be ready to restore them after enemy fire or nuclear strikes. The faster they are restored, the greater the guarantee that the efforts of the troops will be directed in time toward the satisfaction of the stated combat mission.

The volume, content and procedure for restoration of control depend on the scales of damage done to personnel, failures of the communications, and the situation which has developed in the given segment of the front line. Therefore quickly obtaining data on the condition of the control point near which a nuclear strike has taken place is of the greatest importance. For

this purpose, the higher headquarters can send out officers on helicopters (aircraft) or vehicles with off-road capacity so that they are in a position to discover the consequences of the strikes and also to use the communications lines of other control points which are near the detonation zone. In a number of cases, a comparatively large amount of time is required for gathering complete data as a result of which a delay can occur in taking measures to restore control. Therefore, in our opinion, it is more justified to obtain data by forecasting losses and the radiation situation which has developed as a result of a nuclear strike. On the basis of forecasting, the commander is in a position to make decisions to restore troop control. However, this does not exclude the organization of special reconnaissance to obtain more exact data.

The restoration of control or, in other words, renewal of the interrupted activity of the control points in a short time, depends to a high degree on the advance, clear determination of the basic paths of the solution of this problem. According to the opinions of foreign authors, the basic move here is to switch control to a second (reserve) point. One of the control points of the chiefs of combat arms can also be used as a reserve point.

Thus, in the infantry division of the U.S. Army, the battalion artillery command post is considered to be such a point. This point carries out missions that are similar with respect to content and is in a position quickly to set about performing the new duties which will differ from the previous ones only with respect to scale and not with respect to specifics. On switching control, provision is made for its reinforcement by the communications means and personnel. In this case, continuity and the most complete priority in troop control are ensured. It is possible for even subordinate commanders and headquarters not to perceive the change in leadership, for it continues to perform its duties in its customary style.

In addition, a procedure such as transfer of control to the command post of subordinate subunits with its subsequent reinforcement by others and with communications means is considered the most expedient.

In predicting the possibility of switching control to the subordinate post, during the course of battle it is required to systematically report the situation to this subordinate and to report the content of all basic orders and instructions given by the commander, so that the subordinate will be ready at any time to assume the functions of the higher command unit. Consideration must also be given to the possibility of a superior commander assuming the functions of a neutralized control point of a subordinate commander. This temporary combination of duties will permit continuous input of the control units to the troops.

The possibility of realizing this type of control is ensured by the fact that the superior unit must have communications with the control unit a step lower than his direct subordinate, and therefore rearrangement of the communications system is not required. It is necessary to consider that in

this case the information flow will increase sharply in connection with an increase in the number of subunits directly subordinate to a given control unit, which is felt in its operational efficiency.

One of the effective methods, as has been noted in the foreign press, is the isolation of a small operative group from higher headquarters with communications means and service subunits, which reinforces the unit (subunit) that has lost its command post and sets about carrying out the mission of troop control. The application of this procedure has justified itself in cases where not only the control point has failed, but the organizational integrity of the subunit has been disrupted. Undesirable consequences of a moral-psychological nature have been detected, and intervention of the senior officer is required.

Under any conditions, the presence of reserve communications media has the greatest significance in restoring control. In the presence of a reserve of communications media ready to advance directly into the vicinity of the created command post, restoring troop control is facilitated significantly.

Finally, there is the possibility for troop control to be realized temporarily from the rear subunit control point. For its successful performance of the new missions, it must be reinforced by officers and communications media.

The selection of the appropriate course will depend on the scale of destruction of troop control, the number of control points, officers and communications media preserved, and also the situation which has developed on the front as a result of enemy nuclear attack.

In a number of cases, the restoration of the control point will not take place in the same order planned. Nevertheless, the timely preparation of measures can to a great extent promote successful performance of this work.

Cases are not excluded where the control units will suffer only partial losses from nuclear strikes. Depending on the size of the losses, it can turn out to be expedient to perform certain organizational TO&E measures, namely, to reduce the number of officers occupied with secondary duties and to use them to reinforce the basic positions on which the stability of troop control depends.

The measures with respect to possible movement of the officers in case of neutralization of certain control points must be provided for in advance in the corresponding plans, and during the course of exercises worked out in practice with the duty personnel on the level of interchangeability of their new positions. The importance of these measures is confirmed by the fact that the level of training of the officers is the decisive condition for quick recovery of destroyed troop control.

In case of nuclear strikes by the enemy, the control points can find themselves in areas with high radiation levels. It is important in this case case that the staff officers retain their tenacity and stability and serve as an example to the troops in their behavior, ensuring continuity of troop control and organized withdrawal of the troops from the contamination zones. Accordingly, the role of the moral-psychological tempering of the officers of the control bodies, their readiness under complicated conditions and under sharp physical and psychological stress to retain their capacity to make objective evaluations of events and perform their duties knowledgeably increases.

The volume, the content, and the methods of operation of the restored control points and units will have characteristic features. In particular, the personal intercourse of the commander and the staff officers with subordinates by trips into the field will be used so that the decisions will be delivered to them in place, and under difficult conditions they will have personal influence on the performance of the stated mission. The transmission of oral commands over technical communications means will be practiced significantly more frequently.

Considering that the composition of the restored point, as a rule, will be small at first, broader interchangeability of officers acquires important significance. It is impossible to count on having the control point officers feel at home in the first few minutes after taking control. A certain amount of time will be needed to get into the new role. During this initial period it is especially important that subordinates, without waiting for requests from the new leadership, themselves report the condition of the subunits, their support, the course of the performance of the stated mission, grouping and nature of enemy operations as soon as they hear a signal, command or order. This approach permits the new commander to grow into the situation more rapidly. Consideration and foresight are required on everyone's part in order to help the officers in assuming their new and difficult functions to deal successfully with troop control.

If the subordinate control unit, for example, commander and battalion headquarters is forced to assume the functions of the superior echelon, the question can arise as to what is going to happen to the control of their own assigned subunit? To combine the functions or proceed along a different path--separate them, creating two control groups? It appears to us that the latter choice is better, but it is possible only in the presence of communications means and forces. In this case the commander and the battalion chief of staff can switch to the more complex and responsible work of performing the functions of the higher headquarters, and a small group of officers headed by the deputy commander will assume control of the regular subunit.

If the control point assumes the duties of the neutralized subordinate control point, then it is expedient to isolate a small group of officers. With this separate control, the efficiency and specific nature of the direction of the troops improve; the officers are in a position more deeply to

study the situation and to take the necessary measures in time for changing it. Their functions are clearly outlined, their attention is not divided, and the work proceeds more purposefully. In addition, the interests of control dictate location of the control points in accordance with their purpose, which is impossible without their territorial separation.

Consequently, well-thought-out organization of the control points, the taking of effective measures to protect them and also for recovery when the enemy applies nuclear strikes, are decisive conditions for ensuring continuous and stable troop control in any situation.

Communications Organization

The communications means are distributed reckoning that stable conditions will be maintained with the subordinates and the interacting subunits, with the senior officer and neighbors. Responsibility for communications along the front is left to the right-hand neighbor; responsibility for communications of the combined-arms subunits with the subunits of the combat arm is left to the subunits of the combat arms; responsibility for communications with the subunits of the special troops is invested in combined-arms subunits.

Radio and signal communications in the battalion are usually organized by the battalion and the subordinate subunits; wire communications are organized by battalion means.

Communications between the interacting subunits are established by order of the commander organizing the interaction.

Under any conditions the communications media must be capable of giving the commander and the staff the possibility of constantly knowing the situation and reacting in a timely manner to changes in it. The presence of various, new, improved communications means, in particular radio, facilitates the satisfaction of these requirements to a significant degree.

A communications system is created in the battalion which is in the form of a set of stations and communications lines deployed to ensure control of subordinates and the attached and interacting subunits, and to provide communications with the superior commander and neighbors.

The motorized rifle company creates its own radio network which includes the radios of the company commanders and platoon leaders and also all of the armored carriers of the company. The coordination of the operating procedures of the motorized rifle companies can be realized by the company commanders over the radio network of the battalion commander or by mutual entry into the company radio network.

Communications with the tanks attached to the battalion are realized over the radio network of the attached tanks. It includes the commander's

radio or the radio of the chief of staff. In order to maintain communications with the attached or supporting artillery battalion, its radios are joined to the radio network of the battalion commander. During combat the artillery battalion commander usually is located with the battalion commander, so that reliable communications between them are achieved.

In order to improve stability, in each instance the communications system must have several channels with basic correspondence. Figure 18 shows the organization of the communications of a motorized rifle battalion reinforced with a tank company, artillery battalion and combat engineer platoon. For communications with the senior officer, the battalion commander has two basic ultrashort-wave channels (R-105M and R-123) and two alternate channels (one on short-wave and ultrashort-wave each). For communication with the company commanders there are three direct channels (R-105, R-123, R-126) and one alternate artillery communications channel. In the presence of this number of channels high reliability and carrying capacity of communications are ensured.

The maintenance of stable communications depends not so much on an increase in the communications means and junctions as on its organization and the skillful use of the forces and means under different conditions, especially during the course of the maneuvering combat operations.

The skill of the commanders and staff officers in using communications means, especially radio, has important significance. The personal conversations of the officers by radio decrease the number of errors and repeated requests, and in a short time they permit not only situation data to be obtained, but also the necessary orders and instructions to be reported immediately. In addition, the orders given personally by the commander have defined psychological effect on subordinates, and they inspire certainty of success in the subordinates. It is necessary to strive for maximum reduction of information transmission time here. Under the conditions of active interference, information must literally be "fired" at the radios. The important role is played not by conversations but by giving commands, signals and sending telegraph messages. The shorter the time of the transmission and reception of the information, the greater the guarantee that it will be received and used in time.

A reduction in the conversation time depends on the personal organization of the officer himself. Before establishing communications, it is expedient to think through the basic content, select meaningful words and convincing expressions, prepare the working map and the necessary documents. A clear, candid, logically consistent discussion of the situation or content of the decision accelerates transmission and at the same time decreases the load on the communications network.

The complexity of the organization of communications increases also as a result of the fact that several dozen different radios are concentrated in a comparatively limited battalion combat operation zone. In addition, enemy

radios will be in operation in direct proximity. Under these conditions, the problem arises of ensuring electromagnetic compatibility. If the mutual interference of the radios can be excluded, then the interference on the part of the enemy will remain. Hence, when organizing communications, provision is made for measures to protect both against planned interference and against noise which is the result of a comparison of the frequencies of our own and the enemy radios. Space frequencies are planned for this purpose, and versions of new call signs are developed.

The proper selection of the communications means and type depending on the nature and content of the problems solved by the troops has great significance. Whereas on the offensive, communications are carried out basically by radio, on the defensive, they are most frequently carried out over wire communications media. However, in defensive combat, all necessary radio networks are deployed in readiness for operation.

Under any conditions, the most important index of the skillful organization of communications is proper selection of the means and methods of information transmission. Experience shows that under modern conditions, maintenance of stable communications is possible only by exceptional flexibility and the use of all communications means. The communications means used in a complex have taken on new qualities. Thus, the multichannel radio relay stations have high carrying communications capacity, which are less mobile. The short-wave radios have high mobility, but they have a limited number of channels. The combining of various means into a communications system compensates for the deficiencies of certain ones and the most complete use of the positive qualities of others. The broad maneuvering by these means will to a significant degree increase the control stability. Where the commander and the staff have modern technical equipment at a control point, there is no possibility of their losing communication with subordinates or higher headquarters. Radio communications or wire communications can be destroyed by the enemy, but there are mobile and signal communications means with which it is possible to receive data and transmit orders.

Even in cases where stable radio communications are maintained, sometimes it is more advantageous to send a report or orders by mobile means. This type of situation is possible when the control points are located at short distances away, or when secrecy is to be maintained. This is especially the case when the control point has vehicles with high off-road capacity, which alleviates the problem to a high degree.

With significant separation of the control points from the troops, which is most characteristic of pursuit, the completion of a march, operations of the troops on a broad front, when the spacing between the control points exceeds the range of the radios, power amplification units are used, the stations are placed on promontories, and directional antennas are used; communications are established through an intermediate point, and combined use of radio and radio relay stations is provided for.

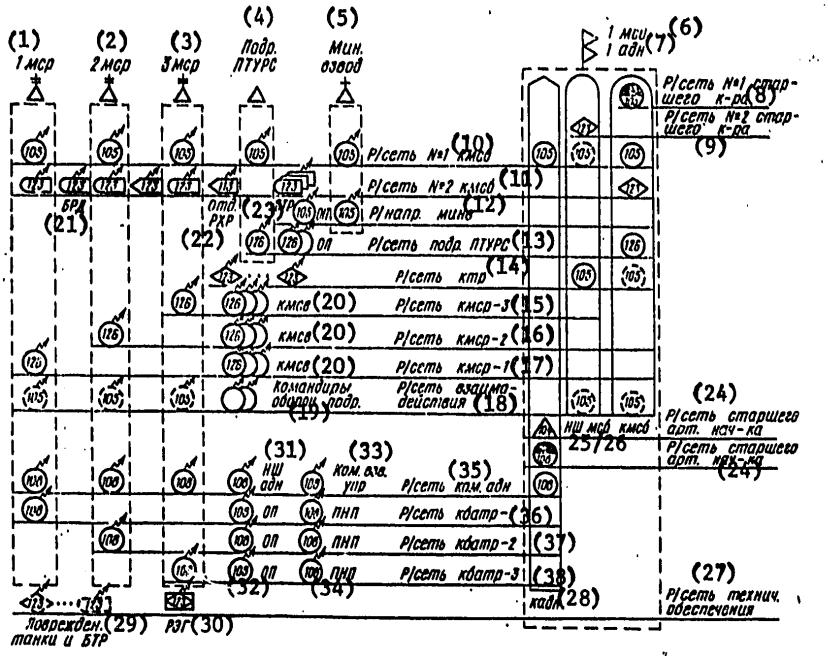


Figure 18. Schematic of the Organization of Radio Communications in the Motorized Rifle Battalion on Attacking From the March

Key:
1. 1st motorized rifle company
2. 2nd motorized rifle company
3. 3rd motorized rifle company
4. Antitank guided missile subunit
5. Mortar platoon
6. 1st motorized rifle battalion
7. 1st artillery battalion
8. Radio network No 1 of the senior commander
9. Radio network No 2 of the senior commander
10. Radio network No 1 of the motorized rifle battalion commander
11. Radio network No 2 of the motorized rifle battalion commander
12. Radio link of the mortar platoon
13. Radio network of the antiaircraft guided missile subunit
14. Radio network of the tank company command
15. Radio network of the motorized rifle company No 3, commander
16. Radio network of the motorized rifle company No 2, commander
17. Radio network of the motorized rifle company No 1, commander
18. Interaction radio network
19. Commanders of the defensive subunit
20. Motorized rifle platoon leader
21. Combat reconnaissance patrol
22. Radiation and chemical reconnaissance squad
23. Topographic reconnaissance battery
24. Radio network of the senior artillery chief

[Key continued from preceding page]

25. Chief of staff of the motorized rifle battalion
26. Commander of motorized rifle battalion
27. Technical support radio network
28. Artillery battalion commander
29. Damaged tanks and armored personnel carriers
30. Maintenance and recovery group
31. Chief of staff of the artillery battalion
32. Firing position
33. Administrative platoon leader
34. Forward observation post
35. Radio network of the artillery battalion commander
36. Radio network of the battery 1 commander
37. Radio network of the battery 2 commander
38. Radio network of the battery 3 commander.

For automatic radio relaying of the transmitted radiation at the contact point of the radio relay channels and the radios, various special attachments are used.[1]

An increase in range of the radios can be achieved as a result of carefully planned location of the control points with respect to the combat (marching) formation of the subunits, clear organization of their displacement and also skillful selection of the places for deployment of the radios. Here at the battalion level it is important to use all of the communications means complexly considering their properties and the possibilities with respect to the support of fast and hidden information transmission under the developed conditions. Only under this condition will it be possible to ensure continuous communications throughout all of the combat period. At each command level a united communications system is created which is coordinated with the systems of higher headquarters and subordinates, neighbors, interacting subunits, and providing for the requirements of the commander and the control units.

The basic initial data with respect to the organization of communications are provided by higher headquarters and the chief of staff who defines the communications missions, the locations of the control points and also the procedure for moving them under combat conditions, with whom and at what time communications must be provided.

Explaining the missions received and evaluating the situation with respect to communications, the communications chief determines the volume of

1. See: Voyennyy Vestnik (Military Vestnik), No 7, 1972, p 92; No 5, 1972, p 82; G. I. Garbuz, D. F. Loza, I. F. Sazonov, "Motostrelkovyy Batal'on v Boyu" [Motorized Rifle Battalion in Combat], Moscow, Voyenizdat, 1972, p 176.

operations, the sequence of their execution and the specific missions to the signal subunit. Here it is possible to begin the evaluation of the communications situation with an estimation of the operations of our own troops: what subunits and what mission, at what speed it is possible to advance, from what line the second echelon (reserve) will engage in combat, what the distance is of the control points from the elements of the combat formation, and what the possibilities of the subunit communications are. Beginning with the estimates of our own troops, the basic directions are determined in which communications must be realized and the expedient methods of trying various communications means, and the number of channels required to ensure communications in each direction are defined.

When evaluating the enemy, primary attention must be given by the signal chief to determination of the capability of the enemy for destruction, damage to the communications and creation of radio interference, and he must plan what measures to take so that under these conditions communications will continue uninterrupted. The terrain and the meteorological conditions are evaluated from the point of view of their influence on the operating stability of all types of communications.

The careful explanation of the missions and a comprehensive estimation of the situation with respect to communications will permit the signal chief to define the organization of communications using all of the available means, to distribute them for the solution of the stated problems, to isolate the reserve of the means, to plan measures with respect to the protection of communications against the weapons of mass destruction, ensurance of secrecy, and establishment of the material and technical support procedures.

It is unquestionable that during the course of combat operations, in connection with the appearance of additional problems and also losses in communications forces and means, the signal chief will make changes in the operation of the signal subunit. The maneuvering by communications means and forces, skillful maneuvering of the communications channels considering their load will find broad application. It is also important to have reliable internal communications at the control points themselves. For organization of this type of communication, different equipment is used which provides for two-way, loudspeaker communications. It is not complex, and no great expenditures of effort or time are required to establish it.

Great prospects are being opened up for internal communications using compact television and video telephone devices, phototelegraph units and radiophones. In the presence of stable, closed internal communications, the necessity is reduced for personal calling of subordinates. Conditions are created for improving operativeness and achievement of coordination in the operation.

The index of clear organizational communications is ensurance of the established procedure in the use of communications, especially in observing radio discipline. Not only the radio operators but also all of the duty

personnel using radio communications must strictly adhere to the rules for radio conversations. Only under this condition is it possible to achieve improved stability in the communications operations and to maintain secrecy with regard to the content of the conversations. Therefore, when organizing communications, provision is made for monitoring the use of the communications means and observing radio discipline.

CHAPTER 3. ORGANIZATION OF THE WORK OF THE CONTROL UNIT

1. Basic Principles of Troop Control

The organization and methods of operation of commanders and control units in each specific case depend on the nature of the combat mission received, the time, the level of training of the officers, the degree of equipment of headquarters with technical control means and other conditions. However, this work is characterized also by certain general principles, the correct understanding and observation of which is required under any conditions.

As applied to the troop control area, by principles we mean the basic rules and principles by which the control units and commanders must be guided in their practical activities when controlling subordinate subunits. Here, the principles are by nature the result of scientific generalization of practice and follow from the objectively operating laws of the conduct of combat.

"...Principles are not the starting point of our research," wrote F. Engels, "but the concluding results; these principles are not applied to nature and to human history, but are abstracted from them; it is not nature and man that agree with the principles, but on the contrary, the principles are valid only inasmuch as they correspond to nature and history."[1]

Whereas laws cannot be repealed or replaced by different ones, principles, in contrast, are more mobile. With a change in means and methods of combat, the principles change. Some lose their meaning and others are filled out with new meaning; man is relatively free in the choice of certain principles. However, their creative application under other equal conditions always promotes more successful fulfillment of the stated missions.

At the same time, principles cannot be identified with the requirements on troop control investigated by us above. These requirements characterize the qualitative state of control. They correspond to the question of

1. K. Marx and F. Engels, Collected Works, Vol 20, p 34.

what control must be, in order to correspond to the nature of the combined-arms combat and insure its success. The control principles, based on the laws of armed combat and the requirements of control, give recommendations about the most expedient operations of the commander and staff. They determine what must be done and how it must be done in order to satisfy the existing requirements on control. It is entirely obvious that in the different phases of development of combat art, the control principles operated differently inasmuch as the means and methods of armed combat and the requirements on control have changed. This is the difference and the interrelation between the requirements on troop control and the principles.

There is an interrelation between the control principles and the style of operation of the commanders and the control units. If the principles contain the basic rules which guide the commanders and the control units in their practical activity, then the characteristic features of the operating style, what personal qualities they must have and what procedures, methods and means are more advantageous to use for successful application of these principles and in the final analysis the satisfaction of the requirements on control, are indicated to them. The style of operation, consequently, is to a greater degree than the principles, a subjective characteristic of the leaders. In other words, the control principles are embodied and specified through the operating style. The nature and style of activity of the commander and the staff to a significant degree determine the practical realization of the basic principles. The Leninist style of operation, the characteristic features of which are as follows, must constitute a model for them: high communist ideology and principle, unity of theory and practice, words and deeds, innovation, prospectiveness, a businesslike attitude, modesty, independence, decisiveness, demandingness, organization, clarity and justifiability.

In a number of works the authors indicate the extremely large number of principles, as a result of which their practical value is lost as the basic principles in the activity of the control organs, and they essentially already begin to express the features of the work style or requirements imposed on troop control.

In order to avoid this deficiency, at the present time only those basic principles are given which on the whole constitute a united complex of principles determining the theoretical base and the direction and activity of the control unit. The many years of experience of the last war and also postwar teaching will permit the statement that the most important troop control principles are hearty nature, scientific approach, prediction, one-man command and centralization.

The party nature is the founding principle of troop control following from the class nature of armed combat and the decisive significance for successful fulfillment of the combat mission of the moral-political state of troop personnel. The given principle requires of the commanders and staff on all levels of practical work in troop control that the policy of the CPSU and the Soviet government be initiated and implemented persistently, that

subordinates be educated in the spirit of infinite devotion to their homeland and hate for its enemies, faith in the oath, friendship and fraternity of people and proletarian internationalism. The practical implementation of the party principle is insured primarily by the guiding role of the CPSU in the building of the armed forces. The CPSU Program indicates the following: "The basic principle of the building of the military is the leadership of the Communist Party exercised with regard to the armed forces, strengthening of the role and influence of the party organizations in the army and in the navy. The party gives constant attention to improving its organizing and guiding effect on all life and activity of the army, air force and navy..."[1]

The Leninist party principle requires the manifestation of constant concern for the ideological hardening of the troops, the waging of an unflagging battle with any manifestations of bourgeois ideology, the facts of a political outlook, against the penetration of revisionist views. Life convincingly confirms that the successful fulfillment of the missions is achieved where the personnel are educated in the spirit of communist ideology and party concerns, where a persistent struggle is under way to convert the ideas of Leninism to deep personal convictions on the part of each troop. The given principle penetrates all the activity of the commander, the staff officers and the party-political apparatus. When solving any problem, evaluating facts, events and phenomena, they are always and everywhere obligated to begin with the requirements of party outlook: they correspond in this way to the interests of the Soviet people and the goals stated by the party in the given phase for our Armed Forces.

The growing significance of the principle of scientific approach in troop control follows all of the basic changes which have occurred in the means and methods of armed combat which have significantly complicated the control and imposed new, higher requirements on it. In order to satisfy these requirements, first of all a scientific approach to troop management is needed.

In the broadest sense this approach means the use by the commanders and staff in their practical activity of the objective laws of various sciences: Marxist-Leninist theory, military science and engineering, physics, chemistry, cybernetics, radioelectronics, mathematics, pedagogics, psychology and the advanced experience of the troops. It is obvious that in order to implement the given principle, deep, comprehensive knowledge of the basic principles of Marxist-Leninist theory, the understanding of the laws of social development and the laws of armed combat, the capacity on the basis of materialistic dialectics deeply and comprehensively and objectively to analyze and evaluate the situation, to see what is new and advanced, define the main thing, the decisive link in a long chain of stated goals, skill in clearly and creatively satisfying the requirements of the rules and regulations

1. Programma Kommunisticheskoy Partii Sovetskogo Soyuza [Program of the Communist Party of the Soviet Union], Moscow, Politizdat, 1974, p 112.

which constitute a scientific generalization of the many years of combat experience, are required of the commanders and staff on all levels. Therefore it is no accident that the basic index of the scientific approach to troop control is the making of a comprehensive, substantiated decision by the commander, effective utilization of the available forces and material, the achievement of the combat mission with minimum losses and in the established times.

In discussing the scientific approach to troop control, the role of the personal (subjective) qualities of the officer, especially his businesslike approach, strong will, decisiveness, bravery and also strongly developed intuition and even fantasy is in no way reduced. Above all, in military affairs the role of these qualities of the leader increases significantly by comparison with the control in other areas of social life. Consequently, troop control stands before us not only as a science but also as an art, the capacity of the officer to use scientific data in practice. The administrative work of commanders and their staff itself is also in need of scientific organization. The planning, purposefulness and organization in work, proper placement of the duty personnel considering their businesslike qualities and skill in the efficient utilization of time acquire especially important significance.

The prediction principle is in continuous relation to the principle of scientific management; it somehow complements and enriches it.

In essence, prediction consists in the capacity of the commander and the staff to provide in advance for possible changes in the duration and the probable course of the forthcoming combat operations. This principle plays an important role in the theory and practice of troop control inasmuch as without prediction it is impossible to achieve victory over the enemy. The role and significance of prediction follows from the nature of armed combat itself in which each of the sides strives with all measures to hide their intention from the enemy, to achieve surprise and rout the troops of the other side. For this reason, in war there is always insufficient information about the enemy, and some of this information is accidental, insufficiently reliable and even false. However, the shortage of information does not relieve the commander of the duty of making a timely, substantiated combat decision.

In connection with the introduction of nuclear weapons and the change in the nature of combat, the role of prediction increases, and its area is significantly broadened. In particular, the commanders and staff of all levels are faced with new goals in the field of prediction such as the discovery of the grouping of the means of an enemy nuclear attack and determination of the possible order of their application; consideration of the effect which the application of these means will have on the moral state and combat readiness of the troops and also the nature of the terrain; forecasting the radiation and chemical situation; discovery of the possible intention of the operations of various enemy reserves and other problems.

The scientifically substantiated solution of these problems in the process of prediction requires skill on the part of the commander and staff officers in using the dialectic method of thought, the capacity properly to analyze the situation, to discover its main aspects, and also deep knowledge of the principles of combined-arms combat. Skill in prediction is, therefore, an indication of the overall tactical mastery and maturity of the officer. In addition, proper prediction is unthinkable without exact calculation, well laid out reconnaissance, without deep knowledge of the materiel, the organization of the troops, and the tactics of the enemy, for without this, it is impossible to predict the development of the forthcoming operations, to provide for the difficulties which can be encountered when carrying out the combat mission and plan means of overcoming them.

Therefore under modern conditions, the degree of mastery by the officers of the methodology of scientific prediction to a great extent determines the depths of analysis of the developed conditions and the making of the basic decision. Here, the commanders and staff are greatly assisted in studying the situation and predicting the course of combat operations by the skillful application of modern technical control means, mathematical methods of investigating operations, and PERT planning methods.

The one-man command constitutes not only the most important principle of the building of the armed forces, but also of troop control. As the control principle, it expresses the one-man leadership by the commander of subordinate troops on the basis of the authority granted him by the laws of the Soviet government and the orders given by the superior officers. The one-man command commander personally is responsible before the party and the government for all aspects of the life and combat activity of the subunit and the unit. The operative-tactical, political, administrative and economic functions which offer the commander the possibility of flexible and firm control, the effective use of forces and means in combat, insurance of unity of will and actions by personnel are concentrated in his hands.

V. I. Lenin emphasized the special necessity for one-man command in building the armed forces and in troop control under combat conditions. He taught: "The irresponsibility covered by references to group command is the most dangerous evil which threatens everyone who does not have great experience in the broad type of operation and which in combat leads unavoidably to catastrophe, chaos, panic, anarchy and destruction."[1]

In troop control the principle of one-mand command was always necessary under modern conditions, in connection with changes in the armament and the nature of combat operations of troops. Its significance has grown greatly. It is recognized as insuring effective application of the new control means, operative and reliable troop control and strong military discipline of the personnel under the complex conditions of highly maneuverable combat operations with the application of nuclear weapons by both sides.

1. V. I. Lenin, Poln. Sobr. Soch. [Complete Collected Works], Vol 39, p 46.

In our Armed Forces, one-man command is constructed on the party basis, which indicates the high political consciousness of each commander and his persistent implementation of the policy of the CPSU. The most complete and clearest reflection of the principle of one-man command lies in the fact that only the commander bears complete and personal responsibility for the control of subordinate troops and their successful performance of the combat mission, and that he alone has the right to make the combat decision, which is the basis for control.

However, this in no way means that in the case of troop control the commander can ignore the collective, not consider it in his opinion. V. I. Lenin, requiring strict observation of the principle of one-man command, at the same time warned many times against the onesided understanding and application of it, the use of bare administration. He taught that it is possible to lead by one process or another without basing the leadership on the creativity and initiative of the collective, without maintaining close relations to the masses, and without learning from them. Hence, the necessity arises for skillful combination of this principle with initiative and creativity of the collective which is made up of the party and Komsomol organizations and also staff personnel and other duty personnel of the control unit.

"In other words, in the recent past military art was manifested primarily in terms of the personality of the commander, the military leaders, and often the basis for the manifestation was the personal qualities of the commander, his intuition and volitional risk. Now military art, including the mentioned elements, is more and more manifested in terms of the creativity of the collective based on exact calculations and comprehensive consideration of the nature of combat, operations and war as a whole. However, the single commander bears complete responsibility for decision making and for the fulfillment of the stated combat mission."[1]

The concentration of the most important control functions in the hands of the single commander imposes higher requirements on his moral and businesslike qualities, his professional training, skill in forging the collective and mobilizing it for successful operations under any complex conditions.

The principle of centralization of control is continuously connected with the principle of one-man command. However, these two principles cannot be considered identical.

By centralization of control we usually mean the combination by the higher echelon of subordinate troops in its hands and the direction of their efforts to achieve the common combat goal in accordance with a united plan. Here, the senior officer not only states the missions for subordinates, but in a number of cases indicates to them the procedures for carrying out these missions, and he also influences the course of combat operations by the forces and means at his disposal.

1. V. Kulikov, "Soviet Armed Forces and Military Science." KOMMUNIST [Communist], No 3, 1973, p 83.

On the different historical level, the problem of the degree of centralization of control was solved differently depending on the armament, the organization and the nature of the combat operations of the troops, the level of training and experience of the command personnel and other conditions. Here, the less mobile the forms of combat, the greater the degree to which troop control was centralized.

In modern combat, the fulfillment of the mission is achieved by various combat arms and special troops with their various materiel, which requires, just as before, the centralized combination of their conditions and constant coordination by the senior officer of their operations. The especially rigid centralization of control at the present time is needed when solving the problems of the application of powerful fire weapons and above all, nuclear weapons. The observation of the principle of centralization in this area permits the senior officer to make effective, and at the same time economical, use of these means, to decisively influence the course of combat, quickly carry over the forces from one direction to the other and also to coordinate the operations of all of the forces and means participating in combat with the fire and the nuclear strikes. In addition, the centralization of command permits the achievement of complete unity of views in all echelons of the solution of the basic problems of troop control, the use of forces and means in combat and also insurance of purposeful training of the troops, the commanders and staffs for the forthcoming battle.

However, in addition, the more highly maneuverable nature of modern combat, the reduction of the preparation times for it, nonuniformity of its development, the growing fire power of the subunits, the increase in volume of operations with respect to control and other circumstances require closer combination of centralized command with granting of greater independence to subordinate commanders and the possibility of exhibiting initiative and creativity in carrying out their missions.

Hence, the degree of centralization and the dependence of subordinates in the case of centralized control will depend every time on the conditions of the situation. However, the senior officer must indicate to the subordinate the method of performing his stated combat mission only when this is possible with respect to time and actually required in the interests of the higher echelon.

In the majority of cases, the subordinate must be granted independence in the selection of the methods of carrying out the combat mission, the more so since he always has greater possibilities than the senior officer to consider all the details of a specific situation and to quickly react to changes in it. Considering the powerful fire weapons with which the troops are equipped, and the highly maneuverable nature of the combat operations, the importance of initiative and independence on the part of subordinates has increased greatly, especially during the course of combat. Ignoring this fact, an excessive increase in centralization of control unavoidably lead to bureaucratic red tape and confusion, for the senior officer begins to be involved in the details and decides all of the questions for the subordinates,

is delayed in the reaction to changes in the situation and at the same time unnecessarily holds up the operations of the troops. In addition, this breaks down the confidence of the subordinates themselves and accustoms them to passively waiting for orders or advice from above. It is necessary to note the following important psychological aspect of troop control: the officer inspired by his best ideas, but without the authority to exhibit initiative, gradually loses his energy reserve. He becomes apathetic and begins to feel apprehension, and not confidence. This command practice is in general strange to the spirit of the Soviet people, who are distinguished by high activity, initiative and creativity.

Any initiative and independence of subordinates must be, however, reasonable and be aimed at finding the best methods and means of achieving the general combat goal planned by the senior officer. Only confident, decisive and strong-willed officers are capable of such initiative and independence. In addition, it is necessary to show concern that the subordinates have clearly conceived the situation, understand the intentions of the senior officer and have received timely reinforcement with the necessary forces and materiel; without this, their manifestation of initiative and independence is complicated, and sometimes is impossible. Accordingly, the stimulation of initiative and heroism on the part of the subordinates, especially awarding orders and medals in a timely manner, popularization in the press, the conferring of military ranks, and so on have important significance.

The investigated basic principles of troop control are closely interrelated, they are interconditioned, and are in dialectic unity and play an important role in control theory.

2. Planning the Work of the Commander and the Control Unit

Under modern conditions, extremely limited time is allotted for the organization of combat operations, as a rule. Hence, the most important problem has become finding means to insure the most effective use of the allotted time. The solution to this problem depends to a significant degree on the clear organization of the work of the officers, skill of the responsible agents in achieving maximum returns in working with minimum expenditures of forces and time.

It is no accident that many years of practice have generated a serious warning to the commanders and staff that they, in organizing their combat operations, "not use up" the time of the subordinates, that they not take as their right the basic part of the time allotted to combat preparations. No one refutes that the higher the command echelon, the more complex and responsible the missions which must be carried out. Nevertheless, in any instance, the interests of the subordinates, their possibilities with respect to preparation for the forthcoming combat must be of paramount interest.

The struggle to save time when preparing for combat begins before receiving the combat mission. In order to prepare the map of the forthcoming operations in advance, the necessary forms are prepared, and reference

materials are selected. The presence at headquarters of the latest situation data reflecting the actual situation, the state and the nature of operations of our own troops and the enemy have especially important significance. When such data are available, the responsible agents do not need to question the sources during organization of combat or to gather additional data which detracts from their performance of the mission.

Especially high realization in the work is promoted by the presence of combat calculations which are developed in time and are performed during the course of training, and exercises taking into account the personnel distribution, the communications means and transportation means with respect to the control point, determination of the specific obligations for each executive organ. Here, it is entirely justifiable that if the officer develops his own plans on the basis of them in which the data, the calculations, documents and technical means which are required of him are reflected in detail, then the time calculation for performance of each measure is performed, the problems are clearly defined which must be coordinated with other duty personnel.

The basic role in the organization of the work of the control units goes to the chief of staff. He establishes the volume, the times and the executive organ for the work with respect to the organization of combat operations. He determines in what form the planning results will be reflected, what combat documents will be developed and by what times; he coordinates and directs the work of all the control units. He gives special attention to the timely delivery of the data required by the subordinate commanders and staffs for parallel operation with respect to the organization of combat operations to the responsible agents.

The basis for the organization of the work is the calculation of the time for preparation of combat operations. The procedure for calculating the time usually reduces to the following. Initially, the total amount of time available for organization of combat is more precisely determined with breakdown of it into daytime and nighttime. Then a list of basic operations is made up which can be performed with approximate notation of the expenditures of time. Simultaneously, the operations which can be performed in parallel are satisfied at one time or another; the times determined by the order of the senior officer are stated; the operations performed at night are grouped. Then the times for the performance of all the basic measures are more precisely defined. The results of this work usually are reflected in the calendar plan of combat preparation. One version of this plan is presented on pages 196-197. In the presence of limited time which is most characteristic of modern combat, it is especially important to include the basic composition of the officers, the control units in the operation of organization of combat without any delay. The successful solution of this problem depends to a great extent on the clear knowledge by each officer of what he is obligated to do.

[redacted]

FOR OFFICIAL USE ONLY

Approval:
Commander _____

_____
(Rank, last name)

(Date)

PLAN FOR PREPARATION OF THE OFFENSIVE

_____(subunit) from _____ to _____

Time of receiving the mission _____ Preparation time for offensive _____

(a) № по пор.	Мероприятия (b)	(c) Сроки выполнения, ч/мин 1: 20	1: 40	1: 60	2: 20	2: 40	2: 60	3: 20 и т. д. (d)	Исполнители (e)	(f) Отметка о выполнении
1	Уяснение полученной задачи с учетом реальной обстановки								Командир, НШ (g)	
2	Доведение предварительных распоряжений								Штаб, зам. командира (h)	
3	Подготовка данных и расчетов, необходимых для принятия решения и планирования								Штаб, зам. командира (h)	
4	Продолжение оценки обстановки, определение замысла, отдача предварительных боевых распоряжений								Командир, НШ (g)	
5	Завершение принятия решения, постановка задач войскам								Командир (i)	
6	Доклад решения старшему начальнику								Командир (i)	
7	Проведение рекогносцировки на местности с целью уточнения решения и организации взаимодействия								Командир, офицеры штаба (j)	
8	Организация наступления в звене рота — взвод								Командиры подразделений (k)	
9	Подготовка маршрутов и дооборудование исходного района								Командиры подразделений (k)	
10	Выдвижение и развертывание на огневых позициях артиллерии и минометов								Командиры подразделений (k)	
11	Выдвижение мотострелковых (танковых) подразделений на рубеж атаки								Командиры подразделений (k)	
12	Пополнение материальных запасов, ремонт и эвакуация неисправной техники								Зам. командира (l)	
13	Контроль за работой подчиненных								Командир, зам. командира, штаб (m)	

[See key on following page]

Начальник штаба (14) _____ (15)
(звание, фамилия)

FOR OFFICIAL USE ONLY

Key: a. Item number
b. Measures
c. Execution time, hours/minute
d. And so on
e. Reasonable agents
f. Note on execution
g. Commander, chief of staff
h. Staff, deputy commander
i. Commander
j. Commanders, staff officers
k. Subunit commanders
l. Deputy commander
m. Commander, deputy commander, staff

1. Explanation of the received mission considering the actual situation
2. Delivery of the preliminary orders
3. Preparation of data and calculations required for decision making and planning
4. Continuation of the evaluation of the situation, determination of the intent, giving the preliminary combat orders
5. Completion of decision making, statement of the goals for the troops
6. Report of the decision to the senior officer
7. Performance of reconnaissance in the terrain in order more precisely to determine the decision and organize the interaction
8. Organization of the offensive at the company-platoon level
9. Preparation of the routes and equipment of the attack position
10. Advancement and deployment in the fire positions of artillery and mortar
11. Advancement of the motorized rifle (tank) subunit to the assault position
12. Supplementing the materiel reserves, repair and evacuation of failed equipment
13. Monitoring of the work of subordinates
14. Chief of staff
15. (Rank, last name)

Note. In the battalion, the given plan cannot be developed as an independent document, and all measures with respect to preparation for the offensive are reflected by the chief of staff in the working map.

There can be no standard for the distribution of duties among the officers. In each individual case, beginning with the present time, the content and volume of the problems subject to solution and also the personal training of the officer and his specialization, the specific peculiarities will be determined. Unquestionably, the observation of the specialization principle has decisive significance in the work distribution. It is difficult to count on, especially under combat conditions, the training of the universal officer capable of carrying out a broad class of missions with high quality and in a short time. As the officer accummulates experience and knowledge, the necessary prerequisites are created for the expansion of his duties. Then it will be possible to tell him to carry out the duties of another person on the level of mutual interchangeability. Otherwise, it is

impossible to be certain of the stability of troop control and the achievement of high operational efficiency of the work of the control unit. To specialize the officers and develop solid skills in them with respect to the performance of only a narrow class of jobs without concern for mutual replaceability means to work without prospects for the future, without seeing tomorrow, without preparing the staff for work under the most difficult conditions which can develop on application of the nuclear strike by the enemy on the control point.

It is important not only to approach the determination of the content of the work sensibly. How to state the mission for the responsible agent also has great significance. Of course, the personal qualities of the responsible agent will have decisive significance here. However, under any conditions the enemy must receive instructions from his commander; what to do, by what time, and in what form to present the results of his work. It is necessary to see that the officers of control units not expect developed instructions, but understand their chief, as they say, with half a word, capture for themselves the content of the measures following from the situation, the decision of the commander and the received combat mission.

Accordingly, education in the officers of a sense of high responsibility for precise execution of work in established times with high quality has special significance. It is important "that every worker," as L. I. Brezhnev pointed out at his meeting with the workers of the ZIL Automobile Plant, "clearly see his role in the labor process, know what he is doing, why he is doing it, what depends on him, feel that his labor is a necessary part of the overall work."[1]

The organization of work will become high quality only if it reflects the advanced procedures and methods and also in full degree takes into account the possibility of the use of the available technical control means. In his time, F. Engels noted that the individual is evaluated not only by what he does, but how he does it. The selection of the advanced methods most completely corresponding to the developed situation is one of the component conditions of high-quality organization of work.

Another index of high organization in work is the maintenance of the clear regime, which provides for the coordination in the work of all of the duty personnel, strict successiveness in the execution of the missions, rigid regulation of time allotted for each operation. A component part of the organization of work is also allowing for rest for the officers. It is important not only to perform the work with quality and on time but also to conserve strength for subsequent operations. Accordingly, skillful alternation of work and rest is required. Practice has demonstrated for a long time that it is impossible to achieve high output capacity and not learn how to rest, not be concerned for the recovery of strength. No one denies that it is difficult to provide in advance for the rest time of every officer "from"

1. PRAVDA, 1 May 1976.

and "to" some specified time, but if rest is not planned, then there is a danger that there will be no possibility for rest as a result of the course of events in general.

3. Scientific Organization of the Labor of the Control Unit Officers

For clear organization of the work of control units, in many cases it is insufficient to depend only on the vital experience and practical knowledge of the chief of staff. In the control sphere, scientific organization of labor is especially necessary.

It is necessary to consider scientific only that organization of administrative labor which is based on the achievements of science and advanced experience systematically introduced into the activity of the commander and the control units, which insures the greatest effective use in combat of subordinate troops and their fulfillment of the stated mission in the established times with minimum expenditures of forces and materiel.

In other words, this is the labor of the control unit officers, ordered, arranged, reduced to a system in accordance with the recommendations of science and the achievements of advanced experience.

The difference between the ordinary organization of labor and its scientific organization consists in the methods of taking certain measures, the selection of the methods and procedures. In one case the commander and the control units intuitively and mechanically repeat the customary procedures which have been well mastered by them, and in the other, they persistently master and skillfully introduce into practice the latest recommendations of science and the achievements of advanced experience. The results will unconditionally be different in the two cases.

Therefore the primary goal of scientific organization of labor is maximum improvement of the efficiency of the labor of the control unit officers, the achievement of more efficient use of time with minimum expenditures of forces.

The basic areas of the scientific organization of labor in the operation of the troop control units can be the following: the education among the officers of a communist attitude toward their military duty, the introduction of efficient methods and procedures into operation, the improvement of the methods of organizing work, improvement of the equipment of the work areas of the officers in the command post vehicles, the development of norms for performing the basic measures with respect to troop control, the rationalization of the working conditions, improvement of the training and mastery of the officers, insurance of independence and creative activity of the responsible agents, improvement of the practice of moral incentive for the officers, successfully carrying out their duties and so on. In addition, the requirements of the scientific organization of labor are taken into account by the designers when creating new machines, instruments, and technical control units. In particular, using special studies, the admissible levels of

noise, temperature fluctuations, degree of illumination in command post vehicles and structures of the control point are defined. The degree of the effect of these factors on the fitness, the fatigue and efficiency of carrying out the missions with respect to troop control is determined by the methods of engineering psychology, psychophysiology, psychoengineering, and so on.

In the practical work of the control units most frequently the simpler forms of scientific organization of labor find application: observation of the work of the responsible agent, time studies of the operation and subsequent analysis of the organization and the procedure for performing the work, the performance of experiments with the application of the latest methods, technical means, and so on.

The process of introducing scientific organization of labor usually begins with a detailed study of the content of the work and methods of performing it by the responsible agents. This process can be schematically represented in the following form. Initially, the final goal or final result of the work is defined, and then all of the forthcoming work is broken down into component elements.

For clarity in the given case, one of the possible alternatives is taken. The staff officer has received an assignment for the development of combat orders to engage the 2d echelon in battle. The researcher has not determined, but fixed the component elements of the operation of the responsible agent. In the most consolidated form they look like the following (in minutes): the plotting of the mission for the 2d echelon from the commander's map onto their own working map -- 2; the study of the problem plotted on the map -- 1.5; the more precise determination of the work area -- 1; coordinating the data on the enemy with the chief of reconnaissance -- 2; writing the heading and the first item -- 2; more precise determination by the engineering service chief of the classification of the combat engineer's subunit assigned to reinforce the 2d echelon -- 1.5; checking the time calculation for advancement of the 2d echelon to the attack position -- 2; more precise definition of the fire missions solved by the artillery for support of the engagement of the 2d echelon -- 1.5; writing the second item -- 4; writing the third item and completing the filling out of the combat orders -- 3; the presentation of the orders by the chief of staff for checking and testing -- 2; printout of the combat orders -- 8; signing of the orders by the chief of staff and commander -- 2; acceptance of the document for dispatch -- 1.5. The total is 34 minutes. The officer has worked at high speed.

Out of the total time, an insignificant amount of time was spent directly on the development of the document, and the greater part went for more precise determination of the problems, coordination, testing and printing.

On the basis of the comprehensive analysis of all of the elements (the performed operations) it is established which of them are unnecessary,

which can be simplified, which can be replaced by others or combined, how efficient the procedures used by the officer are. As a result of this analysis, the possibility of reducing the time required to perform the operations is discovered.

In the given example, it was entirely possible to exclude the plotting of the mission for the 2d echelon on their working map, checking of the orders by the chief of staff (4 minutes); acquisition of missing data by calling the required people is combined (3 minutes). The greatest time is taken in printing and writing by the draftsmen. When dictating the orders directly from the map to the typewriter, savings of up to 6 to 7 minutes can be achieved. If the officer used a formalized order form, then filling out the document took 5 minutes, and there was no necessity for printing.

Thus, only as a result of improving the organization and the introduction of improved procedures in operations could the combat orders be written in 16 minutes. If we study the performance of analogous work by various people, then it is possible to discover that one works faster and the other more slowly. Therefore, one of the missions of the scientific organization of labor is the study of the best procedures and methods of operation for their introduction into the practice of other duty personnel. It is necessary also to consider that it is very difficult to convince the experienced responsible agent that the methods of his operation are imperfect. He often remains convinced that his procedures and methods developed by proper experience are the only correct ones. This causes a definite resistance on his part to breaking the established pattern and introducing new methods. Knowledge and practical use of the advanced methods in work will permit achievement of maximum effect with least expenditures of forces, materiel and time.

The principle of co-measurement of the expenditures of forces and time which provides the basis for the scientific organization of labor requires consideration of at what price and by what methods success is achieved. To save time means to deal with the losses and exclude unnecessary expenditures of forces.

The comprehensive analysis of the work of the control units will permit effective evaluation of what is good and useful, proper introduction into practice of the work of others and, in addition, it shows up the bottlenecks where forces and time are wasted, which hinders efficiency in the execution of their duties. It is important to establish what is to be done, who is to do it, when, in what times and by what procedure; how effective the organization of the work of the responsible agents is, and whether the low distribution is being coped with normally.

The chief of staff will deal best of all with this problem. During the fulfillment of the assignment by the officer, he can find time to look over the methods of operation of the subordinates with experienced eyes.

The chief of staff usually knows the capabilities, the nature, the level of training of the officers well, and he will understand readily the causes for miscalculations. He can show how best to approach the performance of the mission. The personal example is one of the most effective means of introduction of scientific organization of labor into practice and improvement of the operating efficiency of the duty personnel.

Experience shows that scientific organization of labor is unthinkable without the presence of normative, admissible indexes for the expenditure of time on performance of the operations. The normalization of labor is the basis for its scientific organization. The labor of any responsible agent, especially technical labor, is made up of defined standard elements, each of which can be quite clearly normalized. The purely creative, mental operations are subjected to normalization with the greatest difficulty.

The reality of the organization of the operations significantly increases if it is based on scientifically developed time normatives for the performance of the basic control operations checked out in practice. The determination primarily of the times for decision making, the statement of the goals and organization of the interaction have decisive significance. These times are taken as the basis for establishment of the duration of many other operations.

However, it is necessary to consider that the determination of the times for performance of the administrative operations is a highly complicated matter. These times depend on many factors, including the degree to which the staff are up to full strength and the level of training of the officers, the presence of technical control means, the quality of organization of their work, and so on.

The expenditures of time on the performance of operations under defined specific conditions can significantly deviate in one direction or another from the weighted mean value. However, knowing the average norms for time expenditures, it is always possible to select the methods of operation correspondingly which, under given conditions, will provide for the performance of the work in the established times, and more easily to determine the officer's staff for the operations. The normatives must be substantiated and corresoond in full measure to the modern level of development of the technical control means and advanced methods of operation. Here the normatives cannot be considered as invariant, established forever. As mastery of the officers grows and new technical control means are introduced, they must be shortened. The normatives are the limit, the starting point from which the increase in mastery of the officers and degree of efficiency in the work of the staff actually begin.

Often the authors investigating the problems of improving the efficiency of troop control reduce everything to the use of the automated control system and leave out the possibility of ordinary technical mans which are capable of greatly increasing the efficiency of the work of the officers.

Therefore, perhaps in practice the means of so-called mechanization and low automation are not always sufficiently effectively put to use. Nevertheless, experience convincingly indicates that without their help it is impossible to accelerate and facilitate the work of the officers.

The improvement of labor on a scientific basis is a constant process, and not a sporadic action calculated only to eliminate bottlenecks in operation. It is unquestionably the case that the scientific organization of labor gives the greatest effect under the conditions of the performance of a single set of measures with respect to improving the activity of all of the control units. Of course, it is impossible to underestimate the "special procedures" measures aimed at eliminating bottlenecks.

The complex, systematic improvement of the activity of the control units during the course of the organization and conduct of combat operations will permit a sharp increase on the whole in operativeness of the troop control. The principle of completeness in operation with respect to the scientific organization of labor follows from the close interrelation and interdependence of the operations and measures performed by the control units. On failure to observe this principle, the often good and useful recommendations can turn out to be ineffective. For example, the time savings achieved when performing the tactical calculations using computer engineering are not felt in an improvement in the operational efficiency of control if the commander makes the decision by prolonged listening to the proposals of his subordinates.

Thus, the complex approach alone to the organization and performance of all of the operations insures an increase in operational efficiency of the control, it prevents the occurrence of new bottlenecks as a result of some of the responsible agents being ahead and others behind.

Here the process of introducing advanced procedures and methods and also the best achievements of science in practice provides an effect, if it is continuous, in which the officers of all of the control units participate.

One of the procedures promoting improvement of the operational efficiency in the operation of the control unit is the application of PERT charts. They permit much more complete and deeper reproduction of the logical flow charts of the sequence of the performance of the basic control functions (measures) by comparison with the traditional strip diagrams, they permit clear representation of the entire process of preparation of combat operations and substantiated establishment of the priorities and the times for performance of the operations (see Figure 19).

PERT charts are especially irreplaceable when determining the optimal versions of the work of the officers with respect to organization of combat operations. As a rule, this work is done in limited times. It is participated in by a large number of responsible agents in closest dependence on each other, and therefore exceptionally clear organization is required. In addition, the basic measures with respect to the organization of combat are

based on defined normatives which are subjected to quantitative consideration permitting completely objective determination of the effectiveness of one method of organization of work or another. The mathematical basis for the method of PERT planning is the PERT chart (PERT model, network) which permits determination of the volume of operations, establishment of the most expedient sequence of performance of the measures, the best distribution of duties among the duty personnel, discovery of the reserve times and means of reducing the times for organization of combat operations.

The procedure for development of the chart is distinguished by great variety. For example, let us consider one of them.

The chief of staff proposes, with the help of the chart, early determination of the most expedient version of the distribution of operations among the responsible agents in the process of organizing combat operations. Here the time for organization of the combat is taken as 4 hours. After development of the chart, the calculation can be made by the same procedure for 5, 6 or 7 hours.

When a short time is allotted to the organization of combat, the parallel operations of all of the duty personnel is unquestionably justified by their exercising great independence in solving the problems dealing with their functional obligations, maximum coordination of the operations with respect to time and also reduction of the time for the performance of all the measures.

Under these conditions, the basic results of the planning are expediently reflected on the working maps, and without developing other written documents, the missions are delivered to the subordinates orally with recording of their content in the working notebook or on magnetic tape, reconnaissance is carried out to more precisely determine the solution and the problems of interaction only in the direction of the main strike. The chief of staff arrives at these conclusions not by special investigation, but based on experience in performing analogous operations. In the presence of other times for combat preparation, unconditionally it is necessary to take other initial positions for the calculation. Beginning with the content, volume and sequence of performance of the operations, a list of operations is prepared. Experience shows that the times for compiling the chart are significantly reduced if the staff has several versions of such lists developed in advance as applied to the most difficult operating conditions of the control unit. If the lists are compiled, then one of them can turn out to be appropriate for the specific conditions which exist in the given case or it is necessary to introduce individual, more precise definitions with respect to content, sequence of performance of the operations and the responsible agents. It is also necessary to define the duration of the operations in the list. The code for each operation can be inserted when developing the chart.

Usually the list of operations is given in the form of the following table.

Table 11

Name of operation (in consolidated form)	Responsible agents	Operations code	Duration of operation (min)
1	2	3	4
Explanation of the mission received by the commander jointly with the chief of staff	Commanders and chief of staff	1.2	20
Plotting the mission on the second working map	Chief of staff	1.3	18
Study and evaluation of the enemy	Chief of staff	1.3'	20
Calculation of time for organization of combat operations (in the process of explaining the mission)	Chief of staff	2'.4	7
Giving instructions with respect to preparation of data and calculations required for making the decision and performance of measures with respect to training troops for the forthcoming combat operations	Commander	2.5	10
Issuing preliminary orders to reconnaissance subunits	Staff officer	5.6	5
Issuing preliminary combat orders to the combined-arms subunits	Staff officer	5.7	12
Issuing preliminary orders to the special forces subunits	Service chief	5.8	5
Evaluation of the enemy	Commander and chief of staff	5.10	20
Report of data and calculations on the enemy to the commander	Staff officer	6.9	10
Explanation of the received mission	Service chief	8.14	10
Development of the calculation of the ratio of forces and materiel	Staff officer	7.13	20
Participation in development of the calculation of the ratio of forces and materiel	Staff officer	9.11	10
Statement of goals for the reconnaissance subunits	Staff officer	11.17	18

[Table 11 continued]

1	2	3	4
Preparation of the data and calculations with respect to application (use) of the special forces subunits	Service chief	14.15	32
Evaluation of our own troops	Commander, chief of staff	10.12	25
Development of the calculation of the time for advancement of the troops to attack position	Chief of staff	10.16	12
Estimation of the situation and formulation of the decision	Chief of staff	16.20	28
Planning of reconnaissance	Staff officer	17.19	30
Planning measures with respect to camouflage and the commandant's service	Staff officer	13.18	25
Development of control plan and plan for rendering aid	Staff officer	19.24	18
Development of planning document with respect to use of subunits of special troops	Service chief	15.23	30
Estimation of radiation situation and terrain	Commander and chief of staff	12.20	15
Development of combat orders	Staff officer	18.22	20
Commander listens to proposals of the chief of staff with respect to the decision	Chief of staff	20.21	5
Statement of the missions for subunit commanders, the giving of orders with respect to interaction, comprehensive support of combat operations, party-political work	Commander	20.24	55
Checking and signing planning documents	Commander, chief of staff	24.25	15
More precise determination and development of combat orders and the reconnaissance plan	Staff officer	22.25	50

[Table 11 continued]

1	2	3	4
Performance of reconnaissance in order more precisely to define the decision and the interaction problems	Commander, chief of staff, service chief	25.26	75
Report to senior officer on readiness for attack	Commander	26.27	5

This list hardly contains anything new; the staff had previously developed the ordinary strip charts for the organization of the control units. They also reflected the basic missions (operations) which had to be performed by the officers. The times and the direct responsible agents were indicated. However, in these charts the internal relations of the processes were not obvious, the sequence for the performance of the enumerated operations was not clearly provided for, and it was difficult to determine what the consequences would be from the delay in completion of the individual operations, what maximum times for performance of the operations are admissible, where the greatest bottlenecks are and which operations must be given greatest attention. Therefore the reflection of the organization of the work of the control units in the form of a PERT chart will permit more careful selection of these problems and demonstrate in clear form the logical interrelations and sequence of all the operations performed by each responsible agent. Even if of all of the advantages of the PERT chart we use only the principle of representation of organization of combat in the form of a network, then it is necessary to recognize that it is unquestionably useful. The significance of the PERT model increases immeasurably when complex work is to be done with the participation of a large number of responsible agents. In this case the internal processes and operations of individual control units (headquarters division) usually are indicated in the form of local PERT charts which subsequently are "sewn" into a common network.

When compiling the list, the establishment of the duration of the separation presents defined difficulties. This is all the more complicated in that in the majority of cases the established normatives are in need of more precise determination as applied to the level of training of the staff officers, the degree of mechanization and automation of the work processes and also the question of time. In cases where there are no normatives, probability theory is used. For this purpose three estimates are made of the duration of the operation: T_{min} is the minimum (optimistic) when there are the most favorable conditions for performing the work; T_{max} is the maximum (pessimistic) when the work is performed with disadvantageous course of events;

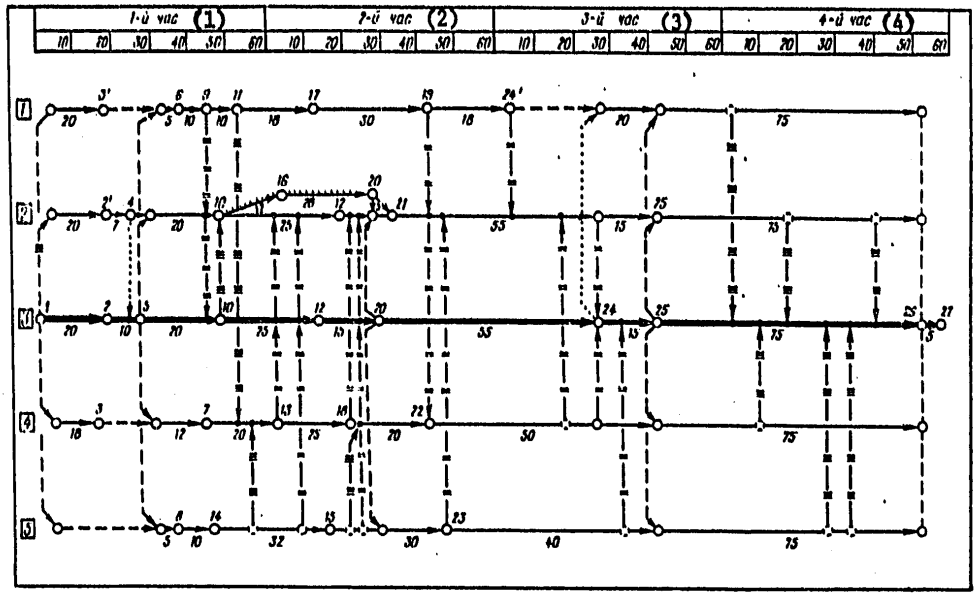


Figure 19. PERT chart for the operation of the control units with respect to organization of the offensive (simplified version).

Key: 1. 1st hour; 2. 2d hour; 3. 3d hour; 4. 4th hour.

T_{HB} is the most probable duration of the work.[1] The mean or expected duration T_{exp} is calculated by the formula

$$T_{exp} = \frac{T_{min} + 4T_{HB} + T_{max}}{6} \quad (1)$$

or

$$T_{exp} = \frac{3T_{min} + 2T_{max}}{5} \quad (2)$$

Formula (2) is simpler; the difference in the result of the calculations performed by one formula or another is small.

1. For more details on the method of calculating this time see P. G. Skachko, V. M. Kulikov, G. T. Volkov, "Upravleniye Voyskami s Pomoshch'yu Setevykh Metodov" [Troop Control Using PERT Methods], Moscow, Voyenizdat, 1974, pp 36-43.

However, the initial data selected for determination of T_{exp} are in turn, random variables; therefore errors in the calculation are possible. In order to determine which data are closer to the expected value or, in other words, what the magnitude of the dispersion σ is with respect to its expected value, the following formula is used:

$$\sigma^2 = \left(\frac{T_{max}-T_{min}}{6}\right)^2 \qquad (1)$$

or the simpler formula

$$\sigma^2 = 0.04\ (T_{max}-T_{min})^2\ . \qquad (2)$$

The smaller the magnitude of the dispersion is as a result of the calculation, the more precisely the estimate was made for the duration of the operations and, consequently, T_{max} and T_{min} are closer to each other.

If there are developed normatives checked out in practice, then there is no necessity to resort to the indicated formulas for determining the duration of the operation.

Here it is necessary to begin with the fact that the preparation of the initial data and the development of the graph occupies a comparatively large amount of time which, for the most part, does not exist during the combat organizations period. Therefore, all of the basic work with respect to compiling the chart must be done before receiving the combat mission.

In the presence of initial data, the construction of the graph is realized by combining the operations (arrows) through events (circles) in a defined sequence from left to right. Here the direction of the arrows is taken arbitrarily, and their length is expediently selected in scale. Each operation begins and ends with an event. In order to develop this PERT model, a detailed list of operations and a clear distribution of them among the responsible agents are required. In the investigated example, these developed indexes are not presented, and therefore the PERT model is not analyzed in complete form. Beginning with the possibilities, several characteristic versions of the graph are used. In it an effort is made along with the indication of the interdependence and basic relations between the operations to preserve the independence of the responsible agents in performing these operations to the maximum. A second characteristic of the presented chart consists in the fact that the volume and duration of performance of the operations by the responsible agents are directly dependent on the times for completion of operations by the commander. Thus, they are placed in defined frames, within the limits of which their obligations must be performed using the methods of operation corresponding best to the conditions and more precisely defining the volume of their work within reasonable limits.

Even in the presence of these characteristics on the chart (Figure 19) provision is made for such relations between the operations of the different responsible agents.

Among them undoubtedly the operations performed by the commander (1.2, 2.5, 5.10, 10.12, 12.20, 20.24, 24.25, 25.26, 26.27) have decisive significance on the entire process of organization of the offensive. The times and methods of operation of all of the other duty personnel are determined depending on the preparation and style of operation of the commander and his knowledge of the situation.

In addition to this constantly operating function, there are others which also have a defined effect on the times and quality of the operations with respect to the organization of combat. Most frequently, the relation is encountered in practice where the subsequent operation cannot be started until the work of another officer has been completed. This type of relation, in spite of the granting of the necessary independence in performing the operations to the responsible agents, plays a significant role in the organization of combat operations. In particular, until the mission has been explained (1.2) preliminary orders cannot be given (5.6, 5.7, 5.8); without performing the calculations of the time for organization of combat (2', 4), it is impossible to give instructions to the duty personnel (2.5); without evaluating the enemy (5.10), it is impossible to define the missions for the reconnaissance subunits (11.17) and so on. Practice indicates that the more frequently the given type of relation is encountered between the operations, the more complex it is to achieve a reduction in the times of performance of the operation as a whole. In the graoh the given relation for the operations is depicted by lines made of points.

Closely related to it is the function which indicates that the completion of one operation depends on the completion of the other operations performed by another responsible agent. For example, the qualitative estimate of the enemy by the commander (5.10) can be completed only after obtaining the data and calculations on the enemy from the reconnaissance officer (1.3'; 6.9); the evaluation by the commander of his own troops (10, 12) can be completed under the condition of completion of the calculation of the time of advancement of the troops to the line for going over to the attack (10, 16) and calculation of the ratio of the forces and materiel (13) and so on. Here it is possible also to include the type of relation where completion of the operation depends on receiving the necessary instructions from the commander (the chief of staff). On the chart this function is indicated by a dotted line with two cross strokes.

During the organization of combat, often the necessity is encountered for joint (simultaneous) participation of the responsible agents in the performance of an operation. It is characteristic for the performance of the most complex operations (the calculation of the ratio of the forces and materiel, estimation of the situation, and so on). The combination of the forces of the different responsible agents in the solution of such problems insures the best conditions for the reduction of the time and improvement of the quality of the work performed. The same type of interrelation which is considered together with it is the necessity for coordination (more precise determination) between the responsible agents of the initial data on performance of two different operations. On the chart the given type of relation is indicated by a dotted line with three transverse marks.

Table 12

Номер пути (1)	Составляющие события (2)	Работы, образующие путь (3)	Продолжительность пути в минутах (4)
1	1, 3′,5, 6, 9, 11, 17, 19, 24′, 25, 26	(1,3′),(3′,5), (5,6), (6,9), (9,11), (11,17), (17,19), (19,24′), (24′,25), (25,26)	216
2	1, 2′,4, 5, 10, 16, 20, 21, 24, 25, 26	(1,2′), (2′,4), (4,5), (5,10), (10,16), (16,20), (20,21), (21,24), (24,25), (25,26)	235
3	1, 2, 5, 10, 12, 20, 24, 25, 26, 27	(1,2), (2,5), (5,10), (10,12), (12,20), (20,24), (24,25), (25,26), (26,27)	240
4	1, 3, 5, 7, 13, 18, 22, 25, 26	(1,3), (3,5), (5,7), (7,13), (13,18), (18,22), (22,25), (25,26)	230
5	1, 2, 5, 8, 14, 15, 23, 25, 26	(1,2), (2,5), (5,8), (8,14), (14,15), (15,23), (23,25), (25,26)	222

Key: 1. No. of path
2. Component events
3. Operations forming the path
4. Duration of the path in minutes

During the course of the organization of the combat operations, the type of relation is encountered where one operation is imposed on the other and is performed in parallel, "dovetailed." This type of relation exists between the estimation of the situation (5, 10; 10, 12; 12, 20) and the formulation of the decision. In the graph it is indicated (partially) by the dotted line.

The clear representation on the PERT model of the relation between operations permits clearer regulation of the activity of each responsible agent, exclusion of the nonsystematic intrusion of one operation in another, and the creation of conditions for planned performance of his operations by each officer.

On the presented chart (Figure 19) five paths (flows) are isolated which are based on the beginning and ending events (see Table 12).

Among these paths the longest is the third path, which is the critical one. In our example it is not very sharply different with respect to its magnitude from the other paths. The critical path, which is outlined on the graph using a double or boldfaced line, is the total duration of the operations which limit the entire process of the operation, determine the general time of its completion. Therefore, in increasing the operational efficiency in the work of the control units, above all reducing (decreasing) the duration of the critical path, has decisive significance. In order to solve this problem, a comprehensive analysis is made of the content and the procedure for the performance of each operation located on the critical path, and the optimal version of the organization of work is determined on the basis of this.

The optimization of the PERT chart is the most complex stage and is aimed at reducing the total duration of the work. The basic procedures for optimization can be the following: variation of the sequence of performance of the individual operation, or in other words, reexamination of the structure (topology) of the network; redistribution of the officers; replacement of certain efforts by others; exclusion of the secondary (unnecessary) operations from the network; maximum coordination in time of the performance of different measures, and so on.

Decreasing the duration of the critical path (T_{cr}) is not a one-time action. It must be carried out constantly, for the component elements or the initial data determining its magnitude vary. In particular, the technical equipment of the control points and units varies, the level of mastery of the commander and the staff officers is improved, and the methods of their operation are improved. All of this combined with skillful organization of work has a decisive effect on decreasing the magnitude of the critical path.

The commander and the chief of staff, knowing the critical path, are in a position to concentrate basic efforts on the operations on this path, achieving maximum reduction of their performance time. In other words, a sharp boundary is drawn between the basic and secondary items. If it turns out that the duration of the critical path exceeds the established time for completion of planning of the combat operations, then measures are taken to reduce the expended time by changing the layout of the forces or using improved methods of operation.

Other paths are noncritical (unstressed). For all of the operations of these paths there are time reserves. When necessary this permits reexamination of the work load of the responsible agents, enabling them during the time reserves to perform other operations.

The difference between the duration of the critical path T_{cr} and the duration of the other paths $T_{l(i)}$ is the total time reserve of the path $P_{l(i)}$:

$$P_{l(i)} = T_{cr} - T_{l(i)} .$$

$P_{l(i)}$ indicates the amount of time, within the limits of which an increase in the duration of the operations is admissible without significant effect on the total completion time of the plan. For example, the time reserve with respect to the path L_4 is $P_{(4)}=L_{3(cr)}-L_4=240-230=10$ minutes.

It is possible to define the time reserve as applied to each event (P_i). For this purpose, the earliest (of the possible) time of beginning the completion of the event $t_{p(i)}$ and the latest possible time of completion of the events $t_{n(i)}$ are reckoned:

$$P_{(i)} = t_{n(i)} - t_{p(i)} .$$

Table 13

Events / $t_{n(i)}$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
$t_{n(i)}$	0	20	28	25	30	39	50	38	49	50	59	75	70	48	80	67	77	95	108	90	100	110	120	145	160	235	240
$t_{p(i)}$	0	20	18	20	30	35	40	35	45	50	55	75	60	45	77	62	73	85	103	90	95	105	107	145	160	235	240
$t_{n(i)} t_{p(i)}$	0	0	10	5	0	4	10	3	4	0	4	0	10	3	3	5	4	10	5	0	5	5	13	0	0	0	0

For the events on the critical path, there is no time reserve, as a result of which $t_{n(i)}=t_{p(i)}$. On the presented graph, $t_{p(i)}$ for the events (1) will be equal to zero -- the beginning of planning ("the combat order of the senior officer has been received"); for the event (5) this time will be defined as the sum 20+10=30 minutes from the time of receiving the combat order of the senior officer. Here the times of the events are calculated beginning with the maximum duration of all the preceding operations.

The times of latest completion of the events are defined as the difference between the duration of the critical path (240 minutes) and the duration of the segments located between the investigated and final events.

The analysis data usually are expressed in the form of Table 13.

In addition to calculating the time reserve of the events, the necessity for determining the time reserve with respect to each operation is encountered. For this purpose it is necessary to define the maximum admissible time of completion of each operation beginning with the duration of the corresponding "critical" operations for which, as is known, the time reserve is equal to zero.

For example, in order to determine the operations (7.13), it is necessary that the successive interrelated operations be traced. The basic responsible agent here is the staff officer. He can proceed with the performance of operation (7.13) after the completion of operations (1.3), (2.5), (5.7), that is, 40 minutes after receiving the combat mission. Initially he fills out the data for his own troops, and then when another staff officer becomes involved in this work, they continue the calculation jointly. This officer can be included in the operation only 45 minutes after the beginning of planning.

When estimating the troops, the given calculation is required for the commander approximately in the middle of the operation (10, 12). Thus, the responsible agent has 63-(18+10+12)=23 minutes for compiling the calculation. However, in this case the time reserve for it is a total of 3 minutes, and if the commander tries more precisely to define the procedure for evaluating

his own troops and he needs to calculate the ratio of the forces and materiel at the beginning of the operation (10, 12), then the responsible agent cannot represent this calculation in completed form. The presented example clearly indicates the advantage of the PERT planning. It offers the possibility of objectively determining the minimum required time for the performance of one operation or another and at the same time avoiding subjectivity in estimating the operating times. Only by comprehensive calculation and analysis of the interrelations of all of the operations is the possibility created for eliminating bottlenecks when organizing combat operations and sharply reducing the times for the performance of the basic measures.

Let us assume in the first version of this operation that there is a sequence of the performance of the operations by the staff officer as follows: (1,2), (2,5), (5,6),(1,3'), (6,9), that is, after the preliminary orders are delivered to the reconnaissance subunit, he proceeds with the study and estimation of the enemy. As a result, the operation (5, 10) -- the estimate of the enemy by the commander -- was almost completed before the staff officer received the data. This situation created a threat to the timely performance of the operation (5, 10). In order to prevent this, the following solution is clearly provided for on the chart: a change in sequence and time of beginning of the operations of the staff officer. The operations ($1,3^1$) went into first place, that is, on receiving the mission the staff officer was immediately summoned to the commander, and during the course of explanation of the mission to the latter, he performed a study and evaluation of the enemy.

Approximately the same situation was created with the performance of the operations (7, 13; 13, 18 and 16.20) by the other staff officer. By the times defined by the duration of the other operations connected with them, they could not be performed by one man. As a result, the necessity arose for the redistribution and giving of operations (16,20) to the chief of staff.

Another approach to reducing the times is noted when performing the operation (2, 5). Here operation (1,3) is also included in the graph -- the plotting of the situation and the mission received on the second chart. It is performed simultaneously with explanation of the mission by the commander, which permits him significantly to reduce the time for giving instructions to the staff officer and service chiefs. In this case, they have the possibility of taking a significant part of the data from the staff officer.

A careful calculation of the time reserves permits study of the officers and a substantiated approach to determining the sequence of performance of the operations, achievement of expedient distribution of the operations among the officers, and establishment of the actual times for their beginning and ending. The presence of the time calculation not only facilitates the distribution of assignments among the responsible agents, but it also permits corresponding determination of the methods of performing the operations which insure their completion in the available time.

As a result of the recalculations it is possible to obtain the optimal versions of the operations with respect to organization of the combat operations. With respect to each operation, the earliest time of the beginning of the operation is established along with the latest admissible times of beginning and ending of operations and the reserve times permitting the performance of one operation or another to be put off without breaking the final deadline. This optimized chart is delivered to all of the responsible agents and serves as the specific plan of operations for all of the control officers.

Thus, the skillful use of different methods of organization of work is one of the conditions of timely performance by the control units of their missions.

CHAPTER 4. GATHERING AND PROCESSING SITUATION DATA WHEN PREPARING FOR AND DURING THE COURSE OF COMBAT OPERATIONS

1. Content of the Situation Data and Requirements Imposed on It

During the decision-making and the implementation of the remaining measures with respect to troop control in combat on the basis of the decision, the commander and staff must have, evaluate and consider various situation data. With all the variety, these data are grouped according to the elements making up the combat situation: the enemy, our own troops; neighbors; radiation situations; terrain; hydrometeorological conditions; time of year and time of day; data on the economic condition of the combat zone and the social-political composition of a population.

The enemy is the most important element of the combat situation. Inasmuch as any battle is a two-way combat process, constant deep study of the enemy by the commanders and staff on our levels is required; otherwise it is impossible to count on effective application of our means of destruction and, consequently, success of the combat operations.

It is necessary for any commander or staff to know the optimal amount of reliable information about the combat composition and the structure of the grouping of enemy forces and materiel, the locations and degree of readiness of the enemy nuclear weapons, the degree of completeness and support of his subunits (units), the moral spirit of his personnel, the troop control system, the engineering equipment of the positions occupied by the enemy and also the possible nature and methods of enemy operations before the beginning and during the course of combat. It is especially important to know the attitude of the enemy personnel toward the given war, the interrelations between the enlisted men and the officers, the social-political composition, the degree of combat training, creative, volitional and organization capabilities of the commanders and the stability of the personnel in a complex situation. The combat capabilities, the intentions and probable nature of the enemy operations in the future, the strong and weak points, the most important targets the destruction of which will sharply reduce the enemy combat capability -- all of these are revealed on the basis of these data.

However, in all cases all of the commanders and staffs must consider that the enemy will always be striving to hide his grouping and his intentions from them and also to confuse them. Therefore, as a rule there is no excess information about the enemy; on the contrary, there is always a shortage of information, and the commanders and staffs must be skillful in drawing the correct conclusions on the grouping and intentions of the enemy operations by the available spotty data. Under modern conditions, all commanders and staffs must give primary attention to the most detailed possible discovery of the nuclear resources of the enemy (to individual weapons and launchers), although the other forces and materiel of the enemy in their zone and on the flanks capable of influencing the combat mission have been studied with the required detail. Their details will be different in different types of combat and different control levels. In the company and battalion level, for example, data are needed on the enemy taking up the defensive to the individual fire point and platoon strong point, and the superior echelon need information about the enemy with less detail.

The commander and staff study their own troops with approximately the same indexes as the enemy. These indexes are as follows: position, combat composition, grouping and missions to be executed; the combat capacity of the troops, including whether they are at full strength, the presence and condition of their equipment, the political-moral condition and the degree of irradiation of the personnel; the position and state of the body, the possibilities with respect to bringing up materiel, rendering medical aid, and so on. Simultaneously with studying these data, a calculation is made of the quantitative and qualitative relations of the forces and materiel of our own troops on the enemy; the influence of the position on the performance of the stated mission is established, what regrouping must be carried out is determined, a calculation of the time required for this is made, the combat capabilities of the troops are calculated, especially with respect to the application of the means of destruction, and also measures are planned with respect to improving these possibilities.

The neighbors are studied so that in the final analysis it can be determined to what degree their position, condition and nature of operations will promote fulfillment of our own combat mission. Initially the neighbors on the right and left are studied and then the troops operating ahead. During this study it is discovered where and in what grouping they are located, their combat problem and the decisions made and also the results of their execution and interaction conditions.

The radiation situation which has developed as a result of the possible application by the enemy of nuclear weapons is studied by the reconnaissance, forecasting and dosimetric control data. The type, time and method of radioactive contamination of the combat zone, the distribution of the radiation levels in it and how they will vary with time are established here.

As a result of studying the enumerated data, the conclusions with respect to the methods of operation of the troops when carrying out the combat mission are more precisely defined, and measures are planned with respect to protection of the troops from nuclear weapons, including elimination of the consequences of their application.

The terrain as an element of the situation under modern conditions has acquired still greater significance than earlier with the complete motorization and mechanization of the troops. It is studied with respect to our entire combat zone. The commander and staff are required most frequently to know its nature and type of relief, the presence of natural and artificial obstacles and hydroengineering structures, the conditions for protection against nuclear weapons, camouflage, observation, conduct of fire and orientation of the presence and condition of roads, the nature of the soil, the passibility of the terrain and conditions of maneuvering the troops off road, the presence of building materials, sources of water supply and topogeodetic points. Special attention has been given to predicting changes which can occur as a result of the application of the means of combat by the opposing sides. As a result of studying the terrain, its effect on the operations of our own troops and the enemy is established, and it is determined how best to use it when carrying out the combat mission.

The hydrometeorological conditions are studied to determine to what degree weather conditions and the weather forecast, the force and direction of the prevailing winds, the precipitation, river conditions (canals, lakes and swamps) and so on influence the performance of the combat mission. Special attention has been given to the presence and condition of hydroengineering structures and the possibility of flooding the terrain as a result of their destruction from nuclear and fire strikes, and during winter operations, the properties of the ice and snow cover.

The time of year and time of day are also studied from the point of view of their effect on the combat operations of our own troops and the enemy and determination of the measures which must be taken to decrease the negative effect. Thus, for example, during operations in the spring season when roads are bad, measures are also planned with respect to improving the passability of our troops, and during winter operations, measures to prevent frostbite of the personnel. When studying the time of day, the length of the day and night are first of all determined, and specific measures are planned with respect to the transition from day operations to night operations and back. During operations at night, in addition, measurws are planned with respect to illumination of the terrain and camouflage and also the order of observation of the enemy, orientation and target indication are determined.

When studying the economic conditions in the area and the social-political composition of the population, special attention is given to the possibility of using the repair enterprises by our own troops to repair the materiel that has failed, the medical institutions for treatment of the

wounded and sick, the transport media, fuel and food reserves, for troop support. It is also important to determine the means of establishing the proper interrelations with the local population considering its class and national composition, traditions and customs, political moods and attitude toward our troops and toward the war as a whole. Measures are planned accordingly, with respect to increasing the vigilance, maintaining order in the rear, strengthening the security of the control bodies, especially in the presence of a population that is ill-disposed toward us in the operations zone.

The enumerated situation data and the measures following from them are needed by the commanders and staff not only at the operative but also the tactical levels. They are mandatory, for example, for the battalion commander and staff operating in the forward detail, in the airborne landing in the rear of the enemy, during encirclement, and so on. This information will be of vital interest to the company commanders and platoon leaders when doing reconnaissance in the rear of the enemy. Ignoring them, judging by the experience of past wars, as a rule, has led to serious consequences.

These are the elements and situation data studied and taken into account by the commander and staffs during combat troop control. It is necessary, however, to note that as the resources of armed combat have been developed, they have changed, which is shown in the strengthening of the role of such situation elements as radiation and others. However, with all the variety, the situation elements and the data making them up are clearly interconnected and mutually dependent, and it is impossible, for example, to study the enemy, his troops and the radiation situation apart from the conditions of the terrain or the time. However, the effect of the different elements of the situation on one element of decision or another can be different and even opposite. In practice it often happens, for example, that by the conditions of the terrain the main strike in an offensive is advantageously made in one direction, and with respect to the nature of the enemy grouping on the defensive, in the other. In order to permit such contradictions, the art of the commander and the staffs, their analytical minds, the capacity to find the main, decisive factor in the situation and to make the most expedient decision acquire primary significance. It is important also to consider another thing, that the obtained information must correspond to a number of requirements, the most important of which are the following: timeliness of obtaining information, completeness, reliability and precision.

These types of requirements were also imposed on the situation data previously. Now, they are acquiring a high degree of new significance. First of all, this pertains to the timeliness of the arrival of the situation data. It must support the commander's combat decision making or more precise determination of the decision during the course of combat in a time which offers the possibility of delivering the missions to the responsible atents, preparation of personnel and materiel for battle, preceding the enemy in opening fire and launching the attack. The combat experience of past wars teaches that late situation data, as a rule, is useless. Its use has often led to errors in the commander's decision with all of the resultant serious consequences.

In modern combat, as a result of the increased maneuverability of the troops, the speed of the combat operations and the ability of targets quickly to change their location, the significance of the time factor when gathering the situation data has increased greatly. This factor acquires special importance when trying to prevent delivery to the enemy of nuclear weapons such as tactical missiles, nuclear artillery and aircraft. As has already been noted, the weapons and rocket launchers can be put into position to fire within a few minutes. Under these conditions, in order to prevent an enemy nuclear strike on our troops, reconnaissance data must be obtained by the staff during these few minutes, it must be evaluated and reported to the commander, who must make a decision either to personally destroy the enemy materiel and weapons of destruction, or to deliver the mission to the other staff, which must then carry out the mission. From this it is obvious what high efficiency is required of the modern staff when governing and analyzing situation data. As for doing battle with enemy aviation, here success or failure will often be decided in a matter of seconds.

Along with this, the commander needs complete data on the situation which will permit him to know the state of affairs comprehensively, to make a well-founded combat decision and correctly react to changes in the situation during the course of battle. This completeness and degree of detailing of information about each situation element will at any time depend on the troop situation, the nature of the combat mission received, the degree of knowledge of the situation by the commander and the staff at the given time and other conditions. Therefore it is impossible to have ready formulas for commanders and staffs for every variety of combat activity with respect to a given problem. It is only possible to stress that all of the staff strive to obtain as much detailed data as possible about the enemy and have what is usually sufficient information about our own troops with details two levels lower, that is, in the battalion to the platoon, in the regiment to the company, and so on. More detailed data are required only in individual cases.

Any commander requires most complete data on each element of a situation during the period of preparation of combat operations, when making the combat decision during the course of combat operations he will in turn be interested in information about the elements of the situation which at the present time have the greatest effect on troop operations and require more precise definition or the alteration of a previously made decision. In modern combat this will be information about the nuclear weapons of the enemy, for they constitute the basis for the combat capability of his troops, and the success of the performance of the combat mission depends in turn on their destruction by our own troops. Often the data on the terrain, the radiation situation, the weather, the supply of our troops with fuel, ammunition, and so on will have if not decisive significance, then very important significance. The absence of certain data on the situation does not relieve the commander of the obligation to make (more precisely define) a decision in time or to take measures with respect to troop control arising from the situation on the basis of it.

In modern combat, reliability and accuracy of the situation data, that is, complete correspondence of them to the actual activity, have acquired important significance.

With respect to the degree of reliability, the situation data are divided into completely reliable, probable, doubtful and false. These data are considered entirely reliable which are received from several sources or repeated from one reliable source, and which completely correspond to the developed situation and cause no doubt. The probable data include the data which correspond to the situation and the already available information, but were obtained from only one or several sources needing checking and additional confirmation. The doubtful data are the data which contradict the information previously received from other sources and therefore requiring checking and mandatory confirmation. False data are the data explicitly not corresponding to the situation and contradicting the information received from other sources.

Of course, out of the enumerated types of data, the entirely reliable data have the greatest value. Only with consideration of these data is it possible to make efficient use of the available forces and materiel and to achieve the goal of the combat. Any oversights in evaluating the situation, on the basis of the growing destructive power of modern combat means, can lead to undesirable consequences -- unjustifiable losses and failure to carry out the combat mission. Therefore, no commander or staff officer has the right to violate the requirement of correctness and accuracy of reporting the situation, to color reality no matter how unpleasant it may be. Accordingly, it is appropriate to remember the following behests of V. I. Lenin: "...The Marxist must consider real life, the precise facts of reality..."[1] "The most dangerous thing in war ... is underestimation of the enemy and feeling contempt that we are stronger."[2] "... Only when we learn to overcome, will we be unafraid to recognize our weakness and deficiencies, will we truly, however sad the situation, look ourselves directly in the face."[3] The clear execution of these behests is a matter of honor for each officer, his service and party duty, and one of the most important indexes of high staff integrity.

In realizing the indicated requirements, it is necessary constantly to consider that under the effect of the latest materiel and methods of combat the volume of situation data required at each control level will greatly increase. In a number of cases this volume, especially during combat, can be not only equal to the remaining volume of operations with respect to subunit control, but also exceed it. In addition, the data received during the

1. V. I. Lenin, Complete Collected Works, Vol 31, page 134.
2. V. I. Lenin, Complete Collected Works, Vol 41, page 144.
3. V. I. Lenin, Complete Collected Works, Vol 44, page 309.

course of combat change quickly and sharply; they must be gathered from numerous sources, from a larger space than before with respect to front and depth and in short times.

As never before, the commander and staff are now required to have skill not only in quickly and correctly evaluating the available situation data but also predicting and considering the changes in it in time; above all, they must have skill when creating a situation that is advantageous for themselves. For this purpose, of course, it is necessary to improve the operating process of the commander and the staff with the situation data in all phases, the basic ones of which are the following: gathering the situation data from different sources; processing these data, that is, putting them in a form that is convenient for evaluation, study, and output, that is, a report on this data to the commander, the superior officer (headquarters), and informing the subordinates and interacting troops and neighbors of them.

All of these phases of working with the situation data are interconnected and are carried out, as a rule, simultaneously. Let us consider them in somewhat more detail.

2. Procedure for Gathering Situation Data

The commander gathers situation data personally through the staffs and chiefs of the combat arms (services). Above all data are gathered which are required for making a decision or more precise definition of a decision. Before making the decision, the commander can define in his instructions to the chief of staff what data are missing, and by what time the data must be prepared and delivered to him.

The chief of staff organizes the work with respect to gathering situation data directly. He establishes the total volume and the content of the information about the situation required to insure control of the subunits in combat, he defines the specific goals for the staff officers with respect to the data gathering. In addition, the chief of staff can establish the sources and the methods of obtaining the required information.

The information about the situation is obtained from different sources (see Figure 20), which, in turn, includes the following: observation of the combat field, the commanders and staff of the subordinates, the attached, supporting and neighboring subunits; the reconnaissance subunits carrying out ground reconnaissance and the reconnaissance aircraft; the superior chiefs and headquarters; prisoners, deserters and local residents; various types of materials and documents (references, maps, geographic descriptions, and so on) of both our own production and those captured from the enemy.

Every source has different significance with respect to both quantity and value of information. However, with respect to purpose, they can be provisionally divided into primary and secondary. The primary sources include those which conduct direct observations of some target about which it is

necessary to obtain information and also have direct contact with it. These sources can be people (the commander, staff officer, observer, the pilot of a reconnaissance aircraft, a scout from among the reconnaissance group or patrol, a prisoner, a deserter, local resident, and so on) or technical means (radar, radio reconnaissance resources, radiation, engineering, meteorological, sound metering reconnaissance, and so on). The secondary sources are those which do not observe the objects or events directly but report the generalized data on them received before this from the primary sources. These include subordinates, superior, adjacent and interacting commanders and staffs, the chiefs of combat arms and services, the commandant's service agencies, civil defense agencies and also their references, descriptions, topographic maps, captured combat documents, and so on.

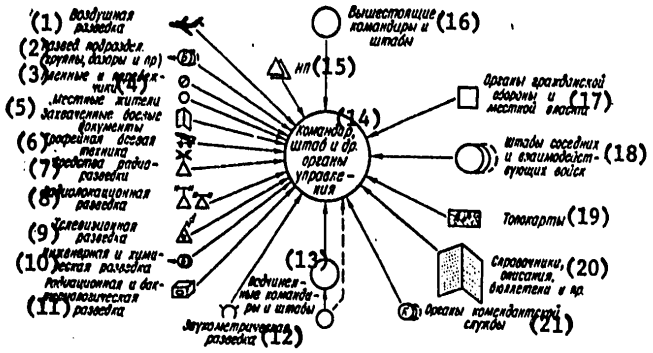


Figure 20. Sources of obtaining situation data in combat by the commanders and staff headquarters.

Key:
1. Air reconnaissance
2. Reconnaissance subunits (groups, patrols, and so on)
3. Prisoners and deserters
4. Local residents
5. Captured combat documents
6. Captured materiel
7. Radio reconnaissance means
8. Radar reconnaissance
9. Television reconnaissance
10. Engineering and chemical reconnaissance
11. Radiation and bacteriological reconnaissance
12. Sound metering reconnaissance
13. Subordinate commanders and staff
14. Commander, staff and other control bodies
15. Observation post
16. Superior commanders and staff headquarters
17. Civil defense agencies and local forces
18. Staff of adjacent and interacting troops
19. Topographic maps
20. References, descriptions, bulletins and so on
21. Commandant's service agencies

The combat experience of World War II and the practical training exercises indicate the highly important significance of the complex utilization (combination) by the commander and the staff of all available sources considering both their positive properties and their deficiencies. Thus, for example, valuable information about the location of nuclear weapons or enemy reserves can be obtained by the staff by radio from onboard an air reconnaissance aircraft. However, it is impossible not to consider that the pilot cannot always visually exactly determine the number of detected targets, distinguish a false target from a real one. Therefore, in order to be convinced of the reliability and accuracy of the information received, as a rule, it must be confirmed, supplemented and more precisely defined using several sources.

Here, all of the staff must give primary attention to the skillful use of modern technical reconnaissance equipment, since only with its help is it possible in a short time to obtain much of the necessary data. This was confirmed by the experience of World War II, although there was then comparatively little such technical equipment. Thus, during the course of the battles in eastern Prussia, on the basis of the radio reconnaissance data it was possible to discover the grouping of the 8th Tank and 4th Field Armies, the 26th Army and 41st Tank Corps of the German Fascist Forces. The staff of our 71st Rifle Corps, 61st Army, alone was able to capture and make use of more than 20 enemy radiograms in 3 days.

When preparing for the offensive operation in the Crimea (1944), multiple photographing of the enemy defenses in the vicinity of Perekop and Sivash made it possible to discover the enemy grouping, the nature of the terrain and the system of obstacles to a depth of 25-55 km. The photographic survey data were reported by the headquarters staff to each company battery and commander. The staff and the 86th, 125th and 63rd Guards Rifle Divisions of the Leningrad Front organized a prospective photographic-visual survey from the advanced observation posts to the depth of two enemy defensive positions; this was of great assistance in preparing the offensive, especially when organizing the artillery fire.

The procedures for receiving data on the situation from the above sources are characterized by great variety. The basic ones include the following: the personal observation of the commander and the staff officers of the troop operations; the reception of reports from the sources on the situation over the communications facilities and with the help of visual and sound signals; presentation of written reports (texts, graphs) or tape recorded reports; listening to subordinates' oral reports on the situation (on personal intercourse with them); the interrogation of prisoners; the study of photographs, combat documents and models of enemy equipment, and so on.

The greatest effect is achieved, however, by the complex application of these procedures. During the course of combat, for example, any staff will find it advantageous to have the most urgent and important information about the situation and nature of the operations of their own troops and the

enemy troops from the subordinates in the form of short radio signals, and then to require of them to present a written or graphical combat report characterizing the situation in more detail. Time will be the basic criterion when selecting one procedure or another for obtaining data in the majority of cases.

Many foreign specialists consider that the cardinal measure with respect to cutting time for gathering the situation data is automation of this process. Of course, it is impossible not to agree with this. However, it must be remembered that many situation data on the modern level of development of science are not subject to exact quantitative measurement, formalization and mathematical simulation. For example, these include the moral and psychological state of the personnel among our own troops and the enemy, the degree of their combat training, the personal qualities of the commanders, national traditions and customs, and so on. Therefore, at the present time, along with automation of the data gathering process it is necessary to achieve high operational efficiency in the work of the commanders and staff and the means for its clear organization. It is also important that the officers be able to predict what changes can occur in this situation, what new mission they can receive from the senior officer and what situation data will be required accordingly for combat decision making and troop control during the course of the combat operations. They are obligated actively and persistently to obtain these data in advance, not waiting for special instructions to this effect from the chiefs.

Thus, for example, during peacetime all of the staffs must comprehensively know their troops, study the location, armament and tactics of the enemy, the conditions of the terrain and especially the routes of the probable direction of operations. Being on the defensive, the staff prepares data in advance which the commander will require on going over to the offensive; controlling the troops on the march, he takes every measure to provide the commander with all of the data required for ambush and meeting engagement, and so on. With this organization of the work, the commander and the staff will have a significant part of the information about each element of the situation before receiving the new combat mission, which has enormous practical significance.

It is natural that with obtaining a new combat mission, the work of the commander and staff with respect to gathering and studying the situation data will acquire a more purposeful and specific nature. However, for this purpose clear direction of the staff by the commander and the chief of staff is needed. In particular, it is very important that the commander and the chief of staff properly explain the mission, calculate the time, determine what situation data are already known to them, and what data are missing. On the basis of the explanation of the mission and timely study of the available information on the situation, the commander must at least in general features plan and personally explain or explain through the chief of staff his intention in combat to all of the control officers. He must point out for whom by what time the insufficient data on the situation and the

calculations must be prepared, and what requires special attention in so doing. Practice shows that without such instructions on the part of the commander and the chief of staff it is impossible to achieve purposefulness and organization in the work of the control units, and the efforts of the officers will to a significant degree be in vain, for the calculations prepared by them, the data and the proposals can turn out to be simply unnecessary to the commander. In accordance with the instructions of the commander and the chief of staff, the work of the remaining officers of the control units is organized. Each of them is connected directly to certain sources of obtaining information, and prepares the data for the commander in accordance with his job profile.

The data obtained on the situation as a whole are concentrated and generalized for the commander, the chief of staff and his assistant. The remaining people gather only the information needed by them. Accordingly, a clearly organized mutual information about the situation between all of the officers of the given control point and also between different points, has great importance. This mutual information permits deeper and more complete study of the situation, and, the main thing, eliminates the requesting of information from subordinates by various duty personnel of the superior control units which, in turn, unloads the communications channels.

The organization of mutual information among the control officers on the basis of the instructions of the chief of staff is the responsibility of his assistant. It is important that their basis for this organization, in addition to the direct service subordination, be the concern of each officer about the general situation, healthy interrelations among them, understanding by them of the leading role in control of the officer operators inasmuch as they solve the problems connected with the organization of the combined arms combat and the execution of the common combat mission. Any officer, receiving data on the situation, in addition to reporting to the commander and the chief of staff, is obligated to report as fast as possible to all other interested parties. The request from subordinate headquarters for certain data by various duty personnel of higher headquarters must be categorically forbidden. For mutual information personal discussion and internal communications at the control point (by telephone, radio or selector) are used. The gathering of all of the duty personnel for exchange of information can be accomplished only in extreme necessity.

The most complex is the exchange of data during combat when the control points are in motion. A significant part of the data is obtained even under these conditions by the commander, as a rule, from subordinates personally, and he reacts to the changes in the situation, that is, he makes a decision (more precisely defines one) and states the combat mission for the responsible agents. Rendering assistance to the commander, the staff gathers, processes and reports data to him by various methods (see Figure 21). They report orally over the internal radio communications of the control point or during personal discussion with the commander on short halts during the course of

combat. Each duty person reports on his functions directly to the commander, or all of the data on the changes of the situation are initially reported to the chief of staff who sums them up and reports to the commander.

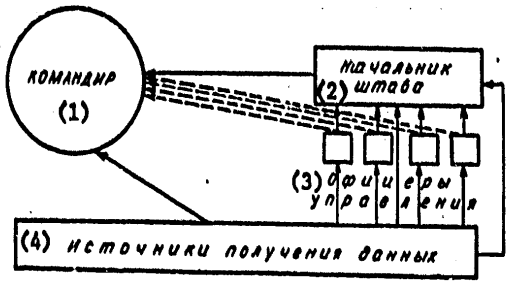


Figure 21. Procedure for reporting situation data and information at the control points.

Key: 1. Commander
2. Chief of staff
3. Control officers
4. Sources of obtaining the data

Using the technical communications means to obtain the situation data from the subordinates, just as when transmitting these data to higher headquarters, every officer must strive for maximum possible reduction of the size of the report in order to save time and not overload the communications channels with excess information. For this purpose it is necessary to request and transmit only the data which actually is needed by the commander and the staff for subunit control. The previously mentioned requirement that the information on our own troops must be gathered with detail two steps down must be satisfied creatively. The reduction of volume of the data transmitted over the communications media and also the time of the officers can be achieved by the application of short, clear formulations of their thoughts, the use of standard report forms and established signals.

The clear regulation of the times for presentation by subordinates of reports on the situation for which the situation data must be divided with respect to degree of urgency, has important significance. The most urgent data are those which require direct reaction by the commander. These data include preparation of the enemy to employ nuclear weapons and all of the sharp changes in the situation. These data are transmitted outside any priority to all of the interested commanders and staffs. The less urgent data are the data not requiring direct action on the part of the commander.

3. Processing and Reporting Situation Data

The situation data received from different sources are subject to primary processing, the essence of which consists in reducing these data to a convenient form for study. They are plotted initially on the working maps, then entered in the notebooks or the field books of the duty control

personnel. The newly obtained data are classified and compared with the already available data, the degree of their urgency and reliability is determined considering the reliability of the sources of obtaining them. Here time is also taken into account to which the information belongs, and it is established what changes in the situation could occur from the time of transmission of the data by the primary source.

Simultaneously, the data are consolidated, it is established what elements of the combat formation of their own troops and the enemy they belong to. Thus, by the location of the individual fox holes, the fire weapons and the obstacles of the enemy, it is possible to determine the outline of the forward edge of his defense, the presence of platoon and company strong points and battalion defense positions, and by the location of the individual batteries, it is possible to determine the grouping of the enemy artillery. Redundant, false and doubtful data are screened out in this way, and the information which is missing is determined. The latter are more precisely defined and procured by additional interrogation of the corresponding source.

The most important data on the map are reflected in more detail and more clearly than the secondary data. The degree of detailing of the data depends on the category and purpose of the map. For example, a reconnaissance officer plots on his map all data about the enemy without exception. Other officers keep their working maps in the volume and detail which they need for their own service duties.

The working maps therefore are the basic document where the situation is reflected. The generalized data on the situation as a whole are plotted on the working maps of the commander, the chief of staff and his deputy and also the officers heading up the control points. Especially high requirements are imposed on the maps of all of these officers. They must be a genuine mirror of the situation. Therefore, it is necessary to give primary attention to the acquisition of skills in keeping them. With the introduction of the means of complex automation of the control processes among the troops, the situation can be depicted on screens, displays and other electronic devices.

The clear organization of the work of the staff officers with respect to presentation of the situation data obtained from different sources to the commander or the chief of staff has important significance. Under modern conditions of training and, the more so, during the course of combat, prolonged meetings of the commander with his aides and extensive reports on the situation are inadmissible. The data of interest to the commander are reported in the form of brief, clear answers to specific questions. The most important information is reported by purpose at each control level and between them in the form in which they are obtained. These reports are added to and made more specific as new information comes in about the situation, especially the enemy.

This is how, for example, it was done during World War II when discovering the plans of the German Fascist command which tried to pull out the 4th SS Tank Corps which was defending positions between the Bugom and Visloy Rivers in January 1945 and reassign it to Hungary for participation in the counterattack. The process of gathering and studying the data about this situation by our command went as follows.

On 30 December 1944, our radio reconnaissance noted that the operation of the radios of the enemy's 3rd and 5th Tank Divisions had stopped. On 1 January 1945, secret agents reported that the presence of soldiers with the 5th Tank Division ensignia had been noted in Chenstokhov. On 3 January 1945, radio reconnaissance noted movement of the radios of the 3rd and 5th Tank Divisions in the Kryukov-Der direction. On 4 January 1945, by capturing a prisoner of the 3rd Tank Division in the vicinity of Komarno, the movement of the 4th SS Tank Corps to Hungary was finally confirmed.

When studying the received data it is necessary to take into account the possibility of misinformation on the part of the enemy. Let us present one of the characteristic examples of the last war. In June 1944, our radios took bearings on the operation of the radio network of the Viking SS Tank Division radio network in the area 25 km southwest of Kolomyya. In addition, a "deserter" cam over to our side, who indicated that a tank division had been moved to the indicated area to take the city of Chernovitsa. The mission of more precisely defining all of these data was given to one of our reconnaissance groups operating in the enemy's rear. It turned out that the enemy was periodically moving model tanks from the depths of its defenses in the direction of Kilomyya and back on tractors. The local population indicated that there were no echelons with tanks or other equipment in the indicated area. The previously obtained data turned out to be false. The plot of the enemy to misinform our command was uncovered.

In reporting situation data to the commander, the chief of staff plays an especially responsible role. On the basis of explanations of the mission received and estimation of the situation, he must be ready to report to the commander: the possibilities of the enemy with respect to the employment of nuclear weapons and other means of destruction, its grouping, the nature of the operations, possible plans, weak and strong aspects; the possibilities of their subunits with respect to the performance of the given mission, the required regrouping of the troops and calculation of the time for its realization; quantitative and qualitative relations of the forces and materiel; estimation of the developed radiation situation and its effect on the troop operations; proposals with respect to the decision, that is, the most expedient plan of operations in the given situation, what combat missions should be given to the subordinates, the order of interaction of the troops, the measures with respect to supporting combat operations, the organization of control.

Simultaneously, the chief of staff must be ready to substantiate the reported conclusions and proposals. For this purpose, he, just as any other

officer, must always have a working map, the necessary entries, calculations, schematics, photographs, tables and other reference material. However, in the report this material must not be converted to "crib sheets"; it is necessary to know how to make a clear oral report by the map and refer to the references only in extreme necessity, for example, when discussing digital data which it is difficult to remember. Usually the basic calculations connected with studying the situation and planning the combat operations include the following: calculation of the training time for the combat operations, the ratio of forces and means of the opposing sides, calculations connected with the application of nuclear weapons, estimation of the radiation situation, troop movement, the manning of the airborne, forced crossing of rivers, and so on.

When reporting the situation data to the superior commander and headquarters, the same procedures are used as when obtaining them from the subordinates, namely the situation report and the transmission of the report over the technical communications media and through the staff officers (personal intercourse), presentation of written or graphical combat reports and surveys.

With respect to purpose and content there are combat reports, reconnaissance reports, communications, rear and other reports, and there are operative surveys, reconnaissance surveys, communications, rear, and so on. In addition, the reports are broken down into urgent, that is, presented at the established time to higher headquarters, and nonurgent, which are presented by the initiative of headquarters itself or by the basic requirement of higher headquarters in connection with sharp changes in the situation. The volume in contact can be quite varied: from a signal, for example, of readiness for combat, to a developed combat document made up of several items. The content of this combat report can be expressed graphically on the map, tracing paper or ordinary paper. One version of this graphical combat report of the battalion commander is presented in Figure 22. Its basic advantage by comparison with the text report is clarity and, consequently, speed of mastery of its content. However, significant time is required for filling it out. Therefore headquarters often resorts to the text combat report which is usually discussed in the following order.

The first item of the report reflects the general results of the performance of the combat mission by our subunits by the time of development of the report, its situation, the nature of the operations, the condition and support one step lower.

In the second item, the situation and nature of the operations of the neighbors in the indicated, especially in the case where they have an effect on the operations of the subordinate troops, and the data on them for some reason are not known to higher headquarters.

The item of the report contains a compressed general estimate of the situation, the state and the nature of enemy operations. It is proposed that more details about the enemy are available in the reconnaissance reports.

In the fourth item there is a discussion of the intention of their operations according to the commander's decision.

If because of the situation it is necessary for the forces and materiel of the senior officer to be used to assist the subordinate, then this is discussed in the fifth item of the report. The appropriate content of this report must be as follows:

Classification and series

To the commander of the 5th Motorized Rifle Regiment

Combat report of the 3rd Motorized Rifle Battalion No 05. Commanders observation post -- hill 120.7 (1725). 5 January 1945 1100 hours. Map 25000, First edition 1943.

1. 3rd Motorized Rifle Battalion performed the next mission by 1030 hours.
The 7th Motorized Rifle Company enveloped the enemy strong point on hill 140.5 from the north. Losses: 15 killed and 10 wounded.
8th Motorized Rifle Company took the western edge of the grove (0722), (0622). Losses: 10 killed, 18 wounded.
9th Motorized Rifle Company approached the bridge (0823) at the head of the column.
The 1st Artillery Battalion was at the firing position, garden (0724).

2. Neighbor on the right -- 2nd Motorized Rifle Battalion took Petrovka, on the left 1st Motorized Rifle Battalion halted at the line of the hill 100.5, Ivanovka.

3. The enemy with strength of up to two infantry companies and 10 tanks tried for reinforcements on the west bank of the Malyy stream. Simultaneously the enemy advanced its brigade reserve for the counterattack, which was possible after 1 to 1.5 hours in the direction of Don, hill 153.2.

4. The decision was made: at 1130 hours to engage the 9th Motorized Rifle Company battle from the line of the northwest slope of hill 140.5 in the direction of the bridge (0821), hill 147.1 (0720), and by 1300 hours on 5 January to take hill 147.1.

5. I request to prohibit the advance of the brigade reserves of the enemy in the direction of the grove (0310), Don (0621).

Commander 3rd Motorized Rifle Battalion (rank, last name)

Battalion Chief of Staff (rank, last name)

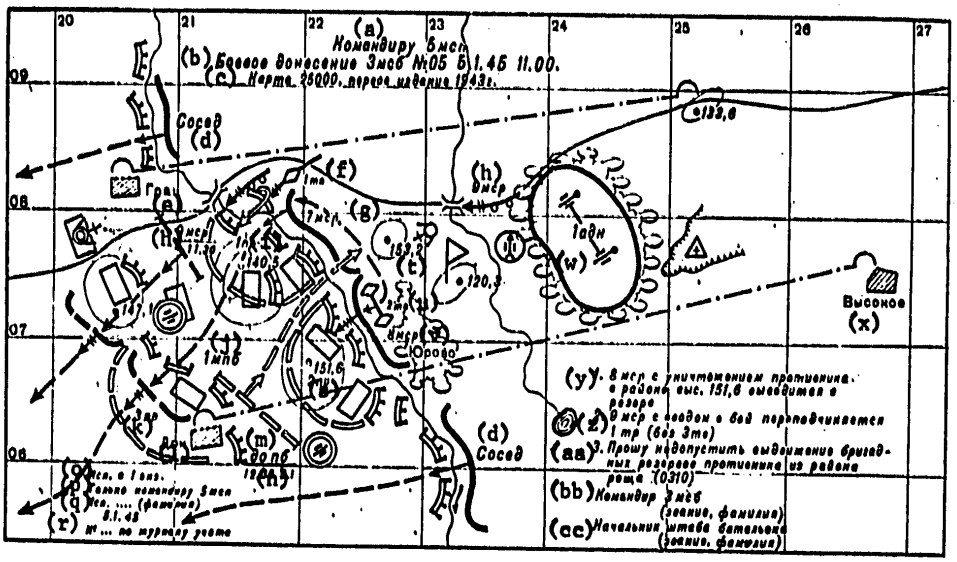


Figure 22. Combat report of the battalion command.

Key: a. To the commander of the 5th Motorized Rifle Regiment
b. Combat report of the 3rd Motorized Rifle Battalion No 05 5 January 1945 1100 hours
c. Map 25,000 1st edition 1943
d. Neighbor
e. Grats
f. 1st Tank Platoon
g. 7th Motorized Rifle Company
h. 9th Motorized Rifle Company
i. 1st Infantry Company
j. 1st Motorized Infantry Battalion
k. 3rd Rifle Company 1. Don
m. To infantry battalion
n. 1230 hours 5 Jan o. Executed 1 copy
p. Only to the commander of the 5th Motorized Rifle Regiment
q. Exp. ... (last name) 5 Jan. 1945
r. No ... by report log
s. 2nd Infantry Company
t. Yurovo u. 2nd Tank Platoon
v. 8th Motorized Rifle Company
w. 1st Artillery Battalion
x. Vysokoye
y. 8th Motorized Rifle Company with destruction of the enemy in the vicinity of hill 151.6 is moved into the reserve
z. 2. 9th Motorized Rifle Company with platoon is subordinated in combat to the 1st Tank Company (without 3rd tank platoon)

[Key to Figure 22 continued]

aa. 3. Our request to prohibit advance of the brigade reserves of the enemy from the vicinity of the grove (0310)
bb. Commander 3rd Motorized Rifle Battalion (rank, last name)
cc. Battalion chief of staff (rank, last name)

Make 2 copies.
Copy No 1 -- Headquarters 5th Motorized Rifle Regiment
Copy No 2 -- file
Ex... (last name, initials)
Dis... (last name, initials)
... (date) No ...

The given procedure for the discussion of a textual combat report must of course be considered only one of the possible procedures. In a number of cases, the combat report does not begin with the evaluation of the situation, the condition and nature of the operations of our own troops and the enemy. Nonurgent combat reports are discussed in arbitrary form, but they always begin with the principal, defining thing in the situation. Thus, it is necessary to select the most efficient form in the combat report each time. For example, the application of standard forms as follows is possible:

To the commander _____ Motorized Rifle Regiment

Combat report _____ Motorized Rifle Battalion No _____

Commanders observation post _____ Date____ Time_____ Map_____

Constant data	Variable data
I. Results of carrying out the mission and the situation of the subunits	
1. No, name of battalion took line ... and so on.	
II. Evaluation of the enemy	
1. No, composition of enemy	
2. Defending of the line..., and so on.	
III. Solution and request of the battalion commander	
1. Decided to engage the motorized rifle company in battle from the line..., and so on.	

Commander... motorized rifle battalion
(rank, last name)

Chief of staff (rank, last name)

Transmitted ... (time)

Received ... (time)

Make one copy only for file

Ex... (last name)

_____ date No ...

Each report must be extremely short, clear and accurate, and it must be presented to the addressee in the established time. Its content is discussed so that the senior officer can quickly plot it on his work map, study and react in time to the information and requests reported to him. The reports transmitted over the radio must be especially short but without loss of clarity. They contain only what is most important, approximately in the following form.

"Kama-8" (code name of the senior officer).

"3rd Motorized Rifle Battalion has carried out its next mission. The enemy is preparing a counterattack in the direction... The decision has been made at 1100 hours to engage the 9th Motorized Rifle Company in battle from the line..., and by 1300 hours, to take the town of Dal'nyaya.

"Don-5" (code name of the commander of the 3rd Motorized Rifle Battalion)

The combat report containing a discussion of the commander's decision and addressed to the senior officer is signed by the commander and chief of staff of the subunit. The remaining reports addressed to the chief of the higher headquarters are signed by the chief of staff.

The commanders and staffs of the subordinates, the interacting troops and neighbors are informed of the changes in the situation, as a rule, by personal intercourse with them and direct conversations with them over the closed communications channels. The changing situation data important to the senior officer are explained as a matter of course to them. The senior officer must not, however, distract the subordinates from direct work with respect to troop control without special need. Each call of the subrodinates must be justified by the necessity for delivery or receiving important information. For information about the enemy, in a number of cases, copies of the information documents are sent out to them.

4. Prospects for Automation of the Process of Gathering and Processing Situation Data

When analyzing the content of the commander's and staff's work process with respect to gathering and generalizing the situation data in combat it is impossible not to note that much in it is subject of formalization and simulation. Therefore the cardinal means of accelerating and increasing the efficiency of the given process is, of course, its automation in the future.

At the present time it is difficult to imagine the entire depth of the changes which can occur in the process of gathering and processing situation data in each control echelon under the effect of automation. However, it is obvious that the degree of this effect will depend on the possibilities of the means of automation with which the echelons and control units will be equipped. Here it is possible to state only certain proposals, summing up the experimental data and the theoretical views discussed in the military press of foreign armies in recent years[1].

Thus, the control echelons and units which will have the bottom set of automation media -- the information sensors -- and the required number of communications media, can automatically gather and output as directed not everything, but only certain information: on the location of the commander's control point, on whose vehicle the sensor is located, the radiation levels and other information which will be transmitted automatically to the superior control unit or body. At the same time, various types of signals, short orders, commands and basic information about the enemy can automatically proceed from this control unit, to the sensor of the lowest echelon. The remaining volume of information must be obtained and processed by ordinary means and methods for which the agents and duty personnel of the lowest control echelon must be ready.

It is proposed that the capabilities of the control echelon which in combination with other modern control means have transceiving equipment available directly in the vehicles of the basic duty personnel will be comparatively large. The gathering and transmission of the most important information about the combat situation in transient to the higher echelon can be realized over the telecode channels by using this equipment. The higher control echelon can transmit signals; commands, short orders and the required information itself to the subordinates over this equipment.

The greatest changes in the process and methods of gathering and studying the situation data take place in the control echelons and units which have available computers, remote devices from the computers and a set of other automation media installed at the work areas of the basic duty personnel. The information coming from the various sources will be processed

1. American journals: ARMOR and MILITARY REVIEW, ELECTRONICS, ARMY TIMES, West German journal WEHRKUNDE.

correspondingly, stored and output from the computer by request in alphanumeric form on printers and electronic displays in the machines.

The application of the automation media combined with other control means also offers a number of other advantages: it insures greater precision and reliability of the information, optimalness of the volume and speed of execution in the interests of carrying out the combat mission. This is possible only on efficient combination of the automated and nonautomated devices with the creative activity of the duty personnel while maintaining the leading role of the human reason. A still higher level of training and organization of the work of the control agencies is required. They must not only know, but know how to practice to use the capabilities of the automation media, improving the current developments and also finding new, better procedures and methods of gathering and studying the situation data.

CHAPTER 5. COMBAT DECISION MAKING (REFINEMENT) AND PLANNING THE BATTLE TACTICS OF TROOPS

1. Content of the Combat Decision

Basic Elements of the Decision

The combat experience of past years and the practice of postwar training indicate convincingly that the successful fulfillment of the requirements imposed on a combat decision, especially its substantiation and timeliness of making the decision, depends primarily on the depth of knowledge, experience and will of the commander. For this purpose the commander must have a clear idea of the content of the decision, that is, the kind of problems to which it must give full, accurate and clear answers. The latter is also confirmed by science, such as psychology. It says that man cannot create a thought model of any object, and then characterize it by words, in writing or graphically when its structure, boundaries and operating principles are unclear.

With respect to the problem of the content of the commander's combat decision there can be various points of view, and in reality there are various points of view. If the given problem is approached only from the point of view of the necessity of observing the principles of one-man command and centralization of control, then this solution under any conditions of the situation must reflect all the phenomena and aspects of the forthcoming combat. For this purpose it must with respect to its content include such elements as the idea of the combat operation, the problems of all subordinate subunits of the troops and special troops, the order of their interaction and also measures with respect to political work, the organization of control and all types of support of combat operations, reconnaissance, protection against nuclear weapons, security, camouflage, engineering, rear services and supply, technical, topogeodetic and other types of support and also the commandant's service.

However, this approach alone to the content of decision, in our opinion is inadequate. In addition to the indicated necessity, we must without violating the principles of one-man command and centralization, consider the psychological possibilities of the command, the level of his knowledge and experience, the degree of familiarity with the actually developed situation,

the presence of time for preparing for combat operations and including decision making, the composition of the subordinate troops and nature of the combat mission assigned by the senior officer. It is also considered important to take into account the level of training and experience of the officers of the control units and the subordinate subunit commanders.

From the enumerated factors, the time that the commander has available for decision making most frequently has the greatest effect on the approach to the content of the decision.

For the commander the most favorable temporary conditions for decision making for combat will be between the performed and the forthcoming combat operations in the presence of a prolonged interval. During World War II often these intervals amounted to several days, from which the commander of each control echelon usually received no less than 1 or 2 days for decision making and for the organization of combat operations as a whole. Under these conditions, he could, without hurrying, coherently explain the mission and estimate each element of the situation, perform reconnaissance of the terrain, think through all possible versions of the course of the forthcoming combat operations, consult with his assistants, weigh everything carefully, calculate and, in the final analysis make a decision in which a definition is given to the ideas and missions of all of the subunits of the troops and special troops, the procedure for their interaction and also measures with respect to critical work, control, communications and each type of support of combat operations. In a word, it is not required that any restrictions be introduced into the content of the decision under these conditions. The necessity for reflecting all aspects of the forthcoming combat in the decision was matched with the capabilities of the commander.

However, when studying the given experience at the present time the question unavoidably arises: will the conditions exist for decision making by the commander in a future war if it is unleashed by the aggressive circles of the imperialist governments? The studies of recent years give a negative answer to the question.

When conducting combat operations in the future, each commander will unavoidably encounter a sharp contradiction between the volume of operations which must be performed in the decision making and the time which he can actually use for this. This contradiction unavoidably arises with respect to the following basic causes. As has already been noted, the time for the preparation of combat operations has been sharply reduced. The prolonged spaces between the active combat operations, as a rule, will be absent. The struggle with the enemy to gain time and lead time in making a strike will become more acute. The speed of combat operations will be greater, which means the times for the fulfillment of one mission will be reduced, and the obtaining of a new assignment by the commander from the senior officer will be accelerated. The replacement of one type of operation with another will be more frequent than before.

Accordingly, Marshal of the Soviet Union A. A. Grechko wrote the following in his book "Vooruzhennyye Sily Sovetskogo Gosudarstva" [Armed Forces of the Soviet Government] (p 263): "Whereas during World War II each operation, as a rule, was preceded by a preparation period, the duration of which was reckoned in several days and even weeks, and at the division-regiment level usually 5 to 7 days were set aside for the organization of offensive combat, now it is impossible to count on such significant amounts of time. It is entirely probable that the new operation or battle often must be organized during the course of continuing combat operations, under the conditions of unclear and frequently contradictory situations."

The indicated contradiction will be manifested especially sharply when the commander receives a new combat mission during the course of the combat operations being conducted in order to fulfill a previous mission. Under these conditions the so-called period of combat preparation as it is usually understood will not be available in general, and the commander will have to make his decision to carry out the new mission simultaneously with the control of the subunit conducting active combat operations. The amount of time which will be used for decision making and the organization of new combat operations will often depend on the nature of the operations of the enemy and be reckoned in minutes.

For confirmation of what has been stated, let us present an example. A motorized rifle battalion had carried out its mission, it had taken the enemy's strong point and received a new mission -- to develop an assault and break through the defenses at a line 3 km from the battalion for the occupation of which an enemy reserve was advancing. On movement of the battalion at a speed of 4 km/hr it could attack the enemy at the given line in 45 minutes. Practice shows that in this time not even an experienced commander can make a decision with reflection in it of all of the problems of the organization of the forthcoming battle and its comprehensive support. He physically cannot perform all of the required organizational measures to carry out the decision.

The given conclusion becomes more obvious if we consider that the subordinate commanders down to the squad leaders also require time to make decisions and organize combat inside their subunits.

Thus, under the conditions of limited time the commander has the responsibility of personally making a decision with detailed determination in it of all of the measures of the organization of the forthcoming battle and the support of it -- this means that he is faced with unrealistic problems, he is forced either to make a superficial (unfounded) decision or use the time which his subordinates need to prepare for the performance of their missions or halt the troops and force them to wait until the decision is made. At the same time the commander will doom the troops to passiveness and unsuccessful action, break down his authority among the subordinates, discredit the principles of one-man command and centralization of control.

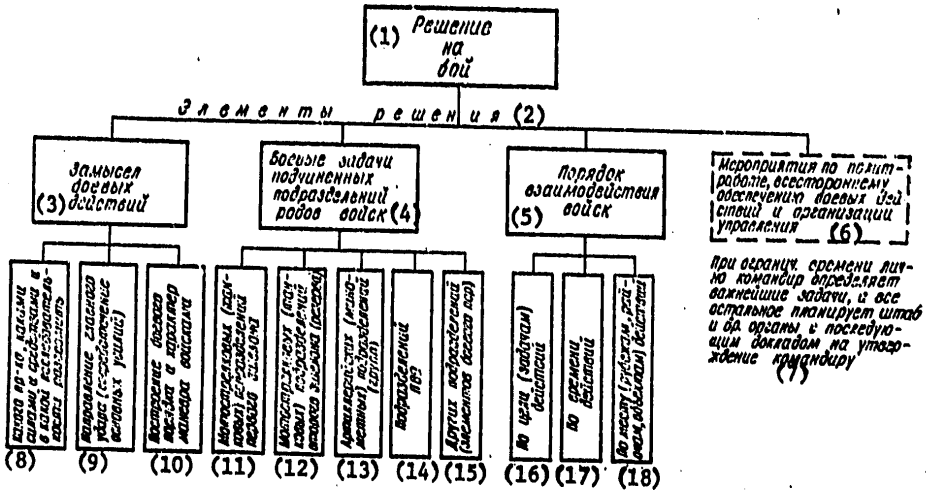


Figure 23. Content of the commander's combat decision.

Key:
1. Combat decision
2. Decision elements
3. Intent of the combat operations
4. Combat missions of the subordinate subunit of the combat arms
5. Order of interaction of the troops
6. Measures with respect to political work, comprehensive support of combat operations and the organization of control
7. In case of limited time the commander personally defines the most important goals, and all the rest is planned by the headquarters and other agents with a subsequent report for approval to the commander
8. What exercise, with what forces and materiel in what sequence to destroy
9. Direction of the main strike (concentration of basic efforts)
10. Construction of the combat formation and nature of the maneuver by troops
11. Motorized rifle (tank) subunit of the 1st echelon
12. Motorized rifle (tank) subunit of the 2d echelon (reserve)
13. Artillery (mortar) subunit (groups)
14. Antiaircraft defense subunit
15. Other subunits (elements of combat formation)
16. With respect to purpose (goals)
17. With respect to time of operations
18. With respect to place (lines, rayons, targets) of operations

In addition, with this statement of the situation the ground in unavoidably prepared for the flowering of subjectivism and voluntarism fraught in combat with especially serious consequences.

In order for this not to occur, the degree of centralization of control and detailing of the decision must be commensurate with the capabilities of the commander with respect to information processing. The basis for his work must be the differentiated approach to the content of the decision. Practice teaches that under the conditions of extremely limited time the commander of each echelon, including the battalion, must personally define only those elements of the decision which in the given situation are the most important and which cannot be determined by their people. These elements of the combat decision usually are the following (Figure 23): the intent of the combat operations, the combat missions of the subordinate subunits of the combat arms (motorized rifle, tank, artillery, antiaircraft), that is, the subunits which do combat directly with the enemy, destroy the enemy with its fire and attack; the principles of the interaction of the subunits when they are carrying out their combat missions; the mean problems with respect to physical work, support of the combat operations and the organization of control (indicated in Figure 23 by the dotted line).

As for the remaining problems connected with measures with respect to political work, the organization of all forms of support of combat operations and troop control, in the presence of sufficient time, the commander himself can, before giving instructions to the responsible agent, make the decision with determination of the missions, forces, materiel, times and methods of execution. In the absence of time, he can be completely bound by the determination not only of the most important problems with respect to this type of support which under the given conditions has the greatest significance, and leave the rest of the planning on the basis of his intent to his deputies, staff, chiefs of the combat arms and services (where they exist) and then confirm or, if necessary, correct their plans. This becomes more obvious if we consider that the circle of problems connected with implementing the enumerated measures is quite broad and complex. It requires additional analysis of the situation, the answer to many dozens of problems, complex calculations and even special knowledge. For example, let us take the organization of troop control. It cannot be reduced only to determination of the places of deployment of the control points which sometimes occurs in the training exercises. In addition, for organization and control it is necessary to solve and define the composition (the combat group) of each point, their technical equipment, the order of placement of each duty personnel and machine, the organization of security and defense, engineering equipment of the points, the procedure for their movement during the course of the battle, the procedure for restoration of control in the case of failure of one or another point from nuclear blast and enemy fire, the organization of communications, latent control and also the work of the duty personnel at each point with the specific installation: who, where, when and how it must be done with the implementation of each of the measures with respect to control.

This situation exists in organizing the political work in each of the many types of support of combat operations. Here, too, before giving substantiated indications to subordinates, it is necessary to determine the missions, forces, materiel, times, methods and procedures for carrying them out. It is easy to see that if under limited time conditions the commander personally tries to resolve the enumerated measures in all details and give answers to all of these questions, then he will unavoidably bog down and lose the main thing -- determination of the intent of the battle, the combat missions of the subordinate troops and the procedure for their interaction. On the contrary, the differentiated approach to the content of the decision discussed by us will make it possible for the commander not to have his attention divided, to concentrate on the main thing and, using the collective intelligence and creativity of his nearest aides, to insure a timely, high-quality solution to all of the problems connected with the organization of the forthcoming battle and its support. With this approach, in addition, the kind of problems the commander must analyze when explaining the mission and estimating the situation is reduced, and this means the total time on decision making is reduced. The experience of the exercises indicates that for the given approach to the content of the decision, the timely making of the decision is within the battalion commander's possibilities even for a limited time.

This approach to the solution in no way indicates multiple power. It does not contradict the principles of one-man command and centralization inasmuch as the right to maintain the plans of the assistants is left to the commander, and the personal responsibility is retained not only for their personal acts but also for the actions of their subordinates. It makes it possible intelligently to combine the principles of one-man command of the commander and centralization of control with initiative and creativity of the subordinates, to reinforce the authority of the commander among the subordinates and improve their activity and moral satisfaction with their routine work. During the last war it was stated convincingly that the effort of the commander under the limited time conditions to "comprehend the incomprehensible," his lack of faith in the officers of the control organs kills any initiative in them, it does a great deal of harm to the troop control and, consequently, to the success of the combat operations.

In the control collectives these interrelations are the more inadmissible under modern conditions when the dynamism of the combat operations has increased significantly and the level of training of the officers has been raised. Consequently, not only the necessity but also the possibility of sharply improving the responsibility of each officer for the matter with which he is entrusted is at hand. "The basic control principle...," taught V. I. Lenin, "is that a definite person is wholly responsible for the performance of a definite job."[1]

Of course, responsibility can be different. The commander and only the commander has the authority to make a combat decision as such. He is

1. V. I. Lenin, Complete Collected Works, Vol 52, p 23.

personally responsible for the outcome of the combined-arms combat and successful performance of the combat mission by the subordinate troops. He has no right to put this responsibility upon anyone. However, every chief must be responsible for his section of the operation; otherwise, he cannot be called the chief. Wherever there is some responsibility, there must be the authority to define the corresponding measures with respect to the special problems based unconditionally on the intent of the commander in combat and subject to his mandatory approval.

This approach to the matter will correspond not only to the advanced experience, but also the principles of control theory that the decisions encountered in life are general and special. The combat decision of the commander investigated by us is a general decision inasmuch as it includes his intent pertaining to all of the subordinates without exception, and aimed at the fulfillment of a common goal. The measures with respect to individual problems (political workers, organization and control, types of support) can be considered partial decisions providing for the making of the general combat decision.

Finally, the above-presented approach to the combat decision will take into account the trend toward a sharp increase in the role of the creative and organizational work of the collectives of the control organs clearly planned in our country in recent years and strengthened in the resolutions of the 25th Congress of the CPSU and in the new Constitution of the USSR. The presence of the general and specialized combat decisions, consequently, both from the theoretical and the practical point of view, is entirely justifiable and does not harm, especially in that they begin in the final analysis with the intent of one person -- the commander -- and only with his consent go to the responsible agents. Multiple power in this case is completely excluded.

The general structure of the content of the commander's combat decision and its basic components must be of this type under modern conditions.

Content of the Basic Decision Elements

Each element of the decision is in need of a clear definition, specification of content and reduction of volume. Inasmuch as it does not appear possible in this book to give a detailed analysis of each such element in all of the control echelons and in all forms of combat operations, we shall take the commander's decision to attack from the march as the basis for the investigation and accordingly, we shall try to establish the general principles of the approach to the given question, the observation of which, in our opinion, will help in practice in any other situation.

The intent of the combat operations expresses the main guiding idea of the commander determining the purpose of these actions and also in general form the forces, materiel and methods of achieving it. Therefore it is the most important element (nucleus) of any combat decision and the skeleton of the model of the forthcoming combat operations. All the remaining elements

of the decision and also all the special plans and actions of the troops themselves are based on it.

In order to correspond to its basic purpose, the plan must clearly and specifically answer the following basic questions for the subordinates.

1. What enemy, where, with what forces and materiel and in what sequence does the commander plan the attack? The answers to the given questions are needed primarily because the final purpose of any combat cannot be achieved by only one, even powerful but short strike or the use of only one means. In any form of combat it is always necessary to break down the general problem with respect to the purpose, place (lines) and time for a number of successively fulfilled intermediate goals, calling on the corresponding forces and means of destruction for their fulfillment and the application of various methods of operations. In the offensive these missions usually are the next and subsequent missions, the direction of the future advance. Each of them can be broken down into a number of smaller specialized problems with respect to size connected with the destruction of enemy targets (strong points, fire weapons, control points), penetration of his intermediate lines of defense, repulsion of the counterattacks, forced crossings of rivers, and so on. On the defensive, this clear division of the general mission usually is not made, but the combat plan always provides for successive damage to the enemy with respect to directions on the approaches to the defense, when deploying for attack, during the attack and when wedging into our defense.

Both on the offensive and on the defensive, it is especially important that the plan define the targets and how the basic weapons of destruction are to be used in theory.

2. In what direction is the main strike made in the offensive or by the basic forces concentrated in the defensive? The given question follows from the most important principle of the conduct of any combat requiring that the forces and materiel not be split up uniformly over the entire front, but that they be concentrated in the decisive direction in order to achieve superiority over the enemy in this direction.

3. How is the combat formation of the troops and what form of maneuver is planned for use by them during the forthcoming combat operations? The answer to the question is closely connected with the preceding ones. It somehow gives material embodiment to the main idea of the commander in the corresponding grouping of forces and the methods of its operations.

The most expedient content of the combat operations plan is of this type. As is obvious, it should not be overloaded with secondary measures; otherwise, it will be difficult for the subordinate commanders to understand. In addition, in the effort at brevity it is necessary not to strip the plan down too much, to limit it too much, for example, only to determination of the direction of the main strike of the offensive, for this is clearly

insufficient for explanation of the basic idea of the superior commander to the subordinate.

The combat missions of the subordinate subunits of the troops are determined in the decision in strict correspondence to the plan. The essence of the term "combat mission" consists primarily in determination of what enemy grouping (target) must be destroyed or neutralized by fire and attack by each subunit of the first echelon, second echelon or reserve, the artillery and mortar subunits, and so on. It follows from the very essence of the combat operations. However, inasmuch as these operations are always conducted within the framework of time and space, the second component of the concept of the "combat mission" is always determination of the readiness times, beginning and end of execution and the location (area, line) of operations.

This approach to the content of the combat mission has great not only theoretical but also practical significance. It permits formulation and freedom of this content of many secondary (supporting) measures, at the same time accelerating the process of making the basic decision and then the reporting and explaining of it to the responsible agents.

In order to confirm the given conclusion, let us present the expedient content of the combat missions of the subunit in the offensive from the march. In his attack decision, the commander can limit himself to definition of the combat missions of the subunit in the following volume:

a) The motorized rifle (tank) subunit of the 1st echelon -- the reinforcement means, the line of transition to the attack, which enemy and where the attack is to take place and what line is to be taken as a result of the fulfillment of the next and following mission, the direction of the future advance, the readiness time; when necessary the delineating lines between the subunit and the neighbors can also be planned;

b) The 2d echelon subunit -- the means of reinforcement, where the advance is to be made at the beginning of the offensive, the possible lines of engagement in combat, which enemy, where the rout will take place after engagement, what line is to be taken (the next mission), the direction of the future advance;

c) The artillery (mortar) subunit -- the area of the basic firing positions, what objects (targets) are to be neutralized or destroyed during artillery preparation, support and accompaniment during combat in the depths of the enemy's defenses, and the readiness time;

d) The antiaircraft subunit -- the area of the basic fire positions, who, where and when to cover, and for the coverage of which targets to concentrate the basic efforts.

The analogous approach is necessary for determination of the combat missions and other elements of the combat formation if they are created.

This approach becomes not only necessary but also completely possible if we also take into account the important fact that the combat missions are continuously connected also with the corresponding element of the decision -- the principles of interaction of the troops. The separation of these two decision elements is of a highly provisional nature. Indeed, when determining the combat missions for the troops, that is, establishing what enemy, where and when the subordinate subunits of the troops must be routed, the commander at the same time lays down the basis for their interaction, the essence of which consists in matching the forces and operations of the troops with respect to the target (goals), time and location (lines, areas and directions). However, as the experience of World War II has demonstrated, one definition in the solution of the combat missions of the troops for achievement of their close interrelations is inadequate. In addition to these, it is necessary to determine and then indicate the methods of performance of the special missions by the subordinate subunit when solving the general problem in order that mutual aid and clear-cut coordination of operations be insured.

The degree of detailing of these methods of operations in the different echelons and types of combat operations can be, of course, different depending on many factors: the nature of the problem, the presence of time, the conditions of the terrain, the level of training and experience of the subordinates, and so on. It is impossible and inexpedient to give a single outline which is suitable for all cases encountered in real life. It is only possible to state that this stage must always have a reasonable limit which can be seen from the work experience of battalion commander Maj P. Ivanov in one of his exercises in attacking from the march.

After studying the plan and the instructions of the regimental commander, explaining the mission and evaluating the situation, Maj P. Ivanov made his own combat plan, he planned combat missions of the subordinate subunits and then set about defining the order of their interaction. From the decision of the senior officers, he took the following into account: the time and procedure for advancement of the subunit from the waiting area to the line of transition to the attack; the lines and the times of successive deployment in combat formation; the beginning, the duration and construction of combat formation, the order of operations during this period of the fire weapons and all other subunits of the battalion; the location, times and methods making passages, designation and use of the passages in the obstacles. Taking this into account, the battalion commander defined the formation and the line of rushing and attack of the motorized rifle and tank subunit, the procedure for their use of the results of a nuclear attack by means of superior officers, artillery fire, direct laying weapons, tanks, armored personnel carriers and other means; methods of maneuvering the subunit (envelopment, circumvention, maneuvering of fire) with joint seizure of the most important strong points of the enemy, during combat in depths of enemy defenses and repulsion of enemy counterattacks, rendering mutual aid among the motorized rifle, tank, artillery, mortar, engineer and other subunit; the nature of operations of the subunit in case of an enemy attack during the advance and during counterpreparations; procedures for operations in the

case of an attack without the application of nuclear weapons; target indication, mutual recognition and warning signals.

This circle of problems solved by the battalion commander when determining the interaction procedure has completely justified itself. The battalion has successfully performed its mission.

Let us present another, opposite example also existing in the tactical training and described by former troop commander of the Order of Lenin Moscow Military District, General of the Army Ye. Ivanovskiy in KRASNAYA ZVEZDA [Red Star] for 20 June 1972. The commander of one of the tank battalions decided to deploy the subunit at the attack line somewhat before the established time. This "initiative" turned out to be misplaced. As a result, it did not result in coordinated simultaneous operations with the neighbors. At the same time the force of the strike was weakened. During the careful analysis of the causes of this error it was discovered that the battalion commander saw the general tactical situation, his place and role in the execution of the plan of the senior officer incorrectly. Therefore the effort to be active on the battlefield turned into a harmful fiasco.

From these examples it is obvious how carefully and creatively the commander must proceed when determining the order of interaction of the troops in his decision. On the one hand, he must see that his subunits act as a clearly organized and united organism and forestall the enemy in launching the attack. However, on the other hand it is impossible to consider the practice normal when one commander or another unnecessarily and without consideration of the actual possibilities strives personally to define in detail all of the procedures to be followed by the troops which are the "internal affairs" of the subrodinate commanders. These procedures can be defined by the subordinates themselves inasmuch as they note the situation which must be taken into account in detail.

The same thing pertains to the problems of political work, types of support and organization of control. Here it is also necessary harmoniously to combine the principles of one-man command and centralization of control with independence, initiative and creativity of the officers of the control organs and the subordinate commanders and not to accustom them to look to the senior officer and wait for instructions regarding the procedures for their own operations.

V. I. Lenin, attaching enormous significance to one-man command and centralization of direction, nevertheless emphasized that "unity basically and essentially is not disturbed, but it is insured by variety in details, in local peculiarities, in the methods of approaching a matter, the methods of realizing control..."[1]

1. V. I. Lenin, Complete Collected Works, Vol 35, p 203.

Accordingly, it is useful again to mention the experience of World War II. In its initial period, when the commanders of the tactical elements still had not received sufficient combat experience, there was a very high degree of centralization of control on the part of the senior officers, especially when preparing combat operations. However, subsequently when the command personnel acquired experience, the combat operations came to be more of a maneuvered nature, and the times for their preparation were reduced. This centralization became unnecessary and even harmful. Considering the given facts, on 18 May 1943, the General Headquarters of the Supreme Command was forced to publish a special directive to the troops according to which the senior officers were forbidden to intervene unnecessarily in the function of the subordinate commanders, to control the troops "through their head." These instructions by General Headquarters played a highly positive role in improving troop control.

It is important again to note that the harmonious combination of one-man command and centralization of control on the part of the senior officers with independence, initiative and creativity of the subordinates is one of the basic trends in the development of modern control in all areas of country's social life. The given trend has been given a great deal of attention in the resolutions of the 24th Congress of the CPSU. L. I. Brezhnev made the following statement in his summary report to the Central Committee of the CPSU: "When a decision is made, it must be entirely clear who bears responsibility for it. And it must be precisely just as clear who bears responsibility if the timely decision is not made or it is delayed. On all levels of control it is important to determine the volume and the relation of the rights and responsibilities... Each level of the administrative system must deal with its own affairs so that the higher levels will not be cluttered up with a mass of current affairs distracting them from the large problems, and the lowest levels can operatively solve the problems entering into their competence."[1] Considering the exceptional importance of the given problem, he again touched on it at the 25th CPSU Congress, stating in the summary report: "The essence of the organizational problems, simply speaking, is that each one, having the necessary authority for this and within their limits bearing complete authority, deals with its own affairs. This elementary everyday rule is at the same time a basic principle of the science and practice of control."[2]

The fulfillment of the given party requirements in the case of troop control in combat will permit more complete use of the great creative possibilities of the commanders and staffs of all degrees, the creation among them of a healthier "psychological climate," and the main thing, improvement of

1. Materialy XXIV S"yezda KPSS [Materials of the 24th Congress of the CPSU], Moscow, 1971, pp 68-69.
2. Materialy XXV S"yezda KPSS [Materials of the 25th Congress of the CPSU], Moscow, 1976, p 61.

the substantiation of the combat decisions, reduction of the time for making the decisions and delivery to the subordinates, the granting of more time to the subordinates for preparation for combat operations and in the final analysis achievement of the successful fulfillment of their combat missions.

2. Procedure for Combat Decision Making by the Commander

Essence of the Procedure and the Requirements Imposed on It

The well-foundedness and timeliness of the decision making depend to a great extent on the procedure which is used in this case.

By the procedure in general in science we mean the set of procedures and methods of performing some operation based on objective laws of reality and insuring achievement of the planned goal.

In order to apply the given definition to the combat decision making process by the commander, it is first necessary to take into account the following peculiarities. First, this process basically is of a clearly expressed creative nature, for it is always connected with the search for the new and best means of routing the enemy and successful fulfillment of the mission. The given peculiarity arises from the fact that any forthcoming combat will be organized in a new, variable situation, and therefore it sometimes is not an exact copy of the preceding battles. Secondly, the combat decision making process, as a rule, takes place under conditions of limited time, and therefore its success depends to a great extent on the clear organization of the work of the commander and his subordinate officers of the control units in the decision making.

Considering these peculiarities it is possible approximately to give the following definition of the essence of the combat decision making procedure: the combat decision making procedure is the basic set of procedures and methods of creative thought of the commander based on the objective laws and principles and also the organization of his joint work with the officers of the control units in the decision making process. Its purpose is, under any complex conditions of the situation, to assist the commander in the timely, well-founded definition of the combat operations plan, the combat missions of the subordinate troops and their interaction. For this purpose the procedure must correspond to a number of requirements following from the conditions of the specific nature of the decision making process itself.

Inasmuch as the given process basically is of a creative, cognitive nature, the most important requirement on the combat decision making procedure is its correspondence to Marxist-Leninist dialectics, the theory of knowledge, logic, the laws of armed combat and the principles of military science. "The Red commander," wrote M. V. Frunze, "must learn how to fully master the method of thought, the art of analysis of phenomena which is set forth in Marxist teachings."[1] The achievements and conclusions of such

1. M. V. Frunze, "Izbrannyye Proizvedeniya" [Collected Works], Moscow, Voyenizdat, 1965, p 70.

sciences as psychology, mathematics and cybernetics can be of great assistance to the commander in combat decision-making under modern conditions. His mission, consequently, consists in perfect mastery of the entire set of logical and mathematical methods of thought and knowledge generated by modern science.

The observation of the given most important requirements will permit the fulfillment of such requirements of the decision making process as universality and flexibility. The essence of the latter consists in suitability of the procedure for decision making not for any one, but for any type of battle: the offensive, defensive, and so on and also under various conditions of the situation, including with limited time. Their satisfaction is recognized as freeing the commander from a long, difficult search in each special case for the methods and the thought sequence and also the methods of organization of their work during the combat decision making.

What has been stated, of course, does not mean that the decision making procedure is recognized to give the commander some previously compiled schematic or questionnaire from which, on filling it out, he obtains a decision for any b-ttle in finished form. "To make up a formula or a general rule... which will be good in all cases is absurdity," noted V. I. Lenin.[1] The purpose of the procedure is different -- to arm the commander with scientific methods of thought and the most efficient methods of organization of his work offering the possibility of exhibiting creativity, art and personal talent. The presence of such a common procedure for all types of combat does not exclude, but, on the contrary, presupposes use of special laws and principles of the conduct of each type of combat and also the peculiarities of the combat operation by various troop echelons (company, battalion, regiment, and so on).

It is necessary to indicate such requirements on the combat decision making process as simplicity and clarity permitting its comparatively easy and fast assimilation by all commanders, including the young ones not having sufficient practical experience.

In addition, it is necessary to consider that the practical satisfaction of the enumerated basic requirements on the combat decision making process is unthinkable without deep and comprehensive knowledge of the commander, without his solid mastery of the entire arsenal of logical-mathematical methods of thought. In addition, during combat decision making an important role belongs to the subjective qualities of the commander, especially those such as skill in predicting the course of the forthcoming combat, the development of intuition, strong will, courage and decisiveness, cleverness, skill in deceiving the enemy, independence, the capacity for creative thought under a high psychological load, readiness to enter into a reasonable risk and take responsibility for the outcome of the combat operations. The

1. V. I. Lenin, Complete Collected Works, Vol 41, p 52.

combat and training practice indicate that if the commander does not have such qualities and at the first difficulty vacillates, then no well-developed procedure will help him to make the decision.

General Content of the Combat Decision Making Process

Both the content of the decision itself and the procedure for making it by the commander are definitely influenced by the following initial data: the nature of the combat mission received from the senior officer and his instructions with respect to the preparation for battle[1]; the developed conditions of the situation, especially the presence of the decision making time; the personal qualities of the commander and his subordinates.

In spite of the variety of these data, the thought of the commander and organization of his work during the combat decision making, the general principles which we shall discuss below are characteristic.

The thinking process of the commander in combat decision making occupies the predominant position in his entire multifaceted activity with respect to troop control, inasmuch as it, in turn, determines the substantiation and timeliness of the decision, which means, the success of the combat operations of the troops. Therefore, the study of this procedure has been given a great deal of attention in all armies, especially in recent years in connection with the changes that have taken place in the materiel and methods of armed combat.

It is necessary, however, to note that the thought process of any command during decision making, especially the thought of the commander during combat decision making in a complex situation, is very difficult to subject to analysis and description. Some authors even call the given process the "age-old secret." Nevertheless, we shall try to do this based on Marxist-Leninist theory of knowledge and the results of studies of the advance experience of war and training exercises.

In many of the official and unofficial sources,[2] the commander's combat decision is entirely justifiably considered the result of his explanation of the combat mission received from the senior officer and evaluation of the situation (see Figure 24).

1. Here and hereafter the decisions are not taken into account which were made by the commander with respect to his initiative in the absence of communications with the senior officer and sharp changes in the situation.

2. See "Taktika" [Tactics], Voyenizdat, 1966, pp 115-116; "Resheniye Komandira Na Boy" [Combat Decision of the Commander], Voyenizdat, 1964, pp 20-38; "Vvedeniye v Teoriyu Vyrabotki Resheniy" [Introduction to the Theory of Decision Making], Voyenizdat, 1972, pp 15-17.

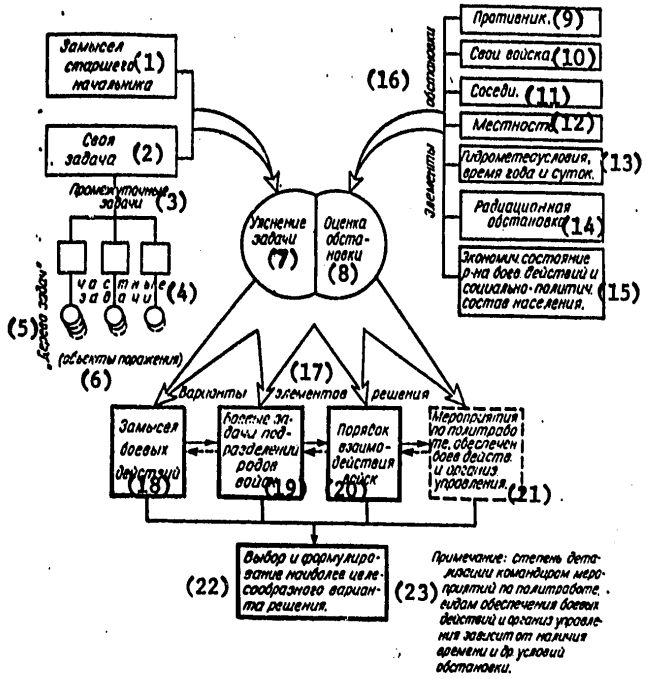


Figure 24. Combat decision making process of the commander.

Key:
1. Plan of the senior officer
2. Commander's mission
3. Intermediate missions
4. Special missions
5. Mission tree
6. (Targets for destruction)
7. Explanation of the mission
8. Evaluation of the situation
9. Enemy
10. Our own troops
11. Neighbors
12. Terrain
13. Hydrometeorological conditions, time of year and day
14. Radiation situation
15. Economic condition of the area, combat operations and special social-political composition of the population
16. Elements of the situation
17. Versions of the decision elements
18. Plan of combat operations
19. Combat missions of the subunits of the combat arms
20. Procedure for interaction of the troops
21. Measures with respect to political work, support of combat operations, and organization of control
22. Selection and formulation of the most expedient version of the solution
23. Note: Degree of detailing by the commander of the measures with respect to the political work, type of support of combat operations and organization of control depends on the presence of the time and other conditions of the situation.

However, the commander's thought process itself when making a decision often is divided into three independent and successively realized steps: initially the problem is explained, and then the situation is evaluated, and only then is the decision made. It is impossible to fully agree with the last thinking, for it does not entirely correspond to reality, advanced experience and the theory of knowledge. The independence and consistency of realizing the mentioned thought operations of a commander are of a highly provisional nature. They are more a feeling than a reality. The nature of the process of explaining the mission itself is such that during its realization the commander is forced to one degree or another to become involved in evaluating the situation. His thinking from the very beginning of the decision making process is none other than the creation of the thought model of the forthcoming battle by constant comparison of the mission with the conditions of its execution and, above all, with the counteraction of the enemy. Without knowing the situation perfectly, it is impossible properly to explain the given mission.

"... The goals of man," V. I. Lenin pointed out, "are the result of the objective world and presuppose it..."[1] From the knowledge of this "objective world," the real combat situation, the thought process of the commander must begin in order to deeply understand the goal of the combat operations planned by the senior officer and his mission. In order to confirm what has been stated, let us first consider the essence and the content of each of the indicated operations connected with decision making.

By the explanation of the combat mission, we mean the thought process of the commander aimed on the one hand at deep perception of the intention of the senior officer and on the other hand, the study of the content of his combat mission and establishment of the role and the location which his subunit will have in fulfilling the mission of the higher troop echelons.

The proper understanding of the mission and the intention of the senior officer and also his combat mission will permit the commander clearly to represent the purpose of the forthcoming battle and the means planned by the senior officer, the times and methods of achieving the goal, explanation of the requirements on his own decision and the actions of the subordinate troops. In addition, this explanation of the problem offers the commander the possibility in the short term to replace the senior officer in case of failure during the force of combat operations, which is especially important in the case of use of nuclear weapons by the enemy.

The evaluation of the situation consists in recognition of the objective conditions of the performance of the assigned mission. As a result of this recognition, factors are discovered which promote or complicate the achievement of success in the forthcoming battle. These factors are, as is known, the above-investigated elements of the situation.

1. V. I. Lenin, Complete Collected Works, Vol 29, p 171.

The sequence for estimating them can be different, basically beginning with two events: the mutual relation between the elements and the importance of each of them under specific given conditions. It is impossible, for example, to estimate the radiation situation before evaluating the weather, and the enemy and his troops separately from the terrain on which they are to operate. The importance of each of the elements of the situation can also be different. Thus, on completion of the march, the presence and condition of the roads and the march possibilities of the troops can have a basic effect on the content of the commander's solution; on breaking through a prepared defense, the enemy; on forcing a river crossing, the properties of the river itself, and so on. Therefore it is impossible to establish any single sequence for all cases in real life of estimating the elements of the situation, and those who permit this possibility are in error. They enter into contradiction with the dialectics and guide the commander's thinking along a false path. The conclusions from evaluating each element of the situation are usually of a dual nature. On the one hand, in generalized form they reflect the main thing, in one element or another, and its effect on the performance by the troops of the combat mission, and the other, they determine the specific content of the corresponding element of the decision (where it is necessary to apply the principal strike, how to set up the combat formation of the troops, and so on). These special conclusions with respect to each element of the situation and with respect to the decision in the thinking process are compared with each other and with the conclusions from the explanation of the mission. When necessary the latter are more precisely defined and are made more specific with respect to target, time and place. With this comparison, the commander again unavoidably encounters an entirely regular dialectic contradiction expressed in the fact that each element of the situation or groups of elements has a different effect not only on the solution as a whole but also on one element or another of it. For example, it is not excluded that beginning with the plan of operations of the neighbors, it is expedient to apply the main strike on the right flank of our own troops; from an evaluation of the enemy, in the center of the combat formation, and from an evaluation of the terrain, on the left flank. As a result of this contradiction in the commander's thinking during the decision making, a "struggle of motives" unavoidably arises, and several alternative decisions appear.

The final selection of the best (optimal) or most expedient (close to optimal) among these possible versions of the decision and then formulation of it constitutes the essence of the concluding operation and the entire thinking process of the commander during combat decision making.

In general features this is the procedure followed by the commander's thought during combat decision making.

For more specific explanation of its content, let us present a sample list of questions in the form of a summary table to which the commander must provide answers and also the conclusions to which he must arrive during the process of making a decision to attack from the march (see Table 14).

The sequence of determination of the indicated decision elements in Table 14 and Figure 24 can be different. Thus, in training practice the procedure is well recommended in which initially the mission is explained and each element of the situation is estimated separately. The combined effect of the corresponding elements of the decision is analyzed, and only then are the generalized conclusions drawn. This procedure is sometimes provisionally called decision making by elements of the situation.

Its basic advantage consists in the fact that it gives the commander a complete, specific class of problems for which he must consistently find well-founded answers during combat decision making. As practice has demonstrated, it is especially valuable during the initial training of young officers in the decision making process at the military training institutions and the commander's training system among the troops when they are given the assignment with a new, complex and entirely unknown situation. In this case, the trained officer, being guided by the given procedure when preparing for the exercise, carefully analyzes each element of the situation, and during the course of the exercise, his leader brings the trainee to an expedient decision gradually, step by step with the participation of the entire collective of the training group in this process. Indeed, the history of the given procedure indicates its designation primarily for training purposes. It was comprehensively developed during the years immediately following World War II in order to train the officers in skills of deep analysis in the exercises of each element of the situation and thus making well-founded combat decisions.

However, the given procedure has significant deficiencies. The basic one is that a great deal of time is required for making the decision by this procedure which, as has already been noted, the commander as a rule will not have available in combat. In addition, it artificially separates the explanation of the mission from evaluation of the situation as a whole and each of its elements, it insufficiently completely analyzes the dialectics of the commander's thinking process, it does not entirely clearly indicate to him how in the final analysis to approach the decision and find the correct answers to the numerous questions which are presented in Table 14.

The means of eliminating these deficiencies, as advanced practice and theoretical studies have demonstrated, can also be different. One of them has already been investigated in the preceding section. It consists in a clear definition of the content, a reduction in the number and volume of each element of the decision as a result of exclusion of excess parts and supporting measures from them.

Table 14. Approximate Content of the Commander's Decision Making Process for an Attack From the March

No	Name of the Operation	List of basic problems subject to study by the commander (in consolidated form)	Conclusion to which the commander arrives as a result of his thinking process
1	2	3	4
1	Explanation of the combat mission obtained	1. The senior officer's plan: which enemy, in what sequence and by what means he plans to-attack; the direction of the main strike and the breakthrough sections; the basic targets for destruction by nuclear weapons and conventional weapons in their zone of attack; the combat formation and nature of the maneuver; the methods of operation in case of an attack without the application of nuclear weapons	Conclusions from explanation of the mission: location and role of our own subunit in the mission carried out by the higher echelon; the location in the combat formation and its variation during the course of battle; in what (primary or other) direction the attack is to be made; the role of the subunit itself in the rout of the general enemy grouping; the required rates of the offensive attack.
		2. Mission of our own subunit: purpose of operations and content of the next and subsequent missions (what enemy, where to attack, what line to take), the depth of these missions and execution times; direction of further advance; width of the offensive strip and the breakthrough sections; means of reinforcement and support; routes of advance and lines of deployment; readiness time	Conclusion by decision: 1. Expedient sequence of rout of the enemy. 2. Direction of main attack and breakthrough section. 3. Construction of combat formation and the nature of the maneuver during the course of combat. 4. Approximate content of the missions of the subordinate subunit. 5. Especially urgent measures with respect to preparation and support of the combat operations.

1	2	3	4
2	Estimation of the situation: a) Estimation of the enemy	1. Composition, position, state and nature of the enemy operations at the given time in the offensive strip: composition with respect to types of troops and capability; structure of the defense -- forward edge, lines, positions and strong points, their engineering equipment, the fire and obstruction system; combat formation, including the arrangement of the means of application of nuclear weapons and reserves; points at which flanks of adjacent units meet and flanks; control points, basic radioelectronic facilities, rear targets; makeup and possible densities per km; composition and nature of operations of aviation, landing forces and airborne units; moral-psychological state of the personnel, operational qualities of the commanders.	Conclusions from evaluation of the enemy: 1. Main grouping of the enemy, from the destruction of which his combat capability is sharply reduced. 2. Strong and weak aspects in the enemy defenses. 3. Possible scales and procedure for the application of nuclear weapons and other means of destruction by the enemy. 4. Probable plan and nature of enemy operations during the course of combat with or without the application of nuclear weapons.
		2. Probable nature of enemy operations during the course of the offensive of our troops: possible plan of operations, including the direction of concentration of the basic forces; expected procedure for the application of nuclear weapons and other means of destruction; lines and directions of counterattacks by reserves; probable changes in the	Conclusions with respect to the decision: 1. Expedient battle plan: sequence for routing the enemy, objects of destruction of the primary attack, the structure of the combat formation and the nature of maneuvering. 2. Combat missions of the subordinate submit of the combat arms.

1	2	3	4
		grouping; possible scales and nature of operations of the enemy by air.	3. Order of interaction of the troops. 4. Basic measures with respect to the missions with respect to enemy reconnaissance.
	b) Evaluation of our troops	1. Combat position and state (with respect to combat arms and special troops); providing for reinforcements, combat training, experience, moral-psychological state of the personnel, degree of training, organizational capacity of the commanders and staffs; state of the art with respect to armament, materiel and transportation, support with reserves of materiel.	Conclusions from evaluating our own troops: 1. General condition and combat capability of subordinate subunits. 2. Correspondence of their position to the nature of the combat mission, what regrouping is necessary and the time required for this.
		2. Combat capabilities (with respect to combat arms and special troops); artillery and mortars -- for destruction of enemy targets from closed firing positions; direct-laying weapons and antitank guided missiles -- with respect to destruction of the fire points and tanks; antiaircraft defense resources -- with respect to the control of air targets; motorized rifle and tank subunits -- with respect to the creation of superiority over the enemy on breakthrough of the defense and	Conclusions with respect to decision: 1. Direction of main attack (beginning with the position of our own troops), structure of the combat formation, distribution of forces and materiel, elements of the combat formation which must be reliably covered by the antiaircraft defense resources. 2. Combat missions of the subunits. 3. Order of advance, deployment and interaction of troops. 4. Basic measures with respect to political work, organization of

1	2	3	4
		repulsion of the enemy counter-attacks; engineering troops -- with respect to making passages in the obstructions, laying out routes, providing for first crossing of rivers, the placement of obstructions when repelling enemy counter-attacks; reconnaissance equipment--complete reconnaissance of the enemy; control resources -- support of continuous control; rear services and supply -- with respect to materiel, technical and medical support; ratio of forces and materiel and created densities (general and in the breakthrough section).	the control of the troops and support of the combat operations.
	c) Evaluation of neighbors	1. Position: where, in what grouping they are operating, the size of the gaps between them and our own troops. 2. Nature of operations: what is to be done in the given time. 3. Missions: content of the mission, operations plan and rates of advance of our own subunits from the right, from the left and straight ahead, the lines and directions of engagement of the second echelons and the missions of the airborne used by the senior officer in his offensive zone.	Conclusions from evaluation of the neighbors: 1. Effect of the operations of the neighbors on the fulfillment of the mission. 2. With which of the neighbors, when and how must we interact most closely. Conclusions with respect to decision: 1. Direction of principal attack (beginning with the operations of the neighbors). 2. Measures with respect to support of close interaction with the neighbors (communications, mutual aid by fire, support of the flanks, and so on).

1	2	3	4
	d) Estimation of the location in the arrangement of the enemy and their troops.	1. General nature of the terrain: type of relief, local objects, hydrography, advantageous lines for the enemy defenses and lines with the taking of which conditions are created for successful development of the offensive of our troops; presence of building materials.	Conclusion from evaluation of the terrain. Effect of terrain on the use of nuclear weapons and the fulfillment of the assigned combat mission; directions most successful for troop operations.
		2. Conditions of observation, firing, concealment and camouflage; command heights, natural camouflage, cover, advantageous areas for placement of the elements of the combat formation, control points, rear services and supply; lines of possible nuclear attack; counterattack and mining by the enemy.	Conclusions with respect to decision: 1. Direction of primary attack and breakthrough section. 2. Construction and placement of combat formation, routes of advance, deployment lines. 3. Lines of the next and subsequent missions of the subunit, direction of future offensive. 4. Lines of engagement of the 2d echelon, deployment of the antitank means, mobile obstacle detachments and other means. 5. Sections for forced crosings of the river. 6. Placement areas for the control points and the rear services targets, supply and evacuation routes. 7. Measures with respect to engineering support of the offensive and defense against mass destruction weapons. 8. What must be reconnoitered in the terrain.
		3. Passability: presence and condition of roads, nature of the soil, off-road maneuvering conditions, accessible and inaccessible directions, water barriers, the presence of hydroengineering structures.	
		4. Variation of the terrain: correspondence of the map to the actual terrain at the given time; possible changes in terrain after the application of nuclear weapons by both sides (destruction, flooding, fires, and so on).	

1	2	3	4
	e) Estimation of hydrometeorological conditions, time of year and day	1. Water barrier conditions (rivers, lakes and swamps): water level and changes in it during rains and on destruction of dams, possible flooding; thickness of ice and snow cover (in the winter); suitability of the water for drinking and technical needs.	Conclusion from evaluating the hydrometeorological conditions — effect of hydrometeorological conditions on troop operations when carrying out their mission and the application of various means of destruction by the two sides.
		2. Weather: air and water temperature; direction and velocity of the wind with respect to altitudes and in the ground layer; atmospheric pressure; clouds, fog and visibility; 24-hour weather forecasting, the forecasting of precipitation, dust storms and so on.	Conclusions with respect to decision: 1. Direction of principal attack and structure of the combat formation (beginning with the hydrometeorological conditions).
		3. Time of year and day: sunrise and sunset, duration of the dark and light periods.	2. Measures for cases of sharp changes in hydrometeorological conditions (flooding, snowstorms, bad road seasons, and so on).
	f) Estimation of radiation situation	1. Scales and nature of damage to the terrain and the troops: location, time, materiel, procedure and level of damage, boundaries of the damaged zone; what subunits and to what degree are they destroyed as a result of the possible application by the enemy of nuclear weapons at the given time.	Conclusions from estimating the radiation situation: 1. Degree of effect of the given situation on the fulfillment of the combat mission. 2. Safest areas of operation of the troops.
		2. Nature of effect of the damage on the troops: irradiation doses (at the present time and in the future,	Conclusions with respect to decision: 1. Direction of principal attack and combat formation of the troops,

1	2	3	4
		beginning with the forecast); degree of damage to materiel, supplies, and sources of water. 3. Possible consequences of the destruction: expected troop losses; effect of the damage on the moral-psychological state and on the whole on the combat capability of the troops.	beginning with the given situation; methods of surmounting the damaged zones. 2. Measures with respect to elimination of the consequences of the application of nuclear weapons by the enemy.
	g) Estimation of the economic conditions of the zone of combat operation and the social-political composition of the population	1. Possibilities of the use of repair enterprises, medical institutions, reserves of materiel, local communications systems for the needs of our troops (without loss to the working population). 2. Class composition of the population, its mood, attitude toward the war and our troops, traditions, customs, and so on.	Conclusions from estimating the given element of the situation: Its effect on the combat operations of the troops (our own and the enemy troops). Conclusion with respect to decision: Measures with respect to use of local resources for the needs of our troops and means of establishing friendly relations with the population.
	3 Selection and formulation of the most expedient decision	1. Plan of combat operations: what enemy, where with what forces, materiel, procedures in what sequence the rout is to take place, basic targets for destruction by available materiel, direction of principal attack, structure of the combat formation and nature of the maneuver.	

1	2	3	4
		2. Combat missions of the subordinate subunits of the combat arms; reinforcement resources, what enemy, where and when to attack (destroy, neutralize), what line to take as a result of the performance of the next and subsequent missions, direction of future offensive, location in the combat formation, readiness times.	
		3. Fundamentals of interaction: how to coordinate the forces and actions of the troops with respect to the target (missions), location (lines, zones) and time.	
		4. Most important goals with respect to political work, support of combat operations and organization of control.	

A second important means of acceleration of the process of preparing the decision and improving its substantiation is the skillful combination (but not replacement) by the commander of the above-indicated decision making sequence with respect to developments of the situation with somewhat different order, which can be provisionally called decision making by the decision elements. There is no theoretical difference between these two procedures and there can be none inasmuch as both are based on the same procedural base: the explanation of the mission and estimation of the situation. The difference in them consists only in the thought sequence of the commander.

During the combat decision making by elements of the decision the commander explains the assigned mission and evaluates each element of the situation in close interrelation and by the angle of their complex effect on the corresponding element of the decision. On proceeding with the generation of the decision, the commander immediately states a specific problem (where to make the principal strike, how to construct the combat formation, and so on) and finds the answer considering the requirements of the senior officer's plan, the structure of the enemy defense, the nature of the terrain and all other conditions of the situation on which the answer depends. At the same time, from the very beginning his thinking acquires a more purposeful nature, it proceeds along a shorter path, which means more quickly making the final goal -- determination of the plan, the combat missions of the troops, and the principles of their interaction (Figure 24).

For the application of this procedure the commander not only has the necessity but also the possibility. It is caused by the presence of the above-indicated dialectic relation between the process of explanation of the mission, estimation of the situation and between the elements of the situation and also the circumstance that the commander in combat receives much data on the situation and studies it in time, that is, before assignment of a new mission. In this he differs significantly, for example, from the student of an academy who receives an assignment to hold a meeting. On receiving the mission, the commander in combat has no need to begin "from zero" and successively sort out each element of the situation mentally inasmuch as he has already done this work. He therefore has the complete possibility of immediately proceeding with the latter -- the determination of the elements of the decision. This is also required by the laws of logic and the theory of knowledge. In order to be convinced of this fact let us refer to Table 14.

On careful analysis of this table it is easy to see that the thinking process of the commander when making the decision cannot be artificially broken down in any way into the independent and successively realizable steps such as explanation of the mission and evaluation of the situation. These operations are so closely connected that the smallest disturbance of this relation leads directly to a contradiction with the requirements of theory of knowledge, the essence of which consists in the following.

The consciousness of man is formed by reflection of the objective will. From this fact it follows that the process of combat decision making by the

commander, just as any other cognition, must necessarily begin with the sensitive perception of the real combat situation, objective reality and following along the path "from vital contemplation to abstract thought and from it to practice -- such is the dialectic path of recognition of the truth, recognition of objective reality."[1] Failure to fulfill the given requirement of the theory of knowledge can lead to gross errors, especially in the case where these errors have been permitted by the senior officer and the errors of the commander making the given decision are superimposed on them. In order for this not to occur, before the commander resorts to specific, deep explanation of the assigned mission, the situation must first be analyzed at least in general outlines, and for example, it is necessary to determine such factors as where our own troops and the enemy troops are located and what they are doing (taking the offensive, defensive, on the march, and so on), what approximately their composition is and also the general nature of the terrain. Without this, he cannot correctly answer any of the problems of the explanation of the mission presented in Table 14. How is it possible, for example, correctly to understand and deeply realize the goal of the operation, that is, what enemy the senior officer plans to destroy, what enemy is to be destroyed by our own (subordinate) troops, what lines are to be taken, not having even the most general concept of the enemy in the terrain. Without this, when explaining the mission it is impossible to take even a step along the path to the decision, to plan, for example, even the approximate direction of the principal attack.

The given conclusion is confirmed also by the practice of the thinking of experienced commanders during decision making during the past war and postwar training exercises. They have always explained the assigned mission and estimated the situation in close dialectic interrelation and casuality. In addition, as has already been noted, there has been no necessity, but a possibility for this. Indeed, in combat reality the commander always knows the situation of one degree or another. He constantly lives it. Thus, before obtaining a new mission from the senior officer, on the basis of his preliminary orders and prediction of the future operations he constantly studies the situation, the state and the capabilities of his troops and also the enemy opposite, the terrain in the direction of probable operations, weather and so on. On assignment of the mission, he only gathers the missing information and makes a more purposeful study of all of the obtained data on the situation considering the nature of the mission. Therefore, the commander does not need to find answers to the dozens of questions reflected in Table 14. Many of these answers he has in his head or require only refinement. He can use the situation not as the "raw material" for study but as the finished "parts" for constructing the "building" of the decision. Here the capacity of the commander to encompass all of the numerous factors of the situation with his thinking, quickly to find among them the main ones determining one element or another of the decision. These main factors will look different under different conditions. For example, the sequence of the routing of the enemy, the direction of the primary attack and the combat formation of the troops

1. V. I. Lenin, Complete Collected Works, Vol 29, pp 152-153.

depend primarily on the structure of the enemy defense, the form of the maneuver -- on the presence of open flanks and gaps, the content of the combat mission and the order of interaction of subordinate troops -- their combat capabilities. However, it is not excluded that other factors can turn out to be the main factors, for example, the condition of the terrain, the radiation situation, the support of our own troops, and so on. The art of the commander will, in particular, consist in quickly analyzing the complex labyrinth of the situation and finding the proper way out of it. This art is within the power only of a literate, experienced officer.

Thus, the commander's explanation of the mission and his evaluation of the situation are not independent steps in his thinking isolated from each other, but a united creative process of decision making. After explanation of the mission, the evaluation of the situation does not begin, but continues and goes into greater depth in order more completely and in more detail to find out all of its positive and negative properties influencing the performance of the stated mission by the subordinate troops.

The given theoretical situation permits a different approach to the content of the process of explaining the mission itself. It offers the possibility for the commander not to be limited only to the analysis of the thinking of the senior officer and his mission, but to take a more certain step along the path to his own decision, to drop his explicitly inexpedient version, to make the plan approximately, to give the troops specific preliminary orders, to give his further thinking a more purposeful nature and thus significantly accelerate the entire decision making process. In addition, in explaining the assigned mission in combination with the general conditions of the situation already known to him, the commander can break down the mission into a number of intermediate and special problems (subproblems) and simultaneously distribute the latter among the responsible subordinate subunits. This procedure is widely discussed in the literature on the theory of production control under the name of construction of the "problem tree" or the "target tree," and it is used completely in the military affairs considering, of course, their specific nature.

In confirmation of what has been stated, let us present an example of the application of the given procedure when the commander explains the mission to attack a reinforced enemy motorized infantry company. Knowing the organization, weaponry, reinforcement standards and tactics of the company in advance, the battalion commander mentally divides the mission into a number of special missions during his explanation, such as destruction of the enemy in three platoon strong points, neutralization of 15 machineguns, one large-caliber machinegun, three mortars, 10 entrenched tanks, six antitank guided missiles, six recoilless guns, two radar, and one observation post. He can simultaneously plan the distribution of all these enemy targets among his available forces considering the application of the means of destruction of the senior officers with respect to some of them. In spite of the fact that this distribution is of a preliminary nature (without specific indication of time and place), it permits the creation of the form,

the "skeleton" of the future decision which then can be filled out with respect to content much faster and much more easily. The close combination of the process of explaining the mission with evaluation of the situation consequently has great practical significance.

It is impossible to consider the last, concluding operation in the thinking of the commander -- determination of the expedient version and formulation of the solution -- as an independent step. Moreover, it cannot be called decision making, as some authors say. We have seen above that the combat decision does not form in the consciousness of the commander immediately or suddenly, but as a result of complex, at times agonizing thinking, weighing the many pros and cons when explaining the mission and estimating the situation, that is, over the extent of the entire decision-making process.

The nature of the given process itself is characterized by a search nature, inasmuch as during its course, on the basis of the contradictory effect of the various elements of the situation several alternative versions of the decision unavoidably occur to the commander in the form of hypotheses. At the end of this process, no decision making takes place, but the selection of one out of several versions which the commander for one reason or another (by one index or another) considers the best, the optimal or the most expedient, that is, close to optimal.

The search for this version begins at the very beginning of the decision making process. During the course of this process, a literate, experienced commander comparatively easily sifts out the explicitly erroneous from the set of possible versions. The remaining few (two or three) expedient or rational versions are compared by the commander at the end of the decision making process by the expected combat results (the possible losses to the enemy and his own troops, the consumption of materiel and time for fulfillment of the mission, the capture of the terrain, and so on) and he finally selects the best of them. Let us note that at this time not only the mind but also the will of the commander has great significance. The forced decision is not to decide anything, that is, in action. After selecting the best version, the commander formulates and explains his decision to his subordinates. The decision making process ends.

However, this ending of the given process can be considered only relative. Subsequently, the thinking that the commander does about the solution continues, especially for special changes in the situation which is most characteristic for the time of conduct of the combat operations. During the given period, the commander unavoidably must refine, supplement and specify one element or another of the previously made decision again and again, and in case of a sudden, sharp change in the situation, make a theoretically new decision as a whole. Most frequently, the necessity for more precise determination or alteration of the previously made decision will occur during the course of combat on sharp changes in the situation which will be difficult for the commander and staff to foresee in advance before the beginning of the combat operations. Thus, on the approach of the advancing troops to the

forward defensive line of the enemy, which cannot be reconnoitered in all the details before the beginning of the battle, the commander can obtain entirely new data on the grouping of the enemy and the location of his fire power which requires more precise definition not only of the missions of his artillery but also the structure of the combat formation of the subunits and sometimes the direction of the main strike. Still greater refinements and changes in the decision can be required after a sudden nuclear attack by the enemy, his destruction of hydroengineering structures, flooding of the terrain and other analogous situations.

Thus, the commander's thought process about his decision occurs in all phases of troop control, beginning with the time of obtaining the combat mission and ending with its fulfillment. No commander can hope that after making even a substantiated decision and issuing the combat order everything will proceed automatically on its own, inasmuch as the enemy will always strive to take the corresponding countermeasures. There is no discontinuation in thinking or creativity of the commander in battle.

Logical Methods of Thinking of the Commander During Decision Making

Now let us consider which specifically logical methods of thinking the commander can use when making a combat decision.

Out of these methods, the comprehensive dialectic materialistic method of recognition of the truth has primary significance. From the very beginning of the thought process when making the combat decision, it requires that the commander base his thinking primarily on the objective fact, the actual conditions and situation, correctly evaluate them from the quantitative and qualitative points of view, consider them in close interrelation, continuous development and change, discovery of contradictions of this development, finding the basic element, discovery of the possible factors having a decisive influence on the success of the fulfillment of the combat mission by the troops, that is, see the essence of the battle as the external phenomenon.

When using the given method it is especially necessary to discuss the importance from the commander's point of view of the consideration of the combat situation not so much statically as dynamically, the changes and development during the course of combat. Only with this approach can the commander not simply passively consider the situation but be its creator, actively influence the operations of his troops during the course of battle and through them, affect the enemy. For this purpose, the capacity of the commander to predict the possible changes in the situation and the course of the forthcoming combat operations has primary significance. It is easier, General of the Army S. M. Shtemenko notes in his memoirs, "for the combat chiefs having the gift of foresight to generate and quickly make decisions. Frequently it occurs that one commander or another experiences great difficulties when making a decision, he considers the various versions and does not know which one to take. Another commander, in the same situation, immediately selects a version and throws out the others. This occurs because the latter, as they say, can see ahead."[1]

1. S. M. Shtemenko, "General'nyy Shtab v Gody Voyny" [General Staff During the War Years], Book 2, Moscow, Voyenizdat, 1973, p 494.

Skill in predicting the course of the forthcoming combat operations during World War II was characteristic of all of the commanders of the Soviet Army who had mastered the dialectic method of thinking perfectly. For example, this is what A. Chakovskiy writes in his novel "Blokada" [Blockade] about the thinking practice of Marshal of the Soviet Union G. K. Zhukov: "Looking at the map, Zhukov did not simply reproduce the picture of the past battle, he knew how to predict the nature of the future battle, in calculated minutes, somehow 'play out' the various versions first for himself and then for the enemy. He knew how to abstract out of himself and become embodied in the enemy, then, again becoming himself, to evaluate the intentions of the enemy."

During combat decision making, the combination of such general theoretical methods of logical thinking as analysis and synthesis, abstracting and generalization, induction and deduction, analogy and comparison also have important significance.

By breaking down the general mission into a number of intermediate missions and the general situation into individual elements, analysis permits a deep study of each of them and a discovery of the main ones among them and separation of the secondary ones. An example from the experience of World War II confirms how important such analysis is. When making the decision to go on the offensive in October 1944 at the reinforced Shtallupenskiy rayon, the decisive factor in routing the enemy was proper selection of the vulnerable spot in his defense. The commander of the 96th Guards Rifle Division discovered on the basis of the data obtained from the units and subunits commanders when studying the enemy that southeast of Shtallupen the enemy had a field type defense: this also determined the combat decision making. The decision was made to make the main strike against this weakest point, bypassing the reinforced region from the south which insured success of the offensive.

The method of analyzing the situation is continuously connected with synthesis, which permits joining the results of estimating the partial elements of the situation obtained during the analysis process into a united whole, which is especially important when making a decision by its elements. F. Engels emphasized that without analysis there can be no synthesis, but gotether with it "...thinking consists as much in expanding the objects of consciousness to their elements as in combining the elements connected together into a unity."[1]

Analysis and synthesis are used in making decisions in close combination not only with each other but also with such methods as induction and deduction. Induction helps the commander, on the basis of single, at times insignificant facts of the combat situation, to arrive at general conclusions. Deduction, on the contrary, permits, on the basis of the knowledge of the general principles of the conduct of combat operations, judgment of

1. K. Marx and F. Engels, Works, Vol 20, p 41.

the special phenomenon of combat reality. The conclusions made by the inductive method of thought always are checked out by the method of deduction and vice versa. Induction and deduction consequently "...are related to each other in the same necessary way as synthesis and analysis."[1] Let us demonstrate this in a simple example.

In one of the staff command exercises the battalion commander received reconnaissance data that in the vicinity of M there were to be 10 to 15 special vehicles and crane vehicles under reinforced guard. On receiving this special type data, knowing the enemy's materiel in advance, he immediately assumed by induction that the enemy's missile battery had arrived in the indicated area, but which one? The deductive method helped him to answer this question. For this purpose he plotted the area of concentration of the vehicles on a map, compared it with the general structure of the enemy's defense, and established that it was within 10 km of the forward line between the defensive positions of the enemy. Knowing the general principles and normatives of the use by the enemy of the missile troops, he drew the solid conclusion that a battery of tactical missiles was being deployed in the given area which could launch a nuclear attack in 15 to 20 minutes.

In this way the commander was able to determine the structure of the enemy's strong point by individual entrenchments and higher points, by the operation of individual radios, the system of enemy control points, and so on.

Even in these simplest examples we can see that in addition to the above-mentioned thought processes the commander also uses such processes as abstracting and generalization. Their role is especially important in the more complex situations where it is necessary to withdraw from this bit of information about the situation and concentrate attention on the main, decisive information for the given time. However, the discovery of the main element of the situation is not a simple problem, the more so in that many of the situation data can be missing, and part of them will be false. Accordingly, analogy and comparison can be of great assistance to the commander, the essence of which consists in comparison of the available data on the situation with the previously known cases and thus finding the necessary conclusions for the present and the future. However, such conclusions, as a rule, are of a propositional (probability) nature, they appear in the form of hypotheses inasmuch as the situation is nonrecurrent, and one battle is in no way similar to another. Ignoring this fact, the standard copying of the previous operations sooner or later leads to failure to fulfill the mission. On the contrary, creative consideration of the changes in the situation, finding what is new always promotes success. For confirmation of what has been said let us present two examples from the experience of World War II.

In carrying out the offensive operation, in February 1943 our troops were engaged in battle at Lugansk. In the city itself and on the approaches to it the enemy created a strong defense. Repeated efforts to take the city ended in failure, and not only because of the lack of superiority over the enemy. Our troops made an error in that the repeated attacks were usually

1. K. Marx and F. Engels, Works, Vol 20, p 542.

made at the same time: they began in the morning and ended at dark. The enemy quickly made use of this: he used night to regroup his forces and materiel and reinforce his defenses. Thus, by the beginning of the daytime attack by our troops the enemy was prepared again. When this situation was properly evaluated and the necessity for attacking at night was understood, the corresponding decision was made. Then the offensive was crowned with success. In the given case the decisive role was played by departure from the standard, proper and creative selection of the time of beginning the attack when making the decision.

Let us consider a second example. One of the battalions was to cross a large water barrier and capture a powerful strong point of the enemy. This mission was quite complicated in itself, and the battalion commander, Captain Tret'yakov, complicated it still more, it would seem, by the decision that he made after detailed familiarization with the situation. He considered it necessary to make the river crossing where it split into three arms flowing through a difficult swampy area. However, in reality this most difficult alternative turned out to be the shortest path to victory. The enemy defenses here were the weakest, and in addition, the enemy did not expect attack from this direction, was taken by surprise and routed.

The characteristic of the thought process of the commander when making the combat decision would be incomplete if he did not employ the so-called inductive-heuristic methods. In recent years a great deal of attention has been given to them in all armies. Their essence consists in the capacity of the commander to make a decision without a developed opinion and intermediate phases of their thinking process with subsequent mental selection of all of the situation elements. In other words, these methods are based on the ability of the commander to "see" the decision, to draw a fast, developed mental conclusion, to select the main item from a set of initial situation data and immediately arrive at the final result -- the decision.

These methods are most clearly exhibited during decision making in the course of combat operations when fast reaction of the commander to the changes occurring in the situation is required. They are based not only on the subjective qualities of the commander, but primarily on his deep knowledge of the objective laws of armed combat, the principles of military science, solid mastery of the dialectic methods of thought and great practical experience. Consequently, they do not so much contradict the logical method but supplement and extend them in the united decision making process. In addition, they are closely connected with the psycholcgical state of the commander, his inspiration, mood, collectiveness of will, and spiritual and physical forces.

This peculiarity of the combat decision making by the commander has been figuratively characterized by General of the Army P. I. Batov in his memoirs "On the March and in Combat." He writes: "The front line commanders know how many thoughts crowd together when you look at the location of a forthcoming battle for the last time. Like any creation of the hands and will of man, the battle is realized twice -- first in thought and then in

reality. If the chief of staff is an operations mathematician, this in insufficient for the commander. He must have the power of fantasy, straining his senses, to survive the first mental battle, the parts of which are still imprinted in his memory like frames of photographic film."

The Application of Mathematical Methods and Means of Mechanization and Automation When Making the Combat Decision

In order to make a timely, substantiated combat decision, the application not only of logical but also mathematical methods by the commander has great importance. This is indicated by all of the many centuries of history of military science. A. Makedonskiy had Aristotle as his "adviser on mathematics," who helped him develop the disposition of the battles and the formation of the troops on the battlefield. For A. V. Surov, one of the basic operating principles, along with speed and impact, was visual estimation.

It is unquestioned that the role of the mathematical methods in modern combat has increased greatly inasmuch as now instead of movement of the troops by foot and arrangement of continuous uniform columns on the battlefield it is necessary to calculate theoretically different and more complex phenomena to the radiation situation, and to supplement the ordinary calculations and "estimation by sight" there are linear and dynamic programming, probability theory, differential equations, systems analysis, operations research, game theory, PERT planning, programming and computer engineering. Without mathematical methods, without quantitative and qualitative substantiation, it is impossible to adopt a proper, especially an optimal decision in modern combat. One healthy idea, experience or intuition is now insufficient, the trial and error method is in general inadmissible, for in nuclear warfare many errors turn out to be uncorrectable.

In addition to necessity, the application of mathematical methods arises from possibility. The creative nature of the decision making process does not mean that it is not characterized by operations which can be formalized, algorithmized and expressed by mathematical language. These operations primarily include the performance of various calculations required for making a substantiated decision to use the available forces and materiel in combat. The most important and most recently encountered calculations in control practice are usually the following:

a) Calculation of the combat capabilities of the combat arms and special troops on both sides (Table 14), such as, for example, artillery and mortars -- with respect to damage of the enemy targets from closed fire positions; the direct-laying methods and antitank guided missiles with respect to destruction of the fire points and tanks; the antiaircraft defense means with respect to destruction of air targets; the engineering troops with respect to making passages and obstructions, laying out routes, the support of river crossings, and so on;

b) Calculation of the quantitative and qualitative relations of the forces and materiel and the created densities per km of front;

c) Calculation of the possible losses to the troops on both sides;

d) Calculations connected with the movement and transportation of troops by various forms of transportation, surmounting water barriers, airborne landings, and comprehensive support of combat operations;

e) Calculations with respect to forecasting the radiation situation and irradiation doses of the personnel.

Depending on the type and scale of combat, other calculations, of course, can be made. Among them, the calculations permitting comparison of the combat capabilities of our own troops and the enemy have important significance, not only those which occur at the beginning of the combat operations (in statics), but also those which considering the expected losses of the sides can occur during the course of combat (dynamically) when solving the intermediate and special problems: breakthrough from the march of the defensive positions in depth, repulsion of the enemy counterattacks, accomplishing river crossings, and so on. On the basis of these calculations, the commander and the staff determine the number and ratio of the forces and materiel required for successful satisfaction of the goal, grouping of the forces and the methods of their operation. The quantitative and qualitative aspects of the forces and materiel are usually calculated in several versions. Thus, in the offensive it is initially determined in the entire zone of forthcoming combat operations and the entire depth of the mission, and then when performing each partial mission also separately on the direction of the principal attack. During operations involving use of nuclear weapons, in addition, it is necessary to define the ratio of the forces and materiel after the presupposed (expected) nuclear strikes of both sides.

The basic indexes by which the calculation is made of the ratio of the forces in the battalion echelon are the following: motorized rifle (motorized infantry) subunits, tanks, artillery and mortars (by calibers), the antitank means. The initial data for the calculation are the following: the actual composition of the subunits participating in the given combat, the grouping of forces and materiel which can participate in the fulfillment of each mission, the grouping of the enemy which will withstand our troops each time. On the basis of these data, the number of forces are calculated, and the previously defined quality of the forces and materiel on both sides is taken into account. Then by division of the greater indexes by the smaller ones, their ratio is determined. The results of the calculation are usually recorded in the table forms that are prepared in advance.

As practice shows, the greatest accuracy of such calculations can be achieved when using the so-called coefficients of commensurableness of the combat possibilities (the fire power, the strike force, maneuverability, and so on) of various types of materiel and combat potentials of the subunits as a whole of their own troops and of the enemy. For example, taking the combat capabilities of our 122-mm howitzer and motorized rifle battalion as the initial unit (1.0), it is possible to compare the combat capabilities of the other means of destruction, subunits and units of our own troops and

the enemy with them and at the same time obtain their commensurableness coefficients (the combat potentials) permitting the calculation and comparison of the combat capabilities of any grouping of the troops on the sides.

The consideration of the changes in these capabilities, depending on the type of troop operations (offense, defense, meeting engagement), the nature of the terrain, the amount of engineering equipment, weather conditions and also the suffered or expected losses of the troops on both sides can be realized using additional (correction) factors.

Using the presented coefficients, the commander and the staff can also if necessary determine the most expedient procedure for replacement of certain materiel or subunits by others in order to improve the combat capabilities of their troops and insure their greatest superiority over the enemy, especially in the primary direction. Thus, the insufficient number of tanks on the offensive can be compensated for by an equivalent increase in number of artillery, and the capabilities of the antitank means on the defense can be increased by installing antitank barriers, and so on.

In order to perform the calculations in all of the modern armies, the most different means find application, beginning with the calculation rules, tables and graphs (Figure 25), the nomograms, and ending with the keyboard calculators and computers. All of these means permit significant acceleration of the performance of the calculations and improvement of their precision.

The previously prepared standard calculations such as, for example, the calculation of the required amount of artillery for doing damage to the enemy at the platoon and company strong point, the depth of the marching column of subunits on the march, the required number of transport means for moving the subunits, and many others are of great assistance to the commander in his decision making. Having these calculations at hand, the commander can quickly use them in finished form or if necessary somewhat refine them beginning with the specific conditions of the situation.

For performance of the calculations using computer engineering, at each staff headquarters it is expedient to have specially trained officers and sergeants and also advance compiled procedures, forms and formulas. Of course, this does not relieve all the rest of the officers of the obligation of knowing how to perform the calculations, but the specialization of some of them is of great use. It permits time to be saved and the precision of the calculations to be improved.

In addition to the performance of the calculations, in many modern armies a great deal of attention is given to the so-called mathematical simulation of the dynamics of the forthcoming combat operations of the troops. It can be used during the course of the entire process of decision making. However, it is especially important during the concluding operations of this process when the commander selects the best (optimal) or most expedient, close to optimal out of several possible versions of the decision.

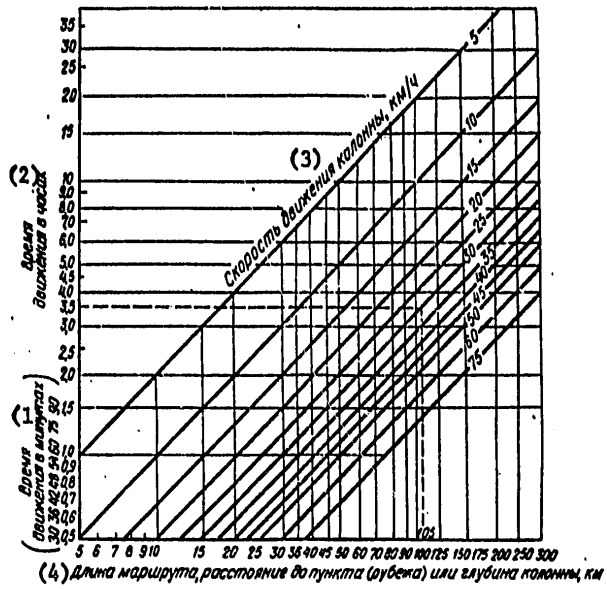


Figure 25. Graph for determining the required time, magnitude of the transition or speed of the troops on the march.

Key: 1. Movement time, minutes
2. Movement time, hours
3. Speed of the column, km/hr
4. Length of the route, distance to the post (line) or depth of column, km

This operation is called optimization of the decision, the basis of which is not only logical and qualitative but also quantitative substantiation insuring the most effective use of the available forces and materiel. When realizing the given operation, the knowledge, art and will of the commander, his capacity to overcome contradictions and have the last word, to give the decision the strength of mandatory law for all of the subordinates are exhibited to the highest degree.

The essence of any simulation consists in the construction of the model of the object (subject) reflecting with some accuracy and completeness of the structure, the course and the final quantitative results of the operation. After studying the results, it is possible to introduce changes into the model and at the same time discover the conditions by means of procedures and times for achievement of higher results.

The simulation procedures can be the most varied: logical, heuristic, cybernetic, graphical, experimental and so on. The combat decision of the

commander which we investigated is none other than the logical model of the dynamics of the forthcoming battle. The relief plan or map with the decision reflected on it is a graphical model of the battle. The tactical training in a situation which is close to the conditions of the forthcoming combat is its experimental model (repetition). The basic bottleneck of all such models is the absence of sufficient quantitative bases. The mathematical simulation of the combat operations is recognized to eliminate the given deficiency.

By mathematical simulation of the dynamics of the forthcoming combat operations, the formalized algorithmic and logical description of them is understood (in the form, for example, of the system of equations and logical rules) then permitting use of a computer to play out their course in several possible versions, to predict and determine by the selective criteria the final quantitative results of the combat and on their basis to select the best version of the decision.

The combat operations which pursue the goal of destruction of some enemy targets having no resistance or which are of a dual nature and are conducted by some individual combat arms with the application of identical means of destruction are comparatively easily subjected to this type of mathematical simulation. Their results are usually estimated by some basic criterion (index), for example, by the number of enemy losses. These operations can, in particular, include the combat operations of the antiaircraft defense troops against the enemy aircraft. If for any version of their grouping we take the expected number of enemy aircraft knocked down as the basic deficiency criterion, then the mathematical model of their operations can look as follows:

$$M_0 = N_0 \cdot T_{firing} \cdot P_{enemy} \cdot K_{control} \cdot K_{participation},$$

where M_0 is the mathematical expectation of the number of knocked down aircraft; N_0 is the number of available antiaircraft firing units and the given version of their grouping; T_{firing} is the number of firings which can be produced by each firing unit in one enemy attack; P_{enemy} is the probability of destruction of an enemy aircraft by one fire unit in one round; $K_{control}$ is the reliability equation of the fire control system; $K_{participation}$ is the coefficient of participation of the available fire units in the repulsion of the enemy aircraft.

Using the given model and a computer, when making a decision the commander (chief) can quickly obtain an answer to the questions, for example, of how many enemy aircraft can knock down the available antiaircraft defense means in one attack for each version of the planned grouping or how many fire weapons are required to insure damage to a certain number of aircraft and what regrouping of them must be carried out in connection with this.

The analogous mathematical models can be compiled for the combat operations of the antitank subunits against the enemy tanks; for the artillery, on damage of various objects, and so on.

As for the combined-arms combat as a whole, in which a large number of troop subunits and special troops participate on both sides distinguished from each other by purpose, organization, armament, capabilities and methods of operation, then comparison of the mathematical model reflecting all aspects of the operations of their troops and the enemy is a complex matter. The basic difficulty, as we have noted in the first chapter, consists in the fact that the expected results of the two-way combined-arms battle must be estimated not by some one criterion, but by several contradictory (not commensurate) indexes: namely, the expected enemy losses; the possible or preventable losses of our own troops; the consumption of materiel and time for execution of the mission; taking (holding) the terrain, and so on. It is desirable to have some of these indexes maximal or minimal. In addition, a number of the initial data required for mathematical simulation are difficult or impossible to formalize and to measure quantitatively (the combat training, discipline and moral-psychological state of the personnel on both sides, the mental and organizational capacities of their commanders, the national characteristics of the people, the social-political consequences of the work, combat operations, and so on). A number of the initial data are of an incomplete, random, contradictory and even logical nature. The compilation under such conditions of a "victory equation" reflecting the entire variety of combat operations is not an easy matter, and therefore no miracle should be exp-cted of the mathematician. One must not only not underestimate mathematics, but also not overestimate it. The fact should not be ignored that the enemy sooner or later will know our "equation" and take countermeasures.

It is possible to surmount the noted difficulties by a single path -- skillful combination of the above-investigated logical methods of thought by the commander when making the combat decision with mathematical methods, especially with the performance of the mastered calculations and also with manifestation of creativity, art, courage and cleverness, the capacity to deceive the enemy, achieve surprise in attacking the enemy with skillful application of the principles of the conduct of battle discussed in the rules and regulations.

Any arbitrary mathematical simplification of the combat operations, fitting the mode formula can lead to a useless expenditure of time and gross errors in the commander's decision, which means, to unjustified losses and even a disruption of the fulfillment of the assigned mission by his troops. The decision of A. V. Suvorov to attack the 100,000-man Turkish Army in Rymnik with only 10,000 soldiers was based not so much on mathematics as on the use of the combat characteristics of the Russian "miraclemen" and the incapacity of the Turkish command to control its large army flexibly. There was a risk, but the risk was reasonable, based not on the number but on the quality of the troops. It completely justified itself. Many analogous examples come to us from the experience of World War II. The decision of General Headquarters of the Supreme Command of the Soviet Armed Forces to go on the offensive in the spring of 1944 was based primarily on the incapacity of the German-Fascist troops to carry out their combat operations during the season when roads were bad. The launching of the principal

attack of our forces in the Belorussian operation through the difficult swampy terrain was justified primarily by the achievement of surprise attack.

The analogous approach to the decision is possible also on a tactical scale. At one of the troop exercises in the Far Eastern Military District the tank battalion commander Maj N. Revnichenko, in order to achieve a surprise attack, decided to advance across country, across sections of mountainous forested terrain and passes with crossings over the solid ice on the river. Inasmuch as the "enemy" did not expect the tank attack from this direction, the attack of the battalion was a surprise, it was fast and could not be repelled.[1]

On the whole, the close combination of logical and mathematical methods in combat decision making is one of the most important indexes of the maturity of the commander, his knowledge and his skill in troop control. The presence of computers and mathematical methods does not decrease, but on the contrary, increases the role of the thinking process and the creativity of the commander, for in this case he is committed, in addition to performance of the ordinary functions, to define the problems for the computer, direct the development of the programs for it, and make creative use of the results of the computer operations. Only close interaction of the human commander with the machine with the decisive role of the former can insure the satisfaction of modern requirements on combat decisions.

Organization of the Work of the Commanders and the Control Units in Decision Making

The final results of the creativity of the commander when making combat decisions, the substantiation and the timeliness of the decision depend to a great extent not only on knowledge, experience, the thinking process, the will of the commander and his use of mathematical methods and computer equipment, but also the organization of his work in the given period which is compatible with the control elements. This organization, in turn, will be determined every time by many factors, among which the decisive effect again will come from the presence of time for decision making. Inasmuch as this time will be different under various conditions, with respect to the given problem it is impossible and inexpedient to give any single formula which is suitable for all cases. In the organization of the work of the commander and the control units in decision making, a creative approach, skill and inventiveness are also necessary to order to make economic use of every minute and to give the subordinates as much time as possible to prepare for decision making.

Considering what has been stated and also the general principles with respect to the organization of the work of the control units, let us consider the specific nature of this organization during decision making under the most difficult conditions from the point of view of time.

1. See "Krasnaya Zvezda" [Red Star], 23 January 1974.

More or less significant time for decision making will be available to the commander when preparing for the offensive from the march with an advance from the buildup zone. In addition, in this case the entire situation will be comparatively favorable inasmuch as the subordinate troops are located outside direct contact with the enemy and the combat operations are not conducted with the enemy, excluding, of course, the protection from nuclear strikes, control of aviation, airborne and reconnaissance-diversion groups. From the point of view of time, the conditions will be distinguished in the better direction also when making the transition to an attack from the defense position, although in this case as a rule there will be no prolonged breaks.

Under all such conditions the work of the commander and the officers of the control units during the combat decision making can be organized approximately as follows. After evaluating the general situation usually together with the chief of staff and explaining the combat mission assigned from the senior officer, the commander makes an approximate operations plan, he determines the specially timed measures with respect to preparation for combat and he calculates the time available for this. The chief of staff familiarizes the rest of the leading officers of the control organs with the mission and the commander's plan in the time established by him, and he simultaneously gives them instructions about reporting the preliminary combat orders to the subordinate subunit commanders and also preparation of the missing data for the commander on the situation and the calculation.

The positive aspect of this beginning of operations consists in the fact that it gives the future operations of the subordinates a purposeful nature, for the officers of the control units know in what name (in the name of what commander's concept) they must prepare the data on the situation and the calculations, and the subordinate commanders and chiefs have the possibility of proceeding with specific preparation for combat and the performance of it in parallel with the higher control echelon.

Continuing to evaluate the situation, the commander in the operating procedure listens to the conclusions and proposals of the chief of staff and other people with respect to the questions of interest to him and in the final analysis formulates and explains his decision. All of this work usually is done first by the chart, and then its results are more precisely defined and specified on the terrain during reconnaissance.

The commander will be forced to organize his work differently on making a decision or more precisely defining the decision under the conditions of limited time, for example, in obtaining a new mission during the course of combat operations already under way. Judging by the experience of the exercises, the most efficient organization of the work will be that where the commander is located in the field when making the decision or at the control point and is working in a specially equipped location (in a dugout shelter or a staff command vehicle) together with the chief of staff, his deputies and other leading officers, he explains the new mission with their help and estimates the latest changes in the situation, he exchanges ideas with them

briefly with respect to the most important problems and at the same time makes (more precisely defines) and explains his decision. At the control point the combat control center is organized simultaneously. If the decision is made by the chart, then if there is time the commander more precisely defines it during the short reconnaissance time using armored staff command vehicles only in the principal direction and with the participation of a strictly limited circle of people.

The version of the organization of the work is not excluded where the commander will be forced to make one decision directly or more precisely define it and give orders immediately (give instructions, a signal) to the subordinates for the execution of the decision. Most frequently this version will be unavoidable when making and refining the decisions during the course of combat operations in the immediate reaction to sharp changes to the situation when every minute will be valuable: the decision to repel a sudden counterattack by the enemy, eliminate the enemy grouping or airborne penetrating into the rear of our troops, and so on. Under such donditions, the control will be realized by the commanders by the principle of "I see (I hear) the command."

In all of the remaining cases, the commander must use the smallest possibility to exchange opinions with his closest assistance, especially with the chief of staff and the specialist for the use of the combat arms and special troops. The timely combined-arms combat is conducted with the application of very different and complex materiel. It is difficult for one commander, even if he has a higher military education, correctly to solve all the tactical and purely technical problems connected with its use. Therefore, in the organization of such combat it is very important to remember the behest of V. I. Lenin that "any specialist must be valued as a unique achievement of engineering and culture without which nothing, no communism could exist."[1] At another point, discouraging the leaders from taking a purely bureaucratic approach he wrote: "Isn't it disgraceful to correct the work of hundreds of the best specialists in an offhand manner and express disapproval as if it were simply a joke?"[2]

In addition, V. I. Lenin often warned of the inadmissibility of long meetings and conferences when working out decisions. "The range of the discussion," he wrote, "must be reduced to the necessary minimum, with due regard to the speed and solidness of the decision..."[3] This advice by the leader is especially valuable for the modern commander when controlling troops in combat. The foreign reports, discussions and contradictory

1. V. I. Lenin, Complete Collected Works, Vol 40, p 217.
2. Ibid., Vol 42, p 344.
3. Ibid., Vol 39, p 308.

proposals of the subordinates when making decisions, of course, are inadmissible, for they unavoidably lead to loss of valuable time and can confuse the commander, especially if he still does not have sufficient experience. A short exchange of ideas with his closest subordinates, their clear response to questions of specific interest to him -- all of these are what the commander needs for combat decision making. The role of the chief of staff is especially great here. Above all, he must always be ready to demand that the commander give a short, exact answer to any question connected with evaluating the situation and also proposals with respect to the decision with required substantiation by calculation and conclusions.

It is also necessary to note the psychological aspect of the participation of the collective in generating the decision. Practice confirms that during collective work there is adjustment in the commander's psychological state: his receptiveness, self-criticism and reaction to the conditions of the situation are improved, the danger of subjectivity and voluntarism is decreased. The subordinate officers of the control units, in turn, have the possibility of more deeply and identically understanding the plans of the commander and his mission. The atmosphere of businesslike cooperation, mutual understanding and trust is strengthened, the certainty and the correctness of the decision made by the commander and the achievement of success in the forthcoming battle and satisfaction in their military labor are strengthened.

On the whole, the superior personal qualities of the commander, his skill, independence and strong will combined with the collective reason and creativity of the officers of the control units are the most important condition of making a timely, well-founded combat decision and purposeful further work of the control units with respect to combat operations.

3. Planning the Combat Operations

Planning Content and Procedure

In the preceding sections we established that the combat decision made by the commander cannot fully encompass all aspects of the organization and conduct of the forthcoming combat operations. Therefore, it is unavoidably in need of further detailed development and documenting. This detailing and documenting of the decision also completes the planning of the combat operations.

The first part of this process -- the detailing of the decision -- consists of a detailed determination of the forces, materiel, the procedures and times for the fulfillment of each mission planned by the commander in the decision, and also the procedure for the deployment of subunits, combat arms and special forces, the organization of the interaction, measures with respect to political work, the comprehensive support of the combat operations, the commandant's service, the organization of monitoring and control.

The second part of the planning process -- the documenting of the combat operation decision -- is needed so that the decision will be available to other people and take on a completed, regular form.

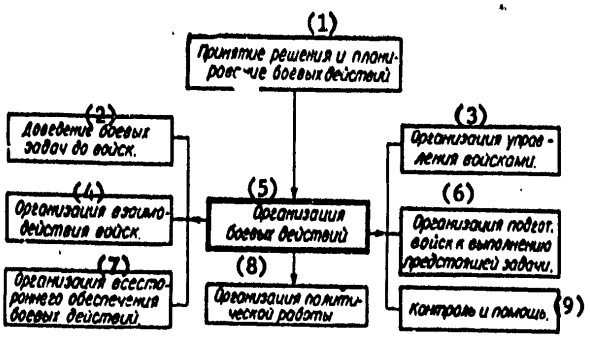


Figure 26. Planning location in the system of basic measures with respect to the organization of combat operations.

Key:
1. Decision making and planning of combat operations
2. Reporting the combat mission to the troops
3. Organization of troop control
4. Organization of the interaction of troops
5. Organization of combat operations
6. Organization of training of the troops for performance of the forthcoming mission
7. Organization of comprehensive support of combat operations
8. Organization of political work
9. Monitoring and assistance

Thus, the planning is based on the decision, it makes up the continuous unity with it and at the same time is closely connected with other measures performed by the commander and the control units with respect to the organization of the combat operations (Figure 26).

During the planning process basic attention is concentrated in determining the most effective deployment in combat of subordinate troops, determination of the best procedures for their operation, insuring maximum rout of the opposite grouping of the enemy in short times with the least expenditure and materiel. The achievement of this goal is considered taking into account the role of nuclear weapons in case of their use by the senior officers when carrying out the combat mission. It is the decisive factor in determining the content and procedure for implementing the planned measures. Depending on the number, the hour and the type of nuclear explosions used by the senior officer's plan and the expected results of their use, the utilization of our own forces and materiel in the forthcoming battle is also planned.

The planning usually begins with receiving the preliminary orders or the combat mission from the senior officer, and it ends during the organization of the combat by the development and signing of the combat documents by the commander and the chief of staff. During the course of combat operations, the planning continues. In accordance with changes in the situation and the decision of the commander, corrections and more precise definitions are introduced into the previously developed plan, and on sharp variations of it or obtaining the new, next mission, the planning is again repeated.

When time is short for preparation of combat operations, the support of parallel work with respect to planning in all echelons permitting reduction of the total time spent on planning by two or three times has special significance. This parallelness in the work is achieved primarily by reporting the preliminary combat orders to the subordinates after the commander defines the intention of the operations, in which they are acquainted with the nature of the preceding combat mission.

The specific content, volume, sequence and methods of planning combat operations depend on the planning level, the form of the combat operations, the nature of the assigned mission, the established style of operations of the commander, the quantity and the level of preparation of the staff officers, the presence of technical control means and also time for preparation of combat operations.

At the battalion and even the regimental level, the decision making by the commander, the planning of the combat operations, the development and filling out of the basic combat documents is always a united, interconnected process. As the commander makes a decision, he plots it on the map, and the required text information and calculations are entered in the work notebook. After making the decision, the individual problems are detailed, and the filling out of the documents is completed. Let us briefly consider this process as applied to the offensive.

Many years of experience have developed a defined, most expedient sequence in decision making, its formulation on the map and the planning of the combat operations, the observation of which corresponds to the established order of operations of the commander with respect to explanation of the mission, estimation of the situation, determination of the operations plan, combat operations, the principles of interaction, insurance and control (Figure 27).

The formulation of these decisions begins with the plotting of the data from the combat order received from the senior officer on the previously prepared map. The strip of forthcoming operations is first plotted in the offensive. This immediately determines the boundaries within the limits of which the data will be shown with the greatest detail on the enemy defenses and also the utilization of the forces and materiel of the senior officer in his strip. Part of the data can also be taken from other documents, in particular, from the reconnaissance system and the summaries,

photographic diagrams, photographic plans, and so on. The degree of the Q-factor of the population is determined by the level of command organs.

The following are usually plotted on the enemy map of the battalion commander: the outline of the forward edge and positions, the platoon strong points and their engineering equipment, the fire system with details to a separate fire point -- machinegun, tank, antitank missile, weapon: the vicinities of the fire positions of the artillery and mortar subunits, the system of obstacles in front of the forward edge and in depths of the defense; the areas where the closest enemy reserves are located and the possible nature of their operations (the deployment lines and the directions of the counter-attacks, the occupation of the prepared positions or areas), the locations of the enemy control points. The most consolidated data are plotted on the map in the higher-lying echelons.

After the data on the enemy has been reflected, it is necessary, with consideration of the elements of the defense and the structure of the combat formation, to plot the combat mission on the map. Simultaneously with this it is necessary to also indicate the problems which are solved in the offensive zone of the subunits by the resources of the senior officers, especially the data on the use of aircraft, airborne, artillery and also the planned lines of engagement in combat of the 2d echelon, the firing lines of the antitank reserve and the mining lines for the mobile obstacles detail. The areas of deployment of the forces and materiel which are intended to reinforce the subunits are also plotted.

A component element of the situation is the neighbors. In the order of the senior officers, the missions of the neighbors equivalent to their units (subunits) will be indicated. Therefore the staff will require a decision making process by the commander to obtain from the neighbors and plot on the map the data on the subunits which will directly affect the flanks.

Where the route of advance, the initial line, the control line, the deployment line into the battalion, company and platoon columns, the line of conversion to the attack and the time of passage or emergence at these lines are indicated in the order by the senior officer, then they are also plotted on the map. If these data must be defined by the commander and the staff, then they are reflected later on the map, during the decision making process.

The above-enumerated information is used by the commander as initial data that he needs for making a substantiated decision.

During the course of the comprehensive evaluation of the situation, the grouping of the enemy and the possible nature of the enemy operations when fulfilling the stated mission by the subordinate subunits is reflected in more detail on the map than would occur in the order by the senior officer.

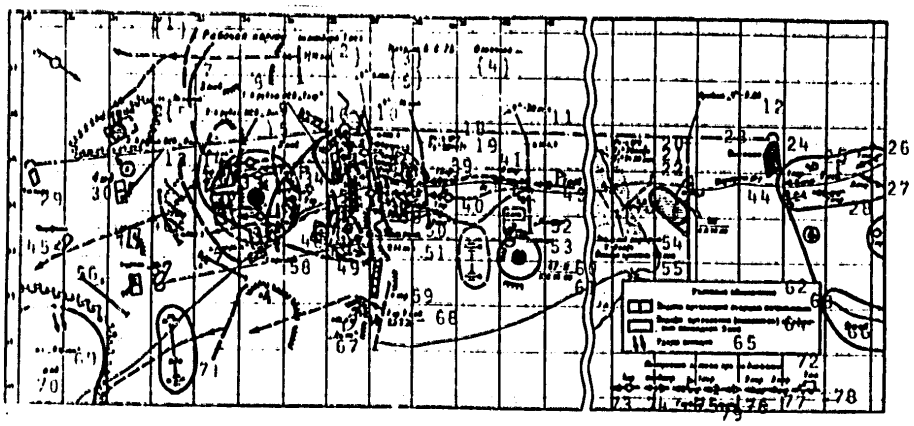


Figure 27. Working chart of the reinforced battalion commander with a decision to attack from the march (version).

Key: 1. Working map of the commander of the 1st Motorized Rifle Battalion; 2. 2/14 Motorized Rifle Regiment; 3. Started on 5 June 1975; 4. Ended...; 5. "Ch" -- 5 minutes; 6. Zelenyy forest; 7. 3d Motorized Rifle Battalion; 8. First line of the Tigr PSO [decontamination station]; 9. 2d line of the Lev PSO; 10. Ch -- 15 minutes; 11. Ch -- 30 minutes; 12. Pass Ch -- 2.00; 13. 3d line of the Pantera PSO; 14. Shipka; 15. 3d Motorized Rifle Battalion; 16. Yadloko; 17. 1st Motorized Rifle Co; 18. Uch-k No 2; 19. V_2=20 km/hr; 20. Uch-k No 1; 21. V_1=25 km/hr; 22. B_1=1 h4 30 minutes; 23. Vysokoye; 24. 1st Motorized Rifle Co; 25. 1st Motorized Rifle Bn; 26. Rear; 27. 3d Motorized Rifle Co; 28. 2d Motorized Rifle Co; 29. Belovo; 30. 4th Mortar Battalion; 31. 3d Infantry Co; 32. Lykevo; 33. Vishnya; 34. 1st Motorized Rifle Co; 35. 2d Infantry Co; 36. 1st Tank Co; 37. Duby; 38. 1st Motorized Rifle Bn; 39. 1st Motorized Rifle Co; 40. 1st Tank Co; 41. 3d Motorized Rifle Co; 42. 5th Motorized Rifle Regiment; 43. 1st Motorized Rifle Battalion; 44. Route No 1; 45. Marfino; 46. 3d Motorized Rifle Co; 47. Ararat; 48. 2d Motorized Rifle Co; 49. Silva; 50. Vikhrevo; 51. 1/44 Motorized Rifle Rgt; 52. Pamir; 53. Lipetsy; 54. Reserve route V=8 km/hr; 55. Decision number -- 15 min; 56. B; 57. Pik mound; 58. Gorskoye; 59. 4th Motorized Rifle Co.; 60. 47-N; 61. 5.6 15.00; 62. Provisional notation; 63. Missions of the senior officer's artillery; 64. Artillery (mortar) mission by decision of the commander of the 3d Motorized Rifle Bn; 65. Aviation strikes; 66. 2d Motorized Rifle Bn; 67. Dynya; 68. 3d Inf Co of the 2d Motorized Rifle Bn; 69. Yurovo forest; 70. Motorized Rifle Bn; 71. Artillery Bn; 72. Structure of the columns during the advance; 73. 1st Tank Co; 74. Mortar battery; 75. 1st Motorized Rifle Co; 76. 2d Motorized Rifle Co; 77. 3d Motorized Rifle Co; 78. Rear; 79. Depth of column ... km.

The boundaries of the strong points, the possible lines of deployment of reserves and the directions of their attacks, the location of the control

points not only in the subunit offensive zone but also in the zones of their direct neighbors are defined and plotted especially carefully.

During the course of determination by the commander of the elements of the decision, they are plotted on the map. Initially the direction of the parimary attack and all the elements of the combat formation at the attack time are indicated. If the transition to the offensive from the buildup zone is noted, then for each subordinate subunit of the 1st echelon the following are plotted: the line of conversion to the attack and the time of emergence added, the direction of the attack and the line of the nearest and subsequent missions, the direction of the future attack, the lines and the times for passing them, the initial, regulating and deployment lines into company (platoon) columns, the safe removal lines, the limiting lines between the subunits.[1]

For the 2d echelon subunits, the following are defined and plotted: the route of movement, the line of engagement in combat, the line for the next mission, the direction of the future offensive, the time of passage of the lines -- initial and regulation.

On the map, the missions are reflected which are performed by the authorized and assigned artillery and mortar subunits with respect to periods of combat operations of the artillery -- during the artillery preparation of the attack, the artillery support of the attack and the artillery accompaniment of the offensive during combat in depth of the enemy advance; the regions of the fire positions planned during training and during the course of development of the offensive.

The antiaircraft subunits are given the fire positions, the direction of displacement and the regions in which they must cover the troops from enemy air strikes.

The antitank reserve, if it is called on in the operating zone of the battalion to destroy the fire weapons of the enemy by direct laying during artillery preparations, the positions and the times for taking them up are indicated. For the period of combat operations, the lines are reflected from which the senior officer plans to use this time to repel the counterattack of the enemy tanks; for the mobile obstruction detail -- the mining lines.

On the map the places and time of deployment of the control points and the direction of movement of the command posts during the course of the offensive are noted.

It has been possible to consider the decisions completely formulated if the basic problems of interaction have not found reflection on the map.

1. See Pombrik, I. D., Shevchenko, N. A., Rabochaya Karta Komandira [Working Map of the Commander], Moscow, Voyenizdat, 1972, p 41.

Here there is no doubt that the principles of the interaction are determined by the commander in his decision. However, for coordinated application of all the forces and materiel in combat, the necessity arises for additional solution of a number of problems. In particular, it is necessary to coordinate the action of the subunits in case of nuclear strikes in accordance with the plan of the senior officer and also with the fire and strike by conventional weapons of destruction. For this purpose, first of all the targets are distributed between the fire weapons considering the possible results of nuclear strikes. The procedure to be followed by the subunits on advance to the attack line, during the attack of the forward edge, during the battle for important objects and the lines in depth of the enemy's defenses are defined.

When plotting all of these data on the map it is necessary, however, to consider that excessive detail can make the map confused and complicated. Therefore, in our opinion, in addition to the previously indicated problems, the following can be reflected on the map:

a) When performing artillery preparation: the dismounting line, the line for putting on the minesweeping blades for the attached tank subunit, the points of passage through the obstacles in front of the forward edge of the enemy and the time for making these passages;

b) When carrying out the next mission: the direction of attack of the subunit during joint operations when capturing the attack of strong points and destroying the enemy grouping jointly with the neighbor, the methods of repelling possible enemy counterattack;

c) When performing the next mission and developing the future offensive in the depth of the defense: the lines for repelling possible counterattack, the forces and materiel called on for the solution of this problem, the direction of the strikes to complete the rout of the counterattacking enemy group, the antitank reserve line and the mobile obstruction detail, the missions of the artillery subunit with respect to destroying the enemy reserves with concentrated and barrage fire during the advance and deployment.

A significant part of the interaction problems will be reflected by the commander in his working notebook. The details of these entries will depend to a great extent on the degree of training of the commander himself, the presence of time for organization of the offensive and the methods of bringing the interaction of problems to the subordinates.

On the same map with the solution, the basic results of planning measures with comprehensive support of the combat operations can be reflected such as, for example.

With respect to reconnaissance: composition, direction of operations and the missions of the reconnaissance groups and scout patrols;

With respect to protection from nuclear weapons: the area of deployment of the composite detail for the elimination of the consequences of nuclear strikes, the planned areas for complete specialized processing;

With respect to engineering support: the composition and direction of the operations of the detail for supporting movements, the reserve or bypass routes, prepared by the engineers subunit in case of destruction of sections on the basic groups, passages through the obstacles;

With respect to rear support: the point of deployment of the rear subunits during the course of the offensive.

In the working notebook of the commander and partially on the fields of the map the following are reflected in the form of tables: the distribution of forces and materiel, the ratio of forces and materiel (the combat possibilities), the construction of the artillery preparation, the interaction signal, warning signals and target indication signals, the presence and distribution of material resources.

In addition to the map with the decision, its detailed development will find its reflection in the planning of the problems of use in combat of the subunits of the combat arms and also the measures with respect to political work and comprehensive support of the combat operations. As has already been noted, with respect to these problems, the commander usually defines only the basic goals and the areas of their execution in his decision and at the same time offers the responsible agent the possibility of independent search for the best methods of using the forces and materiel subordinate to them. The role of the officers of all of the control units as creative organizers of the combat operations is clearly manifested in this.

The number of all other (except the commander's decision) combat documents and also their content and completeness of the discussion are determined by the chief of staff considering primarily the practical necessity of the presence of time and nature of the mission fulfilled by the troops. The documents must be clear and multiple, they must be written in compressed form, without substantiation and general phases, with the use of simple terms of speech and with observation of the adopted form and also the provisional signs and notation. In addition, the content of the documents must be exact, clear and reliable, not permitting other interpretation even if someone would like to understand the content differently.

Often it is possible to hear that in modern combat in the case of rapid development of the situation there is no meaning to expending time on careful processing of the working maps and combat documents. Practice convinces us otherwise. Wherever the operating maps are being carelessly kept, and the more so, if the written combat documents are carelessly developed, rejects in operation are more frequently permitted, there are more errors in calculating the time and determining the missions for the subordinate subunits. In addition, the carelessly developed working map does not

educate a sense of high responsibility in the officer at work for the precision of plotting the situation, it does not orient him in the procedure, organization and culture control. He becomes accustomed to commanding the subunits without exact calculation, without subjecting the complicated situation to deep analysis.

In this respect the positive experience of the work of staff headquarters during World War II is indicative. Studying the materials of the last war in the archive, you always investigate with deep respect the combat documents of the staff of the 311th Guards Rifle Regiment of the 108th Guards Rifle Division.[1] More than 30 years have passed, and these documents as before retain their high quality. They serve as an example of how it is necessary to relate to their development. The main thing is that they are distinguished by brevity, clarity, and accuracy in being filled out. They are all executed with a high sense of responsibility for the quality of the work. Now it is even difficult to imagine that the majority were developed in the trenches, under enemy fire, with poor lighting, and sometimes in bad weather. Not one strikeover, not one correction or carelessly formulated sentence. The people who wrote them understood the high purpose of combat documents and used all their effort and mastery in their development.

Credit goes first of all to the chief of staff, Lt Col I. F. Tarkhanov, who went through the enormous school of work in the operative determination of division headquarters. This is only one of the components of the work of the chief of staff.

The realization of the planning in short periods of time is acquiring exceptionally important significance in modern combat. Hence the necessity arises for reducing the volume and number of documents, refusal to develop awkward plans and, in addition, broader application of oral orders with subsequent writing of them in the practice of control. Under these conditions, the role of the working map increases. With this help the commander estimates the situation, makes the decision, states the missions for the subunits, organizes the interaction, and monitors the missions received for execution by the troops. The reflection of the basic problems with respect to the organization of the combat operations on the working maps and the calculations and reference materials, in the working notebooks, permit sharp education in the planning time.

In addition to the working maps, during the planning process, as the training practice shows, in a number of cases it is more advantageous to develop other documents graphically. They insure not only better clarity and convenience of use, but they also permit a sharp reduction of the time for processing them and study by the addressee. This was especially true in that the topographic base, the explanatory inscriptions and table forms in

1. Arkhiv MO SSAR [Archive of the USSR Ministry of Defense], f. 4794, op. 144509. 144510, p 2-6.

them have the possibility of being executed ahead of time, before receiving the combat mission, on the basis of a preliminary order of the senior officer.

In particular, on the map they can be reflected in advance: errors of deployment of our own subunits, data on the enemy, radiation situation, the routes of advance have been raised, the bottlenecks in them have been defined and the bypass routes have been marked. In addition, it is possible to write in the name of the document: "The decision of the commander of the 1st Motorized Rifle Battalion to advance to 17.9" or "The working map of the commander of the 1st Motorized Rifle Battalion. Started... Ended..." For convenience of working on the map it is important to raise the populated areas, their altitudes, if necessary also to apply the coding.

A significant reduction of time can be achieved if the required table forms are prepared in time. In particular, when preparing for the offensive battle it is possible to ready the following table forms (see Tables 266-268).

Table 15

Distribution of Forces and Materiel in _____ (type of combat)

	Forces and materiel of reinforcement & support			
Subunit	Artillery & mortar	Antitank Weapons	Tanks	Engineering and other subunits
1st motorized rifle battalion, and so on				

Table 16

The Construction of the Artillery Preparation of the Attack

Fire attacks	Duration (minutes)	Time of conduct of fire
1st, and so on	10	Ch-0.32-- Ch. -- 0.22

Table 17

Comparison of Forces and Materiel in the Offensive Zone ... and the Combat Possibilities of the Sides with Respect to the Situation at ... (the time)

Name of forces and materiel and the basic indexes of the combat capabilities of the troops	Number			Ratio
	Our own troops... (composition)	Among the enemy troops... (composi-	Quantitative	Considering quality (of the combat potentials

[Table 17 continued]

Total personnel, including in the combat subunit of the motorized rifle company (motorized infantry co)	
Density per km	
Tanks -- general number	
Among them:	medium
	light
Density per km	
Amphibious combat infantry vehicle and armored personnel carrier -- total number	
Density per km	
Artillery and mortars	
Total weapons and mine, of them more than 100 m gauge	
Density per km	
Total area of destruction of the open manpower lb/k (hectare)	
Antitank weapons	
Total antitank units, of them:	antitank guided missile
	on the armored carrier portable antitank
	guided missile
Antitank weapons	
Grenade launchers	
Density per km	
Total number of damaged tanks	
Antiaircraft defense	
Total of the defense means	
Among them:	the antiaircraft missile system of
	the antitank weapons (installation) type
Total number of air targets knocked down per attack	
Automobiles and trailers	

Table 18

The Presence and Distribution of the Materiel Reserves on the Offensive....

Name of reserves	Available and present at ... (time)	Hauled to... (time)	Consumed for fulfillment	
			Artillery preparation of attack	Next mission...
Artillery ammunition (b/k) and so on				

Table 19

Signal for Mutual Recognition, Target Designation and Warning for the period from ... to ...

Name of signal	By radio	Light (visual)	Sound
Going over to the attack			
Calling for artillery			
Cessation of artillery fire			
Danger from the air			
Here are our troops, and so on			

The broad possibilities for reducing the planning time are reflected when using formalized combat documents. The formalization process is based on the fact that the documents contain constant and variable values or putting it differently, permanent and variable information.

The analysis shows that out of the total content of each document, up to 50 percent goes to permanent information. Thus, half of the document can be written in advance on a blank form, which will permit a significant reduction of the time for its development. In the presence of the previously prepared forms with a list of constants, the compilation of the document reduces to the entering of the variable data in the form of names of populated areas, local objects, dates, numbers, and so on. In this case there is no necessity for formulating the final proposals which unconditionally will reduce the time for development of the document.

Decreasing the planning time can also be achieved as a result of better thought-out organization of the work with respect to writing the documents. In a number of cases, it is justified to call on several officers

for the development of individual documents, for example, the combat orders. In addition, it is important more completely to introduce the advanced process of writing the documents: to do away with the preparation of rough drafts, to write plainly or dictate the text to a typist from the maps. This method of preparing the combat documents requires definite skill. Before dictating, it is necessary to prepare all of the necessary data, plot the mission on the working map (if the combat orders are written), place the populated areas which will be mentioned, make an entry in the working map fields of the means of amplification, time, measures to support the combat operations, and so on. The officer must clearly imagine the sequence of the discussion of the combat document. Then he does not need to be distracted to obtain the missing information or more precisely determine the procedure for writing the document, and he concentrates all his attention on the exact, multiple reflection of its content.

Planning Methods

During the process of planning combat operations most frequently two methods have found application -- series and parallel. A different combination of them is also possible.

The series method reduces to the fact that the planning of the combat operations is made especially in each command level: on completion of planning in one element the problem is brought to the next subordinate level. Subsequently the planning moves from top to bottom, involving subordinates in the work. This was the basic method of organizing planning during World War II, and under those conditions it was completely justified.

A positive aspect of this method is the fact that under the condition of isolation of sufficient time for working in each level, it insures a more qualitative performance of the operations with respect to planning. The officers of the control units can, as soon as the combat operations are planned, render actual assistance to the subordinate staff in solving the missions set before them. This assistance is especially useful to the staff outfitted with officers who do not have sufficient theoretical training and have little work experience. The series method promotes maintenance of secrecy of the preparations for combat.

However, there are significant deficiencies characteristic of this method. The basic one is that with this organization of work, the planning process takes too much time. In addition, the series method frequently is characterized by excessively rigid centralization in the troop control, which significantly reduces the possibilities of subordinates in the independent, creative solution of the problems.

Whereas during the past war this method was basic, under modern conditions it can find application when planning combat operations when and only when a great deal of time is put into the preparation of combat.

For modern times it will be more justified to use another method which usually in practice is called the parallel method.

The parallel method means the organization of work with respect to planning for which the subordinates, not waiting for completion of all the firing problems in full volume at superior level proceed parallel with it to the planning of the forthcoming combat operations in their own echelon.

This method will permit the planning of the combat operations in comparatively short times, as a result of which the troops receive more time for direct preparation for the performance of the stated mission. This predominance of the given method makes it basic, especially under conditions of limited time.

In order to realize the parallel planning, defined conditions are needed. First of all it is necessary to bring the initial data to the subordinates which is required by them for planning. First of all it is necessary to consider the information about the enemy, his grouping, composition, fire system, the engineering equipment of the line and also the characteristics and peculiarities in the operations of the enemy.

In addition to this, the following can be brought to the subordinates in time: the radiation situation, the conditions of the terrain in the zone of the forthcoming operations and also the nature of operations of the neighbors. Obtaining these data permits the subunit commander to grow into the situation and have a better founded approach to the organization of the forthcoming combat operations.

After the problem is explained, it is necessary immediately to issue the preliminary order so as to orient the subordinates in the nature of the forthcoming operations and to determine the measures they are obligated to take before obtaining the specific mission: the preparation of the forces and reconnaissance means setting out the reserves of materiel, repairing the equipment, evacuation of the sick and wounded, use of engineering equipment on the terrain in the zone of forthcoming combat operations, more precise combat calculation of the control points, and so on.

What has been stated makes it possible to confirm that the application of the parallel method is not limited to the framework of the combat operation planning. It unavoidably extends to all the measures with respect to combat training, beginning with the explanation by the commanders of all stages of the combat mission and ending with the control of the readiness of the troops for its execution.

One of the possible versions of the application of the parallel method is the work of the subunit commanders with respect to preparation of combat operations on the scale of the battalion can be the following (see Figure on pages 360-361).

Operation Sequence of the Commanders for the Subunits With Respect to Preparation of the Battalion Combat in the Parallel Method (Version)

<table>
<tr><td rowspan="2">Subunit commanders</td><td>Calculation of the time</td><td colspan="7">Time for organization</td></tr>
<tr><td></td><td colspan="7">1st hour</td></tr>
<tr><td></td><td>15'</td><td>30'</td><td>45'</td><td>60'</td><td>75'</td><td>90'</td><td>105'</td></tr>
<tr><td>Battalion commander and his staff</td><td colspan="3">Explanation of mission (on basis of preliminary orders of regiment). The response indicates the preliminary arrangements and decision making.</td><td colspan="2">Reconnaissance trip, study of the route and the deployment lines</td><td colspan="3">Work in the field under the direction of the regiment commander, obtaining of combat operations, explanation of interpretation procedure, more precise determination of the decision and report on it to regimental commander.</td></tr>
<tr><td>Company commanders</td><td colspan="2">Preparation of the submits for battle</td><td colspan="2">Explanation of problem of giving of preliminary orders, decision making</td><td colspan="2">Trip for reconnaissance, study of march route and the deployment lines</td><td colspan="3">Study of the terrain, the enemy, the line of attack and the emergence at it, direction of attack</td></tr>
<tr><td></td><td colspan="5">Explanation of the mission, preparation of the personnel and also the equipment and weapons for the forthcoming battle</td><td colspan="3">Trip for reconnaissance, study of the route and limits of reconnaissance</td></tr>
</table>

[Table continued]

of combat						
2d hour		3d hour			4th hour	
120'	135'	150'	165'	180'	195'	210'
Organization of combat with company commanders: giving of combat orders, organization of the interaction, comprehensive support and communications		Monitoring and rendering of aid to the company commanders and platoon leaders in the organization of combat, the participation in the performance of the party-political measures				
Work on the terrain under direction of battalion commander, obtaining combat mission, explanation of the order of interaction, more precise definition of the solution and report of it to battalion commander		Organization of combat with platoon leaders: issuing of combat orders, organization of interaction, comprehensive insurance and medications			Rendering of aid to the platoon leaders in the combat organization	
Study of the terrain, the enemy, the line of attack and the emergence at it, the directions of attack.		Work in the field under the direction of the company commander, obtaining the combat assignment, explanation of the interaction procedure, more precise determination of the solution and the route for it to company commander			Organization of combat with the squad leaders and the drivers of the combat vehicles, response of the counter attribute	

Thus, during the parallel method of operation, even without receiving another assignment, the subordinates are ready not only to prepare the required reference data, tables, charts, document forms and maps, but to study the enemy, radiation situation and terrain and also to think through the versions of the use of their subunits, and so on.

After determination by the commander of the operations plan there is a possibility of bringing the preliminary combat orders to the subordinates which will permit the lesser commanders to proceed with the decision making on their own level. In particular, when organizing the offensive in the preliminary combat order the following can be indicated: the direction and the zone of operations, the approximate contour of the combat mission, the means of amplification, and the data on the neighbors and readiness time. Of course, the returns from these orders under the decision making process requires high operative-tactical training of the commander, knowledge in quickly analyzing the decision of the senior commander and the developed situation, and on the basis of this, determination of their plan and the main content of the combat operations for the subordinates.

The application of the parallel method of operation is possible and expedient not only at the different command levels but also inside the control of one level. For clear organization of work, the duty personnel simultaneously, without delay, familiarize themselves with the content of the combat mission received in the unit, they apparently and directly proceed with the preparation of the data and the calculations required to generate a decision by the commander. As each element of the decision is defined by the commander (ideas, combat missions, basis for interaction) they immediately become the advantage of the interested officer, as a result of which the actual possibility of the parallel operation of all duty personnel is created.

With this order of operations of the control units, the subordinates can almost simultaneously obtain all the missions and instructions with respect to the organization of combat, which will permit them quickly to proceed with the work on the decision making and planning of the combat operations.

The essence of the directional method of planning is exhibited not only in the organization of the work of the users but also in a number of cases in the planning content itself. Particularly under modern conditions, in planning the use of the 2d echelon, it is necessary to consider that in addition to its own basic problems it is obligated to be ready to carry out the missions of the subunits of the 1st echelon in case of failure of the latter. Thus, during the planning process both versions of the use of the 2d echelon are being developed in parallel. The given requirement will introduce significant difficulties into the planning process. It will increase the volume of operations of the organs of control, but it is justified and follows from the nature of modern combat.

Only with clear organization in the work of the control units is it possible to provide the lower staff with the required initial data for planning in a timely manner. Accordingly, the systematic familiarization of the subordinates with the new incoming data on the situation, especially on the grouping, the position, the intent of the operations of the enemy and the radiation situation acquires special significance. Without waiting to receive the combat orders, they must systematically obtain these data, especially when the troops are not in direct contact with the army and cannot receive information from any other source except higher headquarters.

Thus, the effective use of the parallel method of planning combat operations is possible under the condition of clear organization and high operativeness in the work of all of the control units.

CHAPTER 6. DELIVERING THE COMBAT MISSIONS TO THE AGENTS RESPONSIBLE FOR CARRYING THEM OUT. ORGANIZATION AND SUPPORT OF TROOP INTERACTION

1. Procedures for Reporting the Combat Missions to the Responsible Agents

The making of a proper combat decision by the commander in itself does not insure successful fulfillment of the combat mission. The decision becomes the basis for troop control and the law for the subordinates only after its contents becomes known to them, that is, when each of them receives his specific combat mission. Therefore, of course, informing the responsible agents of the combat mission is one of the most important functions of the commander and the staff with respect to combat troop control.

Making use of it, the commander and staff begin with the fact that, first of all, the combat missions were delivered to the responsible agents in a timely manner, that is, in time for the subordinates to prepare for the execution of the mission and secondly that they be reported precisely and clearly without distortion of the content, thirdly, the intent and nature of our operations are kept secret from the enemy, and fourthly, so that the subordinates will have all the initial data available for their decision making.

When studying the combat mission, usually the following items are assigned to the subordinates.

1. The conclusions from evaluating the enemy drawn by the superior commander in order that the subordinates be able to explain the enemy groupings, the route of which determine the success of the fulfillment of the general combat missions and that they understand what forces are required of them for fulfillment of the mission.

2. The combat mission and the intent of the commander's operations at the superior levels so that the subordinates are able to understand their place and their role in the performance of the general combat mission and be ready to replace the commander in case he is put out of action.

3. The combat mission of the subordinates, the basic data on the missions of his neighbors, the missions of the forces and materiel of the

senior officer decided in his interest and also his instructions with respect to the interaction.

4. The preparation time for the fulfillment of the combat mission, who is designated deputy commander for taking control in case of failure of the control points of the senior officer, and also the location, deployment time and direction of the displacement of these control points.

Often it is necessary for the subordinates to know, in addition, the instructions of the senior officer with respect to various types of support -- reconnaissance, protection against nuclear weapons, rear support, and others. All of this is necessary in order that the subordinate commanders be able not only correctly to explain the procedures for the performance of the combat missions and determine the expedient methods of combat operations of the subordinate troops, but also to plan the auxilliary measures with respect to comprehensive support of the combat operations by their forces and materiel.

Thus, the volume of information reported to the subordinates together with the combat mission is significant. However, the absence of certain information does not relieve the subordinates of the performance of the combat mission; this absence requires initiative, creativity and independence of the subordinates. Reproach is earned not by the one who does not fully achieve the planned combat mission, but the one who, in waiting for instructions from the senior officer has manifested inactivity and indeciveness, who is afraid to take on the responsibility for independent action. This is especially important when controlling troops during battle, for with sharp changes in the situation in connection with the limited time, the senior officer cannot always give the subordinate all the necessary information from his point of view and even is forced to limit himself to sending a radio signal or command on the nature and the direction of the forthcoming operations.

The procedures for delivery of the combat missions to the responsible agents are highly varied, but the following are used most frequently (see Figure 28):

a) The oral statement of the mission for all or several subordinate commanders with personal discussion with them by the commander himself or by his designation, the officer of the control unit;

b) Transmission of combat orders over the technical communication means by the commander himself or other duty personnel of the administration;

c) Sending out written, graphical or tape recorded combat documents (orders) to the subordinates;

d) Combined method in which the above-indicated procedures are combined in various versions. Let us consider them in somewhat more detail.

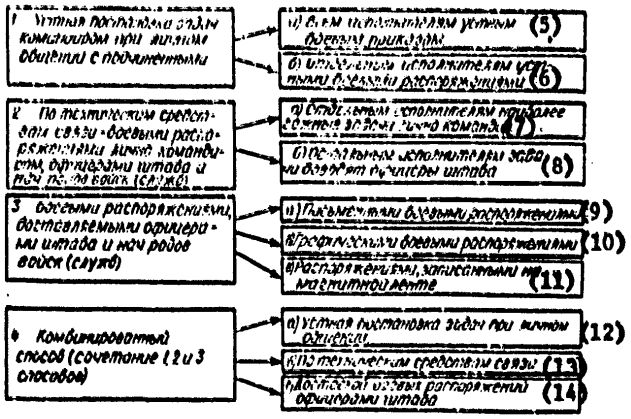


Figure 28. Procedures for delivery of the combat mission.

Key: 1. Oral statement of the problem by the commander in his personal discussion with the subordinates
2. With respect to technical communication means, a report on the combat orders of the commander himself, the staff officers and the troop (service) chiefs
3. Combat orders delivered by the staff officers and the troup (service) chiefs
4. Combined procedure (combination of methods 1, 2 and 3)
5. To all of the responsible agents by oral combat order
6. Individual responsible agents by oral combat order
7. Individual responsible agents, the most important missions by the commander himself
8. The staff officers report the missions to the remaining responsible agents
9. By written combat orders
10. Graphical combat orders
11. Orders recorded on magnetic tape
12. Oral statement of the missions with personal discussion
13. With respect to technical communications
14. Delivery of the combat orders by the staff officers.

Oral statement by the commander of the combat missions for the subordinates with personal discussion with them had primary significance in the past and now retains that significance. The subordinate commanders, as a rule, are called up for this purpose by the senior officer to his command post or to a convenient location in the field. If this does not appear possible, then the commander calls up certain subordinates to his command post or goes to their command post where he personally delivers the combat missions. In each of these cases the commander can most intelligently

deliver to the subordinates everything that is necessary for them to know from the decision and the information of the senior officer for preparation for the forthcoming combat, he can be sure of proper explanation of the combat missions and the conditions of their execution to the responsible agents, present explanation with respect to any questions which arise and give practical assistance. Here it is assured that the plan will be kept secret and there will be secrecy regarding all preparation of combat operations.

Where the commander can assemble all the subordinates, he gives them the missions in the form of an oral combat order, the content and the order of discussion of which depend on the type of combat, the mission received and the conditions for its fulfillment. It contains the most important parts of his decision -- the intention and the combat missions for the subordinates. The orally given order is filled out in writing by items. In the frist item of the order, the commander reports basic conclusions from evaluating the enemy to his subordinates. Here, the enemy is evaluated not only as to his subunits, but also with respect to the neighbors, from which the enemy can take direct action on the progress of the execution of the combat mission. The conclusions are drawn either by the commander who gave the combat order, from the point of view of the combat mission and on the basis of the latest (at the time of the decision making) reconnaissance information generated by the staff. It follows from this that the content of the given item cannot be literally taken from the order of the senior officer, for the latter gives an evaluation of the enemy within the framework of his combat order. An exception to this rule can occur where the subunit given the order is not in contact with the enemy (on the march, in the 2d echelon on the defensive, and so on) and does not use his forces for reconnaissance means. In this case the commander discusses strictly the required quantity of data on the enemy, taken from the order of the senior officer, from the information of the neighbors and the subunits operating in front.

The number of problems evaluated by the commander and, consequently, the volume, content and sequence of discussion of the data on the enemy depend on the reconnaissance preparation, the state of the subunits and the type of combat operations.

Thus, in the order to attack the following are indicated: on what front, what subunits (units) of the enemy are on the defensive, where the forward line of their defense is, where and in what composition the strong points have been created and positions prepared for the nuclear attack means; his reserves, capable of influencing the execution of the combat mission where the positions are prepared for the reserves, including the cutoff reserves.

In the order to defend, the following are reflected: the composition, position and nature of operations of the enemy grouping preparing for the offensive; the possible direction of its main strike and his expected use of nuclear weapons, the probable times of going over to the offensive.

In the given item of the order, depending on the situation, other important conclusions on the enemy can be indicated in one form of combat or another. However, the order should not be overloaded; the insufficiently substantiated or doubtful conclusions should not be discussed in it and the information about the enemy which is obtained by the subordinates by other means should not be discussed.

In the second item of the order usually there is a discussion of the mission of the subunit itself stated by the senior officer.

In the third item, the procedure for the application by the senior officer of the means of destruction in the zone of his subunits, the missions of the airborne and other mapping parties and also the missions of the neighbors and the delimiting lines with them are indicated. The given time of the order combined with others is planned so that the subordinates can explain their missions and take into account what influence there will be on their execution from the application by the senior officer of the destructive means and the actions of the neighbors. Here the neighbors are indicated as those with whom the subordinates will interact directly in the fulfillment of their missions. Thus, in the order to the battalion, the missions of the adjacent companies are indicated. However, if at the time of giving the order the battalion commander does not know the decisions of the commanders of the adjacent battalions, he indicates the missions of the adjacent battalions in the order. In this case the company commanders will be obligated to find the missions of adjacent companies by mutual exchange of information with them.

On attacking from the march, on the march and under other conditions, in addition to the missions of the neighbors on the right and left, at the beginning of the given item the position and nature of operations of the enemy directly in front and in contact with the enemy can be discussed.

The fourth item of the order usually contains the plan of operations of the commander giving the order. Here it is pointed out which enemy and in what sequence the rout is to take place; the direction (area) of concentration of the basic efforts; the objects at the disposal of the enemy destroyed by the destructive means; the combat procedure and nature of maneuvering of the forces and materiel. This is reported to the subordinate commanders in order to insure purposefulness of their operations, the possibility of proper explanation of the basis for the decision of the senior officer, to understand his role and place in the solution of the general problem and to be ready for replacement of the senior officer in case of his loss.

In the fifth item of the order after the phrase "I order" the individual paragraphs denoted by letters in alphabetical order discuss the combat missions of the subordinate subunits. Here the sequence of the discussion, for example, when attacking from the march can be as follows:

The subunits of the 1st echelon (from right to left, depending on their location and the combat formation) -- the number of subunits and the

means of reinforcement: the line and direction of attack; what enemy is to be routed and what line is to be taken when carrying out the next and other missions; the direction of the future offensive; who supports; the line on the left, the route (routes) of advance; the time of passage of the lines (posts) -- initial, regulation and arrival at the line of going over to the attack;

The subunits of the 2d echelon -- route (direction) of motion; from this line they will be ready to go into combat; the next mission -- which enemy, in which area to rout the enemy and what line to take; the direction of the future attack; when to pass the line (post) -- initial adjustment; the forces and means of reinforcement transferred on going into combat. If the combined-arms reserves are isolated, then only the direction of the advance and the displacement during the course of the offensive are indicated, and the specific mission is stated before going into battle;

Artillery -- duration of the artillery preparation; missions for the time of artillery preparation and support of the attack and artillery accompaniment of the advance in depth; the readiness time for opening fire; the composition and commander of the artillery group; the vicinity of the firing positions and the advancement route. When discussing the artillery missions, only their tactical content is indicated (what enemy and where to destroy, neutralize and so on), considering that the method of their fire execution (fire type and rate, shell consumption and so on) is determined by the artillery chief;

The antiaircraft subunit, which means, who to cover during preparation and the course of the assault.

Then in the fifth item the composition and the mission of various reserves are discussed in special subitems.

In the fifth item of the combat order for the defensive in the corresponding subitem the following are defined: the subunits of the 1st echelon--the reinforcement means, the areas (strong points) of the defensive and the missions, where and what composition the combat security is to have, how the points at which adjacent flanks join are to be supported, who is to support, the delimiting line on the left; the 2d echelon -- the reinforcement means, the basic and reserve areas (strong points) of the defense and the mission; the direction and lines of deployment for the counterattacks and for the tank subunits and, in addition, the firing lines for repulsion of the enemy tank attacks; for the artillery, the missions with respect to the defensive goals, the readiness to open fire, the firing positions, composition and commander of the artillery group; for the antiaircraft subunit, the objects to cover and the firing position; for the antitank reserve, the composition, the area of deployment and the firing lines. The remaining subunits (elements of the combat formation) have their mission stated for them considering the nature of the defensive combat.

In the sixth item the preparation time of the subunits for combat is indicated.

In the seventh item of the order, the locations and the time of deployment of the control items in the direction of placement of the command outpost are defined.

In the eighth item it is indicated who of the subordinate officers is designated deputy commander for taking control in case of loss of the commander.

The personal statement by the commander of the missions simultaneously for all subordinates is possible only during preparation of the combat and, of course, is excluded during combat. However, any possibility for the statement of the most important missions during personal communications with them by short oral combat orders is used, the basic difference from the combat order being that they are, as a rule, designed only for one responsible agent.

The sequence of his oral or written discussion can be recommended, for example, as follows.

In the first item of the order, just as in the combat order, the conclusions from estimating the enemy are indicated.

In the second order, a discussion is presented of the combat mission of the subunit to which the given order is presented. This item is the most important, and special attention must be given to the quality of its formulation.

In the third item usually the missions are indicated which are performed in the interests of the given subunit by the forces and materiel of the senior officers.

In the fourth item, the preparation time of the subunit for carrying out the mission is indicated.

This is the most typical content of the combat order and the most frequently encountered in practice. However, when there is necessity for it, other problems of interest to the subordinates can be discussed, for example, the methods of operations when performing the combat mission (in the second item), the problem of the neighbors (in the third item), and so on. In addition, if for any reason the subordinates do not know the mission of the higher echelon and the plan of operations of the senior officer, then these problems can also be indicated in the second or in a separate item of the order.

The content of any combat order must not be overloaded with excessive data, general rules and regulation requirements. For example, it is impossible to consider successful the following frequently encountered formulation of the combat mission: "One motorized rifle battalion, making maximum use of

the results of nuclear strikes, interacting with the neighbors decisively and at high rates is to develop the offensive in the direction of Ivanovka, Petrovka and by sunrise on 10 February take the Dymovo, Davidino line." The given formulation can be abbreviated almost to half its length without loss of meaning, namely: "First motorized rifle battalion attack in direction of Ivanovka, Petrovka and by 0600 hours on 10 February take the Dymovo, Davidino line."

In addition, when discussing any item of the combat order it is necessary to consider the level of training, the experience and other qualities of the subordinates of the commanders. It is quite obvious that the literate, experienced and volitional commander requires less detailed instructions and explanations on the part of the senior officer than the one who does not have these qualities.

The oral reporting of the combat mission to the subordinate officers of the control units by direction of the commander is realized using their operating maps on which these missions are reflected. Before the officers go to the troops, the commander or the chief of staff personally checks the correctness of their explanation of the instructions, and finds their maps.

The clear reporting of an oral order to the subordinates depends to a great extent on the mastery of the commander and the other officers of the command language, their skill in briefly, and at the same time, completely and clearly discussing the combat plan and delivery of the combat mission to the subordinates.

The old saying: "Tell me how you give your order and I will tell you how it will be executed" remains applicable even today. To everyone, by external appearance, behavior, diction when giving the order, the commander must demonstrate and inspire confidence in his subordinates in the success of the outcome of the forthcoming battle. It must not be forgotten that the smallest amount of vacillation on the part of the commander, his nervousness or rough tone in this case immediately has a negative psychological effect on the subordinates. The order must be given at a rate such that the subordinates can plot the data on the map and briefly enter in the working notebook.

If there is any possibility, the oral combat order is given directly in the field. For this purpose the most advantageous point is selected from which a view of the terrain is provided in the zone (direction) of the forthcoming operations not only in the disposition of our own troops but also the maximum possible depth of the disposition of the enemy.

The reporting of the mission to the subordinates by technical communications means is a procedure which, as a rule, it is possible to use only during the course of battle. Skillful use of the communications channels makes it possible to convey the missions simultaneously to several responsible agents and comparatively quickly, which at this point is especially important.

However, it also has negative aspects. Transmissions over technical means can be intercepted by the enemy; therefore, when resorting to this method, it is necessary strictly to observe control secrecy. In addition, the given method does not permit checking subordinates' understanding of the mission.

When transmitting the missions over technical communications means, the maximum possible reduction of volume of the orders to their replacement by giving commands and signals has primary significance. Thus, for example, the orders "Destroy the attacking enemy and develop the offensive in the direction of Smolino, Andreyevka" can be transmitted by the previously established signal: "Bereza 1256 1858" (the coordinates). This reduction in volume of information is especially necessary when using various automated and signal devices. Considering the possibility of loss of communications with the troops for various reasons, it is first necessary to transmit the combat mission to the subordinates and then all other necessary data. In addition, it is important to observe the defined transmission rate. In particular, everything that the subordinates must know should not be transmitted to them at once (in a volley), for in this case on distortion of what has been transmitted it is difficult to find and correct the error. Under the high-line organization, the organs of the staff officer will be able to transmit orders to the responsible agents during the process of generating the decision by the commander as he finally determines the goals and the measures with respect to organizing the forthcoming combat.

The most important and urgent orders are usually transmitted by direct confrontations with the subordinates. However, for holding these conversations the officers must have special training and have solid skills. When transmitting the orders by telegrams it is necessary to use the blanks of established color which will obligate the radio operator (the telephone operator) to transmit these telegrams with first priority.

The reporting of the combat missions to the subordinates by the written or graphical combat documents is a procedure which is used only in the higher echelons. In the battalion and lower echelons it is not used. Here only oral combat orders are given to the subordinates which are written down by the commander (the chief of staff) in his notebook completely, and by the subordinates, in the part pertaining to them.

The basic forms of the documents by means of which the combat missions are delivered to the subordinates are the written combat order, the written order recorded on magnetic tape or the graphical combat order. With respect to content and order of discussion, they theoretically do not differ from the oral orders and include all of the basic information from the commander's decision which the subordinates must know, which was outlined above. This information is formulated in the written order as briefly as possible in order to reduce the volume to the minimum, which means also the development time.

For this purpose, it is necessary to make wide use of the standard order forms, for example, in the form:

To the Commander

Combat Order No _____
(place, date, time)

Map _____
(scale, year of publication)

Constant data	Variable data
1. Brief estimation of the grouping and operations of the enemy	
2. Content of the combat mission of the subunit to whom the order is addressed:	
a) From what line and at what time to engage in combat;	
b) Direction of operation;	
c) What enemy to rout;	
d) What area (line) to take;	
e) Readiness time;	
f) Other indications	
3. Information about the operations of the forces and materiel of the senior officer in the interests of the given subunit.	

Commander _____
(rank, surname)

Chief of staff _____
(rank, surname)

Transmitted (time)

Received (time)

Only the righthand side of the form is filled out where brief answers are given (on the basis of the commander's decision) to the questions stated in the lefthand side. In so doing, the time both for compiling the form and for studying it by the subordinates is reduced.

The graphical combat orders are also efficient: they have maximum brevity, and the clarity and succinctness of the contents distinguish them advantageously from other forms of orders. It is necessary, however, to find at any time the possibilities for accelerating the process of preparing them as a result of the application of the mechanization means and better working techniques of the staff officers.

The subordinate commanders (staffs) discuss in advance the sending of the combat orders to them or the transmission of their content over communications means so that they can better prepare for the reception and execution of them. At the same time, the subordinates immediately report the reception of the combat orders (combat missions) to the superior commander (staff).

The combined procedure for reporting the combat missions consists in the fact that the decision made (more precisely defined) by the commander is delivered to the responsible agents by various methods: by a subordinate -- orally with personal discussions; another subordinate over closed communications channels, and so on. For example, this is how it can be used during the course of the offensive when stating the missions for the subunits during the time of execution of the next mission:

Responsible agents	Time		How and by whom the missions are to be delivered to the responsible agents
	Preparation for performance of a combat mission	Reporting of the mission	
1. Subunits of the 1st echelon	9.00*	8.55	Orally, personally by the commander or the chief of staff by radio
2. Artillery	9.35	9.05	Commander orally through the artillery chief
3. Antiaircraft defense means	9.35	9.05	Chief of staff orally by radio
4. 2d echelon	9.50	9.10	Orally, personally, the commander at his command post
5. Rear services	9.50	9.10	Chief of staff over the radio

*The time is taken arbitrarily, only for indicating the possible sequence of times of delivering the mission.

For the most part the given procedure is necessary during the course of combat operations in the higher echelons when personal discussion with the subordinates is limited or excluded altogether. In this case the commander states the mission for the basic responsible agents, to others they are reported by the staff, the troop and service chief.

Thus, a broad class of duty personnel are attracted to the delivery of the missions. These personnel also work in compressed time and almost simultaneously. It is entirely obvious that their work must be timely and clearly organized by the commander himself or the chief of staff. During the decision making (refinement) process, depending on the place and the role of the subordinates in the solution of the general problem, they plan

by what means and when to deliver the mission to them, who of the duty personnel will be called on for this purpose, when and how they will be prepared, and what is to be done by one of the two versions. The commander can explain his decision in the form of brief orders already prepared for the report to the responsible agents considering the priority of the command readiness time. As these orders are written down or plotted on the maps and the correctness of their assimilation by the duty personnel is checked, the latter immediately report them to the responsible agents orally with personal discussion with them or by other means. It is possible also that this type of order be given by the commanders during the decision making process, that is, as the missions are defined for the subordinates. At the same time, time is saved for training the subordinates to execute the mission and especially those who began to operate earlier than the others. In both cases, the commander personally and through the chief of staff sees to the reporting of the combat mission to the responsible agents by the established procedure.

An important role in reporting the missions to the responsible agents by any method is played by the staff. In the case where the commander states the mission personally to all the responsible agents, the staff prepares the materials and the working maps that he needs, it gathers up the subordinate commanders at the designated point in the field, it organizes communications from this point with command posts and the senior officer and takes security measures. During the process of stating the missions, the staff records the oral combat orders and instructions of the commander, they check the accuracy of the recording and the explanation of the combat mission by the subordinates. For other versions of operation of the commander, the staff delivers the missions to the responsible agents to whom the commander has been unable to deliver the missions personally. In order to confirm the orally stated missions by the subordinates, the staff of the higher echelons, as a rule, duplicate the written combat orders and send them out. In all cases the staff delivers the orders for support to the subordinates in which the following are defined with respect to each type of support: the missions, forces, material, measures for execution and readiness time.

2. Organization and Support of Continuous Interactions of Troops

The subunits and units of various combat arms, specialized troops and aviation participate in modern combat. Their limited interaction is one of the decisive prerequisites of the successful achievement of the combat goal, that is, routing of the enemy and capture (holding) of the noted area (line) of the terrain.

The essence of organized interaction consists in coordinated operations of all of the forces and materiel participating in the combat by the mission, the directions, the lines and the time in the interests of successful performance of the common combat mission. The interaction with respect to the missions indicates the direction of the forces to route this grouping, with the destruction of which the next given combat mission is decided: the next, subsequent and so on. Within the limits of each of these missions the

interaction is detailed with respect to direction of operation of the troops and also with respect to the specially important lines, targets and methods of operation. The coordination of the forces of the subunits with respect to time is determination of what they must do at the same or a different time when taking the same line or target.

The interaction is considered organized only when the commanders and the staff of the interacting troops first know the general combat mission and the intention of the operations of the superior chief; secondly, they know the content of each other's combat missions, the methods and the time of joint operations with respect to their fulfillment; thirdly, they have reliable interaction communications with each other and with the senior officer and can realize mutual information exchange in a timely manner; fourthly, they have and can quickly make use of the required number of interaction signals.

In each combat level and with respect to each next combat mission, its own interaction system is created so that in it the possibilities of the various forces and materiel will be realized as fully as possible, so that their efforts will be coordinated in the interests of the execution of the combat missions of the combined-arms subunits, and within the latter, in the interests of those who play the primary role in the soluiton of the general problem and, finally, so that their interaction will be specific, that is, with respect to the target, the location and the time it will reflect the peculiarities of each troop level (subunit, unit, and so on).

It is obvious that the organization of the interaction is not a one-time act, but a defined process of the work of the commander and the staff. The primary role goes to the commander, whose work with respect to organization of interaction consists of two stages: the first stage is the preparatory stage, and the second is the practical reporting of the planned method of interaction to the troops (see Figure 29).

The training of the commander for the organization of the interaction begins immediately with obtaining the combat mission, and ends with making the combat decision. When explaining the combat mission the commander, along with the other problems, reveals the role and the place of his subunits in the system of interaction of the higher echelons, and he plans how best to interact with the neighbors and also with the forces and materiel of the senior officers. When evaluating the situation, a study is made of its effect on the application and coordination of the operations of the various combat-arms.

As a result of estimating the situation and making the decision, the commander defines the principles of interaction of the troops when executing the forthcoming combat mission. He draws a picture (model) of the course of the forthcoming combat operations, he plays out the combat mentally, in several versions, as a result of which the following are determined: the sequence of the routing of the enemy, the direction of concentration of

basic forces, the grouping of forces and materiel, the missions of the subunits, the nature of the maneuvering and so on. It is also noted when and how to convey the planned interaction procedure to the subordinates.

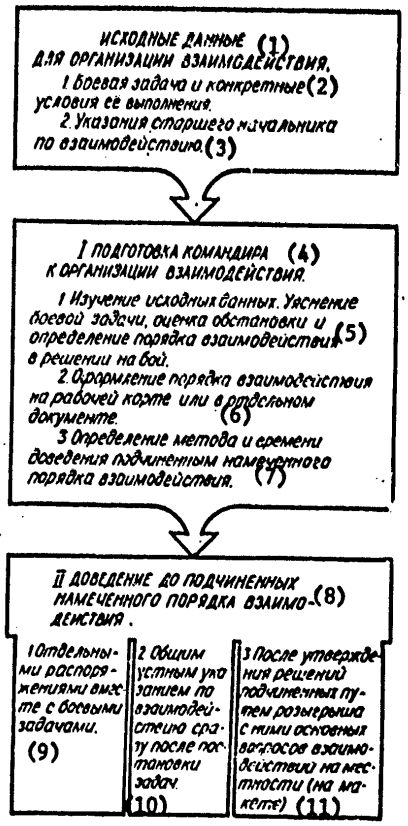


Figure 29. Process of the organization of the interaction of troops in combat.

Key:
1. Initial data for the organization of interaction
2. Combat mission and specific conditions of its execution
3. Instructions of senior officer with respect to interaction
4. I Training of the commander for organization of interaction
5. Study of the initial data. Explanation of the combat mission, estimation of the situation and determination of the procedure for interaction in the combat decision
6. Formulation of the interaction procedures on the operating map or in a separate document
7. Determination of the method and time for the delivery to the subordinates of the planned interaction procedure
8. II Delivery of the planned interaction procedure to the subordinates
9. By individual orders together with combat missions
10. General oral instructions with respect to interaction immediately after statement of the mission
11. After confirmation of the decisions of the subordinates by playing out the basic problems of interaction in the field (on a model) with them.

In helping the commander, the staff prepares the required data and calculations for it, fills out the planned interaction procedure on its

working map or in an individual document, and realizes other measures with respect to preparation for the organization of the interaction by the method established by the commander.

Various methods of organization of the interaction are used. Their selection depends primarily on the possibility of personal communication with the subordinates, the level of their training, and the time available. If the time is extremely limited and it is impossible to gather all the subordinates into one point in the field (at the command post), then the instructions with respect to interaction are delivered to them simultaneously with the combat missions in the brief combat orders sent to the subordinates by the commander himself and the staff officers over the closed communications channels and also by personal communications with some of them. If the situation permits, after oral statement of the combat missions the commander can give all of the subordinates general instructions with respect to the interaction directly in the field, on a model (a relief map) or by the map.

The instructions of the commander with respect to interaction in this case are discussed in a strictly defined plan. With respect to each intermediate combat mission he defines and indicates: a) the goal of the coordinated operation (interaction); b) the possible grouping and expected counteraction of the enemy (if necessary, by versions); c) which forces and materiel or subunit of the different combat arms participate in achievement of the goal, that is, in routing the enemy; d) the procedure for coordinated operations of these forces and materiel (subunits) with respect to the lines, directions, targets and times within the limtis of the given intermediate combat mission.

Initially, the problems of interaction can be resolved within the limits of visibility on terrain, and outside visibility, by the map or on a mockup (relief plan) not only by giving the instructions, but also with the application of the method of playing out the forthcoming combat operations.

The instructions of the commander with respect to interaction are not identical with respect to content themselves, for they are made up of the content of the combat mission and the specific problems and conditions of its execution. In the instructions of the commander it is not especially necessary to repeat the already stated combat missions. The procedure for coordinated operations of the subunits of the various combat arms with respect to mission, lines and time and also the neighbors in the interests of successful execution of the combat mission is defined. On organization of the attack from the march, for example, in these instructions the following is defined with respect to each mission.

On performance of the next mission:

a) During the artillery preparation and advancement of the subunit to the line of going over to the attack: the time and the procedure for occupation of the fire positions by the artillery and the antiaircraft means

and the means of firing by direct laying -- the firing lines in the initial area for the offensive; the structure of the subunit (unit) for advancement to the line of going over to the attack; the procedure for advancement, deployment and operations of the subunit on going to the attack line considering the possible counteraction of the ground and air enemy; the time of beginning, duration and structure of the artillery preparation of the attack, the problems and coordinated operations of the various forces and materiel during artillery preparation; the time and method of clearing passage through obstacles (ours and the enemy's) and designation of them; the time and the procedure for conduct of fire by the weapons of direct laying, tanks and motorized rifle subunits before the attack; each will aid with the subunits which are in front in direct contact with the enemy; coordination of the operation of the antiaircraft defense means with respect to covering the troops from enemy air attacks and other problems.

b) When the subunits of the 1st echelon attack and take the lines of their next missions, the following are indicated: the time and procedure for going over from the artillery preparation to artillery support of the attack; the targets of destruction during artillery support, the support procedure, the signal and the fire transfer procedures; the time, the signal and the method of going over to the attack on the part of the subunits; the procedure for passage of the subunits through obstacles; the procedure for coordinated operations of the subunits of all combat arms of each other and the neighbors when taking the strong points and repelling the enemy counterattacks, the nature of their maneuvering and their mutual aid; the procedure for covering the combat formation from enemy air strikes; the time and the procedure for displacement of the artillery and the antiaircraft means to the new positions and other problems.

On fulfillment of the given mission, the instructions of the commander are less detailed with respect to interaction. In them only those problems are permitted which particularly correspond to the goals of coordinated operations -- completion of the rout of the target after the fire damage and during the course of the enemy attack in which they will try to strengthen their position by holding advantageous lines (targets) and launching counterattacks.

For the attacking troops it will be characteristic to try to build up strength by engaging the 2d echelon (reserve) in combat, in connection with which the commander defines the following: the targets damaged by artillery fire and aviation strikes in the direction of the 2d echelon operations; the line of deployment of the 2d echelon (reserve), the time and the routes for advancement to this line, who will free them or prepare them and when; making up forces and materiel in connection with engagement of the 2d echelon (the reserve) in combat and the interaction with the subunits of the 1st echelon and the neighbors; the procedure for covering the subunits against enemy air strikes; as a result of who, when and how the 2d echelon (reserve) will be restored, and other problems.

When developing a further attack, the instructions of the commander with respect to interaction are still less detailed than the preceding ones, for it is difficult to estimate the possible changes in the situation in advance, which means to plan in detail the procedure for the coordinated operation of their troops. Therefore, here on the basis of the evaluation and considering the probable changes in the situation, it is planned in general features how the fire damage to the enemy is realized and how the rout of the enemy will be completed by the operations of the combined arms subunits.

In the instructions of the commander with respect to interaction for the time of fulfillment of any of the next missions, problems are also resolved which are connected with the coordination of the operations of the subunits when overcoming water barriers, the development of the attack at night, when surmounting different types of obstacles and obstructive areas and also the repulsion of the counterattacks and other operations of the enemy, especially with their application of nuclear weapons. If by the decision of the senior officer the airborne is used, then the problems of interaction with them are also resolved. The places and the procedures for movement during the course of the attack of the control points in the interaction signals are reported to the subordinates.

In all cases primary attention is given, of course, to the fire damage by the enemy and fast utilization of the results in order to fulfill each intermediate mission with the least losses and expenditures of materiel and, in the final analysis, fulfill the combat mission.

On organization of interaction, the growing significance of the combat with the air enemy is especially taken into account. This combat must be continuous, active and carefully organized, designed so that the combat formation of the attacking troops is reliably covered. The commanders of the antiaircraft defense subunits must receive specific instructions on the degree of preparedness of the forces and materiel of the antiaircraft defenses for repelling enemy air strikes; their locations in the combat (marching) formations; the routes of movement, the sequence of the displacement and the nature of the maneuvering during the course of the combat operations; the procedure for interaction with the covered subunit (target) and also with the antiaircraft defense means of the junior officer and neighbors.

For all of the subunits, the procedure and the warning signals are given with regard to the air enemy and the nature of their operations by the signal: the conduct of small arms fire, measures with respect to distribution, cover and camouflage. Special attention is given in this case to the control of the low-flying targets, including enemy combat helicopters, with the use for the destruction of not only antiaircraft equipment, but submachineguns and machineguns.

In the instructions of the commander with respect to interaction on the defensive, coordinated operations of their subunits are defined with respect to the probable directions of the enemy attack, with respect to the

missions and the direction of the counterattack of their troops. The special problems by which interaction is organized on the defensive are the following: the damage to the enemy on the approaches to the forward line of defense; the repulsion of the enemy attack in front of the forward line; the destruction of the enemy wedging into the defense. For destruction of the enemy on the approaches to the defense, the areas of mass and sections of concentrated artillery fire and mortars are planned in combination with the fire means of the senior officer, the air operations and the operations of the neighbors and also the security forces in front of the forward line of defense.

For repulsion of the enemy attack in front of the forward line of defense, the commander indicates the areas of massed fire, the sections of concentrated fire and the lines of barrage fire in the most important directions, the lines and the procedure for opening fire by antitank means, the depth of the zone of continuous fire of all types, the places for creation of fire pockets and the construction of engineering obstacles. In addition, the procedure for the maneuvering of the fire of all types and reserve for reinforcing the threatened areas and also the procedure for the utilization of forces and materiel from secondary directions for the repulsion of the enemy attack in the main direction are planned.

In order to destroy the enemy wedged into the defense, as a rule, the following are indicated: the local areas which must be tightly held in each direction of attack of the enemy; the procedure for concentrated fire of all types for damage to the wedged enemy, the occupation of the fire lines with antitank means and the construction of the engineering obstacles during the course of battle. In each direction of the counterattack the commander defines the following: the deployment lines, the routes of advance and the 2d echelon mi-sion, the artillery mission, mortars and the subunits of the 1st echelon with respect to the damage to the enemy before the beginning and during the course of the counterattack. In addition, the procedure is established for interaction on restoration of the defense in case of failure from the counterattack and on launching the counterattack by the reserves of the senior officers.

The interaction when sufficient time is available can be organized not immediately after daily combat missions, but after some time. The given method was widely used during the last war. It consists in the fact that after giving the oral combat order in the field, time is allowed to the subordinates for making the combat decisions. Then the commander hears and approves the decisions and successively resolves the basic problems of interaction with them.

In support of the work of the commander with respect to organization of the interaction, the role of the staff is significant. The staff helps the commander in the practical resolutions of the problem of interaction in the field (on a model) and records his instructions with respect to interaction. In accordance with these instructions the staff more precisely

defines or develops documents with respect to interaction and if necessary sends notes to the subordinates. The staff resolves the problems of interaction with the subordinates to whom the commander has not been able to issue orders personally. In addition, the staff organizes and supports reliable communications between the interacting subunit, it delivers the established signals to them and realizes monitoring of the correctness of the organization of the interaction by the subordinates, reporting the results to the commander.

The interaction can be reflected in the combat documents that differ with respect to form. In the subunit it is formulated only on the working map of the commander, by means of which he gives the oral combat orders in the field and immediately organizes interaction. In the higher echelon, it can be formulated by an individual document -- schematic (on the map), graph or planning interaction table.

For any version of the formulation of the interaction -- on the working map or in regular documents (schematic, graph, planning table) -- it is important to achieve extreme brevity and clarity of representation of the basic problems of the interaction and at the same time promote their fast and specific practical resolution by the commander and the staff both on organization and especially when maintaining interaction during the course of combat.

The maintenance of continuous interaction is one of the important problems of the commander and staff during the course of combat. Realizing it, the commander and the staff must do the following: first realize with sufficient completeness and decision the procedure of coordinated operations of the forces before combat on fulfillment of each next combat mission; secondly, more precisely determine, supplement and develop the procedure in time considering changes in the situation; thirdly, in the case of disturbance of the interaction, restore or organize it again.

The specific content of this work by the commander and the staff depends a great deal on the type of combat, the characteristic feature of each next combat mission and the methods of carrying them out, the degree of correspondence of the interaction procedure planned before combat to the situation developing during the course of combat, and so on. For the success of the support of the interaction in all cases the following have definite significance: constant knowledge of the situation and prediction of changes in it; monitoring of the exact fulfillment of the combat mission by the subunits and the planned interaction procedure; the application of the refinement procedure corresponding to the situation, the development and restoration of the disruptive interaction; the maintenance of reliable communications insuring interaction of the subunits and timely sending of the established interaction signals.

Exact knowledge of the situation and prediction of changes in it -- initial prerequisite for the success of the work of the commander and staff with respect to maintaining interaction. This is achieved, in turn, by the

continuously conducted reconnaissance, maximum use of all sources for obtaining data on the change within the situation, systematic mutual information about it between the commanders of the interacting subunits. Of the total data obtained during the course of combat, those have special significance which permit rapid evaluation of to what degree the previously planned interaction procedure is being held to with respect to time, lines (targets), and if there are deviations, then what they consist of, what, when and how it is necessary to do something so as to eliminate and maintain clear interaction. All of the refinements regarding the coordinated operation procedure are conveyed to the responsible agents by short oral orders (commands).

Refining the interaction procedure within the limits of the already fulfilled (next) mission, the commander and the staff developed and detailed the basic problems of interaction for the next (subsequent) mission, for before the battle they have been resolved only in general outlines. The timeliness of the problems which must be resolved here is predetermined by the content of the combat mission itself, the methods and the conditions for its fulfillment.

If this, for example, is the next mission in the offensive, then it usually is connected with the completion of the previously started rout of the enemy and the effort to develop success in the depth of his defenses. For this purpose, as a rule, the 2d echelon is engaged in the battle. Almost all of the forces and materiel participate in the fulfillment of the mission, the operations of which must be coordinated without a break in the offensive rate. Here it is impossible to call all of the subordinates of the commanders to the control point of the senior officer. Each of them is given the combat orders orally by radio in a strictly defined procedure in which along with determination of the combat mission, brief instructions are presented with respect to the basic interaction problems.

The list of these problems within the framework of the next mission can be approximately as follows: the 2d echelon (reserve) -- the line and time of engagement in combat, the combat mission, the procedure and the methods of interaction with the neighbors or completion of the rout of the enemy; the artillery -- the fire problems considering the attacks of their aviation, the methods and times of their execution, the procedure for displacement, deployment and conduct of fire; the special reserves -- what, when and how it is to be done to support the operations of the subunits performing the most important combat missions. In addition, new places and deployment times are reported during the course of combat of the control points of the senior officer and the additional interaction signals.

The interaction, for example, during the course of defensive combat when launching a counterattack for rout of the enemy wedged into the defense is organized by the same method and theoretically with respect to the same set of problems, but with different direction and content. Here, first of all, the operations of the elements of the combat formation are coordinated

which create advantageous conditions for the counterattack, and then all of the forces and materiel participating in the counterattack.

The interaction can be disturbed during the course of combat for various reasons. The degree of this disturbance will also be different: in one case there can only be loss of communications with one or several subunits; in another case, loss by the subunits (the elements of the combat formation) of fitness for battle, which means the possibility of solving the problems; thirdly, both can take place simultaneously, distinguished by a variety of versions. Consequently, the volume, content and methods of operation of the commander and the staff with respect to the restoration of the disturbed interaction are different.

In such a case of destruction of the interaction, the commander and the staff first of all establish the relation to the subunits, they explain the situation and the condition of the subujits and the causes of the disruption of the interaction among them as quickly as possible. The measures, and when and how to implement them so that it will be restored without hindering the fulfillment of the combat mission, are planned at the same time.

First of all interaction is set up between the subunits which play the primary role in the solution of the general problems or can continue execution of the mission at the same time as the other subunits are forced before this to restore their combat capability. First of all the combat missions and the interaction between the forces and materiel designed for fire strikes on the enemy and also using the results of these strikes and completing the rout of the enemy are more precisely defined.

All of the instructions of the commander are conveyed by short orders over the existing communications channels and with personal communication with the subordinate commanders. Personal communications with the commanders whose subunits have turned out to be under the most serious conditions, is especially important. The senior officer's visit to them is one of the best means of accelerating and improving the efficiency of the measures with respect to restoration of the combat capability and their disruptive interaction. Another thing is no less important -- the maintenance of constant readiness of the commanders of the subordinates and interacting subunits for taking the initiative in restoring the disrupted interaction. In this way there are broad possibilities for their manifestation of creative initiative. On the basis of the general plan and the proper understanding of their role in its implementation, without waiting for instructions from above, they must more precisely determine the procedures for the operations of their subordinates in accordance with the change in the situation. For this purpose it is necessary that reliable communications and mutual information be maintained between them so that they will know not only each other's missions, but also the results of the fulfillment of the missions. It is necessary that they be constantly ready to render mutual aid, that they know how quickly to apply and execute the established interaction signals in a clear-cut fashion.

Thus, the skillful organization, continuous maintenance of close interaction of the troops during the course of battle and its fast restoration in case of disruption are some of the most important indexes of the ability of commanders and staff in troop control and also the conditions for their successful fulfillment of the assigned combat mission.

CHAPTER 7. ORGANIZATION AND IMPLEMENTATION OF MEASURES WITH RESPECT TO THE SUPPORT OF COMBAT OPERATIONS AND THE COMMANDANT'S SERVICE

Under any conditions of combat activity of the troops, one of the most important problems of the control units is the organization of measures with respect to the support of combat operations and the direction of their implementation during preparation and in the course of combat.

In connection with the adoption of nuclear weapons for armament, the equipment of the troops with new materiel, the effect of these measures on the external execution of the goals by the troops is increasing incommensurably. They are faced with the goal, on the one hand, to create the necessary conditions among the troops in any situation for their timely execution of the stated missions, maintenance of their combat capability and when necessary, to restore it in short order, and on the other hand, to complicate the application of forces and materiel by the enemy, especially nuclear weapons, as much as possible.

The achievement of this goal is possible under the given condition of the complex utilization of various types of support. In addition to such types of support widely used in World War II as reconnaissance, security, camouflage, engineering, radar and topogeodetic support, new provisions must be made to protect the troops against nuclear weapons, and hydrometeorological support. In the American Army a great deal of attention is given to combating the radioelectronic means of the enemy.

There is no doubt that the commandant service can also include types of support. With respect to purpose and content of the missions performed, it is organized in the interests of supporting the troop operations although in a number of cases it is done not only by the commandant service but also the combat units.

Measures with respect to types of support are organized by the staff, the chiefs of the combat arms and services on the basis of the decision of the commander and his instructions and also the orders of higher headquarters. Usually the content of the work with respect to organization of any type of support in most general form includes the following: the preparation of

data and calculations required by the commander for substantiated determination of the goals, the composition of the forces, the materiel and the procedure for utilizing them with respect to a defined type of support; the explanation of the missions and the conditions of their fulfillment; planning of the support problem, conveying the mission to the responsible agent; realization of the direction and control of the troop operations with respect to fulfillment of the missions. Here it is necessary to consider that the measures with respect to each type of support are highly varied, and their performance has its own specific peculiarities. This requires great preparation on the part of the responsible agents with respect to analysis of the available data, the coordination of the problems that arise with other interested duty personnel, the performance of a large quantity of calculations which, in turn, are based on the deep knowledge by the responsible agent of the possibilities of technical facilities called on for implementation of the noted measures. All of this increases the responsibility of the staff officers and other control units for the organization and implementation of the measures with respect to comprehensive support of the combat operations.

Reconnaissance

Reconnaissance must under any conditions supply the commander and staff with the required data on the enemy, the terrain, the radiation and hydrometeorological situation. Here the data must be obtained in a timely manner, it must be reliable and accurate, especially the coordinates of the most important targets on which the senior officer plans nuclear strikes.

The timely obtaining of initially complete data on the enemy presents great difficulties. With the dynamics and speed of the combat operations and the mobility of the majority of the targets, the information about them is quickly obsolete. Many foreign specialists have concluded that the break between the means of destruction and the reconnaissance capabilities has taken place. One author writes with outright alarm: "The system for gathering, processing and distributing information about the enemy does not correspond to modern requirements... The infantry does not have sufficient capabilities to find the enemy and obtain data on the enemy during the time and with the precision which will insure the most effective utilization of their growing firepower and mobility."[1]

The solution of this problem is connected not only with the application of modern reconnaissance means but also the clearcut organization of reconnaissance. Usually the direct work of the staff with respect to the organization of reconnaissance, in contrast to the other types of support, begins with obtaining the preliminary order or explanation of the missions obtained. The commander or chief of staff immediately determines what primary data on the enemy and the terrain and at what time it is necessary to get it, what forces and materiel to use for this. On the basis of these

1. Signel [Signal] journal, 1972, July.

instructions, the staff officer proceeds with the planning and organization of the measures on reconnaissance which he plans to implement immediately without waiting for the commander to make a decision. When the decision is made the commander can more precisely define these missions or state additional ones.

Beginning with the decision of the commander and the basic reconnaissance missions set up by him, the chief of staff, who is responsible for the organization and the state of reconnaissance, gives instructions to the staff officers on the organization of reconnaissance. In them he usually specifies the reconnaissance goals. He establishes the sequence of their solution and the forces and materiel needed for this; he determines the methods and times of satisfaction of the goals, in what direction, area or object to concentrate the basic reconnaissance forces and what forces and materiel to call on for this; he establishes the composition of the reserve of reconnaissance forces and materiel, the procedure for application and restoration during the course of combat. He indicates the procedure for preparation of the subunits isolated from the conduct of reconnaissance, the organization of communications with the reconnaissance agencies, the times for saving the missions for the responsible agents.[1]

On receiving the missions and the instruction, the staff officer explains the content of the missions with respect to reconnaissance, he studies the condition and the capabilities of the available forces and materiel, he estimates the situation in which it is necessary to perform reconnaissance when carrying out the stated missions, he determines what measures must be carried out in order to insure successful solution of the problems. During the process of this analysis it is determined which data can be obtained with respect to each problem from the reconnaissance, motorized rifle and tank subunits and also higher headquarters and, in particular, the radar, artillery, engineering and radiation reconnaissance. With the complex utilization of forces and materiel alone it is possible to insure successful fulfillment of the reconnaissance missions.[2]

Here the proper determination of the methods of obtaining the data has exceptionally great significance depending on the content of the mission and the nature of possible enemy operations. Therefore, during the process of estimating the conditions of the situation, the reconnaissance officer especially carefully studies what data can be obtained by observations, search, ambush, attack, what reconnaissance information can be obtained as a result of troop combat operations, the interrogation of prisoners and deserters, the interrogation of local residents, what reconnaissance data can come from higher headquarters, the neighbors, air reconnaissance, and so on.

1. R. G. Simonyan, F. I. Yeremenio, N. S. Nikolayev, V. A. Tumas, "Takticheskaya Razveda" [Tactical Reconnaissance], Moscow, Voyenizdat, 1968, pp 22-24.

2. Ibid., p 27.

As a result of the comprehensive study of the situation and all the initial data, the staff officer distributes the available reconnaissance forces and materiel considering the most effective utilization of their capabilities and with respect to the mission, more precisely defines the specific times and methods of carrying out the missions, the measures with respect to supporting the operations of the reconnaissance subunits, the procedure for maintaining communications with it, the times and methods of presentation of the data obtained. Here special attention is given to the timely detection of nuclear weapons, reserves and other important targets of the enemy.

All of the basic problems of planning and reconnaissance usually are reflected on the operating maps of the chief of staff, the reconnaissance officer and other interested officers. The data difficult to show on the map are entered in the working notebooks of the responsible agents. In order to convey the missions to the subunits when necessary, combat orders for reconnaissance are developed in which usually the following are indicated: brief information on the enemy; the reconnaissance missions and the forces and materiel allocated for them (who, where, when and what information is to be obtained or more precisely defined), the times and the procedures for presentation of reports, the delivery of prisoners, weapons and documents captured from the enemy; password and response; control signals.

One of the missions of the staff in all types of combat activity, especially when the subunits are preparing to break through the enemy defenses, remains as before and in modern combat -- the organization of observation. It is important here to insure continuous observation of the enemy and the terrain in the entire combat operations area and on the flanks, to the greatest depth possible. Therefore, when organizing observations, the staff especially carefully plans the locations for the observation command post and observation posts, selects the composition of the observers, and provides them with the necessary observation devices.

Not all of the data on the enemy, the terrain and the radiation situation can be gathered by our own forces and facilities. In order to obtain the missing data, a request is sent to higher headquarters, and measures are taken to obtain this information from the neighbors, the troops operating in front, and aviation.

During the course of the fulfillment of the stated missions by the subunits, depending on the developed situation, the commander or the chief of staff more precisely defines or states the additional reconnaissance missions for the reconnaissance subunits, and if necessary reassigns forces and materiel to other areas or targets. All of these measures usually are reflected on the working map of the chief of staff and the officers directly responsible for the actions of the reconnaissance subunits. The missions, as a rule, are conveyed to the responsible agents orally or by technical communications means.

The basic index of skillful organization of reconnaissance is the timeliness of obtaining exhaustive, reliable data on the enemy, the terrain and the radiation safety by the commander.

Protection of Troops Against Nuclear Weapons

The protection against nuclear weapons is an entire system of measures performed to prevent damage to our own troops or attenuate the results of the effect of the nuclear weapons as mush as possible, and at the same time retain or restore in a short time the combat capability of the subunits and insure their reliable fulfillment of the stated missions. Beginning with this designation of the given type of support in accordance with the views adopted in the majority of armies, the content includes the following: prediction of the radiation situation, the destruction and flooding zones; the organization and conduct of aviation reconnaissance; warning the troops about the direct threat of application of nuclear weapons by the enemy and also the areas of destruction, fires and obstructions; provision of the personnel with individual protection means; deconcentration of the troops and their location during the protective properties of the terrain; engineering equipment of the areas occupied by the subunits, determination of the most expedient methods of surmounting damage and destruction zones; preparation of paths for troop maneuvering; dosimetric monitoring and consideration of the doses of radioactive radiation of personnel; the performance of the counterepidemic, sanitary-hygienic and specialized preventive measures; elimination of the consequences of the use of nuclear weapons by the enemy.

On the basis of the commander's decision and his instructions, the staff develops specific measures with determination of the times, the forces and materiel called on for their performance. The basic planning data are reflected on the working maps of the commander, the chief of staff and the corresponding chiefs. The missions and the content of the measures with respect to protection against nuclear weapons are conveyed to the responsible agents in the combat orders and also in the instructions and the orders with respect to engineering, rear services and other types of support.

On launching nuclear strikes by the enemy, the commander and staff first of all analyze the situation in the damaged areas, they establish the condition and the position of the subunits who have suffered damage from nuclear weapons, they determine the nature of the operations of the enemy. Then measures are taken to restore the combat capability of the troops, continue the combat operations and eliminate the consequences of the enemy's use of nuclear weapons. In carrying out these missions, the following acquire the greatest significance: the restoration of the disrupted control, making the decision and conveying the refined combat missions to the subunits which have remained combat fit; removal of the troops from the contamination and damaged zones, the areas with fires and flooding; reinforcement of the subunits with materiel, and so on.

Along with these measures, the extinguishing and localization of fires, the restoration of engineering structures and shelters for the personnel, the cleaning of paths and routes, special processing of the subunits, degassing and deactivation of the materiel, the terrain, roads, structures, and so on are organized.

The subunits which have suffered insignificant losses are put into formation, and are given the necessary aid; in the troops having greater losses, authorized organization measures are taken.

The organizational measures are determined by the degree of damage. In one case the subunits receive reinforcements at the expense of the reserves or subunits which have lost their combat capacity, and in another case it is necessary to create a reduced formation.

Security

In all types of combat troop operations and also during their movement and deployment, security is always organized. On the march, predicting an engagement with the enemy, the troops are guarded by the march security.

When the subunits are in place, security at the halt is organized, and when conducting combat operations, combat security.

When organizing security, the commander defines its goals and establishes what subunits to involve in executing them. The chief of staff bears direct responsibility for the organization and implementation of security. Planning security, he determines in accordance with the decision of the commander the forces and materiel necessary to organize security, he plans the areas (lines) for location of the security elements or the routes (directions) of their movement; he details the problems for the security units considering possible enemy operations, he establishes the times in which they are to accomplish these goals; he establishes the procedure and method of advancement of the security subunits to fulfill their missions, and when necessary he establishes the time and the procedure for changing from one type of security to another. In addition, the chief of staff defines the organization of communications with the security units, he establishes the signals and the procedure for interaction of security subunits with the secured troops and also their support with everything needed for successful fulfillment of their missions.

Under any conditions, provision is made for the organization of direct security of the troops to protect them against attacks from diversionary groups and to give them timely warning of the threat of an enemy attack. The security of the most important targets is organized most reliably. Forces and materiel capable of successfully dealing with the stated missions under any conditions are allocated for their security.

The developed security measures are reflected on the working maps of the commander and the chief of staff. The missions are delivered to the security units, as a rule, orally.

Engineering Support

Engineering support is the engineering measures and problems promoting successful conduct of combat operations by our own forces and complicating the operations of the enemy troops.

With the use of nuclear weapons, in the presence of mass destruction, obstacles, fires, flooding and radioactive contamination of the terrain, the volume of engineering operations increases immeasurably.

The most important problems of engineering support are the following: engineering reconnaissance; facilitating the movement and maneuvering of the troops, hauling and evacuation; the clearing of passages through obstacles and destruction; the equipment and methods of crossings; the construction of shelters and structures at the control point; the installation of barriers and removal of the aftermaths of the destruction; the execution of measures with respect to camouflaging the troops and the targets; the performance of the most complicated operations requiring the application of engineering equipment for the areas of defense and the lines occupied by the subunits; the performance of engineering measures to eliminate the consequences of use by the enemy of nuclear weapons; the securing of water, and construction of water supply stations.

Depending on the type of combat operations, the developed situation, the presence of forces, materiel and time and also the condition of the terrain, the time of year, time of day, weather conditions, the most important of the enumerated missions are defined, and the procedure and times for their performance are established.

During the organization of combat, the commander determines the following: what engineering measures must be taken, how to use the assigned engineering subunits, the operations performance time. On the basis of the decision and instructions of the commander, the engineering reconnaissance mission, the volume of engineering measures to protect the troops against nuclear weapons, camouflage, equipment of the control point, the times and sequence when performing engineering operations, and so on are defined, or more precisely defined.

The organizer of engineering support and control of the engineering subunits is the engineering service chief.[1] On the map he develops an

1. V. Ya. Plyaskin, I. F. Lysukhin, V. D. Ruvinskiy, "Inzhenernoye Obespecheniye Obshchevoyskovogo Roya" [Engineering Support of the Combined-Arms Combat], Moscow, Voyenizdat, 1972, p 12.

engineering support plan in which the goals of engineering support, the forces and materiel for the performance of these missions, the times of performance, the material and technical support are reflected. The plan is necessarily coordinated with the combined-arms headquarters. Usually the missions with respect to engineering support are given to the responsible agents orally.

During combat, the planned measures with respect to engineering support are more precisely defined in accordance with the changing situation and the decision of the commander, and if necessary, additional measures are determined for the subunits.

Camouflage

Camouflage is organized to cover the true position and the operations of the subunits from the enemy and also to cover up plans and show false groupings in troop operations, present our plans, intentions and missions to the enemy in false form. To achieve this goal, a set of measures has been developed which provides for covering the decamouflaging signs on location and during operations of the subunits and reproduction of false decamouflaging signs by which the enemy usually detects and recognizes the troops and targets. In order for the planned false decamouflaging signs to be convincing, they must be plausible, tactically substantiated and varied.

Camouflage can be effective only if it is continuous. "Modern warfare," wrote M. V. Frunze, "requires the constant application of camouflage during all periods of combat operations. The application of camouflage periodically, from case to case, means almost not to use it at all..."[1] Skillful realization of camouflage is possible with careful estimation of the terrain, the meteorological data, the behavior of the enemy and the possibilities of his reconnaissance means.

Among the camouflage measures an important role goes to the deconcentration and secret deployment of the subunits considering maximum use of the camouflaging properties of the terrain; radio camouflage; the observation of the condition previously established in the subunits, clear satisfaction of the requirements of light and sound camouflage, equipment of false areas for location of the subunits, the positions and crossings; the performance of demonstration operations and troop movements.

Measures are taken to preserve the combat secrecy and maintain high responsibility among all personnel for the observation of the order and organization in the performance of all operations connected with preparation for the forthcoming combat operations. It is unquestionably true that any measure with respect to confusing the enemy is connected with defined risk for

1. M. V. Frunze, Izbrannyye Proizvedeniya [Selected Works], Moscow, Voyenizdat, 1965, p 130.

carrying out the basic mission. Foreign authors note that before making a decision for demonstrative operations, it is necessary to study the possibilities of the enemy with respect to discovery of the false operations, isolation of a sufficient number of forces and materiel, selection of a suitable time, insurance of plausibility and conviction of the realized demonstrative operations. Here, a number of problems, especially with respect to confusion of the enemy, are carried out in accordance with the plan of higher headquarters.

All of the basic camouflage measures are reflected on the working maps of the commander and the officers of the control units. The missions are delivered to the responsible agents orally. In certain cases, written orders for camouflage can be developed in which the following are defined: the camouflage missions of the subunits; the forces and materiel allocated for performance of these missions; the times; the responsible agents. If necessary, the indicated methods of performing the camouflage operations, the procedures for using the tables and the behavior of the troops can be indicated in the orders.

The effectiveness of camouflage measures during preparation and during the course of combat operations depends to a great extent on the established strict control of the performance of planned measures by the troops. For these purposes provision is made for using the ground and air observation facilities, radar, night vision instruments, control photography from aircraft (helicopters) of the areas where the troops and the targets are located. Here special attention has been given to the camouflaging of the most important targets, the areas where second echelons are located, the reserves and control points on which the nuclear strikes and enemy air attacks are most probable.

Combating the Enemy Radioelectronic Devices[1]

Combating enemy radioelectronic devices has been organized and is being carried out in order to disrupt or disorganize the control of the enemy troops and combat materiel. It includes the purposeful creation of interference, planned radio misinformation, the organization of radar camouflage and the protection of our facilities from enemy radio interference and also measures with respect to the destruction and suppression of the most important radioelectronic targets. This struggle can be successful with the use of modern methods of attaining detailed data on the radiotechnical facilities of the enemy. The basic part of the information usually is provided by the radiotechnical reconnaissance which has the longest range, highest speed of obtaining data and highest reliability. In comparatively short time it detects radio emission, analyzes it and determines the classification of the radioelectronic devices.

1. This section was written from materials printed in the foreign press.

Under modern conditions, one of the basic methods of disrupting the operation of the enemy's radioelectronic equipment is considered to be radio interference. In a defined time it is possible to prevent the enemy from receiving and transmitting information over the radiotechnical means, or to significantly reduce the audibility and visibility of the signals, confuse the operators and cause errors in the operation of the automated communications units.

In order to create active interference usually special transmitters and different interference stations are used. There are also one-time interference transmitters which usually are dropped from an aircraft or missiles into enemy territory. In addition, passive interference created by using antiradar reflectors (dipoles) is not significant. In order to create false targets and to camouflage the real ones, angle reflectors are finding broad application in antiradar camouflage. Among these measures an important role is played by radio misinformation -- the transmission of false information, faking radio transmissions, switching on the enemy systems, and so on. A number of NATO armies designated special army security service and radio electronic warfare subunits for these missions. However, the application of the indicated measures provides only temporary success. They can complicate the operation of the radioelectronic means only for a limited time. The most effective method of controlling the radioelectronic means of the enemy is considered to be destruction or damage by nuclear weapons, missile and air strikes, artillery fire, mortar fire and airborne landings. Finding broad application are various rockets, missiles and aviation bombs with radar and radio heads which provide for homing on the target by the emissions of the enemy radioelectronic devices.

Defined principles have been developed in radioelectronic warfare. The most important are the following: mass application of forces and materiel in the direction of the main strike in the interests of the performance of the most important goals in troop combat; continuity of effect on the radioelectronic devices and enemy systems; surprise application of combat means. The practical utilization of these principles can improve the effectiveness of interfering with the operation of enemy radioelectronic devices.

Along with the organization of the combating of the enemy radioelectronic devices, the staff provides measures for the protection of their own facilities. For these purposes, the destruction of the interference stations available to the enemy, the intensification of radio camouflage and the performance of certain special measures are planned. In particular, as special radio protection measures it is recommended that the radios be located behind promontories, forests, and complexes of buildings having a shielding effect. It is more frequently useful to utilize "directional antennas" which provide minimum radiation in the direction of the enemy. In addition, the most important protection measure is considered to be elimination of the characteristic errors which are committed by the radio operators and at the same time facilitate the control of the radio means by the enemy. These errors include the following: the operation of the radios at high power, tuning

the emitting antenna for transmission, long-term tuning of the transmitter, excessive service talk, unnecessary multiple calls, failure to switch off the high voltage of the radio transmitter after completion of the calls, failure to change call signs simultaneously on all radios in the network, the presence of individual "signatures" and "recognition signs" of individual radio operators.

In addition, it is recommended that the operation of individual types of radioelectronic devices be completely or partially forbidden, the operating frequency band and transmitting characteristics be kept secret, the powerful transmitters be kept outside the limits of the control points and the secret troop control rules be strictly observed. The most effective turn out to be the measures for protection of our radioelectronic devices if they are carried out constantly, in combination and in all control units.

Topogeodetic Support

The terrain was always one of the most important situation elements. Making the combat decision, the commander constantly evaluates the terrain in the forthcoming operation zone, and it often has decisive effect on the success of combat. Therefore it is necessary that during the decision making process the commander have all the necessary data on the terrain permitting clear presentation of the directions (areas) most accessible for troop operations, the presence and the state of the road network and the conditions of off-road movement, the possible effect of the terrain on completion of the maneuvers. Hence, the significance of the topogeodetic support for timely reporting of all the terrain data to the commander and the staff required for organization of combat operations increases.

In addition, according to foreign press data[1] the topogeodetic support missions include the following: equipment of the troops with the topographic maps, diagrams, descriptions of the terrain, the delivery of data to the artillery subunits required for topographic gridding of the elements of the combat formation of the artillery and also preparation of the data required by the troops for orientation in the terrain and target indication.

Missions such as the forecasting and reflection on the maps of the nature of the alteration of the terrain after nuclear strikes has under modern conditions acquired the most important significance. These data, as foreign specialists indicate, can be obtained in the shortest possible time not only by forecasting the results of the changes in the terrain but also by surveying (photographing) these areas which will then permit the plotting (entry) of the changes that have occurred on the topographic map.

1. U.S. Army Regulations: FM-5-188 "Topographic and Geodetic Service"; FM-5-231 "Mapping Functions of the Corps of Engineers."

Hydrometeorological Support

Successful troop control, especially under modern conditions, is unthinkable without exact knowledge of the air temperature and moisture, the wind speed and direction at different altitudes, clouds, amount of precipitation, atmospheric pressure, river conditions, canals, lakes, reservoirs, swamps and ice and snow cover. In addition, detailed data are required on the presence and the condition of the hydroengineering structures (dams, headgates, and so on) and the possibility of flooding of the terrain in case of damage to them by the enemy. It is important to have forecasts about the beginning and the duration of the bad road season, the melting time for the swamps, the beginning of the thawing of the snow and ice in the rivers and in the mountains, the beginning of the flooding of the rivers, and so on.

All of these data, being objective factors of the situation, have serious effect on the content of the commander's decision and the nature of troop operations. The meteorological conditions can have especially significant effect on the accuracy of the strikes by the artillery subunits, the optical, sound and radar reconnaissance, engineering operations, the use of all types of communications, the operations and maintenance of equipment and the maneuvering possibilities of the troops. When conducting combat operations when nuclear weapons are used, the knowledge of the area and the average wind speed and other meteorological data are especially required. Only with them is it possible correctly to determine the safe removal of our own troops and carry out forecasting of the radiation situation and determine the methods of troop operation.

Hence, the most important goals of the staff with respect to hydrometeorological support are the following: the gathering of data on the meteorological conditions, the organization and observation of weather conditions, information of the subordin-tes about the meteorological data, timely warning of the subunits about the dangerous weather phenomena (glazed ice, rains, mudslides, fog, high winds, and so on).

The staff receives the basic part of the data on the hydrometeorological conditions of reconnaissance, higher headquarters, the indications of the local residents and also their references, descriptions, short-range and long-range forecasts, and information about the current weather. The data obtained are reflected on the operational maps of the staff officers, the chiefs of combat arms and services, and they are taken into account in developing measures with respect to the organization and support of combat operations.

Considering the importance of the timely obtaining of meteorological data, in a number of armies automated meteorological systems are created. In these systems the meteorological bulletins can be generated almost immediately after the end of sounding and then in a form that is suitable for direct input to the automated artillery fire control system.[1]

1. INTERNATIONAL DEFENSE REVIEW, August, 1972.

Rear Services and Technical Support

These forms of support include measures with respect to organization of the rear, material, technical, medical and other measures of support and servicing the troops. The index of clear organization of the operation of the rear subunits is uninterrupted troop support, fast maneuvering with the rear forces and materiel in accordance with changes in the situation, timely restoration and evacuation of damaged materiel and armament, rendering medical aid to the wounded and their evacuation from the battlefield, timely movement of the rear of the troops and reliable covering of it.

The problem of evaluating the rear situation is included as a component part in the general evaluation of the situation when the commander makes a decision and when planning the combat operations. It is impossible to make a substantiated decision without knowing how much ammunition, fuel and food must be imported and what consumption of materiel should be provided for combat.

Just as when determining the measures with respect to other types of support, the base for management in the rear services and supplies is the commander's decision. The commander can define the following: the area of deployment of the rear and the direction of movement of rear services and supplies; the paths of approach and evacuation; the sizes of the required reserves and times for their creation; the norms for the consumption of the materiel; the basic measures with respect to technical and medical support; the forces and materiel used for security in the rear; the point of deployment of the rear control point in the direction of displacement.

Beginning with the commander's decisions and the instructions obtained from the superior officer, the officer of the rear unit defines the procedure for the placement and movement of the rear subunits, he organizes their operation, he controls their activity with respect to the execution of the stated missions, and he realizes the defense and security of the rear.

He agrees with the chief of staff on the basic problems with respect to organization of the rear, he informs the chief about the condition of the equipment, presence of materiel reserves, the capabilities of the medical facilities. On his side, the chief of staff is obligated to deliver the content of the combat mission and commander's decision to the officer of the rear unit and also the most important measures which are to be implemented in preparing for the forthcoming operations. During the course of carrying out the mission, he constantly orients him on the changes in the situation, especially when these changes require definite operations on the part of the rear units.

All of the basic measures developed by the officers of the rear units are reflected in the rear support plan. The following are indicated in it: the locations of the rear subunits and their missions; the sizes and times

of creating the reserve; the procedure for hauling up materiel, the standards for their use; the missions with respect to medical support; measures with respect to protection against nuclear weapons, security in the rear and the forces and materiel allocated for this; the location of the rear control point, and so on.

The missions with respect to the rear are delivered to the responsible agents orally and by written orders. During the development of the combat operations, the combined-arms headquarters and rear officers constantly maintain communications, insuring a coordinated decision on all the basic problems.

Technical support acquires most important significance in modern combat. Its basic goal is maintenance of the machines and other equipment making up the armament of the subunits in proper working order and in constant readiness for use. This goal is achieved by the organization and implementation of technically correct maintenance, servicing, repair and evacuation of the armored equipment and motor vehicles and also the supply of spare parts.

The direct organizer of technical support is the deputy commander of the technical units.[1]

The rear support also includes medical support. It is aimed at maintenance of security and protecting the health of the personnel, modern medical aid to the wounded and sick, their evacuation, fastest treatment and return to duty, and also prevention of the occurrence and spread of diseases among the troops. Medical support includes the organization and the performance of the treatment and evacuation, sanitary hygiene and counterepidemic measures and also the medical service measures with respect to the protection of the troops from nuclear weapons.

Commandant's Service

The movement and the completion of the maneuvers on the battlefield under modern conditions are playing a significant role in the activity of the units and subunits. In order to support the timely and secret movements, for concentration and deployment of the troops, the commandant's service has been organized.

Its basic goals are as follows: the regulation of the movement of the troops on the routes, the crossings and passages over obstacles; the control of the observation by the troops of the established procedures and

1. V. B. Zelenskiy, A. A. Chistov, G. S. Chulkov, "Tekhnicheskoye Obespecheniye Tankovykh i Motostrelkovykh Podrazdeleniy v Sovrenenxom," [Technical Support of the Tank and Motorized Rifle Subunits in Modern Combat], Moscow, Voyenizdat, 1972, p 6.

camouflage measures when deployed in place and when being moved; the security for the routes and the combating of diversionary reconnaissance groups of the enemy on the routes and in the deployment areas.

In addition, the agents of the commandant's service gather the reserve personnel, materiel and motor vehicles and dispatch them to their units. On detection of radioactive contamination on the routes or in the deployment areas of the troops, the appearance of diversionary-reconnaissance groups and also destruction of sections of the routes, they report directly to headquarters and warn the troops. In addition, the commandant's service is charged with the duty of maintaining the order of movement of the local population in the troop operations or deployment areas.

Depending on the nature and content of the activity of the troops, the commandant's service is organized on movement routes, in deployment areas, in combat operation zones, on approach and evacuation paths and also in rear services and supply areas. On the troop movement routes, the commandant's sections are organized; in the combat operations zones and troop and rear services deployment areas, commandant zones; on the routes passing through cities, mountain passes and other important points, individual commandant sections. The commandant of the section (zone) is designated to direct the commandant's service, and the commandant posts (three to five people), traffic control posts (two or three people) are set up which are equipped with means of movement, communications and radiation reconnaissance, road signs, traffic direction indicators, symbols of obstacles and other accessories. The chiefs of the commandant posts having special importance are usually officers.

On the basis of the commander's decision and the instructions of the chief of staff, the commandant's service is planned by one of the staff officers. Its planning begins with a study of the content of the commander's decision and the instructions of the chief of staff and also the orders of higher headquarters with respect to organization of the commandant's service. Hrst of all, the sections (zones) are isolated on the map where the commandant's service is organized by the forces and materiel of the senior officer. The remaining sections (zones) are carefully studied by the map in order to determine the boundaries of the commandant's sections (zones), the places of setting up the commandant's posts and the traffic control points (controllers) and also the road signs and indicators. Practice shows that on movement of the column over comparatively dense terrain a significant part of the control points can be replaced successfully by the use of the corresponding indicators (provisional signs) and organization of the mobile commandant's posts. After study of the routes and zones by the map if there is a necessity for this and there is time, the staff organizes reconnaissance of the routes (zones), making wide use of helicopters for this purpose. During the course of reconnaissance, the locations of the commandant's posts, the traffic control points and their composition are more precisely defined; the most difficult sections of the route and the means required for towing

vehicles in these sections are defined; the directions of the bypasses, the alternate routes, the locations of reserve forces and materiel of the commandant's service are planned; the points of installation of the road signs and indicators are more precisely defined. It is expedient that the reconnaissance group has commandant's sections (zones), representatives from the combat engineers subunits and communications and also people who are charged with installing road signs and indicators.

After careful study of the terrain and other situation conditions, the total number of personnel and also material and technical supplies required for organization of the commandant's service are determined. The best version of the planning will be that in which for organization of the commandant's service the limited forces and materiel, primarily the subunits of the commandant's service having correspondingly prepared personnel and the required means of movement, communications, reconnaissance, evacuation and road equipment will be used. Under any conditions provision is made for the isolation of reserve forces and means designed to solve the suddenly occurring problems with respect to the commandant's service, such as, for example, sending out the details on the bypasses of the sections with destruction, flooding and contamination, replacement of the casualties, and so on. On the basis of this calculation plans are made as to which subunit the personnel should be called from and what means should be used. Officers are especially carefully selected for the duty of the section commandants (zone commandants).

The proper determination of the deployment times of the commandant's service has great significance; usually they are determined with some lead with respect to the troop operations so that the duty personnel of the detail will be able to study the terrain and the route in time, and they will be free of their duties. The deployment times are established beginning with the performance of the missions by the troops. On movement of only one unit along the route or with insufficient forces and materiel, the commandant's service is deployed successively, as the troops move. For acceleration of the transfer of the people and the commandant's detail from one section to another helicopters can be used.

Most careful provision is made for the organization of the commandant's service at the initial line, the adjustment lines, at the unprotected railroad crossings, in large populated areas, when bypassing zones of radioactive contamination and also on crossings over water barriers.

The results of planning the commandant's service are reflected on the working map of the officer who is designated responsible for the organization of the commandant's service. Usually the following are plotted on the map (Figure 30): the missions of the commandant's service, the commandant's section (zones), the locations and composition of the commandant's post and the traffic control point, the procedure for deployment and the time for preparation of the commandant's service, the locations of the commandant's sections (zones), the organization of communications, the composition and

location of the reserve forces and means of the commandant's service. In addition, the sections (zones) are indicated on the map on which the commandant's service is organized by higher headquarters, and the forces and materiel are calculated with indications of where they are to be called from.

The timely reporting of the missions to the responsible agents has especially important significance. A clear understanding of them by the duty personnel of the commandant's detail depends to a great extent on the skill in clearly and completely stating the mission. During many years of practice, a defined sequence has been worked out and justified itself for the statement of the mission by the chief of staff to the section (zone) commandant. Here, he indicates the following: the information about the enemy, the order and time of passage of the lines (points) by the troops; the boundaries of the section (zone), the missions and the location of the commandant, the boundaries of adjacent sections (zones) and the location of their commandant; the allocated forces and materiel; the composition and the location of the post; the areas to which the reserve subunits or machines must be sent; the deployment and move-out time of the commandant's service; the procedure for maintaining communications with headquarters and presentation of reports; the location of the commander and the chief of staff.

In addition, the chief of staff delivers the content of the instructions given to the troops for camouflage, location of medical stations, special processing stations, assembly stations for damaged machines and other information to the commandant of the section (zone).

In individual cases, written orders with respect to the commandant's service can be developed for the troops in which the following are indicated: where, when and with what missions the commandant's service must be organized and what special attention must be given to it; the commandants of the sections (zones), forces and materiel placed at their disposal; on what routes or in what areas (sections) the commandant's service will be organized by the forces and materiel of higher headquarters; the procedure for maintaining communications with the commandants of the sections (areas); the ready time of the commandant's service.

On completion of the march and also during the course of combat operations the staff controls the performance of the missions by the commandant's service units, it constantly maintains communications with them and as the situation changes assigns additional missions or redirects them on other routes (to other zones). Here the radio communications of the commandant's service, especially during the march, can be used by the commander in the headquarters for orders and signals to the troops and also to obtain data from them on the condition of the subunits and the time of passage of the planned lines by them.

During the course of the offensive, especially when it is conducted at high speed, quite frequently the troops must accomplish various river crossings.

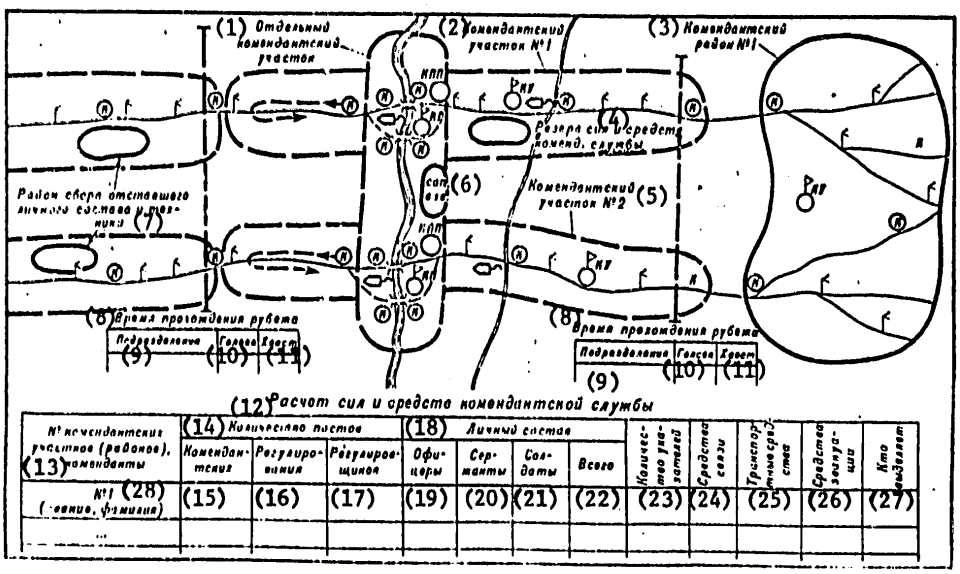


Figure 30. Working map of the staff officer with reflection on it of the organization of the commandant's service on completion of the march.

Key:
1. Individual commandant section
2. Commandant's section No 1
3. Commandant's zone No 1
4. Reserve forces and materiel of the commandant's service
5. Commandant's section No 2
6. Combat engineer's platoon
7. Build-up point for the reserve personnel and equipment
8. Time of passage of the line
9. Subunits
10. Head
11. Tail
12. Calculation of the forces and materiel of the commandant's service
13. No of the commandant's sections (zones), commandants
14. No of posts
15. Commandants
16. Regulation
17. Regulators
18. Personnel
19. Officers
20. Sergeants
21. Soldiers
22. Total
23. No of indicators
24. Communications media
25. Transport means
26. Evacuation means
27. Who assigns
28. No 1 (rank, last name).

When crossing water barriers the commandant's service is organized on the routes of advance of the troops to the water barrier, in the tank sealing areas, in the position areas and in the fire positions of the artillery and at the crossings. For this purpose, the commandant of the forcing section and the crossing commandant are designated, and the control pass points, commandant's posts and traffic control points are deployed (see Figure 31).

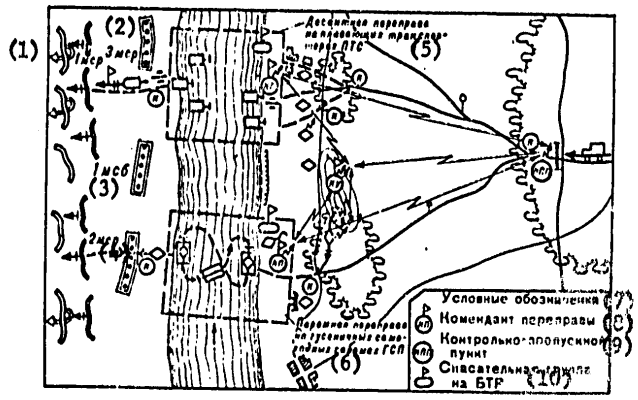


Figure 31. Organization of the commandant's service at landing and ferry crossings.

Key:
1. 1st Motorized Rifle Company
2. 3d Motorized Rifle Company
3. 1st Motorized Rifle Battalion
4. 2d Motorized Rifle Co
5. Ferrying operation on PTS amphibious transport
6. Ferry crossing on caterpillar self-propelled GSP ferries
7. Provisional notation
8. Crossing commandant
9. Control pass point
10. Rescue group on armored personnel carrier

The instructions and the requirements of the crossing commandant with regard to observation of the established procedure are mandatory for all personnel of the crossing subunits.

On each route which leads to the crossing, the control pass points are set up which pass the subunits to the crossing in strict accordance with the established order.

At the points where the troops are put on the ferries, if they are assigned, commandant posts are set up, and between the boarding location, the control pass points and the crossing points, traffic control points (controllers). At night light signals are widely used to indicate the direction of movement to the crossing.

CHAPTER 8. FORMATION AND MAINTENANCE OF HIGH MORAL SPIRIT OF THE TROOPS IN COMBAT

The successful performance of the mission by the officers is possible through their profound knowledge of Marxist-Leninist teachings on the moral factor, understanding of the dialectic unity and interrelations in combat of man and machine, skill in achieving the maintenance of a high moral state among the troops under any conditions of the situation.

1. Role of the Moral Factor in Combat and Means of Building It in the Personnel

Victory in war depends on many factors. Among them an exceptionally important role belongs to the morals of the troops. "In any war," V. I. Lenin points out, "in the final analysis victory comes from the state of the spirit of the masses who spill their blood on the battlefield."[1]

The bourgeois military specialists also agree that the high moral state of the troops "is the most powerful weapon known to man," that "low moral condition of the troops is more dangerous for the army than a shortage of ammunition."[2]

However, recognition by bourgeois researchers of the importance of the moral spirit is not reinforced by scientific analysis of the essence, the means of formation and the maintenance of high moral spirit of the troops in combat. They more frequently reduce the concept of moral spirit to the superclass, biological category independent of the social-political structure of the warring government and the goals of the war. The objective analysis of the nature of the moral spirit unavoidably would lead them to discovery of the true causes and goals of predatory wars, to an indication of the aggressive policy of the material and recognition of the incapacity of the bourgeois structure to serve as a source of moral strength in the

1. V. I. Lenin, Complete Collected Works, Vol 41, p 121.

2. N. Cooplend, PSIKHOLOGIYA I SOLDAT, Moscow, Voyenizdat, 1958, pp 21, 24.

people and the army. Therefore many bourgeois ideologies see sources of moral spirit of the army only in the military organization itself, in the living conditions and activities of the soldiers, in training them to do battle. It is no accident that in the U.S. Army reference "Naval Officers Guide" it is recommended that concern be shown for rest, entertainment and food in order to maintain the moral strength of the personnel.

In the U.S. Army regulations "Psychological Operations" it is pointed out that the psychological effect is the principal means of maintaining the moral-psychological factor on the level of the missions with the most dramatic situations. It is recommended in these regulations that the "moral feelings of love for America" which can become "decisive in the spiritual engine of the troops" be encouraged.[1]

The English military ideologist Letang states that the moral spirit of the troops is determined primarily by the realities of war: the fatigue of the troops, fear, hunger, sleeplessness, weather conditions, and the complex situation at the front. If the command takes measures and eliminates the causes of these negative phenomena, then the moral spirit of the subordinate troops is strengthened.[2]

There is no question that these measures have a defined effect on the moral state of the troops, but they cannot serve as the basic sources for the formation of the moral spirit of the troops.

The tested means of imperialism in maintaining the moral state of the troops is the ideological processing of the soldiers. The basis for it is the homily of anticommunism and antisovietism, the maintenance of the myth of "the communist threat" and "Red danger," the perversion of Marxist-Leninist teaching, the slander of the foreign and internal policy of the countries of socialism, the spreading of the myth of their aggressiveness and together with this the glorification of war, the propaganda of self-seeking bourgeois nationalism, racism and misanthropy. All of this is designed so as to leach out of the people such spiritual qualities as ideology and conscientiousness, to lower the soldier, to extinguish his consciousness, and incite in him the most base instincts and passions.

It is characteristic also that the views and ideas with which they indoctrinate the army personnel do not shine with originality or novelty. In preparing for the Italian campaign in 1796, Napoleon inspired his soldiers: "I want to lead you into the most fruitful plains of the world. The rich countries, great cities will be in your power. You will find honor, glory and wealth there."[3] And later after more than 150 years, during the predatory war in Korea, in the battle for Seoul the American General

1. FM-33-5 "Psychological Operations", 1968.
2. Royal United Services Institute for Defense Studies journal, March 1972.
3. Napoleon, Selected Works, Vol 1, Moscow, Voyenizdat, 1941, p 45.

MacArthur exhorted his soldiers: "Before you is a rich city, in it there is much wine and candy, take Seoul and all of the girls will be yours, the property of the residents will belong to the victors." As is obvious, the aggressors in the past and today strive to incite base passions in the soldiers, to excite a spirit of baiting, violence and plunder. For this educational work, a colossal propaganda apparatus is called on, including the church and special services with respect to questions of misinformation, and the press, radio, movies and television are widely used.

The direction and content of the ideological processing of the soldiers begins with the prerequisites that the role of the armies of the imperialist governments reduces to protection of the "free world." Hence, any actions they take are justified. The propaganda contains discussions of the slanderous fabrications of the "crimes" of the Russians against the Germans in World War II, there are reports on the "corporal punishment system in the socialist army," there are stories about the "Siberian labor camps" planned for future military prisoners. A number of manuals defining the content and methods of ideological-psychological influencing have been written for the realization of this processing.

On the training fields, a situation is created which suppresses the psychology of the soldier to the limit and dulls his emotional susceptibility. Everything is done to "...accustom the soldier to the diabolical atmosphere of fire and death, to achieve a situation such that he will feel good in the fire, smoke and confusion, as in an ordinary situation, and they will act--fire, move and fight."[1]

The ideological and combat training of army personnel performed by the imperialists offers, of course, its "fruits". As a result of this training, the modern armies of the imperialist governments are converted into a dutiful machine and combat for implementation of the aggressive plans of the ruling classes.

In the bourgeois society there are no real, reliable sources for the formation of a high moral spirit of the troops. No artificial effect on the personnel can create a constantly, long-lasting effective force--the moral factor which combined with other factors ensures victory.

Only Marxism-Leninism offers a genuinely scientific solution to the problem of the formation of the high, persistent moral spirit of the troops. It takes into account that the moral forces of the people and the army present a continuous unity and are determined by the nature of the social and government structure, the social-economic relations of the people and the ideology prevailing in the country.

The moral spirit expresses an attitude of the people toward the interests of their homeland, the government policy, the goals of the war, and

1. R. Rigg, "Combat Training of Troops," Moscow, IL 1965, p 13.

it represents their readiness to go through any tests for the sake of the achievement of victory over the enemy. This can be used to explain the fact that the moral strength is always higher in the people who are conducting a just war, who are fighting against aggressors, for freedom and independence of the country.

In evaluating the combat capacity and the moral state of the enemy troops before the Stalingrad operation, Marshal of the Soviet Union G. K. Zhukov wrote: "The satellite troops were armed worse by comparison with the German troops. They had less experience, and they had insufficient combat capacity even on the defensive. The main thing is that their soldiers, indeed many of the soldiers, did not want to die for foreign interests..."[1] Therefore it was no accident that our command dealt the principal blow in the sections where the troops having comparatively low moral strength were located.

The state of the moral spirit of the troops depends to a decisive degree on the nature and goals of the war, the degree of their understanding by the personnel. "The conviction in the justice of the war, the creation of a necessity for sacrificing one's life for the good of one's brothers," V. I. Lenin taught, "raises the spirit of the soldiers and forces them to bear unheard of difficulties... This consciousness by the masses of the goals and the reasons for the war has enormous significance and ensures victory."[2]

Thus, the "moral factor indicates the spiritual capacity of the people and the army persistently to bear any difficulties and deprivations, the most severe tests of war and not lose the will to fight and become victorious over the enemy."[3]

The role of the moral factor in modern warfare has been increased sharply. This is caused primarily by the political nature of a future war. A war, if the imperialists wage it, is with respect to political essence a decisive collision of two opposite social systems which determines the extreme decisiveness of the operations of the two sides. This type of war unconditionally requires complete straining of all of the efforts of the people and the army, it immeasurably increases the responsibility of each soldier and officer for the fate of his country.

The significance of the moral strength of the troops has increased as a result of adopting nuclear weapons, the most destructive and powerful armament and a change in the procedures for armed combat and the nature of modern warfare. Combat operations will assume an exceptionally intense, highly maneuverable nature and they will be distinguished by fast, sharp

1. G. K. Zhukov, "Vospominaniya i Razmyshlevniya" (Memoirs and Thought), Moscow, Academy of Applied Sciences, 1971, p 383.
2. V. I. Lenin, Complete Collected Works, Vol 41, p 121.
3. A. A. Epishev, "Mogucheye Oruzhiye Partii" (Powerful Weapon of the Party), Moscow, Voyenizdat, 1973, p 264.

changes in the situation, mutual struggles to gain time and capture the initiative. All of this has an unprecedentedly strong effect on the psychology of the soldier. Only those personnel convinced of the just nature of the war, having strong nerves and high combat mastery can withstand the tests of the complex conditions of the combat situation. It is not the materiel, however powerful or threatening, but the soldier who has mastered it to perfection who achieves victory in combat. The more complicated the equipment and the more powerful the means of destruction, the higher the requirements on the man, his ideological conviction, combat mastery and psychological tempering.

When determining the role of the moral spirit it is impossible not to consider also the expansion of the scales and sharpening of the ideological struggle between the warring countries. In modern warfare it is necessary to expect significantly greater effect from enemy propaganda on the consciousness and psychology of the people than was practiced in past wars. People with solid ideological convictions devoted completely to the party and the people can withstand the pernicious effect of this propaganda.

All of these facts immeasurably increase the role of the moral factor in modern warfare. At the same time, the high moral spirit is not a congenital quality of man, and it does not arise in him automatically. It is developed as a result of hard, purposeful educational work with the young before service in the army. Being the son of his people, the draftee, just as all members of society, is educated in the spirit of Marxism and Leninism, in accordance with the norms of the moral code of a builder of communism. The principles of this code motivate all of the affairs and the ideas of our people. During the period of army service, active and purposeful formation and reinforcement of the moral strength of the soldier takes place. This process has two aspects--the moral-political and social-psychological aspect entering in continuous unity. During the course of the moral-political and psychological training, all of the intellectual, moral and physical capabilities of man are cemented into a united whole, converting them to one of the decisive components of the combat power of the army--a high moral spirit.

The moral-political training forms a Marxist-Leninist point of view, communist conviction in the troops, it arms them with a deep understanding of the policies of the CPSU and the Soviet government, the essence and the goals of the war, and it reinforces the moral principles in them determining the behavior of people in combat.

The moral-political qualities of Soviet troops are formed primarily by purposeful party-political work. As L. I. Brezhnev noted at the 25th Party Congress, the "complex approach to the statement of the entire business of education, that is, ensurance of close unity of the ideological-political, labor and moral education considering the peculiarities of the various groups of workers" must be manifested.[1]

1. Materialy XXV S"yezda KPSS (Materials of the 25th CPSU Congress), p 74.

It is undoubtedly the fact that in the combat situation the efforts at educational work are aimed at maintenance of constant, high combat readiness of the troops and successful fulfillment of the stated combat mission.

The basis for party-political work is the propaganda of Leninism, the decisions of the party congresses and the resolutions of the CPSU Central Committee and the Soviet government. In these sources and documents there is enormous spiritual wealth ensuring the formation of a scientific point of view in the troops.

The explanation of the problems of the internal and foreign policy of our party and government acquires special significance. The deep understanding of it develops in the troops a sense of patriotism and pride in their country, it develops in them a sense of personal responsibility for the protection of our homeland.

It is impossible morally to prepare the people for combat if we do not explain the goals of the war to them, if we keep them in ignorance with respect to the tests which they can encounter during the course of fulfillment of the combat mission. Every troop must be convinced of the just nature of the war which our people must wage, clearly see the goals of this war, know that the nuclear missiles will be the decisive means of armed combat, but under defined conditions the units and subunits can conduct combat operations only with conventional weapons.

Education is aimed at improving the combat activity of the troops when they perform specific combat missions and skillful action by them primarily when nuclear weapons are employed. During the process of the education work, the troops are indoctrinated with a sense not only of moral but also material superiority over the enemy. The advantage of our weapons is indicated, and at the same time faith in their strength is developed. A convincing demonstration of the weak and strong characteristics of the weapons of the enemy and the characteristics of the procedures for their application in combat helps to develop efficient procedures and methods of doing combat with the means of destruction of the enemy and protection against them in the personnel.

It is no less important to accustom the troops to working with high efficiency on the battlefield, completely giving all of their efforts and tolerating great physical loads. Only under this condition are they in a position to withstand the extreme stress of the forces in combat, especially during the course of combat operations continuously for several days when nuclear weapons are employed.

Greatest attention is given to the education in the personnel of high offensive impetus, which is the primary index of their combat activity. The development of these qualities in the troops follows from the specific nature of the offensive--the type of combat characterized by decisiveness of the methods of operation of the troops, the speed and intensity of their development, the acute struggle for the initiative and gain of time.

The psychological training is organically connected with the moral-political training which affects the consciousness, the reason of the troops and the other aspects of their psychology--will, feeling, tolerance and emotion.

During the psychological training, the personnel develop an inner readiness and capacity to carry out the combat missions courageously in stressed situations that are dangerous to their lives, successfully to survive the most severe tests of wartime and in serious, critical times retain their self-confidence, strength, skill in operating selflessly, actively, and persistently, in complete accordance with communist convictions and moral principles of behavior. The formation in the personnel of such qualities as courage, cunning, discipline, decisiveness, persistence, imagination, and readiness for mutual aid and assistance acquires the greatest significance.

The most important goal of the psychological training consists in teaching the personnel to overcome fears occurring under dangerous conditions to withstand the sudden effect of powerful stimuli. Here it must be considered that the manifestation of fear, in contrast to fright, is caused not by direct stimuli, but the expectation of danger. Therefore before the application of a nuclear weapon by the enemy some soldiers can manifest confusion or apathy. On occurrence of a dangerous situation fear can paralyze the will of man, taking away his capacity to control his actions. The prevention of these harmful phenomena is possible through developing solid faith of the troops in their forces, knowledge of the destructive effect of the weapon and expedient means and methods of defense.

In psychological training, along with the personal characteristics of the troop, the specific nature of his duties performed during the course of battle is taken into account. Thus, the personnel of the reconnaissance subunits, the special crews whose job is to minimize the consequences of nuclear attack must act under conditions of constant danger of irradiation and burns. Their psychological hardening can be achieved by systematic exercises on the training fields permitting convincing simulation of the conditions under which it is necessary to perform in combat.

The critical and dangerous situations during the course of battle cause equal psychological stress in the commanders. Initially the stress that occurs can increase the fitness for work, but then lead to disruption and disorganization of its activity. "The commander experiences on the battlefield..." Marshal of the Soviet Union M. V. Zakharov wrote, "the same thing as a soldier, but as the leader he must also make scientifically substantiated decisions, answer for the fate of the battle, the fight, the operation, the life and activity of the people subordinate to him."[1] The complexity of his work increases as a result of the fact that in the majority

1. M. V. Zakharov, "O Nauchnom Podkhode K Rukovodstvu Voyskami (Scientific Approach to Troop Management), Moscow, Voyenizdat, 1967, p 59.

of cases he is forced to make a decision without having exhaustive, complete data on the situation, having extremely limited time for generating the decision.

In addition, skill in doing psychological battle with the enemy is required. The battle is not only a collision of forces, weapons and people, but also a battle of minds, wills, tenacity, the effect on the psychology of the enemy in order to generate doubt in him, indecisiveness, and confusion, and to force him to abandon his intentions.

During the process of psychological training it is important to teach a man skill in the control of his behavior in combat and to be always ready so that any test will not turn out to be unexpected for him. Of course, no one can completely eliminate stress when in a dangerous situation. With the corresponding psychological hardening, the man, in spite of the effect of powerful stimuli and the strain caused by them, does not lose the presence of a spirit, does not lose mastery and skills, but, on the contrary, mobilizes all of his capacity, his strength of will for successful actions corresponding to the most complicated situation.

The generation of such qualities is achieved to a significant degree when performing exercises before the battle under conditions approaching battle conditions to the maximum. In order to form emotional-volitional stability it is fully justified to apply such procedures as the firing of artillery, mortars and tanks over the heads of our own troops, firing machine guns and submachine guns from behind the flanks and in the gaps between the subunits; attacking the motorized rifle subunits after a rolling barrage; dropping bombs directly on the attack targets, overtaking the personnel with tanks, the throwing of hand grenades, negotiating mine fields, log obstacles, flooding, sections of contamination and destruction; forced crossing of rivers using the means at hand; simulation of the external picture of the battle, and so on.

The specific content and direction of the measures with respect to improving moral strength of the troops are varied. They are differently manifested when fulfilling each mission by the troops.

The application of various measures creating a situation of risk and danger causes high nervous strain in the troops, it accustoms them to the complex conditions of the combat situation, it forms solid will, bravery, decisiveness, combat activity, readiness to withstand serious combat tests.

During the course of the training exercises performed under conditions approaching the combat situation to the maximum, a proper representation of combat is formed in the officers, the capacity objectively to estimate the combat capabilities of our troops and the enemy is developed, a fast reaction to the changes in the situation develops, skills are acquired in proper evaluation of the real scales of the danger in combat.

The development in the officer of the capacity to act on the field of battle decisively and skillfully even with incomplete data on the situation, the presence of subunits that are not to full strength and high activity on the part of the enemy have important significance. In the case of insufficient professional and psychological training the officer, falling into complicated conditions, more frequently lowers the combat capabilities of his troops and uncritically evaluates the possibilities of the enemy, and hence makes unfounded decisions.

The performance by the officer of his duties under conditions which are close to the combat situation will promote the development in him of the necessary moral-psychological stability. It is important that the situation created in such training exercises excite the commander to manifest skill, decisiveness, independence, intelligent initiative, and readiness to take a justified risk for the sake of fulfillment of the mission.

Here the moral-psychological qualities of the officer become a real force in the control when they are supplemented by firm knowledge of the rules and regulations, the combat materiel and also the comprehensive knowledge of the enemy troops, their weapons and tactics.

2. Procedures for Maintaining High Morals in the Troops During Combat Operations

Combat experience confirms that it is most difficult to ensure the moral strength of the troops immediately at the beginning of combat operations. This has many causes. There is a sharp transition from peacetime conditions to wartime. The personnel are not experienced under fire; they have no combat experience. Approaching suddenly, the enemy will apply new combat means or new methods of utilizing previously existing means from the beginning of the combat operations on a broad scale. It is known, for example, that at the beginning of World War II the mass application by the enemy of tanks and aircraft, striking deep, cutting blows, the creation of conditions for encirclement in individual cases had a negative effect on the combat capacity of a defined troop unit. A sense of fear and uncertainty of their own strength arose among some of the troops. However, on finding methods of counteracting the enemy and also on improving combat mastery, improving the moral-psychological state of the troops, this fear was more successfully overcome.

With the use of nuclear weapons on the battlefield there are still more such phenomena and unexpected events. This is especially true in that the destructive properties of nuclear weapons have only been determined experimentally, under testing conditions. It is not excluded that on the use of nuclear weapons by the opponents on a battlefield, the concept which was developed during peacetime about their destructive characteristics and the methods of using them will change sharply, which requires corrections to be made in the combat procedures and, consequently, in the training of the personnel.

One of the causes of breakdown of the moral spirit of the troops is unquestionably the constant threat of nuclear strikes by the enemy and the absence of confidence in the reliability of the means and methods of protection against the destructive factors, in particular radioactive contamination.

On use of nuclear strikes by the enemy and during operations in the zones of contamination, destruction and fires, some part of the personnel will exhibit excessive caution, leading to a slowdown and a premature rush to get medical treatment.

The maintenance of high moral spirit among the troops when conducting combat operations in radioactive contamination zones will acquire exceptional significance and the finding of effective means of solving this problem. The basic means is the performance of carefully thoughtout and purposeful educational work, mobilizing the personnel to active operations, the taking of the necessary protective measures and elimination of the consequences of the use of nuclear weapons by the enemy.

Under these conditions, the level of combat training of the troops and their internal readiness to conduct active operations with complete stress on their forces will have decisive significance in the performance of the stated mission. This readiness is made up of ideological conviction, certainty in the strength and power of their weapons and materiel used according to the plan of higher headquarters, unconditional faith in their commanders. This is also promoted by the firm knowledge by the troops of the means of combating the enemy. "...If each one sees and knows," M. V. Frunze wrote, "what can be sent against him and in practice foresees the application of these technical means, then we have achieved a great deal in the meaning of combat education and combat hardening of the personnel of our Red Army."[1]

"Man is so created," said Admiral Makarov, "that he will go to certain death when the danger to him is known, but he is afraid of even the sound of bilge water if he is not accustomed to it."

In turn, it is required that a special approach be exhibited to those for whom a serious inhibition has developed causing a benumbed attitude and indifference to the situation and immobility. In order to restore the psychological equilibrium it is necessary to talk with them, calm and direct them to the performance of the required protective measures and then by giving commands, cause activity and direct attention to the fulfillment of the stated combat mission under the most complicated conditions.

In order to overcome the benumbed attitude and neutralization, the personal example of a comrade, a certain command from an officer, an inspiring word from a political worker can be effective. Then the man more

1. M. V. Frunze, Selected Works, Moscow, Voyenizdat, 1965, p 446.

quickly overcomes his confusion, suppresses his instinct for self-preservation and begins active participation.

With a decrease in the seriousness of the damage and preservation of the psychological strength of the personnel during troop operations under radioactive contamination conditions, observation of a strict regime, discipline and skillful use of the protective properties of the terrain acquire special significance.

However great the losses suffered by the subunits from nuclear attacks, it is important that the personnel remaining not lose their combat capacity or faith in their own strength. The persistence and activity in the performance of the stated mission under any condition is an index of the high moral spirit of the troops. Here, evaluating the developed situation, it is necessary to begin with the real relation of forces and materiel and also the moral state of the enemy troops on whom a powerful answering nuclear strike has been made. Daring and courageous action under these conditions can ensure victory. The moral strength of the enemy can be broken by the decisive operations of our troops, a deep rush into the depth of his defenses, the application of strikes to the flanks and rear, the conduct of active combat operations day and night. The successful advance promotes lifting of the moral spirit, instills courage and confidence in their strength and at the same time generates a sense of defense against the effects of nuclear weapons, for being in direct contact with the enemy complicates the use of nuclear weapons.

It follows to see the principal factor of recovery among the troops of psychological stability in the successful solution of the combat mission. In whatever state the subunit turns out to be after the enemy makes the nuclear strike, if the commander has been skillful in comprehensively evaluating the developed situation in a short period of time and making a well-founded solution and mobilizing the subordinates for its execution, then in this case all of the alarm and danger of the troops can be overcome by their active movements.

During the course of fulfillment of the combat mission, the measures corresponding to the removal of excessive stress will have important significance. Here the decisive role is played by the personal communication between the commander and the party and political apparatus with the subordinates, a well-thoughtout placement of communists and Komsomol members, the appearance of the subunits in the second echelon or reserve or from the damage zone, alternation of the combat operations with rear, organization of regular nutrition, timely rendering of aid to the wounded and sick, the suppression of rumors and the panic mood, and so on.

The encompassing of all of the personnel during the course of combat operations with political influence depends to a great extent on the proper placement of the communists and the Komsomol members in the subunit so that in each of them a strong group of active party members will constantly exist--the combat nucleus capable of retaining its strength under the most

complicated conditions, high discipline, the manifestation of courage, inspiration from the feats and the intelligent action of the other troops. Specific missions are stated for the communists and the Komsomol members to perform individual work with each soldier and sergeant.

The maintenance of high moral spirit of the troops leading the combat operations in the contamination zones depends to a high degree on the effectiveness and timeliness of the measures with respect to radiation reconnaissance, elimination of the consequences of the enemy's nuclear strike, and maintenance of strict order on the paths of movement and in the rear of our troops. Therefore, the subunits performing these measures must find itself under strong party-political influence.

The smallest manifestations of confusion or panic on the part of the individual military servicemen must be suppressed immediately. In order to prevent such dangerous phenomena it is necessary, in addition to constant explanatory work, to plan a number of organizational measures.

An important role in the maintenance of strict order on the paths of advance and in the rear of our troops and, perhaps, in preventing undesirable consequences for the outcome of the battle goes to the commandants subunits. Therefore, the educational and organizational work in these subunits must be given special attention. The commandant's detail includes the most experienced and trained officers, sergeants and soldiers from among the communists and Komsomol members capable of suppressing possible disorganization and spontaneous action of individual troops with a heavy hand.

In overcoming the elements of fear and disorganization, the spoken word can at times turn out to be irreplaceable, and especially the personal example of the commander and the political worker. They are obligated by personal influence to restore the combat spirit of the demoralized subunit, overcome the moods of depression, eliminate uncertainty in their strength, mobilize the personnel to the conduct of decisive combat operations.

The role of the force of the example of the commander is great. V. I. Lenin, studying Napoleon's book "Thoughts," wrote the following sentence: "...In each battle there is a time when the bravest soldiers have a desire to run after the greatest effort; this panic is generated by the absence of faith in his own courage; an insignificant event, a pretext is sufficient to return this faith to him; there is a great art in doing this."[1] Personal respect, self-confidence, and the firm decisiveness of the commander can return this "faith in his courage," exclude the manifestation of panic, turn the course of events in the required direction, for the "personal influence..." emphasized V. I. Lenin, "means terribly much."[2]

1. V. I. Lenin, Complete Collected Works, Vol 29, p 357.
2. V. I. Lenin, Complete Collected Works, V-1 47, p 54.

In the system of party-political action on the personnel, an important role must be given to the popularization of the heroic deeds and advanced experience of the combat operations of the troops under the conditions of the use of nuclear weapons. The importance of this work comes primarily from the fact that during wartime the methods and means of protection of the troops from nuclear weapons will be continuously improved as combat experience is accummulated. The command, the headquarters and political organs must make comprehensive use of this experience and introduce the most valuable methods and procedures of both individual soldiers, sergeants and officers and entire subunits into practice. The advanced experience is disseminated by various means, primarily by personal discussions of the commanders, the staff officers and political workers with the troops and also sending them reminders and other printed materials.

The role of the commander and his deputy with respect to the political unit is exceptionally great in maintaining the moral spirit of troops. When making a decision for combat operations, they are obligated not only to estimate the available moral possibilities of subordinate troops but also to note specific measures with respect to their maintenance or strengthening. For this purpose, the commander directs the party-political work, orients the subordinates to the difficulties which can be encountered by the troops during the performance of the missions and determines what measures with respect to moral-political training, when, where and by what means to operate.

Directing the party-political work, the commander participates directly in the most important measures, using every possibility for personal moral influence on the subordinate, especially from the subunits which have suffered great losses and, consequently, have suffered serious moral breakdown. Not only is the content of the special measures with respect to maintaining the high moral spirit of the troops, but also the behavior, the tact of the commander, the staff officer and political worker must become an additional factor which strengthens the political influence on subordinates. By their tenacity, coolness, calm, strength and confidence in victory, they must educate and support similar feelings and qualities in the subordinates.

It is important that the subordinates not only receive the missions in a timely manner, but also that they properly understand and note the methods of carrying out the missions that correspond to the situation. The situation will change quickly and sharply. These changes are brought to the subordinates in the required volume, in order to prevent surprise by the enemy, including his psychological diversions.

This type of diversion will be aimed at undermining the moral spirit of our troops. In the special handbooks on the conduct of psychological warfare published in the bourgeois countries, the procedures are reflected and recommendations are made on how to compel the enemy soldiers to desert, to surrender and commit other amoral crimes, undermine their competence and their strength, weaken their will and seed panic. All of these procedures will be used on a broad scale from the very beginning of the war. Therefore,

such operations by the enemy must not be underestimated. They must be combated by more powerful ideological weapons permitting neutralization of the slanderous effect of the bourgeois ideology on our troops. In addition, it is necessary to do active political work among the troops and the population of the enemy to break down the moral-combat spirit of their forces at the front and the population in the rear, paralyze their will to resist and incline them to get out of the war by antiwar demonstrations and operations.

The basic content of this work must be explanation of the just goals of the war waged by the countries of the socialist fraternity and, on the contrary, the unjust nature of it on the part of the imperialist governments, a truthful discussion of the economic and military power of the socialist countries, unmasking the lies and rumors of imperialist propaganda; objective demonstration of the unavoidability of victory of the socialist fraternity in the war, explanation of the weakness of the imperialist coalition and indication of the paths of withdrawal from the unjust war.

This work must be purposeful and specific. It is planned in accordance with the combat mission performed by the subunits which means that it is directed against the enemy group which is to be routed. For this purpose, the moral state of the personnel, their strength and psychological hardening are carefully studied, for which various sources are used: the radio interception data, interrogation of prisoners and the local population, intercepted letters, diaries and other materials and documents. As a result of studying these materials, the commander discovers and more precisely defines the strong and weak points of the moral preparation of the enemy during his decision making and plans active measures to intensify the moral effect on the enemy in order to achieve that destruction.

Measures against propaganda and ideological diversions of the enemy are taken by all, but in accordance with a united plan. In this respect, the experience of the counterpropaganda in World War II by the political organs, the party and Komsomol organizations, commanders and staff has not lost significance.

The basic efforts of the Fascist propaganda were aimed at spreading the myth of the undefeatability of the German Army, the superiority of their weapons and materiel, calls to surrender and cease resistance, inciting disputes among the different nationalities, and so on. It is sufficient to state that during the period from June to October 1941 the Fascists dropped 400 million leaflets over our troops.[1] During the battles outside Leningrad, 15 million leaflets were dropped.

In the struggle with enemy propaganda, various forms and methods were used. The basic forms of the ideological battle with the enemy were the following: printed and oral propaganda, radio propaganda, visual agitation.

1. Yu. Chernyak, "Khimery Starogo Miry" (Chimeras of the Old World), Moscow, Molodaya Gvardiya, 1970, p 204.

Among them the primary role was played by printed propaganda. Its basic forms were leaflets, bulletins, circulars, newspapers, letters, brochures, journals and books.

Along with the printed propaganda, oral propaganda has also become widespread. It was carried out by the political organs using special loudspeakers. The radio propaganda was handled through the military and captured radio stations and also the civilian radio stations in the cities at the front. Posters, transparencies, slogans, and boards with agitation calls found application in the visual agitation. Our counterpropaganda in specific examples demonstrated the weakness of the combat and moral state of the Fascist army and the fall off in military production. It revealed the bestiality perpetrated by the Nazis on the military prisoners and peaceful population and it taught hatred for the invaders. Our counterpropaganda was distinguished by an offensive nature and was one of the most important areas of ideological-political work providing for improvement of the moral spirit of the troops, strengthening of discipline, organization, education, political maturity, conviction and personal responsibility of the troops of model conduct of the combat missions.

The experience in combat against the undermining propaganda of the Fascists during World War II has not lost its significance, for the imperialist countries have completely armed themselves with the basic goals, means and methods used by the Nazis.

CHAPTER 9. MONITORING DURING TRAINING AND IN THE COURSE OF COMBAT OPERATIONS

1. Monitoring Problems and Techniques

Combat troop control is based on the certainty of the commanders that his subordinates will carry out the combat missions assigned by him exactly and in time. This belief begins with the prerequisite that the subordinates take complete responsibility for performing the mission. Therefore, they must not overlook details, and they must have the capability for manifesting initiative and at the same time acquiring faith in their own troops and in the success of the battle.

It is important in this case that the subordinate commanders know and constantly feel that they are not alone in combat. Believing in them, the senior officer constantly sees to the course of combat and can at any time render assistance to them with all the forces and materiel that he has available. However, this assistance is possible only under the condition of knowledge by the senior officer of the course and the results of the performance of the combat missions by the subordinates. Hence, the unquestioned requirements: "Believe and check." At the same time the checking is not an extraordinary measure calculated to "trap," "expose,"* its primary and "more complex goal is to check the correctness of the work... check the system of organization of operations; insurance of the highest productivity of the operation..."**

The general purpose of the monitoring reduces to checking the readiness of the subordinate troops for combat and the results of the performance of the combat missions by them with simultaneous rendering of practical aid to them. The specific goals and methods of monitoring are derived from the content of the combat mission and the conditions of the fulfillment of it, especially the level of training of the subordinate commanders and staff and the presence of time. Theoretically monitoring is carried out in two directions: on the one hand, the commander controls the operation of the staff,

*V. I. Lenin, Complete Collected Works, Vol 44, p 127.

**V. I. Lenin, Complete Collected Works, Vol 37, p 339.

the chiefs of combat arms and services directly subordinate to him, and on the other hand, the commander and the staff, chiefs of combat arms and services subordinate to him jointly check the activity of the subordinate troops by a united plan. Each of these areas is characterized by a special monitoring problem.

The commander sees to the correctness of the execution of the operations with respect to maintenance of constant combat readiness of the troops, planning and comprehensive support of combat operations, the conveying of the combat missions to the responsible agents and also the organization of the interaction, the control points and communications points in time by the staff, the chiefs of combat arms and services. As for the monitoring problems with respect to the line of subordinate troops they are greater with respect to volume and are more varied with respect to content. They encompass the most important aspects of training and activity of the subordinate troops and their control elements. Most frequently and above all the following are checked: the state of the art with respect to combat readiness of the subunits, the timeliness of obtaining and correctness of explaining the combat missions by the subordinate commanders, the correspondence of their decisions to the attention of the senior officer, the correctness and completeness of realization by the subordinates of the measures for interaction, the comprehensive study of the combat operations, the organization of control and communications points.

The checking of the state of the combat readiness of the subunits is a primary mission. During its accomplishment, the degree to which the subunits are supplied with personnel and various materiel, their provision with everything necessary for combat and life and also the level of combat and political training of the personnel and other problems of constant readiness of the subunits are established.

It is obvious that all of the remaining monitoring missions, especially with respect to the support measures, are connected to one degree of another with checking and maintaining the combat readiness of the subunits. Thus, checking the readiness of the subordinates to defend against enemy nuclear weapons reduces to the discovery among the personnel of the subunits of individual protection means, the skill in making correct use of them, knowledge and skills of the personnel in observing the safe distribution norms and other protection measures. It is very important to monitor the correctness of the organization of reconnaissance for which knowledge by the responsible agents of the reconnaissance missions, times and methods of executing them, careful preparation of the reconnaissance units for operations and then, the results of these operations with respect to carrying out the stated missions is also tested. It is no less important to check out the correctness of implementing the measures with respect to other types of support, especially camouflage, security and radio counteraction.

The checking of the quality of their work done by the subordinates with respect to planning the combat operations and the reportinf of the missions is done usually with respect to a broad class of problems which cannot

be limited to any one list. One thing is certain: it is necessary to find and state to the subordinates the best means of accelerating and improving the effectiveness of their given work under actual conditions. As for monitoring the organization of the control points and communications points by the subordinates, in a number of other questions their readiness to restore control under the most serious instances of its disruption by the enemy is checked out.

The organization, quickness and secrecy of movement and operations of the troops and the control units in combat depend to a great extent on the commandant's service. Therefore the timeliness and correctness of its deployment and its support in the indicated areas or on the routes are checked. It is considered that the commandant's service itself has a very broad and responsible monitoring function: It is invested with monitoring the procedure for movement or deployment of the troops, camouflaging them, and so on. Thus, the commandant's service has been converted to one of the most important monitoring means and is directly connected with the monitoring techniques which are selected by the superior chief (headquarters) for checking out the subordinate troops.

In combat practice the most effective was the method of sending the duty personnel of the superior control unit to check the important problems directly in the subordinate units. This is understandable, for it is here that the known principle is realized: better to see once than to hear a hundred times. The efficiency of this method is unquestioned. It permits local conviction of the properness of the performance of the measures by the subordin-tes with respect to troop control; in addition, it offers the possibility of local detailed information of the subordinates about the situation, answering the problems that arise among them and also the rendering of specific aid. Therefore, a possibility is found for personal communications with the subordinates and checking out the results of their activity locally.

However, in modern combat conditions for application of this method will not always be favorable. The extremely limited time, complex radiation situation and the speed of development of events--all of these limit and sometimes exclude the possibility for the commander personally or the staff officers to go to the subordinates to monitor them. Most frequently this method is applicable under more or less stable conditions, that is, during the organization of combat or the march and also during the course of combat under conditions where the personal intervention of the chief or staff officers is the only possible or expedient measure to equalize a serious situation that has developed. However, in these cases it is necessary to weigh to what degree a trip to the subordinate location will insure fulfillment of the monitoring goals and whether it is more efficient to use another method.

The monitoring is also realized by studying the verbal or written reports of the subordinate commanders (chiefs) or various written combat

documents developed and sent by them to higher headquarters (orders, and so on). The given monitoring technique can be used both for organization and during the course of combat. Its advantage is that the monitoring problems are solved by studying the data expersed by the subordinates in brief, clear formulations which accelerates the monitoring process. In addition, the recording of the information in the documents improves the responsibility of the subordinates for their accuracy which increases the decree of reliability of the data reported in them.

In the documents, however, the events that have taken place, operations already completed by the subordinates, can be reflected, therefore they quickly become obsolete, which lowers their value. The application of this method is limited also by the fact that it is not always possible and expedient to require that written combat documents be sent out by the subordinates. In addition, not all of the problems (information) needed by the senior officer for monitoring can be discussed in them. All of this emphasizes that the oversights detected by the documents in the operations of the subordinates often will ge difficult to prevent or eliminate, especially during the course of combat when the time for analysis and issuing of the corresponding instructions to the subordinates will be extremely small or not exist at all.

In these cases, direct conversations are held with the subordinates with respect to the communications channels during the course of which the results of the work of the subordinate commanders and staff with respect to troop management and the course of the combat missions are explained. This method permits comparatively fast obtaining of the required information from the subordinates and it makes it possible to give them instructions with respect to elimination of the discovered deficiencies in their decisions or operations. However, even in the given method there are also bottlenecks. For example, the oral reports of the subordinates cannot always correspond to the objective state of affairs as a result of unskillful or inaccurate evaluation of it. Not all of the monitoring goals can be solved with the desired completeness, in particular, the possibility of checking out the work of the subordinates with respect to planning and support of the combat operations as a result of their large volume and complexity is limited. In addition, certain problems for purposes of achieving secrecy of preparations of combat operations cannot be discussed in general over the technical communications means. Therefore monitoring by conversations with the subordinates over technical communication means is used only for the solution of simple problems: checking the time of reception of combat orders by the subordinates, the time of passage or engagement of lines (targets) in combat, and so on.

Inasmuch as each of the investigated monitoring techniques has advantages and disadvantages, they are used in combination and in a way as to more completely use the stronger aspects of each of them when organizing monitoring under actual conditions.

2. Organization and Realization of Monitoring

The organization of the monitoring includes determination of the purpose and the goals of the monitoring, the development of the monitoring plan, the conveying of the contents of the monitoring plan to the duty personnel participating in its implementation, training (instruction) of these personnel in doing the monitoring, determination of the procedure and time for reporting the monitoring results.

These problems are resolved depending on the actual conditions and the scale of the troop echelon. In the control units where there are no staff headquarters, the monitoring is organized and conducted by the commander himself. Where there are staff headquarters and other control units, the monitoring is realized somewhat differently (Figure 32). Unconditionally, even here the role of the commander is significant. He defines the problems of monitoring the work of the subordinate commanders and staff, he gives instructions to his staff, when and how best to implement them. The commander participates personally in the monitoring, checking the accuracy of the performance of the most important missions and measures by the subordinates. In addition, the special duty of the commander is to monitor the quality of the work of the subordinate control apparatus, especially the headquarters unit which usually performs a significant volume of work.

The staff plans the monitoring, it conveys the monitoring missions to the duty personnel participating in it, it trains these personnel for implementation of the monitoring, it directly participates in the monitoring, generalizes the results of monitoring and assistance to the subrodinates and reports them to the commander.

The planning of monitoring includes specification and definition of the procedure for carrying out the monitoring missions, that is, what, where, in what sequence and when to check, which methods to use while calling on which duty personnel to implement the monitoring, when and in what form to request the monitoring results to the commander.

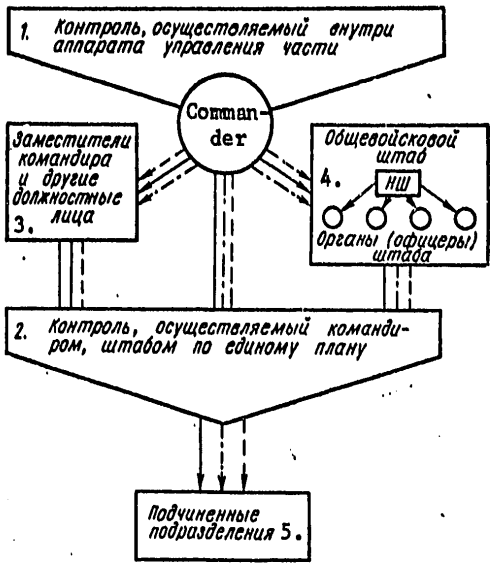


Figure 32. Organizational monitoring

Provisional notation: ←——— Personal report (observation)
←– – —— Study of documents and oral reports
←– – – – With respect to technical communications means.

Key: 1. Monitoring realized inside the unit control apparatus
2. Monitoring realized by the commander, the staff by a single plan
3. Deputy commander and other duty personnel
4. Combined-arms staff, staff unit (officers)
5. Subordinate subunits

The content of the monitoring plan is discussed in the form of short items (notes) in the work notebook of the commander (the chief of staff), and if there is time, then in a special document with approximately the following form:

"I approve"

Unit commander _____
(rank, surname)

Date

Plan for Monitoring the Preparation of the Unit for the Offensive

Order No.	Goals of monitoring	Who monitors	Monitoring Time	Who does the monitoring	Who, how and when to report the monitoring results
1	Occupation of the initial position for the offensive, and so on	3rd motorized rifle battalion	1800 hours to 2100 hours on 4 August	Deputy commander of the unit	Unit, commander orally at 2130 hours on 4 August

Unit headquarters chief _____
(rank, surname)

The requirements imposed on monitoring are as follows: purposefulness, that is, checking out the basic problems where required by the situation; time limits of monitoring, that is, performance of it calculating the prevention of deficiencies in the work of the subordinates; combination of the testing of the quality of the work of the subordinates with practical assistance to them.

The execution of the planned monitoring goals is achieved by a combination of various methods. They are combined with respect to time so that the problems of primary importance of interest to the commander can be checked by various methods simultaneously or at different times and so that a prolonged separation of the subordinate commanders from the subunit control does not occur. Let us assume that the commander has made the decision to apply a fire strike against the enemy during the course of combat, but he doubts the accuracy of the report of the commander to the subordinate subunit with respect to the line reached by him. In addition, knowledge of the true position of the subunit is very important, for it operates in the direction where the target of the fire strike is located. For checking and more precise determination of the position of the given subunit it is possible to combine several methods: sending out the staff officer on the mobile means for visual observation; request of additional data from the subordinate commander or staff with respect to technical communications means, obtaining of these data from the commanders or the staff of the adjacent subunit.

In determining the times and the participants in the monitoring, it is necessary to consider that there will not always be a possibility of establishing time and isolation of the special group only for monitoring. Most frequently, when training and especially during the course of combat the monitoring must be done simultaneously with the performance of other measures with respect to troop control. Thus, along with the conveying of

the combat missions to the responsible agents, the correctness of their explanation by the subordinate commanders is checked. Then their work is monitored by the decision making and realization of the measures with respect to the support of the combat operations.

The proper estimation of the quality of the work of the subordinates, the discovery and elimination of deficiencies in it, is a problem which can be solved only by competent and trained officers. Therefore monitoring, for example, of the training and the operations of the artillery subunits or the subunits of the special troops is carried out by the officers having the corresponding service work profile.

The problems resolved on the monitoring level are tied to the measures with respect to monitoring the higher levels, in order to avoid duplication, that is, simultaneous testing of certain subunits with respect to certain problems. On the basis of the plan for the monitoring developed by the combined-arms headquarters, the chiefs of the combat arms and services can if necessary develop their special monitoring plans, detailing in them the problems of the methods of monitoring the subunits of their combat arms or services.

However well the officer is trained with respect to the profile of his service activity, being designated for monitoring, he is obligated carefully to prepare for this work. This is especially important for the officers who are monitoring by the method of personal intercourse with the subordinates. The officer present among the troops is an authoritative representative of the superior chief. He must carry out the will of the commander, exhibiting persistence and decisiveness in the requirement of accurate execution of all of the planned measures by the subordinate commanders or staff headquarters. However, the authority of the officer present for monitoring depends entirely on the quality of the work done by him and the assistance which he has rendered the subordinates, correcting deficiencies and inaccuracies in their work. In order to correct, it is necessary to know how to correct. It is necessary, as V. I. Lenin emphasized, "first of all, to study and study the conduct of a matter in an institution, enterprise or section, and so on; secondly, it is necessary to make the required practical changes in time and implement them in the affairs."* This is the point of view from which the officers are trained to monitor.

In staying with the troops for checking, each officer explains his special goals, he studies the conditions and plans the procedure for carrying out these goals. The initial data required is picked up from the monitoring plan and is conveyed to the officers sent to perform the monitoring in advance so that they can prepare and coordinate their participation in the monitoring with the other forms of operations with respect to troop control. These data are brought to the officers most frequently by

*V. I. Lenin, Complete Collected Works, Vol 44, p 127.

the commander or the chief of staff personally in the operating procedure and, first of all, to those who are sent to the troops for the performance of the most important and urgent monitoring problems.

When selecting the procedure for realizing the monitoring, the following are established: the root that is convenient from the point of view of speed and safety; the time of arrival of the subordinate commander at the control point; where the control is to begin and in what order; when and where considering the movement of the control point he will return after carrying out the monitoring missions and how to put the results. The underestimation of these problems leads to disturbance of the monitoring plan with all of its consequences. Thus, failure to take into account the importance of selecting hidden, safe paths (directions) of movement to the monitoring targets leads to unjustified losses from enemy fire or the effects of its dispersion-reconnaissance groups. Lack of knowledge of the location of the subordinate control points where it is necessary to go for monitoring or the location of the control point at the time of return to it from the subordinate locations leads to the fact that the officers lose a great deal of time uselessly and therefore do not participate in the routine work of troop control.

The participants in the monitoring prepare for its realization depending on the nature of the monitoring problems. If, for example, it is necessary to estimate the correctness of the decision of the subordinate commander, then the person doing the testing must first study the decision of his commander and analyze in detail the conditions of implementing it to the subordinates. A study is especially carefully made of the situation at the front line of this subunit to which the officer is sent for monitoring; here the situation is studied not only at the given time but also considering the prospects for its change and development during the course of combat. Without this preparation it does not deal with the problem of checking the expediency of the decision of the subordinate commander and, of course, cannot be of specific assistance to him. The corresponding training is required also when checking the more narrow problems, for example, the development by the subordinates of measures for reconnaissance or other types of support. Striving to see that the testing is objective and complete, the officer conducting it studies all of the orders and the data serving as the basis for the development of these measures by the subordinates.

Often for checking the performance by the subordinates of a set of measures related by a single goal, for example, with respect to restoration of combat capability, it is necessary to send out a group of officers. This group is instructed usually by a commander or staff chief. The officers primarily are oriented on the content of the orders given to the subunit to which they are sent for monitoring. The possible procedures for the combat use of this subunit after restoration of the combat fitness is reported to them. As a result they are given instructions as to how and about what to inform the commander of this subunit, what, when and how to check and render aid locally, when and how to report the results of the work done. The efforts of the group officers are aimed at checking the performance of the basic measures by the subordinates in time.

The monitoring is done so that there will be no necessity for the subordinate commanders to take leave from their work. When visiting the subunit to check them out, in a number of cases it may be justifiable to observe the course of the work of the commander or explain interesting data to the chief of staff and other responsible agents. When monitoring over the communications channels it is also desirable to vary the procedures for obtaining and checking the interesting data. It is not always efficient for checking and more precise determination of one problem or another to hold direct conversations with the subordinate commander and staff officers. To save the time of the subordinate commander it is possible to limit ourselves to listening to his conversations with the commanders of the subordinate levels by connecting to their radio network.

During the course of monitoring, the monitoring results are summed up which are recorded in the work notebooks of the duty personnel called on for this purpose. The actual state of the checked problems, when and how they were checked out and the brief contents of the instructions given to the subordinates with respect to eliminating the discovered deficiencies are recorded. All of this is reported in oral or written form to the commander or the chief of staff, who, to an equal degree must constantly know the following: the degree of readiness of the troops for the operations, what they have done and what remains to be done, what difficulties are encountered among the subordinate troops and what it is necessary to undertake to eliminate them in the shortest possible time.

The evaluation of the monitoring results is also carried out from the point of view of improving the methods and achievement of educational goals with respect to the subordinates. During the monitoring process, the genuine executive qualities of the subordinates, their advantages and deficiencies are discovered. At the same time the subordinates are trained to critically evaluate the results of their work. The sense of personal responsibility for the matter at hand and the creation of the necessity for improving the level of their knowledge are improved. Therefore the meaning of monitoring is greatly enhanced if the results are instructively discussed in time. The subordinates receive only what will promote improvement of combat troop control.

CHAPTER 10. STUDY OF COMBAT EXPERIENCE AND CONVEYANCE OF IT TO THE TROOPS

1. Organization of the Work of the Control Units With Respect to the Study and Dissemination of Combat Experience

The significance of the combat experience is determined by the fact that war is a severe higher school in checking the combat readiness of our troops and the correctness of military theory developed under peacetime conditions. Only during the course of the war is it possible to discover and evaluate the genuine views and possibilities of the enemy for conducting combat operations with sufficient completeness.

Thus, the study of the comparison of the true views and results of combat practice of the opponents permits us to find the best means of improving the composition, the organizational structure and combat use of our troops. This explains, for example, the fact that during World War II the composition and structure of the combined-arms unit of the Soviet Army were changed three times, by which their combat capabilities were improved. The normatives and the methods of their combat use were more precisely defined, respectively, which was reflected in the regulations which were also revised three times during the war years.

Now, as is known, the means of armed combat have changed greatly, and under their effect, the nature and the methods of combat operations, and the practical combat experience in their application does not exist. Therefore with the beginning and during the course of a war to a greater degree than before it will be necessary to refine, alter and develop views of the combat application of the troops more than once.

The control units for the study and dissemination of combat experience are being trained in advance, in peacetime. The volume and the content of their given work are variable and they depend on the type of combat operations, the assigned mission and the actual conditions of performance. However, under any conditions their efforts are distributed so that the basic problems will be solved as completely and objectively as possible which consists in the fact of discovering the following: the state of the combat readiness of the enemy troops and by what means he will support it;

the possession by the enemy of nuclear weapons, combat characteristics and principles for the use of these weapons; composition, technical equipment and organizational structure of the troops; new methods of conducting and insuring enemy combat operations, their strong and weak sides; the system, methods and means of controlling the enemy; the possibilities and methods of operation of the enemy with respect to the disruption of the control of our troops; the effect of new means of combatting and the operations of the enemy for the methods of operation of their troops, their composition, organizational structure, the control of them, support of their combat operations. These and other goals are resolved so that as a result of the study and consideration of the data from combat experience surprise on the part of the enemy will be excluded.

All of the duty personnel and control units will participate to one degree or another in the study and dissemination of combat experience in each link. All of the instructions sent in this case will begin with the commander. During the troop control process, he takes into account everything that is instructed from the previously investigated combat experience. He notes and considers, in particular, everything that is new about the enemy, he plans measures and times for broadening the study of especially important information about the enemy. Everything positive and all the deficiencies in the operations of our troops are also recorded by the commander. He discovers the causes for the deficiencies, he notes the procedures and the times for eliminating them, and also the delivery to the subordinates of everything instructive and valuable for improving their combat mastery. The commander gives the chief of staff instructions, defining in these instructions the missions with respect to the study and dissemination of the combat experience. The commander approves the plan for their execution and then traces the planning precision and the realization by the staff of the measures with respect to the study and dissemination of combat experience and, he personally executes the especially important ones.

The basic part of the work of studying and disseminating the combat experience is done by the staff. The duties of the staff include the following: the development of a plan for studying the combat experience and the conveying of the planned measures to the troops; the gathering and discussion of the data on combat experience and reporting of them in the established times to the commander and higher headquarters, information about new developments of the staff of the subordinate, interacting troops and neighbors; the keeping of notes from oral discussions and instructions of the commander with respect to the realization of the generalized combat experience; the development in accordance with the instructions of the commander and by the available materials of the drafts of the orders to the troops; the keeping of a log of combat operations and the development of other reporting information combat documents; monitoring of the work of the subordinates with respect to study and assimilation of combat experience. These missions are distributed by the chief of staff among the staff officers.

The work at staff headquarters with respect to the performance of the missions is distributed approximately as follows (see Figure 33). The greatest volume falls to the staff officers in charge of operative problems. The participation in the work of other officers is limited only to special problems. Organizing their work, the chief of staff personally carries out the most important and urgent missions, he confirms and describes the information report documents, he draws conclusions, makes reports and proposals to the commander with respect to the investigated problems. He conducts oral discussions connected with the conveyance of combat experience to the troops, and he monitors the execution of the planned operations by the staff officers in time.

The work of the staff is organized so that the basic efforts of their officers will be concentrated in the solution of the primary problems and so that without special necessity the subordinates will not be pulled away from the control of the troops engaged in combat. Provision is also made to make the study and conveyance of the combat experience into a united process in which the most valuable factual data are realized directly by the troops as they are received.

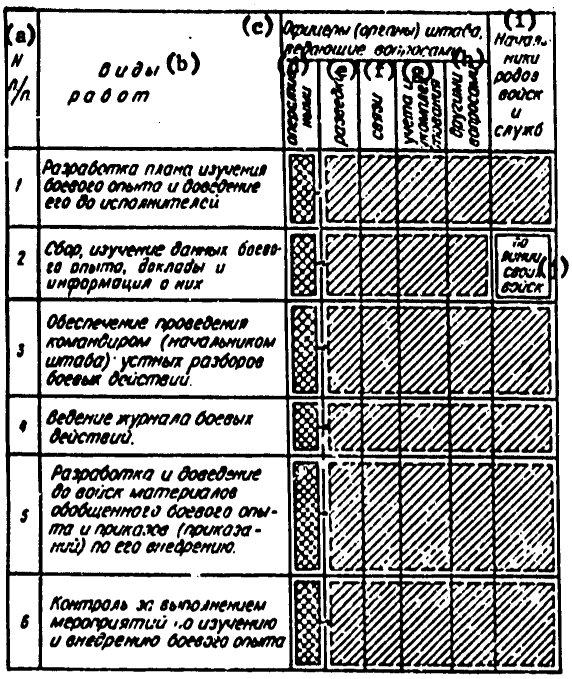


Figure 33. Distribution of work in the staff with respect to the study and dissemination of combat experience.

Key:

a) Item number
b) Types of operations
c) Officers (units) of staff headquarters dealing with the following problems
d) Operative
e) Reconnaissance
f) Communications
g) Reporting and reinforcements
h) Other problems
i) Chiefs of combat arms and services
j) By the line of our own troops.

Provisional notation

Bears complete responsibility for the performance of the operations;

Participates in the work, solving specialized problems.

[Key to Figure 33 continued]

1) Development of the plan for studying the combat experience and conveying it to the responsible agents
2) Gathering, study of the data on the combat experience, reports and information about them
3) Support of the holding by the commander (the chief of staff) of oral discussions of the combat operations
4) Keeping the combat operations log
5) Development and delivery to the troops of the materials from the generalized combat experience and orders with respect to its introduction
6) Monitoring of the execution of the measures with respect to study and introducing the combat experience.

2. Study of Combat Experience

The study of combat experience includes the following: the development of the officer's work plans, gathering, generalization of the combat experience data and its formulation in the corresponding documents.

The plan for studying combat experience has been developed in specific forms of combat or for a more prolonged period of current (forthcoming) operations, during which it is possible to study the problems of interest. The basis for the plan is made up of the instructions of the commander and higher headquarters and also the combat mission and actual conditions for carrying it out. It is important here to predict the development of the situation, to know how to state the most important problems and plan effective methods of studying them. The plan is formulated as a table. It reflects the most important problems of combat experience, subject to investigations; who participates in this; the times and methods of solving the planned problem; when, what reporting documents must be developed and to whom presented; which, by whom, when, where and with whom are the oral discussions of the combat operations or individual tactical examples and other problems to be held.

The content of the plan is reported to the responsible agents in the form of notes or instructions in which the special problems are defined, when and what methods of their execution, in what form the results are to be reported.

The success of studying the combat experience depends primarily on the presence of the required amount of reliable information about it and, secondly, on the approach to its interpretation and evaluation. It is desirable, of course, that this information be as comprehensive as possible, but the systemization and interpretation are no less important.

Information is obtained from many sources and by various methods: a) the trips by the officers and studies made by them of the combat experience on location or observation of the course of the combat operations from

the control points; b) in the form of oral or document information of higher headquarters, interacting troops and neighbors; c) by studying documents captured from the enemy, models of equipment, the interrogation of prisoners and local residents; d) holding conferences and meetings for the study and evaluation of the problems of combat experience; e) the study of the oral reports, the reporting-information and other combat documents coming from the subordinate troops. Generalized materials stored in the headquarters on previous battles are also used.

The work of the officers in studying the combat experience directly among the troops is one of the basic methods. It is used both before the beginning and during the course of combat operations and after their completion. This procedure gives the required effect, but only with appropriate preparation of the officers who are carefully instructed. Clear instructions are given to them: what problems to study locally, what sources (materials) and how to use them, by what time to generalize and formulate the information that is obtained, to whom and when to report. The study of the combat experience often can be combined with the solution of another problem--support of the control of the troops engaged in combat operations. In this case it is important to point out to the officers and to visit the troops in what sequence and by what methods these assignments are to be carried out without losses in quality of each of them.

It is always necessary to consider that the application by the enemy of new materiel and new methods and means of combat operations are first experienced by the troops directly participating in the battle. The advanced experience in operations is accumulated by them. The efforts of the officers sent out for this purpose are concentrated on the gathering and studying of this experience. During the process of studying the combat experience, they hold discussions with the participants in the battle, studying the most instructive episodes and valuable information about the operations of the troops and the control units as much as possible in the field.

In order to study these especially important and complex problems such as the construction of the enemy defense and others, after which combat special groups can be sent directly into the field. They include the representatives of the various combat arms and special troops and also participants in the investigated combat operations from among the officers, sergeants and soldiers. The work of the groups is done by plan which is developed on a map and is approved by the command or the chief of staff. In the plan the following are indicated: the composition of the group and its equipment; the posts (routes, sections) and operating in time in the fields; the problems noted for study at each post (route, section); the procedures for solving especially important problems, the measures for supporting the operations of the group (security, communications, and so on).

The data gathered from various sources are processed, they are plotted first of all on the working maps of the officers and they are entered in the notebooks (the working notebooks) in the form in which they were

gathered. The problems arising in this case for the officers are also recorded. Thus, the facts, the statistical and other information on the investigated problems are systematically accumulated. When studying them not everything, of course, is taken on faith. For example, the summary documents of the subordinates and various types of oral information (the stories of eyewitnesses, and so on) must be carefully checked out, for inaccuracy and subjective evaluations are probably in them. Everything that is duplicated is sifted out, the doubtful is more carefully defined, and the missing information is filled in. This is the continuous process of generalizing the data which serves the purpose of establishing reliability of the generalized data, their importance, the times for formulation in the summary document and delivery of them in accordance with the assignment.

The results of studying the combat experience are reflected in the information reporting documents: the log of combat operations, the summary map, various types of summaries or summary reports or simply in the notebooks of the officers in the form of notes and comments.

The combat operations log is the basic information reporting document. It contains the generalized material for the study and use of combat experience, a complete and objective evaluation of the course and the results of the combat operations is presented. It is kept by one of the officers in arbitrary form. As a rule, the entries in the journal are preceded by the selection of the documents and the materials for the described period: the decisions of the commander, the combat orders, combat reports of the subordinates, the entries from oral orders and conversations over the technical communications means. Carefully studying them, the staff officer keeping the log explains how the combat operations took place, what new information (positive and negative) that influences the result of the combat was discovered.

The entries are made clearly on one side of the sheet and in the following sequence: date (day, month and year); general situation at the front of the unit; enemy--his strength, composition, the presence of nuclear weapons, grouping and tactical density, the characteristic of the defensive lines, the new combat means used by him and new tactical procedures; our own troops--names of all of the subunits entering into the unit, their arrangement, combat and numerical composition; list of unit control officers; position of neighbors and the combat missions carried out by them, ratio of forces; material support of the troops with respect to basic types of equipment; political-moral state of our own troops and the enemy; data on the nature of the terrain and the weather conditions; combat mission of the unit delivered by the senior officer, combat decision of the unit commander, description of the course of the combat operations of our troops and the enemy with respect to the problems solved by the unit and also the work of the control units. The instructive combat episodes and heroic deeds of the personnel, new procedures and methods of conducting conduct operations and other data pertaining to the evaluation of the condition and operations of our own troops and the enemy are entered in the log. The entry in the log after a day of battle ends with short conclusions pertaining to the results

of the performance of the combat mission and a reference to the sources used. The reporting maps, the diagrams of the individual reinforcements (objects) of the enemy, photographs of outstanding heroes, copies of the necessary documents (combat orders, diagrams of the combat orders, and so on) are attached to the log.

The entries in the journal are systematically checked by the chief of staff; it is important that they be made without interruption, fully and objectively. With respect to the course of the control check, the chief of staff gives instructions to the officer keeping the log, with respect to what problems and what conclusions to draw, what to supplement and refine or develop, what appendices to make to the log, and so on. At the end of a fixed time, a copy is made from the combat operations journal which is presented to higher headquarters.

The reporting map is a combat document which is used when filling out the combat operations log, when preparing the analyses, reports and the documents (orders) with respect to the propagation of combat experience. The following are depicted on it: the position and the grouping of the forces and materiel of the unit two steps down, its neighbors and the enemy before the beginning of the combat; the combat mission of the unit and its neighbors; the combat decision of the unit commanders; the course of the combat operations of the unit with indication of the basic changes in the situation and the decisions of the commander with respect to them. During the course of combat various provisional signs (different colors) are used to indicate the basic principles and operations of the unit and its subunit, the reflection of the enemy counterattacks, the engagement of combat of the second echelon, the counterattack, and so on with the detail required for description of the combat operations in the log.

The results of the combat report on the results of generalizing the combat experience are presented to higher headquarters, which usually establishes the volume of the problems and the times for distributing them in it. In this report an estimate is made of the combat operations of the troops for the defined time: namely, the brief characteristics of the results of the combat activity of the unit for the reporting period; the enemy gives a general characteristic of the combat operations, the peculiarities of the organization and conduct of battle, the methods of application of nuclear weapons, the combat arms and the materiel, the new models of armament and their basic tactical-technical specifications, the peculiarities of constructing the defense, the best reinforced sections, individual defense units and the strong points of the enemy occupied by our troops; their own troops--the peculiarities of the combat operations with respect to each combat arms, new forms of constructing the combat procedures and methods of preparation and conduct of combat operations, new methods of controlling the troops and supporting the combat operations of the troops used during the reporting period.

Various types of diagrams, photographs, descriptions of the instructive combat episodes, and so on are appended to the report.

In addition to the indicated reporting and information documents, the data on the combat experience are depicted in various types of emergency and nonemergency combat reports and summaries presented to the higher echelon during the course of the combat operations and also in the combat documents for troop control (the working maps, combat orders, and so on).

All of them have been studied in combination with the other materials and information so as to discover everything valuable from the combat experience and report it to the subordinates reliably and clearly and in time.

3. Conveyance of Combat Experience to the Troops

The combat experience is conveyed to the troops by various methods, most frequently oral instructions, oral reports on the basic results of the combat, the summary written orders, oral analyses of the combat results, the holding of exercises with the subordinates considering the combat experience. As a rule, these procedures are combined and are supplemented by the printed editions published by the superior agencies for all of the personnel--newspapers, memoirs, combat sheets and so on.

The oral instructions of the commander to the subordinates are the most effective and therefore the frequently practiced means of conveyance of combat experience. They contain the dispatch data and the requirements with respect to the introduction of the positive combat experience by the subordinates. The commander gives these instructions during the course of combat, combining them with a performance of measures to control the troops or before the beginning and after the end of combat at the service conferences, reconnaissance meetings and exercises. The instructions are given to all subordinates with personal discussion with them or over the technical communications means. The briefness and clarity, the value of the content helping the subordinates successfully to solve the problem--these are the basic things to which this type of instruction must correspond. Therefore, considering their necessity under actual conditions, the commander gives instructions to the subordinates only after careful training.

Other methods of the conveyance of the combat experience are applied before the beginning and after the end of the combat operations when favorable conditions exist for the gathering of the subordinates and reading of the report to them, oral analysis or holding practical exercises with them.

The summary report is designed for familiarization of all of the officers of the unit with the data from the combat experience obtained in battle. In it there are clear, compressed discussions of the facts and the conclusions from the combat experience with respect to any important phase of battle or the battle as a whole. Therefore the report can be general and special and is made either for the personnel of all categories or only for those on whom the discussed problem has direct bearing.

The content of the report is discussed in arbitrary form, but its thematic and purpose are taken into account. If its purpose is summing up the battle as a whole, then frequently the following problems are briefly discussed in it: the content of the combat mission and the conditions of its fulfillment; the most characteristic peculiarities of the battle to which attention must be given. At the end of the report conclusions are drawn and instructions are presented on how to use the combat experience. The discussion of a more narrow class of problems in the report, of course, is possible. It is usually done by the commander or the chief of staff.

The oral analysis of the combat is made only with the directly subordinate commanders and staff or with all of the officers of the unit (subunit).

The oral analysis can be constructed on this level.

1. The general situation developed at the front at the time of obtaining the combat mission and the conclusions drawn from it.

2. The content of the combat mission and the role of the units (subunits) in the combat.

3. The combat decision of the commander and the content of the work of the control agencies performed on its basis during organization of combat.

4. The conduct of the combat operations: to what degree they correspond to the decision made; the operations of the subordinate troops, what, when and how the enemy will take counteraction against them; the work of the control units during combat; how the subordinate subunits and control units have taken into account everything positive and eliminate the deficiencies discovered in the previous battles.

5. The general conclusions and instructions following from the analysis are as follows: the results of performance by the units (subunits) of the combat mission; what can be considered positive and negative in the operations of their troops; how the new methods of doing battle used by the enemy were counteracted; what must be taken into account in training the troops and the control units, with respect to what basic problems to organize exercises with them and by what methods; what out of the combat experience, in what form, by what method and at what time to convey it to the subordinates in higher headquarters.

This analysis procedure is only one of the possible ones. The number of analyzed problems can be greater or smaller, and they can be considered with a different degree of detail, and if necessary in a different sequence. It is important that it be discussed in as compressed and clear a form as possible. It includes only the most basic and instructive. During the analysis, for example, of the control problems, an effort is made to show in what measure operational efficiency has been achieved in the development of the especially difficult measures and the discovery of the basic

deficiencies in order to avoid their repetition in the future. The course of combat is discussed not in the form of a simple description of troop operations, but in the form of an analysis of the operation of the subunits of various combat arms, commanders and staff with demonstration of what was instructive in their operations, the application of the materiel and what lessons can be learned from it. The evaluation and the conclusions with respect to the combat operations of the troops and the work of the control units must follow from the actual conditions which are analyzed in detail in the analysis process. For the analysis for clarity of the interpretation of the situation, photographs and movies, reports by the participants in the battle, and graphical combat documents (our own and those captured from the enemy) are used.

Preparations are made for an analysis such that it can be held soon after completion of the battle. The officers preparing the analysis explain the topic and the goal in advance, they explain the composition of the participants, the location and the time of the analysis, and they prepare the required topical materials with respect to the basic problems, illustrations, references, and so on.

The exercises with the commanders and the staff of the subordinate troops to study the combat experience are held by various methods--in the form of tactical meetings or group exercises, the staff command training when the troops are in reserve, during rest and relaxation and if possible, in preparing for combat operations.

The holding of this type of exercise when preparing for combat operations, as the experience of the last war demonstrated, is always justified. However, it is necessary that the topics and the training goals correspond to the nature of the forthcoming combat operations and that the acquired combat experience be fully used in the exercises. This is achieved by various methods. In one case, the basis for the exercise can be considered to be the instructive situation of the combat or one of its final steps and considering this situation, develop defined training problems. In another case, an arbitrarily selected tactical background is used for the exercise, and when working out the training problems and during the analysis, constructive examples are presented from combat practice. In addition, the exercise topic can be an analysis of one instructive battle or another or its individual episodes. Depending on the type of exercise and its training purposes, it is also possible to use a combination of indicated methods.

The characteristic feature of modern combat operations is the fast and sharp changes in situation, the consequences of which can now be very serious for any of the operating sides, and their elimination, much more complicated than in the last war. This gives rise to the necessity for finding more effective means and methods of combat and protection, the performance of a growing volume of measures to insure safety of our troops. Therefore the combat experience must be conveyed to the troops more efficiently.

CONCLUSION

The changes that have taken place in recent years as a result of scientific and technical progress in the means and methods of conducting combat operations have had a significant effect on troop control on the part of the commanders and headquarters of all degrees. They have imposed new, increased requirements on the control. Here the following have acquired expecially important significance: high combat readiness of the commanders and the staff for control of the troops literally from the first minutes of the war unleashed by the aggressor, firmness, flexibility, continuity (stability), secrecy and high efficiency of control in any complex situation, including when the enemy launches nuclear attacks on the control point and when he uses mass radio interference on our communications system.

In addition, the practice and the studies performed in the given work have demonstrated that the satisfaction of the enumerated requirements on troop control is a highly complex, multifaceted problem.

For its solution in all of the modern armies it is considered necessary to take a complex approach, to realize an entire system of measures of a technical, organizational and research nature.

The first group of such measures, both in the Soviet Union and abroad, often include the equipment of headquarters with the latest technical control means, especially the means of mechanization and automation of the control processes which constitute the scientific-technical base of modern control. This opinion is entirely well founded. Practice confirms that without the perfection of the troop control techniques it is impossible to satisfy the requirements now imposed on it. In addition, the latest achievements of science and engineering permit the given opinion to be considered not only substantiated but also actually realizable. However, the given path cannot be considered the only one. The staff commanders cannot wait passively until they have a theoretically new control technique and equipment. They have great possibilities for improving control on the basis of the already existing technical means.

Many researchers consider the second group of measures closely connected with the first to include the improvement of the structure of the

control units and points of the troops, in order that on the basis of the new equipment they are made small with respect to composition, mobile, stable and viable with the enemy's use not only of conventional means of destruction, but also of nuclear weapons. This opinion also is unquestioned. However, here, in our opinion, it is necessary to note that the practical realization of the given group of measures must necessarily be preceded by careful testing of them on an entire series of training exercises. Above all this pertains to the structure of the control units. Here special care and a scientific approach are required, for speed and inadequate substantiation of any reorganization of the control units unavoidably will do harm to the combat readiness of the troops.

When discussing the necessity for improving the structure of national economic control in the summary report of the Central Committee to the 25th CPSU Congress, L. I. Brezhnev warned: "The Central Committee is against hurried, poorly thought out rearrangement of the administrative structure and the developed methods of management. It is necessary to measure not seven, as is commonly said, but eight or even 10 times, before cutting. However, if we have measured, if we have understood what has become restrictive in the continuously developing national economy within the framework of the existing economic mechanism, then it must be decisively improved."* These instructions of the party unquestionably pertain also to improvements of the structure of the troop control units.

The third group of measures includes further improvement of the organization and methods of operation of the commanders and staff with respect to the implementation of each control function with the use of the available control equipment and with the existing structure of the control units. The experience of past wars, the postwar exercises and the results of the studies demonstrate that along this path each commander and staff has great, and still not completely used reserves.

Thus, when gathering and studying the situation data during the preparations and during the force of combat the greatest effect comes from the centralized method of this gathering, the establishment and exact execution of the scientifically substantiated periodicity of the reports and the degree of detailing of the situation data, the complex utilization and combination of the available technical means, sources and methods of obtaining these data, advance (before receiving the mission) study of them, the application of short (to the signals) reports and formalized forms, reduction of multiphasing and parallelism (excess duplication) in the information transfer offer the best effect.

For timely, substantiated combat decision making (refinement) by the commander and planning of the combat operations of the troops, a clear definition of the volume and content of this decision, ridding it of secondary problems, harmonious combination of one-man command and centralization of

*Materials of the 25th CPSU Congress, Moscow, 1976, p 61.

control on the commander's part with initiative, creativity and independence of the duty personnel subordinate to him when making the decision have important significance. When making the decision and planning the measures with respect to comprehensive support of the combat operations, political work and organization of control, it is necessary sharply to increase the role of the chief of staff and the chiefs of the combat arms (services), more widely to practice the joint work with them of the commander during the decision making by creating a combat control center at the command post, to reduce the number and volume of planning combat documents, skillfully to combine the logical methods with mathematical methods and use computer engineering for the calculations and quantitative substantiation of the decisions made. It is necessary to improve the procedure for making decisions itself, to teach the officers to make decisions considering the complex effect on them of all of the conditions of the situation.

When conveying the combat missions to the troops, organizing and supporting their interaction, preliminary combat orders with orientation of the subordinate commanders and staff on the nature of the forthcoming operations have recommended themselves well. They offer the possibility of quickly engaging in preparations for combat and the performance of many measures with respect to this preparation in parallel (almost simultaneously) with the superior commander and headquarters. The specific combat missions and the instructions with respect to interaction of the troops must be conveyed to the subordinates as they are determined by the commander by short combat orders. For speed of recording of the latter and their transmission over the communications means, it is advantageous to use formalized blanks. It is also important skillfully to combine the various methods of conveying the missions and the instructions with respect to interaction: the issuing of an oral combat order personally by the commander or its conveyance to the subordinates by the staff officers going to the field; the transmission of short (to signals) orders over the radio by personal conversations with the subordinates; the delivery to the subordinates of the text, graphical or order written on magnetic tape. First of all it is necessary to deliver the missions and instructions to the troops who play the main role, begin operations first and who require a great deal of time for preparation.

These are only the basic measures with respect to further improvement of troop control. Their successful implementation, however, wholly depends on the comprehensive development of a specialized branch in the general military science system--the theory of combat troop control--and the mastery of this theory by our officers. In the light of the well-known instructions of V. I. Lenin on the necessity for developing the science of control and the resolutions of the 25th CPSU Congress with respect to control problems in all areas of social life of the country, the given problem is one of the most urgent inasmuch as without the scientific control theory there can be no effective practice. It is impossible successfully to improve the technical means, the structure and methods of operation of the control units. After it has been firmly mastered by the officers, the given theory will become a threatening material force for the enemy; it essentially will improve the combat readiness of the troops.

The study made in this book, the consideration of the requirements of practice and the results of a broad discussion of the given problem in our military press permits the statement that the object of the study for the theory of troop control must be in practice the activity of the commanders on the control units of all degrees with respect to combat troop control, and its subject, the discovery of the laws and the principles of this control, the mechanisms of their effect and also the means and methods of a practical utilization by the commanders and staff of the different echelons in the combat situation.

With respect to content, the combat troop control theory must include a number of interconnected divisions of a general-theoretical, theoretical, organizational and applied (practical) nature.

The first section can be made up of the general and procedural principles of the troop control theory. The following basic problems must be developed and discussed in it: the general concept of control in engineering, nature and society; the purpose, content and essence of combat troop control; the development of the theory and practice of control by the experience of past wars and exercises; modern requirements on control and the criterion for estimating its effectiveness; the general laws for all elements and the troop control principles; the peculiarities of this control at strategic, operative and tactical levels and also in the various forms of armed forces, combat arms and special troops; the state of the art with respect to troop control in the armies of the union republics and in the armies of probable enemies; the object of investigation, the subject of the content and the methods of investigation of the troop control theory, its place in military science and interrelation to the Marxist-Leninist science and other sciences studying various aspects of control.

The second division of the combat troop control theory can also be made up of organizational problems such as the construction (structure) of modern control systems, the functions and rights of command, the control units and duty personnel; the principles of selection and deployment of personnel, the organization of the control points and the work at them of the agents of the various echelons and combat arms and in various forms of combat operations; the structure of the troop control systems in the union armies and in the armies of probable enemies.

The content of the third section of the control theory can be the technical means of control: their purpose, classification, operative-tactical characteristics and the procedure for their use in the units and at the control points. Here the prospects for the automation of the processes of troop control and also the characteristics of the control techniques of foreign armies must find their reflection.

The enumerated three divisions constitute the procedural, general theoretical, organizational and technical base for the next, the fourth division of control theory--the methods and the art of combat troop control. In

it, the classification and characteristic of these methods must be analyzed by parts, and the main thing, it is necessary to give specific recommendations to the commanders and the control units of the various echelons with respect to the artificial practical implementation of the functions (technology) of control using modern and prospective technical means; gathering and study of situation data; making well-founded decisions and planning combat operations; conveyance of the missions to the troops, organization of their interaction, comprehensive support, political work and monitoring; preparation of the troops for combat and also control of them during the course of the combat operations. The most important problem of this section is the procedure for making an optimal or substantiated decision by the commander, for this decision is the basis for the entire process of troop control.

Inasmuch as the practice of troop control is a dynamic, continuously developing process, to that degree it is mandatory to have a fifth division of this theory which analyzes the problems occurring in the given historic phase and the possible means of solving them by further improvement of the troop control system as a single interval organism, its structure, technical equipment and the functioning procedure.

As is obvious, the type of problems which the troop control theory must discuss is very broad, important and complex. It cannot be replaced by any other science or theory, including cybernetics, which, as A. I. Berg, D. M. Gvishiani and A. N. Kolmogrov and other well-known Soviet scientists have emphasized many times, studies the very broad control laws, independently of where the control occurs: in a live organism, in machines or in human society. For the practical application of these general laws the officers must solidly know the specifics of troop control in combat, the reflection of which is recognized in the troop control theory on the basis of the complex analysis of all aspects of the given process: ideological-political, moral-psychological, social-legal, organizational-procedural and pure military technical.

The study of the specific nature together with the other problems of military science, as experience shows, cannot fully satisfy the practical requirements under modern conditions. For this purpose, a special, more fundamental theoretical development of them is required which combines science and art into an integral whole and lights the path of practice in the work of the commanders and staffs. The initial procedural and general scientific base for this development is the Marxist-Leninist theory, the laws of social development and armed combat, the principles of military art, the resolutions of the CPSU and the measures taken in the country with respect to improving the control of the national economy, the advanced experience in troop control in previous wars and in postwar exercises, the achievements in the field of the control of the armies of other socialist countries and capitalist countries, and also the conclusions of such sciences as cybernetics, mathematics, psychology, sociology, law and other sciences investigating the various aspects of control. For the development of control theory consequently there is not only necessity but also possibility.

Along with the fundamental development of troop control theory it is necessary to improve the procedure for its study and to indoctrinate the officers in the practical skills of control in all of the military training institutions and in the system of command training in the troops. V. I. Lenin indicated that we "...must withstand the test of the knowledge of the fundamentals of the theory with respect to the question of our government apparatus, the knowledge of the fundamentals of the science of control..."* These instructions of the leader have not lost their significance in our time. "Control," L. I. Brezhnev noted, "has been converted to a science, but this science must be mastered as fast and as deeply as possible, it must be persistently studied."** The given requirement of the party undoubtedly pertains also to our officers. For successful combat control it is necessary for them primarily to make a creative study of Marxism-Leninism theory, have a deep knowledge of the materiel and the principles of conducting combat operations. However, in addition, they need solid knowledge and practical skills directly from the area of troop control. The further development of theory, improvement of the troop control system and improvement of the training of the officers in the area of control will promote an increase in the combat readiness of our armed forces.

*V. I. Lenin, Complete Collected Works, Vol 45, p 394.

**L. I. Brezhnev, "Leninskim Kursom" [Following Lenin's Course], Vol 2, p 522.

BIBLIOGRAPHY

1. K. Marx and F. Engels, Soch. [Collected Works], Vol 6, 20, 21, 23, 25.

2. V. I. Lenin, Poln. Sobr. Soch. [Complete Collected Works], Vol 6, 15, 18, 25, 29, 31, 35, 36, 37, 38, 40, 41, 42, 44, 45.

3. Programma KPSS [Program of the CPSU], Moscow, Politizdat, 1971.

4. Materialy XXIV S'ezda KPSS [Materials of the 24th CPSU Congress], Moscow, Politizdat, 1971.

5. Materialy XXV S'ezda KPSS [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1976.

6. L. I. Brezhnev, "Leninskim Kursom" [Following Lenin's Course], Vol 1 to 5, Moscow, Politizdat, 1970-1976.

7. M. I. Kalinin, "O Vospitanii i Obuchenii" [Education and Training], Moscow, Politizdat, 1970-1976.

8. M. V. Frunze, Izbrannyye Proizvedeniya [Selected Works], Moscow, Voyenizdat, 1965.

9. A. A. Grechko, "Na Strazhe Mira i Stroitel'stva Kommunizma" [In the Battle for Peace and the Building of Communism], Moscow, Voyenizdat, 1971.

10. A. A. Grechko, "Vooruzhennyye Sily Sovetskogo Gosudarstva" [Armed Forces of the Soviet Government], Second Edition, Moscow, Voyenizdat, 1975.

11. A. A. Yepishev, "Mogucheye Oruzhiye Partii" [Powerful Weapon of the Party], Moscow, Voyenizdat, 1973.

12. R. Ya. Malinovskiy, "Bditel'no Stoyat' na Strazhe Mira [Stand Up Convincingly in the Battle for Peace], Moscow, Voyenizdat, 1962.

13. V. A. Abchuk, L. A. Yemel'yanov, et al., "Vvedeniye v Teoriyu Vyrabotki Resheniy" [Introduction to the Theory of Decision Making], Moscow, Voyenizdat, 1972.

14. "Avtomatizirovannye Sistemy Upravleniya" [Automated Control Systems], General editing by V. G. Shorin, Moscow, Znaniye, 1973.

15. V. S. Akent'yev, I. S. Vinnik, A. Ye. Vodnev, I. I. Kandaurov, B. F. Kosenko, "Mekhanizatsiya Inzhenerno-Tekhnicheskogo i Upravlencheskogo Truda" [Mechanism of Engineering-Technical and Administrative Work], Lenizdat, 1973.

16. V. G. Afanasyev, "Nauchnoye Upravleniye Obshchestvom" [Scientific Control of Society], Moscow, Politizdat, 1968.

17. N. Baybakov, F. Rusinov, "Organizatsiya i Effektivnost' Upravleniye Proizvodstvom" [Organization and Effectiveness of Production Control], Moscow, Moskovskiy rabochiy, 1973.

18. A. V. Barabanshchikov, A. V. Beshentsev, et al., "Metodologicheskiye Problemy Voyennoy Teorii i Praktiki" [Procedural Problems of Military Theory and Practice], Moscow, Voyenizdat, 1966.

19. A. I. Berg, "Kibernetika--Nauka Ob Optimal'nom Upravleniye" [Cybernetics --Science of Optimal Control], Moscow-Leningrad, Energiya, 1964.

20. S. Bir, "Nauka Upravleniya" [The Science of Control], Abridged translation from the English, Moscow, Energiya, 1971.

21. V. A. Bokarev, "Kibernetika i Voyennoye Delo" [Cybernetics and Military Affairs], Moscow, Voyenizdat, 1969.

22. I. I. Bykov, "Organizatsiya Upravleniya v SSHA" [Organization of Control in the United States], Moscow, Ekonomika, 1966.

23. N. Viner, "Kibernetika Ili Upravleniye i Svyaz' v Zhivotnom i Machine" [Cybernetics or Control and Communications in Animal and Machine], Moscow, Sovetskoye Radio, 1958.

24. "Voyennaya Strategiya" [Military Strategy], Edited by V. D. Sokolovskiy, Moscow, Voyenizdat, 1964.

25. "Voprosy Nauchnogo Rukovodstva i Sovetskikh Vooruzhennykh Silakh" [Problems of Scientific Administration in the Soviet Armed Forces], Edited by Ye. F. Sulimov and V. V. Shelyag, Moscow, Voyenizdat, 1973.

26. "Voprosy Upravleniya Ekonomikoy" [Problems of the Control of the Economy], Moscow, Politizdat, 1974.

27. "Voyennye Memuary Marshalov Sovetskogo Soyuza A. A. Grechko, I. Kh. Bagramyana, S. S. Biryuzova, A. M. Vasilevskogo, G. K. Zhukova, I. S. Koneva, R. Ya. Malinovskogo, K. K. Rokossovskogo, V. I. Chuykova, Generalov Armii S. M. Shtemenko, P. I. Batova, General-Leytenanta A. K. Blazhey i Drugikh Vidnykh Voyenachal'nikov" [Military Memoirs of Marshal of the Soviet Union A. A. Grechko, I. Kh. Bagramyan, S. S. Biryuzov, A. M. Vasilevskiy, G. K. Zhukov, I. S. Konev, R. Ya. Malinovskiy, K. K. Rokossovskiy, V. I. Chuykov, Generals of the Army S. M. Shtemenko, P. I. Batov, Lieutenant General A. K. Blazhey and Other Famous Military Chiefs].

28. G. I. Garbuz, D. F. Loza, I. F. Sazonov, "Motostrelkovyy Batal'on v Boyu" [Motorized Rifle Battalion in Combat], Moscow, Voyenizdat, 1972.

29. A. K. Gastev, "Kak Nado Rabotat'" [How It Is Necessary To Operate], Moscow, Izd-vo VTsSPS, 1927.

30. D. M. Gvishiani, "Organizatsiya i Upravleniye" [Organization and Control], Moscow, Nauka, 1970.

31. V. M. Glushkov, "Vvedeniye v Kibernetiku" [Introduction to Cybernetics], Kiev, Izd-vo AN USSR, 1964.

32. A. A. Udunov, "Vvedeniye v Teoriyu Upravleniya" [Introduction to Control Theory], Moscow, Ekonomika, 1967.

33. S. V. Grishin, P. A. Zhukov, Sh. I. Kitoshvili, "Taktika (Po Inostrannym Vzglyadam)" [Tactics (With Respect to Foreign Views)], Moscow, Voyenizdat, 1972.

34. O. A. Deyneko, "Metodologicheskiye Problemy Naukhi Upravleniya Proizvodstvom" [Procedural Problems of the Science of Production Control], Moscow, Nauka, 1970.

35. O. A. Deyneko, "Nauka Upravleniya v SSSR" [The Science of Control in the USSR], Moscow, Ekonomika, 1967.

36. V. V. Druzhinin, D. S. Kontorov, "Ideya, Algoritm, Resheniye (Prinyatiye Resheniy i Avtomatizatsiya)" [Idea, Algorithm, Solution (Decision Making and Automation)], Moscow, Voyenizdat, 1972.

37. M. V. Zakharov, "O Nauchnom Podkhode k Pukovodstvu Voyskami" [Scientific Approach to Troop Control], Moscow, Voyenizdat, 1967.

38. I. G. Zav'yalov, "Skorost', Vremya i Prostranstvo v Sovremennoy Voyne" [Speed, Time and Space in Modern Warfare], Moscow, Voyenizdat, 1965.

39. Ya. Zelenevskiy, "Organizatsiya Trudovykh Kollektivov" [Organization of Labor Collectives], Translated from the Polish, Moscow, Progress, 1971.

40. V. D. Zelenskiy, A. A. Chistov, G. S. Chulkov, "Tekhnicheskoye Obespecheniye Tankovykh i Motostrelkovykh Podrazdeleniy v Sovremennom Boyu" [Technical Support of Tank and Motorized Rifle Subunits in Modern Combat], Moscow, Voyenizdat, 1972.

41. N. A. Zubkov, D. A. Ivanov, "Resheniye Komandira na Boy" [The Combat Decision of the Commander], Moscow, Voyenizdat, 1964.

42. D. A. Ivanov, P. V. Shemanskiy, V. G. Yanov, "Upravleniye Voyskami v Boyu" [Troop Control in Combat], Moscow, Voyenizdat, 1964.

43. S. P. Ivanov, "O Nauchnykh Osnovakh Upravleniya Voyskami" [Scientific Principles of Troop Control], Moscow, Voyenizdat, 1975.

44. S. K. Il'in, "Moral'nyy Faktor v Sovremennoy Voyne" [Moral Factor in Modern Warfare], Moscow, Voyenizdat, 1969.

45. "Istoriya Voyennogo Iskusstva" [History of Military Art], General Editor A. A. Strokov, Moscow, Voyenizdat, 1966.

46. S. Ye. Kamenitser, "Osnovy Upravleniya Promyshlennym Proizvodstvom" [Fundamentals of Control of Industrial Production], Moscow, Mysl', 1971.

47. A. N. Kachalina, "Nauchnaya Organizatsiya Upravlencheskogo Truda--Orgproyektirovaniye" [Scientific Organization of Administrative Labor--Organization of Planning and Design], Moscow, Ekonomika, 1971.

48. P. M. Kerzhentsev, "Bor'ba za Vremya" [The Battle for Time], Moscow, Ekonomika, 1965.

49. Yu. Ya. Krishin, "O Nauchnoy Organizatsii Voinskogo Truda" [Scientific Organization of Military Labor], Moscow, Voyenizdat, 1970.

50. Yu. M. Kozlov, "Upravleniye Narodnym Khozyaystvom SSSR" [Administration of the National Economy of the USSR], Moscow, Izd-vo MGU, 1971.

51. O. V. Kozlova, N. N. Kuznetsov, "Nauchnyye Osnovy Upravleniya Proizvodstvom" [Scientific Fundamentals of Production Control], Moscow, Energetika, 1970.

52. V. K. Konoplev, "Nauchnoye Predvideniye v Voyennom Dele" [Scientific Prediction in Military Affairs], Moscow, Voyenizdat, 1974.

53. N. Kouplend, "Psikhologiya i Soldat" [Psychology and the Soldier], Moscow, Voyenizdat, 1958.

54. "Kurs Dlya Vysshego Upravlencheskogo Personala" [Course for Higher Administrative Personnel], Abridged translation from the English, Moscow, Ekonomika, 1971.

55. "Leninskiye Printsipy Khozyaystvovaniya i Ikh Tvorcheskoye Razvitiye" [Leninist Principles of Management and Their Creative Development], General Editor A. M. Omarov, Moscow, Mysl', 1971.

56. B. F. Lomov, "Chelovek v Sistemakh Upravleniya" [Man in Control Systems], Moscow, Znaniye, 1967.

57. "Matematika v Boyu" [Mathematics in Combat], Collection of articles, Moscow, Voyenizdat, 1965.

58. "Metodologicheskiye Problemy Voyennoy Teorii i Praktiki" [Procedural Problems of Military Theory and Practice], Moscow, Voyenizdat, 1969.

59. V. Mikheyev, "Sotsial'no-Psikhologicheskiye Aspekty Upravlenniya" [Social-Psychological Aspects of Control], Moscow, Molodaya Gvardiya, 1975.

60. "Nauchnaya Organizatsiya Upravlencheskogo Truda" [Scientific Organization of Administrative Labor], Translated from the Czech, Moscow, Progress, 1968.

61. "Nauchno-Tekhnicheskiy Progress i Revolotsiya v Voyennom Dele" [Scientific and Technical Progress and Revolution in Military Affairs], General Editor M. N. Galkin, Moscow, Voyenizdat, 1973.

62. S. A. Neustroyev, "Put' k Reykhstagu"[Path to the Reichstag], Moscow, Voyenizdat, 1961.

63. "Organizatsiya i Upravlenne (Voprosy Teorii i Praktiki)" [Organization and Control (The Problems of Theory and Practice)], Moscow, Nauka, 1968.

64. "Osnovy Nauchnoy Organizatsii Truda" [Fundamentals of the Scientific Organization of Labor], General Editor Yu. N. Dubrovskiy, Moscow, Ekonomika, 1971.

65. P. M. Petrus', P. V. Shemanskiy, N. K. Chul'skiy, "Yadernoye Opuzhiye i Razvitiye Taktiki" [Nuclear Weapons and the Development of Tactics], Moscow, Voyenizdat, 1967.

66. L. A. Petrushenko, "Printsip Obratnoy Svyazi" [Feedback Principle], Moscow, Mysl', 1967.

67. V. Ya. Plyaskin, I. F. Lysukhin, V. A. Ruvinskiy, "Inzhenernoye Obespecheniye Obshchevoyskovogo Boya" [Engineering Support of Combined-Arms Combat], Moscow, Voyenizdat, 1972.

68. N. N. Popol', V. P. Savel'yev, P. V. Shemanskiy, "Upravleniye Voyskami v Gody Velikoy Otechestvennoy Voyny" [Troop Control During World War II], Moscow, Voyenizdat, 1974.

69. G. Kh. Popov, "Problemy Teorii Upravleniya" [Problems of Control Theory], Moscow, Ekonomika, 1974.

70. A. V. Prokov'yev, "Sredstva Mekhanizatsii i Avtomatizatsii v Shtabakh" [Mechanization and Automation Means in Headquarters], Moscow, Voyenizdat, 1976.

71. "50 Let Vooruzhennykh i SSSR"[50th Anniversary of the Armed Forces of the USSR], Moscow, Voyenizdat, 1968.

72. V. D. Ryabchuk, V. I. Kovalev, "Psikhologiya Resheniya Komandira" [Psychology of the Commanders' Decision], Moscow, Voyenizdat, 1976.

73. V. Ye. Savkin, "Osnovnyye Printsipy Operativnogo Iskusstva i Taktiki" [Fundamental Principles of Operational Art and Tactics], Moscow, Voyenizdat, 1972.

74. P. G. Skachko, V. M. Kulikov, G. T. Volkov, "Upravleniye Voyskami s Pomoshch'yu Setevykh Metodov" [Troop Command and Control Using PERT Methods], Moscow, Voyenizdat, 1974.

75. M. P. Skirdo, "Narod, Armiya, Polkovodets" [People, Army, Military Commander], Moscow, Voyenizdat, 1970.

76. V. D. Skugarev, K. O. Dubravin, "Nauka Upravleniya i Flot" [Science of Command and Control and the Fleet], Moscow, Voyenizdat, 1972.

77. "Soldat i Voyna. Problemy Moral'no-Politicheskoy i Psikhologicheskoy Podgotovki Sovetskikh Vonnov" [Soldier and War. Problems of Moral-Political and Psychological Training of Soviet Troops], Edited by A. S. Zheltov, Moscow, Voyenizdat, 1971.

78. A. G. Sorokovoy, "Sotsial'no-Psikhologicheskiye Osnovy Rukhovodstva" [Social-Psychological Principles of Command], Moscow, Ekonomika, 1971.

79. Ye. Staros'tsyak, "Elementy Nauki Upravleniya" [Elements of the Science of Control], Translated from the Polish, Moscow, Progress, 1965.

80. N. Stefanov, N. Yakhiel, S. Kyachaunov, "Upravleniye, Modelirovaniye, Prognozirovaniye" [Administration, Simulation, Forecasting], Translated from the Bulgarian, Moscow, Ekonomika, 1972.

81. "Taktika v Boyevykh Premerakh" [Tactics in Combat Examples], General Editor A. I. Radziyevskiy, Voyenizdat, 1974 (regiment), 1976 (division).

82. "Taktika" [Tactics], General Editor I. G. Roznichenko, Moscow, Voyenizdat, 1966.

83. V. I. Tereshchenko, "Organizatsiya i Upravleniye (OPYT SSHA)" [Organization and Control (Experience of the United States)], Moscow, Ekonomika, 1965.

84. "Tekhnika Upravleniya" [Control Techniques and Equipment], Edited by G. Kh. Popov, Moscow, Izd-vo MGU, 1968.

85. Yu. A. Tikhomirov, "Upravlencheskoye Resheniye" [Administrative Decision], Moscow, Nauka, 1972.

86. "Upravleniye Sotsialisticheskim Proizvodstvom" [Control of Socialist Production], Moscow, Ekonomika, 1975.

67. V. N. Fedotov, "Metod Optimizatsii Potokov Informatsii v Upravlenii Proizvodstvom" [Method of Optimizing Information Flows and Production Control], Moscow, Ekonomika, 1970.

88. Ye. A. Khomenko, "Logika" [Logic], Moscow, Voyenizdat, 1971.

89. A. F. Shramchenko, "Voprosy Psikhologii v Upravlenii Voyskami" [Problems of Psychology in Troop Control], Moscow, Voyenizdat, 1973.

SUBJECT INDEX

10845
CSO: 1801

END

END OF FICHE

DATE FILMED

April 11 1979

TL

APPROVED FOR RELEASE: 2007/02/08: CIA-RDP82-00850R000100040016-9