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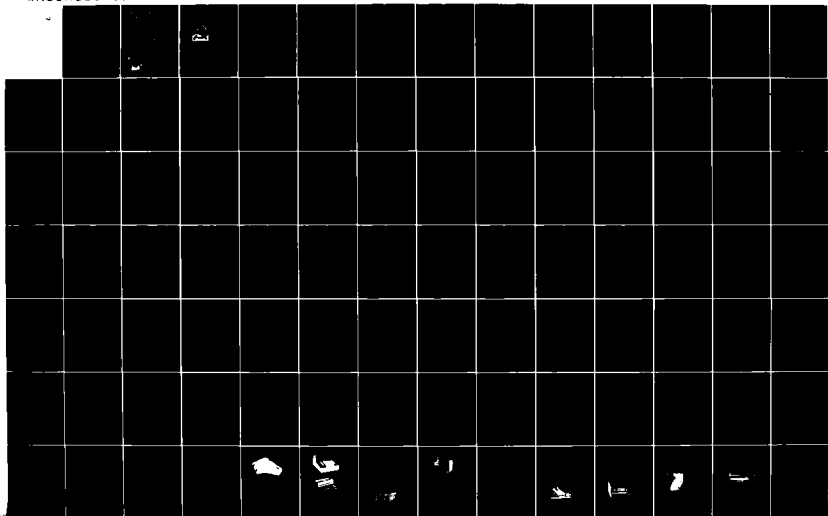
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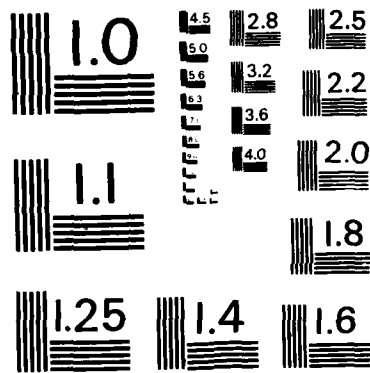
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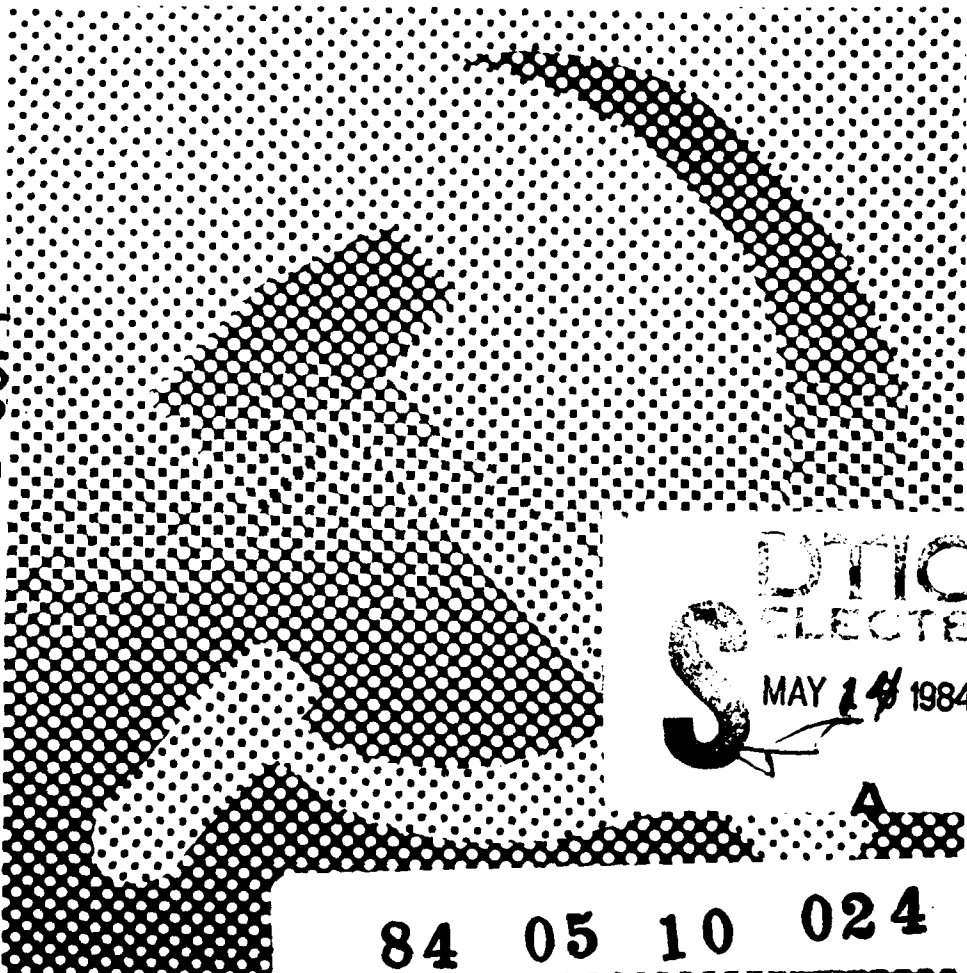
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Fundamentals of Tactical Command and Control



A Soviet View

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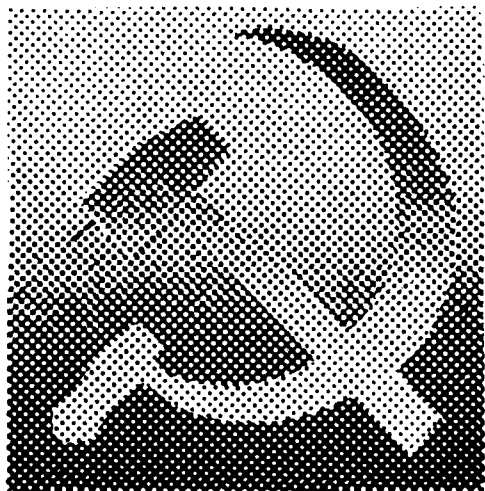
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Fundamentals of Tactical Command and Control

A Soviet View



Authors:

D. A. Ivanov

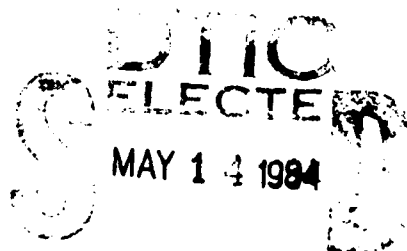
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Moscow 1977

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*The translation and publication of **Fundamentals of Tactical Command and Control** does not constitute approval by any U.S. Government organization of the inferences, findings, and conclusions contained therein. Publication is solely for the exchange and stimulation of ideas.*

Abstract

On the basis of party and government decisions on questions of control, an analysis of the changes that have occurred in the means and methods of conducting combat operations and the organization of troops, as well as the experience in past wars and postwar exercises, this book brings to light general theoretical principles for tactical command and control, and indicates the place of the theory of control in the overall system of military theoretical knowledge and its relationships to cybernetics and other sciences.

At the same time, the book makes practical recommendations on implementing the main functions of command and control of subunits by commanders and staffs in various types of combat operations with modern technical control equipment.

The book is intended for officers and generals of the Ground Forces, those studying at military educational institutions of various levels, reserve officers and students in civilian institutions of higher learning, and those studying command and control questions in the system of non-uniformed-service training.

Introduction

The first edition of this work was prepared for printing in late 1969. On publication, the work was widely and approvingly received by 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 the Czechoslovak Socialist Republic. After publication, many noteworthy events took place in our country and its Armed Forces which had a direct or indirect effect and continue to greatly influence development of the theory and practice of command and control. Without doubt the most important among these events is the adoption of the resolutions regarding further improvement of control in all areas of public life by the 24th and 25th CPSU Congresses and the plenary sessions of the CPSU Central Committee.

In accordance with these party resolutions, scientific research has been undertaken on a broad scale in the country to develop the science of control founded by V. I. Lenin. As a result, in just the past few years many fundamental works, textbooks, pamphlets, and articles have been published on the problems of control with famous Soviet scholars and experienced administrators as their authors.

Measures have been taken for fundamental improvements in the selection, placement, and training of all levels of management specialists for the national economy. An economic reform is being developed. New means of mechanization and automation of control work have been devised and put into practice. Entire automated control systems are being built. The structure of the control organs is being improved, and their functions are being more precisely defined. The most effective mathematical economic methods are being explored for production planning based on the use of computers and other control equipment and also the theoretical principles of scientific organization of labor.

In evaluating the importance of these measures, L. I. Brezhnev made the following statement at the 25th CPSU Congress: "... Measures for improving management of the economic structure should be, must be considered a most important reserve, whose use will help to successfully fulfill the Tenth Five-Year Plan and produce an effect in the immediate future."

The resolutions of the 24th and 25th CPSU Congresses and the plenary sessions of the CPSU Central Committee regarding problems of control of the national economy undoubtedly apply also to the command and control of the troops of our Armed Forces, which are a component part of the socialist society. The measures taken throughout the country on the basis of the party resolutions to improve control of the economic structure are for military personnel an unsurpassed model of the scientific approach to solving the problems of command and control brought about by scientific and technical progress and by the revolution in military affairs which this progress has produced.

The fulfillment of these party resolutions will promote improvement in the combat readiness of our troops and, in the final analysis, successful fulfillment of one of the primary missions formulated 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 extreme importance of the state of command and control for maintaining high combat readiness has been confirmed by the entire history of military science over many centuries. The experience of past wars, especially the Great Patriotic War, provides us with many examples where skillfully led troops won brilliant victories over superior numbers of the enemy. However, there have also been cases where well-armed troops suffered defeat simply because they lacked scientific, firm, constant control on the part of commanders and staffs. In order to prevent this in the future, it is necessary to make constant improvements in command and control and remember the behest of V. I. Lenin that ". . . any battle includes the abstract possibility of defeat, and there are no other means of *diminishing* this possibility but organized preparation for battle."³

At the same time, history confirms that the state of the practice of command and control depends to a decisive degree on the extent of theoretical resolution of control problems in the overall system of military science. This dependence is especially sharply manifested now, when new means and methods of armed conflict have imposed new, greater requirements on control, the practical satisfaction of which is inconceivable without a scientific theory of command and control.

The purpose of the second edition of this work is to bring to light theoretical principles of command and control in modern combat based on party and government resolutions concerning problems of control

and also on the experience of past wars, military exercises, and changes in the means and methods of armed conflict to bring to light the theoretical principles of command and control in modern combat and to indicate the possible means of improving command and control as they have been observed to develop in the armies of the most technically developed countries. Since it does not appear possible to consider command and control in all components and various forms of their activity (when carrying out combat and political training, when performing unit administration, etc.) in a single work, the authors have limited themselves to an analysis of the command and control process only under battlefield conditions. This is reflected in the new, somewhat more precise title of the book: *Osnovy upravleniya voyskami v boyu* [Fundamentals of Tactical Command and Control], rather than *Osnovy upravleniya voyskami* [Fundamentals of Command and Control], as it was previously called.

In order to reduce the volume of the work and avoid excess repetition, the so-called functional feature is used as the basis for its structure. Each of the basic functions of control (acquisition and processing of data on the situation, decisionmaking, and planning of combat actions, etc.) is considered in a separate chapter or section both for preparation for and during combat actions. This structure is taken as the basis in view of the fact that troop control, like any other control, always is of a clearly expressed cyclic nature—the majority of the command and control functions in preparation for and during the course of combat actions are inevitable and repeated again and again. Only their specific content and conditions of execution change, which the authors have taken into account in presenting each chapter.

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

Notes

1. *Materialy XXV s'yezda KPSS* [Materials of the 25th CPSU Congress] (Moscow, 1976), pp. 61–62. [Hereafter cited in its English translation—U.S. Ed.]
2. *Materialy XXIV s'yezda KPSS* [Materials of the 24th CPSU Congress] (Moscow, 1971), p. 81. [Hereafter cited in its English translation—U.S. Ed.]
3. V. I. Lenin, *Poln. sobr. soch.* [Complete Collected Works], VI, 137. [Hereafter cited as Lenin—U.S. Ed.]

Chapter 1. Content, Essence, and Methodological Fundamentals of Command and Control

1. General Concept of Control

In any science, the soundness of theoretical conclusions and value of practical recommendations for solving some particular problem are directly dependent on the researcher's proper understanding of the phenomena and processes which are of a more general nature with respect to the given problem and also on the methodology of the research and the ideological and general scientific principles. Attaching great importance to the specific nature of management, V. I. Lenin at the same time warned: "... He who takes on particular problems without first solving the general ones will inevitably at each step unconsciously 'stumble on' these general problems. And to stumble blindly into them in each particular case means to be doomed to a policy that is the worst kind of vacillation and lack of principle."¹ V. I. Lenin taught that the general is a "step towards understanding the specific."²

This methodological principle obliges us to consider the general concept of control and the principles on which the construction and functioning of absolutely all control systems are based before we talk about the particular and specific problems of command and control in combat.

A correct, common interpretation of the terms we use is very important for theory and practice. The experience of many sciences shows that otherwise no theory can be successfully developed, while in practice there are various misunderstandings, disputes, arguments, and even disorganization of work both on research teams and in control organs. To prevent this, the well-known French scientist Descartes, even in his youth, advised: "Define the meaning of words precisely and you will save mankind half of its confusion." The validity of this opinion for the science that we are investigating will become all the more obvious if we consider that there is a different approach in our Soviet

press from the foreign press when defining and interpreting one and the same terms and general concepts of control. Philosophers usually characterize control as one of the properties of material systems; those in cybernetics, as the process of movement of information regulating or converting a system from one state to another. Mathematicians are primarily interested in the possibilities of formalization, algorithmization, quantitative description, and modeling of control processes in order to create the mathematical bases for automating them. Sociologists and lawyers usually emphasize the social and legal relations which develop in control systems, and economists, the economic aspects of control.

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

The essence of command and control in engagements and operations is also in need of precise definition. Some of the published definitions encountered reduce the essence of command and control to direction of troops by commanders and staffs. This cannot be considered satisfactory, for the word "direction" also requires explanation.

An inadequately clear-cut definition of the essence of command and control is also presented in a work with the authority of the *Shorter Soviet Encyclopedia*. It says: "Command and control (engagement and operations control) is the preparation, conduct, and support of combat operations by the commander with the help of the staff and other control organs." The imprecision of this definition applies at least to the statement that the commander conducts combat operations with the help of the staff and other organs. Actually combat operations are conducted by none other than the troops, who are also the object of control for the commander, staff, and other organs. In addition, in this definition the term "engagement and operations control" is used. This term is more figurative than scientific. After all, both engagement and operation are two-way processes in which both friendly and enemy troops participate with clearly opposite (hostile) objectives. Under these conditions, in order to control the engagement (or operation) it is necessary to control not only friendly troops but also the enemy. In the literal sense of the word "control" the latter is impossible in principle, if only because the commander cannot require reports from the enemy or give the enemy troops orders, assign missions, etc., and without this there is no control as such. It is possible and necessary to influence the enemy actively by the fire and strike of friendly troops and by disinformation, camouflage, and other measures in order to force the enemy to act where, when, and how it is advantageous to have him act. It is precisely this reflexive aspect of control that is emphasized by

certain authors in using the term "engagement and operations 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 "command and control in combat" in particular. In order that this definition be understandable and, most importantly, that it have practical value, it must, in our opinion, 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 actually exercised?

It is possible to solve this 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 we will consider its proposition that we should take the essence of any process, including any kind of control, to mean its deepest, most general, stable, and constantly repeated internal aspects. Here the essence is not obvious on the surface of the process under investigation inasmuch as it does not coincide with the external phenomena.

The latest achievements in the sciences that deal with the various aspects of control, such as sociology, military science, cybernetics, psychology, etc., can also be of great assistance in solving the problem at hand. The combined approach, i.e., the approach considering the conclusions of all sciences investigating certain aspects of control, has great methodological significance. Here the initial base for the investigation can only be practice, since one cannot just invent a scientific theory or formulation. It can only be derived 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 a theory of knowledge."³

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

Above all they prove that control is not a phenomenon that is thought up or comes from "out of the blue," but is one of the general and objectively necessary 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 normally; a current cannot travel over a wire; there can be no life, including our own organism; an industrial enterprise, a collective farm, and the state as a whole cannot function; and no military formation (subunit, unit,

etc.) can engage in combat successfully.

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

- (1) Control in inanimate nature, including machines and complexes of machines;
- (2) Control in living organisms (biological systems);
- (3) Control in human society, in collectives of people in their social life, including the conduct of armed conflict (social control).

There is a considerable difference in 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 living cell and a tank regiment. However, by virtue of the dialectic unity of the material world, all forms of control are characterized by identical formal attributes, as well as by the general principles and laws which are studied by the comparatively young science of cybernetics. The knowledge of these principles and laws 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 first of all that there is a subject or object which controls and, at the same time, there is one which is controlled. The former is called the control organ and the latter, the object of control.

With respect to semantics the term "control" is used when it is a question of the actions of an object which cannot and must not take place spontaneously, without organization, when some guiding and organizing influence on the part of the control organ is required. However, in order that the effect be realizable, there must be some communication between the control organ and object.

Such words as "direction," "adjustment," "guidance," etc., are identical in meaning (synonymous) with the word "control." These words are usually used when 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 by higher government, party, and military authorities and officials and when this control is more in the nature of general coordination and guidance, combining not only economic or military-strategic functions, but also sociopolitical 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," etc.

As a rule, the words "guidance," "regulation," "adjustment," and others are used instead of the word "control" when it is a question of control during the course of some process, in its dynamic state.

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

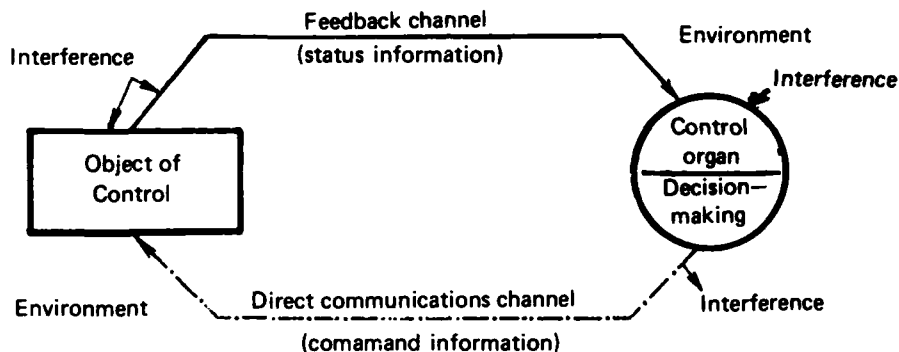


Figure 1. Schematic Diagram of the Structure and Operations of a Control System (Closed Control Loop).

The totality of these three elements—the control 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* (figure 1).*

In this general system the control organ sometimes is called the controlling system (or subsystem), and the object of control, the controlled system (or subsystem). The authors who exclude the object of control from the concept "control system" permit a gross methodological error, since, as such, a system cannot in principle function without an object of control (something to control). For implementation of the control process, all of its material carriers are needed—both the "producers" and the "consumers," i.e., a closed loop.

* In general it is customary in science to consider a system to be an organized, closed unit of regularly connected elements capable of interaction (objects, subjects, opinions, etc.). Here the properties of the system as a whole are not identical to the properties of each element or group of elements taken individually.

Consequently, the control system forms an internal structure, the material base for any control process. Without the system, without a material structure, there can be no control and vice versa. A systematic nature is a universal property of all matter and an objectively necessary condition for any control process. The world surrounding us is literally "woven together" from various systems. "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 control systems does not mean, however, that they remain unchanged. On the contrary, they are constantly developing and improving as material life develops.

Certain attributes of control are observed in the most primitive ("embryonic") form in the systems of inorganic nature.* During the prolonged course of historical evolution, on the basis of these elementary systems more complex and organized biological control systems arose, beginning with the living cell and ending with the most complex and highly organized system—the human organism. As a result of autonomy† (autoregulation) in such systems, blood pressure that is acceptable for life, temperature, and sugar content in the blood are maintained, and the products of the processing of food are eliminated, protection from harmful external effects is provided, and many other processes take place.

However, the development of control systems in nature has not stopped 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, etc.—all of these are control systems that were created by man. Man himself always appears here as the basic control organ. The so-called "man-machine" system is formed. As aids, man uses various levers, instruments, and automatic control devices which operate on a program compiled by him. The object of control is either a whole machine (or complex of machines) or individual elements of it. The communications channels between man, the control instruments, and the machine can also vary: visual, auditory, mechanical, electromagnetic, chemical, document, etc. Thus, a still more complex "man-

* For more details on control in inanimate nature see L. A. Petrushenko, *Printsip obratnoy svyazi* [Feedback Principle] (Moscow, 1967). The author indicates the unsoundness of views that refute the presence of control attributes in inanimate nature without the participation of man because they contradict materialistic dialectics.

† [The parts of the Russian word here are equivalent to *self* and the word for *control* used throughout the book, and so *self-control* would fit much more nicely into the context, were it not for that combination's having a different meaning in English—U.S. Ed.]

automaton (instrument)-machine" system is formed (figure 2).

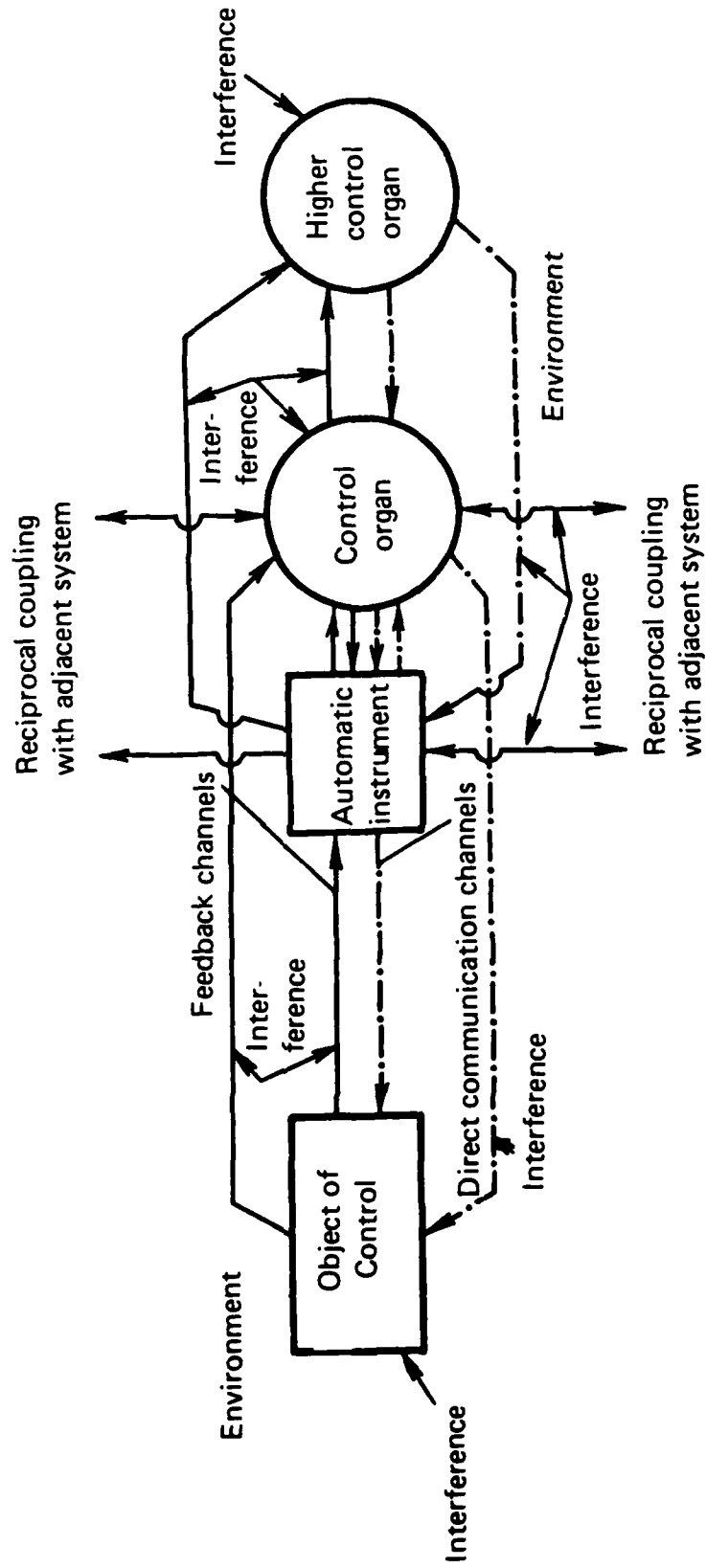
Here, if the system is capable of operating without the direct participation of man (but by his program), then it is said to be automatic, and with the participation of man, automated.

Simultaneously with the technical systems, as the division and cooperation of human labor have increased, various social control systems have been created, inasmuch as man has lived and worked not alone but in various kinds of collectives. "Any directly social or joint labor performed on a comparatively large scale," wrote K. Marx, "to a greater or lesser degree requires control, which establishes coordination between the individual operations and performs general functions occurring from the movement of the entire production organism as distinct from the movement of its independent organs. The individual violinist controls himself; the orchestra needs a conductor."⁴

With respect to purpose, social systems, like technical systems, are varied: the shop, the industrial enterprise, the brigade, the collective farm, the school, the scientific research institution, the symphony orchestra, theater, industrial association, branch of the national economy, government as a whole, and also the company, the battalion, the regiment, etc., etc. Here either an individual or a collective of people who have different assignments may be the control organ: the chief, the director (or the board of directors), the brigade leader, the chairman (or the board), the university president, the conductor, the minister (or the board), the council of ministers, the commander, the staff, and so on. The object (subject) of control in such systems is always people using the appropriate equipment. Various channels, beginning with visual and audio channels and ending with the complex electronic devices making up automated control systems, are used for communications between the organs and objects of control.

Thus, social control systems, compared with technical systems, are distinguished by a great complexity and take the form of a multifaceted combination of "man-automaton (instrument)-man-machine."

Anticipating ourselves somewhat, let us note that a proper understanding of the essence and structure of control systems has not only great cognitive-methodological significance, but also great practical significance. In light of the resolutions of the 24th and 25th CPSU Congresses, it obliges us, in particular when seeking means of improving command and control, to use the so-called systems or complex approaches requiring simultaneous improvement on the basis of the achievements of a number of the sciences that study the various aspects



== **Figure 2. Structure of a Control System Using Means (Devices) of Automation.**

of control, not only of certain individual elements, but also the system as a whole. This means both the control organs and their functions and the control objects and channels of communication with them. Only in this way can the desired result be achieved.

Now that we have considered the external form, let us proceed to an analysis of the internal *content of control*, by which we usually mean the sum of interconnected functions carried out by the control organs in order to operate as necessary on the objects of control and achieve the ultimate goal. The control function, in turn, is customarily considered to be a special form of control work by the control organ which leads to the achievement of a particular (intermediate) goal on the path to the general, ultimate goal. Therefore not every elementary action of the control organ can be raised to the level of a control function. A function is a more independent, general, and extended concept than any separately taken measure. It includes a firm group of measures of uniform nature, whose implementation permits achievement of the particular goal and the step forward carrying out the next function, although in practice sometimes there is a change in role and a certain intertwining, a superimposing of one function on another in terms of the time of their implementation, as we shall see below. In the functions, their interrelations, and the totality, the content, technology, and dynamics of the entire control process are consequently manifested. Their manifestation arises from the separation and specialization of control work.

Based on the functions, the structure of the control organs is drawn up, and, for the performance of each of them, usually there is a requirement for the appropriate distribution of rights, obligations, and responsibility among the component parts (for example, the officials) of these organs, their special knowledge and skills, the use of the appropriate technical control means and also logically sound methods and procedures for action. A clear-cut definition of the functions, consequently, is very important.

In order to correctly define the control functions characteristic of any control organ, it is necessary to analyze again the practice of the actions taken by the latter. In this analysis we can with relative ease establish first the fact that the control process on the part of any control organ occurs not of itself, but as the consequence of some cause, as 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 up 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 radar or by personal observation, the commander of an antiaircraft battery gives the command to open fire. Measuring the applicable parameters of motion of the aircraft, the automatic pilot takes action on the controls and changes the heading and flight altitude. One can cite an infinite number of examples of this sort.

What has been stated indicates quite obviously that the primary (initial) function of any control organ is to obtain information on the state and the actions of the object of control and its environment via the feedback channel (figures 1 and 2). This information is customarily called *status information* in cybernetics. Without this information, any sort of successful control on the part of any organ is in principle impossible, for this inevitably (sooner or later) comes into conflict 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 organ, requiring from it special rights, knowledge, and use of the appropriate means and methods of operation. For these reasons, it is entirely correct to consider it a control function, and not an auxiliary measure. This is especially true of 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 a nationwide automated system for acquiring and processing information, while special attention is always given to acquiring and studying data on the situation in tactical command and control practice.

The reaction of the control organ to the status information received varies. In highly developed systems, the control organ not only receives but also perceives, stores, studies, and converts the status information, it compares it with the given state and, if necessary, converts the system to an essentially new state corresponding to the altered conditions. By this the control organ actively influences the object of control. This active reaction of the system becomes possible thanks to the fact that it is constructed on the basis of the feedback principle. This principle necessarily presupposes not only receiving status information but also the next function of the control organ—planning the actions of the object of control, whose most important and objectively necessary act is decisionmaking. Without a decision by the control organ, no purposeful action by the object of control is possible in principle.

The essence of making any decision and, on the whole, of planning consists in the control organ's determining the goal of the actions taken

by the object of control, its specific missions, the sequence, the forces, the means, methods, and times of their execution and also the measures in support of these actions based on analysis and evaluation of the status information and also the laws in the given medium.

In cybernetics the decisionmaking process is usually defined as conversion of status information to *command information* (or control information) by the control organ, i.e., conversion to information by means of which the tasks of the object of control are then assigned, and thus its actions and the functioning of the system as a whole are given a purposeful nature. It is quite obvious that purposeless random actions on the part of any object cannot be considered controlled, inasmuch as they contradict the very meaning of the word "control." Any control is carried out not for its own sake, but so that the controlled object can achieve some purpose. Purposefulness, consequently, is also an obligatory and a primary attribute of any type of control, independently of where it is carried out (in machines, a living organism, or in a collective of people).

In terms of their nature, the goals of control can be highly varied. They depend entirely on the purpose of the system and the conditions of its functioning. The process of determination of the goal by the control organ also varies among systems. In systems functioning without the participation of man, in animal organisms, for example, the goal is formed on the basis of unconditioned and conditioned reflexes acquired over many hundreds and thousands of years, adaptation to the environment, and also developed instincts. There is an essentially different determination of control goals in the systems in which man participates. Here the basis for this determination is a higher form of reflection of objective reality—thought, conscious goal-setting aimed at satisfying one's needs. Here man is capable of acting on nature, ideally anticipating (foreseeing) the final results of the actions taken by the object of control. In this respect, K. Marx wrote: ". . . The poorest architect differs at the outset from the best bee in that before constructing the cell of wax, he has already constructed it in his head. At the end of the labor process, a result is achieved which already existed in the man's imagination at the beginning of this process, that is, ideally."⁵ In another place he noted that "in nature . . . one blind, unconscious force acts on another, in whose interaction general laws are exhibited. There is no conscious, desired goal at all here. . . . On the other hand, in the history of society, people take action who are gifted with consciousness, striving for defined goals carefully or passionately. Nothing is done here without conscious intent, without a desired goal."⁶ Moreover, in the control of collectives of people in social life the goal is not only defined, but also achieved by man. Here control work is a version

of mental work 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 work, knowledge and skills, habits, customs, etc.). The purpose of control here has a purely class character.

After a decision is made, the planning process, when necessary and possible, continues and is completed. Here the control organ specifies and details the tasks, 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 action made by the control organ, the following control functions are performed: allocation of tasks for the object of control (giving it an order, instructions, a command, a signal, etc.), organization of coordination and communication with it and the environment and also comprehensive support of its actions. Of these functions, the allocation of tasks for the object of control is the one that is objectively necessary and the most important for, without it, its purposeful actions also are in principle inconceivable.

In carrying out the above-mentioned functions, the control organ is dealing not with status information, but with material objects and action on them by transmission of command (control) information to them. The implementation of the decision and the plan of action is thus achieved organizationally. For these reasons, some authors combine this 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, it being a highly provisional and mobile one. This stipulation is confirmed by the fact that without obtaining status information and without decisionmaking, no proper organization is possible. On the contrary, the gathering of information, the decisionmaking, and all the other functions require organization. Organization, consequently, permeates the entire process of control and operation of the system itself.

All of the enumerated functions constitute a type of preparatory stage in the activity of the control organ and the system as whole (static control). After their implementation, a new state, one of performance, occurs, at which the control functions are carried out during the course of actions taken by the objects in performing the tasks allocated to them, i.e., dynamic control. These functions of the control organ are often generalized and called regulation, adjustment, or operational control. In content and essence they are similar in many

respects to the preceding (preparatory) functions.

In order to confirm what has been said let us again return to practical application. During the course of actions of any object of control carrying out its task, the control organ again receives information over the feedback channel about its state and environment, compares it with the previously made plan, in case of a deviation (nonconcurrency) introduces the appropriate adjustments into the plan or makes an essentially new decision in the event of sharp changes in conditions), and then sends the corrected or new task over the direct communications channel to the object of control, i.e., transmits the command information.

These operations are repeated until the object of control completes its task and the final goal of the operation of the system as a whole is achieved. The entire control process, consequently, is of a clearly expressed cyclic nature.

Finally, it is necessary to discuss briefly another control function—monitoring. This function is mentioned in the works of a number of authors. However, setting monitoring apart as an independent function can be justified to some degree only by the great significance which it has in the overall control process, especially in command and control in combat. It is for these reasons that in this book monitoring by the commander and staff of the readiness and the operations of troops in combat is considered in a separate chapter.

If we approach this problem from the point of view of content, then setting monitoring apart as an independent control function cannot be considered justified. We are easily convinced of this by practice. After all, monitoring both statically and dynamically, the control organ simply performs the functions that we have already considered. That is to say, it gathers data on the readiness, the actual state, and the actions of the objects of control; it compares these data with the decision made and the plan of action, and in case of a discrepancy between them, it determines the necessary adjustments (more precisely defines the previous decision or makes a new one); and it gives the appropriate instructions to the object of control (assigns a refined or new task to it). Consequently, the basis for monitoring is the principle of feedback between the organ and object of control.

Thus, an analysis performed by us from the point of view of materialistic dialectics and cybernetics on any control process makes it possible to state that wherever this process is carried out (in a machine, in a living organism, in a collective of people, or in society as a whole) its

common features are the following:

- the obligatory presence of a control system made up of the control organ, the object(s) of control, and the direct communications and feedback channels connecting them;

- the existence of a cause-and-effect relationship 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, to undergo large loads from the external input without disturbance of its structure and properties.

With respect to form, 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 various functions, of which the main, obligatory, and fixed ones constantly repeated in each cycle are the following: obtaining status information via the feedback channel, decisionmaking on the basis of this information, and delivery of command information to the object via the direct communications channel, i.e, formulation of its task. Without these three functions, no control is possible in principle. If just one of them is left out, then the control process sooner or later is disturbed or stopped. Moreover, they permeate all the remaining functions, they are closely intertwined with them, and thus characterize the detailed features of the entire control process. Therefore they fit perfectly into the philosophical category of essence and allow us to define the general concept of control thus: any control is a process of input from the control organ to the object of control based on the objective laws of the given environment, the input being achieved by obtaining information about the state of the object of control, making a decision on the basis of this information, and formulating tasks for the object. This definition answers all of the questions asked of it: what is the control for, who (what) controls, who (what) is controlled, on what basis does the control take place, and how does it take place.

2. The Specific Nature of Tactical Command and Control and the Requirements Placed on It

The general cybernetic concept of control—investigated by us in the preceding section—as a process occurring in any material environment is fully applicable to tactical command and control.

However, just this general concept of control is obviously inadequate for the practical activity of officers involved in tactical command and control. In order to more fully comprehend the subject, V. I. Lenin taught that "it is necessary to embrace, to study all its facets, all the relationships and mediacies." As applied to our topic, this methodological requirement means that in addition to the general concepts concerning control it is necessary for officers to have a thorough understanding of the specific nature of command and 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 command and control, the officers must be guided by the general laws of social development and state control, inasmuch as any war is a social phenomenon, and the armed forces are a component of society and an instrument of the state. Secondly, they must know and skillfully use the laws and principles applying particularly to military art, which derive from the special purpose and structure of troops as an object of control and also from the conditions of armed conflict, which differ significantly from the conditions of any other phenomenon of social life.

In order to discover the specific nature of tactical command and control, we again use the methodology of the theory of cognition and we perform a systems analysis of the organizational structure of the troops and the process of their combat operations.

The Structure of Modern Command and Control Systems

In terms of their organizational structure and the nature of their operations there is every reason to categorize troops as so-called *large autonomous systems*, since they are characterized by all of the basic distinguishing features of these systems: a comparatively large number of component elements; complexity of structure; variety of relationships and interaction between the elements and the external environment; complexity of the problems to be solved; highly dynamic nature of the system and its capacity to perform new (not previously provided for) tasks; the presence of several criteria for assessing the results of the operations of the system.

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

If we consider these troops as a system and combined arms combat and armed conflict as a whole as its operations, then, in spite of their

complexity, we can establish the following components (figure 3).

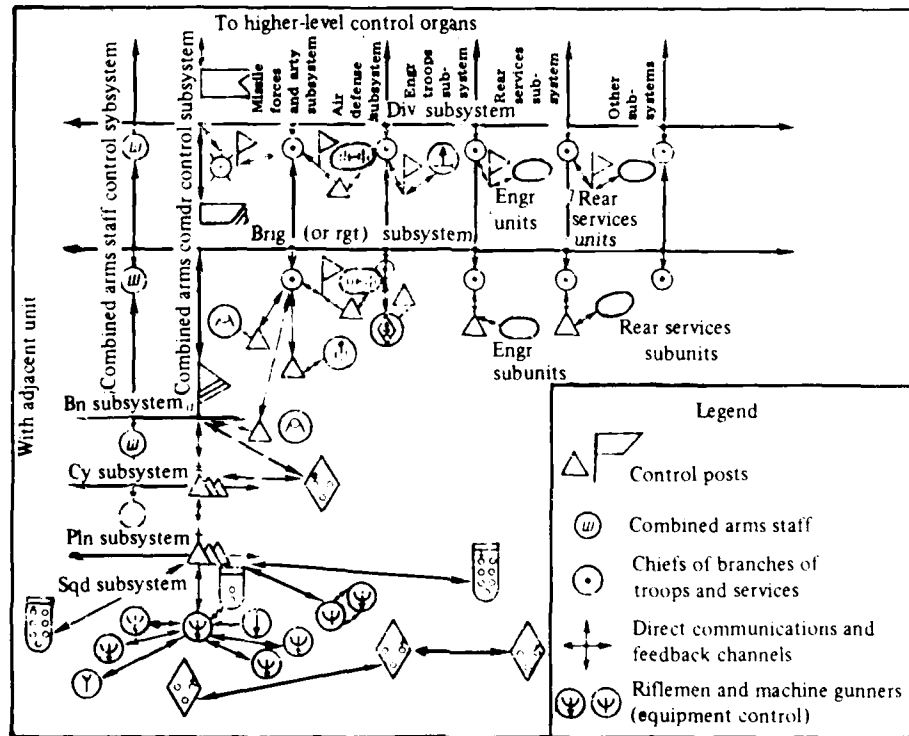


Figure 3. Schematic Diagram of the Modern Combined Arms Unit as a Complex Autonomous System (From Data in the Foreign Press).

The first component is the *subunits of the branches of troops*, whose soldiers engage in direct combat with the enemy by employing the resources at hand, destroying his manpower and materiel by fire and strike. In the ground forces of modern armies, these forces are made up of motorized rifle troops (infantry, motorized infantry, mechanized), tank troops, missile troops, artillery, and air defense troops.

The second component of this system is the *subunits of the special troops and rear services*, whose soldiers engage in open combat with the enemy only in the event of extreme necessity. Their basic mission is comprehensive support of the combat operations of the above-enumerated branches of troops. For this purpose, they conduct reconnaissance with the appropriate equipment, build roads, organize communications, haul fuel and ammunition, treat the wounded, etc. These subunits include the radiotechnical, engineer, communications, motor transport, road, medical, and other subunits.

A third component of the system of each given element in all modern armies is the *commanders* and the various *control organs*. Their mission is command and control of the first two components of the system, i.e., the subordinate subunits of the branches of troops, special troops, and rear services, which comprise their objects of control. The successful operations of the latter are in principle inconceivable without control, especially when they are carrying out the overall mission in the presence of active enemy opposition. Under such conditions the absence of control and of coordination of operations in terms of target, time, and location will inevitably turn them into a mob doomed to certain destruction by the enemy.

It should be noted that in the distant past, especially during the period of comparatively small armies and limited battlefields, the subunit, unit, and formation commanders and even the commanders in chief of armies not only controlled the troops but were also direct participants in the battle. They were right in the combat formations of the troops under their command and personally led them into battle, performing both control and fighting functions, i.e., they participated in the destruction of the manpower and equipment of the enemy by employing their own physical strength and weapons.

By now, due to the appearance of mass armies and a significant increase in the space and time scale of combat operations, the situation has changed radically. The control function, first for the commander in chief, and then the commanders of formations, units, and even subunits, gradually became not just the main function but the only one. For performing this function, the commanders have at their disposal the necessary organs and technical means of control, and, as a rule, they are at the respective control posts located in the combat formations of the troops under their command. In modern warfare the commanders and officers of the control organs do not usually participate in direct destruction of the enemy by personally employing various weapons. The only exceptions are the commanders of small tactical subunits (the squad leader, crew chief, platoon leader, or company commander) and the senior commanders in cases where they are obliged to set a personal example and lead wavering troops into the attack or replace a disabled soldier at a weapon or in a tank, etc. At all other times the most important and even the only mission is command and control of their troops, giving them the direction required for successful fulfillment of the tactical mission.

Unit and subunit control systems are set up in accordance with the present structure of modern ground forces. First of all, they are characterized by an extensively developed **hierarchy**, by which we

mean a previously established chain of command of lower-level organs and responsible personnel to the higher ones, according to strictly defined levels (the "hierarchical ladder").

These levels are as follows (figure 3): soldier—squad (combat crew, detail)—platoon—company (or battery)—battalion (or artillery battalion). In many armies the higher levels include the following: brigade (or regiment)—division—corps—army (or army group)—ground forces as a whole. Two adjacent intermediate levels (for example, platoon—squad; company—platoon; etc.) form a control link (closed loop) joined to the superior, subordinate, and adjacent elements.

This graduated nature of the structure of command and control systems permits regulation of information flows, achievement of organization in troop operations, and matching of the number of objects of control in each element with the capabilities of the commander and the control organs.

The "primary cells" of the overall command and control system are the soldiers who directly control the relevant combat equipment (weapons) and who destroy the enemy with this equipment 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 primarily on their ideological tempering, morale, combat training, and all other purely human qualities. The combination of soldier and combat equipment makes up a "man—weapon" subsystem in the overall system. Its peculiarity consists in the fact that the object of control here is not man, but equipment. Therefore this subsystem will more properly be assigned 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 refines the initial data for firing, aims the weapon at the target, and fires. In this case control can be performed manually, mechanically, semiautomatically, or automatically. Depending on the control procedure in a given system, various channels and technical means of direct communications and feedback are used: visual, mechanical, line, radio, etc. In addition to developing the program of operations of the control devices, man comprehensively prepares the entire complex of weapons for employment, has them available at the required place and at the required time, monitors the operation of the instruments and is constantly ready to assume their functions in case of failure or for other reasons. These causes can be changes in the situation and incompatibility of the previously assigned program with it, the necessity to deceive the enemy, especially if the program for operation of our instruments has become known to him. Therefore at this level the proper

combination of man's intellectual capacities with the capacities of the equipment becomes especially important.

Direct command and control, i.e., control of the people equipped with the materiel and combined organizationally into appropriate troop collectives, begins with such primary subunits as the squad, the gun and launcher combat crew, the tank crew, etc. It is precisely here that a system is generated in which people are both the control organ and the object of control, i.e., the squad leader (crew chief) and the soldiers subordinate to him. As a rule, visual, auditory, and sometimes direct and feedback technical channels are used for communications among them. Thus what we have is a manifestation of the attributes characteristic of a troop command and control system, that is, a control system for armed people.

Organizationally the squad (combat crew) is a subsystem in the system of the higher subunit—the platoon—where the functions of the control organ are also performed by the commander, but his control input usually is addressed not directly to the soldier equipped with the weapon, but to the squad leaders. Consequently, the squad leaders perform the functions of the control organ with respect to the soldiers under them 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, etc.). In the same way an even more complex system than in the squad is formed in the platoon: "man (platoon leader)—equipment (radio, telephone)—man (squad leader)" with all the attributes characteristic of command and control systems. These attributes are again reinforced and broadened on the subsequent steps of the "hierarchical ladder," where the commanders control their subordinates not only personally but also by means of specially created control organs and also the most varied technical means. Thus, even the motorized rifle company commander has a deputy for political affairs, a first sergeant, an engineer, a medic NCO, and an armored personnel carrier driver. In addition, in the company there can be an organic or a nonorganic control section (or position) providing for observation of the battlefield, communications with the subunits, and equipping them. In the U.S. Army, for example, this section includes a company executive officer, a communications sergeant, a supply sergeant, a company clerk, and three radio operators.

In the battalion control system, in addition to the commander, there is his deputy for political affairs and an organ such as the staff. In the U.S. Army, this staff includes the chief of staff and personnel, intelligence, operations and training, rear services, and communications

officers, and also a chemical warfare officer and others. In order to set up the direct and feedback channels and also to provide for the operations of the control system, the battalion headquarters company has special communications, reconnaissance, and surveillance subunits. The control organ of the battalion is, consequently, a rather 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 performance of the assigned mission (artillery, tank, combat engineers, etc.). Each of these attached subunits, while being the object of control, at the same time has its own control organ with its own technical means and specific methods of control. The control organs of these subunits, in addition to the fact that they are part of the battalion control system, can be considered component elements (subsystems) for the control of some branch of troops and of the special troops.

The battalion control system carries out its functions, as a rule, through the company commanders and their deputies and also the commanders of the other subunits directly subordinate to the battalion commander. The battalion commander assigns the missions to them, receives from them the bulk of the information about the situation that has developed in their zone of operations, makes these commanders responsible for carrying out their missions. Thus, he brings his influence to bear on the personnel and directs the efforts of the subunits toward carrying out the missions through the company commanders subordinate to him; the latter in turn have control input to the platoon leaders.

In the brigade (or regiment) and higher the combined arms staff is considered the basic control organ in all armies. In addition to the staff, here there are political organs, the chiefs of the respective branches of troops and of the special troops and services (artillery, engineer service, etc.).⁸ The "hierarchical ladder" thus develops not only vertically but horizontally, also forming the control subsystems for the branches of troops and the special troops and services (figure 3). Here the authority to make the overall decision at all levels is granted only to the commander. The most important principle in the structure of control systems is, consequently, the one-man management of the commander.* All other personnel with control responsibilities and the

* [The origin of the concept *yedinonachaliye* 'one-man management' (sometimes translated as 'unity of command') dates back to reforms instituted by M. V. Frunze in 1925. Prior to the reforms, an order had to be countersigned by the political officer to become effective. Afterwards, the political officer's duties were concerned primarily with party-

troops themselves operate in strict accordance with his decision.

To carry out their control functions, the commanders and the officers of the control organs use the particular methods of operation appropriate to them, station themselves at the respective control posts, and use specially designated means of control.

Thus, in the general structure of troops carrying out combat operations, command and control is in **form** (external appearance) none other than the activity of the commander, the staff, the political organs, and the chiefs of the branches of troops and services. The following elements make up the troop control system in each component:

(a) The commanders and the control organs (where they exist) of the given component, located at the respective control posts and using various technical means and methods of operation peculiar to them;

(b) The commanders and the control organs of the subordinate subunits and units (control objects) of the branches of troops (motorized rifle, tank, missile, artillery, air defense troops, etc.) and also the special troops and rear services (communications, engineer, medical, etc.);

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

Since troop units have a hierarchic structure, control input to the soldiers of the subordinate subunits from the commander of each echelon, beginning with the platoon, is usually achieved not directly but through the subordinate commanders. The latter, consequently, are the control organ for their subordinates and the object (subject) of control for the superior commander and control organ. Consequently, in form and structural outline, battlefield command and control is basically similar to control in any other area, for example, control in industry. However, in terms of purpose, functions (content), and conditions of implementation there is a much more fundamental difference, the consideration of which has great theoretical and practical importance.

Objectives of Tactical Command and Control, Its Content and Essence

The Soviet Armed Forces are charged with reliable defense of the peaceful labor of the Soviet people building communism and also, in fulfillment of their treaty obligations, defense of the interests of other

political affairs within the unit, and the military commander was responsible for the unit's military effectiveness. Another form with the same significance is *yedinonachal'nik*, 'one-man management commander'—U.S. Ed.]

socialist countries against the aggressive aspirations of the imperialist powers. The strengthening of their combat might, as the 25th CPSU Congress pointed out, remains one of the primary tasks. It follows from this that the *primary objective of command and control* of the troops in our army by the commanders and staffs at all levels, both in peacetime and in case an aggressor unleashes a war, is constant maintenance of high combat readiness, including a high political-morale state in the subunits under their command (figure 4).

It must be noted that in certain official and unofficial sources the maintenance of high troop combat readiness has been interpreted until recently not as an objective but as a separate measure taken by commanders and staffs, equal in importance to other measures (the acquisition of data on the situation, the planning of combat operations, etc.). This opinion is in need of refinement, since it far from completely conforms to reality, it unjustifiably constricts and impoverishes the essence of troop combat readiness, and, besides, it contradicts the requirements of logic, which forbids one to place an equal sign between the whole and its parts or to place them on the same level.

In order to eliminate this deficiency in theory, intervention by party and government leaders was required. Thus, L. I. Brezhnev noted the following at a reception for the graduates of the military academies on 5 July 1967: ". . . The enormous efforts and material expenditures of the people directed toward equipping the army; the consciousness; the combat training and discipline of all servicemen; the art of the command personnel in command and control; and much more have their concentrated focus in the combat readiness of the troops. This, in the final analysis, is the crown of the combat mastery of the troops in peacetime and the key to victory in war."

Making this position more concrete, Marshal of the Soviet Union A. A. Grechko defined it by saying in his work *The Armed Forces of the Soviet State* (p. 109) that by combat readiness of the troops we must understand that state in which they are capable of repelling and breaking up aggression at any time and under the most difficult conditions, no matter what the source or the means and methods used, including nuclear weapons.* He pointed out that the main components of the combat readiness of our Armed Forces are the following: high morale-combat qualities of all personnel, training, discipline, organization, and physical conditioning; supplying the troops with weapons and combat equipment and maintenance of these weapons and equipment in

* [This passage appears on page 86 of the English language edition, published by the U.S. Government Printing Office as No. 12 in the United States Air Force "Soviet Military Thought" series—U.S. Ed.]

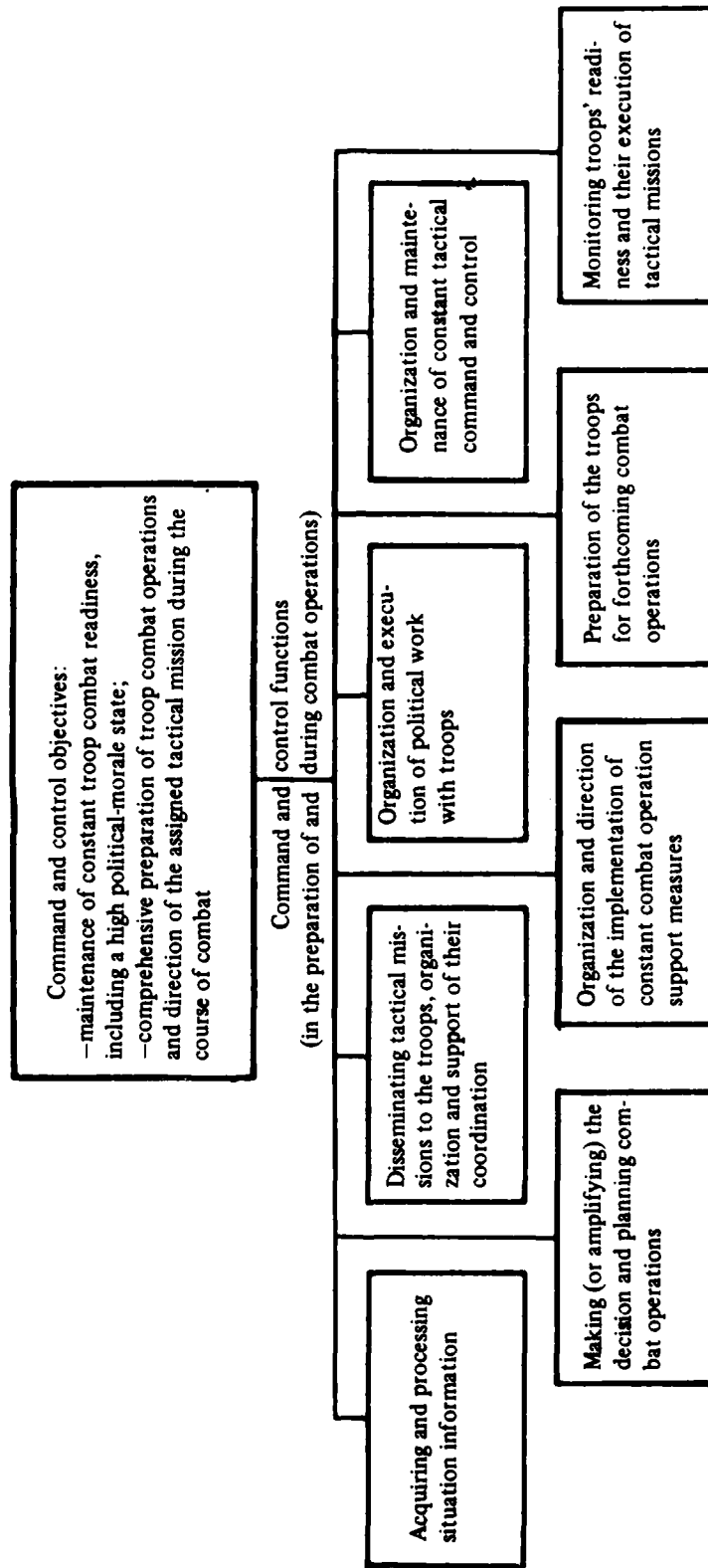


Figure 4. Content of the Process of Tactical Command and Control.

operating condition; a high level of military and specialized training of commanders and their ability to take on the command and control of troops, to skillfully direct their operations, to organize uninterrupted supplies of material resources; readiness of political organs, party organizations, and all communists, by word and personal example, to inspire the troops to accomplish their tactical missions.

Thus, high troop combat readiness, being one of the principal objectives of command and control by officers at all levels, is achieved as a result of the implementation of a large complex of interconnected measures, including command and control measures. The latter are a component part and one of the important conditions for achieving 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 well-founded decision or how to organize the coordination and support of the troops with everything that is necessary to achieve success in combat operations, etc.

The second objective of command and control, also arising for commanders and control organs at all levels under combat conditions and with the assignment of a specific tactical mission, consists in the following. In any complex situation they must carry out comprehensive preparation of combat operations and, while they are being conducted, ensure the effective employment by the subunits under their command of the available weapons, and direct their efforts toward the successful performance of the tactical mission, i.e., the rout of the enemy they are facing in the minimum time, with the least losses for themselves, least expenditures of material, as well as the capture or holding of a certain sector (area, line) of the terrain.

This objective follows from the very essence of combat operations and, of course, is absent in any other field. Command and control on the battlefield is exercised not just for its own sake, but for the sake of achieving the indicated objective, performing the assigned tactical mission. Based on the performance results of the tactical mission, that is, the effectiveness of employment of men and weapons, and based especially on the number of enemy and friendly losses, it is possible and necessary in the first place to assess the effectiveness of command and control by any commander or control organ. These are the main *criteria for assessment* not only of troop operations but also the activity of commanders and staffs. It is quite obvious that one may not consider command and control successful if the subordinate subunits and units

* In specific details, the work of the commanders and the control organs in maintaining high troop combat readiness in peacetime and wartime requires a special study, and therefore it is not dealt with in this work.

have not carried out their tactical mission or if they have carried it out with great, unwarranted losses and have achieved the planned combat objective at too great a price.

All other particular criteria and effectiveness indexes of command and control such as, for example, the operativeness (speed) of the system in taking each control measure; its ability to withstand nuclear strikes, enemy radio interference, and fire; the rhythmicity and continuity of operations; security; carrying capacity of communications channels; accuracy of the data received and the calculations performed; officers' qualifications; the intensity, quality, and conditions of their work; quality of control equipment provided; completeness and reliability of information; quantity, quality, and time taken to develop documents; the economic expenditures on maintenance of the entire system, etc., can be considered as only auxiliary and supplementary to the above-indicated main criteria, especially the size of our troop personnel losses, since people are our most valuable "capital," and preservation of their lives is the highest measure of the price of victory and, consequently, of the quality of command and control.

This is the specific nature of the objectives of tactical command and control as compared with control in any other area.

The *content of command and control*, i.e., the functions which the commanders and the control organs perform both in preparation and during the course of combat operations to achieve the enumerated objectives—maintenance of high combat readiness of the troops and their successful execution of the assigned tactical mission—also differ substantially in combat in comparison with other conditions. Here certain functions characteristic of other organs, despite the fact that they keep the same name, have a different internal content, while part of them are auxiliary and characteristic only of troop control. In addition, it is important to note that the volume of operations of the commanders and the control organs of all of components in performing each function in modern combat has increased greatly in comparison with the past. Meanwhile the time for this has been reduced sharply as a consequence of the troops' acquiring new combat equipment, an increase in the spatial dimensions and tempos of combat operations, and also a reduction in the time for battle preparations. In contrast to the past, commanders and staffs now must perform, for example, such new and complex missions as organization to combat enemy means of nuclear attack, effective exploitation of friendly nuclear strikes, organization and conduct of combat operations employing various weapons, restoration of troop combat readiness after enemy nuclear strikes, organization for negotiation by the troops of contamination and destruction zones, and

many other missions.

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

The first of their functions is always the **acquisition and processing of information on the situation**. In other areas, the analogous function, as we have already seen, is customarily called receiving status information by the control organ. It is precisely with this that the process of command and control by any commander or staff begins. Whatever general or particular objective they have in the preparation of and during combat operations (improving troop combat readiness, ensuring successful performance of their mission, organizing troop coordination, reconnaissance, treatment of the wounded, etc.), their practical activity always and everywhere begins with receiving and interpreting information on the objective, actually developing combat situation. Without this, they cannot take even one step along the path to the planned objective, and, if they do, then gross errors and bias are inevitably permitted.

It is important to note that in a number of sources this control function is called not acquiring (receiving), but procuring the situation information. This designation cannot be considered correct either, since it does not correspond to reality, it leads to confusion in the theory and practice of troop control. The commanders and the staff officers, especially in the lower echelons, themselves procure the situation information only by personally observing the battlefield, performing reconnaissance functions in this case. All the rest of the information they actually acquire (receive) from the various sources that procure this information. Thus, information about the enemy is procured by intelligence forces and resources. They reveal his objectives (targets), determine their composition, location, etc. Information on the radiation situation and the weather is determined by the appropriate instruments, data on air targets, by radar stations, etc. The function of the commander and staff consists in timely acquisition (receiving) and study of all of this information from the respective sources and skillful use of it to achieve the battle objective. If they are charged wholly with the function of information procurement then such concepts as "command and control," "control system," etc., are expanded to limits beyond the bounds of theory and practice.

It is not, however, just a question of the name and meaning of this function. The main thing is its specific content, which is characterized by the large volume, variety, and contradictory nature of the informa-

tion which every commander and control organ needs for modern tactical command and control.

For successful command and control, any commander or control organ requires data on the following factors, which have come to be called the *situation elements*: the enemy, friendly troops, the adjacent units, terrain, radiation situation, hydrometeorological conditions, time of year and day, economic condition of the combat operations zone, and sociopolitical composition of the population. In the U.S. Army, the content of the mission received from a superior commander is also considered to be a separate situation element.

The commanders and staffs must acquire data on all of the above situation elements in modern combat from a much greater area than previously, since the breadth of combat operations zones and the depth of missions performed by the troops are much greater. Much of the situation information will quickly become obsolete at the tempo of today's combat operations, and some of it, especially the data on the enemy, will be incomplete, contradictory, and even false, for the enemy will use all measures possible to try to hide his grouping from us, and to deceive and mislead us. A number of important kinds of information are still difficult and even impossible to precisely quantify. This information includes, for example, data on the political-morale and psychological state of personnel, the extent of their combat training, their national characteristics, their stability in life-threatening situations, the mental and organizational qualities and strength of will of the commanders, etc. This characteristic of information, in the opinion of foreign experts, is especially important to consider not only when adopting the decision and planning combat operations but also when solving the problems of automating command and control processes.⁹

The sources and means by which the commander and the command and control organs obtain combat situation information are distinguished by great variety. This is dealt with in chapter 4 of this book.

The next command and control function is the **commander's adoption of the decision and his planning of combat operations.**

The essence of any decision is to determine the objective of the operations and to select the forces, resources, procedures, and time for attaining it. In any control system involving man's participation, the decision is the result of his knowledge, creativity, experience, and will. Not to deny the latter's role, but it still should be pointed out that will must be based on a thorough knowledge of the laws operating in the given environment, a correct estimate of the situation that has actually

developed and of the available forces and resources. Bias and willfulness 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 adopts a decision involving the employment of nuclear weapons. This is because not only does the troops' successful accomplishment of the tactical mission depend on its scientific soundness and appropriateness to the combat situation, but also the lives of his men and, at the level of operations and strategy, the fate of the country as a whole, its social and political structure. The reason for this is that combat differs in essence from any other social phenomenon. Any combat is a component of the two-way process of armed conflict in which the enemy also strives to destroy our troops. Here modern forces are not just missiles, tanks, guns, and other weapons, but first of all the people employing them, organizationally combined into the various subunits and constantly subjected to the danger of being killed. They are always characterized by a sense of fear and self-preservation. Under these conditions the commander's decision must combine them into a united whole; ensure their precise coordination in terms of objective, time, and place; and subordinate their operations to the single will of the commander. Therefore in our army the decision is justifiably considered to be the basis for command and control, and making it is considered the most important creative function and personal act of the one-man-management commander. All other measures respecting control as well as the operations of the troops themselves in performing the tactical mission are implemented in strict accordance with the decision.

Considering what has been said, one may define the essence of any commander's decision thus: **a decision is the result of the creative thought and will of the commander and defines the objective of the combat operations and the forces, resources, procedures, and times for achieving it and also the missions of his subordinates.** It is based on the laws and principles of military science, correct understanding of the tactical mission, and evaluation of the situation.

The most important requirement placed on the decision is for scientific *soundness*, i.e., its applicability to the existing and expected situation, the assigned mission, the senior commander's concept of the battle, and the laws and principles for conducting combat operations as established in the regulations. Only in this case can the decision be a reliable basis for command and control. It is especially important that the decision be unexpected (a surprise) for the enemy; that it be substantiated by the relevant estimates of the combat capabilities of the troops on both sides; ensure the best (optimum) employment of weapons by friendly troops; be most effective, imposing maximum

losses on the enemy and reducing the losses of friendly troops to a minimum. A decision made "off the top of one's head" and not in conformity with the situation leads either to formulation of unrealistic (unfulfillable) missions for the troops or poor utilization of their combat capabilities. In the past, these errors came to light gradually, and they could be eliminated during the course of combat operations. In modern warfare, especially in combat operations involving nuclear weapons, they can be felt instantaneously and be fraught with much more serious, at times irreparable, consequences than before, including the knocking out of entire elements of the combat formation of the troops and unwarranted losses of personnel. It should also be noted that an improper decision has a negative effect on the morale-psychological state of the troops, undermining their faith in the commander's ability and the chances for success.

In addition to being sound, every decision must be adopted *in a timely manner*, must permit the troops to prepare carefully for its execution, provide for opening fire before the enemy, and also be as clear as possible for one's subordinates, leaving nothing open to varied interpretations.

Satisfaction of the above requirements placed on the decision, especially for maximum suitability and timeliness of adoption, is made very difficult today because, 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 importance of maximum suitability (soundness) and timeliness, the decision for combat differs from decisions in other areas in that for certain reasons its quality is impossible to check in practice (to rehearse) before the beginning of combat operations under absolutely similar conditions. 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 one may perform a test run-through with a 'No, not that way' and then a 'Now, that's right.' In war one can't make a rough draft, tear it up, and then write a final copy. Here everything is written in blood, everything from beginning to end, from A to Z. . . ."

This deficiency can be compensated for to some degree by the mathematical simulation of the decision for the forthcoming combat operations and by checking it (playing it through) on a computer. This method, as we know, is widely used at the present in decisionmaking 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 involves the following important difficulties.

First, much of the situation information basic for mathematical simulation, especially the information on the state of personnel on both sides, is not subject to exact quantitative measurement, but nevertheless is important, at times even decisive for decisionmaking and achieving success in combat. When they unleashed their aggressive war in Vietnam, the American generals and officers thought they had taken everything into consideration and hoped for quick and easy victory. However, they suffered a shameful defeat, for they did not and could not take into account the high morale and determination of the Vietnamese.

Secondly, no new battle is ever an exact copy of the preceding one, since one does not have an identical situation on which to base his decision.

Thirdly, a large number of subunits of the branches of troops and special troops with greatly divergent functions, organization, arms, capabilities, and methods of operation participate in modern combined arms combat.

Fourthly, the soundness of the decision to be made must be evaluated not by some single criterion but all at once by several indexes of differing nature, as follows: expected enemy losses, prevented* or possible friendly losses, expenditure of materiel and time in carrying out the tactical mission, the capture (or holding) of terrain, and also the sociopolitical consequences of the forthcoming combat operations.

Fifthly, in a combat situation the greatest success can often be achieved by the commander who has adopted a decision which, from the purely mathematical point of view, is a less sound one but, on the other hand, is not expected by the enemy. A. V. Suvorov, even in his day, wrote, "Surprise is victory," and this aphorism has profound meaning today as well. Combat is above all a battle of minds, a struggle of intellects. Behind the bare figures and any formula, every commander must see live people, his own troops and the enemy opposing them, who is sometimes intelligent and strong and knows our tactics and our "algorithm" for making decisions and fighting battles.

* [At first glance it may not seem logical to speak of "prevented" losses before a battle has occurred. Here it is a question of losses which would be likely if certain advance measures were not taken to avoid them—U.S. Ed.]

Thus, when adopting a decision the commander has to deal with many contradictions, the basic ones of which are the following: contradictions between the necessity for a scientifically sound decision and the difficulty of obtaining all of the situation information necessary for this and creating a mathematical model of the forthcoming engagement; between the necessity for reducing the decisionmaking time and the growing volume of initial information required for this, for the acquisition, processing, and study of which it is necessary to spend considerable time; between the requirement for simplicity, clarity, and brevity of the decision and the large volume of command information which must be disseminated to the subordinates on the basis of the decision; between the capture (holding) of terrain and the sociopolitical consequences of the combat operations which are to be conducted when implementing 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 in the adoption of decisions, it is first of all necessary to have a close combination of logical and mathematical methods and also the thorough knowledge and experience of the commander, his ability to think creatively, his courage, decisiveness, strong will, developed intuition, foresight of the course of the forthcoming combat operations, ingenuity, and capacity for taking a well-founded risk and assuming the responsibility for its consequences. The ideological-political, philosophical, mathematical, and purely military knowledge and also the experience, art and subjective morale-volitional qualities of the commander, which often play an important role in achievement of combat success, are concentrated in the commander's decision. Mathematics and computer equipment are merely a powerful "tool" which enhances the creative potential and the art of officers in making a sound decision.

The making of a decision by the commander is inseparably linked with the concept of *planning troop combat operations*. From both the logical and technical points of view this is a single, continuous process. The opinion encountered in the literature that first the commander makes the decision and only then does the staff begin to plan the combat operations is in essence mistaken. This opinion does not correspond to the facts, and in practice it inevitably leads to procrastination, loss of time, red tape, an excess of useless paper work, etc.

The essence of planning combat operations consists in determining the sequence, methods, and times for performing the assigned mission and also the number and grouping of the troops required for this, the procedure for their coordination, comprehensive support, and control.

It follows that when the commander makes a decision, i.e., outlines the concept of operations and the tactical missions for his troops along with a determination of which enemy to destroy and where and when to do it, where to apply the main thrust, how to structure the combat formation, how to support the coordination of missions, lines (objectives), and time, then he is thus already actually planning the combat operations, and is carrying out the basic missions of planning. This is precisely why the decision is the basis for the planning.

After the decision is adopted, the planning process does not begin, but rather continues and is completed. Here the staff and the chiefs of the branches of troops and services under the leadership of the commander make the individual elements of the decision more specific and give them more detail, especially those which pertain to the procedures and the times of troop operations, the system for their coordination and support. They are substantiated by the required estimates and additional situation information. If this is not possible (for example, in the absence of time), they limit themselves just to making the decision. For these reasons, the term "planning the engagement and the operation" is often used only when it is a matter of the work of commanders and control organs at higher echelons, from the division upward. However, this does not mean that the company, battalion, and regimental commanders do not have their own combat plans. Their decisions, fixed in the memory or depicted on a map (or diagram) and given a detailed dry run with subordinates on the terrain—these are their plans or models of the forthcoming combat operations.

The planning of troop combat operations, just as their coordination and control, is an objective necessity, a law for preparing for and fighting any engagement. It results from the effect of the law of dialectic interrelation and interdependence existing in nature and society, especially where a human collective is in operation, even the very smallest (the squad, the combat crew, etc.). No commander can ignore this law any more than any other law. Their only role is to thoroughly understand and skillfully use each law. A proper understanding of the objective and subjective aspects of command and control is the most important methodological starting point in the solution of all control problems, and above all in making decisions and planning combat operations.

Thus, there is not and cannot be a sharp distinction between making decisions and planning combat operations. The only difference is in the degree of detailing of certain problems: in the decision they are usually reflected in more general form than during subsequent planning.

The decision adopted by the commander will become law for his subordinates after it has become known to them. Therefore the next functions of the commander and the control organs after adoption of the decision and after combat planning are to **disseminate the tactical missions to the troops and to organize their coordination**. Both of these functions are in essence also inseparably linked to each other. In giving operation or fragmentary orders to his troops and indicating therein what enemy to attack, and where and when, the commander is thus also to a certain extent coordinating their efforts and operations with respect to target, time, and location, which is also the essence of the organization of coordination. However, as the experience of the Great Patriotic War has demonstrated, the mere allocation of the missions to the troops is insufficient to achieve their close, continuous coordination. Besides this, it is useful to give them *additional directions* on how they should proceed when carrying out their missions so as to give each other mutual aid and by their coordinated efforts successfully carry out the overall tactical mission.

During the last war these directions were usually given after the subordinate commanders received the missions, made their decisions, and reported them to their superior. 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, the battalion commander, for example, must give the subordinates coordination instructions immediately after assigning their tactical missions to them. Both of these functions, therefore, are closely connected not only in terms of meaning, but also in terms of time of execution.

The next control function in combat preparation is the organization of comprehensive support of combat actions. The purpose of this function is to create for the subunits of the branches of troops the conditions necessary for them to successfully accomplish their tactical missions of destroying the enemy. The main object of control in its implementation is the special troops and rear services subunits. This function also differs from the analogous function in other spheres of control in its variety and complexity. In the view of modern army command elements, the basic *types of support* of combat operations in any control element, including the battalion, are the following: reconnaissance, protection against nuclear weapons, physical security, and camouflage, as well as engineer, rear services (including medical), and technical support. In the U.S. Army, a great deal of attention is also given to such types of support as electronic warfare. In the higher echelons of a number of armies, hydrometeorological and topogeodetic support of combat operations is specially organized. In our opinion, it is reasonable to include the commandant's service among the types of support

since it has the object of providing for the organized movement and operations of troops and also for their systematic deployment.

It is especially important to bear in mind that for the organization of each of the above types of support it is objectively necessary to have additional (special) data on the situation and, based on the commander's overall concept of the engagement, to define the missions for a given type of support and assign these missions to those who will perform them.

An exceptionally important function of tactical command and control which permeates all other functions is the **organization and carrying out of political work** with personnel. Its specific mission in combat (by comparison with other circumstances) is to ensure the formation of strong morale in each officer, sergeant, and soldier; their complete understanding and implementation of the policy of the CPSU and the Soviet government; maintenance of high troop combat readiness; knowledge by personnel of the objective and the nature of the war being waged and of their specific mission; strengthening of their psychological state, certainty of success, courage, and an urge for the offensive. It is charged with inculcating in the troops a loyalty to their oath, hatred for the enemy, vigilance, a sense of teamwork and readiness to help one's comrade, strengthening of the one-man management principle and discipline, publicizing of heroic acts, skillful use of equipment, the urge to carry out the mission whatever the difficulties, even if it means sacrificing oneself. At the same time, the purpose of political work is seeing to providing personnel with everything required for combat and life. A component of political work is the struggle with bourgeois ideology, inculcating personnel with a spirit of internationalism and of comradeship in arms with the armies of the other socialist countries.

* [The connotations of the Soviet term *internatsionalizm* 'internationalism' may not be immediately obvious from the word itself. The scope of its significance varies with the context. It may mean: (1) the blending of the many various nationalities in the Soviet Union into a unified whole in the Soviet Armed Forces; (2) cooperation with the Warsaw Pact Countries; or (3) support of socialist movements throughout the world. The reader is urged to consult the following sources for a more thorough understanding of this important term: "Internationalism," *Great Soviet Encyclopedia*, 3rd ed., 1970, X, 341-42 (as translated and published by MacMillan, Inc., New York); V. I. Lenin, *Collected Works* (Moscow: Progress Publishers, 1964), XXIV, 75; "Internatsionalizm v stroitel'stve Vooruzhennykh Sil SSSR," *Sovetskaya Voyennaya Entsiklopediya* ["Internationalism in the Development of the USSR Armed Forces," Soviet Military Encyclopedia] (Moscow: Voenizdat, 1977), III, 565-66; and, in the same volume of this encyclopedia, "Internatsional'nyy dolg" ["International Duty"], pp. 568-69—U.S. Ed.]

It is especially advisable to discuss one specific function of combat control, i.e., **preparing troops for combat operations**. The experience of the Great Patriotic War has demonstrated that in addition to assigning the troops their mission it is very important to conduct exercises with the commanders, staffs, and subunits of the branches of troops and special troops and drills for performing them under conditions that are as close as possible to those of the forthcoming combat operations. Of course, given the time frames we have today, the possibilities for such exercises and drills will be highly limited because of the lack of time, but they should not be forgotten or completely eliminated.

The commanders and the control organs must take advantage of even the slightest chance to ensure that each officer, sergeant, and soldier achieve solid knowledge of the tactical mission and the methods of carrying it out. A. V. Suvorov even in his day taught that every soldier must know his own maneuver. In accordance with this behest, the commanders and staffs at all levels during the Great Patriotic War never begrudged the time taken to train personnel for carrying out the forthcoming tactical mission under conditions as close as possible to the real ones. Thus, when preparing for an offensive involving forcing a river, the commanders and staffs of the units of the 72nd Rifle Division, 42nd Army of the Leningrad Front in January 1943 worked out with the personnel such problems as the procedure for using crossing equipment, the capture and securing of a bridgehead on the opposite bank of the river, and the organization and support of the coordination of rifle subunits with artillery and engineer troops.¹⁰

In assessing the importance of such drills and exercises, the commander of the 2nd Guards Army noted the following in his analysis of the Silesian operation: "Fifteen to twenty days before the beginning of the operation, we began to conduct joint exercises. . . . Subsequently, during joint reconnaissance, the officers of the branches of troops were very gratified and pleasantly surprised that they had performed their training drills together and were going into battle together. They knew each other, and a certain confidence and mutual understanding had developed. This was highly valuable for combat."

Of course, preparation of the troops for combat is not limited to mere drills, exercises, and training sessions. It is closely connected with measures to provide the troops with everything needed for combat and life and is connected also with their regrouping and occupying and equipping the jump-off positions, etc. The function of preparing the troops for combat, consequently, can have no clear-cut limits.

A function such as the **organization of command and control** itself has a no less specific nature. In the performance of this function under combat conditions, as based on the commander's decision, the following basic measures are usually taken:

(a) the appropriate system of control posts is determined and set up; their composition, technical equipment, places and time of deployment are established; the engineer equipment is installed; their physical security and defense are organized; the procedure is outlined for relocations during combat operations and for recovery in the event of failure of one post or another;

(b) the work of responsible individuals at the control posts is organized with a precise determination of who, what, where, when, and how it must be done;

(c) communications with the subordinate troops, the higher headquarters, adjacent units, and the coordinating subunits and units and also secure means of command and control (SUV)* are organized.

Finally, an important control function is **monitoring** of the readiness of troops for combat operations and giving them the necessary aid. Its primary goal consists in each enlisted soldier, sergeant, and officer knowing his mission in the forthcoming engagement and being ready in every sense for successful accomplishment of this mission by using the equipment entrusted to him. In content, monitoring includes none other than study of the actual state of affairs among the troops, making a decision based on this study to eliminate the deficiencies discovered, and disseminating the appropriate instructions (missions) to the subordinates.

This is the basic content and specific nature of command and control functions in preparation for combat operations.

Command and control during combat operations is simply a direct continuation of the above-investigated control functions performed in preparing for combat. The basis for it is the implementation of the decision adopted, along with adjustments made to the extent that they are required by changes in the situation that actually develops in the course of combat.

Thus, in command and control during combat operations, in order to maintain combat effectiveness at a high level or restore it when it has been lost and in order for the troops to achieve success in carrying out the assigned tactical mission, the commander and the control organs

* [skrytoye upravleniye voyskami—U.S. Ed.]

simply continue to acquire and study data on the unfolding situation; based on this they amplify the previously made decision and, in the event of drastic changes in the situation, make a new decision; they disseminate the revised or new missions to their subordinates, and maintain continuous troop coordination; they direct the implementation of measures for support of combat operations and political work; they provide for continuity of command and control and restore it in case of disruption; they monitor the progress of the combat operations and give the troops the assistance required to carry out their missions. In addition, they study the experience of these combat operations so as to make future use of this experience in enhancing the combat effectiveness of their troops.

As is obvious, in terms of content (the name of the functions), command and control during combat operations does not differ in essence from command and control during preparations for these operations. Of all the functions mentioned, the main, always mandatory, fixed functions and those constantly repeated in practice are the acquisition and processing of information on the situation, making a decision based on this information, and disseminating the missions to those who will perform them. In order to achieve whatever general or particular objective is pursued, both in preparation for and during combat operations, the commander and the control organ must have and study the applicable data on the situation, make a decision, and assign the missions to those who carry them out.

If all the other functions and measures can be of a random nature and, as it were, provide support, then **exclusion from the control cycle of just one of the three mentioned main functions inevitably leads to breakdown of control and, consequently, to disruption of the performance of the mission.**

These functions must be repeated especially frequently by the commanders of the lower tactical echelons. Let us take, for example, the battalion element. The battalion can perform its mission on the offensive in a comparatively short time, after which it receives a new mission. Consequently, in the course of a day of combat operations, the battalion commander must evaluate the situation information several times, and then make a new decision and assign the mission to his subordinates, not to mention the times he amplifies the decision during the course of the performance of each successive mission.

Thus, on the basis of an analysis of the structure of the system and the objectives and content of command and control during preparations for and in the course of combat operations, one may define its essence

thus: command and control in combat is based on the laws of armed conflict and the principles of military science and is a purposeful activity of the commander, staff political organs, and chiefs of the branches of troops and services for maintaining high combat readiness in their subordinate units, for preparing for their combat operations, and for directing efforts toward successful accomplishment of the tactical mission during combat by effective employment of the available forces and resources. Here, among the many control functions both in preparation for and in the course of combat operations, the most important are the following: acquisition and study of situation data, making of the decision and amplification of it by the commander, and dissemination of the missions to those who perform them.

This definition of the essence of command and control does not contradict the formulations set forth in official sources. It only makes them concrete and indicates who, by whom, on what basis, for what purpose, and in what way troops are controlled in the engagement, considering its specific nature. In addition, this definition fits perfectly the philosophical and cybernetic conception of the essence of any control as an information process, which includes acquiring, storing, converting, and disseminating the information. Its theoretical and especially its practical significance is that it indicates to officers at all levels and to the scientists and technicians the main, decisive link in the whole great chain of control measures. **If by using the latest technical (including automated) equipment the officers achieve a situation where they always know the actual circumstances, quickly make a sound decision, and assign the missions in a timely fashion to those who carry them out, then all of today's main problems of command and control can be considered solved.**

Modern Requirements Placed on Command and Control^{*}

The definition of the essence of tactical command and control and its specific nature presented here will become even more valid if, in addition to the objectives and content, we consider the conditions of control and the special requirements derived from them. This means its basic qualitative and quantitative characteristics, which indicate the degree to which the commander and the control organs are capable of confident orientation to the situation, making a purposeful decision, assigning the tactical missions in a timely and competent manner, dis-

^{*} In the first edition of this book, this question was treated in chapter 2, "Development of the Theory and Practice of Command and Control," which has been omitted in this edition because of the publication of the book by N. N. Popel', V. P. Savel'yev, and P. B. Shemanskiy, *Upravleniye voyskami v gody Velikoy Otechestvennoy voyny* [Command and Control in the Great Patriotic War] (Moscow: Voenizdat, 1974).

seminating them to the subunits, organizing coordination, comprehensively supporting troop operations, and firmly and persistently implementing the adopted decision.

Of all of the conditions that determine the requirements placed on command and control, the weapons and the nature of combat operations used by the belligerents always have the greatest impact. It is quite obvious that the most difficult conditions for control will occur during the preparation and in the course of combat operations when the entire arsenal of modern weapons, both nuclear and conventional, is employed. We can make these operations the basis of our investigations, since, if control meets the requirements imposed on it under such difficult conditions, then it will be all the more successful in combat that does not involve nuclear weapons.

When preparing for and conducting combat operations where nuclear weapons and modern conventional weapons are employed, the troops subject to control can be placed in a very difficult position. As a result of enemy nuclear strikes they can in a short time (almost instantaneously) sustain losses unheard of in past wars. It is not out of the question that their organizational integrity and combat formation will be disrupted. After the nuclear strikes, they will, as a rule, be attacked by a large mass of tanks, motorized infantry in armored combat vehicles, combat helicopters, and other enemy equipment. Broad zones of radioactive contamination, destruction, flooding, and fires are formed on the terrain. Personnel may receive large doses of radiation and be subjected to previously unheard-of emotional and psychological shock, especially at the beginning of the war when they are still inexperienced in conducting combat operations in which nuclear weapons are actually employed.

Under such conditions the most important requirement imposed on command and control is for **high combat readiness of all echelons and of the entire control system**. The essence of this requirement is the constant readiness of commanders and control organs at all levels to assume control of their troops literally from the first minutes after receiving the alert signal or after a surprise attack by an aggressor and to ensure successful accomplishment of the tactical mission in any difficult situation.

It is obvious from this definition that the high combat readiness of the command and control system is one of the important factors in troop combat readiness as a whole. It must be noted here that the readiness of the control and communications system must be somewhat ahead of the general readiness of the subunits, precede it, be superior to

it and more mobile. This requirement can be met by timely and complete manning of the control organs with competent, highly qualified personnel; proper scientific organization of staff work; skillful placement, distribution, and careful camouflaging of the control posts; comprehensive technical equipping of the staffs; effective utilization of automated command and control equipment; ensuring flexibility and superior survivability in the communications system and its resistance to jamming; clear-cut organization of combat alert duties; training of the control organs to perform their functional duties under difficult conditions and to quickly restore disrupted coordination and command and control of troops.

The above conditions for preparing and conducting combat operations, and especially their acute, intense, and persistent nature, in a new sense impose on command and control a requirement for **firmness**, by which we mean the capacity of absolutely all the officers and, above all, the commanders to make a courageous decision, persistently implement it, retain control of the subordinates in their hands, preserve organization, and accomplish the tactical mission in any difficult situation. For this purpose the officers must possess, in addition to knowledge and skills, exceptional bravery, decisiveness, courage, great strength of will and tenacity, the capacity to take a sound risk, to think correctly and quickly under great emotional and psychological stress, and the ability to exert a mobilizing, organizing effect on people. Combat experience teaches that the least vacillation and indecisiveness by the officers and frequent and unsound changes in the troops' missions are inevitably communicated to their subordinates on those subtle rumor networks and have a negative effect on them. Firm control, consequently, is mainly characterized by the personal (subjective) qualities of the officer, which can hardly be measured quantitatively, that is, it is hardly possible to introduce any human stability coefficient, even though such attempts are made. Instead of these attempts, perhaps it would be better to concentrate the main efforts on cultivating high qualities in the officers in their training system.

However, firmness of control should not be taken to mean that the commander must stubbornly, in spite of logic and common sense, adhere to a previously made decision. Modern combat is characterized by more frequent and drastic changes in situation than in past wars. Under such conditions one cannot count on an engagement to develop automatically in exact accord with the plan already made. Inevitably, one has to make adjustments and refinements. Therefore command and control not only must be firm but also **flexible**. By flexibility of command and control we mean here the capacity of the commander to make a timely refinement of the previous decision and, if the situation

has changed drastically, then to find the strength of will to drop it, make a new decision, redesign the control system and the methods of its operation to fit the circumstances of the new situation. The requirement for flexibility of control, consequently, applies not only to the commander personally but also to the entire command and control system. For this purpose the commanders and control organs 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, anticipate them, and prevent possible complications.

However, flexibility of command and control cannot be identified with a commander's indecisiveness, which leads to frequent and unsound changes in the decision made and instructions given the troops. As wars have taught, this always has a harmful effect on command and control of troops and on their accomplishment of the tactical mission.

Another requirement has become important in modern combat. This is the one imposed on control for **continuity** or stability, which is attained by the survivability of the control system and consists in its capacity to ensure uninterrupted communications with the troops, constant knowledge by the commander and staff of the situation, and the possibility for them to exert the required influence on the course of combat operations with the available forces and resources.

The importance of this requirement has increased because, as compared with the past, enemy capabilities for destruction of our control posts by nuclear and conventional weapons as well as by jamming our communications have increased a great deal. In addition, the maintenance of continuous control is complicated by the growing tempos of modern combat operations, the prolonged movements of the control posts, and the increased distances between them. Under such conditions, continuity of control is secured primarily by active reconnaissance, stability of communications, and high survivability and mobility of the control posts.

The basic quantitative criterion of command and control continuity may be the time during which there are no communications with the troops and when, therefore, the commander and staff cannot acquire information on the situation and disseminate the missions to the subordinates. At today's tempos of combat operations, this time cannot exceed a few minutes at battalion level. Otherwise the attacking subunits can penetrate so far as to complicate the commander's making a decision, especially one to direct fire strikes at the enemy without the

danger of hitting his own subunits.

In addition, continuity of control can be characterized by the degree of probability of failure of the control posts as a result of enemy employment of various weapons against them, the time required for their recovery, and the probability of disruption of communications due to interference.

The requirement placed on command and control for **security** is just as important in modern combat. The essence of this requirement is to keep all the command and control measures secret from the enemy. Its violation, given the enemy's modern means of reconnaissance and weapons, can also lead to serious consequences. The basic criteria of control security are the degree of probability of enemy detection of our control posts and the interception and decoding of exchanges and transmissions over communications media.

In order to ensure command and control security, great vigilance is required of all personnel, as well as strict modes and clear-cut procedures for the use of communications media, especially for radio conversations; restrictions on the number of individuals involved in developing operations planning documents and storing them carefully; and concealment of the location and movement of the control posts and adherence to camouflaging measures.

The effectiveness and high quality of command and control depends to a very great extent on such requirements as **operativeness** in the work of commanders and control organs, by which is meant their capacity to perform all of their functions quickly, forestalling the enemy, and at the same time achieving completeness and quality. This applies especially to acquiring information about the situation, making a decision based on it, and disseminating the missions to the subordinates so as to afford them as much time as possible to prepare for combat operations.

This requirement arises from the nature of modern combat operations, which differ from those of the past in their more dynamic nature, in the more frequent, faster, and sharper changes in the situation, and in their short duration. In the last war, troops attacked at a rate averaging 1 to 2 km/hr and they moved on foot at a speed of 4 to 5 km/hr. Under such conditions, delay, for example, of the situation data by 1 or 2 hours was to a certain degree acceptable even in the tactical control elements, since no sharp changes in the situation usually took place during this time. Besides, the commanders at all levels, even including the front commanders, could personally observe the course of combat

operations, if not over the whole zone, then at least in the main sector.

The situation is entirely different in this respect now with the great increase in the volume of control operations and the sharp decrease in the time for performing them. The drive to save and gain time in control, not just hours but minutes and even seconds, has become an implacable demand of the realities of combat and a primary problem of control. The time spent on implementing each control measure is one of the criteria for the capacity of control organs for dealing with the complex mission of modern tactical command and control.

Especially great operativeness is required in organizing to combat newly detected enemy nuclear missile systems and nuclear artillery, since the time they stay in launching (firing) positions is a matter of just a few minutes. If they are detected by our reconnaissance group at the moment of deployment, then in these few minutes the commander must acquire the data, evaluate them, make a decision, and assign the missions to his weapons, and they in turn must get ready to carry out the mission and strike the enemy. If there were a delay, the enemy could strike first and move away from the position he was occupying.

Consequently, the basic quantitative criterion (index) of operativeness in control may be the time spent by the commander and staff of a given element on one control cycle, that is, on acquiring and studying the situation data, making a sound decision on this basis, and assigning the missions to those who will carry them out. This time, of course, must be as short as possible in order to provide maximum time for troop preparations to carry out the mission, to ensure striking before the enemy and effective employment of weapons by friendly troops. Its actual duration in each individual case and at each level must have its own limit, to exceed which (everything else being equal) will lead to failure or incomplete accomplishment of the assigned mission. This maximum admissible duration of one cycle is customarily called the critical control time.

Of course, the critical time will be different for the various branches of troops. It is one matter, for example, when controlling air defense subunits repelling an enemy air attack, where the critical control time is measured in a few seconds and another matter when controlling rear services subunits, where as much as several hours is often acceptable.

This time must in no case be reduced at the cost of control quality, especially at the cost of the soundness of the decision made and the violation of security. Haste and superficial solution of problems are not compatible with the concept of operativeness of command and control.

The most important factors for achieving great operativeness of command and control without loss of quality are the following: high professional level of training of the commanders and officers of the control organs, their organizational abilities, their skillful use of the latest means of mechanization and automation of control processes, and also the use of exact calculations and the most effective methods of operation.

These are the main requirements placed on command and control as determined by the modern conditions of preparation for and conduct of combat operations. They are all closely interrelated and dependent, and failure to satisfy even one of them can lead to a breakdown in carrying out the tactical mission.

Characteristic Aspects of Tactical Command and Control

The objectives, the content, and the conditions of tactical command and control which we have examined indicate that it is multifaceted in nature.

Of all aspects of tactical command and control, one should first take note of the **ideological-political** aspect. Its essence is the close combination of the purely military leadership with the political, with the implementation of the ideology and policy prevailing in a given country, making an impact on those in a subordinate position not only by administrative, but also political methods (propaganda, agitation, education, persuasion, and so on).

This aspect of control also occurs, of course, in other areas of social life. ". . . Without the proper political approach to matters," V. I. Lenin taught, "a given class will not remain at the top *and, consequently, it cannot perform its production task.*"¹¹ However, in wartime command and control this aspect acquires a special nature, since any war, by definition of the founders of scientific communism, is a continuation of the policy of the powers and various classes concerned by other, namely violent, means, and the basic content and main method of achieving the political objectives of any war is armed conflict. This means that when involved in tactical command and control, the officer in any army implements the policy of his class and the ruling party by employing the forces and weapons and the developed and available methods for crushing the troops of the opposite side. The basis for this control is always the principle of the party nature, the class and state approach to the solution of practical problems. Any discussions in the bourgeois press about their officers' being above politics has no connection with reality. Any army is an

instrument of the state. Every officer in a bourgeois army always defends the interests of the bourgeoisie, implements their ideology and policy, which is aimed at suppressing the revolutionary movement within the country and enslaving the peoples of other countries. Any bourgeois control theory, therefore, is an integral part of bourgeois ideology and policy.

In the Soviet Army and in the armies of other socialist countries, the ideological-political aspect of command and control has an essentially different nature. Here every officer is an implementer of the ideology and policy of the Communist Party. Everything he does is aimed at protecting the peaceful labor of the Soviet people and the peoples of the other socialist countries from imperialist aggression and also at strengthening brotherhood and international friendship with the peoples of all countries. For this purpose it is his duty to study Marxist-Leninist theory thoroughly, know party and government policy, explain it to his subordinates, possess such traits of the Leninist style of leadership as high principles and conviction in the triumph of the communist cause and political maturity and understanding. The party orientation of the Soviet officer, consequently, means that any matter, any step taken by him, and the actions of his subordinates must be evaluated by this officer from the point of view of the interests of the CPSU, the Soviet state, the Soviet people. ". . . One must," V. I. Lenin taught, "strive with all his might to reach that point, and keep to it strictly, where party orientation is *not* just *words*, but *deeds*."¹²

The practical embodiment of this aspect of command and control in our army is ensured by the guiding role of the CPSU in the organizational development of the Armed Forces and by well-organized party-political work.

A second aspect of battlefield command and control is the **morale-psychological** aspect. It is closely connected with the ideological-political aspect, and, as it were, continues and supplements it. The essence of this aspect is that in command and control each Soviet officer, in addition to the above-noted high principles and political maturity, must himself possess and instill in his subordinates high morale-psychological qualities, especially those such as boundless devotion to the Homeland and hate for its enemies; internationalism; the capacity to steadfastly endure all of the difficulties and deprivations of combat life and great emotional, psychological, and physical stress; energetic activeness; readiness to help a comrade; contempt for death

* [It should be understood that the Russian adjective *moral'nyy* does not distinguish 'moral' from 'morale,' so that combined forms of this word such as one finds here may connote both ethical qualities and other inner, emotional factors—U.S. Ed.]

and a readiness to sacrifice one's own life for the sake of saving others; belief in the power of the weapons entrusted to him and in the abilities of the commander. It is also important to achieve psychological compatibility of the troops in the military collectives among themselves and with their combat equipment, bearing in mind that the employment of most modern equipment in combat (weapons, tanks, launchers, etc.) involves the efforts of the collective and depends on the psychological stability of each soldier.

On the whole, this aspect of command and control obliges every officer to remember always the behest of V. I. Lenin regarding the decisive role of troop morale in gaining victory. In order to carry out this behest an officer requires thorough knowledge not only of Marxist-Leninist theory but also of pedagogy, psychology, as well as the ability to train and educate his subordinates and to take their morale-psychological state into account when solving the practical problems of command and control.

A third aspect of command and control is the **sociolegal** aspect. It arises from the fact that any troop collective (the squad, combat crew, platoon, company, battery, etc.) and the Armed Forces as a whole are an inseparable part, a cell of our socialist society, and every soldier 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. It is at the same time a good school of ideological and physical tempering, discipline, and organization."¹³ A command and control system is therefore by its nature a social system.

Thus, of great importance in improving command and control is the officers' knowledge and creative application (allowing for the specific nature of military affairs) of the laws of social development and also of the measures which, in the light of party congress decisions, are taken in the country to improve control in other areas. Marxist-Leninist theory and the science of the control of society are the methodological base for command and control theory. Even in the first years of existence of Soviet power V. I. Lenin wrote: "The experience which Soviet power has had in organizational development cannot be considered an isolated experience. . . . Our army's organizational development was able to lead to successful results only because it was created in the spirit of the general development of a Soviet society. . . ."¹⁴

This conclusion of V. I. Lenin has become even more significant today, when the work on improving control of public life has developed on a broad front throughout the country. In the party deci-

sions each officer can find much that is valuable for his practical work in command and control. The use in command and control of the latest achievements in the science and technology of control is especially important.

In addition, this aspect of control obliges each officer not only in peacetime but also in wartime to be a model and to instill in his subordinates a spirit of strict observation of Soviet laws, the rules of socialist society and the requirements of military regulations, and his oath; to strengthen discipline, organization, and team spirit, remembering that it is precisely in the collective that the personality of the soldier is primarily shaped as a defender of the state and the citizen, and his aforementioned ideological-political and morale-psychological qualities are formed. It is inadmissible for a commander or his subordinates to commit even the slightest violation in combat of the requirements of the law, the regulations, and the orders of a superior. The commander is entrusted by his Homeland with its most valuable asset—people—whose life or death determines the fate of their families and relatives. Man, the soldier, is a social creature, and so command and control of the soldier is always social in nature and presupposes the application of the appropriate social and legal standards and methods of influencing him.

It is also important to take into account that the state of command 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 organized command and control helps to create a good, businesslike situation in collectives and brings about growth of initiative in people. On the other hand, "nothing cools people off more than the facts of poorly considered decisions, stupid bungling, or bureaucratic behavior on the part of individual workers. . . ." ¹⁵

Any demands to carry out the laws and the rules and regulations must be combined with the fatherly concern of the officer for his subordinates, a polite manner toward them, and a respect for their human worth. Control relationships in society, including in the armed forces, are first of all relationships among people with their purely human characteristics, and one must always guide these relationships and exert a useful influence on them. Rudeness, an insulting manner, or "a harsh, cutting tone" on the part of an officer have never been conducive to successful control. They have not strengthened but, on the contrary, undermined his authority among his subordinates, which has inevitably affected the success of combat operations.

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

A fourth important aspect of command and control is the **organizational-methodological** aspect. It is also closely connected with the foregoing ones and requires of each officer great organizational capacity, exactingness, mastery of advanced working methods, the ability to carry out all control measures quickly and, at the same time, in a superior manner that is based on the scientific organization of labor. Again, especially important is the skill of the officer in working with people, in merging them into a harmonious combat collective, in creating a healthy, businesslike situation in this collective, in mobilizing them to carry out the tactical mission successfully, in spite of any difficulties or danger. ". . . For successful control," V. I. Lenin noted, "one needs, *in addition to the ability to convince, . . . the ability to provide practical organization.* This is the most difficult problem. . . ."16 In another place he emphasized that "any control work requires special qualities. One can be the very best revolutionary and agitator, and yet a quite worthless administrator."17 Neither can we forget the physiological and esthetic aspects of control aimed at creating normal conditions for labor and rest, preserving people's health, and improving the quality of control work.

Finally, the **military technology** aspect of tactical command and control is exceptionally important, its essence is the solid mastery and skillful use by officers of purely military knowledge, that is, the laws of military science, the laws and principles of military art set down in the regulations and manuals, the characteristics of materiel and of control equipment, organization, the combat capabilities and tactics of friendly and enemy troops, and also these officers' knowledge and practical skills directly related to command and control. It is especially useful to dwell on the importance of officers' knowledge and skills in utilizing the latest technical means of control that have come about as a result of scientific and technical progress. Without them successful tactical command and control today is impossible. These things, especially electronic devices, constitute the "nervous system" of modern forces.

All of the basic aspects of tactical command and control that we have considered are closely interrelated and constitute a dialectic unity. This requires of the officers thorough, all-around knowledge of the various sciences that deal with the respective aspects of control, i.e.,

scientific communism, philosophy, political economics, sociology, law, military science, mathematics, cybernetics, psychology, pedagogy, scientific organization of labor, and also skillful combination of the various methods of control: ideological-political, social, legal, administrative, logical, and mathematical.

On the whole, modern command and control turns out to be a dialectic *unity of science and art*. The laws of armed combat and the principles of military art are manifested not in themselves but through the creative activity of the officers. The opinion that was current in the past to the effect that military affairs are no so much a matter of the mind as of the will is deeply erroneous. Without denying the important role of a commander's qualities of will, we should still remember that any will that he has must be based on a sober mind and thorough knowledge. The assertion of the well-known American general M. Ridgeway that "as a result of the variety of human characteristics and the varying levels of combat experience, command and control is more an art than a science" is erroneous.¹⁸ The need for a close combination of science and art in control has been quite fully proved by history and experience, which V. I. Lenin gave the following scholarly generalization. ". . . In order to control," V. I. Lenin taught, "a person must be competent, he must know all the conditions of production completely and in detail, he must know the very latest production technology, he must have a certain scientific education."¹⁹ This behest of our leader is fully applicable to officers. Their activity in modern tactical command and control is quite similar to the activity of a scientist.

The aforementioned aspects and conditions of command and control impose great requirements on it. Meeting them is considered a problem of the first priority in all modern armies. Various ways to its solution have been explored. The main ones are the following: further development of command and control theory and, based on this, raising the level of officers' training in command and control; improvement of the structure of control organs and the command and control system as a whole; equipping the control organs and posts with new technical control means, including automated means; improving the style and methods of operation of commanders and the control organs in carrying out their functions using new technical equipment.

Notes

1. Lenin, XV, 368.
2. Lenin, XXIX, 252.
3. Lenin, XVIII, 145.
4. K. Marx and F. Engels, *Soch.* [Works], XXIII, 342. [Hereafter cited as Marx and Engels—U.S. Ed.]
5. Marx and Engels, XXIII, 189.

6. *Ibid.*, XXI, pp. 305-6.
7. Lenin, XLII, 290.
8. See the Internal Service Regulations of the USSR Armed Forces.
9. See the journal *l'Armee*, October, 1968, pp. 46-49.
10. *Arkhiv MO SSSR* [Archives of the USSR Ministry of Defense], fond 397, inventory 9247, item 12, folios 1-55.
11. Lenin, XLII, 279.
12. Lenin, XIX, 110.
13. *Materials of the 24th CPSU Congress* (Moscow, 1971), p. 81.
14. Lenin, XL, 76-77.
15. *Materials of the 24th CPSU Congress* (Moscow, 1971), p. 66.
16. Lenin, XXXVI, 173.
17. Lenin, XL, 215.
18. *United States Naval Institute Proceedings*, November 1967, p. 30. [This English translation of the Russian has not been compared with the original English—U.S. Ed]
19. Lenin, XL, 215.

Chapter 2. Command and Control Organs and Technical Equipment and Control Posts

1. Command and Control Organs

The organizational structure of modern control organs took form during the historical development of armed forces under the influence of changes in the means and methods of combat, the quantity and organization of troops, and also the technical means of control. During this development the requirements placed on command and control changed, the range of problems of control organs expanded, the volume of their work increased, and this, in turn, necessitated improvement of their organizational structure to bring it into conformity with the new requirements and missions.

The process of improving the organizational structure of control organs, and also of the troops themselves, goes on continuously and is carried out under the direct guidance of the CPSU. As early as 1918, in the Resolution of the Central Committee of the party it was determined that the "policy of the military department, like that of all other departments and institutions, is conducted on the precise basis of the general directives issued by the party in the person of its Central Committee and under the latter's direct control."¹

Requirements Placed on Control Organs

The control organs can deal successfully with their increased problems only if their regular organizational structure, the level of cohesiveness and training, the methods of operation, and their technical equipment are fully in tune with the nature of modern combat. The control organs will be capable of ensuring reliable command and control in any situation if they meet the following requirements: they are constantly ready to direct the troops subordinate to them; they are capable of carrying out their assigned missions in a short time; they have the number of subordinates (responsible personnel, control organs, subunits) that meets span of control standards; they are small, mobile, and simple

in structure; they provide for deployment of the control post system; their personnel include specialists on the branches of troops and services; they maintain a justifiable ratio of officers and sergeants (or soldiers).

The most important of these requirements is maintaining the control organs in constant readiness to direct the troops subordinate to them, since they constitute the basic element of the command and control system. This requirement was placed on control organs in earlier times also. All armies have always striven for a peacetime organization of control organs that differs as little as possible from the wartime regular organizational structure. This way there is no need in the event of war to reorganize the control organs. They could immediately start performing their missions. Today, when the significance of a sudden outbreak of war has increased immeasurably, this requirement has become even more important. It comes down to the fact that the readiness of the control organs and, consequently, of the entire command and control system must, be greater than the combat readiness of the troops. Only when this condition is observed are the commander and staff in a position to organize the forthcoming operations of their troops in a timely, superior manner.

High combat readiness of the troops, which means also the control organs, as the Chief of the General Staff of the USSR Armed Forces has pointed out, means "a condition that ensures the fulfillment of the missions to repel an aggressor's attacks at any time and under the most difficult conditions, quickly dealt crushing counterattacks against the enemy, and successful conduct of subsequent actions."²

This readiness of the organs, as well as that of the control system as a whole, is achieved by carrying out a set of measures, among which the following are the most important: maintaining a high morale-political state of mind in the personnel; manning the control organs with trained officers and equipping them with modern technical means of control and movement; training the control organs to perform their functional duties and providing for a high level of field training and cohesiveness; scientific organization of staff work.

Because of the way that means of armed conflict have developed and due to the increase in the scale and dynamics of combat operations, the volume and content of command and control missions have increased sharply, while, at the same time, the time frames for carrying them out have grown shorter. Therefore the control organs must be capable of performing all missions in the short periods of time allotted for the organization of combat operations.

Along with a high level of other training, a scientifically sound determination of the composition and structure of the control organs has become very important in solving this problem. When these factors are calculated they also take into account span of control standards, i.e., the maximum permissible number of subordinates (responsible personnel, control organs, subunits, and units) which the commander and staff are able to control effectively. This standard is not a general standard for all instances. It depends on the content and complexity of the missions to be carried out by the subordinates, the degree of independence granted them, the locations of these people in combat, the availability of communications, etc.

As a result of studies made in our country and abroad it has been established that in any sphere of command and control, one chief (director) can, on the average, effectively direct the activities of 5 to 10 people directly subordinate to him.³ An excessive increase in the number of people subordinate to one person creates a situation of "uncontrollability." The subordinate will not receive his missions and instructions regarding the content of the work on time and he will remain outside the range of vision of the commander (or chief). It is necessary here to take into account the fact that the commander, as a rule, has, in addition to constant communications, a significant number of temporary communications (control of the attached and supporting subunits, maintenance of contact with the coordinating subunits, control of the reconnaissance units, etc.). All of this makes the commander busier and increases his load.

A sound determination of the span of control standard follows from calculating the capabilities of the control organs. Violating this requirement leads to a loss in effectiveness of command and control. This may be confirmed by citing an example from the experience of the Great Patriotic War. At the end of 1941, the corps directorates were reduced. Of all the formerly existing directorates there were only six left. As a result of this reorganization, the total number of formations and individual units making up an army was 16 to 18. The experience of the offensive operations in the winter of 1941-1942 demonstrated the serious difficulties in command and control of troops in an army of this makeup. It became necessary to restore the corps control element, and this was eventually done.

Another requirement also becomes especially important—the requirement for small, mobile control organs. Even as long ago as during offensive operations in the Great Patriotic War, the division staffs were forced to move several times a day in order to be closer to the troops and provide continuous control of the subordinate units. In modern

combat, when the offensive is carried out at higher speeds, the commander must change locations much more often and be ready to control the troops on the move and from short halts.

There can be no doubt that under these conditions small and highly mobile organs will be the most suitable ones. Experience shows convincingly that the larger the numerical strength of control organs, the more complex will be the organization of their movement and deployment, the greater the danger of their detection and, consequently, their destruction by the enemy. One should also take into account here the rather important fact of the interrelation between the components of the control organ structure in the work process. Usually, the more people participating in a job that has been put together for a single objective the more complex the organization of their activity becomes, and the more time that is taken up by various kinds of coordination, discussion, and exchange of information.

In theory and practice, certain responsible individuals consider that the main way to improve operativeness of control is to increase the number of control organs. Actually, the reason for delays in carrying out command and control measures and for overworking the individuals who execute them is more often than not insufficiently clear-cut organization of the work of the organs, their inefficient use of technical control equipment, and the use of obsolete working methods that do not meet modern requirements.

In addition to the above requirements, it is very important to ensure great economy. V. I. Lenin considered it necessary to make the control apparatus as economical as possible, to remove any traces of excess from it. The main areas for improving economy are simplification of structure and decrease in the number of control organs and a maximum reduction of service and support personnel. These measures can lead to smaller expenditures on direct maintenance of the control apparatus, its preparation and servicing, and to a decrease in expenditures on means of transportation and communications.

However, cutbacks in control organs made without scientifically sound calculations can do nothing but harm. Their makeup depends on the dimension of the troop organism and the volume of work. These principles, along with a consideration of the other requirements, are used as the basis for determining the makeup of the control organs. For this purpose, the volume of work to be done under various circumstances is established; the tested norms for time spent on each operation are selected, using advanced methods and available technical means; and, as a result of many computations performed on the various

choices, the makeup of the control organs is determined. The solution to this problem is found by using mathematical methods of analysis. The objective approach to determining the quantity of equipment and structure of the control organs is one of the conditions ensuring command and control effectiveness.

The makeup and structure of the control organs must ensure clear-cut, continuous, highly qualified command and control in any situation. The proven principle of division of labor in terms of types of operations (specialties), with strict distribution of functions and objectives among responsible personnel, is taken as the basis for determining the structure. This approach to control organ structure makes it possible to eliminate parallelism and duplication in the job, it clearly delineates the spheres of activity, and, at the same time, facilitates the organization of command and control. It promotes greater operativeness in the job. The presence of various control organs responsible for a certain type of operation has a positive effect on the rate of flow of information. The great flow of information which pours into the control system is split into branches, as it were, and thus its quick processing is ensured. Of course, in the absence of the required organization of work this solution can lead to parallelism, especially in the acquisition of situation information, and slowness and delays in the performance of the jobs in which representatives of the various control organs participate. However, if each control organ has its own specific missions and if each responsible individual has certain functional duties, there is no impassable wall in the interrelations within the control organ, and added to this there is the readiness of the officers to carry out the duties of other executive agents in accordance with the principle of cross-training.

The control organs are one of the main targets of enemy action. If any control element is put out of action, this creates additional difficulties in maintaining stable troop supervision. One of the means of ensuring control reliability is for the makeup of the control organs to be such as to ensure simultaneous deployment of the control post system and make it possible to restore them in case they are put out of action.

Because combat operations are conducted by the joint efforts of the branches of troops and are supported by special troops and services, the control organs must give them qualified direction. The control organs of combined arms units must contain specialists on the branches of troops, special troops, and services.

* [These "specialists" are staff officers of the organizations mentioned here and act as their representatives in the control organ. They are co-located with the control organ and provide a communications link with their respective organizations, at the same time furnishing current data and expert advice to the combined arms commander on

In the view of foreign armies, the so-called standardization of the organizational structure of the troops and control organs, a rejection of excessive diversity in them, is most valid. Thus, in the main NATO armies all of the divisions—infantry, mechanized, armored and air-mobile—have identically organized control organs.

We must not fail to note the requirement imposed on control organs to provide for the correct ratio of officers and sergeants (or soldiers). The clerk and the draftsman are irreplaceable aides of the staff officers. The quality of their work is the determining factor in the quality of formulation of combat documents and in reducing the planning time for combat operations. In control organs where the proportion of officers to sergeants (or soldiers) has been disturbed, the officers are forced to spend a great part of their time on work with minor details—preparation of telegrams for transmission, pasting together topographic maps, transfer of the situation from one map to another, proofreading printed text, preparing diagrams, etc., when these jobs could be done very well by sergeants and soldiers with certain skills, experience, and some training. Therefore one cannot investigate any reduction in support personnel as a new step along the path to the creation of small staff without also seeing the negative consequences to which it leads.

The Role and Tasks of the Commander in Command and Control

When setting up the organizational structure of the control organs, the principle of one-man management is taken as the base. The central control figure is the commander. This principle, which has taken form on the basis of the experience of long-term development of control organs, has become especially important today, when combat operations develop exceptionally quickly and are distinguished by great intensity and drastic situation changes. Under these conditions only the one-man management commander invested with great authority is capable of providing centralized control and directing the efforts of his subordinates toward successful completion of the assigned mission. Lenin's instructions that in military affairs more than anywhere else there must be the strictest unity of actions of large masses of people and subordination of their will to the will of one man do not lose any of their significance here.

employment of their organizations—U.S. Ed.]

The commander exercises command and control of the troops and bears complete responsibility for their performance of the assigned missions. In his practical work he is supported by the staff and other control organs. They help him to organize combat operations and to maintain constant troop control during combat.

The commander makes the decision, assigns the tactical missions to his subordinates, organizes coordination, and gives instructions regarding party-political work, organization of command and control, and comprehensive support of combat operations. The degree to which his decision fits the actual situation is indicated by the results of the troops' performance of their missions. The skill and ability to make sound decisions quickly is the basic measure of the operational-tactical maturity of the commander. Here, as expressed by M. V. Frunze, must be exhibited the skill "of selecting from among the many various methods and means the one most appropriate in each particular case. Military theory cannot provide him with any standard decision; it can serve only as a guiding principle."⁴

Napoleon compared the gift of the military leader with a square in which the base is the will and the altitude is the mind. The square will be a square only when the base is equal to the altitude or, in other words, when mind and will are equal. If will is superior to mind, the military leader will act decisively and courageously, but with little reason; in the other instance he will have good ideas and plans, but lack the courage and decisiveness to carry them out.

One may also say on quite good grounds that success in combat is brought about by will combined with professional skill, the commander's sense of great personal responsibility for the accomplishment of the mission, his demonstration of creativity, reasonable risk, and persistent search for the methods that lead to victory. One cannot expect a commander to display resolute, persistent actions in surmounting difficulties on the way to the combat objective if he has poor knowledge of tactics, the combat capabilities of the weapons and equipment, and the enemy and lacks experience in leadership. "The modern leader," noted L. I. Brezhnev at the 25th CPSU Congress, "must have an integral combination of party orientation with thorough competence and of discipline with initiative and a creative approach to matters. At the same time, in any field of activities the leader must take into account sociopolitical and educational factors, be sensitive to people, to their needs and requirements, and he must serve as an example in his work and in his daily life."⁵

With the commander's decision as a basis, the control organ subordinate to him organizes its work, which is aimed at high-quality preparation of the troops to carry out the forthcoming mission.

Today, because their troops are equipped with nuclear weapons and other means of destruction, commanders at all levels have a far greater opportunity to influence the course of combat, to impose their will on the enemy and create a situation advantageous for their own troops. At the same time, one must not fail to take into account the fact that the enemy has gained the same kind of opportunities. Given these conditions, success will go to the one who not only knows the actual situation but also is able to foresee its development, is capable of quickly reacting to the events occurring, thus getting the jump on the enemy in the operations. Any unjustified delay or a commander's passiveness or fear of responsibility for making a decision inevitably leads to defeat. Unquestionably, the commander must be prudent, but ready, at the same time, to take a reasonable risk.

In his book *A Soldier's Duty*, Marshal of the Soviet Union K. K. Rokossovskiy presents a convincing example from actual experience in command and control during the battle of Kursk: "By the end of the third day of the battle almost all of the frontline reserves were involved in combat, while the enemy continued to bring up more and more forces in the sector of his main blow. . . . How could we stop him? I decided to take a great risk. I sent my last reserves to the main sector. They were General S. I. Bogdanov's IX Tank Corps, located in the vicinity of Kursk, and covering the town from the south."⁶ Commitment of the reserves into the encounter played an important role in its outcome. This kind of risk is a measure of the commander's maturity, his skill in soberly evaluating the situation at the critical moment and selecting out of all possible alternatives the one that will bring him the greatest success.

Taking a risk does not mean acting rashly or making premature decisions without a thorough analysis of the situation and the estimates or without a firm belief in success. Any error by a commander in modern combat can lead to serious, at times irreparable consequences.

While performing a tactical mission, troops can get into a difficult situation. In such circumstances the commander must be with the subunits under his command; he must personally influence the course of combat operations and, by his tenacity, the force of his will, and his calm and reasonable persistence, serve as an example for all his personnel. If the troops do not achieve success, then 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 carrying out the mission, to rush to blame his subordinates for all of the failures, to replace certain people with others, to change his plan, to cancel the former missions and assign new ones to the subunits. This kind of haste is usually of no benefit and, besides, generates confusion in the subordinates' work. A commander must exhibit persistence in achieving the assigned objective, soberly evaluate the situation at hand, and make decisions without haste, but quickly and in a short span of time.

It is extremely important for a commander's work to be of a planned character, based on sober consideration of the time and the actual capabilities of the control organs and troops under his command. He must always know clearly what, when, and by what means something has to be done. Without this type of plan, the commander is in no position to work with the future, mentally anticipating events. He will constantly fail to get what he has to do done on time. The less time the commander has, the more careful must be his approach to selecting the problems that he will solve personally. The ability to distinguish the primary from the secondary is an important trait of a commander. "You must, thus," V. I. Lenin advised, "relieve yourself of the 'turmoil and commotion that is the *undoing of us all* and provide yourself with the chance to think calmly about the operation as a *whole . . .*" Being able to see the main thing does not mean that one may ignore what is secondary, for if one does ignore them, the "trifles" will become a significant brake on the operation. In this respect, a characteristic of a commander's mode of operations such as purposefulness, the skill in finding the decisive link in the operation on which it is necessary to concentrate all of his basic efforts, becomes extremely important. The need is clearly manifested here for mastery of the Marxist-Leninist dialectic method of thinking, which makes it possible to study phenomena not in isolation but in their interrelations and to find among the many phenomena the decisive ones.

Life convinces us that however well-prepared and tactically competent a commander may be, he cannot lead the troops under his command by himself. The commander who tries to solve all of the problems, large and small, single-handedly, dissipates his energies, loses time, and as a result does not get the most important things done on time. This is especially true today when the volume of work in command and control has increased greatly, while the time available to get it done has been sharply reduced. Under these conditions, one sees a particularly forceful demonstration of the need for the commander to make skillful use of the work of his control organs. In compressed time frames it is only through joint efforts that people can comprehensively

evaluate a situation, find the best means of using the available men and equipment and thus provide for decisionmaking by a single individual. The commander's skill in relying on his deputies, staff, party and Komsomol organizations, and his ability in uniting and organizing people to perform the missions at hand is one of the most important qualities of the one-man management commander. The principle of one-man management itself presupposes that a commander has high ideological and party orientation, that he actively and personally participates in indoctrinational work, and that he places strict demands on himself and his subordinates.

Hence, the skill of the commander in establishing proper, business-like relationships with his subordinates becomes especially important. Unquestionably, the commander needs a strong will and firm character to control people in combat. However, these useful qualities will become the opposite if they are exhibited in the form of coarseness, insulting actions, and expressions that degrade the human dignity of his subordinates. Swearing and shouting are not the measure of a commander's exactingness and moral principles, but rather evidence of his poor upbringing and lack of culture.

Troops respect commanders who combine strict exactingness with a concern for their subordinates and value their worth and their honor. Hero of the Soviet Union S. A. Neustroyev, commander of the battalion that stormed the Reichstag, writes convincingly about this. "Nobility and respect for his subordinates could be felt in the behavior, the deeds, and the habits, of the division commander. We knew of no case where he was insulting or degraded the dignity of a soldier or commander who suffered a reverse in battle. He retained his composure or self-control in the most difficult situation."⁸

For skillful command and control, it is not enough to know the combat experience of past wars; the commander's intuition does not always come to the rescue in his approach to solving problems that may arise. Every commander must take a genuinely scientific approach by applying the objective laws of materialist dialectics, giving due regard to the specific forms in which they occur in an armed conflict. The commander's scientific approach to troop leadership assumes thorough and comprehensive substantiation of the decisions made, skillful utilization of the achievements of science and of the potentials in the equipment and in progressive methods. The commander will be abreast of modern requirements if he has a developed sense of the new, knows how to discard the outdated and obsolete in time, and to boldly support the advanced, the progressive, even when it is just appearing.

Of all the qualities of the commander, the main one is his preparedness to skillfully perform the full range of his duties, for "no conscientiousness, no authoritativeness in party matters will replace what is basic in a given case: knowledge of one's business. . . ."⁹

V. I. Lenin especially valued the "organizers, people with a sober mind and quick, practical perception, people combining a devotion to socialism with an ability to quietly (in spite of commotion and hubbub) organize the vigorous, harmonious, strong, fraternal joint work of a large number of people."¹⁰

Consequently, the commander who can successfully handle large, complex responsibilities is the one who serves as an example of high ideals and organized performance, who is thoroughly knowledgeable in military theory and weapons, and who has mastered modern methods of command and control.

The Staff: The Basic Control Organ. The commander controls the troops under his command personally, and through the staff. The staff is charged with complex missions in modern combat. Among them one of the most important is maintaining the constant combat readiness of the troops and the control organs to carry out the forthcoming mission. In order to perform it, the staff must have clear, verified data on the state and the position of their troops, their level of manning and supply. They must know what they need, what they lack, and what must be done in order to improve their combat readiness. The staff receives this data not only from the reports of the subordinate staffs, but also by personal observation of the actions of the troops, staff officers' contacts with the subunit commanders, and discussions with the officers, sergeants, and soldiers.

By analyzing this information in a timely manner, the staff is able, without waiting to be assigned a specific tactical mission, to provide for timely, effective measures aimed at eliminating the deficiencies which to one degree or another reduce troop combat readiness. The staff gives unremitting attention to maintaining the control posts in constant combat readiness, to the availability of communications, and to officials' knowing the prescribed signals.

Active participation in party-political work, the indoctrination of personnel and forming high morale and combat qualities in them, is the duty of the staff officers.

On receiving the tactical mission, the staff performs a significant part of the work in combat planning and also provides for disseminating the

missions to the executive agents. In carrying out their job of combat planning and organization, the staff officers prepare the data and the estimates required by the commander to make the decision; they take part in organizing coordination; they plan and implement the basic measures for comprehensive support of combat operations; they organize communications with the subordinate and coordinating subunits, adjacent units, and the next higher staff; they more precisely define all the problems connected with equipping, placement, and movement of the control post during combat operations. Simultaneously, the staff officers organize monitoring of the operations of subordinate staffs and of the preparation of the troops to carry out the forthcoming mission.

For capable command and control, the first requirement is to clearly know the actual situation in which the troops find themselves in carrying out the assigned mission. Considering that the situation changes rapidly, the staff is constantly concerned with procuring, gathering, studying, and making general deductions from data on the enemy, friendly troops, the adjacent units, the nature of the terrain, the radiation situation, hydrometeorological conditions, the economic condition of the combat zone, and the sociopolitical composition of the population.

On the basis of a thorough synthesis and analysis of the situation information, the staff prepares conclusions and proposals on the use of available men and equipment and, in accordance with the commander's decision, it plans the combat operation and implements the indicated measures for organizing combat. At the same time, the staff officers, without waiting for requests, in accordance with the schedule for submitting periodic reports, and also, in the event of drastic and unexpected changes in the situation, report the data to the next higher staff and inform other control organs and adjacent units of them. In this case there is no need for the higher staff to request reports on the situation from those subordinate to them.

Timely receipt of information and quick dissemination of missions to the troops are impossible without stable communications. This is even more true because the enemy will take a number of measures to disorganize our command and control. Therefore, skillfully organizing communications, taking reliable measures to protect electronic equipment from enemy jamming, and improving the survivability of the communications system as a whole remain a constant concern of the staff, whatever the circumstances.

During preparation and conduct of combat operations, one of the staff's missions is keeping an account of personnel, weapons, materiel,

and transportation. Data on the state of manning and equipping of the troops usually come to the staff in recurring reports and summaries. However, when there are unexpected drastic changes in the makeup of the subunits, this is reported immediately. Accounting for radiation dosages has become a new aspect of staff work.

As the basic command and control organ, the staff provides for coordinated operation of all of the control organs, directing their efforts toward carrying out the commander's decision.

The staff officers' successful performance of their missions depends on their professional training, experience, and businesslike cooperation with the commander and other control organ responsible individuals. As for their state of training and personal qualifications, high ideological conviction, party-oriented behavior, the capacity to be guided in their actions by the interests of the party and the state, honor, modesty, self-exactingness, proper understanding of criticism and self-criticism take on the greatest importance. And it is just as important for a staff officer to possess the traits of discipline, executive ability, and the capacity for independent and creative action. The role of the **chief of staff**, who is the commander's first deputy, is exceptionally great in this respect. Even at the battalion level he disseminates the commander's decision and his instructions to all responsible control personnel, and he involves them in the joint working out of the most important problems and measures for organization and support of combat operations. In turn, they report all of the basic information on the situation and the state of their subordinate subunits to the chief of staff and coordinate with him all of the plans regarding their employment in combat. Only with the most closely coordinated work and good relations among all responsible personnel are normal conditions created for the overall command and control system to function.

Therefore the chief of staff plays the role of organizer of the work of the whole command and control apparatus. The smooth, coordinated functioning of all the control organs, especially the staff, depends on his training, experience, and skill in directing the work of his subordinates. His personal qualities of organization, the capacity to find in each situation the link in the chain that will decide the success of the matter and to mobilize all forces to achieve the main objective characterize the chief of staff as the team leader.

Even during the Great Patriotic War the chief of staff was invested with the responsibility for maintaining the high combat readiness of the troops and the control organs, for the organization and support of continuous communications with the subordinate and coordinating

troops, the next higher staff and adjacent units, for the state of reconnaissance, for organization of the commandant's service, for physical security, and for taking measures for all other types of support. Only the chief of staff had the authority to give instructions in the name of the commander to all personnel subordinate to the commander, and, in urgent cases, to make changes on his own in the plans made by the subordinate commanders. This authority imposes a great responsibility on the chief of staff, most importantly for thorough knowledge not only of the commander's decision, but also his assumptions, his outline of action in the event of possible changes in the situation. The proper relationships between the commander and the chief of staff, their ability to work together, and to grasp each other's thoughts quickly—these are the most important requirements for creating a businesslike situation and organized operation of all the control organs.

In his war memoirs, Marshal of the Soviet Union S. S. Biryuzov writes the following about the chief of staff: "The commander must believe in his chief of staff as he would in himself. It is impossible to work otherwise. The chief of staff is not simply an executive agent. He is one of the commander's closest assistants and must have a creative mind and disposition. The chief of staff, on the basis of the general concepts of the commander, considers all the details of the situation with his staff and prepares motivated proposals. It is through him that the execution of orders is monitored and command and control is provided."¹¹

The important position in command and control held by the chief of staff imposes the following obligations on him: to know always the missions assigned to the subunits by their superior and by the commander, to know the situation, the status and capabilities of friendly and enemy subunits, the quantitative and qualitative correlation of forces; to know the current radiation situation and its effect on the accomplishment of the mission; to be ready at any time to draw conclusions from an assessment of the situation; to make proposals regarding the decision; to determine the measures for supporting combat operations and organizing command and 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 they should carry out their missions, and he sees to their timely presentation of reports and various accounts regarding combat activity.

In spite of the large amount of organizational work that he does, he himself performs the most complex missions. During the planning

process, the chief of staff works directly with the commander on making the decision, he calculates the time allocated to organization of combat operations, and he develops those very important operations documents that usually require coordination among the various control organs.

However well trained the chief of staff may be, he cannot carry out all of the staff missions by himself. He relies in his work on his assistants—the staff officers. The level of their preparation to carry out their duties determines the success of the work of the staff as a whole. Hence, the most important mission of the chief of staff is training and educating the officers, perfecting their working methods, improving the smoothness of organization of the staff as the basic command and control organ. There is no doubt that only highly qualified, ideologically tempered, creatively thinking officers will be able to handle the duties of the chief of staff, whose work serves as a model of the communist attitude toward performance of one's duty.

Chiefs of the Branches of Troops and Services. In the units, in contrast to command and control at battalion level, in addition to the commander and the staff, there are the chiefs of branches of troops and services and also the party-political apparatus.¹² The deputy commanders for political and technical affairs, rear services, the artillery chiefs, the air defense chiefs, the chiefs of engineer and chemical warfare services, the chief of the missile and artillery service, the chiefs of the medical, pay, armored, motor, food and clothing services, as well as of POL supply—each of them performs a particular type of work and bears responsibility for the combat readiness of the subunits under his command and for their performance of the mission. They carry out their duties on the basis of the commander's decision and coordinate their actions with the combined arms staff. Within the scope of their authority and duties, the chiefs of the branches of troops and services prepare estimates of the combat capabilities of the men and equipment under their command; they plan, on the basis of the commander's decision, the operations of the subunits of the branches of troops and special troops; they disseminate the missions to the executive agents and they direct the subordinate subunits and services.

The role of the **party-political apparatus** in command and control, in indoctrinating personnel with high morale-combat qualities, discipline, organization, and a strong sense of responsibility for the performance of their duties in combat is exceptionally great. In the course of their morale-political training, the Marxist-Leninist point of view, political maturity, dedication to the party and the Homeland are formed in the personnel. High communist ideals and conviction are the basis for the

troops' stability of morale and the spiritual source of our victories. The party-political apparatus focuses its attention on developing these qualities.

During the preparation and conduct of combat the party-political apparatus works closely with the commander and the staff. This has become the indispensable rule when the deputy commanders for political affairs or the secretaries of the party organizations are present when the commander issues the operation order and when troop coordination is organized. When necessary they give instructions to the subunit on organizing party-political work, they explain to the personnel the most important documents of the CPSU Central Committee and the Soviet government, the orders of the Supreme High Command, and the communications of the Military Council and also present summaries of information on the progress of combat operations and ensure that the troops have a clear understanding of their tactical missions. If the situation in the subunits permits, they organize party and Komsomol meetings and spread the news of selfless acts by fighting men. The main efforts of the political organs are concentrated in the decisive areas on which the success of the battle depends.

The successful performance of their duties and missions by all control organs depends to a great extent on the degree of organization and efficiency of their work, their ability to retain their composure and self-control while, at the same time in any situation, demonstrating high moral principles and placing strict demands on subunit personnel and the lower-level staffs. All of their work today must take place at a fast pace, with a minimum of time expended on each mission. The time has passed when control organs could take days in planning combat operations and developing a multitude of bulky documents. Now new work methods and a different approach to performing the missions at hand are needed.

The effective use of advanced methods in command and control is possible, given a creative approach to determining the content and scale of the work, scientific organization of labor, skillful mastery of combat experience, and systematic improvement by the officers of their ideological-theoretical level.

Successful performance of command and control missions is possible only when the closest of ties are maintained between the activities of all responsible personnel and control organs. As never before, the quality of command and control depends on the work not only of the commander and staff but of the whole collective of control officers.

The most important measure of capable activity by control organs is the performance of all jobs with a high level of *staff professionalism*. Usually this concept includes the system of requirements on the level of training of officers and control organs and the quality of their command and control work as it conforms to the nature of modern combat. Staff professionalism includes not only the competent and careful development of operations documents, but also the officers' thorough knowledge of the problems of military art, a high level of professional training, and skill in finding new working methods that ensure effective employment of available men and equipment in combat.

Under any conditions, including even when automated control systems are introduced, the role of the commander and staff in leading the troops will in no way be diminished. The latest technical equipment gives them invaluable assistance, but it does not replace man, his creative thinking, his will, his logical analysis of the situation. As before, the commander remains the central figure in the command and control system, and the staff remains the basic command and control organ.

2. Technical Control Equipment

The effectiveness of command and control depends to a great extent on the state and amount of technical control equipment. These means must provide the following: rapid acquisition, processing, and presentation (output) of situation information; producing in short time frames the various calculations required for making the decision and planning combat operations; timely drawing up of the commander's decision and dissemination of missions to the troops; great mobility of control posts; protection of control organ personnel from enemy fire and penetrating radiation; and also the creation of the necessary conditions for the officers to work and rest. There is no question that these requirements can be satisfied only when one has modern technical equipment systems.

The technical control equipment on hand at present in the armies of various countries can be arbitrarily divided into five main groups, based on purpose and nature of operation: communications equipment, information acquisition equipment, equipment for processing information and for performing tactical estimates, documentation and document reproduction equipment, and command vehicles (figure 5).

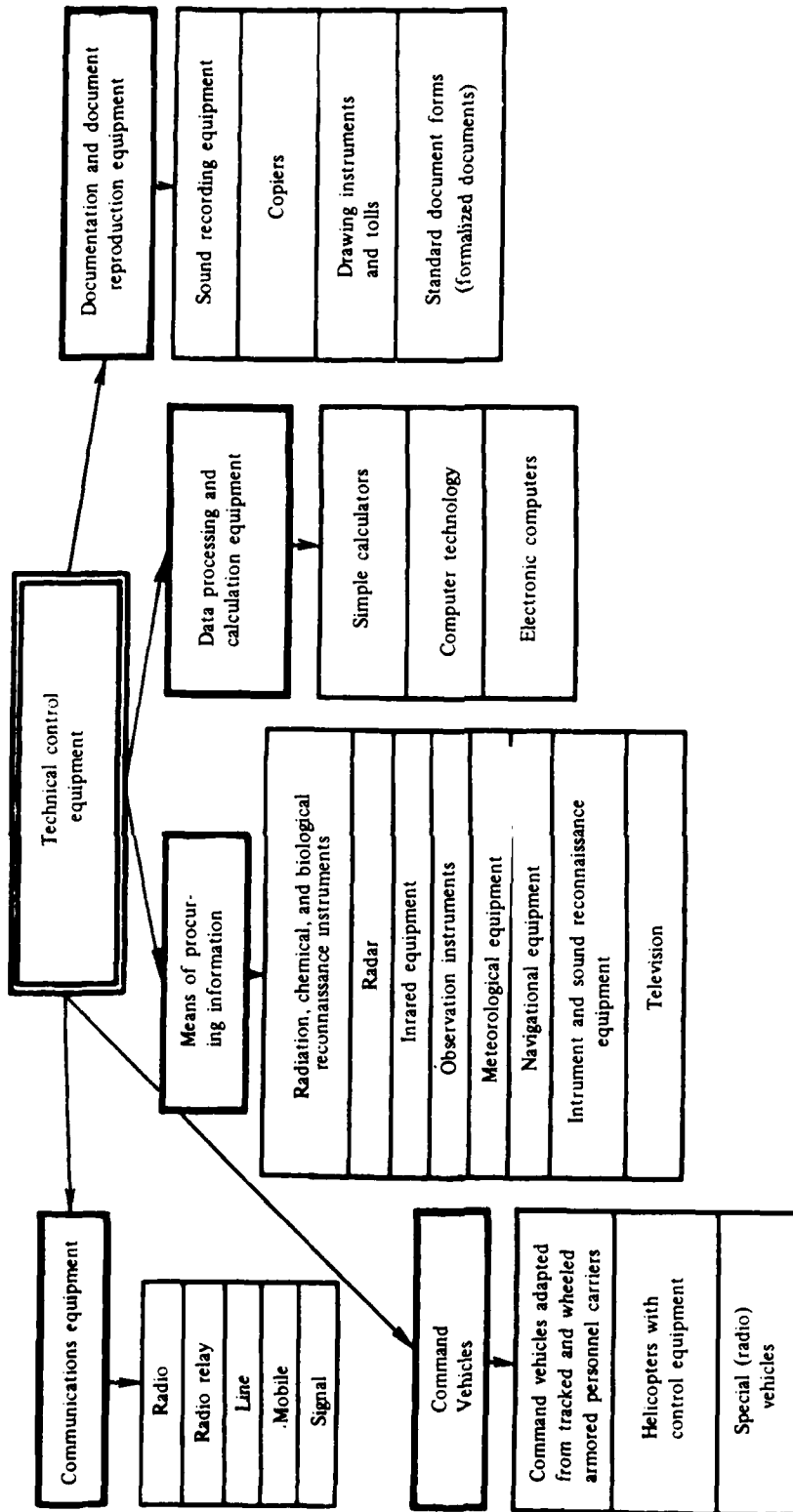


Figure 5. Classification of Modern Technical Control Equipment (as Viewed by Foreign Armies).

Since it is not possible to give a detailed description of all this equipment in this book, basic information is presented below only for certain kinds used at the tactical level in both the Soviet Army and the armies of the most technically developed imperialist states. This will give a general idea of the capabilities of modern command and control equipment. For a more detailed and thorough study of it, one must, of course, consult other sources.¹³

Communications Equipment

Communications equipment plays the leading role in relation to other technical equipment. The stability of command and control depends primarily on the state of this equipment.

In today's most technically developed armies, communications equipment includes the following: radio, radio relay, line, mobile, and signals equipment.

In all armies **radio** is the main means of communication. Already in the Great Patriotic War, especially from the spring of 1943 during the development of the offensive, radio was becoming the main means of communication in the tactical echelons. By the middle of 1944, the rifle division was authorized 123 radio sets. Of these the signal battalion had 10 (RBM, A-7a, A-7b), the signal companies of the rifle regiments had 8 (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.

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

At the tactical level, the chief foreign armies use ultrashortwave radios mainly, as may be seen in table 1.

Table 1. Basic Performance Specifications of Tactical Echelon Radios.¹⁴

Type of Radio	Frequency range (megahertz)	Number of fixed frequencies	Power (watts)	Operating range (km)	Where used
AN/PRC-88 (U.S.)	47-57	80	0.3 and 0.45	0.5 and 1.6	Soldier, squad, platoon
AN/PRC-25 (U.S.)	30-76	920	1.5-2	On the move, 5-8; at the halt, 25	Platoon, company, battalion
AN/VRC-53					
AN/GRC-125*					
AN/VPC-12, -43** (U.S.), -44, -45, -46, -47, -48, -49	30-76	920	Maximum, 40; minimum, 4	At the halt, 35; on the move, 25	Battalion, brigade, division
AN/VRC-24 (U.S.)	225-400	1750	2-20	With an aircraft at an altitude of 300 meters, 48; at an altitude of 3,000 meters, 160	For communications with tactical aircraft and for reception of reconnaissance information from aircraft
SEM-25 (West Germany)	26-76	880	15	80	Tanks units and subunits
UK/PRC-350 (England)	36-57	840	2	5	

*The portable AN/PRC-25 version of the AN/VRC-53 radio is installed on a tank or armored personnel carrier, the AN/GRC-125, only on a quarter-ton vehicle.

**The AN/VRC-43-49 radios differ from the AN/VRC-25 in the units that make up the transceiving equipment.

Modern shortwave and ultrashortwave equipment has almost no electronic tubes. Integrated circuits, semiconductors, and miniaturization are widely used in them. In the new radios that are being developed, as foreign experts see it, provision will be made for reducing the weight and size, decreasing the input power, having a common frequency range for all branches of troops, and reducing the time required to deploy and establish communications.

In a number of foreign armies, there is widespread use of adaptive shortwave radio communications systems in which adaptation of the radio link occurs automatically with a view to maintaining high transmission quality under any conditions. In the near future the most advantageous operating frequency and transmitter power will be automatically selected on these links.

Many armies make extensive use of **radio-relay communications** in command and control. It is organized by using a number of transceiving radio-relay stations located at distances providing stable communications between adjacent stations. The distance between them depends on terrain relief, wavelength, parameters of the receiver and transmitter, and meteorological conditions.

These stations permit duplex multichannel operation. They permit transmission of all forms of information and, at the same time, make it difficult for the enemy to intercept transmission contents, to use his direction finding in locating the stations, and to set up radio jamming. The quality of communications does not depend greatly on the time of year, the time of day, and atmospheric or local interference. Thanks to the fact that radio-relay stations operate in the ultrashortwave band, directional antennas of comparatively simple design are used.

Another important advantage of radio-relay links is that composite paths can be set up: in one sector communications are maintained over radio-relay links, and in another sector, over wire lines. Telephone, telegraph, facsimile, videotelephone, and other communications can be achieved on radio-relay links (table 2).

At the same time, radio-relay equipment limits the possibilities for establishing stable communications while on the move; enemy interception of transmissions and jamming are not out of the question; the communications range is greatly dependent on terrain relief; and camouflaging of antennas is difficult. Moreover, a large number of maintenance personnel are required at terminal and relay stations.

Table 2 Performance Specifications of Radio-Relay Communication Sets.

Designation of set (country)	Communications range, km	Frequency range megahertz	Transmitting power, watts	Number of telephone channels
AN-MRC-54 (U.S.)	40—50	600—1000; 1350—1850	8—20; 16—30	4; 12; 24
AN-MRC-69 (U.S.)	40—50	100—600	up to 120	4; 12; 24
AN/MRC-73 (U.S.)	40—50	600—1000; 1350—1850	8—20; 15—30	4; 12; 24
AN/TRC-90 (U.S.)	160	4400—5000	1000	24; 48
AN/TRC-132 (U.S.)	up to 400	4400—5000	1000, 10000	24; 48; 60
C-50 (England)	up to 80	225—400	10; 250	12
FM-200 (West Germany)		225—400; 610—960	up to 20	4; 12; 24

One means of improving radio-relay equipment, in the opinion of foreign experts, is to increase transmitter power, to use higher frequency and also optical wave bands to create radio-relay trunks with large carrying capacity, to modernize mast antennas, introduce remote control of relay stations, and automate the operation of radio-relay station equipment.

Line communications have not completely lost their importance in command and control today. Line communications provide 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 enemy interception of the transmissions.

However, line communications are characterized by serious deficiencies which make their use in combat difficult. They include the great vulnerability of the lines to enemy nuclear and fire strikes, the comparative slowness of laying the lines, large expenditures of men and equipment on establishing communications, bulkiness of the equipment, impossibility of maintaining communications while on the move.

A cable can be laid on the earth's surface as fast as an automobile can cover the route along which the line is laid. When the line is picked up, the speed at which the cable is wound up from the ground surface will be lower.

In view of the features peculiar to line communications, they are mainly used only when the subunits are in place, in the waiting (buildup) area, on the defensive, on an offensive by subunits in sectors where nuclear weapons are not employed, and also to provide internal communications at the control posts.

However well developed radio and line communications equipment may be, it does not do away with nor does it diminish the role of **mobile communications equipment** in command and control. Of the mobile means, the most maneuverable are helicopters (or planes) and also cross-country vehicles with communications equipment.

In tactical echelons the various kinds of **signal communications equipment** are just as important as before for transmitting commands, reports, mutual recognition, and target indication and warning. For this purpose, visual, sound, infrared, and radiotechnical means are used. Signal rockets, lanterns, tracer bullets and shells, flags, markers, etc., are employed extensively.

The use of mobile and signal equipment for command and control, especially when there is strong radio interference and limited use of radio communications, improves stability of control significantly.

Means of Procuring Information

Various kinds of technical equipment are usually used to obtain information about friendly troops, the enemy, the terrain, the radiation situation, weather conditions, and other data, without which successful command and control is impossible. Thus, this equipment permits combination ("joining") of the purely administrative functions of the control organs with the operations of the reconnaissance forces and equipment. This combination is especially important in putting together automated control systems since, in principle, they cannot function without the means of obtaining initial information for control. The automated antiaircraft site, which cannot operate without air target detection means, serves as a clear example of this.

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

Radars are designed to detect not only air targets but also ground targets. They make observation possible in any kind of weather, at night, under conditions of limited visibility. The principle of ensuring a continuous radar observation field for the enemy's entire tactical zone is provided for in the disposition of radars.

A unit radar with an operating range of more than 10 km is large and heavy. Medium-range (5-10 km) and short-range (less than 5 km) radar with independent power supplies can be hand-carried. A U.S. Army battalion has six radars, while the ground forces are equipped with 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 is equipped with seven types of radar, also automated. The ground forces of Great Britain, Italy, and Sweden have one type of radar each. The forces of the Federal Republic of Germany are equipped mainly with American and French radar (table 3).

Television as a means of obtaining situation information has comparatively limited use at present. With television equipment, as is pointed out in the foreign literature, one can 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 and the results of firing; and so on.¹⁶ The installation of television on helicopters, which can continuously maneuver according to the requirements of the assigned observation mission, is considered more promising. When it detects a target of interest, the helicopter slows its flight and hovers. The range of such equipment reaches 50 km or more.

Visual reconnaissance devices are designed to intercept targets and determine their location in polar or rectangular coordinates. These instruments include reconnaissance theodolites, range finders, aiming circles, and other devices. At night, along with optical devices adapted for nighttime operation, night vision instruments and instruments for illuminating the terrain are used. Under favorable observation conditions, these devices permit reconnaissance to a significant depth, ensuring fast and accurate acquisition of fixes.

Recently low-power lasers have come into wide usage. A number of foreign armies have used them as basis for making range finders designed for tanks and for controlling artillery fire and instruments for aerial reconnaissance, for guiding aerial bombs and missiles to the target, for maintenance of communications, etc.¹⁷

Table 3. Basic Performance Specifications of Radars.¹⁵

Designation of radar set	Range (km) for detection of:		Discrimination (meters)	How transported	Mass (kg)
	People	Motor vehicles, tanks			
AN/PPS-10,15 (U.S.)	1-5	3		Hand-carried	4.5; 6.3
MODEL P-2010 (U.S.)	5	10	±25	Hand-carried	13.3
AN/PPS-25 (U.S.)	11	16	±42	On armored personnel carrier or motor vehicle	1,272
AN/PPS-5 (U.S.)	5	10	±20	Hand-carried	43
AN/TPS-33 (U.S., West Germany)	3	18	±23	On armored personnel carrier or motor vehicle	120
AN/PPS-9 (U.S., West Germany)	15	3	•	Hand-carried	6
"RASURA" DRPT-2A (France, West Germany, Denmark)	5-7	5-10	±25	Hand-carried or on a motor vehicle	60
"RATAC" AN/TPS-58 (France, West Germany)	8-12	15-20	±10	On motor vehicle	160
"OLIPHANT"-2 (France, Great Britain)	1	2	±50	Hand-carried	11
RAPACE (France)	1.5	5	±25	On motor vehicle	30-50
RASIT 72 A, B (France)	8	15-20	±20	Hand-carried or on a motor vehicle	70 "A" 50 "B"

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

Tactical Calculation and Information Processing Equipment

One can speed up the processing of incoming data and make calculations more quickly by using computer technology, various tables, nomograms, slide rules, and other special calculation rules. The selection of the type of computational devices depends on the volume, complexity, and required accuracy of the calculations.

Various types of keyboard calculators are or can be used in the operations of institutions of higher learning or of staffs at all levels from battalion up. They can be used both for the solution of the standard calculation problems by previously prepared procedures and for the solution of nonstandard problems by ad hoc procedures.

The timely development of staff procedures allows them to greatly improve their operativeness in carrying out the calculations and providing effective use of keyboard calculators. Preparation of procedures usually includes the following: selection and formulation 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.

Calculation programs can be presented in universal form—a calculation form and calculation program for a specific type of calculator. The second program makes it possible to use the calculator to its fullest capacity. It provides for reducing the calculation time, although preparation of the program is a comparatively time-consuming process.

In nature of operation and structural design, keyboard calculators are usually divided into two groups: adding machines and calculators.

Adding machines mainly perform addition and subtraction operations. They include the SDM-107, the narrow-carriage SDM-107D and the wide-carriage SDM-133 (figure 6).

Calculators perform all four arithmetic operations. In terms of principles of operation they are divided into mechanical (VK-1); electromechanical, which, in turn, are semiautomatic (VK-2, VK-2M, VMP-2) and automatic (VK-3, VMM-2, Bystritsa-2); electrorelay calculators (Vil'nyus and Vyatka); computers (Vega, EDVM); small digital computers (Promin'-M, Nairi, Mir, Mir-1); and all-purpose

computers (Minsk-32, and so on).

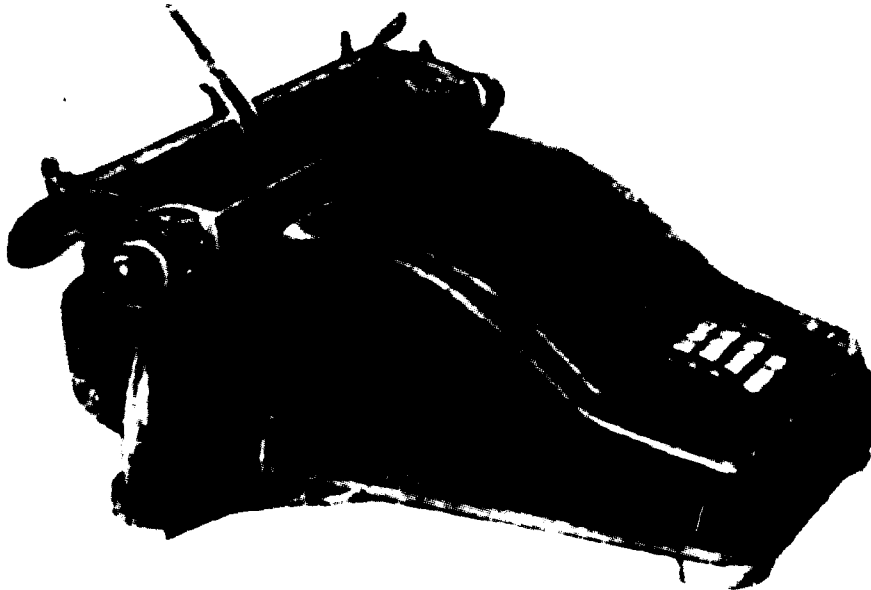


Figure 6. The Wide-Carriage SDM-133 9-Key Adding Machine.

The semiautomatic VK-2 and VK-2M multiply semiautomatically and divide automatically. In contrast to them, the VK-3 also multiplies automatically.

The VMP-2 does not operate differently from the VK-2M, but it is capable of performing some additional operations. The VMM-2 is a modification of this machine. It multiplies and divides 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 various printers and punch devices.

The Vega (figure 8) and EDVM keyboard computers are fully automatic. Electronic circuits and semiconductors 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, etc. The Vega has dimensions of 510 x 450 x 250 and weighs 28.8 kg. It operates on alternating current.

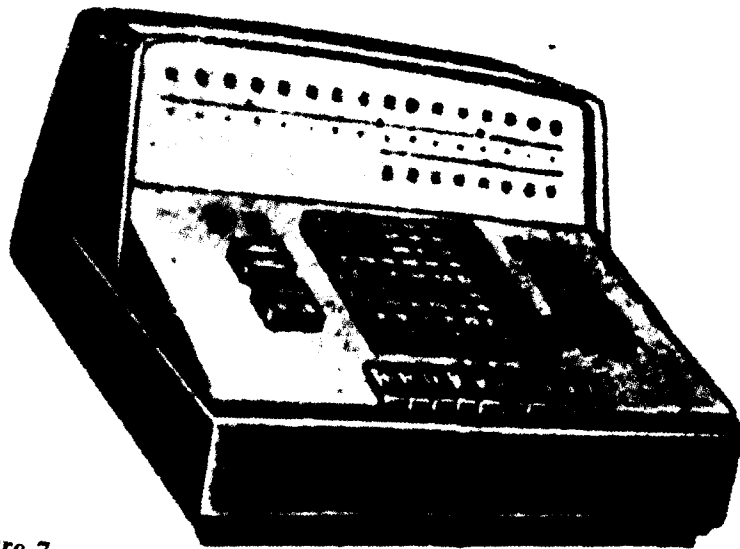


Figure 7. Vil'nyus Electrorelay Calculator.

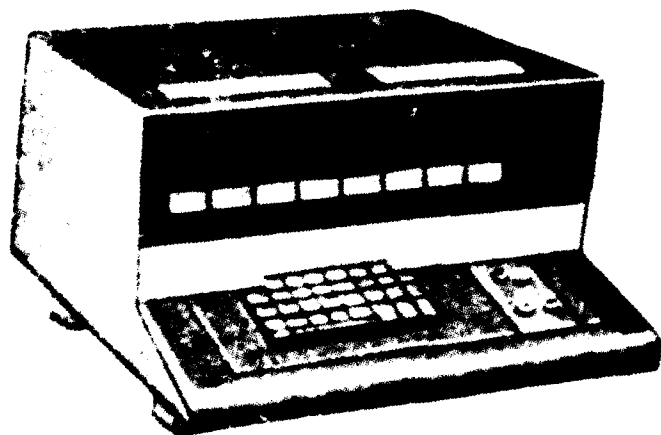


Figure 8. Vega Computer.

The highest output, small electronic computers are the Iskra-110, Iskra-111M, Iskra-121 and Elektronika-4-71B.

The Promin'-M, Nairi, and Mir digital computers are simple in structure. They do not require servicing personnel with special programming training. The Promin'-M (figure 9) and Promin'-2 can perform a great many calculations. They solve systems of differential equations and they find roots, the values of definite integrals, etc. They are similar in structure and basic parameters.

Table 4. Basic Specifications of Keyboard Calculators.¹⁸

Features Types of machines	Mechanical speed, stroke/minute (rpm, cycles/minute)	Overall dimensions (length, width, height), mm	Mass, kg	Power/watts	Standard increase in work productivity, times
Adding machines:					
SDM-107	140—150	435x245x x190	11.8	30	1.5
SDM-107D	140—150	445x250x x310	18	30	1.5
SDM-133	140—150	500x465x x200	18.5	30	1.5
Calculators					
(a) Semiautomatic					
VK-2	280	282x255x x165	11.2	40	2.0
VK-2M	280	289x282x x198	13.5	75	2.0
(b) Automatic					
VMP-2	460	440x350x x270	18.1	30	2.0
VMM-2	460—480	440x350x x250	22	30	2.0
Bystritsa-2	0.2 sec—time of operation		3.5		2.0
(c) Electorelay					
Vil'nyus	from 300 to 1200	430x380x x240	26	100	2.5
Vyatka	from 300 to 1000	438x389x x250	26	100	2.5

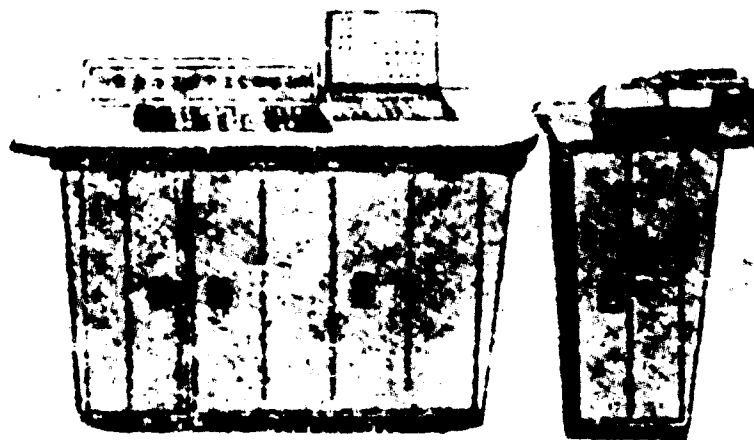


Figure 9. Promin'-M Computer.

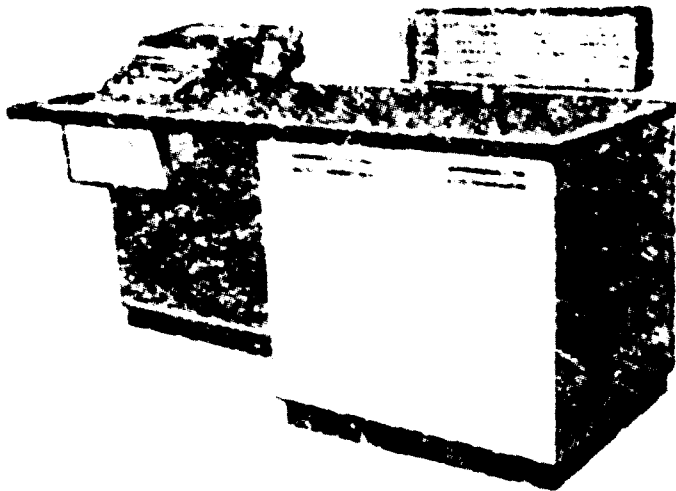


Figure 10. Mir-1 Computer.

Table 5. Basic Specifications of Electronic Keyboard Computers.

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

The Nairi and Nairi-2 are designed to perform a wide range of calculation tasks. They accept an input of problems in a language close to that of mathematics with subsequent automatic programming of the solution. The Nairi-3 is built on integrated hybrid circuits.

The Mir-1 (figure 10) is also designed for automation of calculations. The computation algorithm is input into the machine in the form of a verbal formula description with simultaneous printout on an electric typewriter. The Mir-2 has a screen, "an electronic blackboard," on which the operator sees the results of the calculations and can insert the necessary corrections and explanations with a "light pencil."

In order to perform calculations and process incoming information, tables, graphs, rules, and other devices can also be used. They are widely used to determine the following: the radii of safe distance for personnel in the event of a nuclear blast; the size of the contamination, destruction, and fire zones in the event of nuclear strikes; the depths of columns; the times of passage of columns across the assault line and the

report lines, and so on.

Table 6. Basic Specifications of Small Digital Computers.

Features	Promin'-M	Nairi	Mir	Mir-1
Number system	Binary-decimal	Binary	Decimal	
Average speed (operations/sec)	up to 1000	1500—2000	200—250	200—250
Memory capacity (words):				
direct-access	160	1024	4096	4096
external	---	16384	---	---
Input speed (characters/sec)	---	7	7	7
Input power (kilowatts)	0.45	1.6	1.0	1.5
Overall dimensions (mm)	1270x908x x780	2014x1100x x1100	1840x x750x x1080	2350x x1590x x1065
Mass (kg)	260	620	300	---

Staffs also use punch card equipment for performing calculations involving input of initial data obtained from numerous sources. In the event of comparatively high output these machines require human participation for analysis of the intermediate results, transfer of the punch cards, and adjustment and recommitment of controlling equipment. In addition, the punch card machine memory is bulky, and punch card storage takes up a great deal of space.

More efficient usage of computer equipment depends not only on the quantity and quality of the machines, but also on the way they are used. The best conditions occur when the staff has a computer station. In this case the calculations are performed faster and better because of the availability of qualified computer operators, and the circumstances are more conducive to technical servicing of the machines. When the number of calculations is small, then it is best to decentralize and locate the computer equipment right in the staff officers' work areas. One can also combine the two procedures.

Documentation and Document Reproduction Equipment

Working up various operations documents is an integral part of the command and control process. In order to reduce the manual labor expended on preparing, copying, and duplicating textual and graphic operations documents by the staffs the following are used: sound recording equipment (dictation machines, tape recorders), typewriters, copying (printing) machines, various drafting instruments and devices, office equipment, various rules, templates, stencils, sets of standard inscriptions, conventional symbols, notations, letters, and numbers on transparent film, and also standard forms.

Among sound recording devices, the P-180M dictation machine is now widely used. Its basic characteristics are as follows: tape speed, 4.76 m/sec; recording and playback time, 120 minutes; weight, 9 kg. It can be used to record orders given or reports received under any conditions. In many cases when a dictation machine is used there is no need to prepare written operations documents. The recording on tape, supplemented by the necessary auxiliary 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, dictation machines (tape recorders) can also be used to store various reference data required by staff officers in combat operations planning. For this purpose the officer records the necessary data in advance in his free time so that he will not have to look through various reference documents while he is working.

Typewriters are still irreplaceable for staff work in copying documents. The typing output on an ordinary typewriter, depending on the qualifications of the girl doing the typing, 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 work expended is 16 times less than on an ordinary mechanical typewriter, and the printed text is even and neat. The Ukraina PEK-46 electric typewriter (figure 11) types at a speed of up to 100 characters per minute and produces 15 to 20 copies simultaneously. Automatic typewriters print out a paper punch tape from a roll at a rate 2.5 times faster than the most qualified girl.



Figure 11. Ukraina PEK-46 Electric Typewriter.

New prospects are very promising for the use of typewriters with punch attachments. They make it possible to punch out a text on a tape or a punch card at the same time it is typed. They are also used for printing out a text which had been put on a punch tape in encoded form.

Thermocopiers that make up to 20 copies can be used to reproduce operations documents, especially by staffs at the tactical level (figure 12). They are simple in design 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 thermosetting paper. The copying process is simple. One drawback of this kind of copy is that it eventually turns dark.

The Era and Elektrofot electrographic machines (figure 13) are also used for copying documents. Their design and operation are particularly simple.

Copies can be made from printed text, manuscript, typescript, drawings, or diagrams made in india ink or with a soft pencil.

Table 7. Basic Specifications of Thermocopiers.¹⁹

Features	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
Mass (kg)	26	16	9

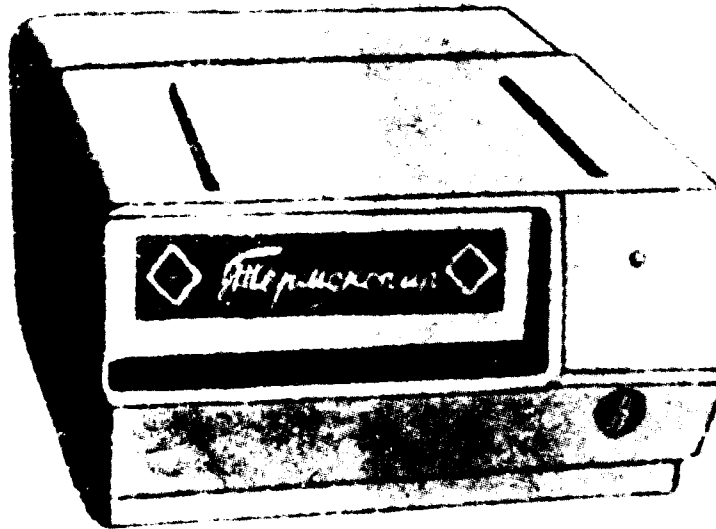


Figure 12. Termokopir Thermocopying Machine.

The photocopiers best suited for work in the field are the table models SKN-2M (figure 14) and SKN-22.²¹ Their structural design, not particularly complex, includes an electric motor with reduction gear, a photocopying unit, and developer. One man can service the machine.

A procedure such as photocopying of documents has a certain value. A high quality image is obtained, and the information can be recorded in greatly reduced dimensions. It can be useful, given sufficient time and the proper equipment. The KP-8M copy frame can be used in making copies of maps and diagrams. Its dimensions are as follows: 840 x 630 x 150 mm, weight 40 kg.

Table 8. Basic Specifications of the Era and Elektrofot Machines.²⁰

Features	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
Mass	260	130	65

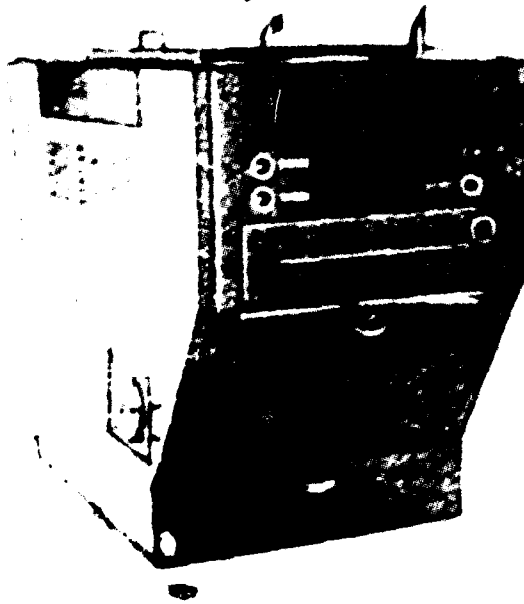


Figure 13. Elektrofot Electrographic Copying Machine.

Table 9. Basic Specifications of Table Model Photocopiers.

Features	SKN-2M	SKN-22
Width of copying zone, mm	940	360
Copy speed, m/hr	30—90	30—320
Overall dimensions, mm	1516x470x410	600x835x360
Mass, kg	120	70

Hectographs can be useful to staffs for copying textual documents and also diagrams, graphs, and tables. The industrially produced Yantar' hectograph will give more than 100 copies from one printed form on ordinary typing paper 297 x 420 mm in size. Using the hectograph is 6 to 8 times more efficient than the typewriter. The machine weighs 36 kg.

A commander's ruler,* slide rules and other special calculation rules, sets of various patterns and templates, drawing instruments, map measurers, gauges, protractors, folding magnifying glasses, and a set of special colored pens and pencils are irreplaceable to staff officers when working up written and graphic operations documents.



Figure 14. Table Model SKN-2M Photocopying Machine.

The following are very often useful in staff work:

(a) Field sets of drawing accessories. They include templates, rulers, india ink, pens, pencils and a pencil sharpener, watercolors and brushes, drawing instruments, thumb tacks, glue, adhesive tape, and a tool kit. The set comes in a metal box and weighs 3 kg;

(b) A set of stamps, conventional symbols, and numbers. The set includes 50 stamps, 3 stamp pads, and ink. It is placed in a box with special pockets 40 x 30 x 50 cm in size;

(c) Sets of standard inscriptions, conventional symbols, notations, letters, and numbers on a transparent film—an overlay. This may also include those of the following that come up most often in planning combat operations: map headings, legends for tables and calculations, officials' signatures, and also various conventional symbols, designations, and numbers. In addition, the set may include self-adhesive transfer

* [A template of standard scales and conventional symbols for map work -U.S. Ed.]

symbols—decals;

(d) Sets of stamps of conventional symbols and inscriptions in special boxes. The size of the stamps is determined by the map scale.

Protective coatings may be used to preserve a map, especially for work in damp weather. For this purpose industry produces KS-229 carbinol lacquer and special clear plastic films.

Various types of standard forms are also part of the means for speeding up paper work. Experience shows that if staffs have various ready standard forms and blanks, then the officers' work will be much easier, especially in planning combat operations. This is all the more true in that it is possible to depict not only the process of performing operational-tactical estimates on a form, but also the content of all of the basic operations documents. In this case only the variables need be entered, which saves a great deal of time and speeds up production of the document.

In addition to the generally used automation and mechanization equipment which the control organs and posts have, every commander's and staff officer's *kit* must include those items required for work in the field. These include a map case (field case), compass, dividers, a gauge, a template of conventional signs and slide rule, colored and ordinary pencils, ball-point pens, colored felt tip pens, a penknife, an eraser, notebook, copy paper, magnifying glass, watch, electric flashlight, topographic map, documents for conversations over the technical communications equipment, reference materials, and an individual dosimeter. This set of accessories may vary, depending on the nature of the missions an officer performs.

Command Vehicles

Exceptionally great demands are made of command vehicles. They must have good cross-country capability and a large fuel capacity, protect personnel from enemy fire and penetrating radiation, operate reliably, and make for convenience in the work of the officers at the control post. The technical equipment mounted on the vehicle must provide for maintaining communications both in place and on the move and also enable the commander and staff officers to perform their functional duties, both at the command post and when they move out among the troops.

In addition to communications equipment, those vehicles are usually fitted out with navigational equipment, observation devices, nuclear protection equipment, and other auxiliary devices. The equipment is

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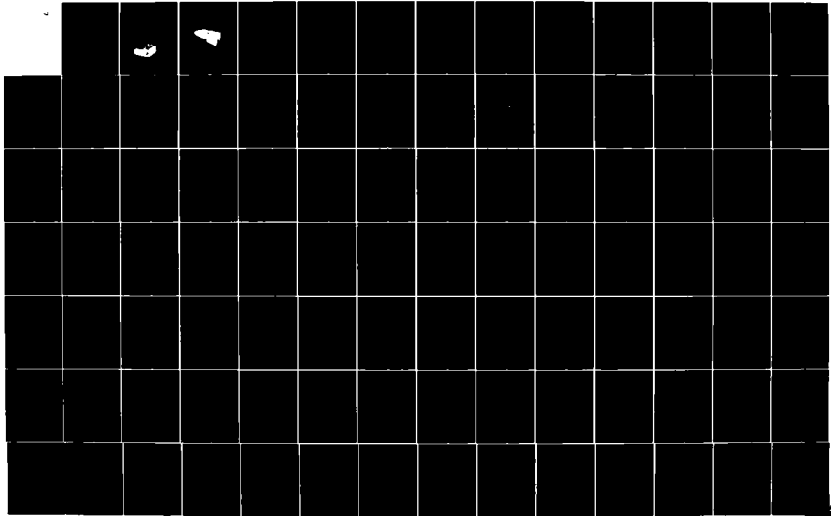
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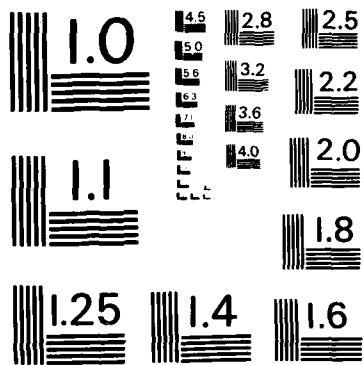
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placed in the vehicle with an eye to convenient use of the communications equipment from each work position and the ability to work with maps. When the officer is outside the vehicle, provision must be made for remote control of the radio sets by wire or radio.

Usually armored vehicles are used as command vehicles. This greatly increases survivability and stability of control and ensures reliable protection of personnel and communications equipment, not only from bullets and shrapnel, but also from a number of the damage factors of a nuclear blast. They also have an advantage in that in external appearance they differ little from ordinary fighting vehicles, which facilitates camouflage and thus eliminates the possibility of rapid detection, especially on the march or when executing a maneuver.

However, the use of armored vehicles to some degree complicates the working conditions of the commander and staff officers. The limited space in the vehicles makes it difficult to work with a map. Therefore, a number of command post vehicles are provided with canopies which are unfolded at the halts and which thus increase the usable area and working convenience of the officers.

Some models of armored command vehicles are shown in figures 15 and 16. The M577 command vehicle is a modification of the M114 amphibious armored carrier. It has work areas for five people.

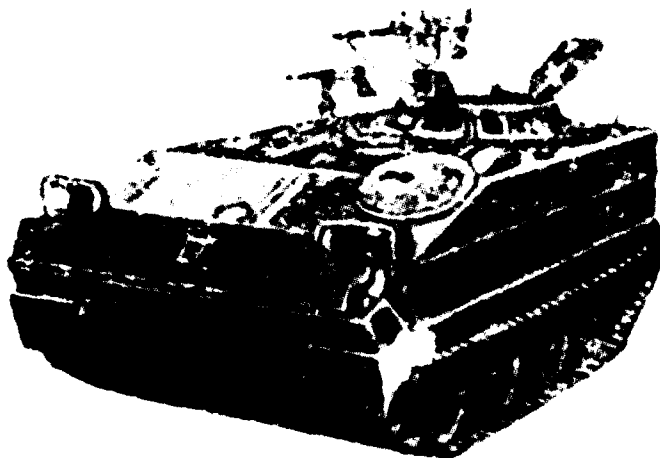


Figure 15. M577 Command Vehicle, a Modification of the M114. Caterpillar Amphibious Armored Personnel Carrier (U.S. Army).

The Sultan FV105 command vehicle is in the production stage. Its basic specifications 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 command and control in foreign armies, as is indicated by the experience of the wars in Vietnam and the Middle East. They are used not only as means of quickly moving control posts, but also for performing command and control missions. For this purpose the helicopters are equipped with communications and observation equipment, and they are fitted with work areas for officers. Besides command vehicles, control post equipment includes various special communications vehicles, mobile communications equipment, and also the transport vehicles required for supporting and servicing control post operations.

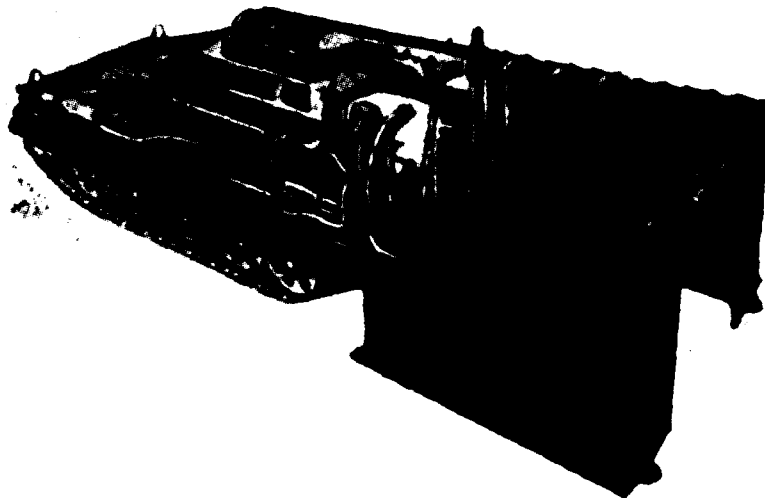


Figure 16. Sultan FV105 Command Vehicle (British Army).

Prospects for Use of Automation Equipment in Command and Control*

The revolution in military technology that has taken place has had decisive influence on the content, scale, and methods of operation of control organs. The time factor has become an important determinant in command and control. The troops' success in performing their assigned missions will depend on the operativeness of control and the ability of commanders and staffs to get the lead on the enemy in taking measures for preparing and conducting combat operations.

* In the view of foreign armies.

In the usual system for acquiring situation data, information from the subunits directly engaged in combat still takes a long time to reach the staffs. This limits the commanders' chances to influence the course of combat, especially those commanders who have powerful weapons at their disposal. Thus there is now a need for a sharp speedup in the transmission of information and increased operativeness in its processing. In principle, the information acquisition and processing system must be such that the data on the most important changes in the situation will reach the staffs at the moment they occur on the battlefield.

To achieve a sharp reduction in time for execution of all of the main command and control operations, it is not enough just to improve the methods of operation and make adjustments in the organizational structure of the control organ; it is necessary, in addition, to introduce improved technical equipment. However, if the best possible technical communications equipment is introduced, then even in this case one should not necessarily count on a drastic improvement in command and control and especially on bringing it into line with the growing combat and maneuvering capabilities of the troops. This is explained by the fact that communications equipment affects only one process in command and control—the information transmission process, which, while the most important, still plays a minor role in the overall scale of all command and control operations. Therefore mere changes in communications equipment do not lead to a sharp increase in operativeness in control organ operations.

The main way to solve this problem is to introduce into the troop units a whole system of essentially new technical means of control based on the latest achievements in electronics. There is the need, then, not just to lighten officers' workloads, but also to shift a number of their functions to special automated devices and machines. Whereas the first phase provided for automation of individual command and control processes, now a number of foreign armies are working on setting up and implementing *automated command and control systems* (ASUV) embracing the main control processes at all levels. The development of such systems is the most promising area in the solution of the main problems of command and control. The shift to an automated system represents a qualitative jump in the development of a material base for control.

The automated system is made up of technical devices that vary in purpose and structure. The following are the main ones: electronic computers, automated data transducers of different types, automated transceiving devices, high-speed automated communications equipment, and other devices. Of all those, the computers play the central role. In

the computers that foreign armies have today, there is extensive miniaturization, the capacity of the storage elements has been increased, and the volume of information these machines can process has been increased many times. They perform such highly important tasks as acquiring and processing information required for command and control; selecting and distributing information to the subordinate and next higher staffs and to the commander and officers of the control organs in a form easy to understand; performing complex calculations, especially those required for the selection of the most effective means of destruction of various enemy targets. The inherent features of the tasks to be performed do not rule out, as foreign experts point out, the creation of an all-purpose computer capable of performing a broad range of tasks. The problem of creating a standard computer with various capabilities (depending on the scope of the information processed) is solved by coupling varying numbers of standard units. Thus, the basic version of one U.S. Army computer consists of these units: a central processor, an input-output module, and two ready-access ferrite memory units, the number of which can be increased up to eight depending on the level of the control organ.

The information transducers are used for acquiring, formatting and transmitting data from the primary sources to the command units and for receiving commands from them in the form of signals. Some of the transducers operate automatically without operator assistance, while others have a manual data input device. The transceivers receive and automatically relay the data transmitted from the primary sources to the computer.

A most important role in the total system is assigned to the communications equipment. It must carry out the automatic exchange of information 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 tasks which it is to perform, the extent to which it is provided with technical equipment, the scope and organization of the control element, and the volume of incoming information. Each echelon in the military is characterized by its own missions, its own particular activities, information content, and degree of automation. Therefore any automated control system provides for the performance of a certain range of control tasks arising from the purpose of the system. The quality of performance of these tasks is assessed by the applicable criteria, which are the characteristics of the automated control system.

They may include such things as adaptability of the system to performance of tasks at any time, operativeness (speed), accuracy in solving the assigned problems, high carrying capacity, noise immunity, sufficient capacity, survivability, mobility, economy, and so on.

The use of an automated system of necessity introduces sharp changes in the operating methods and organizational structure of control organs. Automation of the data acquisition processes frees some of the officers who perform this time-consuming job. In this case the data obtained will be more exact and reliable, since the greater part of the data will be acquired automatically. There is no need to devise and send out written reports and summaries to the higher echelons.

Significant changes will occur in the methods of summarizing and processing the data obtained. Processing of the most important information will be done by computers. They are capable of automatic identification, analysis, summarization, and selection of the necessary data for transmission to the appropriate control organs. The staff will be able by means of a ready program to solve a number of calculation problems involving the employment of fire weapons, advance of troops, regrouping, calculation of the correlation of forces, etc. There will no longer be a need for internal information, since all data fed into the computer can, after processing, be sent through remote equipment to all interested individuals and organs.

As a result, parallelism and duplication in the acquisition of situation data are eliminated and the necessary conditions are created for the officers to carry out their duties in a coordinated, timely manner. There can be no question that all of this will increase operativeness of control.

In making a decision, the commander can, by making an inquiry, obtain all of the calculation and reference data he requires by using the computer's remote equipment.

With the advent of automated systems the commander's operational map is still a most important document. Projected on a screen or an electromechanical plotting board, the map gives a graphic view of the entire situation. With signals from the computer, the latest changes in the situation can be depicted on it immediately. If the need arises, the situation in any sector of the map is schematically isolated in large scale on a cathode ray tube screen. Different colors can be used to designate friendly and enemy troops. The great advantages in this are that the commander and the staff officers can all observe the situation on the screen at the same time.

Automation of data acquisition and processing and performance of the numerous tasks related to referencing and calculation reduces the staff officers' work load and the time required to plan combat operations. The decisions made will correspond more closely to the situation at hand, since they will be based on the latest data reflecting the actual position and state of friendly and enemy troops and also on the exact calculations and data regarding all other factors that influence the content of the decision.

Here the output devices of the automated command and control system provide for input and retrieval of information, printout, graphic representation of the data, and compiling and reproduction of documents. A display device in the form of a screen, a panel, or various plotting boards permits us to obtain the latest situation data at any time.

Despite all the great changes that will occur in control organ operating methods, the role of the map will be just as great. It will be irreplaceable for the commander in making his decision, in planning combat operations, in assigning missions to the subordinates, and in control of the troops' performance of their assigned missions. Therefore the introduction of an automated command and control system in no way lowers the requirements on an officer's professional approach to staff work, especially his ability to work with a map.

The introduction of a new system undoubtedly causes not only a redistribution of the functions among responsible personnel but also leads to a change in the organizational structure of the control organs. Considering that a number of staff officer functions will be transferred to automated devices, one may expect some reduction in command and control personnel. At the same time the staff will gain new personnel who specialize in the use and servicing of automation equipment.

We must not, however, overlook the new problems with which the officers will be faced when automated command and control systems are brought in. In performing operational-tactical missions, a complete mathematical description of the combat operations will be required of them. This is a very complex matter and entails great efforts on the part of the specialists. Unless this problem is solved it will not be possible to input full-value programs into the computer's memory.

The operational-tactical description of the mission must be produced by well-trained officers who have a comprehensive knowledge of its content and the procedure for carrying out this mission, who give a clear presentation of the scale and nature of the activity of all of the control organs, and who are also familiar with the particulars of

converting the description into the language of mathematics. It is very important in the description process to properly establish the approximate quantitative relations between the parameters of the engagement (the rates and width of the offensive zone, the depth of the mission and the time frame for carrying it out, and so on), and the combat capabilities of the belligerents, the procedures for the troops' operations, taking into account the situation and also the data from exercises and combat experience.

With this approach to the operational-tactical description of the mission, the process of algorithmization and programming of the mission for the computer is made much easier. This process is a no less crucial phase of the operations which must be carried out in using an automated command and control system.

Whatever the difficulties in setting up an automated command and control system, there is no question but that it has a future. Whereas in the first phase the computers were used to gain relief from certain time-consuming tasks, now foreign armies are successfully working toward setting up systems which simultaneously automate many control processes in several command-staff elements. Setting up these systems will permit a sharp improvement in command and control efficiency.

3. Organization of Communications and Control Posts

Requirements Placed on Control Posts. The control post is a collective of responsible personnel trained and organized for work and a complex of technical equipment and the personnel to service it deployed at a particular location or on the move and specifically intended for command and control in preparation for and during combat operations. In order to provide for normal operation of the control post, the men and equipment required for security and servicing are also usually allocated. They are located separately from the control post.

The basic purpose of control posts is to ensure firm, flexible, continuous, and secure command and control under any circumstances. In order to meet this requirement, they must be highly mobile, small in strength, equipped with modern technical control means, protected against the enemy's weapons, and must establish the proper conditions for personnel to work and rest.

The degree of mobility of control posts is directly dependent on the quality of the vehicles with which they are equipped. Practice shows that control posts must have the best vehicles, with high speed and

excellent cross-country capability over any terrain and in any weather. In external appearance and protective equipment, they should be much the same as the vehicles the troops are equipped with. If these requirements are observed, mobility and survivability are increased. In addition, the mobility of the control posts depends to a great extent also on their composition. Unwieldy control posts require a great deal of time to set up and move, which reduces their mobility. On the other hand, the smaller control posts are in composition, the easier it is to ensure that they have the required system and organization, and the more mobile and maneuverable they are.

Outfitting control posts with modern technical equipment, especially communications equipment, is decisively important in ensuring stable troop supervision. They must be reliable in operation, simple to service, and ensure uninterrupted control in the face of a fast-changing situation, powerful radio interference, frequent changes in location of the control posts, and also while on the move and when widely separated from each other.

The equipping and supplying of control posts can meet modern requirements only when they are stable and protected against enemy weapons, especially nuclear weapons. In modern combat it is impossible to ensure continuity of command and control if the necessary measures are not taken to protect control organ personnel against these weapons. In addition to the general measures taken to protect the troops, foreign experts consider it necessary to equip the control post vehicles with collective means of protection against radioactive contamination and with means of enhancing the vehicles' protective properties in terms of thermal radiation and the effect of shock waves and to equip personnel with the means of reliable individual protection. In such cases favorable conditions for the normal activities of the officers obviously can be established only if they have sealed vehicles equipped with filtered ventilation units. In particular, these requirements are imposed on the Sultan FV105 command vehicle in the British Army (figure 16).

It is necessary here to deal with the matter of how to establish proper conditions at the control posts for productive work and rest on the part of the responsible personnel. In particular, convenient work areas must be set up with communications equipment and places close by to rest, to eat, for giving medical aid, etc.

The Composition and System of Control Posts. The purpose, the scale of activities of the troop element, and the situation are decisively important in determining the number and composition of the control

posts.

In the battalion one control post is set up—the command and observation post (KNP). The reason for this is that the battalion operates in a comparatively limited sector of the terrain (on the offensive up to 2 km and on the defensive up to 5 km),²² has a small number of subordinate subunits, and accordingly has at its disposal control equipment designed for setting up only one control post. If the command and observation post is put out of commission, its functions can be temporarily taken over by one of the company commanders already trained for these duties.

In the units of foreign armies, in view of the complexity of command and control and so as to disperse the control organs, a command post and a rear services control post are usually set up. The command post carries out direct command and control of the subordinate troops conducting combat operations. It is made up of the greater part of the control organs headed by the commander. The rear services control post is designed for management of rear services. It has officers who are in charge of supplies, maintenance, support, and reinforcement of the troops. Setting up two control posts not only brings the leadership closer to the objects of control, but it ensures the solution of the problem of control post survivability and greater stability of command and control as a whole.

The advisability of setting up, in addition to the command post, a second post designed mainly for command and control of rear services was confirmed during the last war. Accordingly, command and control personnel were usually divided into two echelons. Thus, for example, the first echelon of division command and control during the war years included the following: the commander, the deputy commanders for political affairs and for the line units, the chief of staff, operations and intelligence sections, the communications section, one or two political section instructors, the chiefs of the branches of troops and services and also the required communications and servicing subunits. The second echelon had the following: rear services, the line section, the administrative and supply unit, the political section, the judge advocate's office, the military tribunal, and staff transportation. The first echelon was the command post, from which the observation post was detached. This kind of division of the control organs made it possible to bring control closer to the troops and have small posts within enemy firing range that could provide reliable control, take concealed positions in the terrain, and move rather quickly to new areas.

In the view of foreign authors, there is a much greater need today for echeloning control organs. This is dictated by the requirement for ensuring stability and continuity of control in the event of enemy nuclear strikes in the areas where the control posts are located. Therefore, in addition to command and rear control posts, in the units and formations of the main foreign armies provision is now made for setting up an alternate (auxiliary, forward, reserve) command post. It is set up at the same time as the command post and is designed for assuming control in case the command post is put out of action. When this post is located ahead of the command post in direct proximity to the subordinate troops, the commander can exercise command and control from it during combat operations.

When there are several control posts echeloned along the front and in depth, they are less likely to be put out of action at the same time. When one or several posts are disabled by nuclear strikes, control is transferred to the remaining replacement posts.

Considering that the creation of a second (alternate) control post is an objective necessity, some foreign analysts have proposed that the tables of organization include a small special organ designed to operate at the second post.

With a control post system, greater requirements are imposed on the communications equipment. It must make exchanges on the technical communications channels as nearly like the officers' personal conversations as possible. In particular, the use of television, facsimile, and other modern means for this type of communications deserves great attention. Using quick-operating control equipment allows the officers at the second control post to be constantly informed of the situation and all the most important activities at the command post.

The composition and equipping of each control post is determined in advance. For this purpose the chief of staff prepares a special account of personnel and of the control and transportation equipment of which those posts are composed. In it he specifies the duties of each responsible individual and defines the measures, time frames, and procedures for execution of these duties under various combat conditions. This account must be adjusted periodically taking into account not only officer reassignments, but also the advanced experience accumulated during the exercises in solving command and control problems.

When there are several posts, the question can arise as to which of them should be considered the main one. In our opinion, the main one

is still the one where the commander is located with the necessary means of control and where the most important control measures are taken. This assertion follows from the fact that only the commander is given the authority to make decisions, and he bears personal responsibility for the troops' execution of the assigned mission.

The location of the commander in a battle is determined in each case by the situation as it has actually developed. 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 use his men and equipment to change the situation, to exert an emotional and psychological influence on his subordinates, directing their efforts toward successful execution of the assigned mission.

Placement of Control Posts During Combat Operations. The placement of a control post is determined on the basis of its purpose and the circumstances. Based on experience in the last war, the rear services post, for example, was usually placed near the rear services subunits subordinate to it. The selection of the location for the command post was more complicated. A general tendency was observed for placing the control post close to the troops. Usually on the offensive the command posts were located at the following average distances from the forward edge of the battle area: regimental 1.5 to 2 km; division, 2 to 4 km; corps, 3 to 6 km; observation posts, 0.5 to 1.5 km. This was in complete accord with the nature of the engagement and the state of the weapons and technical control equipment. Wartime experience showed that it was rare for the whole control post to be put out of action by air and fire strikes. Usually after fire strikes the control post remained in operation. It only required replacement of individual officer casualties or communications equipment that was out of commission. One should not lose sight of the fact here that the control posts were, as a rule, located in reliable shelters.

Under modern combat conditions, locating the command posts close to the combat contact line presents certain difficulties in the placement and work of responsible personnel. In order to reduce or eliminate officer casualties from enemy artillery fire and mortars and to set up the kind of conditions they require, it is very often necessary to provide engineer equipment at the control post locations. It should be kept in mind that a poorly chosen location for the control post can lead to undesirable consequences. Slight shifts in the front line toward the control post force it to be moved in a tense situation when the commander and staff must be constantly in contact with the combat

operations.

A decisive factor in determining the distance of the command post from the front line is the need to maintain uninterrupted communications with the subordinate staffs, the adjacent units, and the higher staff, and, in the subunits and units, to keep the battlefield under observation, as well.

The average distances of the main command posts from the forward edge of the battle area are as follows:²³

Table 10

Level of Control	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	up to 25

The other posts are located on the basis of the missions which they carry out and for the purpose of maintaining communications with the command posts. The spacing of the posts must be such as to eliminate the possibility of two posts being hit by a single medium-yield nuclear weapon.

For the sake of increasing the survivability of control posts, foreign armies consider it advisable to locate them away from the most likely targets for enemy nuclear strikes, to use the protective properties of the terrain, and also to use prefabricated engineer structures. In order to protect control posts when in place, it is recommended that maximum use be made of natural shelters—forests, ravines, canyons, mines, etc., which reduce the damaging effects of nuclear weapons and create the best conditions for camouflage. However, if there is time, especially on the defensive, to conceal personnel, control equipment, and transportation, then engineer structures can be set up. Ready-made prefabricated and collapsible structures are widely used to build shelters.

The dimensions of the area in which the control post is set up depend on its composition, the conditions of the terrain, the extent of enemy activity, the distance from the forward edge of the battle area, the length of time in one location, and other circumstances (figure 17).

When selecting the area for location of the control post one should also consider the working convenience of the officers and the opportunities for personal contact among them when carrying out their

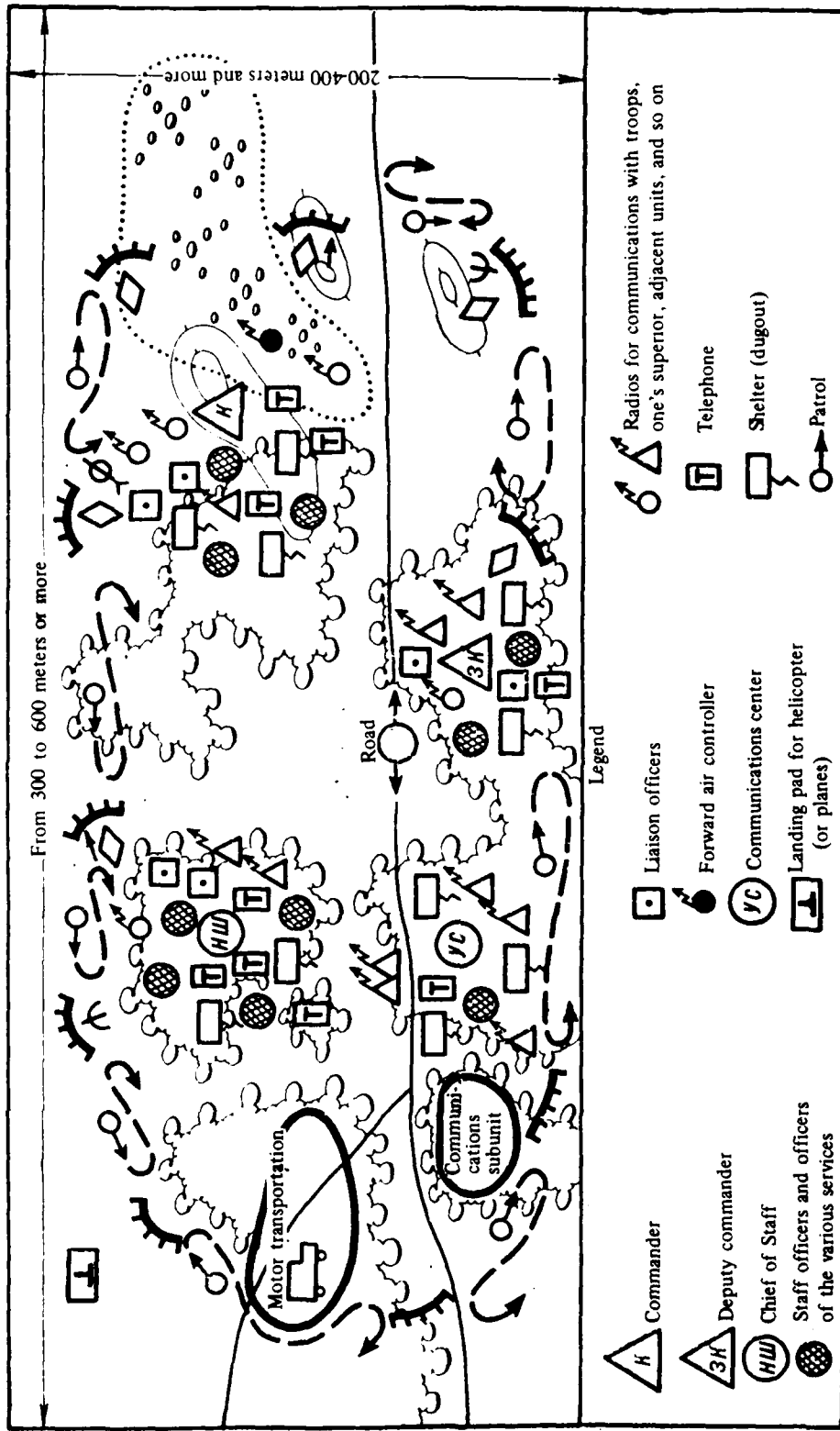


Figure 17. Schematic Diagram of the Disposition of the Control Post of a Combined Arms Unit (U.S. Army).

missions. Selecting terrain where location of the post can be hidden, and which will not require great expenditures of men and materiel on engineer preparation of the area becomes very important. This is especially valid because the chances for engineer preparation of the control post locations, especially during the development of the offensive, will be extremely limited. Measures such as maximum reduction of the time the control post is in one place, fast changing of areas by the control posts, careful camouflaging against enemy ground and air attacks, and reliable cover by air defense weapons prove their value completely. In order to provide for more organized moving and deployment of the control post, it is important for personnel to clearly recognize the signals, the locations of the vehicles in the column, and the system for packing up and deploying for operation. Along with the signals for the threat of a nuclear attack, for an air attack, and for danger of airborne, tank, and motorized infantry strikes, it is advisable to provide for signals which define various degrees of preparedness of the control post to move. If the signal to prepare to move is given in time (by which signal the scope of measures to be taken is clearly defined), then when another signal comes after some time, it is possible to begin an organized column march by the control post.

In modern combat, control posts are most important targets for the enemy. For this reason they cannot remain in one place for a long time, and they must be vacated in good time before a projected enemy strike. They must change location even in cases when the troop combat formations are still occupying their former position.

A sharp increase in tempos of combat operations has made it much more difficult to maintain stable command and control. Under these conditions, the control posts must be capable of operating on the move. In terms of capabilities, the solution of this problem causes no great difficulties now, since control posts in all of the most developed armies are equipped with vehicles with excellent cross-country capacity and new communications equipment capable of operating on the move. However, this problem also depends to a great extent on the capabilities of man—the commander and the staff officer. Indeed, command and control does not amount merely to maintaining communications with the troops. Even with uninterrupted communications, staff officers who are on the move, being in different vehicles, find it quite difficult to gather and generalize data on the situation and to report to their commander, while the latter finds it difficult to make the decision and assign the missions to the troops.

In order to overcome this difficulty, an effort is sometimes made to have frequent halts by the control posts without dispersal and camou-

flage. As wartime experience has demonstrated, these measures are not very effective; moreover, they increase the vulnerability of the control posts to enemy fire and air strikes. War has demonstrated that it is more advisable to move the control posts as quickly as possible, with radios in receiving mode, and to allow for increasing the length of the halts by speeding up the moves, thus providing for concealment, dispersal, and camouflage of the posts. This sort of organization of control when moving the posts increases their survivability and creates more favorable conditions for the officers' work. Of course, in extreme necessity when even a few minutes' delay could seriously affect the course of events, the commander is justified in halting the command post column for a short time in order to make unclear problems more precise, make a decision, and disseminate it to the executive agents.

In the opinion of foreign armies, the greatest time savings in moving the posts and maintaining stable communications during this period can be achieved by using helicopters equipped with radios. Their advantages are especially apparent when control posts negotiate broad radioactive areas, areas of destruction, and wide water obstacles, when an offensive is developed over terrain with a limited number of roads, and on long marches.

Among the many conditions for increasing the survivability of control posts is skillful disinformation of the enemy about their actual location. Even in the last war, the following procedures were widely used: creating dummy control posts and simulating their operation, placing medium- and high-powered radios at some distance from the command posts, replacing previously operating radios of commanders with other sets, transmitting false information about control post locations, radio silence, etc. All of this undoubtedly diverted the enemy's attention and at times led to his hitting false targets. Today the opportunities for deceiving the enemy have increased greatly. If they are skillfully used, the survivability of control posts can be greatly increased.

A most important staff mission is organizing control post security and defense. In addition to their being concealed in the terrain and carefully camouflaged against ground and air observation, provision is made for air defense cover, organization of security and defense, and also the commandant's service. A well-thought-out warning system against the threat of enemy attack and constant monitoring of the service provided by the subunit assigned to security and defense of the control posts are very important.

Restoration of Control Posts

In spite of all the measures that staffs provide for in order to maintain control post survivability, 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 a timely manner toward carrying out the tactical mission assigned.

The scale, content, and procedure of operations to restore control depend on the extent of casualties among personnel, on the number of communications breakdowns, and also on the situation at hand in a given sector of the front. Therefore it is extremely important to obtain data quickly on the condition of the control post near a nuclear strike. For this purpose, the higher staff can send out officers in helicopters (or planes) or vehicles with exceptional cross-country capabilities so as to determine on the spot the consequences of the strikes and also to use the communications lines of other control posts near the blast zone. Quite often it takes a good deal of time to gather complete data, with the result that there may be a delay in taking measures to restore control. Therefore, we view it as more profitable to obtain data by forecasting the losses and the radiation situation resulting from a nuclear strike. Forecasting can assist the commander in making decisions on restoration of troop control. This does not, however, rule out organizing special reconnaissance to obtain more exact information.

Restoring control, or, in other words, resuming interrupted control post activity quickly, depends greatly on the timely and clear determination of the main ways to solve this problem. In the judgement of foreign authors, the best course here is to switch control to a second (alternate) post. One of the control posts of the chiefs of branches of troops can also be used as an alternate post.

Thus, in a U.S. Army infantry division, the battalion artillery command post is considered to be such a post. This post carries out missions that are similar in content and is in a position to quickly set about performing new duties, differing from the previous ones only in scale and not in specifics. When control is switched, provision is made for reinforcing it with personnel and with communications equipment. Thus, continuity and the smoothest possible transition in command and control are assured. Subordinate commanders and staffs may not even perceive a change in leadership, for it continues to perform its duties in the same manner as they are accustomed to.

In addition, a procedure such as transferring control to the command post of subordinate subunits and then reinforcing it with officers

and communications equipment is considered the most advisable.

If the possibility is foreseen of switching control to a subordinate post, there will be a requirement to systematically report the situation during the course of battle to this post and report the content of all the main orders and instructions given by the commander so that the subordinate post will be ready any time to assume the functions of the higher command element. The possibility must also be considered that the next higher commander may assume the functions of a subordinate commander's control post that has been put out of action. This sort of temporary combination of duties makes it possible for the control organs to have continuous input to the troops.

This type of control can be achieved because the superior control organ is in communication with the control organ a step lower than his direct subordinate, and therefore no restructuring of the communications system is required. At the same time, one must bear in mind that in this case the information flow will increase sharply as a result of the increase in the number of subunits directly subordinate to a given control organ, which will be felt in the speed with which it handles its work.

One of the effective methods, as has been noted in the foreign press, is to detach an operations group from the higher staff, along with communications equipment and servicing subunits, which goes out to the unit (or subunit) that has lost its command post and assumes the command and control mission. This procedure has proved its worth in cases where not only the control post has broken down, but the organizational integrity of subunits has been disturbed, undesirable emotional and psychological consequences have come to light, and a superior officer's intervention is required.

Under any conditions, the most important thing in restoring command and control is to have reserve communications equipment. With reserve communications equipment ready to move immediately to the area where a command post is to be set up, the problem of restoring command and control is greatly reduced.

Finally, another possible choice is to exercise command and control temporarily from the rear service subunit control post. If it is to perform these new missions successfully, it must be reinforced with officers and communications equipment.

The selection of the appropriate alternative will depend on how far reaching the disruption of command and control is, the number of

control posts and officers and the amount of communications equipment still intact, and also what kind of situation has developed on the front as a result of enemy nuclear attack.

In a good many cases, restoration of the control post will not always take place in the same sequence as was planned. Nevertheless, the advance preparation of measures can be greatly conducive to successful performance of the job.

There can also be cases where the control organs suffer only partial losses from nuclear strikes. Depending on the extent of the losses, it may be advisable to take certain measures regarding organization and manning, namely, to reduce the number of officers performing secondary duties and use them for manning those primary positions which determine the stability of command and control.

The measures for possible movement of the officers in the event some control posts are put out of action must be provided for in advance in the relevant plans, and worked out during exercises in practice with the responsible personnel on the basis of the interchangeability of their new positions. The importance of these measures is confirmed by the fact that the level of training of the officers is a determining factor in quick recovery of disrupted command and control.

When there are enemy nuclear strikes, the control posts may turn out to be in areas with high radiation levels. It is important here that staff officers retain their tenacity and stability and serve in their behavior as an example to the troops, ensuring continuity of command and control and organized withdrawal of the troops from the contaminated zones. The result is the increased importance of the emotional and psychological tempering of the officers in the control organs, their readiness under difficult conditions and under intense physical and psychological stress to retain their capacity to make objective evaluations of events and perform their duties knowledgeably.

The scale, content, and methods of operation of the restored control posts and units will have their characteristic features. In particular, the commander and the staff officers will have more frequent contact with the subordinates through trips into the field in order to deliver the decision to them on the spot, and, under these difficult conditions, to personally influence the performance of the assigned mission. Verbal commands will be transmitted over technical communications equipment much more often.

Considering that the number of personnel at the restored post will, as a rule, be small at first, broader interchangeability of officers becomes very important. One cannot count on control post officers feeling "at home" within a few minutes after taking control. They will need a little time to adjust to the new role. During this initial period it is especially important that the subordinates, without waiting for requests from their new leader, themselves report on the state of the subunits, their support, their progress in performing the assigned mission, and the grouping and nature of enemy operations just as soon as they hear a signal, command, or order regarding his assumption of command. This kind of report permits the new commander to grow into the situation more rapidly. Thoughtful foresight is required on everyone's part in order to help officers who have assumed new and difficult functions to deal successfully with command and control.

If a subordinate control organ, for example, a battalion commander and staff has to assume the functions of the higher element, the question can arise as to what is going to be done about control of their own organic subunits. Combine the functions or proceed along a different path—separate them, creating two control groups? It appears to us that the latter alternative is better, but it is possible only if one has the men and equipment for control. In this case the battalion commander and chief of staff can switch to the more complex and responsible job of performing the functions of the higher staff, and a small group of officers headed by the deputy commander will head up the control of the organic subunits.

If a control post has assumed the duties of a disabled subordinate control post, then it is advisable to assign a small group of officers to do this. With this separate control, the efficiency and clarity of the direction of the troops improve: the officers are able to gain a more thorough knowledge of the situation and take the necessary and timely measures when it changes. Their functions are clearly delineated, their attention is not distracted, and the work proceeds more purposefully. Besides, the interests of control dictate location of the control posts in terms of their purpose, which is impossible unless they are located separately.

Consequently, well-thought-out organization of the control posts and taking effective measures to protect them and also to restore them in the event of enemy nuclear strikes are decisive prerequisites for ensuring continuous and stable command and control in any situation.

Organization of Communications

Communications equipment is allocated for the purpose of maintaining steady contact with subordinate and coordinating subunits, with one's superior, and with adjacent units. Responsibility for communications along the front is on the adjacent unit to the right; responsibility for communications of the combined arms subunit with the subunits of the branches of troops is on the subunits of the branches of troops; responsibility for communications with the subunits of the special troops is on the combined arms subunit.

Radio and signal communications in the battalion are usually set up with the resources of the battalion and the subordinate subunits, while line communications are set up with battalion resources. The communications between the coordinating subunits are established by direction of the commander organizing the coordination.

Under any conditions the communications equipment must be capable of permitting the commander and staff to keep constantly informed of the situation and to react in a timely manner to changes in it. Various kinds of new and improved communications equipment, particularly radios, go a long way in satisfying these requirements.

A *communications system* is set up in the battalion in the form of a set of stations and communications lines deployed to ensure contact of the subordinate, attached, and coordinating subunits and for communicating with the next higher commander and adjacent units.

The motorized rifle company sets up its own radio network, which includes the radios of the company commanders and platoon leaders and also all of the company armored personnel carriers. The coordination of operating procedures of motorized rifle companies among themselves can be carried out by the company commanders over the battalion commander's radio network or by mutual netting on the company radio network.

Communications with the tanks attached to the battalion are accomplished over the radio network of these attached tanks. It includes the commander's or the chief of staff's radio. In order to maintain communications with the attached or supporting artillery battalion, its radio is included in the battalion commander's radio network. During combat the artillery battalion commander is usually co-located with the battalion commander, thus achieving reliable communications between them.

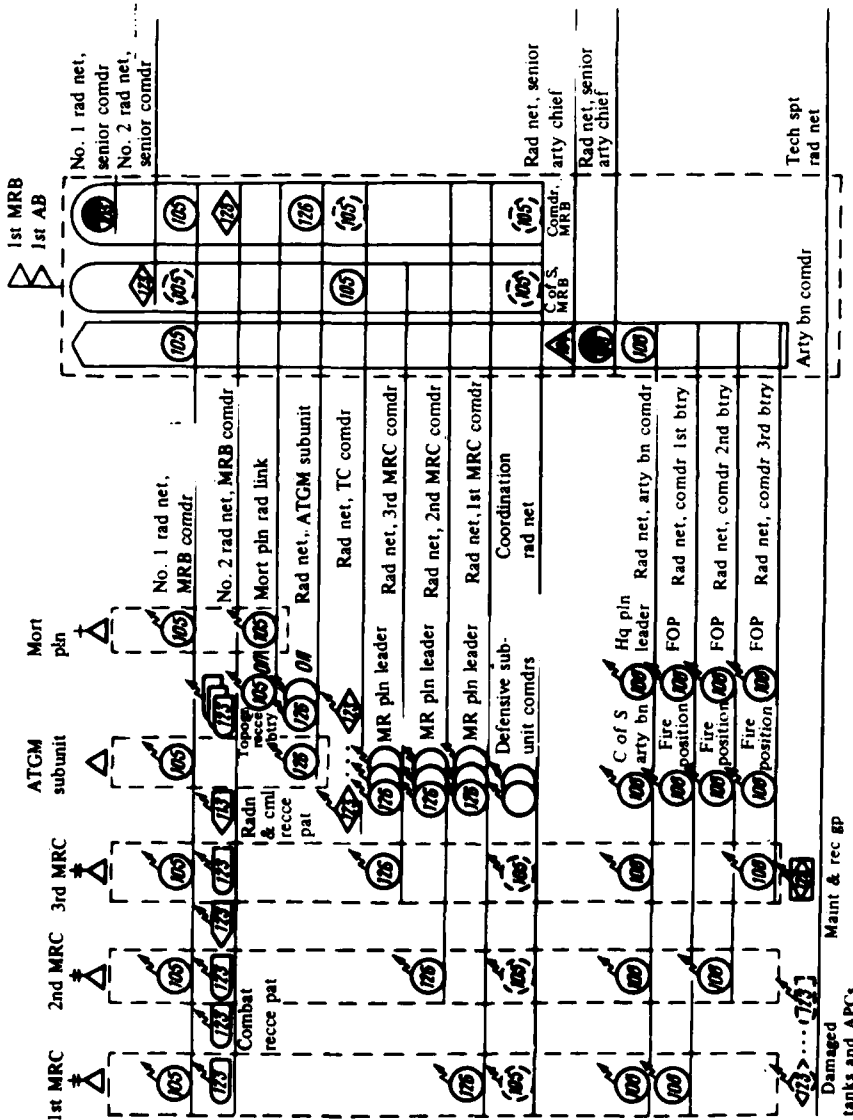


Figure 18. Diagram of the Organization of Radio Communications in the Motorized Rifle Battalion When Attacking From the March.

In order to improve stability, at each point in the chain of command the communications system must have several channels to the main distant stations. Figure 18 shows the organization of the communications of a motorized rifle battalion reinforced with a tank company, an artillery battalion, and a combat engineer platoon. For communicating with his superior, the battalion commander has two basic ultrashortwave channels (R-105M and R-123) and two alternate channels (one each on shortwave and ultrashortwave). For communicating with the company commanders there are three direct channels (R-105, R-123, R-126) and one alternate artillery communications channel. Having this many channels ensures superior communications reliability and carrying capacity.

The maintenance of stable communications depends not so much on an increase in the communications equipment and centers as on organization of communications and skillful use of the men and equipment under various conditions, especially during maneuvering combat operations.

The skill of commanders and staff officers in using communications equipment, especially radios, is very important. The officers' personal conversations by radio reduce the number of errors and repeated requests, and they not only permit situation information to be obtained quickly, but also the necessary orders and instructions to be reported immediately. Besides, the orders given personally by the commander have a definite psychological effect on the subordinates, inspiring in them the certainty of success. It is necessary to strive for maximum reduction of information transmission time here. When there is active jamming, information must be literally "fired" at the radios. The significant role will be played not by conversations but by sending commands, signals, and telegraph messages. The shorter the time of transmission and reception of information, the greater the guarantee that it will be received and used on time.

A reduction in conversation time depends on how well the officer organizes himself. Before establishing communications, it is advisable to think through the basic content, select meaningful words and convincing expressions, and prepare the operational map and the necessary documents. A clear, concise, logically consistent account of the situation or content of the decision speeds up the transmission and thus reduces the load on the communications equipment.

The complexity of organizing communications increases also because several dozen different radios are concentrated in the comparatively limited zone of battalion combat operations. Besides,

enemy radios will be operating in the immediate vicinity. Under these conditions, the problem arises of ensuring electromagnetic compatibility. Even if the mutual interference of the radios can be eliminated, there is still enemy interference. Hence, when communications are organized, provision is made for measures to protect both against intentional interference and against noise resulting from a coincidence of friendly and enemy radio frequencies. Reserve frequencies are planned and new call sign variants are worked out for this purpose.

Proper selection of types and means of communication based on the nature and content of the missions performed by the troops is very important. Whereas on the offensive, communications are achieved mainly by radio, on the defensive, they are most frequently conducted over line communications equipment. However, in defensive combat, all necessary radio networks are deployed in readiness for operation.

Under any conditions, the most important measure of skillfully set up communications is proper selection of the means and methods of information transmission. Experience shows that maintenance of stable communications today is possible only with exceptionally flexible use of all means of communication. Items of communications equipment combined into a set take on new qualities. Thus, multichannel radio relays have high communications carrying capacity, but are less mobile; short-wave radios are highly mobile, but have a limited number of channels. The combination of various kinds of equipment into a communications system makes it possible to compensate for the deficiencies of certain of them and make maximum use of the positive qualities of others. Full use of all this equipment will greatly increase control stability. When the commander and staff have a control post with modern technical equipment, there can be no situation in control in which they lose contact with their subordinates or with the higher staff. Radio or line communications can be disrupted by the enemy, but there is still mobile and signal communications equipment on which one can receive data and transmit instructions.

Even in cases where stable radio communications are maintained, it is sometimes more advantageous to send a report or instructions by mobile means. This type of situation is possible when the control posts are located nearby or when maintaining security is important. This is especially the case when the control post has vehicles with great cross-country capacity, which somewhat facilitates the solution of the problem.

In a situation where the control posts are quite far from the troops, which is most characteristic of pursuit, carrying out a march, or troop

operations on a broad front, when the distance between the control posts exceeds the range of the radios the following measures are taken. Power amplification units are used, the stations are placed on promontories, directional antennas are used, communications are established through an intermediate point, and combined use of radio and radio relay is provided for. For automatic radio relaying of the transmitted information at the contact point of radio relay channels and radios, various special attachments are used.²⁴

The range of radios can be increased by carefully planned location of the control posts in relation to the combat (march) formation of the subunits, clear-cut organization of their moves, and also skillful selection of the places for deployment of radio equipment. Here, even at battalion level, it is important to use all of the communications means in combinations, taking into account their properties and capabilities for providing rapid and secure transmission of information under the conditions at hand. Only on these terms will it be possible to ensure continuous communications throughout the engagement. In each command element a common communications system is created which is coordinated with the systems of the higher staff and of the subordinates, with adjacent units, and with coordinating subunits and which provides for the requirements placed on it by the commander and the control organs.

The basic initial data for organizing communications are provided by the higher staff and the chief of staff, who determines the communications missions, the locations of the control posts, the procedure for moving them during combat operations, and with whom and at what time communications must be provided.

Analyzing the missions received and evaluating the situation as it relates to communications, the chief of communications determines the scale of operations, the sequence of their performance, and the specific missions for the communications subunits. He can begin the estimate of the communications situation with an estimate of the operations of friendly forces: which subunits perform which mission, at what rate they can advance, from what line the second echelon (reserve) will be committed to combat, the distance of the control posts from the elements of the combat formation, and the capabilities of the subunit communications equipment. Based on an estimate of friendly forces, a determination is made of the main sectors with which communications must be effected, productive methods of using various means of communication, and the number of channels required to ensure communications with each sector.

In assessing the enemy, primary attention must be given by the chief of communications to determining enemy capabilities for destroying or damaging communications equipment and for setting up radio jamming, and he must outline what measures to take so that even under such conditions communications will continue uninterrupted. The terrain and meteorological conditions are assessed from the point of view of their effect on the operating stability of all types of communications.

A careful definition of the missions and a comprehensive estimate of the situation as it relates to communications will enable the chief of communications to determine how to organize communications, using all available means; to allocate them for performing the missions assigned; to set aside reserve equipment; to plan measures for protecting communications from weapons of mass destruction, for ensuring security, and for establishing logistical support procedures.

There is no doubt that in the course of combat operations, as a result of additional missions that come up and because of losses in communications personnel and equipment, the chief of communications will make changes in the operation of the communications subunit. There will be extensive manipulation of communications personnel and equipment and skillful switching of communications channels in terms of their load. It is also important to have reliable internal communications at the control posts themselves. For organization of this type of communications, a variety of equipment providing two-way, loudspeaker communications is used. It is not especially complicated, and little effort or time is required to set it up.

A great future is developing for internal communications with compact television and videotelephone devices, facsimile units, and radiotelephones. With stable, closed internal communications, there is less need to summon subordinates personally. The conditions are established for increasing operativeness and achieving maximum operating coordination.

Indicative of clear-cut organization of communications is the provision for an established procedure for use of communications, especially for observing radio discipline. Not only the radio operators but also all responsible personnel using radio communications must adhere strictly to the rules for radio conversations. Only in this way is it possible to achieve greater stability in communications operations and to maintain security of conversation content. Therefore, when communications are organized, provision is made to monitor use of communications equipment and adherence to radio discipline.

Notes

1. *V. I. Lenin i Sovetskiye Vooruzhennyye Sily* [V. I. Lenin and the Soviet Armed Forces] (Moscow: Voenizdat, 1967), p. 128.
2. *Kommunist Vooruzhennykh Sil* [Communist of the Armed Forces], No. 6, 1973, p. 16.
3. See A. N. Kachalina, *Nauchnaya organizatsiya upravlencheskogo truda—org-proyektirovaniye* [Scientific Organization of Control Work—Organizational Design] (Moscow: Ekonomika, 1973), p. 241.
4. M. V. Frunze, *Izbrannyye proizvedeniya* [Selected Works] (Moscow: Voenizdat, 1965), pp. 83-84.
5. *Materials of the 25th Congress of the CPSU* (Moscow, 1976), p. 70.
6. K. K. Rokossovskiy, *Soldatskiy dolg* [A Soldier's Duty] (Moscow: Voenizdat, 1968), p. 223.
7. Lenin, XLIV, 366.
8. S. A. Neustroyev, *Put' k reykhstagu* [The Road to the Reichstag] (Moscow: Voenizdat, 1961), p. 11.
9. Lenin, XLV, 447.
10. Lenin, XXXVI, 193.
11. S. S. Biryuzov, *Kogda gremeli pushki* [When the Cannons Were Roaring] (Moscow: Voenizdat, 1962), p. 147.
12. See the Internal Service Regulations of the Armed Forces of the USSR.
13. One such source is A. V. Prokof'yev's book *Sredstva mekhanizatsii i avtomatizatsii v shtabakh* [Staff Use of Mechanization and Automation Equipment] (Moscow: Voenizdat, 1976).
14. *Voyennyy vestnik* [Military Herald], No. 6, 1973, p. 121.
15. *International Defense Review*, No. 5, 1972.
16. See V. I. Bykov, Ye. P. Gusev, I. M. Kokorin, and V. A. Polyakov, *Televizionnyye v voyennom dele* [Television in Military Affairs] (Moscow: Voenizdat, 1969), pp. 39-41.
17. The journal *Aviation Week and Space Technology*, November, 1971. [This is, of course, an incomplete reference, since the title reveals that this is a weekly publication—U.S. Ed.]
18. See V. S. Akent'yev, I. S. Vinnik, A. Ye. Vodnev, I. I. Kandaurov, and B. F. Kosenko, *Mekhanizatsiya inzhenerno-tekhnicheskogo i upravlencheskogo truda* [The Mechanization of Engineer and Control Work] (Lenizdat, 1973), pp. 17, 39, 42, 50, 57.
19. A. V. Prokof'yev, op. cit., p. 160.
20. V. S. Akent'yev et al., op. cit., pp. 280, 290.
21. *Ibid.*, p. 224.
22. See G. I. Garbuz, D. F. Loza, and I. F. Sazonov, *Motostrelkovyy batal'on v boyu* [The Motorized Rifle Battalion in Combat] (Moscow: Voenizdat, 1972), pp. 93, 215.
23. See S. V. Grishin, P. A. Zhukov, and Sh. I. Kitoshvili, *Taktika (po inostrannym vzglyadam)* [Tactics (According to Foreign Views)] (Moscow: Voenizdat, 1972), pp. 80-83.
24. See *Voyennyy vestnik* [Military Herald], 1972, No. 7, p. 92; 1972, No. 5, p. 82; G. I. Garbuz et al., op. cit., p. 176.

Chapter 3. Organization of Control Organ Operations

1. Basic Principles of Command and Control

The organization and methods of operation of commanders and control organs depend in each individual instance on the nature of the tactical mission assigned, the time available, the level of training of the officers, the degree to which the staffs are equipped with technical control equipment, and other circumstances. However, this work is characterized also by certain general principles, the correct understanding and observation of which is required under any circumstances.

As applied to the field of command and control, principles are generally taken to mean the basic rules and tenets which control organs and commanders must follow in their practical activities when exercising command and control of their subordinate subunits. And principles by their nature are the result of scientific generalization of practice and derive from the objectively operating laws of conducting combat.

" . . . Principles are not the starting point of research," wrote F. Engels, "but the final result; these principles are not applied to nature and to human history, but are abstracted from them; it is not nature and man that conform to the principles, but, on the contrary, the principles are valid only insofar as they correspond to nature and history."¹

Whereas laws cannot be repealed or replaced by different ones, principles, in contrast to laws, 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 content; man is relatively free in the choice of certain principles. However, when they are used creatively, everything else being equal, it always leads to more successful accomplishment of the assigned missions.

At the same time, principles cannot be identified with the requirements on command and control which we investigated above. These requirements characterize the qualitative state of control. They answer the question of what control must be in order to correspond to the

nature of combined arms combat and ensure its success. The *principles* of command and control, being based on the laws of armed conflict and the requirements placed on control, give recommendations about the most advisable actions 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 quite obvious that at different stages of development of military art, principles of command and control operated differently, since the means and methods of armed combat and the requirements on command and control have changed. This is the difference and the interrelation between the requirements on command and control and the principles.

There is an interrelation between the principles of command and control and the style of operation of the commanders and control organs. If the principles contain the basic guidance which the commanders and control organs are to follow in their practical activity, then the characteristic features of the operating style indicate to them 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, for satisfaction of the requirements on control. Style of operation, consequently, is to a greater degree than the principles, a subjective characteristic of leaders. In other words, command and control principles are embodied and made concrete in operating style. The nature and style of work of the commander and the staff to a great extent determine how the basic principles are realized in practice. The Leninist style of operation, the characteristic features of which are as follows, must be a model for them: strong orientation toward communist ideology and principles, unity of theory and practice and of words and deeds, innovativeness, farsightedness, a businesslike approach, modesty, independence, decisiveness, exactingness, organization, honesty, and truthfulness.

In a number of works the authors list far too many principles, which does away with their practical value as basic principles for control organ activities. What they are doing, essentially, is already starting to express the features of the style of operations or the requirements imposed on command and control.

To avoid this fault, this book gives only the basic principles which on the whole constitute a unified set of propositions that define the theoretical base and the direction of a control organ's activity. The years of experience of past wars and also the practice of postwar exercises allow us to assert that the most important command and control principles are party orientation, scientific approach, foresight, one-man management, and centralization.

Party orientation is the basic principle of command and control, following from the class nature of armed conflict and the decisive significance that the morale-political state of the troops has in the successful performance of the tactical mission. This principle requires that in their practical command and control activities commanders and staffs at all levels be guided by and persistently implement the policy of the CPSU and the Soviet government, that the subordinates be indoctrinated with a spirit of infinite devotion to their Homeland and hate for its enemies, fidelity to their oath, friendship and brotherhood among nations, and proletarian internationalism. The practical implementation of the principle of party orientation is provided primarily by the **guiding role of the CPSU in the organizational development of the Armed Forces.** The CPSU Program indicates the following: "The principle of all principles of military organizational development is the Communist Party's guidance of the armed forces and the strengthening of the role and influence of party organizations in the army and navy. The party gives unabated attention to increasing its organizing and guiding influence in all life and activity in the army, air force, and navy. . . ."2

The Leninist principle of party orientation demands that constant concern be shown for the ideological tempering of the troops, that an implacable battle be waged against any manifestations of bourgeois ideology, cases of apolitical behavior, and the penetration of revisionist views. Reality convincingly confirms that missions are successfully performed where the personnel are educated in the spirit of communist ideology and party orientation, where a persistent struggle is waged to turn the ideas of Leninism into deep personal convictions on the part of each soldier. This principle permeates all of the activity of the commander, the staff officers, and the party-political apparatus. When solving any problem or when evaluating facts, events, and phenomena, they are always and everywhere obliged to begin with the requirements of party orientation. To this extent they respond to the interests of the Soviet people and the tasks placed before our Armed Forces by the party at this stage.

The increased importance of the principle of *scientific approach* in command and control is a result of all the basic changes which have occurred in the means and methods of armed conflict which have greatly complicated command and control and imposed new, greater 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 commanders and staffs in their practical activity of the objective laws of various

sciences: Marxist-Leninist theory, military science and technology, physics, chemistry, cybernetics, electronics, mathematics, pedagogy, psychology, and the use of advanced methods by the troops. It is quite obvious that in order to implement this principle, commanders and staffs at all levels must have thorough, comprehensive knowledge of the basic principles of Marxist-Leninist theory; an understanding of the laws of social development and the laws of armed conflict; the ability to use materialistic dialectics to thoroughly, comprehensively, and objectively analyze and evaluate the situation; to see what is new and advanced; to find the main thing, the decisive link in a long chain of assigned tasks; the ability to efficiently and creatively satisfy the requirements of the regulations and manuals, which constitute a scientific synthesis of years of combat experience. Therefore it is no accident that the basic measure of a scientific approach to command and control is the making of a comprehensive, sound decision by the commander, effective utilization of the available men and equipment, and achievement of the combat objective with minimum losses and within the established time.

As regards the scientific approach to military leadership, the importance of the personal (subjective) qualities of the officer, especially his businesslike approach, strong will, decisiveness, bravery, and also strongly developed intuition and even imagination is in no way diminished. Besides, in military affairs the role of these leadership qualities is much greater in comparison with control in other areas of public life. Consequently, command and control is for us not only a science, but also an art, the ability of the officer to use scientific data in practice. Commanders' and staffs' control work itself also requires scientific organization. It is especially important for their work to demonstrate qualities of planning, purposefulness, organization, and knowledge and ability to make efficient use of their time.

The principle of *foresight* is inseparably linked with the principle of scientific management. It complements and enriches it, as it were.

In essence, foresight is the ability of the commander and staff to provide in advance for possible changes in the duration and probable course of forthcoming combat operations. This principle plays an important role in the theory and practice of command and control, since without foresight it is impossible to achieve victory over the enemy. The role and importance of foresight follows from the very nature of armed combat itself, in which both sides strive by every possible means to hide their intentions from the enemy, to achieve surprise, and to rout the troops of the other side. For this reason, in war there is never enough information about the enemy, and some of it is chance,

insufficiently reliable, and even false. However, the lack of information does not relieve the commander of the duty of making a timely, sound decision.

As a result of the introduction of nuclear weapons and change in the nature of combat, the importance of foresight increases, and its sphere is greatly expanded. In particular, commanders and staffs at all levels are faced with new missions in the field of foresight, such as discovering the grouping of enemy nuclear attack weapons and determining the possible procedure for using them; considering the effect that using these weapons will have on the morale and combat effectiveness of the troops and also on the character of the terrain; forecasting the radiation and chemical situation; discovery of the possible concept of operations of various enemy reserves; and other missions.

The scientifically sound solution of these problems in the process of foresight requires skill on the part of the commander and staff officers in using the dialectic method of thinking, the capacity to analyze the situation correctly, to find what is the main thing in it, and also thorough knowledge of the principles of combined arms combat. The ability to foresee is, therefore, an indication of an officer's overall tactical mastery and maturity. Besides, correct foresight is inconceivable without exact calculations, well-organized reconnaissance, and without thorough knowledge of enemy equipment, *troop organization*, and tactics. Without this, it is impossible to forecast the development of the forthcoming operations, to provide for the difficulties which can be encountered in carrying out the tactical mission, or to plan means of overcoming them.

Today, therefore, the degree to which officers master the methodology of scientific foresight to a great extent determines the thoroughness of their analysis of the conditions at hand and the soundness of the decision. It is very helpful to commanders and staffs in this case to study the situation and forecast the course of coming combat operations by skillfully using modern technical means of control, mathematical methods of operations research, and PERT planning methods.

*One-man management** constitutes not only a most important principle of the organizational development of the Armed Forces, but also of command and control. As a control principle, it expresses the commander's absolute authority over the troops subordinate to him, as based on the authority granted him by the laws of the Soviet state and

* [See footnote on p. 24 for discussion of this term—U.S. Ed.]

governed by regulations and the orders given by his superior officers. The one-man management commander is personally responsible to the party and the state for all aspects of the life and combat activity of his subunit or unit. In his hands are concentrated operational-tactical, political, administrative, and economic functions. This gives him the opportunity to exercise flexible and firm control, to effectively use men and equipment in combat, and to provide for unity in the will and actions of personnel.

V. I. Lenin emphasized the special necessity for one-man management in the organizational development of the Armed Forces and in command and control in combat. He taught, "Irresponsibility cloaked in allusions to group management is the most dangerous evil, which threatens everyone who does not have great experience in a practical group management operation and which in combat leads inevitably to catastrophe, chaos, panic, anarchy, and defeat."³

In command and control the principle of one-man management has always been necessary, but today, as a result of the changes in equipment and in the nature of troop combat operations, it has become much more important. It is called upon to provide for effective use of the new means of control, quick and reliable command and control, and strong military discipline of personnel under the complex conditions of highly mobile combat operations with nuclear weapons being employed by both sides.

In our Armed Forces, one-man management is constructed on a party basis, which means each commander's strong political consciousness and his persistent implementation of CPSU policy. The most complete and clearest reflection of the principle of one-man management lies in the fact that only the commander bears complete and personal responsibility for the control of the troops subordinate to him and for their successful accomplishment of the tactical mission and in the fact that he alone has the authority to make the decision, which is the basis for control.

At the same time, this in no way means that when he is exercising command and control the commander can ignore the collective, and not consider its opinion. While V. I. Lenin required strict observation of the principle of one-man management, he nevertheless warned many times against one-sided interpretation and use of it, against a passion for naked administration. He taught that one cannot lead by this process or that without being guided by the creativity and initiative of the collective, without maintaining close ties with the masses, and without learning from them. Hence, there comes a need for a skillful com-

ination of this principle with the initiative and creativity of the collective, which is made up of the party and Komsomol organizations and also the staff personnel and other responsible personnel of the control organ.

"In other words, if in the recent past military art was manifested primarily in terms of the personalities of generals and other commanders, with the basis for this manifestation frequently being their personal qualities, intuition, and resolute risk, then today's military art, while including the elements mentioned, is more and more manifested in terms of the creativity of the collective, based on exact calculations and comprehensive consideration of the nature of the engagement, the operation, and the war as a whole. However, the one-man management commander bears complete responsibility for decisionmaking and for carrying out the assigned tactical mission."⁴

The concentration of the most important control functions in the hands of the one-man management commander imposes greater requirements on his moral qualities and job knowledge, his professional training, skill in forging the collective and mobilizing it for successful operations, however difficult the circumstances.

The principle of *centralization* of command and control is inseparably linked with the principle of *one-man management*. However, these two principles must not be considered identical.

Usually by centralization of control we mean a situation in which a superior echelon unites the actions of the troops under its command and directs their efforts to achieve the common combat goal in accordance with a unified plan. Here, the superior not only assigns the missions to the subordinates, but in many cases indicates to them the methods for carrying out these missions, and he also influences the course of the combat operations by the men and equipment at his disposal.

At various stages of history the question of the extent of centralization of control was solved differently, depending on the equipment, the organization, and the nature of troop combat operations, the level of training and experience of command personnel, and other circumstances. Here, the less mobile the forms of combat, the greater the degree to which command and control was centralized.

In modern combat, accomplishment of the mission is achieved by various branches of troops and special troops with their various kinds of combat equipment, which requires, just as before, a centralized

uniting of their efforts and constant coordination of their operations by their superior. An especially rigid centralization of control is necessary now when solving the problems of employing powerful fire weapons, especially nuclear weapons. Observing the principle of centralization in this area permits the senior officer to make effective and, at the same time, economical use of these weapons, to decisively influence the course of combat, to quickly switch his efforts from one direction to the other, and also to coordinate the actions of all of the men and equipment participating in combat with the fire and the nuclear strikes. Moreover, centralization of direction permits the achievement at all levels of complete unity of views regarding solution of the main problems of command and control and of the use of men and equipment in combat, and it also ensures purposeful preparation of the troops, commanders, and staffs for the forthcoming engagement.

At the same time, however, the more highly maneuverable nature of modern combat, the reduction in the time to prepare for it, the unevenness of its development, the increased firepower of the subunits, the increase in volume of control operations, and other circumstances require closer combination of centralized direction with greater independence for subordinate commanders and the opportunity to demonstrate initiative and creativity in carrying out their missions.

Hence, with centralized control the degree of decentralization and independence of subordinates will depend on the circumstances of each case. However, a superior should indicate to his subordinate the method for performing his assigned tactical mission only when time permits and it is actually required in the interest of the higher echelon.

In the majority of cases, the subordinate should be free to select the methods for carrying out the tactical mission, particularly because he always has more opportunity than his superior to consider all of the details of the specific situation and to quickly react to changes in it. With the troops being equipped with powerful fire weapons and with the highly maneuverable nature of combat operations, the initiative and independence of subordinates is much more important, especially during the course of combat. Ignoring this fact and increasing centralization of control excessively will inevitably lead to bureaucratic red tape and delay, for the superior begins to get involved in the details and decides all of the questions for the subordinate, is late in reacting to changes in the situation, and thus causes an unnatural delay in the troops' operations. Moreover, this undermines the self-confidence of the subordinates, and they get used to waiting passively for orders or advice from above. The following important psychological aspect of command and control should be pointed out. An officer inspired by the

very best ideas, but deprived of the authority to exercise initiative, gradually loses his store of energy, becomes apathetic, and begins to work out of fear rather than because of conscientiousness. This kind of leadership practice is in general alien to the spirit of the Soviet people, who are distinguished by great activeness, initiative, and creativity.

Any display of initiative and independence by the subordinates must, however, be reasonable and aimed at finding the best methods and means of achieving the general combat objective outlined by their superior. Only competent, decisive, and strong-willed officers are capable of such initiative and independence. Moreover, it is necessary to see to it that the subordinates have an accurate conception of the situation, understand the concept of their superior, and receive timely reinforcement in the necessary men and equipment. Without this it is difficult and sometimes impossible for them to show initiative and independence. In this connection, it is of no small importance to stimulate initiative and heroism on the part of the subordinates, especially by awarding orders and medals in a timely and objective manner, by informing the public about them in the press, by promoting personnel, and so on.

The basic principles of command and control examined above are closely interconnected and interrelated, and they are in dialectic unity and play an important role in the theory of command and control.

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

Today, as a rule, an extremely limited time is allotted to the organization of combat operations. Hence, finding the means to ensure the most effective use of the time allotted has become a very important problem. The solution of this problem depends greatly on clear-cut organization of the officers' work and on the ability of the executive agents to achieve maximum returns on their work with minimum expenditures of forces and time.

It is no accident that many years of practice have produced a serious warning to commanders and staffs that, in organizing combat operations they should "not eat up" the subordinates' time, that they should not, by virtue of their rank, take most of the time allotted to combat preparations. No one denies that the higher the echelon of command the more complex and responsible the missions which must be carried out. Nevertheless, at any level, the interests of the subordinates, their capabilities in terms of preparation for the forthcoming engagement

must be of paramount interest.

The drive to save time when preparing for combat begins before receiving the tactical mission. For this purpose the map of the zone of forthcoming operations is prepared in advance, the necessary forms are made up, and reference materials are selected. It is especially important that the staff have the latest situation information reflecting the actual position, state, and nature of operations of friendly and enemy troops. When such information is available, the executive agents will not need to interrogate the sources during organization of combat or to gather additional data, which interferes with their doing their job.

The following will assist in maintaining high-quality organization of the job: combat teams developed ahead of time and checked during training and exercises; a clear-cut allocation of personnel, communications equipment, and transportation to the various control posts; and determination of the specific obligations for each executive agent. Here, it can prove quite valuable if the officer, on the basis of these calculations, develops his personal plan containing the following: a detailed reflection of the data, calculations, documents, and technical equipment which he will require; a calculation of the time for implementing each measure; a precise definition of the problems to be coordinated with other responsible personnel.

The main role in organizing the work of the control organs belongs to the chief of staff. He establishes the scale, time frames, and executive agents for the work of organizing combat operations; he determines the form in which the planning results will be reflected, what operations documents will be developed and by what times; and he coordinates and directs the work of all of the control organs. He gives special attention to the timely dissemination to the executive agents of the data required by the subordinate commanders and staffs for parallel work in organizing combat operations.

The basis for organizing the work is the calculation of the time for preparation of combat operations. The procedure for calculating the time usually amounts to the following. First, the total amount of time available for organization of combat is specified, with a breakdown into daytime and nighttime. Then a list is made of the main jobs to be performed, with an approximate estimate of the times required. Simultaneously, the operations which can be performed in parallel or at the very same time are noted; the time frames determined by the order of the superior are noted; the operations to be performed at night (in the dark) are grouped. Then the time frames for implementing all the basic measures are specified. The results of this work are usually

reflected in a timetable plan of combat preparation. One version of this plan is presented on pages 128-129. When the time frames are compressed, which is typical of modern combat, it is especially important to immediately put the majority of the officers in the control organs to work in organizing the engagement. The successful performance of this task depends to a great extent on each officer's precise knowledge of what he must do.

There can be no stereotype in allocation of duties among the officers. In each individual case the specific duties will be determined on the basis of the content and scale of the problems to be solved and also the level of training of the particular officer and his area of specialization. Unquestionably, it is decisively important to observe the specialization principle in allocating jobs. It is difficult, especially in combat, to count on the training of some sort of universal officer capable of carrying out a broad range of missions quickly and well. As an officer accumulates experience and knowledge, the necessary prerequisites are created for broadening his duties. Then he can be cross-trained to carry out another person's duties. Otherwise, one cannot be confident of the stability of command and control or of achieving great operativeness in the work of the control organs. To give officers specialized training and develop solid skills in them only for performing a narrow range of jobs with no concern for interoperability means to work without looking into the future, without seeing tomorrow, without preparing the staff for work under the most difficult conditions which could develop if the enemy made a nuclear attack on the control posts.

It is not just a thoughtful approach to determining the content of the work that is important. How to present the mission to the executive agent is also extremely significant. In this case, of course, the personal qualities of the executive agent will be decisively important. However, under any circumstances he must receive instructions from his chief on what to do, by what time, and in what form to present the results of his work. One must see to it that the officers of control organs do not expect extensive instructions, but understand their chief, as they say, with half a word, that they grasp the content of the necessary measures that are dictated by the situation, the commander's decision and the assigned tactical mission.

In this connection, it is especially important to indoctrinate officers with a strong sense of responsibility for superior, careful, and thorough performance of their jobs within the time set. As L. I. Brezhnev pointed out at his meeting with the workers of the ZIL Automobile Plant, it is important "that every worker have a clear conception of his

role in the labor process, know what he is doing, why he is doing it, what depends on him, and feel that his labor is a necessary part of the overall job."⁵

We will get high-quality organization of work only if it reflects advanced procedures and methods and also gives full regard to the opportunities for using available technical means of control. In his time, F. Engels noted that an individual is valued not just for what he does, but how he does it. Choosing advanced methods that best fit the situation at hand is one of the essential requirements of high-quality organization of work.

Another measure of superior organization of work is adherence to a precise system which provides for coordination of the work of all responsible personnel, strict logical order in carrying out their missions, and rigid regulation of time allotted to each operation. Also a component part of the organization of work is providing the opportunity for officers to rest. It is important for them not only to do their work well and on time but also to conserve their strength for jobs to come later. Accordingly, intelligent alternation of work and rest is required. Experience long ago demonstrated that one cannot achieve great productivity without having learned how to rest, without seeing to restoring his strength. No one can deny that it is difficult to provide in advance for every officer's rest time "from" and "to" some specified time, but if rest is not planned for, then there is a danger that there will be no chance at all for rest because of the course of events.

3. Scientific Organization of the Work of Control Organ Officers

For clear-cut organization of the work of the control organs, it is very often not enough just to depend on the chief of staff's life experience and practical knowledge. In the area of command and control scientific organization of labor is especially necessary.

What should be termed scientific is the kind of organization of control work that is based on the achievements of science and progressive methodology, which are systematically introduced into the activity of the commander and the control organs, ensuring the most effective employment in combat of the troops under their command and their performance of the assigned mission in the time set with minimum expenditures of men and equipment.

Approved _____
 Commander _____

 (rank, last name)

 (date)

PLAN FOR PREPARATION OF OFFENSIVE

_____ (subunit) from _____ to _____
 Time mission received _____ Time ready for offensive _____

Se- quence Num- bers	Measures	Time frames for accomplishment hours/minutes						Executive agents	When accom- plished
		1		2		3			
		20	40	60	20	40	60		
1	Analysis of assigned mission, taking into account the actual situation	█							Commander, chief of staff
2	Dissemination of fragmentary orders		█						Staff, deputy commander
3	Preparation of data and calculations required for making the decision and for planning			█					Staff, deputy commander
4	Continuation of situation assessment, determination of the concept, issuance of preliminary fragmentary orders						█		Commander, chief of staff

5	Completion of decision, assignment of missions to troops	Commander
6	Report of decision to superior	Commander
7	Performance of reconnaissance on the terrain in order to amplify the decision and organize coordination	Commander, staff officers
8	Organization of the offensive at the company-platoon level	Subunit commanders
9	Preparation of the routes and final organization of the jump-off position	Subunit commanders
10	Advance and deployment in fire positions of artillery and mortars	Subunit commanders
11	Advance of motorized rifle (or tank) subunits to assault position	Subunit commanders
12	Replenishment of material reserves, repair and evacuation of defective equipment	Deputy commander
13	Monitoring of the work of subordinates	Commander, deputy commander, staff

Chief of Staff _____
(rank, last name)

Note: In the battalion, this plan does not have to be developed as an independent document, and all measures for preparation for the offensive are reflected by the chief of staff in the working notebook.

In other words, it is the work of the control organ officers, ordered, arranged, reduced to a system in keeping with the recommendations of science and the achievements of progressive methodology.

The difference between ordinary organization of labor and scientific organization is in the methods of taking certain measures and the selection of the methods and procedures. In one case the commander and the control organs intuitively and mechanically repeat the customary procedures which they have mastered well, while in the other, they persistently study and skillfully implement the latest recommendations of science and the achievements of progressive methodology. The results will undoubtedly be different in the two cases.

Therefore the primary goal of scientific organization of labor is a maximum increase in the working efficiency of control organ officers and more efficient use of time with minimum expenditures of forces.

The basic areas of scientific organization of labor in the operation of the command and control organs can be the following: indoctrinating officers with a communist attitude toward their military duty, introducing efficient methods and procedures into an operation, improving the methods of organizing work, improving the outfitting of officers' work areas in the command vehicles, developing standards for performance of basic command and control measures, making working conditions more efficient, improving officers' training and skill, providing for independence and creative initiative in the work of the executive agents, improving the practice of providing incentives for officers who perform their duties successfully, and so on. In addition, the requirements of scientific organization of labor are taken into account by designers when creating new machines, instruments, and technical means of control. In particular, special studies are used to determine acceptable levels of noise, of temperature fluctuations, and the amount of lighting in command vehicles and control post installations. The extent to which these factors affect work capacity, fatigue, and efficiency of performance of control missions is determined by the methods of engineering psychology, psychophysiology, psychotechnology, and so on.

The most frequently used forms of scientific organization of labor in control organ operations are the simpler ones: observing the work of the executive agent, making time studies of an operation and subsequent analyses of the organization and procedure for performing the work, performing experiments using new methods and technical equipment, and so on.

The process of introducing scientific organization of labor usually begins with a detailed study of the content of the job and the procedures followed by the executive agents in performing it. This process can be schematically presented in the following form. First, the final goal or final result of the work is defined, and then all of the work to be done is broken down into component elements.

This can be made clearer by taking a possible example. A staff officer has received an assignment to develop fragmentary orders for committing the second echelon to combat. The researcher has not defined but has noted the component elements of the executive agent's job. Very generally they take the following form (times given in minutes): taking the second echelon's mission from the commander's map and plotting it on his own working map—2; studying the mission plotted on the map—1.5; clearing up the missing data with the chief of staff—1; preparing the work area—1; coordinating data on the enemy with the reconnaissance chief—2; writing the heading and the first item—2; clarifying with the engineer service chief the subordination of the combat engineer subunit attached as a second echelon reinforcement—1.5; checking the time calculated for advancing the second echelon to the attack position—2; final adjustment of the fire missions to support the second echelon's commitment to combat—1.5; writing the second item—4; writing the third item and finishing filling out the fragmentary orders—3; presenting the fragmentary orders to the chief of staff for checking and the checking itself—2; typing fragmentary orders—8; signing of the orders by the chief of staff and the commander—2; turning over the document for dispatch—1.5. The total is 34 minutes. The officer has worked quickly.

Of the total time, only a very small part was spent directly on developing the document, while most of it went for clarifying questions, coordinating, checking, and typing.

A comprehensive analysis of all the elements (operations performed) establishes which of them are unnecessary, which can be simplified, which can be replaced by others or combined, and how efficient the officer's procedures are. The results of this analysis will reveal how the time required to perform the whole operation can be reduced.

In this example, it was quite possible to eliminate the plotting of the second echelon's mission on the working map and checking of the fragmentary orders by the chief of staff (4 minutes); the actions of acquiring the missing data could be combined by summoning the people required (3 minutes). The greatest time is taken by typing and by writing the rough draft. When instructions are dictated directly from the map to

the girl doing the typing savings of up to 6 or 7 minutes can be achieved. If the officer were to use a standard form for the order, filling out the document would take 5 minutes, and there would be no need for typing it up.

Thus, just by improving the quality of organization and by introducing better working methods the fragmentary orders could be written in 16 minutes. If we study the way various people do similar jobs, then we will discover that some work faster and others more slowly. Therefore, one of the tasks of scientific organization of labor is to study the best procedures and methods of operation and make them a part of the work practices of other responsible personnel. One also has to deal with the fact that it is very difficult to convince the experienced executive agent that his operating methods are not quite what they might be. He often continues to be convinced that his ways and methods, developed by long experience, are the only correct ones. This gives rise to a certain resistance on his part to breaking the established work pattern and introducing new methods. Knowledge and practical use of advanced work methods will permit one to get the maximum effect with minimum expenditures of forces, equipment, and time.

The principle of commensurate expenditures of forces and time, which is fundamental to the scientific organization of labor, requires consideration of the price and the methods it takes to achieve success. To save time means to strive to avoid losses and to eliminate unnecessary expenditures of forces.

A comprehensive analysis of control organ operations makes it possible to objectively assess what is good, useful, and worth being made a part of the work practices of others. At the same time, it shows up the bottlenecks where forces and time are wasted, thus inhibiting the prompt performance of command and control missions. It is important to establish what is to be done, who is to do it, when, in what time frames, and by what methods; how effectively the work of the executive agents is organized; and whether the load is distributed normally.

The chief of staff is best able to deal with this problem. While an officer is carrying out an assignment, the chief of staff can find time to look over a subordinate's operating methods with experienced eyes. The chief of staff is usually quite familiar with the capabilities, the nature, and the level of training of the officers, and he will quickly grasp the reasons for mistakes. He can demonstrate the best way to go about carrying out the assignment. Personal example is one of the most

effective means of putting scientific organization of labor into practice and improving the operating efficiency of responsible personnel.

Experience shows that scientific organization of labor is inconceivable unless one has standards and acceptable indexes for the time spent performing operations. Setting standards for labor is the basis for its scientific organization. The work of any executive agent, especially one who performs mechanical tasks, is made up of certain typical elements, each of which can be quite precisely standardized. It is only creative mental operations that are extremely difficult to set standards for.

The practicability of organizing an operation is much greater if it is based on scientifically developed time standards for performing basic control operations, these standards having been checked out in practice. It is decisively important, first of all, to determine the time frames for making the plan, allocating the missions, and organizing coordination. These time frames are used to determine the duration of many other operations.

One should bear in mind, however, that determining the times for performance of control operations is a highly complex matter. These times depend on many factors, including the manning strength of the staff and the level of training of the officers, the availability of technical means of control, how well the operation is organized, etc.

The time spent in performing operations in particular actual conditions can deviate greatly in one direction or another from the weighted mean. However, if one knows the average norms for time expenditures, he can always use them to select the methods of operation which, under the given circumstances, will make it possible to perform the operation in the established time frames and more easily determine what officers will be involved in the operation. The norms must be substantiated and correspond completely to the modern level of development of technical means of control and advanced working methods. The norms cannot be considered as invariable or given the force of law once and for all. As the officers increase their skills and new technical means of control are introduced, they must be reduced. The norms are the limit, the starting point from which the increase in officers' skills and in degree of operativeness of staff work actually begin.

Often the authors investigating the problems of increasing operativeness in command and control reduce everything to the use of an automated control system and lose sight of the potentials of ordinary technical equipment that is capable of greatly increasing officers'

working efficiency. Perhaps that is why in practice so-called mechanization and low-level automation means are not always used as effectively as they should be. Nevertheless, experience demonstrates that without their help it is impossible to accelerate and facilitate officers' work.

Improving work on a scientific basis is a continuing process, not a sporadic action calculated only to eliminate "bottlenecks" in an operation. It is unquestionably the case that the scientific organization of labor is most effective when one carries out a unified set of measures for improving the activity of all control organs. Of course, one must not underestimate the measures of a "particular" nature aimed at eliminating "bottlenecks."

If an ordered complex of measures is taken to improve control organ operations in organizing and conducting combat operations, this will result in a sharp overall increase in operativeness of command and control. The idea of thinking in terms of systems in work involving scientific organization of labor comes from the close interrelation and interdependence of the operations and measures performed by control organs. When this principle is not observed, good and useful recommendations can often turn out to be ineffective. For example, the time savings achieved in making tactical calculations with computers will not result in an improvement in operativeness of command and control if the commander makes his decision by listening for long periods to his subordinates' proposals.

Thus, only a complex approach to organizing and performing all operations will ensure operativeness of control and prevent the occurrence of new "bottlenecks" resulting from some executive agents being ahead and others behind.

The process of putting advanced procedures and methods and the best achievements of science into practice will be effective if it is a continuous one in which the officers of all control organs participate.

One of the procedures making for increased operativeness in the operation of control organs is the use of *PERT charts*. In comparison with the traditional strip charts, they make it possible to reproduce much more completely and thoroughly the logical flow charts of the basic control functions (measures), to represent graphically the entire process of preparing combat operations, and to establish sound priorities and the time frames for performing various jobs (figure 19).

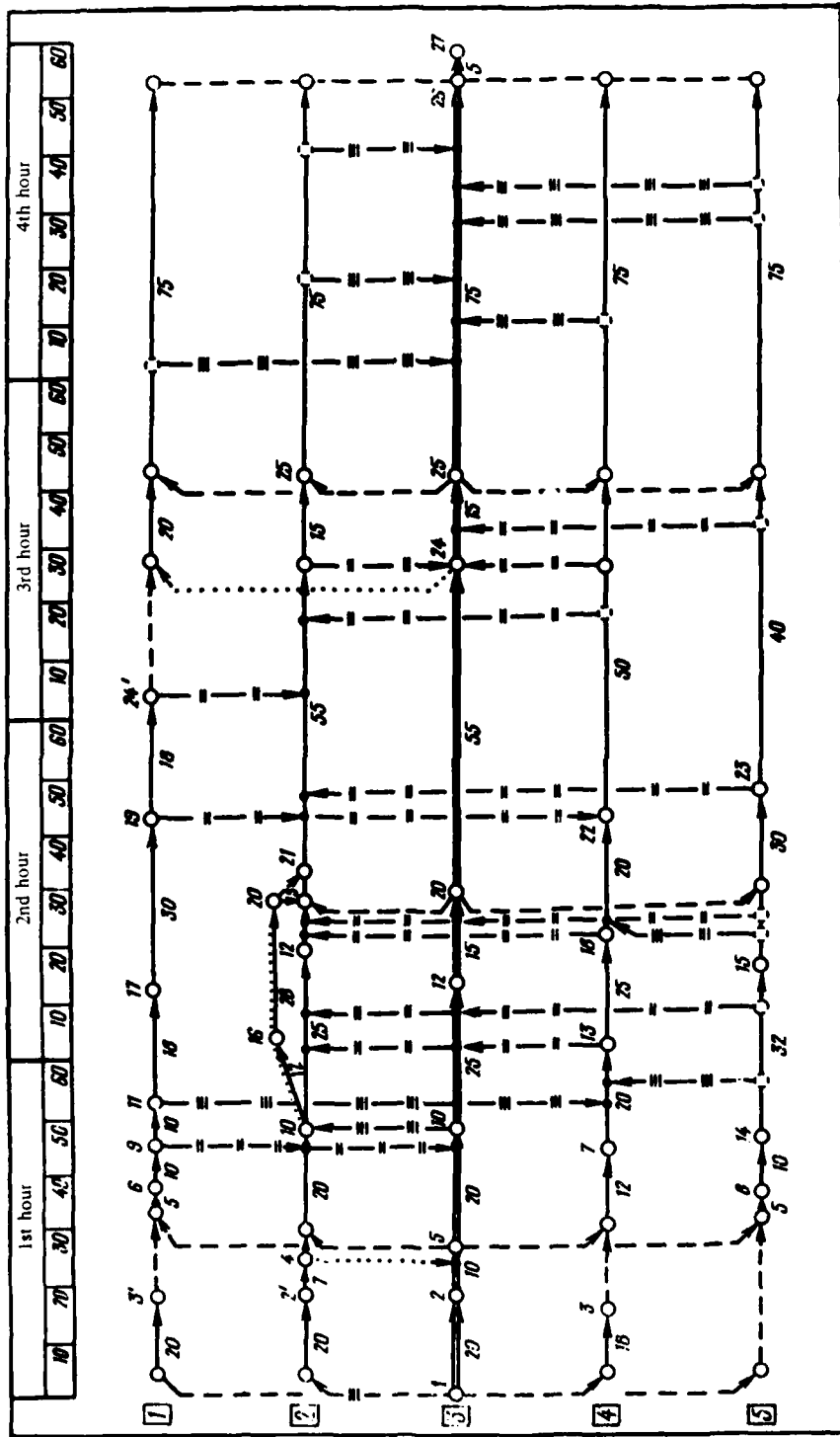


Figure 19. Network Chart of a Control Organ Operation To Organize an Offensive (Simplified Version).

Network charts are especially irreplaceable in determining the optimal alternatives of officers' work in organizing combat operations. As a rule, this work has to be done in a limited time. It involves a great many executive agents who are highly dependent on each other, and it therefore requires exceptionally clear-cut organization. At the same time, the main measures for organizing combat are based on certain norms susceptible to quantitative calculation, making possible completely objective judgments of the effectiveness of this or that alternative of work organization. The mathematical basis for the critical-path method is the network chart (PERT model, network), by which one can determine the scale of the operation, establish the most advisable sequence of actions, make the best distribution of duties among responsible personnel, and discover time reserves and means of reducing the time taken for organizing combat operations.

There are a great many methods for developing the chart. For example, let us consider one of them.

The chief of staff is to use the chart to make an advance determination of the most advisable way of allocating jobs among the executive agents as combat operations are organized. Here the time for organizing combat is taken as 4 hours. After the chart is developed, the calculation can be made for 5, 6, or 7 hours by the same procedure.

When a limited time is allotted to organizing combat, there can be no question that it will be profitable for responsible personnel to work simultaneously on parts of the same operation, and they should be afforded great freedom in resolving problems relating to their functional duties, to maximum combining of the operations in terms of time, and to reducing the time for performing all the measures.

In such circumstances the following actions are advisable: depict the main planning results on working maps without developing other written documents; disseminate the missions to the subordinates orally, recording their content in a working notebook or on magnetic tape; conduct visual reconnaissance to amplify the decision and clear up questions of coordination in the sector of the main thrust only. The chief of staff arrives at these conclusions not by special investigation, but by using his experience in doing similar jobs. Given different time frames for combat preparation, it will certainly be necessary to start from other initial positions in making the estimate. Based on the content, scale, and sequence of performance of the jobs, a list of jobs is prepared. Experience shows that the time taken to compile the chart

* [Also called PERT chart—U.S. Ed.]

can be greatly reduced if the staff has several previously developed versions of such lists that fit the most typical situations in control organ operations. If such lists have been put together, then one of them may prove appropriate for the actual conditions in a given case, or some individual adjustments will have to be made in terms of content, sequence of performance of the operations, and the executive agents. The time span of the operations should also be defined in the list. The code for each operation can be filled in when working up the chart.

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

Table 11.

Name of operation (in general terms)	Executive agents	Operation code	Duration of operation in minutes
1	2	3	4
Analysis of assigned mission by the commander and the chief of staff	Commander and chief of staff	1,2	20
Plotting the mission on the second working map	Staff officer	1,3	18
Study and estimate of the enemy	Staff officer	1,3'	20
Calculation of time for organizing combat operations (while analyzing the mission)	Chief of staff	2,4	7
Giving instructions for preparing data and calculations required to make the decision and for taking measures to prepare the troops for the forthcoming combat operations	Commander	2,5	10
Issuing warning order to reconnaissance subunit	Staff officer	5,6	5
Issuing warning order to combined arms subunits	Staff officer	5,7	12
Issuing warning order to the special troop subunit	Service chief	5,8	5
Estimate of enemy	Commander and chief of staff	5,10	20
Report to commander of data and calculations on the enemy	Staff officer	6,9	10
Analysis of assigned mission	Service chief	8,14	10
Developing the calculation of the correlation of forces	Staff officer	7,13	20
Participation in developing the calculation of the correlation of forces	Staff officer	9,11	10
Assigning mission to reconnaissance subunit	Staff officer	11,17	18

Name of operation (in general terms)	Executive agents	Operation code	Duration of operation in minutes
1	2	3	4
Preparing data and calculations on employment (use) of the special troops subunit	Service chief	14,15	32
Estimate of friendly troops	Commander, chief of staff	10,12	25
Developing the calculation of the time for advancing troops to the assault position line	Chief of staff	10,16	12
Estimate of the situation and drawing up the decision	Chief of staff	16,20	28
Planning of reconnaissance	Staff officer	17,19	30
Planning of camouflage and commandant's service measures	Staff officer	13,18	25
Developing the plan for monitoring and rendering aid	Staff officer	19,24	18
Developing planning documents on employment of special troops subunits	Service chief	15,23	30
Estimate of the radiation situation and the terrain	Commander and chief of staff	12,20	15
Developing fragmentary orders	Staff officer	18,22	20
Commander listens to the chief of staff's proposals regarding the decision	Chief of staff	20,21	5
Assignment of missions to subunit commanders, giving instructions for coordination, for comprehensive support of combat operations, and for party-political work	Commander	20,24	55
Checking and signing the planning documents	Commander, chief of staff	24,25	15
Amplification and final development of fragmentary orders and visual reconnaissance plan	Staff officer	22,25	50
Commander's participation in assignment of missions, and procedures for their performance by the subunit	Staff officers, service chief	23,25	40
Amplification of the missions for the reconnaissance subunit and the procedure for carrying them out	Staff officer	24,25	20
Performance of visual reconnaissance in order to amplify the decision and the problems of coordination	Commander, chief of staff, service chief	25,26	75
Report to the senior commander on readiness for the attack	Commander	26,27	5

This list contains little that is new; even before this, staffs had developed ordinary strip charts for organizing control organ operations which also reflected the basic missions (operations) to be performed by the officers, and these also indicated the time frames and the immediate executive agents. However, these charts did not show the internal relationships among the processes, nor did they make a graphic presentation of performing the operations listed. It was difficult to determine what the consequences would be of a delay in completing individual operations, what the maximum acceptable times for performance of the operations were, where the greatest bottlenecks were, and which operations should be given the greatest attention. Therefore depicting the process of organizing control organ operations in the form of a network chart makes it possible to solve these problems more carefully and demonstrate clearly the logical interrelations and sequence of all the operations performed by each executive agent. Even if, out of all the advantages of a network chart, we use just the principle of depicting the process of organizing combat in the form of a network, it still must be recognized as unquestionably useful. The significance of the network model increases immeasurably when complex work is to be done that involves a great many executive agents. In this case the internal processes and operations of individual control organs (or staff sections) are usually indicated in the form of local network charts which are subsequently "sewn" together into a common network.

When the list is compiled, establishing the duration of each operation presents certain difficulties. This is all the more complicated in that in the majority of cases the established norms require more precise definition as applied to the level of training of the staff officers, degree of mechanization and automation of the work processes, and also the availability of time. In cases where there are no norms, probability theory is used. For this purpose three estimates are made of the duration of the operation: T_{\min} is the minimum (optimistic) time, when the most favorable conditions exist for performing the jobs; T_{\max} is the maximum (pessimistic), when the work is performed under unfavorable circumstances; T_{mp} is the most probable duration of the job.⁶

The average or expected duration T_{exp} is calculated by the formula

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

or

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

Formula (2) is simpler, although there is actually very little difference in the result of the calculations produced by one formula or the other.

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

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

or the simpler formula

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

The smaller the magnitude of the variance obtained by the calculation, the more precise the estimate made for the duration of the operation and, consequently, T_{max} and T_{min} are closer to each other.

If norms are available that have been developed and checked out in practice, then there is no need to resort to the above formulas for determining the duration of operations.

It is necessary here to begin with the fact that preparing the initial data and developing the chart takes a rather long time, which, for the most part, is not available when an engagement is being organized. Therefore, all of the basic work in compiling the chart must be done before the tactical mission is received.

When the initial data are available, construction of the chart is accomplished by joining the operations (arrows) through the events (circles) in a specific sequence from left to right. Here the direction of the arrows is selected arbitrarily, while it is advisable to draw their lengths to scale. Each operation begins and ends with an event.

Developing this sort of PERT model will require a detailed list of the operations and clear-cut distribution of them among the executive agents. In the example in question, these developed indexes are not given, and therefore the PERT model is not displayed in complete form. Based on the possibilities, a somewhat distinctive version of the chart is used. In it an effort is made, while indicating the interdependence and basic relationships between the operations, to retain a maximum of independence for the executive agents in performing these operations. A second characteristic of the chart presented is that the

scale and duration of performance of the operations by the executive agents are directly dependent on the times for completion of the commander's operations. Thus, they are placed in specified limits, within which their duties must be performed, using the operating methods most appropriate to the circumstances and precisely defining the scale of one's work within reasonable limits.

Even given these particular features, the chart (figure 19) displays such relationships between the operations of the different executive agents.

Among them, without question, the operations performed by the commander (1, 2; 2, 5; 5, 10; 10, 12; 12, 20; 20, 24; 24, 25; 25, 26; 26, 27) are decisively important for the entire process of organizing the offensive. The times and operating methods of all the other responsible personnel are to a great extent determined by the training and style of operation of the commander and his knowledge of the situation.

In addition to this constantly operating dependency, there are others which also have a certain effect on the times and quality of work in organizing combat operations. In practice, this dependency is encountered most often when the subsequent operation cannot be started until the work of another officer has been completed. This type of relationship, even when the executive agents are afforded the freedom they need to do the job, plays a significant role in organizing combat operations. Specifically, until the mission has been analyzed (1, 2) the warning orders cannot be issued (5, 6; 5, 7; 5, 8); until the calculations of the time for organization of combat are performed (2', 4), actions cannot begin on giving instructions to responsible personnel (2, 5); without the estimate of the enemy (5, 10), one cannot define the missions for the reconnaissance subunit (11, 17); etc. Practice shows that the more often this kind of relationship between operations is encountered, the more difficult it is to reduce the times of performance of the operation as a whole. This dependency of the operations is shown on the chart by dotted lines.

A dependency closely related to it is one of the sort which indicates that the completion of one operation depends on the completion of another one performed by another executive agent. For example, the commander's qualitative estimate of the enemy (5, 10) can be completed only after obtaining the data and calculations on the enemy from the reconnaissance officer (1, 3'; 6, 9); the commander's estimate of his own troops (10, 12) can be completed upon 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 correlation of resources (7, 13);

etc. One can also include here the type of relationship where completion of an operation depends on receiving the necessary instructions from the commander (or the chief of staff). This function is indicated on the chart by a dotted line with two dashes.

During organization of combat, it often becomes necessary for the executive agents to work jointly (simultaneously) on the same operation. This is typical of the most complex operations (calculation of the correlation of resources, estimate of the situation, and so on). The joint efforts of various executive agents in solving such problems provide the best conditions for reducing the time and improving the quality of the job done. The same type of interrelation, which is dealt with along with it, is the need for the executive agents to coordinate with each other (to clarify) initial data on performance of two different operations. On the chart this type of relationship is indicated by a dotted line with three dashes.

During organization of combat operations one also encounters the type of relationship where one operation is imposed on the other and is carried out in parallel—"dovetailed." This type of relationship exists between the estimate of the situation (5, 10; 10, 12; 12, 20) and the formulation of the decision. It is indicated (partially) on the chart by a line of dashes.

A graphic representation in a PERT model of a dependency between operations makes possible more efficient regulation of the activity of each executive agent, elimination of the nonsystematic intrusion of one operation into another, and creation of the conditions necessary for planned performance by each officer of his operations.

In the chart presented (figure 19) five paths (production lines) are distinguished, based on the beginning and ending events (table 12).

The third path is the longest of them, and the critical one. In our example it does not differ greatly in magnitude from the other paths. The critical path indicated on the chart with a double or boldfaced is the total duration of the operations which determine the limits of the entire process of the operation and the total time for its completion. Therefore, for increasing the operativeness of control organ operations, reducing (decreasing) the duration of the critical path is the most decisive factor. 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 this is the basis for determining the best way to organize the job.

Table 12

Path No.	Component events	Operations forming the path	Duration of the path in minutes
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

Optimization of the network chart is the most complex stage and is aimed at reducing the overall duration of the operation. The basic procedures for optimization can be the following: varying the order in which individual operations are performed, in other words, revising the structure (topology) of the network; redistributing the officers; replacing certain methods with others; eliminating secondary (unnecessary) operations from the network; maximum co-location in time in implementing various measures; and so on.

Reducing the duration of the critical course (T_{cr}) is not a one-time action. It must go on constantly, for the component elements or the initial data determining its magnitude vary. In particular, the level of technical equipping of control posts and organs varies, the skill level of the commander and staff officers is increased, and their operating methods are improved. All of this, combined with skillful organization of work, has a decisive effect on decreasing the magnitude of the critical path.

Since they know the critical path, the commander and the chief of staff are in a position to concentrate their main efforts on the operations on this path, working toward a maximum reduction of their performance time. In other words, a sharp boundary is drawn between the basic and the secondary items. If it turns out that the critical path takes longer than the established time for completing combat operation planning, then measures are taken to reduce the time expended by changing the allocation of resources or by using improved operating methods.

Other paths are noncritical (nonintense). For all of the operations on these paths there are time reserves. This makes it possible, if need be, to revise the work load of the executive agents and put them to work, within the limits of the time reserves, performing other operations.

The difference between the duration of the critical path T_{cr} and that of any other path $T_a(i)$ is the total time reserve of this path $R_a(i)$:

$$R_a(i) = T_{cr} - T_a(i).$$

$R_a(i)$ indicates the amount of time, within the limits of which an increase in the duration of the operations is admissible without any significant effect on the total completion time of the plan. For example, the time reserve for path L_4 is $R_4 = L_{3(cr)} - L_4 = 240 - 230 = 10$ minutes.

One can determine the time reserve as applied to each event (R_i). For this purpose, one calculates the earliest (of every possible) time of beginning of accomplishment of the events $t_e(i)$ and the latest acceptable time of completion of the events $t_l(i)$:

$$R(i) = t_l(i) - t_e(i).$$

For the events on the critical path, there is no time reserve, as a result of which $t_l(i) = t_e(i)$. On the chart presented, $t_e(i)$ for event (1) will be equal to zero—the beginning of planning ("the operation order of the senior commander has been received"); for event (5) this time will be defined by the sum $20 + 10 = 30$ minutes from the time of receiving the senior commander's operation order. Here the times of the events are calculated on the basis of the maximum duration of all 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 events in question and the final events.

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

In addition to calculating the time reserve of the events, it is necessary to determine the time reserve for each operation. For this purpose it is necessary to define the maximum admissible time of completion of each operation, beginning with the duration of the applicable "critical" operations for which, as we know, the time reserve is equal

Table 13

Events																											
	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
$t_i(i)$	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
$t_e(i)$	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
$t_{i(e)}(i)$	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

to zero.

For example, in order to define operation (7, 13), it will be necessary to examine three successive operations related to it. The main executive agent here is the staff officer. He can proceed to carry out operation (7, 13) after operations (1, 3), (2, 5), (5, 7) are completed, that is, 40 minutes after receiving the tactical mission. First 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 will not be able to join the operation until 45 minutes after the beginning of planning.

When assessing his own troops, the commander will need this calculation about midway in operation (10, 12). Thus, the executive agent has $63 - (18 + 10 + 12) = 23$ minutes to compile the calculation. However, in this case the time reserve for it is only 3 minutes, and if the commander tries to elaborate the procedure for assessing his own troops and he needs to calculate the correlation of forces at the beginning of the operation (10, 12), then the executive agent will not be able to give this calculation in completed form. The example given clearly indicates the advantage of network planning. It makes it possible to determine objectively the minimum time required to perform a given operation and thus avoid subjectivity in estimating time frames of an operation. Only with comprehensive calculation and analysis of the interrelations of all the operations are the proper conditions created for eliminating bottlenecks in the organization of combat operations and for sharply reducing the times for carrying out basic measures.

Let us assume in the first version of this list of operations that the staff officer carried

out the following sequence of operations: (1, 2), (2, 5), (5, 6), (1, 3'), (6, 9), i.e., after the warning order was delivered to the reconnaissance subunit he proceeded with a study and estimate of the enemy. As a result, operation (5, 10)—the commander's estimate of the enemy—was almost completed before the staff officer received the data. This situation created a threat to the timely performance of operation (5, 10). In order to prevent this, the following solution was clearly shown on the chart: a change in sequence and time of beginning of the staff officer's operations. Operation (1, 3)^{*} moved into first place, i.e., on receiving the mission the staff officer was immediately summoned to the commander, and while the latter analyzed the mission, he made a study and estimate of the enemy.

Approximately the same situation was created with the performance of operations (7, 13; 13, 18; and 16, 20) by another staff officer. In terms of the times defined by the duration of other operations connected with them, they could not be performed by one person. As a result, it became necessary to reallocate operation (16, 20) and make the chief of staff responsible for it.

Another approach to reducing the times may be observed in the performance of operation (2, 5). Here operation (1, 3)—plotting the situation and the assigned mission on the second map—is also included on the chart. It is performed at the same time as the commander's analysis of the mission, which enables him to greatly reduce the time for giving instructions to the staff officer and service chiefs. In this case, they have the chance to get a great deal of the data from the staff officer.

A careful calculation of the time reserves makes it possible to train the officers to make a sound approach to determining the sequence of performance of the operations and to achieve a rational distribution of the operations among the officers and establishment of realistic times for their beginning and ending. Having the time calculation not only facilitates the distribution of assignments among the executive agents, but it also enables one to properly determine the methods of performing the operations which will ensure that they are completed in the available time.

With recalculations one can obtain the optimal versions of the operations for organizing combat operations. For each operation, the earliest time for beginning the operation is established along with the latest admissible times for beginning and ending the operation and the

* [This could have been intended for a prime sign rather than a superscript 1—U.S. Ed.]

reserve times which will make it possible to delay this or that operation without violating the final deadline. This optimized chart is delivered to all executive agents and serves as the specific plan of operations for all of the control officers.

Thus, the skillful use of different methods of work organization is one of the requirements for timely performance of their missions by control organs.

Notes

1. Marx and Engels, XX, 34.
2. *Programma Kommunisticheskoy partii Sovetskogo Soyuz*a [Program of the Communist Party of the Soviet Union] (Moscow: Politizdat, 1974), p. 112.
3. Lenin, XXXIX, 46.
4. V. Kulikov, "Sovetskiye Vooruzhennyye Sily i voyennaya nauka," *Kommunist* ["The Soviet Armed Forces and Military Science," *Communist*], 1973, No. 3, p. 83.
5. *Pravda*, 1 May 1976.
6. For more detailed treatment of the methods for calculating this time, see P. G. Skachko, V. M. Kulikov, G. T. Volkov, *Upravleniye voyskami s pomoshch'yu setevykh metodov* [Command and Control Using Network Methods] (Moscow: Voenizdat, 1974), pp. 36-43.

Chapter 4. Acquiring and Processing Situation Information in the Preparation of and During Combat Operations

1. Content of Situation Information and Requirements Placed on It

For making the decision and for implementing other tactical command and control measures that are based on the decision, the commander and staff must have, evaluate, and give regard to various kinds of situation information. With all its variety, this information is grouped in terms of the elements that make up the combat situation: the enemy, friendly troops; adjacent units; radiation situation; terrain; hydrometeorological conditions; time of year and time of day; data on the economic condition of the combat zone and the sociopolitical makeup of the population.

The enemy is the most important element of the combat situation. Inasmuch as any engagement is a two-way combat process, there must be a continuing and thorough study of the enemy by commanders and staffs at all levels; otherwise one cannot count on effective employment of one's own weapons nor, consequently, on the success of combat operations.

Any commander or staff must know the optimal amount of reliable information about the effective combat strength and organization of the enemy's grouping of men and equipment, the locations and level of readiness of enemy nuclear weapons, the numerical strength and supply situation of his subunits (or units), the morale of his personnel, his command and control system, the engineer equipment of the positions occupied by the enemy, and also the possible nature and methods of enemy operations before and during combat. It is especially important in this regard to know the attitude of enemy personnel toward the given war; the mutual relations between the enlisted men and the officers; the sociopolitical makeup; the level of combat training and the creative, volitional, and organizational capacities of the commanders; and the stability of enemy personnel in a difficult situation. The combat

capabilities, the concept and probable nature of future enemy actions, the enemy's strong and weak points, the most important objectives the destruction of which will sharply reduce enemy fighting efficiency—all of these are revealed on the basis of this information.

However, in all cases every commander and staff 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 of information about the enemy; on the contrary, there is always a lack of information, and the commanders and staffs must be able to draw the correct conclusions on the enemy's grouping and concept of operations from the spotty data available. Today, all commanders and staffs must give primary attention to detecting every possible detail about enemy nuclear weapons (even individual weapons and launchers). But the rest of the enemy's men and equipment in their zone and on their flanks that are capable of influencing the tactical mission are also studied in the required detail. The degree of detail will vary in different types of combat and different levels of command and control. Company and battalion levels, for example, require information on the defending enemy that even includes the individual fire position and the platoon strongpoint, while higher levels require less detailed information about the enemy.

The commander and staff study **friendly troops** in terms of approximately the same criteria as those for the enemy. These criteria are as follows: position, effective combat strength, grouping, and missions to be performed; combat effectiveness of the troops, including level of numerical strength, availability and condition of equipment, political-morale state and level of training of personnel; location and state of rear services, means for bringing up materiel, rendering medical aid; and so on. At the same time that these data are studied a calculation is made of the quantitative and qualitative ratios of men and equipment of friendly and enemy forces; the influence of one's position on the performance of the assigned mission is established, the regrouping to be carried out is determined, the time required for this is computed, the combat capabilities of the troops are ascertained, especially in terms of the employment of weapons, and measures for enhancing these capabilities are also outlined.

The **adjacent units** are studied in order to determine the extent to which their position, condition, and nature of operations will promote accomplishment of one's own tactical mission. First the adjacent units on the right and left are studied and then the troops operating ahead.

* [Although the Russian original reads *oblucheniye* 'irradiation,' the context would seem to call for *obucheniye* 'training'—U.S. Ed.]

During this study the following is ascertained: where and in what grouping they are located, the content of their tactical missions and the decisions made, and also the results of their execution and conditions of coordination.

The **radiation situation** taking shape as a result of possible enemy employment of nuclear weapons is studied in terms of information from reconnaissance, forecasting, and dosimetric monitoring. 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.

Through a study of the above information, the conclusions regarding the methods of troop operations in carrying out the tactical mission are more precisely defined, and measures are outlined for protecting the troops from nuclear weapons, including those for overcoming their aftereffects.

Because of the complete motorization and mechanization of troops, the **terrain** as an element of the situation has become even more important today than it once was. It is studied for one's entire combat zone and the area forward of the adjacent units' front. Usually the commander and staff must know its nature and type of relief; whether there are natural and artificial obstacles and hydraulic engineering structures; the conditions for protection against nuclear weapons and for camouflage, observation, firing, and orientation; whether there are any roads and what their condition is; the nature of the ground; the passability of the terrain and conditions for maneuvering troops off the road; the availability of building materials, sources of water supply, and topogeodetic points. Special attention is given to predicting changes which can occur as a result of the employment of weapons by the belligerents. By studying the terrain one establishes its effect on the operations of friendly and enemy troops and determines how to make the best use of it when carrying out the tactical mission.

Hydrometeorological conditions are studied so as to determine the extent to which weather conditions and the weather forecast, the force and direction of the prevailing winds, precipitation, river conditions (or of canals, lakes, or swamps), etc., influence the performance of the tactical mission. Special attention is given to the presence and the condition of hydraulic engineering structures, the possibility of the terrain's flooding as a result of their being destroyed by 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 friendly and enemy troops and to determine the measures which must be taken to reduce the negative effect. Thus, for example, during operations in the spring when road conditions are bad, measures are also planned for improving the cross-country capabilities of friendly troops and, during winter operations, measures to protect personnel from frostbite. When studying the time of day, the length of the day and night are first of all determined, and specific measures are outlined for the transition from day operations to night operations and vice versa. During nighttime operations, in addition, measures are planned for lighting the terrain and for camouflage, and the procedure for observation of the enemy, orientation, and target indication is also determined.

In a study of the economic conditions of the area and the sociopolitical makeup of the population, special attention is given to the possibility of using repair shop establishments by friendly troops to put damaged combat equipment back in working order, to use medical institutions to treat the wounded and sick, and to use transport facilities and fuel and food reserves for troop support. It is also important to determine how to establish the proper relations with the local population based on 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 for increasing vigilance, maintaining order in the rear area, strengthening the physical security of the control organs, especially when there is a hostile population in the zone of operations.

The above-mentioned situation data and the ensuing measures are needed by the commanders and staffs not only at operational, but also at all tactical levels. They are mandatory, for example, for the battalion commander and staff operating in the forward detachment, in an assault on the enemy's rear area, during encirclement, etc. This information will be of definite interest to company commanders and platoon leaders when they are to carry out reconnaissance in the enemy's rear area. Judging by the experience of the past wars, ignoring them has usually led to serious consequences.

These are the elements and the component data of the situation which are studied and taken into account by the commander and staff in tactical command and control. It should be noted, however, that as the means of armed combat have been developed, they have changed, which may be seen in the much greater role played by such situation elements as radiation and others. However, with all their variety, the situation elements and the information making them up are closely

interconnected and mutually dependent, and one cannot, for example, study the enemy, his troops, or the radiation situation apart from terrain or time conditions. However, the effect of the various elements of the situation on one decision element or another may be different and even opposite. In practice it often happens, for example, that in terms of terrain conditions it will be more profitable for the main thrust in an offensive to be in one sector, while in terms of the nature of the enemy defensive grouping the advantage is in another sector. In order to resolve such contradictions, the art of the commander and staff, their analytical minds, the capacity to find the main, decisive factor in the situation and to make the most appropriate decision become extremely important. It is important also to consider something else, that the information obtained must satisfy 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 situation information in the past. Now, however, they are taking on a significance which is new in many respects. First of all, this pertains to the *timeliness* of arrival of the situation information. It must enable the commander to make the decision or amplify it during the course of an engagement within a time frame which makes it possible to deliver the missions to the executive agents, prepare personnel and materiel for combat, and get the jump on the enemy in opening fire and launching the attack. The combat experience of past wars teaches that late situation information is, as a rule, useless. Using such late information has often led to errors in the commander's decision with all of the serious consequences that result therefrom.

In modern combat, as a result of increased troop maneuverability, the speed of combat operations, and the capacity of the targets to change their location quickly, the time factor in gathering the situation information has become much more important. This factor takes on particular significance when countering enemy means of delivering nuclear weapons such as tactical missiles, nuclear artillery, and aircraft. As has already been noted, the time the weapons and launchers with the rockets stay at the fire and launching positions from the beginning of their deployment to launching is a matter of a few minutes. Under these conditions, in order to prevent an enemy nuclear strike on our troops, reconnaissance information must be obtained by the staff within these few minutes. It must evaluate the information and report it to the commander, who must make a decision and either personally or through the staff assign the mission to destroy the enemy weapons with his own, and these latter must carry out this mission. From this it is obvious what great operativeness is required of the modern staff in

gathering and analyzing situation data. As for countering enemy aviation, here success or failure will often be decided in a matter of seconds.

Along with this, the commander needs *complete information* on the situation which furnishes him comprehensive knowledge of the state of affairs and allows him to make a well-founded decision and react correctly to situation changes in the course of the engagement. This completeness and degree of detailing of information about each situation element will at any time depend on the level in the chain of command, on the nature of the tactical mission assigned, on the degree of knowledge of the situation by the commander and staff for the given time, and on other conditions. Therefore it is impossible to give ready formulas for all commanders and staffs for any possible cases of the diversity of combat reality with respect to the given problem. One can only point out that all staffs strive to obtain as much detailed data as possible about the enemy, while it is usually enough to have detailed information about friendly troops two levels down, that is, in the battalion, down to the platoon or, in the regiment, down to the company, etc. More detailed data are required only in particular cases.

Any commander requires most complete information on each situation element during preparation of combat operations, when making the decision, whereas in the course of combat operations he will be primarily interested in information about those situation elements which at the given moment have the greatest effect on troop operations and require amplification or alteration of a previously made plan. In modern combat this information will most often be information about the enemy's nuclear weapons, for they constitute the basis for the combat effectiveness of his troops, and the success of the tactical mission depends primarily on their destruction by friendly troops. Often the data on the terrain, the radiation situation, the weather, the level of supply of our troops with fuel, ammunition, and so on will have, if not decisive significance, then very important significance. At the same time, the absence of certain information on the situation does not relieve the commander of the obligation to make (or amplify) a timely decision based on it, to take the command and control measures called for.

In modern combat, *reliability* and *accuracy* of the situation information, that is, its complete correspondence to what is actually happening, have become very important.

In terms of degree of reliability, the situation information is divided into completely reliable, probable, doubtful, and false. The information

considered completely reliable is that which is received from several sources or repeatedly from one reliable source and which corresponds completely to the situation at hand and gives no cause for doubt. Probable information includes that which corresponds to the situation and to the already available information, but which was obtained from only one or several sources needing checking and additional confirmation. Doubtful information is that which contradicts the information previously received from other sources and which, therefore, requires checking and must be confirmed. False information is that which obviously does not correspond to the situation and which contradicts the information received from other sources.

Of course, of the above-mentioned types, the completely reliable information has the greatest value. Only when these data are taken into account is it possible to make efficient use of the available men and equipment and to achieve the combat objective. Any errors in evaluating the situation can, thanks to the growing destructive power of modern weapons, lead to undesirable consequences—unjustified losses and failure to carry out the tactical mission. Therefore, no commander or staff officer has the right to violate the requirement for truthfulness and accuracy in reporting the situation, or to color the truth, no matter how unpleasant it may be. Accordingly, it is appropriate to remember the following behests of V. I. Lenin: ". . . The Marxist must deal with real life, the precise facts of *reality*. . . ."1 "The most dangerous thing in war . . . is underestimation of the enemy and resting content that we are stronger."2 ". . . We will learn to win victories only when we are unafraid to admit our defeats and shortcomings, when we, however sad the situation, look truth directly in the face."3 The precise execution of these behests is a matter of honor for each officer, his service and party duty, one of the most important measures of a highly professional approach to staff work.

In implementing these requirements, it is necessary to constantly consider that, because of the latest means and methods of combat, the volume of situation information required at every level of command and control will greatly increase. In many cases this volume, especially during combat, may not only equal the volume of other work in command and control of subunits but even exceed it. In addition, the information received during combat changes quickly and drastically; it must be gathered from numerous sources and from larger areas in terms of front and depth, and in shorter times.

Now, as never before, the commander and staff must be able not only to quickly and correctly evaluate the available situation information but also to foresee changes in the situation and respond to them

in a timely manner. What is more, they must be able to create a situation that is to their advantage. For this purpose, of course, the commander and staff must have improved processes for working with the situation information in all phases, the basic ones of which are the following: gathering the situation information from various sources; processing this information, i.e., putting it in a form that is convenient for evaluation; study, evaluation, and output of the information, i.e., reporting this information to one's commander, the next higher commander (or staff), and informing the subordinate and coordinating troops and adjacent units of it.

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

2. Procedure for Acquiring Situation Information

The commander gathers situation information personally, through the staff, and through the chiefs of the branches of troops (or services). In the first place, information is gathered which is required for making or amplifying the decision. Before making the decision, the commander can specify in his instructions to the chief of staff what data are missing, and by what time the data must be prepared and reported to him.

The chief of staff organizes the work of gathering situation information directly. He establishes the overall volume and content of the information about the situation required to provide command and control of the subunits in combat and he defines the specific information-gathering tasks for the staff officers. In addition, the chief of staff may establish the sources and the methods of obtaining the required information.

Information about the situation is obtained from various *sources* (figure 20), mainly the following: observation of the field of battle, commanders and staffs of subordinate, attached, supporting, and adjacent subunits; reconnaissance subunits carrying out ground reconnaissance and reconnaissance aircraft; the next higher chief and staff; prisoners, deserters, and the local populace; various types of materials and documents (reference materials, maps, geographic descriptions, and so on) domestically produced as well as those captured from the enemy.

Each source varies in significance in terms of both quantity and value of information. However, in terms of purpose, they can be arbitrarily divided into primary and secondary. The primary sources

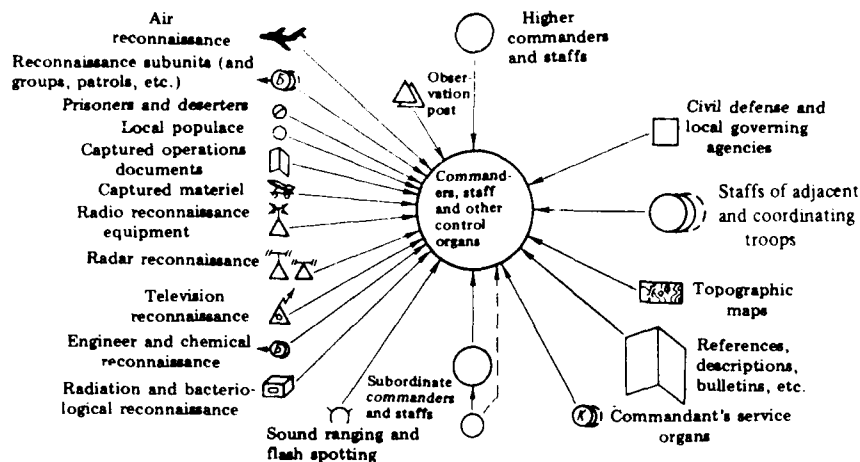


Figure 20. Commanders' and Staffs' Sources for Obtaining Situation Data in Combat.

include those that conduct direct observations of some target about which information must be obtained and that also have direct contact with it. These sources can be people (the commander himself, a staff officer, an observer, the pilot of a reconnaissance aircraft, a scout in a reconnaissance group or patrol, a prisoner, a deserter, local resident, etc.) or technical equipment (radar, radio reconnaissance, radiation, engineering, meteorological, sound ranging and flash spotting, and so on). The secondary sources are those which do not directly observe the objects or events but report generalized data on them received previously from the primary sources. These include subordinates; superior, adjacent, and coordinating commanders and staffs; the chiefs of branches of troops and services; commandant's service agencies, civil defense agencies; and also various reference materials, descriptions, topographic maps, captured operations documents, and so on.

The combat experience of the Great Patriotic War and practical training exercises indicate the very great significance of the composite utilization (combination) by the commander and staff of all available sources, taking account of both their positive properties and their deficiencies. Thus, for example, valuable information about the location of enemy nuclear weapons or reserves can be obtained by the staff by radio from a reconnaissance aircraft. However, one should not fail to take into account that the pilot can not always determine visually the exact number of targets detected or distinguish a false target from a real one. Therefore, in order to be sure of the reliability and accuracy of the information obtained, it must, as a rule, be confirmed, supplemented,

and more precisely defined using several sources.

In this regard, all staffs must give primary attention to the skillful use of modern technical reconnaissance equipment, since only by using it is it possible to obtain much of the necessary data in a short time. This was confirmed by the experience of the Great Patriotic War, although there was then comparatively little of that kind of technical equipment. Thus, during the course of the battles in East Prussia, it was possible, using radio reconnaissance data, to discover the grouping of the 8th Tank and 4th Field Armies, the 26th Army, and 41st Tank Corps of the German fascist forces. Just the staff alone of our 71st Rifle Corps of the 61st Army succeeded in capturing and using more than 20 enemy radiograms in 3 days.

In the preparation of the offensive operation in the Crimea (1944), repeated photographing of the enemy defenses in the vicinity of Perekop and Sivash enabled us to discover the enemy grouping, the terrain features, and the system of obstacles to a depth of 25-55 km. The photographic survey data were reported by the staffs to each company and battery commander. The staffs of the 86th, 125th, and 63rd Guards Rifle Divisions of the Leningrad Front organized a large-scale photographic-visual survey from forward observation posts to the depth of two enemy defensive positions. This was of great assistance in preparing the offensive, especially when organizing artillery fire.

The procedures for obtaining information on the situation from the above enumerated sources are also quite varied. The following are the main ones: observation by the commander and staff officers of the troops' actions; reception from the sources of reports (or data) on the situation via communications equipment and by means of visual and sound signals; presentation of written reports (textual, graphic) or tape recorded reports; listening to subordinates' oral reports on the situation (in personal exchanges with them); interrogation of prisoners; study of photographs, operations documents, and models of enemy equipment, etc.

The greatest effect is achieved, however, by the combined application of these procedures. In the course of combat, for example, any staff will find it advantageous to receive the most urgent and important information about the situation and nature of the operations of friendly and enemy troops from their subordinates in the form of short radio signals, and require of them subsequent presentation of a written or graphic summary report characterizing the situation in more detail. The basic criterion in selecting one procedure or another for obtaining information will in the majority of cases be time.

Many foreign experts consider that the most basic measure for reducing the time for gathering the situation information is automation of this process. Of course, it is impossible not to agree with this. However, it must also be remembered that much situation information at the modern stage of development of science is not subject to exact quantitative measurement, formalization, and mathematical modeling. This includes, for example, the morale and psychological state of friendly and enemy personnel, the extent 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 great operativeness in the work of commanders and staffs also by organizing it precisely. It is also important for the officers to be able to foresee the changes that may occur in this situation, what new mission they may receive from the next higher chief and, as a result, what situation data may be required for making the decision and for command and control during combat operations. They must actively and persistently work on obtaining this information in advance, without waiting for special instructions to this effect from the chiefs.

Thus, for example, even during peacetime all staffs must know their troops in all respects and study the disposition, armament, and tactics of the enemy, the conditions of the terrain, and especially the routes in the probable sector of operations. On the defensive, the staff prepares data in advance which the commander may need on going over to the offensive; while controlling the troops on the march, they take every measure to provide the commander with all data required for entering into and fighting a meeting engagement, etc. With this kind of work organization, the commander and staff will have a great deal of information about each situation element before receiving the new tactical mission, and this has enormous practical significance.

Of course, when they are assigned a new tactical mission, the work of the commander and staff in collecting and studying the situation information will become more purposeful and specific. However, this requires clear-cut direction of the staff by the commander and the chief of staff. In particular, it is very important that the commander and chief of staff properly analyze the mission given them, calculate the time, and establish what situation information is already known to them and what is missing. On the basis of the analysis of the mission and timely study of the available information on the situation, the commander must at least in general terms plan and declare personally or through the chief of staff his concept of combat to all control officers. As concerns situation information and calculations that are lacking, he must indicate who will prepare what part of them and by what

time and what requires special attention in this. Practice shows that without such procedural instructions from the commander and the chief of staff it is impossible to achieve *purposefulness and organization* in the work of the control organs, and the efforts of the officers will to a considerable extent be in vain, for the estimates, data, and proposals they prepare may turn out to be simply unnecessary to the commander. The other control organ officers' work is organized in accordance with instructions from the commander and the chief of staff. Each of them is in direct contact with certain information sources and prepares the information for the commander that is appropriate to his kind of work.

The information obtained on the situation as a whole is put together and synthesized for the commander, the chief of staff, and his deputy. Other personnel gather only the information they need. For this reason a clearly organized system of exchange of information about the situation among all officers of a given control post, and also among the various posts, is very important. This exchange of information makes possible a more profound and complete study of the situation and, what is most important, eliminates identical requests from various responsible individuals in higher-level control organs for information from subordinates, which in turn relieves the load on the communications channels.

The organization of a system of information exchange among the control officers on the basis of instructions from the chief of staff is the responsibility of his deputy. It is important that the basis for this organization be, in addition to direct job subordination, each officer's concern for the common cause, healthy relations among them, and their understanding of the leading role of operations officers in command and control, since they are the ones who solve the problems concerned with organizing combined arms combat and performing the overall tactical mission. Any officer, when he receives information on the situation, in addition to reporting to the commander and chief of staff must inform all other interested parties as fast as possible. The various responsible individuals on higher-level staffs must be categorically forbidden to request identical data from subordinate staffs. For information exchange, personal discussion and internal communications at the control post (by telephone, radio, or selector) are used. Only in extreme necessity are all responsible individuals assembled for exchange of information.

The most difficult exchange of data occurs during combat, when the control posts are moving. As a rule, the commander receives a good part of the data, even under these conditions, from subordinates personally, and reacts on the spot to the changes in the situation, that is, he

makes (or amplifies) a decision and assigns the tactical missions to the executive agents. The staff assists the commander by gathering, processing, and reporting data to him by various methods (figure 21). They report orally over the control post internal radio communications system or in personal discussion with the commander on short halts in the course of combat. Depending on his functions, each responsible individual reports directly to the commander or first reports all information on changes in the situation to the chief of staff, who summarizes it and reports to the commander.

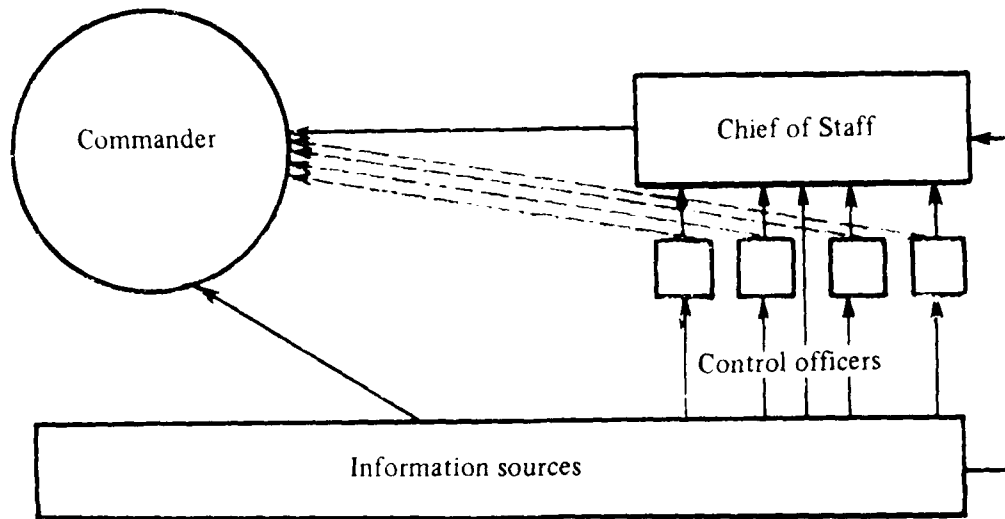


Figure 21. Procedure for Reporting Situation Data and Information at Control Posts.

When using technical communications equipment to obtain situation information from the subordinates, just as when transmitting this information to the higher staff, every officer must strive to keep the reports as brief as possible 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 information actually needed by the commander and staff for command and control of the subunits. Imagination must be used in meeting the previously mentioned requirement that detailed information on friendly troops must be gathered two levels down. Officers can achieve a reduction in volume of information transmitted by communications equipment and also save time by using short, clear formulations of their thoughts and by using standard report forms and established signals.

It is very important to regulate precisely the length of time subordinates take to present reports on the situation. For this purpose

situation information must be categorized in terms of degree of urgency. The most urgent information is that requiring immediate reaction by the commander. This information includes enemy preparation for employment of nuclear weapons and that concerning all drastic changes in the situation. This information is transmitted immediately to all interested commanders and staffs. The less urgent information is that not requiring immediate action by the commander.

3. Processing and Reporting Situation Information

The situation information received from various sources undergoes primary processing, the essence of which is to reduce it to a form convenient for study. It is first plotted on the working maps and entered in the notebooks or the field books of responsible individuals in command and control. The newly obtained information is categorized and compared with the information already on hand, and the degree of its urgency and reliability is determined, with consideration given to the reliability of the sources. Consideration is also given here to the time to which the information applies, and a determination is made as to what changes in the situation could occur from the time of transmission of the information by the primary source.

Simultaneously with the above, the information is consolidated and a determination is made as to which elements of the friendly and the enemy combat formation it concerns. Thus, by the disposition of the individual foxholes, the fire weapons, and the obstacles of the enemy, one can determine the outline of the forward edge of his defense, the presence of platoon and company strongpoints and battalion defensive positions and, by the disposition of the individual batteries, make a judgment about the grouping of the enemy artillery. Redundant, false, and doubtful information is screened out at this point, and the determination is made as to what information is lacking. The latter is more precisely defined and procured by further querying of the appropriate source.

The most important information on the map is reflected in more detail and more graphically than secondary information. The degree of detailing of information depends on the category and purpose of the map. For example, an intelligence officer plots absolutely all data about the enemy on his map. Other officers maintain working maps in the scope and detail needed for their job requirements.

Working maps therefore are the basic document in which the situation is reflected. The synthesized information on the situation as a whole is plotted on the working maps of the commander, the chief of

staff, and his deputy, and also the officers in charge of the other control posts. Especially great requirements are imposed on all these officers' maps. They must be a genuine mirror of the situation. Therefore, it is necessary to give primary attention to acquiring the skills to maintain them. With the introduction of equipment for complex automation of command and control processes at troop level, the situation can be depicted on screens, display panels, and other electronic devices.

It is especially important to achieve clear-cut organization of staff officers' work in presenting the situation information obtained from various sources to the commander or chief of staff. Under modern conditions of preparation for and especially in the course of an engagement, it is simply out of the question to have prolonged meetings of the commander with his aides and extensive reports on the situation. Information of interest to the commander is reported in the form of brief, clear-cut answers to specific questions. The most important information is reported, based on their role, to each control element and among them in the form in which it is obtained. These reports are added to and made more specific as new information comes in about the situation, especially about the enemy.

This is how it was done, for example, during the Great Patriotic War in uncovering the plans of the German fascist command, which was attempting to secretly withdraw the 4th SS Tank Corps defending positions between the Bug and Vistula in January 1945 and transfer it to Hungary to take part in a counterattack. The process of acquiring and studying the information about this situation by our command went as follows.

On 30 December 1944 our radio reconnaissance noted that the enemy's 3rd and 5th Tank Division radios were not operating. On 1 January 1945 secret agents reported that the presence of soldiers with the 5th Tank Division insignia had been noted in Czestochowa. On 3 January 1945 radio reconnaissance noted movement of the 3rd and 5th Tank Division radios in the Kryukov-Der sector. On 4 January 1945 the capture of a prisoner from the 3rd Tank Division in the vicinity of Komarno finally confirmed the movement of the 4th SS Tank Corps to Hungary.

When studying information obtained one must take into account the possibility of disinformation on the part of the enemy. Let us cite a typical example from the last war. In June 1944 our radios took bearings on the operation of the "Viking" SS Tank Division radio network in the area 25 km southwest of Kolomyya. In addition a "deserter" came over to our side, who pointed out that a tank division had been

moved to the indicated area to take the city of Chernovitsa. The mission of more precisely defining all this information was given to one of our reconnaissance groups operating in the enemy's rear area. It turned out that the enemy was periodically using prime movers to haul dummy tanks from the depths of its defenses in the direction of Kolomyia and back. The local populace indicated that there were no trains with tanks or other equipment in the area in question. The previously obtained information turned out to be false. The plot of the enemy to disinform our command was exposed.

In reporting situation information to the commander, the chief of staff plays an especially responsible role. On the basis of an analysis of the assigned mission and an estimate of the situation, he must be ready to report to the commander: the potential for enemy employment of nuclear weapons and other means of destruction, his grouping, the nature of his operations, his possible intentions and weak and strong points; the capability of his own subunits for performing the assigned mission, the required regrouping of the troops, and calculation of the time for carrying it out; the quantitative and qualitative ratio of men and equipment; an estimate of the current radiation situation and its effect on troop operations; proposals for the decision, i.e., the most advisable concept of operations in the given situation, what tactical missions should be assigned to the subordinates, the system of coordination of the troops, the measures for supporting combat operations, and the *organization of command and control*.

At the same time, 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 notes, calculations, diagrams, photographs, tables, and other reference material. However, in the report this material must not be turned into "crib sheets"; one must be able to make a clear-cut oral report from the map and consult the references only in extreme necessity, for example, when presenting hard-to-remember numerical data. Usually the basic calculations connected with studying the situation and planning combat operations include the following: calculation of the time for preparing combat operations, the force correlation of the belligerents; calculations concerning the employment of nuclear weapons, estimate of the radiation situation, troop movement, assault landing, forced crossing of rivers, and so on.

When the situation information is reported to the next higher commander and staff, the same procedures are used as when this information is received from the subordinates: the situation report and the transmission of reports over technical communications equipment and

through the staff officers (personal exchanges), presentation of written or graphic action reports and summaries.

In terms of purpose and content there are the following kinds of reports: action, intelligence, communications, administrative, and others. And there are operational, intelligence, communications, administrative, and other summaries. In addition, the reports are broken down into periodic, i.e., presented at a set time to the higher staff, and aperiodic, which are submitted on the staff's own initiative or in accordance with a special requirement from the higher staff resulting from drastic changes in the situation. The volume and content can be quite varied: from a signal, for example, of readiness for combat to a developed operations document made up of several items. The content of this action report can be expressed graphically on a map, tracing paper, or ordinary paper. One version of this graphic action report by a battalion commander is presented in figure 22. Its main advantage in comparison with the textual report is its visual representation and, consequently, the speed of mastery of its content. However, a good deal of time is required for making it up. Therefore staffs often resort to the textual action report which is usually set forth in the following order.

The *first item* of the report reflects the general results of the performance of the tactical mission by one's subunit as of the time the report is developed, its situation, the nature of the operations, its condition, and the supply situation down to one level lower.

The *second item* may indicate the situation and nature of the operations of the adjacent units, especially when they have an effect on the operations of the subordinate troops and this information is for some reason not known to the higher staff.

The *third item* of the report contains a concise general estimate of the situation, the state and the nature of the enemy operations. It is assumed here that more detailed information about the enemy is available in the intelligence reports.

The *fourth item* sets forth the concept of operations based on the commander's decision.

If because of circumstances it is necessary for the senior commander's resources to be used to assist the subordinate, then this is discussed in the *fifth item* of the report. The approximate content of

this report may be as follows.

Established classification and series

To commander, 5th Motorized Rifle Regiment

Action report No. 05, 3rd Motorized Rifle Battalion.

Commander's observation post—hill 120.7 (1725). 5 January 1945, 1100 hours. Map 25000, first edition, 1943.

1. 3rd Motorized Rifle Battalion performed immediate mission by 1030 hours.

7th Motorized Rifle Company is enveloping enemy strongpoint on hill 140.5 from the north. Losses: 15 killed, 10 wounded.

8th Motorized Rifle Company took western edge of grove (0722), (0622). Losses: 10 killed, 18 wounded.

Head of 9th Motorized Rifle Company column reached bridge (0823).

1st Artillery Battalion is at firing position, orchard (0724).

2. Adjacent units: on right—2nd Motorized Rifle Battalion has taken Petrovka, on left—1st Motorized Rifle Battalion is halted at line hill 100.5, Ivanovka.

3. Enemy with a force of up to two infantry companies and 10 tanks is trying to consolidate position on west bank of Malyy Creek. Enemy is simultaneously advancing brigade reserve for counterattack, which is possible in 1 to 1.5 hours, on axis Don, hill 153.2.

4. Decision is to commit 9th Motorized Rifle Company to action at 1130 hours from a line of the northwest slope of hill 140.5 on axis of bridge (0821), hill 147.1 (0720), and by 1300 hours on 5 January to take hill 147.1.

5. Request you interdict advance of enemy brigade reserves on axis grove (0310), Don (0621).

COMMANDER 3rd Motorized Rifle Battalion (rank, last name)

BATTALION CHIEF OF STAFF (rank, last name)

Copies—2

Copy No. 1—Headquarters, 5th Motorized Rifle Regiment

Copy No. 2—file

Form completed by _____(last name, initials)

Form dispatched by _____(last name, initials)

_____(date) No. _____

The above procedure for making up a textual action report must, of course, be considered just one of the possible procedures. In many cases an action report may not begin with the evaluation of the

* [As with American usage the actual Soviet report is more terse and uses more abbreviations than the translation might imply. An expanded form has been chosen for ease of reading—U.S. Ed.]

situation, the condition and nature of the operations of friendly troops, but rather with the enemy's. Aperiodic action reports are composed in arbitrary form, but they always begin with the principal, determining factor in the situation. Thus one should in each case select the most suitable form for the action report. For example, standard forms may be used as follows:

To commander _____ Motorized Rifle Regiment
 Action report _____ Motorized Rifle Battalion No. _____
 Commander's observation post _____ Date _____ Time _____ Map _____

<i>Constant information</i>	Variable information
<p style="text-align: center;">I. Results of carrying out mission and situation of subunits</p> <p>1. No., name of battalion, took line _____, etc.</p> <p style="text-align: center;">II. Estimate of enemy</p> <p>1. No., composition of enemy 2. Defending on line _____, etc.</p> <p style="text-align: center;">III. Battalion commander's decision and requests</p> <p>1. Decision to commit motorized rifle company to combat from line _____, etc. Commander _____ motorized rifle battalion (rank, last name) Chief of staff (rank, last name) Transmitted _____ (time) Received _____ (time)</p> <p>Make one copy only for file Form completed by _____ (last name) _____ date, No. _____</p>	

Each report must be extremely short, clear, and precise, and it must be delivered to the addressee within the established time. Its content is presented in such a way that the senior commander can quickly plot it on his working map, assimilate it, and react in time to the information and requests reported to him. Reports transmitted over the radio must be especially short without sacrificing clarity. They contain only what is most important, in approximately the following form.

"**Kama-8**" (call sign of the senior commander).

"3rd Motorized Rifle Battalion has carried out its immediate mission. The enemy is preparing a counterattack on the axis _____. The decision has been made to commit the 9th Motorized Rifle Company to combat at 1100 hours from the line _____, and by 1300 hours, to take the town of Dal'nyaya."

"**Don-5**" (call sign of the commander of the 3rd Motorized Rifle Battalion)

The action report containing a presentation of the commander's decision and addressed to the senior commander is signed by the subunit commander and chief of staff. The remaining reports addressed to the chief of the superior staff are signed by the chief of staff.

The commanders and staffs of subordinate and coordinating troops and adjacent units are informed of situation changes, as a rule, by personal exchanges and direct conversations with them over closed communications channels. Changes in situation information important to the senior commander are explained by them at the same time. The senior commander must not, however, distract subordinates from work directly involving command and control unless there is a special need. Each summoning of subordinates must be justified by the need to convey or obtain important information. For information about the enemy, copies of the information and accountability documents are in many cases sent out to them.

4. Prospects for Automation of Situation Information Acquisition and Processing

In an analysis of the content of the work of the commander and staff in acquiring and synthesizing the combat situation information, one cannot fail to note that much in it is subject to formalization and modeling. Therefore the principal means of accelerating and increasing the efficiency of this process is, of course, automation of it in the future.

At the present time it is difficult to imagine the full extent of the changes which can occur in acquiring and processing situation information in each control element when automation equipment is used. However, it is obvious that the extent of this effect will depend on the capabilities of the automation facilities with which the command and control elements and organs will be equipped. We may express here just a few assumptions, summing up the experimental data and the theoretical views presented in the military periodicals of foreign armies

in recent years.⁴

Thus, the control elements and organs, which will have simpler automation equipment outfits (information sensors and the required amount of communications equipment), can automatically gather and output as directed not everything, but just certain information: on the location of the control post of the commander on whose vehicle the sensor is located, the radiation levels, and other information which will be transmitted automatically to the superior control organ. At the same time, various types of signals, short instructions, commands, and basic information about the enemy can automatically proceed from this control organ to the lower echelon sensor. The remaining volume of information must be obtained and processed by ordinary means and methods for which the organs and responsible personnel of the lower control element must be ready.

It is assumed that the capabilities of the control elements which, combined with other modern control equipment, will have transceiving equipment available right in the vehicles of the main responsible personnel will be comparatively great. The most important information about the combat situation can be acquired and transmitted in transit to the higher echelon over the telecode channels with this equipment. The higher control organ can transmit signals, commands, short instructions, and the most essential information to the subordinate organs over this equipment.

The greatest changes in the process and methods of acquiring and studying situation information will take place in the control elements and organs which have computers, remote computer facilities, and a complex of other automation equipment installed where the main responsible personnel work. The information coming from the various sources will be processed appropriately, stored, and output from the computer on request in alphanumeric form on printers and electronic displays in the machines.

The use of automation equipment combined with other control equipment also has a number of other advantages: it ensures greater information accuracy and reliability, optimality of volume and speed of execution in supporting the tactical mission. This is possible only with an efficient combination of the automated and nonautomated devices with the creativity of the responsible personnel, and with human reason kept in the leading role. An even higher level of training and organization of control organ operations is required. They must not only know, but be able to make practical use of the capabilities of the automation equipment, refining the current procedures and methods and seeking

new and better ones for gathering and studying situation information.

Notes

1. Lenin, XXXI, 134.
2. Lenin, XLI, 144.
3. Lenin, XLIV, 309.
4. The American journals *Armor*, *Military Review*, *Electronics*, *Army Times* and the West German journal *Wehrkunde*.

Chapter 5. Making (or Amplifying) the Decision and Planning Troop Combat Operations

1. Content of the 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 decision and especially its soundness and timeliness of adoption, depend 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*, i.e., the range of problems to which it must give full, precise, and clear answers. The latter is also confirmed by a 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, if he does not have a clear-cut idea of its structure, boundaries, and operating principles.

With respect to the problem of the content of the commander's decision there can be and actually are various points of view. If this problem is approached just from the point of view of the necessity to observe the principles of one-man management and centralization of control, then this decision must, under any circumstances, reflect all the phenomena and aspects of the forthcoming engagement. For this purpose it must in terms of content include such elements as the concept of combat operations, the missions of all subordinate subunits of the branches of troops and special troops, their coordination procedure, and also measures for political work, organization of command and control, and all types of combat operation support: reconnaissance, protection against nuclear weapons, security, camouflage, and engineer, rear services, technical, topogeodetic, and other types of support, as well as the commandant's service.

However, this approach alone to the content of the decision is, in our opinion, inadequate. In addition to the necessity indicated, we must, without violating the principles of one-man management and centralization, consider the psychological capacities of the commander, the level of his knowledge and experience, the degree of familiarity with the actual situation, the availability of time for preparing combat operations and for making the decision, the composition of the subordinate troops, and the nature of the tactical mission assigned by the senior commander. It is also considered important to take into account the level of training and experience of the control organ officers and the subordinate subunit commanders.

Of the factors listed, the time that the commander has available for making the decision usually has the greatest effect on the approach to the content of the decision. For that reason special attention should be given to it.

For the commander the most favorable circumstances for making the decision as this relates to time will be to have available a prolonged interval between the combat operations performed and the forthcoming ones. During the Great Patriotic War these intervals often amounted to several days, of which the commander of each control element usually had at least 1 or 2 days at his disposal for making the decision and for organizing combat operations as a whole. Under these conditions, he could, without hurrying, make a methodical analysis of the mission assigned him and estimate each element of the situation, perform reconnaissance of the terrain, think through all possible scenarios of the forthcoming combat operations, consult with his assistants, weigh everything carefully, calculate, and finally make a decision in which a definition is given to the concept and missions of all of the subunits of the branches of troops and special troops, the procedure for their coordination and also measures for political work, command and control, communications, and every aspect of support of combat operations. In a word, there was no need to set any limits on the content of the decision under these circumstances. The necessity for reflecting all aspects of the forthcoming engagement in the decision coincided with the means that the commander had at his disposal.

However, when studying this experience at the present time the question inevitably arises as to whether these conditions will hold true for a commander making a decision in a future war if one is unleashed by the aggressive circles of the imperialist governments. Studies of recent years answer the question negatively.

When conducting combat operations in the future, every commander will inevitably encounter a sharp conflict between the volume of operations which must be performed in making the decision and the time which he will actually have available for this. This conflict inevitably arises for the following basic reasons. As has already been noted, the time for the preparation of combat operations will be drastically reduced. The prolonged intervals between active combat operations will, as a rule, be absent. The struggle with the enemy to gain time and get the lead in making a strike will become more acute. The pace of combat operations will be greater, so that there will be less time for executing one mission, and the commander will be assigned a new one by his superior more quickly. One type of combat operation will replace another more often than before.

Accordingly, Marshal of the Soviet Union A. A. Grechko wrote the following in his book *Vooruzhennyye Sily Sovetskogo gosudarstva* [The Armed Forces of the Soviet State] (p. 263): "While during the Great Patriotic War each operation was usually preceded by a preparatory period, the length of which was measured in many days or even weeks, and 5 to 7 days were usually set aside for organizing offensive combat at the division-regimental level, now it is impossible to count on such a considerable amount of time. It is quite probable that a new operation or engagement will often have to be organized in the course of continuing combat operations, under conditions of an unclear and oftentimes conflicting situation."*

This conflict will be manifested especially sharply when the commander receives a new tactical mission in the course of the combat operations conducted in execution of a previous mission. Under these circumstances the so-called period of combat preparation in its usual sense simply will not exist, and the commander will have to make his decision to carry out the new mission, at the same time executing command and control of the subunits conducting active combat operations. The amount of time which one may take for making the decision and for organizing new combat operations will often depend on the nature of enemy actions and will be reckoned in minutes.

To confirm what has been stated, let us present an example. A motorized rifle battalion has carried out its mission, has taken the enemy's strongpoint, and received a new mission—to develop an assault and break through the defenses on a line which is 3 km from the battalion and which the enemy reserve is advancing to occupy. With

* [An English translation of this book is available as No. 12 in the United States Air Force "Soviet Military Thought" series published by the U.S. Government Printing Office. The passage cited is on p. 208 of the English-language edition—U.S. Ed.]

...to be able to attack the enemy ... shows that in this time not ... decision that deals with ... forthcoming engagement ... cannot take all of the ... of the decision

... consider that the sub- ... leaders also require time to ... subunits

... the commander with the re- ... decision that defines in detail ... forthcoming engagement ... obviously unrealistic tasks, forc- ... make a superficial (unsound) decision or to ... need to prepare to carry out their ... oblige them to wait until the decision ... has already doomed the troops ... undermined his authority ... discredited the principles of one-man ... In addition, with this way ... prepared for the flourishing ... combat with especially serious consequences.

In order to prevent this, the degree of centralization of control and detailing of the decision must be commensurate with the capabilities of the commander for information processing. He should base his work on dealing distinctively with the various parts of the decision. Practice teaches that when time is extremely limited, the commander at each echelon, including the battalion, must personally define only those elements of the decision which in the situation at hand are the most important and which cannot be determined by other people. These *elements of the decision* are usually the following (figure 23): the concept of the combat operations; the tactical missions of the subordinate subunits of the branches of troops (motorized rifle, tank, artillery, antiaircraft), i.e., the subunits involved in direct combat with the enemy, which destroy him with fire and strike; the principles of coordination of subunits when they are carrying out their tactical missions; the main tasks of political work, support of combat operations and organization of command and control (indicated in figure 23 by the broken line).

As for the other problems connected with the measures taken in political work, the organization of all forms of support of combat

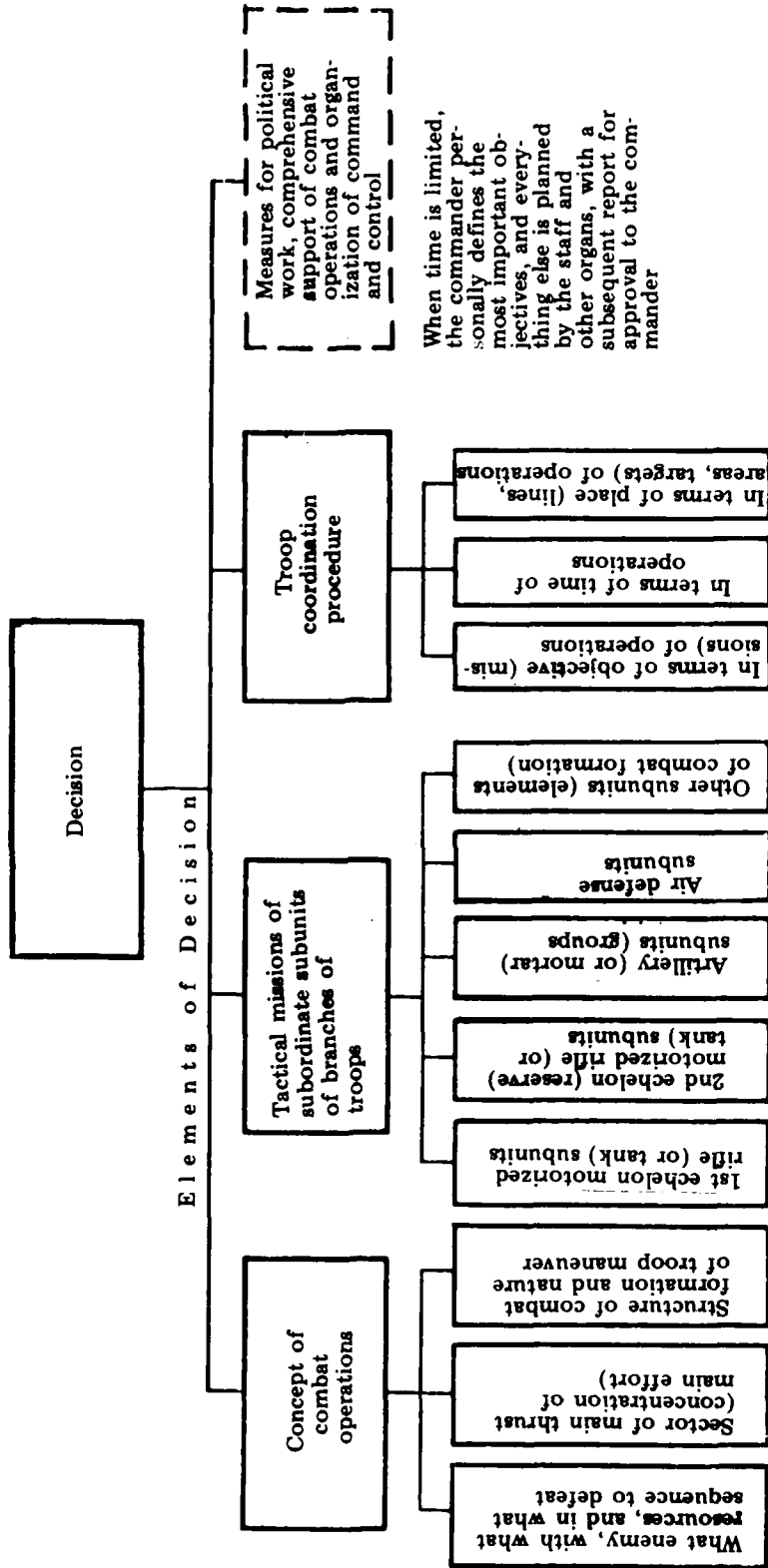


Figure 23. Content of the Commander's Decision.

operations, and command and control, if there is sufficient time, the commander himself can as regards these matters make the decision, determining the missions, forces, means, times, and methods of execution, before giving instructions to the executive agents. When he does not have this kind of time, however, it is perfectly acceptable for him to confine himself to defining only the most important missions of that aspect of support which is most significant in the present circumstances, and leave the rest for his deputies, staff, chiefs of branches of troops and services (when there are such) to plan on the basis of his concept, and then he approves or, if necessary, amends their plans. This becomes all the more obvious if we consider that the range of problems connected with implementing the above 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 command and control. It cannot be reduced to merely defining the places of deployment of the control posts, which is sometimes the case in training exercise practice. For organization of command and control it is necessary, in addition to this, to solve and define the makeup (crew) of each post, their technical equipment, the system of placement of each responsible individual and vehicle, the organization of security and defense and of engineer equipment of the posts, the procedure for their movement in the course of the engagement, the procedure for restoration of command and control in the event a particular post is put out of action by enemy nuclear strikes and fire, the organization of communications, secure command and control, and also the work of the responsible personnel at each post with specific instructions as to who, where, when and how things must be done when implementing each of the command and control measures.

The same situation holds true in organizing political work in each of the many types of support of combat operations. Here, too, before giving sound directions to the subordinates, it is necessary to determine the missions, men, equipment, times, methods, and procedures for carrying them out. It is easy to see that when time is limited, if the commander tries to personally accomplish the above measures down to the last detail and answer all these questions, then he will unavoidably "get in over his head" and lose sight of the main thing—definition of the concept of the engagement, the tactical missions of the subordinate troops, and the procedure for their coordination. On the other hand, the individualized approach to the content of the decision discussed by us will enable the commander to keep his attention undivided, to concentrate on the main thing, and, using the collective intelligence and creativity of his nearest aides, to ensure a timely, high-quality solution to all of the problems connected with organizing and supporting the

forthcoming engagement. With this approach, in addition, the range of problems which the commander must cover thoroughly in analyzing the mission and estimating the situation is reduced, and so the total time for making the decision is reduced. Experience in exercises indicates that with this approach to the content of the decision, it is within the powers of the battalion commander to make a timely plan, even when his time is limited.

This approach to the decision in no way indicates division of authority. It does not contradict the principles of one-man management and centralization, inasmuch as the authority to approve the plans of his assistants still belongs to the commander, as does personal responsibility not only for his own actions but also for those of his subordinates. This approach makes it possible to intelligently combine the principles of one-man management of the commander and centralization of control with the initiative and creativity of the subordinates, to reinforce the authority of the commander among his subordinates and to enhance their activity and inner satisfaction with their routine work. Even during the last war it was stated quite convincingly that a commander's attempts when his time is limited to "encompass the unencompassable" and his lack of faith in the officers of the control organs kills any initiative in them and does a great deal of harm to command and control and, consequently, to the success of combat operations.

In command and control teams such relationships are the all more inadmissible today when the dynamism of combat operations has increased significantly and the level of training of officer cadres has been raised. Thus we have not only the necessity but also the opportunity to greatly **enhance the responsibility** of each officer for the matter with which he is entrusted. "The basic control principle, . . ." taught V. I. Lenin, "is that a particular person is wholly responsible for the performance of a particular job."¹

There are, of course, various kinds of responsibility. The commander and only the commander has the authority to make a decision as such. He is personally responsible for the outcome of combined arms combat and the successful performance of the assigned tactical mission by the subordinate troops. He has no right to share this responsibility with anyone. However, every chief must be responsible for his part of the operation; otherwise, he cannot be called a chief. Wherever there is at least some responsibility, there must be the authority to determine the appropriate measures for particular problems based unconditionally on the commander's concept of the engagement and mandatorily subject to his approval.

This approach to the matter will be in line not only with advanced experience, but also with the principles of control theory to the effect that the decisions encountered in life are general and particular. The commander's decision which we have investigated is a general decision, inasmuch as it includes his concept, which pertains to absolutely all the subordinates and which is aimed at the fulfillment of a common goal. The measures relating to individual problems (political work, organization of control, types of support) can be considered particular decisions providing for the making of the overall decision.

Finally, the above-cited approach to the decision will take into account the trend toward a sharp increase in the role of the creative and organizational work of control organ teams clearly observed in our country in recent years and confirmed in the decisions of the 25th CPSU Congress and in the new USSR Constitution. Having an overall decision and particular decisions is, consequently, both from the theoretical and the practical point of view, quite justifiable and is not detrimental, especially in that they originate in the final analysis in the concept of one person—the commander—and only with his consent go to the executive agents. Division of authority is completely ruled out in this case.

This is what the general structure of the content of the commander's decision and its basic component elements must be like in our day.

Content of the Basic Elements of the Decision

Each element of the decision requires clear definition and specification of content and reduction of volume. Inasmuch as it is not possible in this work to give a detailed analysis of each such element in all 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 from this 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 concept of the combat operations expresses the commander's main guiding idea, which determines the objective of these operations and also, in general terms, the men, equipment, and methods of achieving it. Therefore it is the most important element (nucleus) of any decision and the skeletal 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 answer its basic purpose, the concept must clearly and specifically answer the following basic questions for the subordinates.

(1) *What enemy, where, with what forces and means, and in what sequence does the commander intend to strike?* The answers to these questions are needed primarily because the ultimate objective of any engagement cannot be achieved by just one, however powerful but short, blow or the use of only one means. In any form of combat it is always necessary to break down the general problem in terms of purpose, place (lines), and time into a number of sequentially executed intermediate missions, bringing in the appropriate forces and weapons for carrying them out and applying various operating methods. On the offensive these missions usually are the immediate and subsequent missions, the axis of the future advance. Each of them can be broken down into a number of smaller-scale particular missions involving the destruction of enemy targets (strongpoints, fire weapons, control posts), breakthrough of his intermediate lines of defense, repulsion of counterattacks, forced crossings of rivers, and so on. On the defensive, this clear-cut breakdown of the overall mission usually is not made, but even here the concept of the engagement always provides for the sequential defeat of the enemy along axes on the approaches to the defense, when he is deploying for attack, during the attack, and when wedging into our defense.

Both on the offensive and on the defensive, it is especially important to use the concept to determine against which objectives the main weapons will be employed and how in principle they will be used.

(2) *In what sector is the main strike made on the offensive or the main efforts concentrated on the defensive?* This question derives from the most important principle of the conduct of any engagement, which requires that the men and equipment not be dispersed uniformly over the entire front but that they be concentrated in the decisive sector in order to achieve superiority there over the enemy.

(3) *What is the structure of the combat formation of the troops and what form of maneuver is planned for them to use in the forthcoming combat operations?* The answer to this question is closely connected with the preceding ones. It gives material embodiment, as it were, to the main idea of the commander in the appropriate grouping of forces and the methods of its operations.

This is the most advisable content of the concept of combat operations. As is obvious, it should not be overloaded with secondary measures; otherwise, it will be difficult for the subordinate commanders to understand. At the same time, in striving for brevity one should not impoverish the concept excessively or confine it, for example, to mere definition of the sector of the main thrust of the offensive, for this is clearly insufficient for analysis of the basic idea of the higher com-

mander by his subordinates.

The tactical missions of the subordinate subunits of the branches of troops are defined in the decision in strict correspondence with the outlined concept. The essence of the term "tactical mission" is primarily a matter of determining which enemy grouping (or target) must be destroyed or suppressed by the fire and strike of each subunit of the first echelon, second echelon, or reserve, the artillery or mortar subunit, and so on. It follows from the very essence of combat operations. However, inasmuch as these actions are always conducted within the framework of time and space, the second component of the concept "tactical mission" is always definition of the readiness times, the beginning and end of mission execution, and the location (area, line) of operations.

This approach to the content of the tactical mission has great theoretical as well as practical significance. It makes it possible to formulate this content precisely and to free it of many secondary (supporting) measures, at the same time accelerating the process of making a sound decision and then disseminating it to and analyzing it for the executive agents.

In order to confirm this conclusion, let us cite the advisable content of tactical missions for an attack from the march. In his attack decision the commander may confine himself to defining the tactical missions of the subunits to the following extent:

(a) To the motorized rifle (or tank) subunits of the 1st echelon—the reinforcement means, the line of transition to the attack, which enemy to attack, and where the attack is to take place and what line is to be taken as a result of accomplishing the immediate and the subsequent missions, the axis of the future advance, the readiness time; when necessary, the demarcation lines between the subunits and the adjacent units can also be indicated;

(b) To the 2nd echelon subunit—the means of reinforcement, where the advance is to be made at the beginning of the attack, the possible lines of commitment to action, which enemy to attack, where the attack will take place after engagement, what line is to be taken (the immediate mission), the axis of the future advance;

(c) To the artillery (or mortar) subunit—the area of the main fire positions, what objectives (targets) are to be suppressed or destroyed during artillery preparation, support and accompaniment during combat in the depth of the enemy's defenses, and the readiness time;

(d) To the anti-aircraft subunit—the area of the basic fire positions, who, where, and when to cover, and for the coverage of which targets to concentrate the main efforts.

A similar approach is necessary for defining the tactical missions and other elements of the combat formation if they are created. This approach will be not only necessary but also quite possible if we also take into account the important fact that the tactical missions are also inseparably connected with the following element of the decision—the **bases of coordination**. The breakdown of these two decision elements is of a highly arbitrary nature. In fact, when defining the tactical missions for the troops, i.e., establishing what enemy to attack and where and when the subordinate subunits of the branches of troops must attack him, the commander thus establishes the basis for their coordination, the essence of which is to coordinate the efforts and operations of the troops in terms of objective (missions), time, and place (lines, areas, and axes). However, as the experience of the Great Patriotic War demonstrated, for achieving close coordination in executing tactical missions, troops need more definitions than just one. In addition to these, it is necessary to define and then indicate the methods for carrying out the particular missions by the subordinate subunits in performing the overall mission in order to ensure mutual aid and clear-cut coordination of operations.

The extent of detailing of these methods of operations in the different echelons and types of combat operations can, of course, be different, depending on many factors: the nature of the mission, the availability of time, the conditions of the terrain, the level of training and experience of the subordinates, and so on. It is impossible and impractical to give a single outline which is suitable for all cases encountered in real life. One can only say that this detailing must always have a reasonable limit, as one can see from the work experience of battalion commander Major P. Ivanov in one of his exercises in attacking from the march.

After studying the plan and the instructions of the regimental commander, analyzing his mission, and evaluating the situation, Major P. Ivanov outlined his concept of the engagement and the tactical missions of the subordinate subunits and then went on to define their coordination procedures. In doing so he took into account the following from the senior commanders' decision: the time and procedure for advancement of the subunits from the assembly area to the line of transition to the attack; the lines and the times of sequential deployment into combat formation; the beginning, the duration, and the organization of fire preparation and the sequence of operations during this period of the fire weapons and of all other subunits of the battalion; the locations, times, and methods for breaching obstacles and designating and using these breaches. Taking this into account, the battalion commander defined the procedure and the line for dismounting and

attack by motorized rifle and tank subunits, their procedure for exploiting the results of a nuclear attack by the senior commanders' artillery fire, direct fire weapons, tanks, armored personnel carriers, and other means; methods of maneuvering the subunits (flanking attack, envelopment, maneuvering of fire) with joint seizure of the most important enemy strongpoints, during combat in the depth of the defense and repulsion of enemy counterattacks, rendering mutual aid among the motorized rifle, tank, artillery, mortar, engineer, and other subunits; the nature of operations of the subunits in the event of an enemy air attack during the advance and during counterpreparations; procedures for operations during an attack without the employment of nuclear weapons by the senior commanders and during transition to the use of nuclear weapons; target indication, mutual recognition, and warning signals.

This range of problems solved by the battalion commander in defining coordination procedures has proved its validity completely. The battalion has successfully performed its mission.

Let us present another, opposite example which also occurred in a tactical exercise and was described by the former troop commander of the Order of Lenin Moscow Military District, General of the Army Ye. Ivanovskiy, in the 20 June 1972 *Krasnaya zvezda*. The commander of one of the tank battalions decided to move his subunits out and deploy them on the attack line somewhat before the established time. This "initiative" turned out to be misplaced. As a result, they did not achieve coordinated simultaneous operations with the adjacent units. This way the force of the strike was weakened. During a careful analysis of the causes of this error it was discovered that the battalion commander had an incorrect perception of the general tactical situation and his place and role in the execution of the concept of the senior commander. Therefore the attempt to display initiative on the battlefield turned into harmful willfulness.

From these examples it is obvious how carefully and creatively the commander must proceed in his decision when defining troop coordination procedures. On the one hand, he must see to it that his subunits act as an efficiently organized and unified organism and forestall the enemy in launching the attack. On the other hand, however, one should not consider it normal practice when some commander without any particular requirement for it and without regard for his actual capabilities attempts to personally define in detail all those procedures to be followed by the troops that are the "domestic affairs" of the subordinate commanders. These procedures can be defined by the subordinates themselves, since they have a detailed knowledge of the

situation they are dealing with.

The same thing applies to tasks in political work and to aspects of support and organization of command and control. Here it is also necessary to combine harmoniously the principles of one-man management and centralization of control with independence, initiative, and creativity of the officers of the control organs and the subordinate commanders and not to condition them to look to the senior commander and wait for his instructions on procedures for their own operations.

V. I. Lenin, attaching enormous significance to one-man management and centralization of direction, nevertheless emphasized that "unity basically and essentially is not disturbed, but rather ensured by *variety* in details, in local peculiarities, in methods of *approaching* a matter, *methods* of exercising control. . . ."²

Accordingly, it is useful to mention again the experience of the Great Patriotic War. In its initial period, when the commanders of the tactical elements had not yet received sufficient combat experience, there was a very high degree of centralization of command and control on the part of the senior commanders, especially when preparing combat operations. Later, however, when the command personnel had gained experience, combat operations took on more of a maneuverable nature and the times for preparing them were reduced, this centralization became unnecessary and even harmful. In considering these facts, the Headquarters of the Supreme High Command* was forced on 18 May 1943 to publish a special directive to the troops according to which the senior officers were forbidden to intervene unnecessarily in the functions of the subordinate commanders or to control the troops "through their heads." These instructions by the Stavka played a highly positive role in improving command and control.

It is important to note once more the fact that the harmonious combination of one-man management and centralization of command and control on the part of the senior commanders with the independence, initiative, and creativity of the subordinates is one of the basic trends in the development of modern control in all areas of social life of the country. This trend was given a great deal of attention in the decisions of the 24th CPSU Congress. L. I. Brezhnev made the following statement in the Summary Report of the CPSU Central Committee to the congress: "When a decision is made, it must be entirely clear who bears responsibility for it. And it must be just as clear

* [Henceforth referred to by the Russian term Stavka—U.S. Ed.]

who bears responsibility if a pressing decision is not made or is delayed. At all levels of control it is important to determine the scale and the correlation of rights and responsibilities. . . . Each link in a control system must deal with its own affairs so that the higher echelons will not be overloaded with a mass of affairs of the moment that distract them from the major problems, while the lower echelons can quickly solve the problems that fall in their sphere."³ Considering the exceptional importance of this problem, he again touched on it at the 25th CPSU Congress, stating in the Summary Report: "The essence of organizational problems, simply put, is that each person, having the necessary authority for this and within their limits bearing complete responsibility, is to deal with his own affairs. This elementary everyday rule is at the same time a basic principle of the science and practice of control."⁴

The fulfillment of this party requirement will, in the case of tactical command and control of troops, permit fuller use of the great creative possibilities of commanders and staffs at all levels, the creation among them of a healthier "psychological climate," and, what is most important, increased soundness of decisions, reduction of the time for making the decisions and disseminating them to the subordinates, making more time available to the subordinates for preparation for combat operations, and, in the final analysis, achievement of successfully executed tactical missions.

2. The Commander's Decisionmaking Methodology

The Essence of the Methodology and the Requirements Placed on It

Soundness and timeliness in decisionmaking depend to a great extent on the methodology used.

The general meaning of methodology in science is the totality of modes and methods of performing some operation which are based on objective laws of reality and which ensure achievement of the goal planned.

In order to apply this definition to the process of the commander's making the decision, it is first necessary to take into account the following distinctive features. First, this process is basically 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 accomplishment of the mission. This feature arises from the fact that any forthcoming engagement will be organized in new, changed circumstances, and therefore it is never an exact copy of preceding

engagements. Secondly, the process of making a decision takes place, as a rule, when time is limited, and therefore its success depends greatly on the clear-cut organization of the work of the commander and his subordinate officers in the control organs in making the decision.

Considering these features, one may give a definition of the essence of the methodology of making a decision that is approximately as follows: *the methodology for making a decision is the totality of modes and methods of creative thinking of the commander based on objective laws and principles and also the organization of his work in conjunction with the officers in the control organs while making the decision.* Its purpose is, under any difficult circumstance, to assist the commander in the timely, well-founded definition of the concept of combat operations, of the tactical missions of the subordinate troops, and of their coordination procedures. For this purpose the methodology must answer a number of **requirements** following from the conditions and the specific nature of the decisionmaking process itself.

Inasmuch as this process is basically creative and cognitive in nature, the most important requirement on the methodology for making the decision is *its correspondence to Marxist-Leninist dialectics, the theory of knowledge, logic, the laws of armed combat and the principles of military art.* "The Red commander," wrote M. V. Frunze, "must learn how to completely master the method of thinking, the art of analysis of phenomena set forth in Marxist teachings."⁵ The achievements and conclusions of such sciences as psychology, mathematics, and cybernetics can be of great assistance to the commander making the decision today. His mission, consequently, is to master perfectly the sum total of logical and mathematical methods of thinking and cognizing developed by modern science.

The observation of this most important requirement will also enable one to fulfill such requirements of the decisionmaking process as *universality* and *flexibility*. The essence of these two factors is the suitability of the decisionmaking methodology not for just one type of engagement, but for any type: offensive, defensive, etc., and also under various circumstances, including those of limited time. These two features are to be achieved so as to free the commander of a long, difficult search in each individual case for the methods and the thought sequence and also the modes of organization of his work in making the decision. What has been stated, of course, does not mean that decisionmaking methodology must give the commander some previously compiled diagram or form which, on filling it out, he obtains a decision for any engagement in finished form. "To make up a formula or a general rule . . . which will suit all cases is absurdity," noted V.

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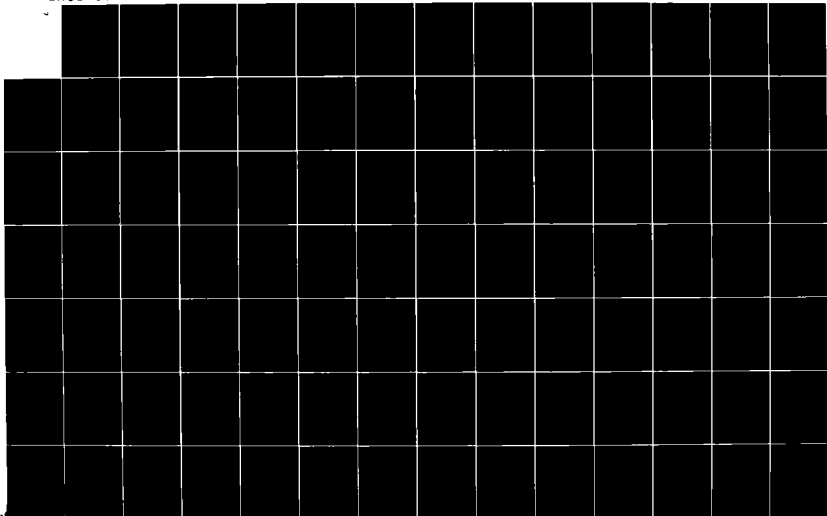
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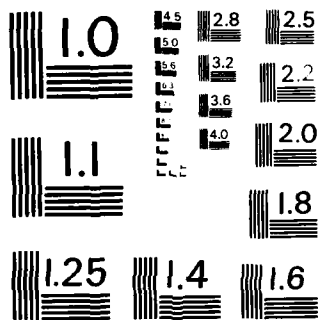
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Lenin.⁶ The methodology has a different purpose—to arm the commander with scientific methods of thought and the most efficient modes of organization of his work, making it possible for him to manifest creativity, art, and individual talent. Having a methodology that is common to all types of combat does not exclude, but, on the contrary, presupposes the use of particular laws and principles in the conduct of each type of engagement and also of the distinctive features of combat operations by various troop organisms (the company, battalion, regiment, etc.).

We should also point out such requirements on the decisionmaking methodology as *simplicity* and *clarity*, which permit its comparatively easy and fast assimilation by all commanders, including the young ones who lack practical experience.

At the same time, one should bear in mind that the practical satisfaction of the aforementioned basic requirements on decisionmaking methodology is inconceivable without the commander's deep and comprehensive knowledge, without his solid mastery of the entire arsenal of logical-mathematical methods of thinking. In addition, in the making of the decision, the subjective qualities of the commander play an important role, especially those such as skill in foreseeing the course of the forthcoming engagement, mature intuition, strong will, boldness and decisiveness, cunning, skill in deceiving the enemy, independence, the capacity for creative thought under great psychological stress, readiness to take a sound risk and accept responsibility for the outcome of the combat operations. Combat and training practice give evidence that if the commander does not have such qualities and at the first difficulty vacillates long and agonizingly, then no well-developed methodology will help him to make the decision.

General Content of Decisionmaking Methodology

Both the content of the decision itself and the commander's methodology for making it are decisively influenced by the following **initial data**: the nature of the tactical mission received from the senior commander and his instructions for combat preparation; the situation as it has developed, especially the availability of time for making the decision; and the personal qualities of the commander and his subordinates.

⁶ Here and later we do not deal with plans made by the commander on his own initiative when he is out of contact with the senior commander and when there are drastic changes in the situation.

In spite of the variety of these data, the general principles which we shall discuss below are also characteristic of the thinking of the commander and the organization of his work while making the decision.

The thought process of the commander as he makes the decision occupies the predominant position in his entire multifaceted activity in command and control, inasmuch as it is the primary determinant of the soundness and timeliness of the decision and therefore of the success of the combat operations of the troops. That is why a great deal of attention has been devoted to studying this process in all armies, especially in recent years, as a result of the changes that have taken place in the means and methods of armed combat.

It should be noted, however, that the thought process of any person as he makes a decision, especially the thinking of a commander as he makes a decision in a complex situation, is very difficult to subject to analysis and description. Some authors even call this process the "secret of the age." Nevertheless, we shall try to do this, using as our basis the Marxist-Leninist theory of cognition and the results of studies of progressive methods of warfare and training exercises.

In many official and unofficial sources, the commander's decision is quite justifiably considered the result of his analysis of the tactical mission received from the senior commander and of an estimate of the situation (figure 24).⁷ However, the commander's thought process itself as he makes the decision is often divided into three independent and sequentially achieved stages: first the mission is supposedly analyzed, then there is an estimate of the situation, and only then is the decision adopted. One cannot agree completely with the last view, for it does not correspond entirely to reality, advanced methods, and the theory of cognition. The independence and sequential mode of performance of the above thought operations by a commander are of a highly conditional nature. It is more a question of their being felt rather than occurring.

The very nature of the process of analyzing the mission is such that during its realization the commander is forced to encroach to one degree or another on the realm of the situation estimate. His thinking from the very beginning of the decisionmaking process is none other than the creation of a thought model of the forthcoming engagement by constant comparison of the mission with the conditions of its execution and, above all, with enemy opposition. **Without knowing the situation perfectly, it is impossible to properly analyze the mission assigned.**

“... The goals of man,” V. I. Lenin pointed out, “are the result of the objective world and presuppose it. . . .”⁸ The thought process of the commander must begin with the cognition of this “objective world,” the actual combat situation, in order to thoroughly understand the objective of the combat operations outlined by the senior commander and his own 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 making the decision.

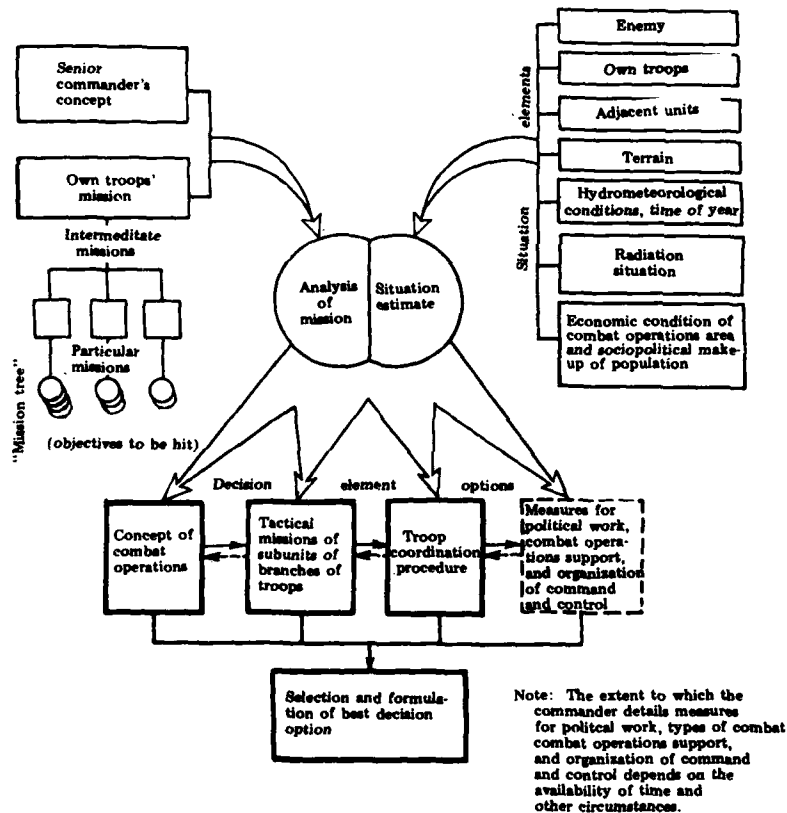


Figure 24. The Commander's Decisionmaking Methodology.

By analysis of the tactical mission we mean the thought process of the commander aimed, on the one hand, at thorough comprehension of the senior commander's concept and, on the other hand, at mastery of the content of his own tactical mission and establishment of the role and the location which his subunit will have in accomplishing the mission of the higher troop echelon.

A proper understanding of the mission and the senior commander's concept and also his own tactical mission enables the commander to precisely conceptualize the objective of the forthcoming engagement and the means, times, and methods of achieving the objective outlined by the senior commander, analysis of the requirements placed on his own decision and on the actions of the subordinate troops. In addition, this analysis of the mission enables the commander to quickly replace the senior commander if he should be put out of action in the course of combat operations, which is especially important when the enemy is employing nuclear weapons.

The situation estimate is a matter of gaining an understanding of the objective conditions of performance of the assigned mission. As a result of this study, factors are brought to light which are either conducive or detrimental to the achievement of success in the forthcoming engagement. These factors are, as we know, the elements of the situation investigated above.

The sequence in which they are dealt with may vary, based mainly on two factors: the interrelationship of the elements and the importance of each of them under given specific conditions. For example, one cannot estimate the radiation situation before evaluating the weather, nor the enemy and his troops independently of the terrain on which they are to operate. The importance of each of the elements of the situation may also vary. Thus, when carrying out a march, the presence and condition of roads and his troops' marching capacities can have a fundamental effect on the content of the commander's decision; when breaking through a prepared defense, the enemy; when forcing a river crossing, the properties of the river itself; and so on. One cannot, therefore, establish any single sequence applicable to all cases in real life for estimating the elements of the situation, and the authors who say that this is possible are mistaken. They are in conflict with dialectics and lead the commander's thinking along a false path.

The conclusions derived from an estimate of each element of the situation are usually of a dual nature. On the one hand, in generalized form they reflect the main thing in a particular element and its effect on the troops' performance of the tactical mission, and, on the other, they determine the specific content of the corresponding element of the decision (where the main thrust should be directed, how to structure the combat formation of the troops, and so on). During the thinking process these individual conclusions on each element of the situation and on the decision are compared with each other and with the conclusions from the analysis of the mission. When necessary the latter are more precisely defined and are specified for target, time, and place.

With this comparison, the commander again inevitably encounters a quite regular dialectic contradiction expressed in the fact that each element of the situation or group of elements has a different effect not only on the decision as a whole but also on a given individual element of it. For example, one does not rule out that, on the basis of the concept of operations of the adjacent units, it will be advisable to deliver the main strike on the right flank of one's 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. Because of this conflict in the commander's thinking as the plan is being made, a "struggle of motives" inevitably arises, and several alternative versions of the plan emerge.

The final selection of the best (optimum) or most expedient (close to optimum) among these possible versions of the plan and then formulation of it constitute the essence of the concluding operation in the whole thought process of the commander as the decision is being made.

In general terms this is the commander's method of thinking as he makes the decision.

For more specific analysis of its content, let us present in the form of a summary table a typical list of questions to which the commander must provide answers and also the conclusions at which he must arrive in the process of making a decision to attack from the march (table 14).

The sequence of determination of the elements of the decision indicated in table 14 and figure 24 may vary. Thus, in training exercises great profit has been found in the procedure in which the mission is first analyzed and a separate estimate made for each element of the situation, their effect on corresponding elements of the decision is established, and only then are the generalized conclusions drawn. This procedure is sometimes by convention called making the decision in terms of the situation elements.

Its main advantage is that it gives the commander a complete, specific set of questions to which he must systematically find well-founded answers as he makes the decision. As practice has demonstrated, this procedure is especially valuable during the initial training of young officers in the decisionmaking process at the military educational institutions and the officer's training system in their units when they are given a task involving a new, complex, and entirely unfamiliar situation. In this case, the officer in training, following this procedure while still preparing for the exercise, carefully analyzes each element of the situation, and, in the course of the exercise, his leader brings the

Table 14. Approximate Content of the Commander's Decisionmaking Process for an Attack from the March.

No.	Name of operations	List of main problems to be studied by commander (highlights)	Conclusions at which commander arrives as a result of his thinking process
1	2	3	4
1	Analysis of assigned tactical mission	<p>1. Senior commander's concept: which enemy, in what sequence and with what procedures he plans to attack; sector of main thrust and breakthrough sectors; main targets for destruction by nuclear weapons and conventional weapons in his zone of advance; combat formation and nature of maneuver; methods of operation in an attack without nuclear weapons.</p> <p>2. Mission of his subunit: objective of operations and content of immediate and subsequent missions (what enemy to attack, where, what line to take), depth of these missions and execution times; axis of future advance; width of zone of advance and breakthrough sectors; reinforcement and support resources; routes of advance and lines of deployment; readiness time.</p>	<p>Conclusions from analysis of mission: Place and role of his subunit in mission carried out by higher echelon; place in combat formation and its change in the course of battle; in what sector (main or other) attack is to be made; role of his subunit in rout of overall enemy grouping; required rates of advance.</p> <p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Most effective sequence for routing enemy. 2. Sector of main thrust and breakthrough sector. 3. Structure of combat formation and nature of maneuver in the course of the engagement. 4. Approximate content of missions of subordinate subunits. 5. Especially urgent measures for preparation and support of combat operations.

No.	Name of operations	List of main problems to be studied by commander (highlights)	Conclusions at which commander arrives as a result of his thinking process
1	2	3	4
2	(a) Estimate of enemy	<p>1. Current composition, position, state, and nature of enemy operations in zone of advance: composition in terms of branches of troops, combat capabilities; structure of defense—forward edge, lines, positions and strongpoints, their engineer equipment, fire plan and obstacle system; combat formation, including disposition of nuclear delivery systems and reserves; flanks and unit boundaries; control posts, main electronic facilities, rear area installations; how nearly up to full strength and possible densities per km; composition and nature of operations of aviation, landing forces, and airborne units; morale-psychological state of personnel, personal qualities of commanders.</p> <p>2. Probable nature of enemy operations during our troops' offensive: possible concept of operations, including sector of concentration of main efforts; expected procedure for employment of nuclear weapons and other means of destruction; lines and sectors of counterattacks by reserves; probable changes in grouping; possible scope and nature of enemy air operations.</p>	<p>Conclusions from estimate of enemy:</p> <ol style="list-style-type: none"> 1. Main enemy grouping, whose destruction will sharply reduce his combat capability. 2. Strong and weak aspects of enemy defenses. 3. Possible scope and procedure for enemy employment of nuclear weapons and other means of destruction. 4. Probable concept and nature of enemy operations in the course of combat with or without nuclear weapons. <p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Most effective combat concept: sequence for routing the enemy, targets for destruction by conventional means, sector of main thrust, combat formation structure and nature of maneuver. 2. Tactical missions of subordinate subunits of branches of troops. 3. Troop coordination procedure. 4. Basic combat operations support measures including final reconnoitering of enemy.

<p>(b) Estimate of own troops</p>	<p>1. Effective fighting strength and state (in terms of branches of troops and special troops): how nearly up to strength, combat training, experience, morale-psychological state of personnel, degree of general training, organizational abilities of commanders and staffs; state of weapons, equipment, and transportation, supply situation.</p> <p>2. Combat capabilities (in terms of branches of troops and special troops): artillery and mortars—for destruction of enemy targets from indirect fire positions; direct-laying weapons and antitank guided missiles—for destruction of firing points and tanks; air defense resources—for countering air targets; motorized rifle and tank subunits—for creating superiority over enemy at <i>breakthrough of defense and repulsion of enemy counterattacks</i>; engineer troops—for breaching obstacles, laying out routes, supporting forced crossings of rivers, placement of obstacles when repelling enemy counterattacks; reconnaissance resources—final reconnaissance of enemy, command and control resources—for maintaining continuous command and control; rear services—for logistic, technical, and medical support; force correlation and created densities (overall and in breakthrough sector).</p> <p>1. Position: where, in what grouping they are operating, size of gaps between them and own troops.</p> <p>2. Nature of operations: what is to be done at time in question.</p> <p>3. Missions: content of missions, concept of operations, rate</p>	<p>Conclusions from estimate of own troops:</p> <ol style="list-style-type: none"> 1. General condition and combat capability of subordinate subunits. 2. Correspondence of their position to nature of assigned tactical mission, what regrouping is necessary and time required for this. <p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Sector of main thrust (based on position of own troops), structure of combat formation, distribution of forces, elements of the combat formation which must be reliably covered by air defense resources. 2. Tactical missions of subunits. 3. Troop move-up, deployment, and coordination procedures. 4. Main measures for political work, organization of command and control and combat operations support. <p>Conclusions from estimate of adjacent units:</p> <ol style="list-style-type: none"> 1. Effect of operations of adjacent units on accomplishment of mission. 2. With which adjacent units, when, and how we must coordinate most closely.
<p>(c) Estimate of adjacent units</p>		

No.	Name of operations	List of main problems to be studied by commander (highlights)	Conclusions at which commander arrives as a result of his thinking process
1	2	3	4
	(d) Assessment of terrain in friendly and enemy dispositions	<p>of advance of own subunits on the right, on the left, and straight ahead, lines and sectors of commitment of second echelons and missions of assault forces used by the senior commander in his zone of advance.</p> <ol style="list-style-type: none"> 1. General nature of the terrain: type of relief, local objects, hydrography, advantageous lines for enemy defenses and lines whose taking would create conditions for successful development of own offensive; presence of building materials. 2. Conditions of observation, firing, concealment and camouflage: commanding heights, natural camouflage, cover, advantageous areas for placement of combat formation elements, control posts, rear services; lines of possible nuclear strikes, counterattack and mining by enemy. 3. Passability: availability and state of roads, nature of the soil, off-road maneuvering conditions, accessible and inaccessible axes, water barriers, the presence of hydraulic structures. 4. Terrain variation: correspondence of map to actual terrain at given time; possible changes in terrain after nuclear weapons employment by both sides (destruction, flooding, fires, etc.). 	<p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Sector of main thrust (based on operations of adjacent units). 2. Measures to provide for close coordination with adjacent units (communications, mutual aid by fire, support of flanks, etc.) <p>Conclusions from assessment of terrain. Effect of terrain on nuclear weapons employment and accomplishing assigned combat mission; sectors most accessible for troop operations.</p> <p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Sector of main thrust and breakthrough sector. 2. Structure and placement of combat formation, routes of move-up, deployment lines. 3. Lines of immediate and subsequent missions of subunits, axis of future advance. 4. Second echelon start line, deployment of antitank resources, mobile obstacle detachments and other resources. 5. Sectors for forced river crossings. 6. Positioning areas for control posts and

<p>(e) Assessment of hydrometeorological conditions, time of year and day</p>	<p>1 Water barrier conditions (rivers, lakes, and swamps): water level and changes in it in the event of rains and destruction of dams, possible flooding, thickness of ice and snow cover (in the winter), suitability of water for drinking and technical needs.</p> <p>2 Weather: air and water temperature, direction and velocity of wind at various altitudes and near the ground; atmospheric pressure, clouds, fog, and visibility; 24-hour weather forecast of precipitation, dust storms, etc.</p> <p>3 Time of year and day: sunrise and sunset times, duration of darkness and light</p>	<p>rear services installations and supply and evacuation routes.</p> <p>7. Measures for engineer support of the offensive and defense against mass destruction weapons.</p> <p>8. Final terrain reconnaissance requirements.</p> <p>Conclusion from assessing hydrometeorological conditions—effect of hydrometeorological conditions on troop operations in performing mission and on employment of various weapons by the two sides.</p> <p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Sector of main thrust and structure of combat formation (based on hydrometeorological conditions). 2. Measures in the event of sharp changes in hydrometeorological conditions (flooding, snowstorms, bad roads, etc.)
<p>(f) Radiation situation estimate</p>	<p>1 Scope and nature of contamination of terrain and troops: location, time, means, procedure and level of contamination, boundaries of contaminated zone; which subunits and extent of contamination as result of possible enemy employment of nuclear weapons at time in question.</p> <p>2 Nature of effect of contamination of troops: radiation doses (at present and in future, based on forecast); extent of contamination of combat equipment, material resources, and water sources.</p> <p>3 Possible consequences of contamination: expected troop losses, effect of contamination on morale-psychological state and overall combat capability of troops.</p>	<p>Conclusions from radiation situation estimate:</p> <ol style="list-style-type: none"> 1. Extent of effect of the given situation on combat mission performance. 2. Safest sectors of operation of troops. <p>Conclusions for decision:</p> <ol style="list-style-type: none"> 1. Sector of main thrust and combat formation of the troops, based on situation at hand; methods of negotiating contaminated zones. <p>Special measures.</p>

No.	Name of operations	List of main problems to be studied by commander (highlights)	Conclusions at which commander arrives as a result of his thinking process
1	2	3	4
3	<p>(g) Estimate of economic conditions in combat zone and sociopolitical composition of population</p> <p>Selection and formulation of most effective decision</p>	<p>1. Possibilities for using repair enterprises, medical institutions, reserves of material resources, local communications systems for needs of friendly troops (without detriment to working population).</p> <p>2. Class composition of population, its mood, attitude toward war and our troops, traditions, customs, etc.</p> <p>1. Concept of combat operations: what enemy to rout, where, with what forces, resources, procedures, and in what sequence; main targets to be hit by reserves; areas at hand, sector of main thrust, structure of combat formation and nature of maneuver.</p> <p>2. Tactical missions of subordinate subunits of branches of troops: reinforcement means, what enemy to rout (annihilate, suppress), where, and when, what line to take by accomplishing the immediate and subsequent missions, axis of future advance, location in the combat formation, readiness times.</p> <p>3. Bases of coordination: how to coordinate the efforts and operations of the troops in terms of objective (missions), place (lines, areas), and time.</p> <p>4. Most important missions in political work, supporting combat operations, and organizing command and control.</p>	<p>Conclusion from estimate of this situation element: its effect on troop combat operations (friendly and enemy).</p> <p>Conclusion for decision: Measures for using local resources for needs of friendly troops and ways of establishing friendly relations with the population.</p>

trainee to an expedient decision gradually, step by step with the whole collective of trainees participating in this process. Indeed, the very history of this procedure gives evidence of its being intended primarily for training purposes. It was comprehensively developed during the first years after the end of the Great Patriotic War for training officers to be able to thoroughly analyze in their exercises each element of the situation and thus to make sound decisions.

However, this procedure also has serious shortcomings. The most important one is that when this procedure is used for making the decision, it requires a great deal of time, which, as has already been noted, will not usually be available to the commander in combat. In addition, it artificially separates the analysis of the mission from the estimate of the situation as a whole and from each of its elements, it does not reveal the dialectics of the commander's thought process completely enough, it does not give him a very clear indication of how in the final analysis to approach the decision and find the correct answers to the numerous questions presented in table 14.

The means of eliminating these shortcomings, as advanced practice and theoretical studies have demonstrated, may also vary. One of them has already been investigated in the preceding section. It consists of a clear-cut definition of the content, a reduction in the number and volume of all the elements of the decision by eliminating superfluous details and support measures.

A second important means of acceleration of the process of preparing the decision and improving its soundness is the skillful combination (but not replacement) by the commander of the above-indicated sequential feature of making the decision in terms of the elements of the situation with a somewhat different procedure, which may be arbitrarily termed decisionmaking by **decision elements**. There is and can be no essential difference between these two procedures, inasmuch as both have the same methodological base: analysis of the assigned mission and estimate of the situation. The only difference between them is in the thought sequence of the commander.

In making the decision in terms of the elements of this decision the commander analyzes the assigned mission and evaluates each element of the situation in close connection with and from the standpoint of their composite effect on the relevant element of his decision. When he starts to work out the decision, the commander immediately asks himself a specific question (where to deliver the main strike, how to structure the combat formation, and so on) and immediately seeks the answer, giving heed to the requirements of the senior commander's

concept, the structure of the enemy defense, the nature of the terrain, and all other circumstances on which this answer depends. Thus, from the very beginning his thinking acquires a more purposeful nature, it proceeds along a shorter path, and so, more quickly toward his ultimate goal—a definition of the concept, the tactical missions of the troops, and the principles of their coordination (figure 24).

There exists not only the requirement for the commander to use this procedure, but he also has the means. It results from the existence of the aforementioned dialectical relationship between the process of analysis of the mission and estimate of the situation and between the elements of the situation as well as the fact that the commander in combat receives much data on the situation and masters it in advance, that is, before receiving the new mission. In this he differs significantly from, for example, the student at an academy who receives an assignment to conduct a skull session. On receiving the mission, the commander in combat has no need to begin "at zero" and successively sort out each element of the situation mentally, inasmuch as he has already done this work. He therefore has every means of immediately proceeding with the job—of determining elements of the decision. This is also required by the laws of logic and the theory of cognition. In order to convince ourselves of this, let us refer to table 14.

On careful analysis of this table it is easy to see that the thought process of the commander when making the decision simply cannot be artificially broken down into such independent and sequentially achieved steps as analysis of the mission and estimate of the situation. Both of these operations are so closely connected with each other that the least disturbance of this relationship leads immediately to a conflict with the requirements of theory of cognition, whose essence follows below.

The consciousness of man is formed by reflection of the objective world. It follows from this that the process of making the decision by the commander, as is the case with any other kind of cognition, must necessarily begin with sensory perception of the actual combat situation, of objective reality and follow the path "from examination of the actual to abstract thought *and from it to practice*. Such is the dialectical path of cognition of the *truth*, cognition of objective reality."⁹ Failure to fulfill this requirement of the theory of cognition can lead to gross errors, especially when these errors have been permitted by the senior commander and the errors of the commander making the given decision are added to them. In order to prevent this, before the commander begins the concrete, thorough analysis of the assigned mission, the situation must first be examined at least in general terms, and it is

necessary to determine, for example, such factors as where friendly and enemy troops are located and what they are doing (engaging in an offensive, defending, carrying out a march, etc.), what their approximate composition is, and also the general nature of the terrain. Without this, he cannot correctly answer any of the questions in the analysis of the mission presented in table 14. How can one, for example, correctly understand and thoroughly comprehend the objective of the operation, that is, which enemy the senior officer plans to defeat, which enemy is to be defeated by one's own (subordinate) troops, what lines are to be taken, if he does not have even the most general conception of the enemy and the terrain. And it is even more true that without this, it is impossible when analyzing the mission to take even a step toward making one's decision or to map out, for example, even the approximate sector of the main thrust.

This conclusion is confirmed also by the thinking practice of experienced commanders in their decisionmaking during the last war and in postwar training exercises. They always analyzed the assigned mission and estimated the situation in their close dialectical interrelationship and causality. In addition, as has already been noted, it was not only necessary for them to do this, but also the means were available. After all, in combat reality the commander always knows the situation to one degree or another. He constantly lives it. Thus, before obtaining a new mission from the senior commander, on the basis of his warning orders and foresight of the future operations he constantly studies the situation, the state and the capabilities of his troops and also those of his enemy, the terrain in the sector of probable operations, the weather, etc. On obtaining the mission, he only gathers the missing information and makes a more purposeful study of all of the obtained data on the situation, taking into consideration 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 already, or they only require 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. What is especially important here is the capacity of the commander to encompass all of the numerous factors of the situation with his thinking, to quickly 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 sector of the main thrust, and the combat formation of friendly troops will depend primarily on the structure of the enemy defense; the form of the maneuver, on whether he has open flanks and gaps; the content of the tactical missions and the system of coordination of subordinate troops, on their combat capabilities. However, it is not ruled out that other factors can turn out

to be the main ones, for example, terrain conditions, the radiation situation, the state of supply of friendly troops, etc. The art of the commander will consist, in particular, of quickly analyzing the complex labyrinth of the situation and finding the proper way out of it. This art is within the power of a competent, experienced officer only.

Thus, the commander's analysis of the mission and the estimate of the situation are not independent stages of his thinking isolated from each other, but a unified, creative decisionmaking process. After the mission is analyzed, the estimate of the situation does not begin, but continues and goes into greater depth so that all of its positive and negative properties that affect the performance of the assigned mission by the subordinate troops may be comprehended fully and in detail.

This theoretical principle permits a different approach to the content of the very process of analyzing the mission. It allows the commander not to be confined to a mere analysis of the thinking of the senior commander and his own mission, but to take a more confident step toward his own decision, to reject the obviously inexpedient versions of the decision, to make a rough outline of the concept, to give the troops specific warning orders, to make his further thinking more purposeful and thus significantly accelerate the whole decisionmaking process. In addition, in analyzing the assigned mission in combination with the general conditions of the situation already known to him, the commander can break the mission down into a number of intermediate and individual missions (sub-missions) and at the same time allocate the latter among the subordinate subunits responsible for their execution. This procedure is widely discussed in the literature on the theory of production control under the name of construction of a "problem tree" or a "target tree," and it is fully applicable in military affairs, with consideration given, of course, to their specific nature.

To confirm the above, let us present an example of the use of this procedure when a battalion commander analyzes a 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 in analyzing the mission mentally breaks it down into a number of individual missions such as destruction of the enemy at three platoon strongpoints, suppression of 15 machine guns, 1 heavy machine gun, 3 mortars, 10 entrenched tanks, 6 antitank guided missiles, 6 recoilless guns, 2 radars, and 1 observation post. He can simultaneously map out the allocation of all of these enemy targets among his available forces, giving consideration to employing the various senior commanders' weapons against several of them. In spite of the fact that this allocation is of a preliminary nature (with no specific

indication of time and place), it permits the creation of the form, the "skeleton," of the future decision whose content can then be filled out much more quickly and easily. Consequently the close combination of the process of analyzing the mission with estimating the situation has great practical significance.

Nor may one consider the last, concluding operation in the thinking of the commander—determination of the most advisable version and formulation of the decision—an independent stage. In particular it should not be called the making of the decision, as some authors say. We were assured above that the 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 in analyzing the mission and estimating the situation, i.e., throughout the whole decisionmaking process.

The very nature of this process has the character of a search, since, as it proceeds, because of the conflicting effect of the various situation elements, several alternative versions of the decision inevitably occur to the commander in the form of hypotheses. At the end of this process, it is not the making of the decision that occurs, but the selection of one of several versions which the commander for one reason or another (by one criterion or another) considers the best, the optimum, or the most expedient, i.e., close to optimum.

The search for this version begins at the very beginning of the decisionmaking process. During the course of this process, a competent, experienced commander rather easily "sifts out" the obviously erroneous versions from the many possible ones. The remaining few (two or three) expedient or well-founded versions are compared by the commander at the end of the decisionmaking process in terms of the anticipated combat results (the possible enemy and friendly losses, the cost in material resources and time of carrying out the mission and capturing of the terrain, etc.), and he finally selects the best one. By the way, let us note that precisely at this moment not only the mind but also the will of the commander becomes highly important. The worst decision is not to decide anything, that is, to do nothing. After selecting the best version, the commander formulates and announces his decision to his subordinates. The decisionmaking process is completed.

However, even this kind of ending to the given process can be considered only relative. After it is done, the thinking that the commander does about the decision continues, especially when there are frequent changes in the situation, which is most characteristic during the time combat operations are conducted. During this period, the commander

must inevitably 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 an essentially new decision as a whole.

Most frequently, the necessity for amplifying or changing the previously made decision will occur in the course of combat when there are radical changes in the situation which were difficult for the commander and staff to provide for in advance before combat operations began. Thus, when attacking troops approach the forward defensive line of the enemy, which could not be reconnoitered in every detail before the engagement, the commander can obtain entirely new data on the enemy grouping and the location of his fire weapons, which will require more precise definition not only of the missions of his artillery but also the structure of the subunit's combat formation and sometimes the sector of the main thrust. Still greater refinements and changes in the decision can be required after a sudden enemy nuclear attack, his destruction of hydraulic structures, flooding of the terrain, and in other similar situations.

Thus, the commander's thought process about his decision occurs at all stages of command and control, beginning at the moment the tactical mission is received and ending when it has been carried out. No commander can hope that after making even a sound decision and issuing the operation order everything will proceed, as it were, automatically on its own, since the enemy will always strive to take the appropriate countermeasures. The commander does not slack off in his thinking or creativity in combat.

The Commander's Logical Methods of Thinking in Decisionmaking

Now let us consider which specifically logical methods of thinking the commander can use when making a decision.

Of these methods, the general **dialectical materialistic method** of cognition of the truth is of paramount significance. From the very beginning of the thought process of making the decision, it requires that the commander base his thinking primarily on objective facts, the actual circumstances; correctly evaluate them from the quantitative and qualitative standpoint; consider them in close interrelation, continuous development, and change; discover the contradictions in this development; find the basic element; discover the main factors having a decisive influence on the successful accomplishment of the tactical mission by the troops, i.e., see beyond the external phenomena to the essence of the engagement.

When this method is used it is especially necessary to dwell on the importance from the commander's standpoint of considering the combat situation not so much statically as dynamically in terms of the changes and development in the course of combat. Only with this approach will the commander be able not just to passively consider the situation but to be its creator, actively influencing the operations of his troops in the course of the engagement and, through them, influencing the enemy. For this purpose, the ability of the commander to foresee the possible changes in the situation and the course of the forthcoming combat operations is of paramount significance. "It is easier," General of the Army S. M. Shtemenko notes in his memoirs, "for military leaders with the gift of foresight to develop and make a decision quickly. It is often the case that a particular commander experiences great difficulties when making the decision. He considers the various alternatives and does not know which one to choose. Another commander, in the same situation, immediately makes a single choice and rejects the others. This occurs because the latter, as they say, can see further ahead."¹⁰

The ability to foresee the course of forthcoming combat operations during the Great Patriotic War was characteristic of all of the commanders of the Soviet Army who had mastered perfectly the dialectical method of thinking. For example, this is what A. Chakovskiy writes in his novel *Blokada* [The Blockade] about the manner of thinking of Marshal of the Soviet Union G. K. Zhukov: "When he looked at a map, Zhukov did not just reproduce the picture of the past engagement; he could foresee the nature of the future encounter and in a matter of minutes, 'play out,' as it were, the various scenarios first for himself and then for the enemy. He could put himself in the enemy's place for a while so that when he became himself again he could evaluate the intentions of the enemy."

When the decision is being made, the combinations of such general theoretical methods of logical thinking as analysis and synthesis, abstracting and generalization, induction and deduction, analogy and comparison are also extremely important.

In its breaking down of the overall mission into a number of intermediate missions and the general situation into individual elements, **analysis** enables the commander to master each of them more thoroughly and to discover the main ones among them and set aside the secondary ones. Even an example such as one from the experience of the Great Patriotic War confirms how important such analysis is. In the decisionmaking for the offensive in October 1944 against the Stallupoenen fortified area, the decisive factor in routing the enemy was

the correct choice of the vulnerable spot in his defense. The commander of the 96th Guards Rifle Division on the basis of the data obtained from the unit and subunit commanders in studying the enemy determined that southeast of Stallupoenen the enemy had a field type defense. And this determined the adoption of the decision. The decision was to deliver the main strike against this weakest point, enveloping the fortified area from the south, and this ensured the success of the offensive.

The method of analyzing the situation is inseparably connected with **synthesis**, which makes it possible to combine the results of estimating the individual elements of the situation obtained in the analysis process into a unified whole, which is especially important when making the decision in terms of its elements. F. Engels emphasized that without analysis there can be no synthesis, but at the same time ". . . thinking is as much a question of breaking down the objects of consciousness into their elements as of combining mutually associated elements into a unity."¹¹

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 to use isolated, at times insignificant facts about the combat situation, to arrive at general conclusions. **Deduction**, on the other hand, enables one, using knowledge of the general principles of conducting combat operations, to make judgements about individual phenomena in combat reality. Conclusions made by the inductive method of thinking are always verified by the deductive method and vice versa. Induction and deduction, consequently, ". . . are just as necessarily related to each other as synthesis and analysis."¹² Let us demonstrate this with a simple example.

In one of the command post exercises the battalion commander received reconnaissance data that in the vicinity of M_____ there were to be 10 to 15 special vehicles and truck cranes under reinforced guard. On receiving this kind of isolated information and already knowing the enemy's materiel, he immediately assumed by induction that an enemy missile battery had arrived in the indicated area, but what kind? 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 norms of enemy employment of missile troops, he concluded with certainty that a battery of tactical missiles which could launch a nuclear

attack in 15 to 20 minutes was being deployed in the given area.

A commander can use the same method to determine the structure of the enemy's strongpoints from individual entrenchments and fire points or to determine the system of enemy control posts from the operation of individual radios, and so on.

Even with these extremely simple examples we could satisfy ourselves 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 move away from this mass of information about the situation and concentrate our attention on what is most important and decisive for the present moment. However, discovering what is most important in the situation is not a simple task, especially since much information on the situation may be lacking, and part of it will be false. Accordingly, **analogy and comparison** can be of great assistance to the commander, its essence being a comparison of the available intelligence with previously known cases and thus finding the required conclusions for the present and the future. However, such conclusions are, as a rule, conjectural (probable) and occur in the form of hypotheses, inasmuch as the situation is nonrecurrent, and one engagement never resembles another. Ignoring this fact and routinely duplicating previous operations sooner or later leads to mission failure. On the other hand, creative consideration of the changes in the situation and looking for what is new always promotes success. To confirm this let us present two examples from the experience of the Great Patriotic War.

Carrying out an offensive operation, in February 1943 our troops engaged the enemy at Lugansk. In the city itself and on the approaches to it the enemy had set up a strong defense. Repeated efforts to take the city ended in failure, and not just because of the absence of superiority over the enemy. Our troops made an error in that the repeated attacks were usually made at the same time. They began in the morning and ended at dark. The enemy quickly took advantage of this. He used the night to regroup his men and equipment 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 assessed and the necessity for attacking at night was understood, an appropriate decision was made. Then the offensive was crowned with success. In this case the decisive role was played by rejecting routine in making the decision and making a proper, creative selection of the time for beginning the advance.

Here is another example. One of the battalions was to force a large water barrier and capture a powerful enemy strongpoint. This mission was quite complicated in itself, and the battalion commander, Captain Tret'yakov, apparently complicated it still more by the decision that he made after detailed familiarization with the situation. He considered it necessary to force the river, crossing where it split into three branches flowing through a nearly impassable swampy area. However, in reality this most difficult version turned out to be the shortest path to victory. The enemy defenses here were the weakest, and, besides, not expecting an attack from this direction, the enemy was taken by surprise and routed.

A description of a commander's methods of thinking in making the decision would be incomplete without saying something about the so-called **intuitive-heuristic methods**. In recent years a great deal of attention has been given to them in all armies. In essence they are a question of the capacity of the commander to make a decision without detailed analysis or intermediate stages in his thinking process and without thinking through all the situation elements in sequence. In other words, these methods are based on the ability of the commander to "see" the decision, to draw a fast, comprehensive conclusion, to select what is most important from the mass of initial situation data, and immediately arrive at the final result—the decision.

These methods are most clearly exhibited in decisionmaking in the course of combat operations when there is a need for the commander to react quickly to changes occurring in the situation. They are based not only on the subjective qualities of the commander, but primarily on his thorough knowledge of the objective laws of armed combat, the principles of military art, solid mastery of the dialectical methods of thinking, and great practical experience. Consequently, they in no way contradict the logical methods but supplement and go along with them in an integral decisionmaking process. In addition, they are closely connected with the psychological state of the commander, his inspiration, mood, and the mobilization of his will and his spiritual and physical forces.

This property of decisionmaking by the commander has been graphically characterized by General of the Army P. I. Batov in his memoirs *In Campaigns and Battles*. He writes, "Front-line commanders know how many thoughts crowd together when you look at the location of a forthcoming engagement for the last time. Like any creation of human hands and will, the battle occurs twice—first in the mind and then in reality. While the chief of staff is the mathematician of the operation, the commander must be more than that. He must, by the power of

imagination and by exerting the acuity of his senses, experience this first mental battle, whose details are periodically imprinted on his memory like frames on photographic film."

The Use of Mathematical Methods and Means of Mechanization and Automation in Decisionmaking

In order to make a timely, sound decision, it is very important for the commander to use not only logical but also mathematical methods. All of the many centuries of the history of military science bear witness to this. Even Alexander the Great had, as his "adviser on mathematics," Aristotle, who helped him develop the disposition of the battles and of the troops on the battlefield. For A. V. Suvorov, one of the basic operating principles, along with "speed" and "initiative," was "vision."

Without question, the role of mathematical methods in modern combat has increased greatly, since now, instead of movement of the troops on foot and arrangement of continuous uniform columns on the battlefield it is necessary to calculate fundamentally different and more complex phenomena, even to include the radiation situation, and besides the ordinary calculations and "vision" we now have linear and dynamic programming, probability theory, differential equations, systems analysis, operations research, game theory, PERT planning, programming, and computer technology. Without mathematical methods, without quantitative and qualitative substantiation, it is impossible to make a correct, especially an optimum, decision for modern combat. Mere common sense, experience, or intuition is no longer enough, while the "trial and error" method is altogether inadmissible, for in nuclear warfare many mistakes turn out to be fatal.

The use of mathematical methods is brought about not only because there is a need for it but also because the means are available. The creative nature of the decisionmaking process does not mean that it is in no way characterized by operations which can be formalized, algorithmized, expressed in mathematical language. These operations mainly involve the **performance of various calculations** required for making a sound decision for using the available men and equipment in combat. The following are usually the most important and most frequently encountered calculations in control practice:

(a) Calculation of the combat capabilities of the branches of troops and special troops of the belligerents (table 14), such as, for example, the capability of artillery and mortars for hitting enemy targets from concealed fire positions; of direct-fire weapons and antitank guided missiles for destroying firing points and tanks; of air defense weapons

for destroying air targets; of engineering troops for breaching obstacles, laying out routes, and supporting river crossings, etc.;

(b) Calculation of the quantitative and qualitative force correlations and the created densities per kilometer of front;

(c) Calculation of the possible troop losses on both sides;

(d) Calculations connected with the movement and transportation of troops by various forms of transportation, forcing of water obstacles, assault landings, and comprehensive support of combat operations;

(e) Calculations for forecasting the radiation situation and personnel radiation doses.

Depending on the type and scale of the engagement, there may, of course, be other calculations. Among them, the particularly important ones are those that make it possible to compare friendly and enemy troop capabilities, not just as they exist at the beginning of combat operations (static condition), but also those which, taking account of the expected losses of the belligerents, can hold true in the course of combat (dynamic condition) during performance of the intermediate and particular missions: in-depth breakthrough of the defensive positions from the march, repulsion of enemy counterattacks, forcing of river crossings, etc. On the basis of these calculations, the commander and staff determine the number and correlation of forces required for successful accomplishment of the assigned mission, grouping of the forces, and their methods of operation. The quantitative and qualitative correlation of forces is usually calculated in several versions. Thus, on the offensive it is first determined for the entire zone of forthcoming combat operations and the entire depth of the mission, and then, during the performance of each particular mission, also separately for the sector of the main thrust. In the event of operations involving nuclear weapons, it is also necessary to define the correlation of forces after the assumed (anticipated) nuclear strikes of both sides.

The basic criteria used to calculate the correlation of forces at battalion level are as follows: motorized rifle (motorized infantry) subunits; tanks; artillery and mortars (by calibers); antitank weapons. The initial data for the calculation are the following: the actual makeup of the subunits participating in the given engagement, the grouping of friendly forces which may take part in carrying out each mission, the enemy grouping opposing our troops in each instance. These data are used to compute the size of the forces, and the previously determined quality of the resources on both sides is taken into account. Then their correlation is determined by dividing the greater indices by the smaller ones. The results of the computation are usually recorded on tabular forms previously made up for this purpose.

Experience shows that the greatest accuracy in such calculations can be achieved by using the so-called coefficients of commensurability of combat capabilities (firepower, strike force, maneuverability, etc.) of various types of materiel and combat potentials of the subunits as a whole of both friendly and enemy troops. For example, taking the combat capabilities of our 122-mm howitzer and motorized rifle battalion as the initial unit (1.0), one may compare them with the combat capabilities of the other friendly and enemy weapons, units, and subunits and thus obtain the coefficients of their commensurability (their combat potentials) that enable us to calculate and compare the combat capabilities of any grouping of troops of the belligerents.

Consideration of the changes in these capabilities, depending on the type of troop operations (offense, defense, meeting engagement), the nature of the terrain, the level of engineer equipment, weather conditions, and also the actual or anticipated losses of the troops on both sides can be achieved using additional (correctional) factors.

Using the coefficients presented above, the commander and staff can also, if necessary, determine the most advisable procedure for replacement of certain equipment or subunits with others in order to improve the combat capabilities of their troops and ensure the greatest superiority over the enemy, especially in the main sector. Thus, a shortage of tanks on the offensive can be compensated for by a corresponding increase in artillery, and the capabilities of antitank weapons on defense can be increased by installing antitank obstacles, etc.

In order to perform the calculations, all modern armies utilize the most diverse means, from slide rules, tables, and graphs (figure 25), and nomograms to keyboard calculators and computers. All of these means make it possible to greatly speed up the calculations and increase their accuracy.

Standard calculations made in advance, such as, for example, the calculation of the required amount of artillery for doing damage to the enemy at the platoon and company strongpoint, the depth of the march column of subunits on the march, the required amount of transportation equipment for moving the subunits, and many others are of great assistance to the commander in his decisionmaking. With these calculations at hand, the commander can quickly use them in finished form or, if necessary, refine them somewhat in terms of the specific circumstances.

For making the calculations with computer equipment every staff should have specially trained officers and NCOs and also procedures,

forms, and formulas compiled in advance. Of course, this does not relieve the rest of the officers of the obligation of knowing how to perform the calculations, but it is very useful, saves time, and increases accuracy if some of them are experts.

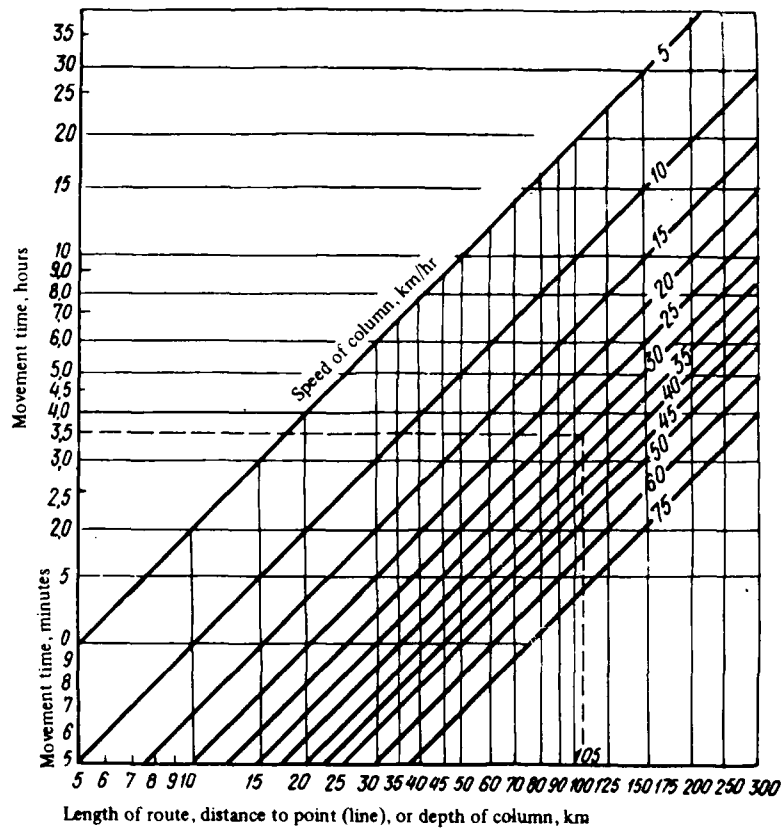


Figure 25. Graph for Determining the Required Time, the Extent of the Move, or the Troops' Marching Rate.

In addition to the performance of the calculations, many modern armies give a great deal of attention to so-called **mathematical modeling** of the dynamics of the forthcoming combat operations of the troops. It can be used during the entire decisionmaking process. However, it is especially important during the concluding operations of this process when the commander selects the best (optimum) or most expedient (close to optimum) of several possible alternative decisions. This operation is called **optimization of the decision**, the basis of which is not just logical and qualitative, but also quantitative substantiation, ensuring the

most effective use of the available men and equipment. It is precisely when this operation is performed that we see exhibited to the highest degree the knowledge, art, and will of the commander; his capacity to overcome conflicts and have the last word; and to give the decision the strength of mandatory law for all of the subordinates.

The essence of any kind of modeling is to construct a model of the object (subject) reflecting with a certain degree of accuracy and completeness its structure and the course and final quantitative results of the operation. After studying the results, one may introduce changes into the model and thus discover the conditions, means, procedures, and times for achieving better results.

Modeling methods can be quite varied: logical, heuristic, cybernetic, graphic, experimental, and so on. The commander's decision which we investigated is nothing more than a logical model of the dynamics of the forthcoming engagement. The relief plan or map with the decision reflected on it is a graphic model of the engagement. Tactical training in a situation which is close to the conditions of the forthcoming engagement is its experimental model (rehearsal). The weakest point in all such models is the lack of a quantitative base. It is mathematical modeling of combat operations that is called upon to eliminate this deficiency.

Mathematical modeling of the dynamics of the forthcoming combat operations means a formalized algorithmic and logical description of them (for example, in the form of a system of equations and logical rules) which makes it possible to use a computer then to play out their course in several possible versions, to foresee and determine on the basis of the criteria selected the final quantitative results of the engagement, and on that basis to select the best version of the decision.

Combat operations which pursue the goal of destruction of some enemy target offering no resistance or which are of a "duel" nature and are conducted by some single branch of troops using identical weapons are comparatively easily subjected to this type of mathematical modeling. Their results are usually assessed in terms of some single basic criterion (index), for example, in the number of enemy losses. Specifically, these operations may include the combat operations of air defense troops against enemy aircraft. If for any alternative grouping of them we take the expected number of enemy aircraft downed as the basic effectiveness criterion, then the mathematical model of their operations may have the following form:

$$M_0 = N_0 + T_{\text{fir}} + P_{\text{hit}} + K_{\text{cont}} + K_{\text{part}}$$

where

- M_0 = the mathematical expectation of the number of aircraft downed;
- N_0 = the number of available antiaircraft weapon types in the given version of their grouping;
- T_{fir} = the number of rounds which can be produced by each weapon type in one enemy attack;
- P_{hit} = the probability of downing an enemy aircraft with one weapon type in one round;
- K_{cont} = the reliability coefficient of the fire control system;
- K_{part} = the coefficient of participation of the available weapon types in repelling enemy aircraft.

With this model and a computer the commander (or chief) can, when making the decision, quickly obtain an answer to such questions as how many enemy aircraft can be downed by the available air defense weapons in one attack in each version of the planned grouping or how many fire resources are required to ensure downing a given number of aircraft and how they should be regrouped as a result of this.

Similar mathematical models may be constructed for the combat operations of antitank subunits against enemy tanks; for the artillery, in knocking out various targets; etc.

As for combined arms combat as a whole, in which both sides use a large number of subunits of branches of troops and special troops distinguished from each other in purpose, organization, armament, capabilities, and methods of operation, construction of a mathematical model reflecting all aspects of the operations of friendly and enemy troops is a complex matter. The main difficulty, as we noted in the first chapter, is that the expected results of a bilateral combined arms engagement must be assessed not by some single criterion, but by several conflicting (incommensurate) indices: namely, the expected enemy losses; the possible or preventable losses of friendly troops; the expenditure of material resources and time for execution of the mission; taking (or holding) the terrain; and so on. It is desirable for some of these indices to be maximal and others minimal. In addition, a number of the initial data required for mathematical modeling are difficult or impossible to formalize and to measure quantitatively (the combat training, discipline, and morale-psychological state of personnel on both sides, the mental and organizational capacities of their commanders, the

national characteristics of the people, the sociopolitical consequences of the forthcoming combat operations, and so on). Much of the initial data are incomplete, random, contradictory, and even false. In such conditions, putting together some sort of "victory equation" reflecting the entire diversity of combat operations is not an easy matter and therefore no miracle should be expected of the mathematician. Therefore, one must neither underestimate mathematics, nor overestimate it. The fact should not be ignored that the enemy sooner or later will know our "equation" and take countermeasures.

There is only one way to surmount the difficulties noted—a skillful combination of the above-investigated logical methods of thought by the commander in making the decision with mathematical methods, especially with the performance of calculations already mastered and also with manifestation by the commander of creativity, art, boldness and cunning, the capacity to deceive the enemy, achieve surprise in attacking the enemy, combined with a skillful application of the principles of conducting combat discussed in the rules and regulations.

An arbitrary mathematical simplification of combat operations can, in its pursuit of a fashionable formula, lead to a useless expenditure of time and gross errors in the commander's decision, and thus to unjustified losses and even a failure in his troops' execution of the assigned mission. The decision of A. V. Suvorov to attack the 100,000-man Turkish Army at Rimnicu with only 10,000 soldiers was based not so much on mathematics as on exploiting the fighting qualities of the Russian "miraclemen" and the Turkish command's incapacity for flexible control of its large army. There was a risk, but a reasonable one, based not on the number but the quality of the troops. It completely justified itself. Many similar examples come to us from the experience of the Great Patriotic War. The decision of the Stavka of the Supreme High Command of the Soviet Armed Forces to go on the offensive in the spring of 1944 was based primarily on the inability of the German fascist troops to conduct combat operations during the season of bad roads. The launching of the principal attack of our forces in the Belorussian operation over nearly impassable swampy terrain was justified primarily by the achievement of a surprise attack.

A similar approach to planning is also possible on a tactical scale. In one of the Far Eastern Military District troop exercises, tank battalion commander Major N. Revnichenko, in order to achieve a surprise attack, decided to advance through areas lacking in roads, over sections of mountainous forested terrain, and passes involving crossing ice-bound rivers. Inasmuch as the "enemy" did not expect a tank attack from this direction, the battalion's attack was a surprise, it was

fast, and could not be repelled.¹³

On the whole, a close combination of logical and mathematical methods in decisionmaking is one of the most important measures of a commander's maturity, his knowledge, and his skill in command and control. The availability 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 coordination of the human commander with the machine and the decisive role of the former can ensure that the requirements imposed on today's decisionmaking are met.

Organization of the Work of the Commander and the Control Organs in Decisionmaking

The final results of the creativity of the commander when making decisions and the soundness and timeliness of the decision depend to a great extent not only on the knowledge, experience, thought process, and will of the commander and his use of mathematical methods and computer equipment, but also on the organization of his work with the control organs during this period. This organization, in turn, will be determined every time by many factors, among which the time available will have the decisive effect again for decisionmaking. Inasmuch as this time will vary with the circumstances, it is impossible and pointless to give any single formula for this problem that will be suitable for all cases. In the organization of the work of the commander and control organs in decisionmaking, a creative approach, skill, and inventiveness are also necessary in order to make economic use of every minute and to give the subordinates as much time as possible to prepare for implementing the plan.

Considering what has been said and also the general principles of organization of control organ operations, let us consider the specific nature of this organization in making a decision under the most typical conditions from the point of view of time.

A more or less significant amount of time for decisionmaking will be available to the commander in preparing for an offensive from the march with an advance from the buildup area. In addition, in this case the whole situation will be comparatively favorable, since the subordinate troops are not in direct contact with the enemy and are not conducting combat operations with him except, of course, for

protection from nuclear strikes and countering of aviation, airborne, and commando-type reconnaissance groups. From the standpoint of time, conditions will differ for the better also when switching to the offensive from a defensive position, although in this case there will be no prolonged breaks as a rule.

In all these circumstances the work of the commander and the officers of the control organs in making the decision can be organized approximately as follows. After assessing the general situation, usually with the chief of staff, and analyzing the tactical mission assigned by the senior commander, the commander outlines an approximate concept of operations, determines the especially urgent measures concerning combat preparation, and calculates the time available for this. The chief of staff briefs the rest of the control organ officers in command positions on the assigned mission and the commander's concept at the time established by the commander and, at the same time, gives them instructions for disseminating the warning orders to the subordinate subunit commanders and also for preparing for the commander the estimates and the data needed on the situation.

The positive aspect of starting the job this way is that it gives the subsequent actions of the subordinates a purposeful nature, since the control organ officers know for what purpose (for what idea of the commander's) they must prepare the situation data and estimates, and the subordinate commanders and chiefs are able to proceed with specific combat preparation and to carry it out *concurrently* with the higher control echelon.

Continuing to assess the situation, the commander in the course of this work listens to the conclusions and proposals of the chief of staff and others on matters that are his concern, and in the final analysis formulates and announces his decision. All of this work is usually done first on the map, and then its results are amplified and specified on the terrain during the commander's reconnaissance.

The commander will be forced to organize his work differently in making or amplifying the decision when there is limited time, for example, when he receives a new mission during combat operations already under way. Judging by the experience of exercises, the most efficient organization of work will be that where the commander makes the decision while he is in the field or at the control post and is working in a specially equipped location (in a dugout shelter or a command vehicle) with the chief of staff, his deputies, and other officers in command positions. Here he analyzes the new mission with their help, assesses the latest changes in the situation, briefly exchanges ideas with them on

the most important problems, and at the same time makes (or amplifies) and announces his decision. Thus, a sort of *tactical command and control center* is organized at the control post. If the decision is made on a map, then if there is time the commander amplifies it during a short ground reconnaissance, carried out in armored command vehicles only in the main sector with a strictly limited group of personnel.

One does not rule out a version of the organization of the job in which the commander alone will have to immediately make a decision or amplify it and give instructions (or a command or signal) on the spot to the subordinates to execute the decision. Usually this version will be inevitable when making and amplifying decisions in the course of combat operations when it is a question of an immediate reaction to drastic changes in the situation and every moment is precious: a decision to repel a sudden counterattack by the enemy, eliminate the enemy grouping or assault force that has penetrated to the rear area of our troops, etc. Under such conditions, command and control will be exercised by the commander on the principle "I see (or hear); I command."

In all of the remaining cases, the commander must take advantage of the slightest opportunity to exchange opinions with his closest assistants, especially with the chief of staff and the specialists in the employment of the branches of troops and special troops. Modern combined arms combat is conducted with materiel that is extremely varied and complex. It is difficult for the commander, even if he has higher military education, to correctly solve all by himself all the tactical and purely technical problems connected with its use. Therefore, in organizing this sort of combat it is very important to remember the behest of V. I. Lenin that "any specialist must be valued as a unique achievement of technology and culture without which nothing, no sort of communism could exist."¹⁴ At another point, in warning the leaders against pure bureaucracy, he wrote: "Isn't it disgraceful to correct the work of hundreds of the best specialists in an offhand manner, to dismiss it with vulgar sounding jokes, to boast of your authority to mark it 'disapproved'?"¹⁵

In addition, V. I. Lenin often warned of the inadmissibility of long meetings and conferences in working out decisions. "Giving everybody his word in a discussion," he wrote, "must be reduced to the necessary minimum and never stand in the way of a quick, confident decision . . ."¹⁶ This advice by the leader is especially valuable for the modern commander exercising tactical command and control. Wordy reports, discussions, and contradictory proposals on the part of subordinates during the decisionmaking process are, of course, inad-

missible, for they inevitably lead to loss of valuable time and can confuse the commander, especially if he still lacks experience. A short exchange of ideas with his closest subordinates, their succinct responses to questions of specific interest to him—all of these are what the commander needs for making the decision. The role of the chief of staff is especially great in this. It is he, particularly, who must always be ready to satisfy the commander's requirement for a short, precise answer to any question connected with assessing the situation and also his need for proposals concerning the decision which are given the required substantiation in estimates and conclusions.

We should also take note of the psychological aspect of the collective's participation in working out decisions. Practice confirms that in collective work the psychophysiological state of the commander is reshaped: his receptiveness, self-criticism, and reaction to circumstances are increased, while the danger of bias and willfulness is decreased. The subordinate officers in the control organs can, in their turn, gain a more thorough and an identical understanding of the commander's concept and their own mission. The atmosphere of businesslike cooperation, mutual understanding, and trust is strengthened, as is confidence in the correctness of the commander's decision and in the achievement of success in the forthcoming engagement and satisfaction in their work as fighting men.

On the whole, the high personal qualities of the commander, his know-how, independence, and strong will, combined with the collective wisdom and creativity of the control organ officers are the most important requirement for making a timely, well-founded decision and for the purposeful further work of the control organs with respect to planning combat operations.

3. Planning Combat Operations

The Content and Procedure of Planning

In the preceding sections we established that the commander's decision cannot encompass absolutely all aspects of the organization and conduct of the forthcoming combat operations. Therefore, it inevitably requires further detailed development as well as paper work. It is this detailing and drafting of the plan that comprises the content of the process of planning combat operations.

The first part of this process—the detailing of the decision—consists of a detailed determination of the men, equipment, procedures, and times for performing each mission outlined by the commander in the decision and also the procedure for employing the subunits of the branches of troops and special troops; the organization of coordination; the measures for political work, for comprehensive support of combat operations, for the commandant's service, the organization of monitoring and control.

The second part of the planning process—accomplishing the paper work for the decision for combat operations—is necessary in order that the decision may be available to other people and so that it takes on a final, official form.

Thus, the planning is based on the decision, it forms an indivisible unity with it, and at the same time is closely connected with other measures taken by the commander and the control organs for organization of combat operations (figure 26).

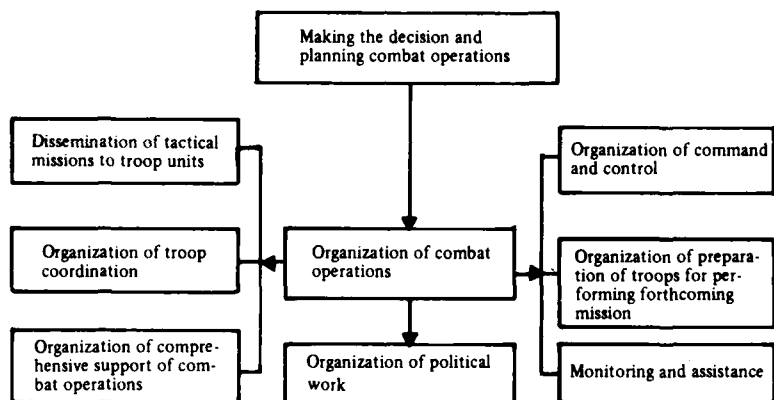


Figure 26. The Place of Planning in the System of Basic Measures for Organizing Combat Operations.

During the planning process the greatest attention is concentrated on finding the means of the most effective employment of the subordinate troops in combat, determination of the best version of the operating procedure, ensuring maximum defeat of the opposing enemy grouping quickly and with the least expenditure of men and equipment. The achievement of this goal is studied from the standpoint of the decisive role of nuclear weapons in the event they are employed by the senior commanders in carrying out the tactical mission. It is the decisive factor in determining the content and the procedure for

implementing the planned measures. Depending on the number, the power, and the explosive type of the nuclear weapons called for in the senior commanders' plan and the expected results of their employment, the employment of friendly resources in the forthcoming engagement is also planned.

Planning usually begins with receiving the warning order or the tactical mission from the senior commander, and it ends when the engagement is being organized with the development and signing of the operations documents by the commander and the chief of staff. Planning continues during the course of the combat operations. In response to changes in the situation and the decision of the commander, amendments and amplifications are introduced into the previously developed plans, and when the situation changes drastically or a new immediate mission is received, planning is instituted again.

When a short time is available for the preparation of combat operations, it becomes especially important to provide for concurrent planning work at all levels, which brings about a two- or threefold reduction in the total time spent on planning. This sort of concurrent work is achieved, after the commander defines the concept of the operations, primarily by disseminating the warning orders to the subordinates, in which they are familiarized with the nature of the forthcoming tactical mission.

The specific content, the volume, the sequence, and the methods of planning combat operations depend on the level of the element doing the planning, the type of combat operations, the nature of the assigned mission, the established working style of the commander, the quantity and the level of preparation of the staff officers, the availability of technical control means and also of time for preparing combat operations.

At the battalion and even the regimental level, the making of the decision by the commander, the planning of combat operations, the development and filling out of the basic combat documents is always a single, interconnected process. As the commander makes the decision, it is immediately plotted on the map, and the required textual information and calculations are entered in the working notebooks. After the decision is made, the individual problems are detailed and the documents are filled out. Let us briefly consider this process as applied to an offensive.

Many years of experience have developed a definite and most expedient sequence in making the decision, its formulation on the map,

and the planning of the combat operations, the observation of which corresponds to the established working procedure of the commander in analyzing the mission, estimating the situation, defining the concept of operations, the tactical missions, the principles of coordination, support, and command and control (figure 27).

The formulation of the decision begins with the plotting of data from the operation order received from the senior commander on a previously prepared map. On the offensive, the zone of forthcoming operations is plotted first. This immediately determines the bounds within which will be depicted the most detailed data on enemy defenses and also on the employment of the men and equipment of the senior commander in one's own zone. Part of the data can also be added from other documents, in particular, from reconnaissance diagrams and summaries, photo mosaics, photographic maps, and so on. The degree of detail with which this is plotted is determined by the level of the command.

The following matters concerning the enemy are usually plotted on the battalion commander's map: the outline of the forward edge and positions; the platoon strongpoints and their engineer equipment; the fire plan with details down to the individual firing point—the machine gun, the tank, the antitank missile, the gun; the artillery and mortar subunit fire position areas; the obstacle system in front of the forward edge and in the depth 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 counterattacks, the occupation of the prepared positions or areas), the locations of the enemy control posts. At higher echelons the maps have more generalized data plotted on them.

After the data on the enemy have been depicted, the assigned tactical mission should be plotted, taking into consideration the elements of the defense and the structure of his combat formation. It is necessary at the same time also to indicate the missions which are performed in the subunits' zone of advance by the senior commanders' resources, especially data on their employment of aviation, assault forces, and artillery and also the planned lines for committing the second echelon to action, the firing lines of the antitank reserve and the mining lines for the mobile obstacle construction detachment. The areas of deployment of the men and equipment designated as subunit reinforcements are also plotted.

The adjacent units are an essential element of the situation. In the senior commander's order the missions of the adjacent units at the same

level as one's own units (or subunits) will be indicated. Therefore, when the commander is making the decision, the staff will have to obtain from the adjacent units and plot on the map the data on the subunits operating directly on their flanks.

When the route of advance, the line of departure, the control line, the line of deployment into battalion, company, and platoon columns, the line for switching to the attack, and the time these lines will be reached or crossed are indicated in the senior commander's order, then they are also plotted on the map. If, however, these data must be defined by the commander and staff, then they are depicted on the map later, during the decisionmaking process.

The above information is used by the commander as the initial data that he needs for making a sound decision.

In the course of the comprehensive estimate of the situation, the enemy grouping and the possible nature of its operations while the subordinate subunits are fulfilling the assigned mission are reflected in greater detail on the map than was the case in the senior commander's order. The perimeters of the strongpoints, the possible lines of deployment of reserves and the axes of their attacks, the locations of the control posts not only in the subunit's zone of advance but also in the zones of the immediately adjacent units are defined and plotted especially carefully.

As the commander defines the elements of the decision, they are immediately plotted on the map. First the sector of the main thrust and all the elements of the combat formation at the time of attack are indicated. If a switch to the offensive from the concentration area is contemplated, then the following are plotted for each subordinate subunit of the first echelon: the line for switching to the attack and the time for moving up to it; the axis of the attack and the line of the immediate and subsequent missions; the axis of the subsequent advance; the following lines and the times for crossing them: the jump-off line, the control line, the line for deployment into company (or platoon) columns, the troop safety lines; the boundaries between the subunits.¹⁷

For the second echelon subunit the following are defined and plotted: the route of movement, the line for commitment to action, the immediate mission line, the axis of the subsequent advance, the time for crossing the jump-off line and the control line.

The map depicts the missions to be performed by the organic and attached artillery and mortar subunits in terms of the periods of combat

operations of the artillery—during artillery preparation of the attack, artillery support of the attack, and artillery accompaniment of the offensive during combat in the depth of the enemy defense; the areas of the fire positions planned during preparation and in the course of development of the offensive. The antiaircraft subunit is given the fire positions, the direction of movement and the areas in which it must cover the troops against enemy air strikes.

The antitank reserve, if it is called on in the zone of operations of the battalion to destroy enemy fire weapons by direct laying during artillery preparation, is given the positions and the times for taking them up. For the period of combat operations, the lines are reflected from which the senior commander plans to use this time to repel enemy tank counterattacks; for the mobile obstacle construction detachment, the mining lines.

The map shows the place and time of deployment of the control posts and the direction of movement of the command posts during the advance.

One may not consider the decision completely formulated if the basic matters of coordination are not reflected on the map. There is no question in this matter that the principles of coordination are determined by the commander in his decision. However, for coordinated employment of all the men and equipment in combat, it becomes necessary to solve a number of problems additionally. In particular, it is necessary to coordinate the operations of the subunits with the nuclear strikes carried out in accordance with the senior commander's plan and also with the fire and strikes by conventional weapons. For this purpose, first of all, the objectives and targets are distributed among the fire weapons, taking into account the possible results of nuclear strikes, and determination is made of the procedure to be followed by the subunits as they move out to the assault line, during the attack on the forward edge, during the battle for important objectives and lines in the depth of the enemy's defenses.

When plotting all of these data on the map it is necessary, however, to keep in mind that excessive detail may detract from the clarity of the map and complicate its use. Therefore, in our opinion, in addition to the previously indicated problems, the following may be reflected on the map:

(a) For carrying out artillery preparation: the dismount line, the locations for putting on the mine-clearing attachments for the attached tank subunits, the points of passage through the obstacles in front of the enemy's forward edge, and the time for making these passages;

(b) For carrying out the immediate mission: the axis of attack of the subunits during joint operations when capturing flank strongpoints and when destroying the enemy grouping in conjunction with the adjacent unit, the methods of repelling possible enemy counterattacks;

(c) For performing the subsequent mission and developing the future advance in the depth of the defense: the lines for repelling possible counterattacks, the resources called on to perform this mission, the axis of the strikes for accomplishing the rout of the counterattacking enemy grouping, the lines of the antitank reserve and the mobile obstacle construction detachment, the missions of the artillery subunits for destroying the enemy reserves with concentrated and barrage fire during their advance and deployment.

A good many of the coordination problems will be reflected by the commander in his working notebook. The details of these entries will depend to a great extent on the level of training of the commander himself, the availability of time for organizing the offensive, and the methods of informing the subordinates on matters of coordination.

Along with the decision, the same map may also reflect the principle results of the planning measures for comprehensive support of combat operations, such as, for example:

—for reconnaissance: composition, focus of operations and missions of reconnaissance groups and patrols;

—for protection from nuclear weapons: the area of disposition of the composite detail for cleanup after nuclear strikes, the areas planned for complete specialized treatment;

—for engineer support: the composition and focus of operations of the movement support detachment, alternate (or reserve) routes to be prepared by the combat engineers subunit in the event of damage to sections of the main route, passages through obstacles;

—for rear services support: the point of deployment of rear services subunits in the course of the offensive.

The following are reflected in the form of tables in the commander's notebook and partially in the margins of the map: distribution of resources, force correlation (combat capabilities); artillery preparation schedule; coordination, warning, and target indication signals; the presence and allocation of material resources.

In addition to the decision on the map, its detailed development will be reflected in the planning of questions of the combat employment of the subunits of the branches of troops and also the measures for political work and comprehensive support of combat operations. As has already been noted, with respect to these problems, the commander's

decision usually defines only the main missions and the basic ideas of how to carry them out and thus gives the executive agents the opportunity for an independent search for the best methods of using the men and equipment under their command. The role of the officers of all the control organs as creative organizers of combat operations is clearly manifested in this.

The number of all other operations documents (besides the map containing the commander's decision) and also their content and completeness are determined by the chief of staff, giving principal consideration to practical necessity, the availability of time, and the nature of the mission the troops are carrying out. The documents must be clear and brief, written in concise form, without discussions *pro* and *con*, and without general statements, using simple phraseology and observing the accepted format and also conventional signs and notations. In addition, the content of the documents must be precise, clear, and reliable, and not allow for varied interpretations, even if someone would like to understand the content differently.

One often hears it said that in modern combat, given the rapidity with which a situation develops, there is no sense in wasting time on carefully devising finished working maps and operations documents. Practice convinces us otherwise. When working maps are carelessly kept, and especially if the written operations documents are carelessly developed, more defective work is permitted and there are more errors in calculating the time and defining the missions for subordinate subunits. In addition a carelessly developed working map does not foster in an officer a high sense of responsibility in his work for plotting the situation precisely, nor does it train him to be orderly, organized, and professional in command and control. He gets used to commanding his subunits without precise estimates and without subjecting the current situation to thorough analysis.

The positive experience of staff work during the Great Patriotic War is indicative in this respect. When one studies the materials of the last war in the archives, he always examines the operations documents of the staff of the 311th Guards Rifle Regiment, 108th Guards Rifle Division with profound respect.¹⁸ More than 30 years have passed, but these documents still retain their high quality. They serve as an example of the attitude that should be taken toward developing them. The main thing that stands out about them is their brevity, clarity, and the care taken in making them out. They are all executed with a high sense of responsibility for the quality of the work. It is very difficult to imagine today that the majority of them were put together in trenches, under enemy fire, with poor lighting, and sometimes in bad weather.

Nothing crossed out, not one correction or carelessly formulated sentence. The people who wrote them understood the high purpose of operations documents and put all of their diligence and skill into working them up.

Credit for this goes first of all to the chief of staff, Lt. Col. I. F. Tarkhanov, who had just gone through that great school of working in operations at division headquarters. This is just one of the components of the work of the chief of staff in modern combat.

It is becoming exceptionally important to get planning accomplished quickly. Thus, the need arises to reduce the volume and number of documents, to give up making unwieldy plans and, at the same time, to make more extensive use in command and control of oral orders to be written down later. Given these circumstances, the role of the working map becomes more important. The commander can use it to estimate the situation, make the decision, assign the missions to the subunits, organize coordination, and monitor the troops' performance of their assigned missions. Depicting the main problems of organizing combat operations on working maps and the estimates and reference materials in working notebooks makes it possible to drastically reduce the time in planning.

Experience in exercises has shown that during the planning process, in addition to the working maps, it is more advantageous in many cases to develop other documents graphically also. They provide not only for better clarity and convenience of use, but they also make it possible to drastically reduce the time it takes the addressee to process and assimilate them. This is especially true in that the topographic base, the explanatory inscriptions, and the tables in them can be made out ahead of time, before the tactical mission is received, on the basis of the senior commander's warning order.

In particular, the following can be depicted on the map in advance: areas of deployment of friendly subunits, data on the enemy, the radiation situation, the routes of advance, the bottlenecks in them, and the alternate routes. In addition, the name of the document can be written in, such as "Decision of the commander of the 1st Motorized Rifle Battalion for 17 September offensive" or "Working map of the commander of the 1st Motorized Rifle Battalion. Started_____ Finished_____." For convenience of work, it is important for the map to depict the populated areas, the elevation and, if necessary, also to have the identifying codes written in.

The time can be reduced considerably if the required forms for tables are prepared in advance. In particular, when preparing for an offensive engagement, one may prepare the following forms for tables (see below and pp. 227-228).

Table 15. Allocation of Resources in _____ (type of engagement).

Subunits	Reinforcement and support resources			
	Artillery and mortars	Antitank weapons	Tanks	Engineer and other subunits
1st motorized rifle battalion, etc.				

Table 16. Schedule of Artillery Preparation of Attack.

Artillery Strikes	Duration (minutes)	Time of firing
1st, etc.	10	"H" hour - 32 min to "H" hour - 22 min

Great possibilities for reducing planning time open up when formalized operations documents are used. The formalization process is based on the fact that documents contain constant and variable values or, putting it differently, constant and variable information.

Analysis shows that of the total content of each document, as much as 50 percent of it is constant information. Thus, half of the document can be written in advance on a blank form, thus making it possible to reduce considerably the time taken to make it out. When one has ready-made forms listing the constants, making out the document amounts to filling in the variable data in the form of names of populated areas, local features, dates, numbers, etc. This eliminates the need to

Table 17. Force Correlation in the zone of Advance _____ and the Mission Capabilities of the Belligerents With Respect to the Situation at _____ (the time).

List of men and equipment and the basic indices of the combat capabilities of the troops	Number		Ratio	
	Friendly Troops (makeup)	Enemy Troops (makeup)	Quantitative	Adjusting for quality (combat capabilities)
Total personnel, including the combat subunits of the motorized rifle (or motorized infantry) company				
Density per km				
Tanks—total number, of which: medium light				
Density per km				
Infantry combat vehicles and armored personnel carriers—total number				
Density per km				
Artillery and mortars				
Total guns and mortars, those exceeding 100 mm				
Density per km				
Total area of destruction of exposed personnel per unit of fire (in hectares)				
Antitank weapons				
Total antitank units, of which: antitank guided missiles on AFVs portable antitank guided missiles antitank guns grenade launchers				
Density per km				
Total number of damaged tanks				
Air defense resources				
Total firing units of which: antiaircraft missile system type antiaircraft guns (installations)				
Total number of air targets downed per attack				
Motor vehicles and prime movers				

Table 18. Availability and Allocation of Material Reserves in Advance.

Supply Items	Available at _____ (time)	Shipped by _____ (time)	Used for performance of		
			Artillery preparation of attack	Immediate mission	...
Artillery ammunition (units of fire) Etc.					

Table 19. Mutual Recognition, Target Designation and Warning Signals for the Period from _____ to _____

Signals	By radio	Light (visual)	Sound
Going over to the attack Calling for artillery fire Cessation of artillery fire Danger of air attack Friendly forces in the area Etc.			

formulate complete sentences, which will certainly reduce the time for making out the document.

Planning time can also be reduced by better-thought-out organization of the work of making out documents. In many cases, it is worthwhile to assign several officers to work up certain documents such as, for example, operation orders. In addition, it is important to go all out in adopting advanced technology in writing the documents: to do away with the preparation of rough drafts, to write clean copy, or dictate the text to a typist from the map. This method of preparing operations documents requires a certain skill. Before dictating, one should prepare all of the necessary data: plot the mission on the working map (if a fragmentary order is being written), mark in the populated areas which will be mentioned, make entries in the working notebook or in the margin of the map showing reinforcements, time, support measures for combat operations, and so on. The officer must have a clear conception of the sequence of presentation of material on the operations document. Then he will not have to interrupt his work to obtain some information that is needed or to more precisely determine the procedure for writing the document, and he concentrates all his attention on a precise, succinct depiction of its content.

Planning Methods

During the process of planning combat operations there are two methods that are most commonly used—sequential and concurrent. Various combinations of the two are also possible.

The sequential method amounts to the fact that the planning of combat operations is carried out separately at each command level: as planning is completed at one echelon, the mission is disseminated to the next subordinate echelon. The planning moves sequentially from top to bottom, involving subordinates in the work. This method of organizing planning was the main one used during the Great Patriotic War, and under those conditions it proved its worth completely.

A positive aspect of this method is the fact that when sufficient time is set aside for the job at each level, it ensures a higher quality performance of planning. The control organ officers can, after combat operations are planned, render real assistance to the subordinate staffs in performing the missions assigned them. This assistance is especially useful to a staff manned with officers lacking theoretical training and job experience. The sequential method is conducive to preserving secrecy of combat preparations.

However, one cannot fail to see the essential deficiencies characteristic of this method. Chief among them is that with this kind of organization work, the planning process takes too much time.

In addition, the sequential method is frequently characterized by excessively rigid centralization of command and control, which significantly reduces the subordinates' opportunities for independent, creative solutions to problems.

Whereas during the past war, this method was the main one, today it may be used in planning combat operations when and only when a great deal of time is allotted to combat preparation.

When time is limited it will be more profitable to use another method, which in practice is customarily called the concurrent method.

The concurrent method indicates the sort of organization of planning operations in which the subordinates, without waiting for the higher echelon to complete absolutely all their planning problems, start working simultaneously on planning the forthcoming operations at their own level.

This method makes it possible to plan combat operations relatively quickly, thus giving the troops more time to work directly on getting ready to perform the assigned mission. This advantage makes the concurrent method the main one, especially when time is limited.

Certain conditions are required if concurrent planning is to be practiced. First of all, the subordinates must receive the initial data that they require for planning. Most importantly these data should include information about the enemy, his groupings, composition, fire plan, engineer organization of the line, and also the characteristic features of enemy operations.

In addition to this, the following may be disseminated to the subordinates in advance: the radiation situation, the terrain conditions in the zone of forthcoming operations, and also the nature of operations in the adjacent units. Obtaining these data allows the subunit commanders to get the feel of the situation and to take a sounder approach to organizing the forthcoming combat operations.

After the mission is analyzed, it is necessary to immediately issue the warning order so as to acquaint the subordinates with the nature of the forthcoming operations and to define the measures which they must take before they are assigned the specific mission: preparing reconnaissance personnel and equipment, replenishing reserves of material resources, repairing equipment, evacuating the sick and wounded, beginning the engineer organization of the ground in the zone of forthcoming combat operations, making a precise determination of the manning and location of control posts, etc., etc.

What has been stated allows us to assert that the employment of the concurrent method is not confined merely to planning combat operations. It extends inevitably to all combat preparation measures, beginning with analysis by the commanders of all stages of the assigned tactical mission and ending with monitoring the readiness of the troops to carry it out.

The following is one of the various applications of the concurrent method in the work of subunit commanders in preparation of combat operations at battalion level (see pp. 232-233).

Thus, with the concurrent method of operation the subordinates are in a position, even before receiving the mission, not only to prepare the required reference data, tables, charts, document forms, and maps, but to be familiar with the enemy, the radiation situation and terrain, and also to think through the various choices of ways to use their subunits,

and so on.

After the commander has defined the concept of operations, the warning orders can then be disseminated to the subordinates, permitting the lower echelon commanders to proceed with making the decision at their own level. In particular, when an offensive is organized, the warning order may indicate the following: the axis and zone of operations, the approximate content of the tactical mission, the reinforcements, and data on adjacent units, and readiness time. Of course, issuing these instructions in the process of making the decision requires excellent operational-tactical training on the part of the commander, the ability to quickly analyze the senior commander's decision and the situation at hand, and, on this basis, to define his concept and the main content of the tactical mission for the subordinates.

Use of the concurrent method of operation is possible and advisable not only at the various levels of command, but also within the command and control system of a single element. With clear-cut organization of work, the responsible personnel simultaneously, without delay, familiarize themselves with the content of the tactical mission received in the unit as it applies to them and proceed immediately to the preparation of the data and estimates the commander requires to work out the decision. As each element of the decision is defined by the commander (the concept, the tactical mission, the bases for coordination) they immediately become the property of the officers concerned, thus affording all responsible personnel the realistic opportunity for concurrent work.

With this system of operation of the control organs, the subordinates can almost simultaneously obtain all of the missions and instructions for organization of combat, which will allow them to quickly proceed with the work of making the decision and planning combat operations.

The essence of the concurrent method of planning is exhibited not only in the organization of the work of the executive agents but also, in a number of cases, in the very content of the planning. In particular, when planning the use of the second echelon today, it is necessary to bear in mind that, in addition to its own main missions, it must be ready to carry out the missions of the first echelon subunit in case the latter is put out of action. Thus, during the planning process both alternatives of the use of the second echelon are being developed concurrently. This requirement causes significant difficulties in the planning process, increases the volume of operations of the control organs, but it is justified and follows from the nature of modern combat.

SEQUENCE OF OPERATIONS OF SUBUNIT COMMANDERS IN BATTALION

Calculation of time	Time for organization						
	1st hour				2nd		
	15"	30"	45"	60"	75"	90"	105"
Subunit commanders							
Battalion commander and his staff	Analysis of mission (on basis of regiment warning orders). Issuance of instructions and warning orders, making decision		Reconnaissance sortie, study of route and deployment lines		Work on terrain under direction of regimental commander, obtaining combat missions, analysis of coordination procedure, amplification of decision and reporting it to regimental commander		
Company commanders	Preparation of subunits for engagement	Mission analysis, issuing warning orders, making decision	Reconnaissance sortie, study of route and deployment lines		Study of terrain, enemy, assault line and approach to it, axis of attack		
Platoon leaders	Analysis of mission, preparation of personnel and of equipment and weapons for forthcoming engagement				Reconnaissance sortie, study of route and deployment lines		

COMBAT PREPARATION USING THE CONCURRENT METHOD (one possible version)
of combat

hour	3rd hour				4th hour	
120"	135"	150"	165"	180"	195"	210"
Organization of combat with company commanders: issuance of operation order, organization of coordination, comprehensive support, and communications	Monitoring and assistance to company commanders and platoon leaders in organization of combat, participation in performing party-political measures					
Work on the terrain under direction of battalion commander, obtaining tactical mission, analysis of coordination procedure, amplification of decision and reporting it to battalion commander	Organization of combat with platoon leaders. issuance of operation order, organization of coordination, comprehensive support, and communications			Assistance to platoon leaders in organization of combat		
Study of terrain, enemy, assault line and approach to it, axis of attack	Work on terrain under direction of company commander, obtaining tactical mission, analysis of coordination procedure, amplification of decision, and reporting it to company commander			Organization of combat with squad leaders and drivers of combat vehicles, issuance of operation order		

Only with clear-cut organization in the work of the control organs is it possible to provide lower echelon staffs 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 enemy's grouping, position, concept of the operations and the radiation situation becomes especially important. Without waiting to receive the operation order, they must systematically obtain these data, especially when the troops are not in direct contact with the enemy and cannot receive information from any other source except the superior staff.

Thus, effective use of the concurrent method of planning combat operations is possible with clear-cut organization and great speed and efficiency in the work of all the control organs.

Notes

1. Lenin, LII, 23.
2. Lenin, XXXV, 203.
3. *Materials of the 24th CPSU Congress* (Moscow, 1971), pp. 68-69.
4. *Materials of the 25th CPSU Congress* (Moscow, 1976), p. 61.
5. M. V. Frunze. *Izbrannyye proizvedeniya* [Selected Works] (Moscow: Voenizdat, 1965), p. 70.
6. Lenin, XLI, 52.
7. See *Taktika* [Tactics] (Voenizdat, 1966), pp. 115-16; *Resheniye komandira na boy* [The Commander's Decision] (Voenizdat, 1964), pp. 20-38; *Vvedeniye v teoriyu vyrabotki resheniy* [An Introduction to the Theory of Decisionmaking] (Voenizdat, 1972), pp. 15-17.
8. Lenin XXIX, 171.
9. *Ibid.*, pp. 152-53.
10. S. M. Shtemenko. *General'nyy shtab v gody voyny* [The General Staff During the War Years], Book 2 (Moscow: Voenizdat, 1973), p. 494.
11. Marx and Engels, XX, 41.
12. *Ibid.*, p. 542.
13. See *Krasnaya zvezda* [Red Star], 23 January 1974.
14. Lenin, XL, 217.
15. Lenin, XLII, 344.
16. Lenin, XXXIX, 308.
17. See I. D. Pombrik and N. A. Shevchenko, *Rabochaya karta komandira* [The Commander's Working Map] (Moscow: Voenizdat, 1972), p. 41.
18. *Arkhiv MO SSSR* [Archives of the USSR Ministry of Defense], fond 4794, inventories 144509, 144510, items 2-6.

Chapter 6. Disseminating the Tactical Missions to the Executive Agents. Organization and Support of Troop Coordination

1. Procedures for Disseminating the Tactical Missions to the Executive Agents

The making of a proper decision by the commander does not in itself ensure successful performance of the assigned tactical mission. The decision becomes the basis for command and control and the law for the subordinates only after its contents become known to them, that is, when each of them receives his specific tactical mission. Therefore, of course, disseminating the tactical missions to the executive agents is for the commander and staff one of the most important functions of tactical command and control.

In performing this function, the commander and staff proceed from the fact that, first of all, the tactical missions are to be disseminated to the executive agents in a timely manner, that is, within a time sufficient for the subordinates to prepare for the performance of the mission; secondly, that they are to be communicated precisely and clearly without distortion of the content; thirdly, the concept and nature of our operations are to be kept secret from the enemy; and, fourthly, that the subordinates are to have available all of the initial data for making their own decisions.

When the tactical missions are assigned to the subordinates the following items are usually pointed out:

(1) The conclusions from assessment of the enemy drawn by the senior commander so that the subordinates may have a clear picture of that enemy grouping whose routing will determine the successful performance of the overall tactical mission and so that they may understand what efforts are required for them for fulfillment of the mission.

(2) The tactical mission and the higher echelon commander's concept of operations so that the subordinates may understand their place and their role in the performance of the overall tactical mission and be ready to replace the commander in case he is put out of action.

(3) The tactical mission of the subordinate, the basic data on the missions of the units adjacent to him, the missions of the senior commander's resources performed to support him, and also his instructions on coordination.

(4) Readiness time for carrying out the tactical mission, who is designated deputy commander for assuming command and control in case the senior commander's control posts are put out of action, and also the location, deployment time, and direction of relocation of these control posts.

It is often necessary for the subordinates to know, in addition, the senior commander's instructions on various types of support—reconnaissance, protection against nuclear weapons, rear services support, and others. All of this is necessary in order that the subordinate commanders be able not only to correctly analyze the procedures for carrying out the tactical missions and determine the expedient methods of the subordinate troops' combat operations, but also to plan additional measures for comprehensive support of combat operations by their own resources.

Thus, the volume of information disseminated to the subordinates together with the tactical missions is significant. However, the absence of certain information does not relieve the subordinates of the performance of the tactical mission assigned them: this absence is compensated for by the initiative, creativity, and independence of the subordinates. Reproach is earned not by the one who does not fully achieve the planned objective of the engagement but by the one who, in waiting for instructions from the senior commander, remains inactive and indecisive, who is afraid to assume the responsibility for independent action. This is especially important in command and control of troops during an engagement, since, when there are sharp changes in the situation and because of limited time, the senior commander will not always be able to give the subordinates all the necessary information in his decision and is even forced to confine himself to sending a radio signal or short command on the nature and direction of the forthcoming operations.

The procedures for disseminating the tactical missions to the executive agents are quite diverse, but the following are used most frequently (figure 28):

(a) An oral face-to-face assignment of the missions to all or several subordinate commanders by the commander himself or by a control organ officer designated by him;

(b) Transmission of fragmentary orders over technical communications equipment by the commander himself or other responsible com-

mand and control personnel:

(c) Sending out written, graphic, or tape-recorded operations 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.

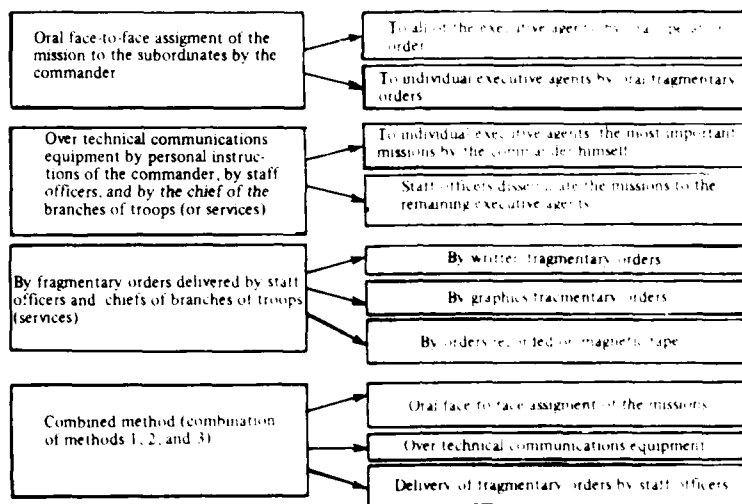


Figure 28. Procedures for Disseminating the Tactical Mission.

Face-to-face oral assignment of tactical missions by the commander to the subordinates had primary significance in the past and still retains that significance. The subordinate commanders, as a rule, are summoned for this purpose by the senior officer to his command post or to a convenient location in the field. If this is not possible, then the commander summons certain subordinates to his command post or goes to their command post where he personally assigns the tactical missions. In each of these cases the commander can most intelligibly communicate to the subordinates everything in the senior commander's decision and information that they need to know for preparation for the forthcoming engagement, he can make certain of proper analysis of the tactical missions and the conditions of their execution by the executive agents, can explain any questions which arise, and can give them practical assistance. This ensures that the concept will be kept secret and that the security of the whole preparation of combat operations will be preserved.

In cases where the commander can assemble all the subordinates, he assigns them their missions in the form of an oral **operation order**, the content and the order of presentation of which depend on the type of engagement, the mission assigned and the conditions for carrying it out. It contains the most important parts of his decision—the concept and the tactical missions for the subordinates. An order given orally is put in written form item by item.

In the first item of the order, the commander reports to his subordinates brief conclusions from assessing the enemy. Here, an assessment is made not only of the enemy force opposite his own subunit, but also those opposite the adjacent units, from which point the enemy can exert a direct influence on the successful accomplishment of the assigned tactical mission. The conclusions are drawn either personally by the commander who gave the operation order, from the standpoint of the tactical mission and on the basis of the latest (up to the moment the decision is made) reconnaissance information processed by the staff. It follows from this that the content of this item cannot be taken verbatim from the order (or instructions) of the senior commander, for the latter gives an assessment of the enemy within the framework of his tactical mission. An exception to this rule can occur when the subunit given the order is not in contact with the enemy (on the march, in the second echelon on the defensive, and so on, and is not using his resources for reconnaissance. In this case the commander presents the strictly necessary amount of information on the enemy, taking it from the senior officer's order, from the information of the adjacent units and the subunits operating forward.

The number of problems evaluated by the commander and, consequently, the volume, content, and sequence of presentation of the data on the enemy depend on the availability of reconnaissance information, the size of the subunit and the type of combat operations.

Thus, the following are indicated in the order to advance on what front, which enemy subunits (units) are defending, where their main line of resistance is; where and in what composition the strongpoints have been set up and positions prepared for nuclear attack weapons; his reserves capable of affecting the accomplishment of the tactical mission, and where the positions are prepared for the reserves, including the switch positions.

In orders to defend, the following are reflected: the composition, position, and nature of operations of the enemy grouping preparing for the offensive; the possible sector of his main thrust and his expected employment of nuclear weapons; the probable time frames for going

over to the offensive.

In this item of the order, depending on the situation, other important conclusions on the enemy can be indicated in a particular form of combat. However, the order should not be overloaded. In particular, poorly substantiated or doubtful conclusions should not be presented in it, nor should information about the enemy obtained by the subordinates by other means.

The second item of the order usually presents the mission of one's own subunit as assigned by the senior commander.

The third item indicates the senior commander's procedure for the employment of weapons in his subunit's assigned zone, the missions of the airborne and other assault forces and also the missions of the adjacent units and their lines of demarcation. This item of the order combined with others has the purpose of enabling the subordinates to analyze their missions and take into account how the senior commander's employment of weapons and the adjacent units' actions will affect the accomplishment of these missions. The adjacent units indicated here are those with which the subordinates will be coordinating directly in carrying out 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 have to find out the missions of adjacent companies by exchanging information with them.

On advancing from the march, on the march, and under other conditions, in addition to the missions of the adjacent units on the right and left, at the beginning of this item the position and nature of operations of the troops in front in direct contact with the enemy may be presented.

The fourth item of the order usually contains the concept of operations of the commander giving the order. It indicates which enemy to rout and in what sequence; the sector (area) of concentration of the main efforts; enemy targets which are subject to destruction by weapons; the combat formation and nature of maneuvering of men and equipment. This is reported to the subordinate commanders in order to ensure purposefulness in their operations, the possibility of correct analysis of the basis for the senior commander's decision and of his role and place in carrying out the overall mission and to be ready to replace the senior commander in case he is put out of action.

In the fifth item of order, after the phrase "I order," individual paragraphs denoted by letters in alphabetical order present the tactical missions of the subordinate subunits. Here the sequence of presentation for example, when there is an attack from the march may be as follows:

— for the first echelon subunits (from right to left, depending on their place in the combat formation)—the identifying number of the subunit and reinforcements; the line and axis of attack; which enemy is to be routed and which line is to be taken when carrying out the immediate and other missions; the axis of the subsequent advance; who supports; the boundary line on the left, route(s) of the move-up; the time of crossing of the following lines (points)—jump-off, control, and approach to the line for going over to the attack;

— for the second echelon subunit—route (axis) of move-up; line at which to be ready to go into action; immediate mission—which enemy to rout in which area and what line to take; the axis of the subsequent advance; when to cross the following lines (points)—jump-off, control; reinforcements resubordinated on going into action. If a combined arms reserve is allocated, then only the axis of the move-up and relocation in the course of the advance are indicated, and the specific mission is assigned before it is committed to action;

— for the artillery—duration of artillery preparation; missions for the period 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 the commander of the artillery group; deployment area and move-up route. In the presentation of the artillery missions, only their tactical content is indicated (which enemy to destroy, suppress, etc., and where), considering that the method of their fire execution (fire type and rate, expenditure of rounds, and so on) is determined by the artillery chief;

— for the anti-aircraft subunit—who to cover during preparation and in the course of the attack and with which weapons.

Then in the fifth item the composition and missions of the various reserves are presented in special subitems.

In the fifth item of the operation order for the defensive, the relevant subitems define: for the first echelon subunits—the reinforcements, the areas (strongpoints) of the defensive and the missions, where to have combat security and in what composition, how the points at which adjacent flanks join are to be supported, who is to support, the demarcation line on the left; for the second echelon—the reinforcements, the main and reserve areas (strongpoints) of the defense and the mission; the axes and lines of deployment for counterattacks and for the tank subunit, in addition, the firing lines for repelling enemy tank attacks; for the artillery—defensive tasking, readiness to open fire,

the fire positions, composition, and commander of the artillery group; for the antiaircraft subunit—the facilities to cover and fire positions; for the antitank reserves—their composition, the areas of deployment, and the firing lines. The rest of the subunits (elements of the combat formation) are assigned missions based on the nature of the defensive engagement.

The sixth item indicates the subunit's readiness time for action.

The seventh item of the order defines the places and time of deployment of the control posts and the axis of relocation of the command post.

The eighth item indicates which of the subordinate officers is designated *deputy commander*, who would assume command and control in the event the commander is put out of action.

It is possible for the commander to personally assign missions to all subordinates simultaneously only during combat preparation and is, of course, ruled out during combat. However, even here any opportunity is used to assign the most important mission face to face by short oral **fragmentary orders**, which differ from operation orders in that they are, as a rule, meant for only one executive agent.

The sequence of its oral or written presentation can be recommended approximately as follows.

The first item of the fragmentary order, just as that of the operation order, indicates conclusions drawn from assessing the enemy.

The second item presents the tactical mission of the subunit to which this order is given. This item is extremely important, and special attention should be paid to formulating it precisely.

The third item usually indicates the missions the senior commanders' resources perform to support the subunit in question.

The fourth item, indicates the subunit's readiness time for carrying out the mission.

This is the most typical content of the fragmentary order and the most frequently encountered in practice. However, when necessary, other problems of concern to the subordinates may be presented in it, for example, modes of operations when performing the tactical mission (in the second item), the mission of the adjacent units (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 concept of operations of the senior commander, then these matters can also be indicated in the second or in a separate item of the order.

A fragmentary order must not be overloaded with excessive data, general rules, and standard requirements. For example, this formulation of a tactical mission, which one actually sees quite often, cannot be considered a felicitous one: "1st motorized rifle battalion, making maximum use of the results of nuclear strikes, coordinating with the adjacent units is to develop the offensive decisively and with great momentum on the Ivanovka-Petrovka axis and by sunrise on 10 February take the Dymovo-Zavidino line." This wording can be cut almost in half without loss of meaning, namely: "1st Motorized Rifle Battalion attack on the Ivanovka-Petrovka axis and by 0600 hours on 10 February take the Dymovo-Zavidino line."

In addition, when presenting any item of an operation or fragmentary order, it is necessary to consider the level of training, experience, and other qualities of the subordinate commanders. It is quite obvious that the competent, experienced, and resolute commander requires less detailed instructions and explanations on the part of the senior commander than the one who does not have these qualities.

In the name of the commander the officers on the control organs disseminate the tactical missions to the subordinates, using working maps that depict these missions. Before the officers go out to the troop units, the commander or chief of staff personally checks the correctness of their interpretation of the instructions they have been given and signs their maps.

The precise communication of an oral order or instruction to subordinates depends to a great extent on the mastery of the commander and the other officers of the language of command, their skill in briefly and, at the same time, completely and clearly presenting the concept of the engagement and assigning 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," is still valid even today. By everything in his external appearance, behavior, and diction when giving the order (or instruction), the commander must demonstrate and inspire confidence in his subordinates in the success of the outcome of the forthcoming engagement. It must not be forgotten that the least vacillation on the part of the commander, his nervousness or rough tone in this case has an immediate negative psychological effect on his subordinates. The order or instruction must be given at a pace that will allow the

subordinates to plot the data on the map and make brief notes in their working notebooks.

Whenever possible, the oral operation (or fragmentary) order is given directly in the field. For this purpose the most advantageous point is selected from which a view is provided of the terrain in the zone (on the axis) of the forthcoming operations, not just a view of the disposition of friendly troops but also of the enemy's disposition to the maximum possible depth.

The dissemination of the mission to the subordinates by technical communications equipment is a procedure which, as a rule, can be used only in the course of combat. When communications channels are used skillfully, missions can be disseminated to several executive agents at once and rather quickly, which at this point is especially important. However, it also has its negative aspects. Transmissions over technical equipment can be intercepted by the enemy; therefore, when resorting to this method, it is necessary to observe strict command and control security. In addition, this method does not allow for immediate confirmation that the subordinates have understood the mission correctly.

When missions are transmitted over technical communications equipment, it is most important to reduce the volume of instructions as much as possible, even to the point of replacing them with commands and signals. Thus, for example, the instructions "Destroy the attacking enemy and develop the offensive on the Smolino-Andreyevka axis" can be transmitted by the previously established signal: "Bereza 1256 1858" (the coordinates). This reduction in volume of information is especially necessary when various automated and signal devices are used. Considering the possibility of loss of communications with the troops for various reasons, it is necessary to transmit to the subordinates first the tactical mission and then all other necessary data. In addition, it is important to observe a set transmission rate. In particular, everything that the subordinate must know should not be transmitted to him all at once (in a volley), for in this case when a message is garbled it is difficult to find and correct the error. With proper organization of the job, the staff officers will be able, while the decision is being worked out, to transmit instructions to the executive agents as soon as the commander makes the final determination of their missions and the measures for organizing the forthcoming engagement.

The most important and urgent instructions are usually transmitted by the method of direct conversation with the subordinates. However, the officers must have special training and well-developed skills in order

to hold these conversations. When the instructions are transmitted by telegraph, one must use blanks of a set color, thus requiring the radio (or telephone) operator to transmit these telegrams as top priority.

Dissemination of tactical missions to subordinates by written or graphic operations documents is a procedure which is used only at higher echelons. At battalion and lower echelons it is not used. Here subordinates are given only oral operation (or fragmentary) orders, which are recorded in full by the commander (or chief of staff) in his notebook, while the subordinates record the part pertaining to them.

The basic forms of the documents used to disseminate the tactical missions to the subordinates are the written operation order and the fragmentary order written, recorded on magnetic tape, or put in graphic form. In content and order of presentation, they do not differ in essence from oral orders and include all of the basic information from the commander's decision which the subordinates must know, as was discussed earlier. This information is expressed in the written order as briefly as possible in order to reduce the volume to the minimum, and therefore also to reduce the time required to make them out.

This requires extensive use of standard forms for such orders. They look approximately like the form on p. 245.

The form is filled out only on the right, where brief answers are given (based on commander's decision) to the questions posed on the left. This thus reduces the time both for compiling the form and for the subordinates to assimilate it.

Graphic fragmentary orders are also effective. They have the advantage over other instruction forms of maximum brevity, clarity, and of providing a good mental picture of the contents. One must, however, always be looking for opportunities to speed up the process of preparing them by using mechanization and better staff officer working techniques.

Subordinate commanders (or staffs) are notified in advance that the fragmentary orders are being sent to them or that their contents are being transmitted by communications equipment so that they can be better prepared to receive and execute them. At the same time, the subordinates immediately report receipt of the fragmentary orders (or tactical missions) to the superior commander (or staff).

To the commander

Fragmentary Order No. _____
(place, date, time)

Map _____
(scale, year of publication)

Fixed data	Variable data
<ol style="list-style-type: none">1. Brief estimate of enemy grouping and operations2. Content of tactical mission of subunit that is given the order:<ol style="list-style-type: none">a) From what line and at what time to move into action;b) Axis of operations;c) Which enemy to rout;d) What area (or line) to take;e) Readiness time;f) Other instructions;3. Information about operations of senior commander's resources in support of this subunit.	

Commander _____
(rank, surname)

Chief of Staff _____
(rank, surname)

Transmitted (time)

Received (time)

The combined procedure for disseminating tactical missions is one in which the decision made (or amplified) by the commander is disseminated to the executive agents by various methods: to some subordinates, face-to-face orally; to others over closed communications channels; etc. For an example of how it might be used in the course of the offensive when assigning missions to subunits during the time of execution of the subsequent mission see p. 246.

For the most part this procedure is necessary during combat operations at higher echelons when personal contact with subordinates is limited or quite out of the question. In this case the commander assigns the missions to the main executive agents while they are disseminated to others by the staff and the chiefs of branches of troops and services.

Thus, a broad class of responsible individuals are involved in the dissemination of missions who, besides, carry out their jobs in compressed time and almost simultaneously. Quite obviously, their work must be done on time and carefully organized by the commander

Executive agents	Time		By whom and how missions are to be disseminated to executive agents
	Preparation for performance of tactical mission	Dissemination of mission	
1. First echelon subunits	0900*	0855	Orally, by commander personally or chief of staff by radio
2. Artillery	0935	0905	Orally, commander through artillery chief
3. Air defense resources	0935	0905	Orally, chief of staff by radio
4. Second echelon	0950	0910	Orally, commander personally, at his command post
5. Rear services	0950	0910	Chief of staff by radio

*The time is taken arbitrarily, merely to show the possible sequence of time frames for disseminating missions.

himself or the chief of staff. Even while the decision is being made (or amplified), depending on the place and the role of the subordinates in the performance of the overall mission, they outline the means and the time for disseminating the mission to them, which of the responsible individuals will be called on for this purpose, when and how they will be prepared and, what is to be done by one or the other of the two methods.

The commander can announce his decision in the form of brief fragmentary orders already prepared for dissemination to the executive agents, taking into account the priority of their planned readiness times. As these orders are written down or plotted on the maps and when it has been verified that the responsible individuals understand them correctly, the latter immediately disseminate them to the executive agents orally, either face-to-face or by other means. It is also the case that this type of order may be given to the commanders while the decision is being made, that is, as the missions are defined for the subordinates. Time is thus saved for preparing the subordinates to execute the mission and especially for preparing those who begin operations earlier than the others. In both cases the commander personally and through the chief of staff sees that the tactical mission is disseminated to the executive agents by the established procedure.

The staff plays an important role in disseminating the missions to the executive agents by any method. When the commander assigns the missions personally to all the executive agents, the staff prepares the materials and the working maps that he needs, assembles the

subordinate commanders at a designated point in the field, organizes communications from this point with the command post and the senior commander and takes measures for its physical security. As the missions are being assigned, the staff makes a written record of the commander's oral operation order and instructions and checks the accuracy of this record and of the subordinates' analysis of the tactical mission. For other versions of the commander's work, the staff disseminates the missions to the executive agents to whom the commander could not assign the missions personally. In order to confirm the missions assigned orally to the subordinates, higher echelon staffs, as a rule, make copies of the written operation (or fragmentary) orders and send them out. In all cases the staff disseminates support instructions to the subordinates in which the following are defined for each aspect of support: the missions, men, equipment, measures for carrying them out, and readiness times.

2. Organization and Support of Continuous Troop Coordination

The subunits and units of the various branches of troops, special troops, and aviation participate in a modern engagement. Their organized coordination is one of the decisive prerequisites for successfully achieving the combat objective, i.e., routing the enemy and capturing (or holding) the projected area (or line) of terrain.

The essence of organized coordination is the coordinated operations of all the men and equipment participating in the battle in terms of mission, axes, lines, and time in the interests of successful accomplishment of the overall combat mission. Mission coordination means directing the efforts of the troops toward routing the grouping, with whose destruction one accomplishes a particular mission in the sequence: the immediate, the subsequent, etc. Within the limits of each of these missions, *coordination* is detailed in terms of the axes of operations of the troops and also in terms of especially important lines, objectives, and methods of operation. Coordination of efforts of the subunits in terms of time is determination of what they must do at one and the same time or at different times when taking the same line or objective.

Coordination may be considered organized only when the commanders and staffs of the coordinating troops achieve the following: first, know the overall tactical mission and the concept of operations of the superior commander; second, know the content of each other's tactical missions, the methods and the time of joint operations for accomplishing them; third, have reliable coordination communications among

themselves and with the senior commander and can achieve timely exchanges of information; fourth, have and can quickly make use of the required number of coordination signals.

In each troop echelon and for each sequential tactical mission, one's own coordination system is set up so that the potentials of the various resources will be realized as fully as possible; so that their efforts will be coordinated in the interests of accomplishing the tactical missions of the combined arms subunits and, within the latter, in the interests of those who play the primary role in carrying out the overall missions; and, finally, so that their coordination will be specific, that is, it will reflect the particular features of scale of each troop echelon (subunit, unit, etc.) as they regard objective, place, and time.

It is quite obvious that the organization of coordination is not a one-time act, but a defined process of the work of the commander and staff. The primary role in it belongs to the commander, whose work in organizing coordination consists, as it were, of two stages: the first stage is the preparatory stage, and the second stage is the *practical* dissemination of the projected coordination procedure to the troops (figure 29).

The commander's preparation for organizing coordination begins when he receives the tactical mission and it ends when he makes the decision. While the tactical mission is being analyzed, the commander, along with other matters, makes known the role and place of his subunit in the system of coordination of the next-higher echelon, and he outlines the best way to coordinate with the adjacent units and also with the senior commander's resources. In the estimate of the situation, a study is made of its effect on the employment and the coordination of the operations of the various branches of troops.

As a result of estimating the situation and making the decision, the commander defines the principles of troop coordination in executing the *forthcoming tactical mission*. He draws a picture (model) of the course of the forthcoming combat operations and plays out the battle mentally in several versions, as a result of which the following are determined: the sequence of the routing of the enemy, the axis of concentration of the main efforts, the grouping of resources, the missions of the subunits, the nature of maneuvering, and so on. At this point the time and manner of disseminating the planned coordination procedure to the subordinates is projected.

In assisting the commander, the staff prepares the required data and estimates for him, marks in the planned coordination procedure on his

working map or on a separate document, and takes other measures to prepare for the organization of coordination employing the method established by the commander.

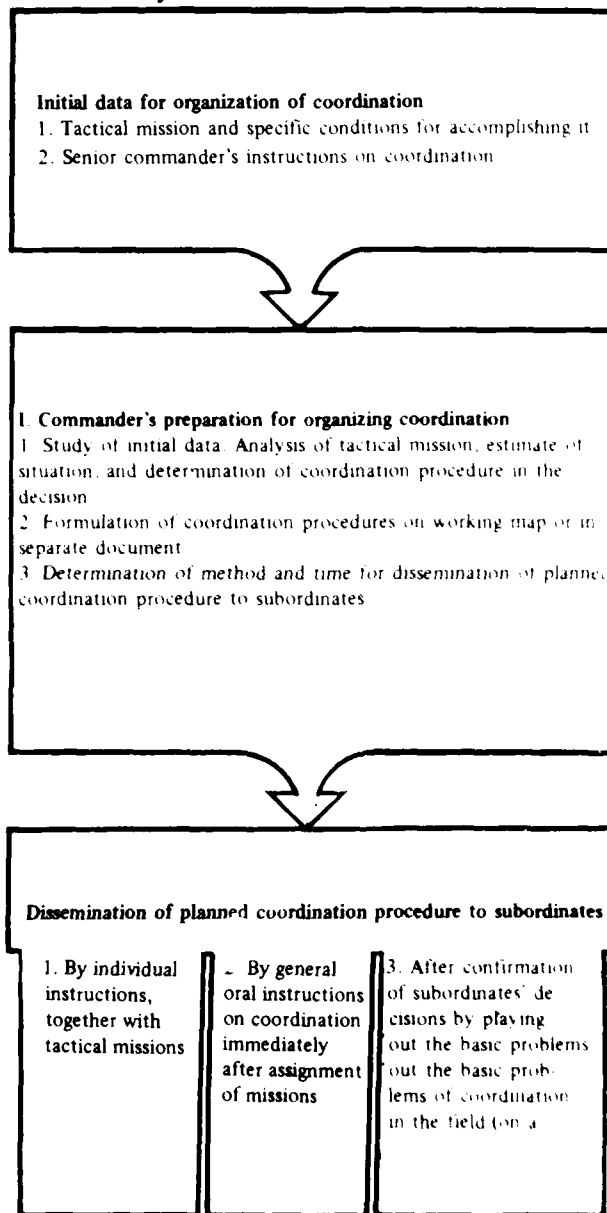


Figure 29. Process of Organizing Troop Combat Coordination.

Various methods for organizing coordination are used. The choice depends primarily on the chances for personal communication with the subordinates, the level of their training, and the availability of time. If time is extremely limited and it is impossible to assemble all the subordinates at one point in the field (at the command post), then the coordination instructions are disseminated to them at the same time as the tactical missions in brief fragmentary orders sent to the subordinates by the commander himself and the staff officers over closed communications channels and also by personal contact with some of them. If the situation permits, after orally assigning the tactical missions, the commander may give all of the subordinates general instructions on coordination right in the field, on a mock-up (a relief map), or from the map.

The commander's coordination instructions in this case are set forth in a strictly defined plan. For each intermediate tactical mission he defines and indicates: a) the objective of the coordinated operations (coordination); b) the possible grouping and expected opposition of the enemy (if necessary, for various scenarios); c) which resources or subunits of the various branches of troops participate in attaining the objective, that is, in routing the enemy; d) the procedure for coordinated operations of these resources (or subunits) in terms of lines, axes, objectives, and time within the bounds of the given intermediate tactical mission.

First, the coordination problems can be resolved on the terrain within the range of vision and, for areas beyond this range, with the map or on a mock-up (relief map) not only by giving instructions, but also by using the method of playing out the forthcoming combat operations.

The commander's instructions on coordination themselves vary in content, for they are made up of the content of the tactical mission and the specific methods and conditions for carrying them out. There is no particular need for the commander's instructions to repeat the tactical missions already assigned. They define in terms of mission, lines, and time the procedure for coordinated operations of the subunits in the various branches of troops and of the adjacent units in support of successful execution of the tactical mission. When an attack from the march is organized, for example, these instructions define the following for each mission.

When performing the immediate mission:

(a) *During artillery preparation and the subunits' move up to the line*

for going over to the attack: the time and procedure for artillery and antiaircraft resources to occupy fire positions and for direct fire weapons to occupy the firing lines in the jump-off area for the offensive; the forming up of the subunits (or units) to move up to the line for going over to the attack; the procedure for advance, deployment, and operations of the subunits as they approach the assault line, taking account of possible enemy opposition on the ground and in the air; the beginning time, duration, and structuring of the artillery preparation of the attack; the missions and coordinated operations of the various resources during artillery preparation; the time and method of clearing passages through obstacles (friendly and enemy) and marking them; the time and sequence of firing by direct fire weapons, tanks, and motorized rifle subunits located forward in direct contact with the enemy; coordinated operations of air defense resources for covering the troops from enemy air strikes; and other matters.

(b) *When the first echelon subunits attack and take the lines of their immediate missions, the following are indicated:* time and procedure for switching from artillery preparation to artillery support of the attack; objectives (targets) of destruction during artillery support, support procedure, signal and procedure for shifting fire; time, signal, and method of going over to the attack on the part of the subunits; subunits' procedure for negotiating obstacles; procedure for coordinated operations of the subunits of all branches of troops among themselves and the adjacent units when taking the strongpoints and repelling enemy counterattacks, the nature of their maneuvering and assistance; the procedure for covering the combat formation from enemy air strikes; the time and procedure for moving artillery and air defense weapons to new positions; and other matters.

In the case of execution of the subsequent mission, the commander's instructions are less detailed with respect to coordination. They resolve only the problems that deal strictly with the objectives of coordinated operations—completion of the rout of the enemy who survived after the fire damage and during the attack and who will try to strengthen his position by stubbornly holding advantageous lines (objectives) and delivering counterattacks.

It is typical for the attacking troops to try to intensify their efforts by committing the second echelon (reserve) to action in connection with which the commander defines the following: the objectives (targets) to be hit by artillery fire and air strikes in the second echelon sector of operations; the line of deployment of the second echelon (reserve); the time and the routes for moving up to this line; who will clear them or prepare them and when; resubordination of resources in connection with the second echelon's (the reserve's) being committed

to action and the procedure for its coordination with the first echelon subunits and adjacent units; the procedure for covering the subunits against enemy air strikes; from whose outfits, when, and how the 2nd echelon (reserve) will be brought up to strength; and other matters.

When a further advance is developed, the commander's instructions on coordination are even less detailed than the preceding ones, since it is difficult to estimate in advance the possible changes in the situation, and so to plan in detail the procedure for the coordinated operations of one's troops. Therefore, based on the estimate and taking account of the probable changes in the situation one makes a general outline of how the fire damage to the enemy will be achieved and how the rout of the enemy will be completed by the swift operations of the combined arms subunits.

In the commander's instructions on coordination during the accomplishment of any of the missions in the sequence, problems are also resolved which are connected with the coordination of the subunits' operations in forcing water barriers, developing an attack at night, negotiating various kinds of obstacles and contaminated areas, and also repelling enemy counterattacks and other operations, especially when the enemy is employing nuclear weapons. If, according to the senior commander's decision, airborne assault forces are to be used, then problems of coordination with them are also resolved. The places and the procedure for relocation of control posts during the attack and the coordination signals are also reported to the subordinates.

In all cases primary attention is given, of course, to fire damage to the enemy and quick exploitation of the results to accomplish each intermediate mission on time with the least losses and expenditures of material resources and, as a result, to accomplish the overall tactical mission.

In organizing coordination, the increased significance of countering the aerial enemy is given special consideration. This combat must be continuous, active, and carefully organized and designed so as to provide reliable cover for the combat formation of the attacking troops. The commanders of the air defense subunits must receive specific instructions on the level of readiness of air defense resources for repelling enemy air strikes; their locations in the combat (or marching) formations; the routes of advance, the sequence of movement, and the nature of maneuvering during combat operations; the procedure for coordination with subunits (or facilities) that are covered and also with the air defense resources of the senior commander and adjacent units.

All of the subunits receive indication of the procedure and the signal for warning of the presence of enemy aviation and the nature of their own operations in the event of this signal, e.g., conducting small arms fire, measures for dispersion, cover, and camouflage. Special attention is given in this case to countering low-altitude targets, including enemy combat helicopters, destroying them not only with anti-aircraft weapons but also with submachine guns and machine guns.

The commander's instructions on coordination on the defensive define coordinated operations of his subunits, with respect to the probable axes of enemy advance and with respect to the missions and the axes of the counterattack of friendly troops. The main missions on whose basis coordination is organized on the defensive are the following: destroying the enemy on the approaches to the main line of resistance; repelling the enemy attack forward of the main line; destroying the enemy wedging into the defensive. For destruction of the enemy on the approaches to the defense, the areas of massed fire and the sectors of concentrated artillery and mortar fire are planned in coordination with the fire of the senior commander's resources and with the air and adjacent units' operations, as well as those of the security forces forward of the main line of resistance.

For repelling an enemy attack forward of the main line of resistance, the commander indicates the areas of massed fire, the sectors of concentrated fire, and the barrage fire lines on the most important axes, the lines and the procedure for opening fire by antitank weapons, the depth of the zone of continuous fire of all types, the places for setting up fire pockets and constructing engineer obstacles. In addition, the procedure for the maneuvering of fire of all types and of the reserve for reinforcing the threatened axes and also the procedure for the utilization of resources from secondary axes for repelling the enemy attack on the main axis are planned.

In order to destroy the enemy that has wedged into the defense, as a rule, the following are indicated: the areas of the terrain which must be held securely on each enemy axis of advance; the procedure for concentrated fire of all types for damage to the wedging enemy; the occupation of fire lines with antitank weapons; and the construction of engineer obstacles in the course of battle. On each counterattack axis the commander defines the following: the deployment line, the second echelon's routes of advance and mission, the artillery, mortar, and first echelon subunits' missions for hitting the enemy before and during the counterattack. In addition, the procedure is established for coordination in restoring the defense in the event of failure to counterattack and when the senior commander's reserve is counterattacking.

When sufficient time is available, coordination can be organized not immediately after tactical missions are assigned, but somewhat later. This method was used extensively during the last war. It consists of the fact that after giving the oral operation order in the field, the commander allots the subordinates time for making their decisions. Then the commander hears and approves the plans and consecutively resolves the main coordination problems with them.

The role of the staff in supporting the commander's work in organizing coordination is important. The staff helps the commander in practical solutions of coordination problems in the field (or on a mock-up) and records his coordination instructions. In accordance with these instructions the staff more precisely defines or develops coordination documents and, if necessary, sends material excerpted from them to the subordinates. The staff resolves coordination problems with the subordinates to whom the commander could not issue instructions personally. In addition, the staff organizes and provides for reliable communications between coordinating subunits, passes on the established signals to them, and checks on the proper organization of coordination by the subordinates, reporting the results to the commander.

Coordination can be depicted in operations documents of varied form. In the subunit it is formulated only on the commander's working map, which he uses to give oral operation orders in the field and to immediately organize coordination. In higher echelons, it can be formulated by a separate document—a diagram (on the map), a graph, or a coordination planning table.

For any version of the formulation of coordination—on a working map or in a separate document (diagram, graph, planning table)—it is important to achieve extreme brevity and clarity of representation of the basic problems of coordination and thus promote their quick and concrete practical resolution by the commander and staff both in organizing and especially in maintaining coordination in the course of combat.

The maintenance of continuous coordination is one of the important tasks of the commander and staff in the course of combat. In implementing it the commander and staff must do the following: first, carry out with the required completeness and precision the procedure outlined before the engagement for coordinated operations of the troops in accomplishing each tactical mission in the sequence; second, amplify, supplement, and develop the procedure in a timely manner, giving regard to changes in the situation; third, in the event of disruption of coordination, restore or reorganize it.

The specific content of this work by the commander and staff depends to a great extent on the type of combat, the characteristic feature of each tactical mission in the sequence and the methods of carrying them out, the degree to which the coordination procedure planned before the engagement corresponds to the situation actually developing in the course of combat, and so on. The following are decisively important to successful maintenance of coordination in all cases: constant awareness of the situation and foresight regarding changes in it; monitoring of the subunits' precise execution of the tactical mission and the planned coordination procedure; employment of a procedure corresponding to the situation for detailing, developing, and restoring disrupted coordination; maintenance of reliable communications that ensure coordination of subunits; and timely sending of the established coordination signals.

Exact knowledge of the situation and the ability to foresee changes in it are the primary prerequisite for successful work by the commander and staff in maintaining coordination. This is achieved, in turn, by continuous reconnaissance, maximum use of all sources for obtaining data on changes in the situation, and systematic exchange of information about it among the commanders of coordinating subunits. Of all the information obtained in the course of combat, the most important is that which makes it possible to quickly assess the degree of adherence to previously planned coordination procedure in terms of time, lines (objectives), and, if there are deviations, then what they consist of and what must be done and when and how, so as to eliminate them and maintain well-organized coordination. All of the adjustments in procedure for coordinated operations are disseminated to the executive agents by short oral instructions (or commands).

Modifying coordination procedure within the limits of the mission already being accomplished (or of the immediate mission), the commander and staff develop and detail the main coordination problems for the next mission in the sequence (the subsequent mission), since they were resolved only in broad terms before the engagement. The distinctive features of the problems which must be resolved here are predetermined by the content of the tactical mission itself and by the methods and conditions for accomplishing it.

If this, for example, is the subsequent mission in an offensive, then it is usually connected with the completion of the previously begun rout of the enemy and the swift exploitation of a success in the depth of his defenses. As a rule, the second echelon is committed to action for this purpose. Almost all of the resources participate in carrying out the mission, and their operations must be coordinated without any notable

break in the offensive tempo. Here summoning all the commanders' subordinates to the senior commander's control post is out of the question. Each of them is given a fragmentary order orally by radio in a strictly defined procedure in which, along with definition of the tactical mission, brief instructions regarding the basic coordination problems are presented.

The list of these problems within the framework of the subsequent mission might be approximately as follows: for the second echelon (or reserves)—the line and time of commitment to action, the tactical mission, the procedure and the methods of coordination with the adjacent units for completion of the rout of the enemy; for the artillery—the fire mission, taking into account friendly aviation strikes, the methods and times of their execution, the procedure for relocation, deployment, and resubordination in the course of combat; for the first echelon subunits—what to do and when and how to support the commitment of the second echelon (or reserve) to combat and how to coordinate with it in accomplishing the mission; for the air defense weapons—the procedure and the time (or period of time) for providing cover for the basic elements (facilities) of the combat formation and also the relocation, deployment, and conduct of fire; for the special reserve—what to do and when and how to support the operations of the subunits performing the most important tactical missions. In addition, in the course of combat, reports are made of new places and deployment times of the senior commander's control posts and additional coordination signals.

For example, coordination during defensive combat, when carrying out a counterattack to rout an enemy wedged into the defense, is organized by the same method and essentially in terms of the same range of problems, but with different tenor and content. Here, first of all, there occurs a coordination of the operations of the combat formation elements that create advantageous conditions for the counterattack.

Coordination can be disrupted during combat for various reasons. The extent of this disruption will also vary: in one case there may only be a loss of communications with one or several subunits; in another case, loss by the subunits (or elements of the combat formation) of fighting efficiency, and so the capacity to accomplish the mission; thirdly, both can take place simultaneously in a great variety of forms. Consequently, there will be a diversity in the volume, content, and methods of operation of the commander and staff in restoring disrupted coordination.

With partial loss of fighting efficiency by one subunit or another engaged in combat, only certain changes are made in the coordination system set up: the mission is more precisely defined for the subunit, and its joint operations with the other subunits of the combat formation are adjusted. The situation is different when one or more subunits is put out of action. In this case the disruption of coordination and the volume of the measures for restoring it will, of course, be more significant.

In this case, when restoring coordination, the commander and staff first of all establish communications with the subunits, and ascertain the location and state of these subunits and the causes of the disruption of coordination between them as quickly as possible. At the same time, plans are made as to what measures to take and when and how to implement them so as to restore coordination without detriment to the accomplishment of the tactical mission.

First of all, coordination is set up between the subunits that play the primary role in the carrying out the overall mission or are able to continue to carry out the mission at a time when the other subunits must restore their fighting efficiency before doing so. First, one defines more precisely the tactical missions and coordination procedure between the resources designed for fire strikes against the enemy and also the tactical missions and coordination procedure of the forces using the results of these strikes and completing the rout of the enemy.

All the commander's instructions are disseminated by short orders over the functioning communications channels and through personal contact with the subordinate commanders. It is especially important to have personal contact with the commanders whose subunits have gotten into very serious situations. The senior commander's visit is one of the best means of accelerating and increasing the effectiveness of measures for restoring their fighting efficiency and disrupted coordination. There is something else that is just as important—maintaining the constant readiness of the commanders of subordinate and coordinating subunits for action with initiative to restore disrupted coordination. Great opportunities are available to them for demonstrating creative initiative. On the basis of the general concept and a proper understanding of their role in implementing it, without waiting for instructions from above, they must detail the mode of their subordinates' operations in accordance with the change in the situation. For this purpose reliable communications and exchange of information must be maintained between them, and they must know not only each other's missions, but also the results of accomplishing them, be constantly ready to render mutual assistance, and be able to employ and execute the established

coordination signals quickly and efficiently.

Thus, the skillful organization, continuous maintenance of close coordination of the troops in the course of the engagement, and quick restoration of it in the event of disruption are some of the most important measures of the art of the commander and staff in command and control and requisite conditions for their successful accomplishment of the assigned tactical mission.

Chapter 7. Organization and Implementation of Measures for Supporting Combat Operations and for the Commandant's Service

Under any conditions of troop combat activity, one of the most important missions of control organs is to organize measures for supporting combat operations and to direct their implementation during preparation and in the course of combat.

As a result of the adoption of nuclear weapons and the equipping of troops with new combat materiel, the effect of these measures on the successful accomplishment of missions by the troops is increasing immeasurably. They are faced with the goal, on the one hand, of creating the necessary conditions for the troops to accomplish their assigned missions in a timely manner under any circumstances, of maintaining their fighting efficiency, and, when necessary, of restoring it in short order; and, on the other hand, of making it as difficult as possible for the enemy to employ his resources, especially nuclear weapons.

Achieving this goal is possible, given the combined use of various types of support. In addition to the kinds of support widely used in the Great Patriotic War, such as reconnaissance, security, camouflage, and engineer, rear services, and topogeodetic support, provisions must now be made for protecting the troops against nuclear weapons and for hydrometeorological support. In the U.S. Army a great deal of attention is given to countering enemy electronic resources.

There is no doubt that the commandant's service can also be included as a kind of support. In terms of purpose and content of the missions performed, it is set up to support troop operations, although in many cases this is done not only by the commandant's service but also by combat subunits.

The measures for the various types of support are organized by the staff and the chiefs of the branches of troops and services on the basis of the commander's decision, his directions, and the instructions of the

higher staff. Usually the content of work in organizing any type of support in its most general form includes the following: preparation of data and estimates required by the commander for well-founded determination of the missions, composition of resources, and the procedure for utilizing them in terms of a particular type of support; analysis of the missions and of the conditions for carrying them out; planning of support matters and disseminating the missions to the executive agents; implementation of direction and monitoring of troop operations to accomplish the missions. It must be taken into consideration here that the measures for each type of support are highly varied, and that the implementation of each of them has its own specific peculiarities. This requires a great deal of preparation on the part of the executive agents in analyzing the available data, coordinating the problems that arise with other responsible personnel involved and making a great many estimates, which, in turn, are based on the executive agent's thorough knowledge of the potentials of technical equipment called on to implement the projected measures. All of this increases the responsibility of staff officers and other control organs for organizing and implementing measures for comprehensive support of combat operations.

Reconnaissance

Reconnaissance must under any conditions supply the commander and staff with the required data on the enemy, the terrain, and the radiation and hydrometeorological situation. The data must be obtained in a timely manner and must be reliable and accurate, especially the coordinates of the most important targets against which the senior commander plans to deliver nuclear strikes.

The timely acquisition of sufficiently complete data on the enemy presents great difficulties. Given the great dynamism and speed of development of combat operations and the mobility of the majority of targets, information about them quickly becomes obsolete. Many foreign experts have come to the conclusion that a gap has formed between weapons and reconnaissance capabilities. One author writes with unconcealed alarm: "The system for collecting, processing, and distributing information about the enemy does not meet today's requirements. . . . The ground forces lack the required capabilities for seeking out the enemy and obtaining data on him quickly and accurately enough to ensure the most effective exploitation of their increased firepower and mobility."

The solution of this problem involves not only the employment of modern means of reconnaissance but also the clear-cut organization of

reconnaissance. Usually the staff's work directly involving organization of reconnaissance, in contrast to other kinds of support, begins from the moment the warning order or the analysis of the assigned mission is received. The commander or chief of staff immediately determines what primary data on the enemy and the terrain to get, when to get it, and what resources to use for this. On the basis of these instructions, the staff officer proceeds with the planning and organization of reconnaissance measures which are to be implemented immediately without waiting for the commander to make the decision. When the decision is made, the commander can amplify these missions or assign additional ones.

On the basis of the commander's decision and the main reconnaissance missions assigned by him, the chief of staff, who is responsible for the organization and state of reconnaissance, gives directions to the staff officer on this organization. In them he usually specifies the reconnaissance missions and establishes the sequence in which they are to be carried out and the resources to be allocated for this; determines the methods and suspenses for accomplishing the missions, on what axis, area, or objective to concentrate the main reconnaissance efforts and what resources to call on for this; establishes the composition of the reconnaissance reserve resources and the procedure for their employment and restoration in the course of combat; indicates the procedure for preparation of the subunits allocated to reconnaissance, for setting up communications with the reconnaissance elements, and the times for assigning the missions to the executive agents.²

On receiving the missions and directions, the staff officer analyzes the content of the reconnaissance missions, studies the status and the capabilities of the available resources, assesses the situation in which reconnaissance forces will have to operate in carrying out the assigned missions, and determines what measures must be taken in order to ensure successful accomplishment of these missions. During this analysis it is determined which data can be obtained for each mission from the reconnaissance, motorized rifle, and tank subunits and also the higher staff and, in particular, radar, artillery, engineer, and radiation reconnaissance. Only when there is a combined utilization of resources is it possible to ensure successful accomplishment of reconnaissance missions.³

Proper determination of the method for obtaining data and the nature of possible enemy operations as they relate to the content of the mission is exceptionally important. Therefore, when he is assessing the conditions of the situation, the reconnaissance officer studies especially carefully which data can be obtained by observation, search, ambush,

or attack and which reconnaissance data can be obtained as a result of combat operations by the troops, interrogation of prisoners and deserters, questioning of local residents, and which reconnaissance data can come from the higher staff, adjacent units, air reconnaissance, etc.

As a result of comprehensive study of the situation and of all the initial data, the staff officer allocates the available reconnaissance resources, taking into account the most effective utilization of their capabilities for performing the various missions and more precisely defines the specific suspenses and methods for accomplishing the missions, the measures for supporting the reconnaissance subunit's operations, the procedure for maintaining communications with it, and the suspenses and methods for submitting the data obtained. Special attention is given here to timely detection of nuclear weapons, reserves, and other important enemy facilities.

All of the main problems of planning reconnaissance are usually reflected on the working maps of the chief of staff, the intelligence officer, and other officers involved. The data difficult to show on the map are entered in the executive agents' working notebooks. In order to disseminate the missions to the subunits, warning orders for reconnaissance are developed when necessary, in which the following are usually indicated: brief information on enemy; the reconnaissance mission and resources allocated for accomplishing them (for whom, where, when, and what information is to be obtained or amplified), the suspenses and procedure for presentation of reports, and delivery of prisoners, weapons, and documents captured from the enemy; password and response; command and control signals.

In modern combat, just as before, one of the missions of the staff in all types of combat activity, especially when the subunits are preparing to break through enemy defenses, is still the organization of observation. It is important here to ensure continuous observation of the enemy and the terrain over the entire combat operations area and on the flanks, to the greatest depth possible. Therefore, when organizing observation, the staff especially carefully plans the locations for the command/observation posts and the observation posts, selects the personnel who will be observers, and provides them with the necessary observation equipment.

Not all of the data on the enemy, the terrain, and the radiation situation can be gathered by one's own resources. In order to obtain the data that are lacking, a request is sent to the higher staff, and measures are taken to obtain this information from the adjacent units, from the troops operating forward, and from aviation.

While the subunits are carrying out their assigned missions, depending on the situation that has developed, the commander or chief of staff amplifies these missions or assigns the additional reconnaissance missions to the reconnaissance subunit and, if necessary, reassigns resources to other axes or objectives. All of these measures are usually reflected on the working maps of the chief of staff and the officers directly responsible for the reconnaissance subunit's operations. The missions are, as a rule, disseminated to the executive agents orally or by technical communications equipment.

The basic measure of capable organization of reconnaissance is the timeliness with which the commander obtains comprehensive reliable data on the enemy, the terrain, and the radiation situation.

Protection of Troops Against Nuclear Weapons

Protection against nuclear weapons involves a whole system of measures taken so as to prevent damage to friendly troops or to attenuate the results of the effect of nuclear weapons as much as possible and thus retain the subunits' fighting efficiency or restore it quickly and to ensure the successful accomplishment of their assigned missions. With such an intended purpose of this type of support as the basis, most armies view its content as including the following: forecasting the radiation situation and the destruction and flooding zones; organizing and conducting aerial reconnaissance; notifying the troops of the immediate threat of nuclear weapons employment by the enemy as well as the areas of destruction, fires, and contamination; supplying personnel with individual protective equipment; troop dispersion and accommodation, taking into account the protective properties of the terrain; engineer preparation of the areas occupied by the subunits, determination of the most expedient methods of negotiating contamination and destruction zones; preparation of routes for troop maneuvering; dosimetric monitoring and calculation of radiation dosages received by personnel; taking of counterepidemic, sanitary and hygienic, and special preventive measures; post-nuclear-attack recovery.

On the basis of the commander's decision and his directions, the staff develops specific measures and determines the suspenses and the resources to be called on to implement them. The basic planning data are reflected on the working maps of the commander, the chief of staff, and the appropriate chiefs. The missions and the content of the measures for protection against nuclear weapons are disseminated to the executive agents in fragmentary orders and also in the directions and instructions on engineer, rear service, and other types of support.

When the enemy launches nuclear strikes, the commander and staff first of all ascertain the situation in the areas hit, determine the condition and position of the subunits that have suffered losses from the nuclear weapons, and determine the nature of the enemy's operations. Then measures are taken to restore the fighting efficiency of the troops, continue combat operations, and carry out nuclear disaster control. When these missions are being carried out, the following take on extreme significance: restoration of disrupted command and control, making the decision and disseminating the amplified tactical missions to the subunits which are still combat fit; removal of troops from contaminated areas and zones of destruction, fires, and flooding; replenishment of the subunits' material resources; and so on.

At the same time that these measures are being taken, the following are organized: extinguishing and localization of fires; restoration of engineer structures and shelters for personnel; clearing of roads and routes; special processing of the subunits; decontamination of material, the terrain, roads, structures; etc.

The subunits which have suffered insignificant losses are put in order and given the necessary aid; in the units with greater losses, organizational measures for regrouping are taken.

The specific organizational measures depend on the extent of the damage suffered. In one case the subunits receive reinforcements from the reserve or from subunits which have lost their combat effectiveness, while in another case it is necessary to create a regrouped formation.

Security

Security is always set up in all types of troop combat operations and also during their movement and deployment. On the march, when an encounter with the enemy is foreseen, the troops are protected by march security. When the subunits are in place, security at the halt is organized, and during combat operations, combat security.

When organizing security, the commander defines its missions and establishes which subunits to allocate for executing them. The chief of staff bears direct responsibility for organizing and implementing security. In planning security, he determines in accordance with the commander's decision the areas (lines) for disposition of the security elements or the routes (directions) of their movement, he details the missions for the security elements, giving consideration to possible enemy operations, and establishes the suspenses for accomplishing these missions; he details the procedure and method for moving the security

subunits out to execute their missions and, when necessary, establishes the time and the procedure for switching from one type of security to another. In addition, the chief of staff determines how communications will be set up with the security elements, establishing the signals and the procedure for coordination of the security subunits with the troops being protected, and also determines how they are to be provided with everything needed for successful accomplishment of their missions.

Under any conditions, provision is made for the organization of local security of the troops to guard them against attacks from diversionary groups and to give them timely warning of the threat of an enemy attack. The most reliable organization is devoted to the security of the most important targets. The resources capable of successfully handling their assigned missions under any conditions are allocated for the security of these targets.

The security measures to be developed are reflected on the working maps of the command and chief of staff. As a rule, missions are disseminated to the security units orally.

Engineer Support

Engineer support is the set of engineer measures and missions that contribute to the successful conduct of combat operations by friendly forces and inhibit enemy troop operations.

When nuclear weapons are employed and in the event of mass destruction, obstructions, fires, flooding, and radioactive contamination of the terrain, the volume of engineer operations increases immeasurably.

The most important support missions are the following: engineer reconnaissance; preparation and maintenance of the routes of march, maneuver, supply, and evacuation; clearing passages through obstacles and ruins; equipping and maintenance of crossings; setting up shelters and structures at control posts; setting up obstacles and carrying out demolition work; taking measures for troop and target camouflage; performing extremely complicated operations requiring the use of engineer equipment for preparation of defended areas and lines occupied by the subunits; the performance of engineer operations for post-nuclear-attack recovery; securing water and construction and maintenance of water supply stations.

Depending on the type of combat operations, the situation as it has developed, the availability of resources and time, as well as terrain

conditions, the time of year, time of day, weather conditions, the most important of the missions listed above are defined and the procedures and suspenses for accomplishing them are established.

During the organization of combat, the commander determines the following: what engineer operations must be performed, how to use the attached engineer subunits, and the suspenses for accomplishing the operations. On the basis of the commander's decision and directions, the following are defined or amplified: the engineer reconnaissance missions; the volume of engineer operations for protecting the troops against nuclear weapons, for camouflage, for preparation of control posts; the suspenses and sequence for performing engineer operations, etc.

The organizer of engineer support and of command and control of the engineer subunits is the chief of the engineer service.⁴ On the map he develops an engineer support plan which depicts the engineer support missions, the resources and suspenses for accomplishing these missions, and the material and technical support. The plan must be coordinated with the combined arms staff. Engineer support missions are usually disseminated to the executive agents orally.

During combat, the planned measures for engineer support are amplified in line with the changing situation and the commander's decision, and, if necessary, additional measures are defined for the subunits.

Camouflage

Camouflage is organized in order to conceal the true disposition and operations of subunits from the enemy and also to conceal one's intentions and plans and to indicate false troop groupings and operations, and to present one's intentions, concepts, and missions to the enemy in false form. In order to achieve this goal, a set of measures is developed which provides for concealment of identifying features in the dispositioning and operations of subunits and reproduction of false identifying features by which the enemy usually detects and identifies troops and targets. In order for the planned false identifying features to be convincing, they must be plausible, tactically well-founded, and varied.

Camouflage can be effective only when it is carried out continuously. "Modern warfare," wrote M. V. Frunze, "requires the constant employment of camouflage during all periods of combat operations. Employing camouflage occasionally, from time to time, means not using it at all. . . .⁵ Skillful camouflaging is possible with careful assessment of the terrain, meteorological data, the nature of the enemy's behavior,

and the capabilities of his reconnaissance resources.

Among camouflage measures, the following play an important role: dispersion and concealed deployment of subunits, giving regard to maximum use of the camouflaging properties of the terrain; radio camouflage; continued observation by the subunits of previously established procedures; precise implementation of blackout and sound masking requirements; equipping of false subunit disposition areas, positions, and crossings; carrying out feinting operations and movements of troops.

Measures are taken to preserve military secrecy and maintain a high sense of responsibility among all personnel for observing order and organization in the performance of all operations involving preparation for the forthcoming combat operations. It is unquestionably the case that any measure for misleading the enemy involves a certain risk for accomplishing the basic mission. Foreign authors note that before making a plan for feinting operations, one has to determine the enemy's capabilities for detecting false operations, allocate sufficient resources, select the right moment, and ensure that the feinting operations to be performed are plausible and convincing. Here a number of actions, especially those for misleading the enemy, are taken in accordance with the plan of the higher staff.

All of the basic camouflage measures devised are reflected on the working maps of the commander and the officers of the control organs. The missions are disseminated to the executive agents orally. In certain cases, written instructions for camouflage can be developed in which the following are defined: the subunits' camouflage missions; the resources allocated for performance of these missions; the suspense times; the responsible executive agents. If necessary, the methods for performing the camouflage operations, the procedure for using authorized equipment, and the troops' routine can be indicated in the instructions.

The effectiveness of camouflage measures during preparation for and in the course of combat operations depends to a great extent on establishing strict monitoring of the troops' implementation of planned measures. For these purposes provision is made for using ground and air observation facilities, radar, and night vision instruments and for verification photography from aircraft (or helicopters) of the areas where troops and facilities are located. Special attention here is given to camouflaging the most important facilities and the areas where the second echelons, reserves, and control posts are located, against which enemy nuclear strikes and aerial attacks are most probable.

Countering Enemy Electronic Resources*

The countering of the enemy electronic resources is set up and carried out in order to disrupt or disorganize enemy command and control of troops and combat resources. It includes intentional jamming, deliberate radio deception, setting up radar camouflage, and the protection of friendly equipment from enemy jamming and also measures for destroying and suppressing his most important electronic targets. This struggle can be successful when there is timely acquisition of detailed data on enemy electronic resources. The bulk of the information is usually provided by signal intelligence which has the greatest range, speed of obtaining data, and reliability. In comparatively short times it detects radio emission, analyzes it, and determines the subordination of the electronic devices.

Today jamming is considered one of the chief methods of disrupting the operation of enemy electronic equipment. It is capable for a certain period of time of depriving the enemy of the opportunity to receive and transmit information over electronic equipment, or it can significantly reduce the audibility and visibility of the signals, deceive the operators, and cause errors in the operation of automated communications devices.

In order to set up active jamming, special transmitters and various jamming stations are generally used. There are also one-time jamming transmitters which are usually dropped by aircraft or missiles onto enemy territory. In addition, passive jamming created by using chaff (dipoles) has not lost its significance. Corner reflectors are widely used in radar camouflage to create false targets and to camouflage the real ones. Among these measures an important role is assigned to radio deception—the transmission of false information, faking radio emissions, switching into enemy systems, etc. A number of NATO armies have designated special army security service and electronic warfare subunits for these missions. However, implementing these measures provides only temporary success. They can impede the operation of electronic equipment for a limited time only. Destruction or damage by nuclear weapons, missile and air strikes, artillery fire, mortar fire, and airborne assault landings is considered the most effective method of countering enemy electronic resources. There is extensive use of various rockets, missiles, and aerial bombs with radar and radio heads, which provide for using the emissions of enemy electronic devices to home in on the targets.

* This section was written from materials printed in the foreign press.

Certain principles have been developed in implementing electronic warfare. The most important of them are the following: massed employment of resources in the sector of the main thrust to support accomplishment by the troops of the most important tactical missions; continuous pressure on enemy electronic devices and systems; surprise in the employment of weapons. The practical utilization of these principles can help to more effectively disrupt the operation of the enemy electronic resources.

Along with organizing the countering of enemy electronic resources, the staff sees to measures for protection of friendly resources. The destruction of enemy jamming stations, the intensification of radio deception, and the performance of certain special measures are planned for this purpose. In particular, as a protective measure for radio equipment, it is recommended that the radios be located beyond promontories, forests, and complexes of buildings that have a shielding effect. It is very often useful to utilize "directional antennas" which ensure a minimum of emissions in the direction of the enemy. In addition, a protective measure which is considered to be extremely important is the elimination of the errors typically committed by radio operators, which make it easier for the enemy to counter means of radio communications. These errors include the following: operating the radios at high power, tuning the emitting antenna for transmissions, prolonged tuning of the transmitter, excessive service talk, unnecessary repeated calls, failure to switch off radio transmitter high voltage after completion of calls, failure to change call signs simultaneously on all radios in the network, and the presence of individual "signatures" and "recognition signs" of particular radio operators.

In addition, it is recommended that the operation of particular types of electronic equipment be completely or partially forbidden, that the operating frequency band and transmitter characteristics be kept secret, that powerful transmitters be kept outside the limits of the control posts, and that the rules for secure command and control be strictly observed. The most effective measures are those for protection of friendly electronic resources if they are carried out constantly, in combination, and at all levels of command and control.

Topogeodetic Support

The terrain has always been one of the most important situation elements. In making the decision the commander carefully assesses the terrain in the forthcoming operations zone, and it often has a decisive effect on the success of combat. Therefore it is necessary during the

decisionmaking process for the commander to have all of the necessary data on the terrain that will permit a clear presentation of the axes (areas) most accessible for troop operations, of the availability and state of the road network and the conditions for movement off roads, and of the possible effect of the terrain on performance of maneuvers. This is why there is an increasing importance in topogeodetic support, which is called upon for timely reporting to the commander and staff of all the terrain data required for organization of combat operations.

In addition, according to data in the foreign press, topogeodetic support missions include the following: equipping the troops with topographic maps, diagrams, descriptions of the terrain, dissemination to the artillery subunits of data required for topographic plotting of the elements of the artillery combat formation, and also preparation of data required by the troops for position finding and target designation.⁶

Missions such as forecasting and depiction on maps of the nature of changes in the terrain after nuclear strikes have also become extremely important today. These data, in the opinion of foreign experts, can be obtained in the shortest possible time not only by forecasting the results of changes in the terrain but also by surveying (photographing) these areas, which will make it possible to subsequently plot (write in) the changes that have occurred on the topographic map.

Hydrometeorological Support

Successful command and control, especially today, is inconceivable without exact knowledge of air temperature and humidity, wind speed and direction at various altitudes, cloud cover, amount of precipitation, atmospheric pressure, conditions of the rivers, canals, lakes, reservoirs, swamps, and the state of ice and snow cover. In addition, detailed data are required on the presence and condition of hydraulic engineering structures (dams, locks, and so on) and the possibility of flooding of the terrain in case they are damaged by the enemy. It is important to have forecasts about the beginning and the duration of the bad road season, the time when the swamps thaw, the beginning of snow and ice thaws in the rivers and mountains, the beginning of the flooding of the rivers, and so on.

All these data, being an objective factor of the situation, have an important influence on the content of the commander's decision and the nature of troop operations. Meteorological conditions can have an especially significant effect on the accuracy of strikes by artillery subunits, visual, sound, and radar reconnaissance, engineer operations, the use of all types of communications, the operation of equipment, and

the maneuvering capabilities of the troops. In conducting combat operations when nuclear weapons are employed, knowledge of the direction and speed of prevailing winds and other meteorological data are especially necessary. Only when they are available is it possible to correctly determine the safe distance for friendly troops, forecast the radiation situation, and determine troop operating methods.

Hence, the most important hydrometeorological support missions of the staff are the following: collection of data on meteorological conditions, organization of weather observation, informing subordinates about meteorological data, and giving the subunits timely warning about dangerous weather phenomena (ice storms, heavy rains, mudslides, fog, high winds, and so on).

The staff receives most of the data on hydrometeorological conditions from reconnaissance, the higher staff, the indications of the local residents and also various reference materials, descriptions, short-range and long-range forecasts, and information about current weather. The data obtained are depicted on the working maps of the staff officers, and the chiefs of branches of troops and services, and they are taken into account in developing measures for the organization and support of combat operations.

Considering the importance of obtaining timely meteorological data, a number of armies have set up automated meteorological systems. These systems can put out meteorological bulletins almost as soon as sounding is finished and, besides, in a form that is suitable for direct input into the automated artillery fire control system.⁷

Rear Services and Technical Support

These forms of support include measures for organization of rear services material, technical, medical, and other measures for supporting and servicing the troops. The measure of clear-cut organization of the operation of rear services subunits is uninterrupted troop support, quick maneuvering of rear services resources in accordance with changes in the situation, timely restoration and evacuation of damaged materiel and weapons, rendering medical aid to the wounded and evacuating them from the battlefield, timely movement of the rear services along with the troops, and providing the rear services with reliable cover.

The problems of making an estimate of the rear services situation are an essential part of the overall situation estimate when the commander makes the decision and when combat operations are planned. It is impossible to make a sound decision without knowing

how much ammunition, fuel, and provisions must be supplied and how great an outlay of material resources should be provided for the engagement.

Just as when measures are determined for other types of support, the basis for command and control of rear services is the commander's decision. The commander can define the following: the deployment area of rear services elements and the direction of their movement; supply and evacuation routes; the levels of required supplies and suspenses for setting them up; the standards for expenditure of material resources; the main technical and medical support measures; the resources to be allocated to rear area security; the deployment point of the rear area control post and the direction of its relocation.

Using the commander's decision and the directions received from the higher commander, the officer of the rear services unit defines the procedures for the location and movement of the rear services subunits, organizes their work, monitors their activities in carrying out the missions assigned, and implements the protection and security of the rear area.

He coordinates with the chief of staff on the main problems of organizing rear services, informs him of the condition of the equipment, the availability of material reserves, and the patient capacity of treatment facilities. For his part, the chief of staff must inform the rear services officer of the content of the tactical mission and commander's decision and also about the most important measures which are to be implemented in preparing for the forthcoming operations. As the mission is being accomplished, he constantly briefs him on changes in the situation, especially when these changes require the rear services elements to do some particular job.

All of the basic measures developed by rear services officers are reflected in the rear services support plan. The following are indicated in it: locations of the rear services subunits and their missions; volume of reserve supplies and the suspenses for setting them up; procedure for delivery of supplies and expenditure norms for them; medical support missions; measures for protection against nuclear weapons and for rear services security and the resources allocated for this; the location of the rear services control post; and so on.

Rear services missions are disseminated to the executive agents orally and in written instructions. During the development of combat operations, the combined arms staff and the rear services officers constantly maintain communications with each other, ensuring a coor-

dinated solution of all basic problems.

Technical support is becoming extremely important in modern combat. Its basic goal is the maintenance of vehicles and other equipment in the subunits' armament in proper working order and in constant readiness for use. This goal is achieved by setting up and carrying out technically correct operation, servicing, repair, and evacuation of armored and motor vehicles and also the supply of spare parts.

The direct organizer of technical support is the technical supply officer.⁸

Rear services support also includes medical support. It is aimed at maintaining fighting efficiency and strengthening the health of the personnel, timely medical aid to the wounded and sick, evacuating them, their fastest possible recovery and return to duty, and also prevention of the occurrence and spread of diseases among the troops.

Medical support includes setting up and carrying out treatment and evacuation, sanitary-hygiene, and counterepidemic measures and also medical service measures for protecting the troops from nuclear weapons.

Commandant's Service

Today movement and maneuvering on the battlefield are an important part of the activity of units and subunits. The commandant's service is set up to provide for timely and concealed movement, concentration, and deployment of troops.

Its basic goals are as follows: regulation of the movement of the troops on the routes, crossings, and passages through obstacles; monitoring troop observation of established procedures and camouflage measures when deployed in place and when on the move; security for the routes and countering enemy subversive reconnaissance groups on the routes and in the deployment areas.

In addition, elements of the commandant's service pick up straggling personnel, combat materiel, and motor vehicles and send them to their units. When radioactive contamination on the routes or in troop deployment areas is discovered or when they sight subversive reconnaissance groups or damage to sections of the routes, they immediately report this to the headquarters and warn the troops. In addition, the commandant's service is charged with the duty of maintaining order in

the movements of the local population in troop operations or billeting areas.

Depending on the nature and content of the troops' activity, the commandant's service is set up on routes of movement, in billeting areas, in combat zones (or areas), on supply and evacuation routes, and also in the rear services areas. On the troop movement routes, commandant's sectors are set up; in combat zones (or areas) and in the places where the troops and rear services are located, commandant's zones; on the routes passing through cities, mountain passes, and other important points, individual commandant's sectors. For performing commandant's service a sector (or area) commandant is designated, and commandant's posts* (3 to 5 people), and traffic control posts (2 or 3 people) are sent out which are equipped with transportation, communications, and radiation reconnaissance equipment and with road signs, traffic direction indicators, symbols of obstacles, and other equipment. Officers are usually put in charge of commandant's posts when they are especially important.

Using the commander's decision and the chief of staff's directions as a basis, one of the staff officers plans the commandant's service. This planning begins with a study of the content of the commander's decision and the chief of staff's directions and also the higher staff's instructions for setting up commandant's service. First of all, the sectors (or areas) where the commandant's service is set up by the senior commander's resources are marked on the map. The map is used to carefully analyze the remaining sectors in order to determine the boundaries of the commandant's sectors (or areas) where to station commandant's posts and traffic control posts (controllers) and also the road signs and indicators.

Practice shows that when a column moves over terrain with a rather extensive road network, a good many control posts can be replaced successfully by using the appropriate indicators (conventional signs) and setting up mobile commandant's posts. After study of the routes and areas by using the map, if there is need for it and time available, the staff organizes reconnaissance of the routes (or areas), using helicopters extensively for this purpose. During the reconnaissance, the locations of the commandant's posts, the traffic control posts, and their composition are more precisely defined; determination is made of the most difficult sections of the route and the evacuation equipment needed for towing vehicles in these sections; the directions of bypasses and alternate routes and the locations of the commandant's service

* [This is usually a mobile group serving as a sort of highway patrol—U.S. Ed.]

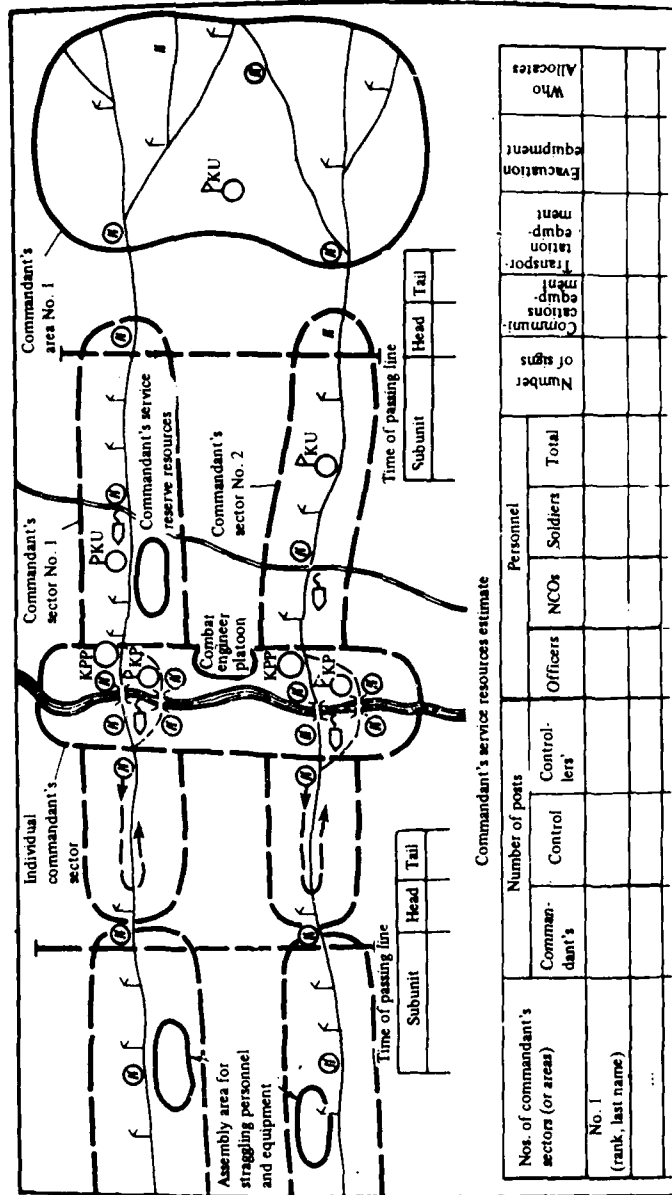
reserve resources are planned; and places for setting up road signs and indicators are more precisely defined. It is advisable for the reconnaissance group to have commandant's sectors (or areas) representatives from the combat engineer subunit and communications, and also people who are assigned to set up the road signs and indicators.

After careful study of the terrain and other situation conditions, the total number of personnel as well as the material and technical resources required to set up the commandant's service are determined. The best plan option will be the one that uses limited resources to set up the commandant's service, primarily commandant's service subunits with appropriately trained personnel and the necessary transportation, communications, reconnaissance, evacuation, and road equipment. Under any conditions provision is made for allocating reserve resources to execute commandant's service missions which come up suddenly, such as, for example, assigning details to the bypasses in sectors of destruction, flooding, and contamination; for replacing casualties; and so on. On the basis of this sort of estimate, plans are made as to which subunits to allocate the personnel from and what equipment should be used. Officers are especially carefully selected for the positions of the sector (or area) commandants.

Proper determination of the deployment times of the commandant's service is extremely important; usually they are determined with some lead time in terms of troop operations so that the responsible personnel in the detail will be able to study the terrain and the route in advance, and so that they will be able to master their duties. The deployment times are established based on the length of time for the troops' accomplishment of the mission. When only one unit is moving along the route or when there are insufficient men and equipment, the commandant's service is deployed sequentially, as the troops advance. Helicopters may be used to speed up the transfer of individuals in the commandant's detail from one sector to another.

Most careful provision is made for the organization of the commandant's service at the jump-off line, the control lines, at unguarded railroad crossings, in large populated areas, when bypassing zones of radioactive contamination, and also on crossings over water obstacles.

The results of planning the commandant's service are reflected on the working map of the officer made responsible for setting up the commandant's service. Usually the following are plotted on the map (figure 30): missions of the commandant's service, commandant's sectors (or areas), locations and composition of the commandant's posts and the traffic control posts, procedure for deployment and readiness



[Note: The following symbols have the significance indicated: *K* = *komendant'skiy post* 'commandant's post', a traffic regulator's position; *KU* = *komendantskoye upravleniye* 'commandant headquarters'; *KP* = *komendant pereprav* 'crossing commandant'; *KPP* = *kontrol'no-propusknoy punkt* 'checkpoint'. These are also used in figure 31—U.S. Ed.]

Figure 30. Staff Officer's Working Map, Showing the Organization of the Commandant's Service During the March.

for the commandant's service, locations of the commandant's sectors (or areas), organization of communications, composition and location of commandant's service reserve resources. In addition, the map indicates the sectors (or areas) in which commandant's service is set up by the higher staff, and an estimate is given of the men and equipment with an indication of where they are to be allocated from.

The timely dissemination of missions to executive agents is especially important. The ability to assign missions clearly and completely to the responsible personnel in the commandant's detail determines in great measure whether they gain a clear understanding of them. Many years of experience have resulted in the elaboration and validation of a particular sequence for the chief of staff's assignment of the mission to the sector (or area) commandant. Here, he indicates the following: information about the enemy, the procedure and time for the troops to pass the lines (or points); the boundaries of the sector (or area), the missions and the location of the commandant, the boundaries of adjacent sectors (or areas) and the location of their commandants; the resources allocated; the composition and locations of the posts; the areas to which straggling subunits or vehicles must be sent; the deployment and move-out times for the commandant's service; the procedure for maintaining communications with the staff and for presentation of reports; the location of the commander and the chief of staff.

In addition, the chief of staff delivers to the sector (or area) commandant the content of the directions given to the troops for camouflage; locations of medical aid posts, special decontamination processing posts, and assembly points for damaged vehicles; and other information.

In particular cases, written orders on the commandant's service may 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 must be given special attention; the commandants of the sectors (or areas) and the resources allocated to them; on what routes or in what areas (or sectors) the commandant's service will be set up by the resources of the higher staff; the procedure for maintaining communications with the sector (or area) commandants; the commandant's service readiness time.

During the march and also in the course of combat operations the staff monitors mission performance by the commandant's service elements, constantly maintains communications with them, and, as the situation changes, assigns additional missions or redirects them to other routes (or areas). Here commandant's service radio communications, especially during the march, can be used by the commander and staff

for passing orders and signals to the troops and also to obtain data from them on the state of the subunits and the time when they pass the projected lines.

In the course of an advance, especially when it is conducted at high speed, troops must quite frequently force various kinds of river obstacles.

When forcing water obstacles the commandant's service is set up on the routes of advance of the troops to the water obstacle, in the tank sealing areas, in the positional areas, in the artillery fire positions, and at the crossings. For this purpose, a forcing sector commandant and crossing commandants are designated, and checkpoints, commandant's posts, and traffic control posts are deployed (figure 31).

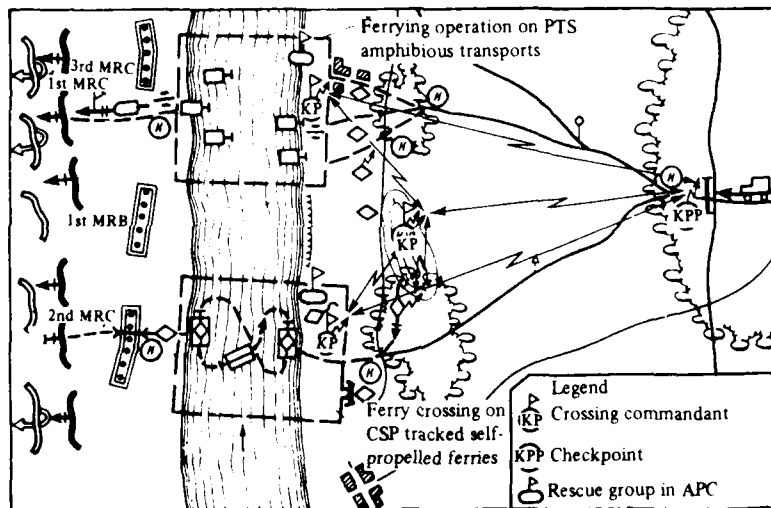


Figure 31. Organization of Commandant's Service at Assault and Ferry Crossings.

The instructions and the requirements of the crossing commandant on observing established procedure are mandatory for all personnel of the subunits making the crossing.

On each route which leads to the crossing, checkpoints are set up for passing the subunits on to the crossing in strict accordance with the established order.

At the locations where the troops are put on the assault ferries, if these locations are stipulated, commandant's posts are set up, and traffic control posts (or individual controllers) are deployed between the boarding location, the checkpoints, and the crossing points. At night lighted pointers are used extensively to indicate the way to the crossing.

Notes

1. The journal *Signal*, July 1972.
2. See R. G. Simonyan, F. I. Yermenko, N. S. Nikolayev, and V. A. Tumas, *Takticheskaya razvedka* [Tactical Reconnaissance] (Moscow: Voenizdat, 1968), pp. 22-24.
3. *Ibid.*, p. 27.
4. V. Ya. Plyaskin, I. F. Lysukhin, and V. D. Ruvinskiy, *Inzhenernoye obespecheniye obshchevoyskovogo boya* [Engineer Support of Combined Arms Combat] (Moscow: Voenizdat, 1972), p. 12.
5. M. V. Frunze, *Izbrannyye proizvedeniya* [Selected Works] (Moscow: Voenizdat, 1965), p. 130.
6. U.S. Army manuals FM-5-188 *Topographic and Geodetic Service* and FM-5-231 *Mapping Functions of the Corps of Engineers*.
7. *International Defense Review*, August 1972.
8. V. D. Zelenskiy, A. A. Chistov, and G. S. Chulkov, *Tekhnicheskoye obespecheniye tankovykh i motostrelkovykh podrazdeleniy v sovremennom boyu* [Technical Support of Tank and Motorized Rifle Subunits in Modern Combat] (Moscow: Voenizdat, 1972), p. 6.

Chapter 8. Developing and Maintaining High Troop Morale in Combat

Officers can perform their missions successfully when they have a thorough knowledge of Marxist-Leninist teachings on the morale factor, understanding of the dialectic unity and interrelationship in combat of man and machine, the ability to maintain high morale among the troops under any circumstances.

1. The Role of the Morale Factor in Combat and Means of Developing It in Personnel

Victory in war depends on many factors. Among them an exceptionally important role belongs to troop morale. "In any war," V. I. Lenin pointed out, "in the final analysis victory is dependent on the morale of the masses who spill their blood on the battlefield."

Bourgeois military experts also agree on the fact that high troop morale "is the most powerful weapon known to man," and that "low troop morale is more dangerous for an army than a shortage of ammunition."

However, recognition of the importance of morale by bourgeois researchers is not backed up by scientific analysis of the essence or of the means of developing and maintaining high troop morale in combat. They usually reduce the concept of morale to a biological category with no reference to matters of class and independent of the sociopolitical structure of the state at war and the goals of the war. An objective analysis of the nature of morale would inevitably lead them to a discovery of the true causes and goals of predatory wars, to an indication of the aggressive policy of imperialism, and to an admission of the incapacity of the bourgeois structure to serve as a source of moral strength in the people and the army. Therefore many bourgeois ideologists see sources of the army's morale only in the military organization itself, in the living conditions and activities of the soldiers, in training for combat. It is no accident that in the U.S. military handbook *Naval*

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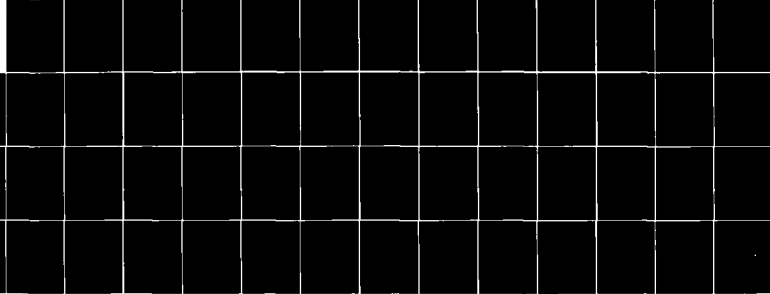
FUNDAMENTALS OF TACTICAL COMMAND AND CONTROL: A SOVIET
VIEW(U) DEPARTMENT OF THE AIR FORCE WASHINGTON DC
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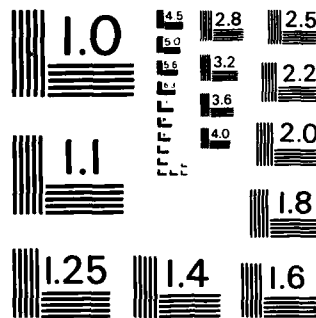
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Officer's Guide it is recommended that concern be shown for rest, entertainment, and food in order to keep up morale among personnel.

In the U.S. Army manual *Psychological Operations* it is pointed out that psychological impact is the principal means of maintaining the morale and psychological factor at the level of missions with the most dramatic situations. This manual recommends arousing "inner feelings of love for America," which can become "decisive in the spiritual motor of the troops."³

The English military ideologist Letang contends that troop morale is determined primarily by the realities of war: their fatigue, fear, hunger, sleeplessness, weather conditions, and the difficult situation at the front. If those in command take measures and eliminate the causes of these negative phenomena, then their troops' morale will be strengthened.⁴

There is no question that these measures have a certain impact on the morale of fighting men, but they cannot serve as the basic sources for developing troop morale.

Imperialism's tested expedient for maintaining troop morale is to brainwash the soldiers. The basis for this is the propagation of anticommunism and antisovietism, maintenance of the myth of "the communist threat" and "the Red danger," perversion of Marxist-Leninist teaching, slander of the foreign and domestic policy of the socialist countries, spreading of the myth of their aggressiveness, and, together with this, the glorification of war and the propagandizing of self-seeking, bourgeois nationalism, racism, and misanthropy. All of this is designed to smother in people such spiritual qualities as moral fibre and conscientiousness, to turn the soldier into an unthinking being, to extinguish his consciousness, and to incite the basest instincts and passions in him.

It should also be pointed out that typically the views and ideas with which the bourgeoisie indoctrinate military personnel are not notable for their originality or novelty. In preparing for the Italian campaign in 1796, Napoleon inspired his soldiers thusly: "I want to lead you into the most fruitful plains of the world. Rich countries, great cities will be in your power. You will find honor, glory, and wealth there."⁵ And this is how more than 150 years later, during the predatory war in Korea, in the battle for Seoul the American General MacArthur exhorted his soldiers: "Before you stands a rich city full of wine and candy. Take Seoul and all of the girls will be yours. The property of the inhabitants will belong to the victors." As we see, the aggressors in

the past and today strive to arouse base passions in the the soldiers, to stir up a spirit of greed, violence, and plunder. For such indoctrination a colossal propaganda apparatus is called on, including the church and special services for matters of disinformation. And the press, radio, movies, and television are widely used.

The main theme and content of the brainwashing of troops is based on the premise that the role of the armies of the imperialist states is a question of protecting the "free world." Hence, any actions they take are already justified. The propaganda expresses slanderous fabrications of the "crimes" of the Russians against the Germans in World War II, gives reports on the "corporal punishment system in the socialist army," and tells stories about the "Siberian labor camps" set aside for prospective prisoners of war. A number of manuals defining the content and methods of ideological and psychological influence have been written for carrying out this brainwashing.

A situation is created on the training fields that suppresses the soldier's spiritual makeup to the limit and dulls his capacity for emotional responsiveness. Everything is done to ". . . accustom the soldier to the diabolical atmosphere of fire and death, to reach a point in which he will feel the same way in the fire, smoke, and confusion as in an ordinary situation, and will act—fire, move, and fight."⁶

Of course the imperialists' ideological and combat training of military personnel offers its "fruits." As a result of this training, the modern armies of imperialist states are turned into an obedient instrument in the struggle to implement the aggressive plans of the ruling circles.

In bourgeois society there are no workable, reliable sources for developing high morale in the troops. All the artificial influences on personnel there are cannot create that steady and long-lasting effective force—the morale factor, which, combined with other factors ensures victory.

Only Marxism-Leninism offers a genuinely scientific solution to the problem of developing high, stable troop morale. It teaches that the moral forces of the people and the army are an inseparable unity and are determined by the nature of the structure of society and the state by the socioeconomic relations of the people, and by the ideology prevailing in the country.

Morale expresses the attitude of the people toward the interests of their Homeland, the state's policy, the goals of the war, and it

represents their inner readiness to endure any trials in order to gain victory over the enemy. This is precisely what explains the fact that stability of morale is always greater in a people who are fighting a just war, who are fighting aggressors and for the freedom and independence of their country.

In evaluating enemy fighting efficiency and morale before the Stalingrad operation, Marshal of the Soviet Union G. K. Zhukov wrote: "The Germans' satellite troops were not armed as well as the Germans themselves. They had less experience and were lacking in fighting efficiency even on the defensive. The main thing is that their soldiers and even many of the officers did not want to die for causes not their own. . . ."7 Therefore it was no accident that our command dealt the principal blow to the sectors where the troops with relatively low stability of morale were located.

The state of troop morale is decisively dependent on the nature and the goals of the war and the extent to which they are understood by the personnel. "Belief in the justness of the war and consciousness of the necessity for sacrificing one's life for the good of one's brothers," V. I. Lenin taught, "lifts the spirit of soldiers and makes them endure unheard-of difficulties. . . . This realization by the masses of the goals and the reasons for the war is enormously significant and ensures victory."<8

Thus, the "morale factor means the spiritual capacity of the people and the army to steadfastly bear any difficulties and deprivations and the most severe tests of war and not lose the will to fight and defeat the enemy."<9

The role of the morale factor in modern warfare has increased drastically. This is caused primarily by the political nature of a future war. A war, if the imperialists succeed in unleashing one, will in its political essence be a decisive collision of two opposing social systems, which will determine the extreme resoluteness of the two sides' operations. This type of war will certainly require that the people and army exert themselves to the utmost, and it will increase immeasurably the responsibility of each soldier and officer for the fate of his Homeland.

The significance of the troops' stability of morale has increased because of the adoption of nuclear weapons, the most destructive and powerful kind, and also a change in the methods of armed combat and the nature of the modern engagement. Combat operations will assume an exceptionally intense, highly maneuverable nature, and they will be distinguished by sudden, sharp changes in the situation, struggles on

both sides to gain time and seize the initiative. All of this has an unprecedentedly strong effect on the mental state of the soldier. Only those personnel convinced of the just nature of the war, having strong nerves and great skill in combat can withstand the tests of the difficult conditions of the combat situation. Victory in combat is attained not by weapons of themselves, however powerful or threatening, but by the soldier who has mastered them to perfection. The more complex the equipment and the more powerful the weapons, the greater the demands on the man, his ideological conviction, combat skill and psychological conditioning.

In defining the role of morale, one should also not fail to take into account the expanded scales and intensified ideological struggle between the belligerents. In modern warfare one should expect a much greater effort by enemy propaganda to influence the consciousness and mental state of the people than was the case in past wars. Those with firm 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 morale factor in modern warfare. At the same time, high morale is not an inherent quality in man, and it does not occur in him automatically or spontaneously. It is developed as the result of hard, purposeful indoctrinational work with the young even 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-Leninism, in accordance with the norms of the moral code of a builder of communism. The principles of this code motivate all the activities and thoughts of our people. During military service, there occurs active and purposeful development and reinforcement of the soldier's stability of morale. This process has two aspects—the moral-political and the psychosocial—which are an inseparable unity. During moral-political and psychological training, all of the man's intellectual, moral, and physical capacities are cemented into a united whole, turning them into one of the decisive components of the combat might of the army—high morale.

Moral-political training^{*} develops a Marxist-Leninist world outlook and communist conviction in the troops, arms them with a thorough understanding of the policies of the CPSU and the Soviet government, and of the essence and the goals of the war, and reinforces the moral principles in them that determine people's behavior in combat.

* [The reader is referred again to the footnote on p. 48 of this book and reminded that there is a problem in Russian with distinguishing the concepts moral and morale—U.S. Ed.]

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, there must be evidence of a "composite approach to organizing the whole business of indoctrination, that is, one that ensures the close unity of ideological-political, labor, and moral indoctrination, taking into account the peculiarities of the various groups of workers."¹⁰

It is undoubtedly the fact that in a combat situation the efforts in indoctrination are aimed at maintaining the constant, high combat readiness of the troops and at successful accomplishment of the assigned tactical 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 an enormous spiritual wealth that ensures that a scientific world outlook will be formed in the troops.

Explanation of the questions of the domestic and foreign policy of our party and government becomes especially important. A thorough understanding of it forms in the troops a sense of patriotism and pride in their country and develops in them a sense of personal responsibility for the protection of their Homeland.

It is impossible to prepare people for combat in terms of morale if we do not explain the goals of the war to them, if we keep them in ignorance regarding the tests which they may encounter in the course of carrying out the tactical mission. Every soldier must be convinced of the just nature of the war which our people must wage, clearly see the goals of this war, know that nuclear missiles will be the decisive means of armed combat, although under certain conditions units and subunits may conduct combat operations with conventional weapons alone.

Indoctrination is aimed at improving the combat activeness of the troops when they perform specific tactical missions and at their skillful actions, especially when nuclear weapons are employed. In the process of indoctrination, the troops are instilled with a sense not only of moral but also material superiority over the enemy. The superiority of our weapons is pointed out, and thus a confidence in their power is developed. A convincing demonstration of the weak and strong features of the enemy's weapons and the characteristic methods for their combat employment will help personnel to develop efficient procedures and methods for countering enemy weapons and for

protection against them.

It is no less important to accustom the troops to working very efficiently on the battlefield, functioning to absolutely full capacity, and enduring great physical burdens. Only in this way are they able to withstand the extreme physical demands on them in combat, especially during combat operations conducted continuously for several days with nuclear weapons.

The greatest attention is given to instilling in personnel a great offensive spirit, which is the most important measure of their combat activeness. The development of these qualities in the troops follows from the specific nature of the offensive—the kind of combat characterized by decisiveness in the troops' operating modes, by the speed and intensity of their development, and by the acute struggle for the initiative and to gain time.

Psychological training is organically connected with moral-political training, which affects the consciousness and reason of the troops and the other aspects of their mental makeup—will, feeling, tolerance, and emotion.

During psychological training, personnel develop an inner readiness and capacity to carry out tactical missions courageously in stressful and life-threatening situations, to successfully endure the most severe test of wartime and in difficult, critical times retain their self-confidence, strength, ability to act selflessly, actively, and persistently, in complete accordance with communist convictions and moral principles of behavior. Developing in personnel such qualities as courage, valor, discipline, decisiveness, resourcefulness, imagination, and readiness for mutual aid and assistance becomes extremely important.

A most important goal of psychological training is teaching personnel to overcome their fears during operations occurring under dangerous conditions and to withstand the sudden effect of powerful stimuli. Here it must be taken into account that the manifestation of fear, in contrast to fright, is caused not by direct stimuli, but the expectation of danger. Therefore before the enemy employs nuclear weapons some soldiers may manifest confusion or apathy. In a dangerous situation fear can paralyze a man's will and take away his capacity to control his actions. These harmful phenomena may be prevented by developing in the troops a firm belief in their own strengths and a knowledge of the destructive effect of these weapons and effective means and methods of protection from them.

In psychological training, along with a soldier's personal characteristics, the specific nature of his duties to be performed in the course of battle is taken into account. Thus, the personnel of reconnaissance subunits and of post-nuclear-attack recovery detachments must operate under constant danger of radiation and burns. Their psychological conditioning may be achieved by systematic exercises on the training fields that make it possible to convincingly simulate the conditions under which they will have to operate in combat.

Critical and dangerous situations in the course of a battle cause mental stress in the commanders to an equal extent. Initially the stress that occurs may heighten their capacity for work, but afterwards it may lead to disruption and disorganization of their activity. "On the battlefield the commander experiences . . ." wrote Marshal of the Soviet Union M. V. Zakharov, "the same thing as the soldier, but as the leader he must also make scientifically sound decisions, answer for the fate of the engagement, the encounter, the operation, and the life and activity of the people subordinate to him."¹¹ The complexity of his work increases as a result of the fact that in the majority of cases he is forced to make a decision without exhaustive, complete data on the situation and with extremely limited time for working out the decision.

In addition, skill in doing psychological battle with the enemy is required. The battle is not just a collision of forces, weapons, and people, but also a conflict of minds, wills, tenacity, and pressure on the enemy's mental state to give rise to doubt, indecisiveness, and confusion in him and to force him to give up his intentions.

During psychological training it is important to teach a man to be able to control his behavior in combat and always be ready so that no test will turn out to be unexpected for him. Of course, no one can completely eliminate stress when in a dangerous situation. When a man has the appropriate psychological conditioning, he will not, regardless of the effect of powerful stimuli and the stress caused by them, lose his presence of mind and his skills and abilities. On the contrary, he summons up all of his faculties and willpower for successful actions appropriate to the actual situation.

These qualities are to a great extent developed in exercises before the battle under conditions as close as possible to those of actual combat. The following methods have been proved to be effective in forming stability of emotions and will: firing over the heads of one's troops by artillery, mortars and tanks, firing machine guns and submachine guns from behind the flanks and in the gaps between the subunits; attack by motorized rifle subunits immediately following a

rolling barrage; dropping bombs directly on the assault objectives; running tanks over troops in foxholes; using hand grenades, negotiating minefields, ruins, flooded areas, and sectors of contamination and destruction; forced crossing of rivers using improvised means; simulation of the external aspects of combat, etc.

The specific content and thrust of the measures for stability of troop morale are varied. They have different manifestations with each mission that the troops carry out.

The use of various measures that create a situation of risk and danger brings the troops to an emotional peak, accustoms them to the complex conditions of the combat situation, develops in them steadfast will, boldness, resolution, combat activeness, and a readiness to stand up under difficult tests in combat.

In the course of the drills and exercises that are as near as possible to real combat situations, the officers form a correct conception of combat, develop the ability to estimate the combat capabilities of friendly and enemy troops, and to react quickly to changes in the situation, and acquire the skills for proper evaluation during combat of the actual extent of the danger.

It is extremely important for an officer to develop the ability to act decisively and boldly on the battlefield even with incomplete data on the situation, with subunits that are undermanned, and when the enemy is demonstrating great activeness. When an officer who has insufficient professional and psychological training gets into difficult situations, he usually underestimates the combat capabilities of his own troops and makes an uncritical estimate of enemy capabilities, which leads him to make unsound decisions.

When an officer performs his duties under conditions approaching those of combat, this helps him develop the necessary emotional and psychological stability. It is important that the situation created in such training exercises move the commander to manifest boldness, decisiveness, independence, intelligent initiative, and readiness to take a justified risk in order to accomplish the mission.

Here the emotional and psychological qualities of the officer become a real force in command and control only if they are supplemented by firm knowledge of the rules, regulations, and materiel and also comprehensive knowledge of the enemy troops and their weapons and tactics.

2. Ways to Maintain High Morale During Combat Operations

Combat experience confirms that it is most difficult to ensure stability of troop morale at the very beginning of combat operations. There are many reasons for this. There is a sharp transition from peacetime conditions to those of combat. The personnel are not seasoned in battle; they have no combat experience. Striving for surprise, the enemy will, at the beginning of combat operations, make extensive use of new weapons or new methods of utilizing previously existing ones. For example, we know that at the beginning of the Great Patriotic War the enemy's massed employment of tanks and aircraft, infliction of deep cutting blows, and creation of conditions for encirclement in certain cases had a negative effect on the combat effectiveness of some troops. Some troops experienced a sense of fear and a lack of confidence in their own capabilities. However, as they subsequently found the ways and means of countering the enemy as well as improving their combat mastery and the troops' emotional and psychological training, this fear was successfully overcome.

When nuclear weapons are employed on the battlefield there are even more of these phenomena and surprises. This is especially true because the destructive properties of nuclear weapons have been determined only experimentally, on the proving grounds. When the belligerents employ nuclear weapons on the battlefield, it cannot be ruled out that peacetime notions of their destructive properties and methods of their employment will change sharply, and thus adjustments will have to be made in combat procedures and, consequently, in the training of personnel.

Unquestionably, one of the causes of breakdown of troop morale is the constant threat of nuclear strikes by the enemy and the lack of confidence in the reliability of the means and methods of protection against the casualty producing elements, especially radioactive contamination.

When the enemy inflicts nuclear strikes and when there are operations in the zones of contamination, destruction, and fires, some of the personnel will exhibit caution, leading to a slowdown and a premature urge to take medical treatment measures.

Keeping troop morale high during combat operations in radioactive contamination zones will become very important, and effective means of solving this problem will have to be found. The most important means consists of carefully thought-out and purposeful indoctrination

that inspires personnel to aggressive operations and of taking the necessary measures for protection and recovery from enemy nuclear attack.

Under these conditions, the level of combat training of the troops and their inner readiness to conduct aggressive operations, exerting every effort, will be decisively important in accomplishing the assigned mission. This readiness is made up of ideological conviction, confidence in the strength and power of their weapons and equipment, used according to the plan of higher headquarters, and absolute faith in their commanders. Also conducive to this is the troops' firm knowledge of the means of combating the enemy. ". . . If each one sees and knows," M. V. Frunze wrote, "what can be sent against him and sees how this technical equipment is actually used; then we will have achieved a great deal in terms of the combat indoctrination and combat conditioning of our Red Army personnel."¹²

"Man is so created," said Admiral Makarov, "that he will go to certain death when he knows the danger facing him, but he is afraid even of the sound of bilge water if he is not accustomed to it."

First, a special approach will have to be taken with those who have developed strong inhibitions that cause them to be paralyzed with fear, indifferent to the situation, and immobilized. In order to restore psychological equilibrium it is necessary to talk with them, calm them, and direct them toward taking the required protective measures and then, by giving commands, stir them to action and focus their attention on accomplishing the assigned tactical mission under the conditions at hand.

In overcoming this paralysis and depression, the personal example of a comrade, a confident command from an officer, or an encouraging word from a political worker can be effective. Then the man overcomes his confusion, suppresses the instinct for self-preservation, and begins to act assertively.

Observation of a strict mode of operations, discipline, and skillful use of the protective properties of the terrain become especially important for reducing the seriousness of losses and preserving the psychological stability of the troops when they are carrying out operations in the face of radioactive contamination.

However great the losses subunits may suffer from nuclear attacks, it is important for surviving personnel not to lose their fighting effectiveness or faith in their own capacities. Persistence and

aggressiveness in accomplishing the assigned mission under any conditions is indicative of the troops' great stability of morale. In evaluating the actual situation here one should begin with the actual correlation of forces and also the morale of the enemy troops, who have suffered a powerful retaliatory nuclear strike. Daring and courageous action under these conditions can ensure victory. The enemy's stability of morale can be undermined by our troops' decisive operations, a deep breakthrough into the depth of his defenses, strikes to the flanks and rear, and by carrying out active combat operations day and night. A successful advance makes for heightened morale, instills courage and confidence in one's powers and at the same time produces the feeling that one is protected against the effects of the nuclear weapons, for being in direct contact with the enemy makes it difficult for him to employ nuclear weapons.

One should recognize the successful accomplishment of the tactical mission as the principal factor in restoring the troops' psychological stability. Whatever the state of the subunits may be after the enemy makes the nuclear strike, if the commander has succeeded in comprehensively evaluating the situation at hand in a short period of time, making a sound decision, and building up his subordinates to carry it out, then all the troops' alarm and fear can be overcome by their taking assertive action.

When a tactical mission is being carried out, measures to relieve excess tension and to produce psychological relaxation are very important. The decisive factor here is personal communication between the commander and the party-political apparatus with the subordinates, a well-thought-out placement of communists and Komsomol members, withdrawal of the subunits to the second echelon or reserve or from the contaminated zone, alternation of combat operations with rest, setting up regular meals, timely aid to the wounded and sick, the suppression of rumors and panic, and so on.

Communicating political influence to all of the personnel in the course of combat operations depends to a great extent on the proper placement of communists and Komsomol members in the subunits so that there will always be a strong group of active party members in each of them—a combat nucleus capable under the most difficult circumstances of preserving stability and strong discipline, demonstrating courage, and inspiring the other troops to great feats and intelligent actions. The communists and Komsomol members are assigned specific tasks to perform individual work with each soldier and NCO.

Preservation of high morale among the troops performing combat operations in contaminated zones is greatly dependent on the effectiveness and timeliness of radiation reconnaissance measures, post-nuclear-attack recovery operations, and maintenance of strict order on the lines of march and in the rear areas of one's troops. Therefore the subunits that carry out these measures must be under unremitting party-political influence.

The least manifestations of confusion or panic on the part of individual servicemen must be suppressed immediately. In order to prevent such dangerous phenomena it is necessary, in addition to constant explanations of the situation, to plan a number of organizational measures.

An important role in the maintenance of strict order on the lines of advance and in the rear areas of one's troops and, consequently, in preventing undesirable consequences for the outcome of the battle belongs to the commandant's subunits. Therefore indoctrinational and organizational work in these subunits is given special attention. The commandant's detail includes the most experienced and trained officers, NCOs and soldiers that are communists and Komsomol members capable of suppressing with a heavy hand possible disorganization and impetuous actions by individual troops.

In overcoming the elements of fear and disorganization, the spoken word can at times be irreplaceable, especially the personal example of the commander and the political worker. They must use their personal influence to restore the fighting spirit of a demoralized subunit, overcome depression, eliminate lack of confidence in one's own capabilities, and build personnel up for carrying out decisive combat operations.

The force of example of the commander plays a great role. V. I. Lenin, while studying Napoleon's book *Thoughts*, copied the following sentence: ". . . In every battle there is a time, after a period of very great stress, when the bravest soldiers feel the urge to run; this panic is brought about by the absence of confidence in one's own fortitude; an insignificant event, any pretext is sufficient to return this confidence to him; the great art is in bringing this about."¹³ The commander's personal valor, self-possession, and firm decisiveness can return this "faith in one's own fortitude," eliminate the manifestation of panic, turn the course of events in the required direction, for "personal influence . . ." emphasized V. I. Lenin, "is terribly significant."¹⁴

In the system of party-political influence on personnel, an important role must be assigned to publicizing the heroic deeds and progressive

methods of the combat operations of the troops in situations where nuclear missile weapons are employed. 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 accumulated. The command, the staffs, and the political organs must make comprehensive use of this experience and put into troop practice the most valuable methods and procedures not only of individual soldiers, NCOs and officers but of whole subunits as well. These progressive methods are disseminated by various means, primarily by the personal discussions of the commanders, staff officers, and political workers with the troops and also by distributing instructions and other printed materials to them.

The role of the commander and his deputy for political affairs is exceptionally great in maintaining the morale of the troops. When making a decision for combat operations, they must not only assess the existing strength of their subordinates' morale but also outline specific measures for maintaining or enhancing it. For this purpose, the commander directs the party-political work, briefs his subordinates on the difficulties which may be encountered by the troops as they perform their missions, and determines what measures to take for moral-political preparation and when, where, and by what means to do so.

In directing party-political work, the commander participates directly in the most important measures, taking every opportunity to influence his subordinates' morale, especially those in subunits that have suffered great losses and, consequently, have had their morale shaken. Not only the content of the special measures for maintaining high troop morale but also everything about the behavior and tact of the commander, the staff officer, and the political worker must become an additional factor for intensifying the political influence on the subordinates. By their tenacity, coolness, calm, stability, and confidence of victory, they must inculcate and maintain the same feelings and qualities in their subordinates.

It is important that the subordinates not only receive the missions in a timely manner, but also that they properly analyze and plan methods of mission performance suitable to the situation. The situation will change quickly and drastically. Sufficient information about these changes is disseminated to the subordinates to eliminate the surprise in enemy operations, including his psychological subversions.

This type of subversion will be aimed at undermining our troops' morale. Special handbooks on conducting psychological warfare published in bourgeois countries reflect procedures and recommendations on how to impel enemy soldiers to desert, to surrender, and to commit other amoral acts, undermine their confidence in their resources, weaken their will, and sow panic. All of these procedures will be used extensively from the very beginning of the war. Therefore such operations by the enemy must not be underestimated. They must be opposed by more powerful ideological weapons that enable us to neutralize the pernicious effect of bourgeois ideology on our troops. In addition, we must carry on active political work among the enemy's troops and citizenry to break down the morale and combat spirit of his forces at the front and the populace in the rear, paralyze their will to resist, and incline them to get out of the war by antiwar demonstrations and activities.

The basic content of this work must be an explanation of the just goals of the war waged by the countries of the socialist commonwealth and, conversely, the unjust nature of it on the part of the imperialist states, a truthful account of the economic and military power of the socialist countries, an unmasking of the lies and rumors of imperialist propaganda; an objective demonstration of the inevitability of the victory of the socialist commonwealth in the war, an explanation of the weakness of the imperialist coalition, and an indication of how to withdraw from the unjust war.

This work must be purposeful and specific. It is planned in accordance with the tactical mission to be performed by the subunit, which means that it is directed against the enemy group which is to be routed. For this purpose, the morale of the personnel, their stability and psychological conditioning are carefully studied. Various sources are used for this: data intercepted by radio, interrogation of prisoners and the local populace, and 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 enemy's preparation in terms of morale as he makes his decision and plans active measures to intensify the impact on enemy morale in order to achieve his destruction.

Measures against enemy propaganda and ideological subversion are taken at all echelons, but in accordance with a unified plan. In this respect, the experience of Great Patriotic War counterpropaganda activities by political organs, party and Komsomol organizations, commanders, and staffs is still valid.

The main efforts of fascist propaganda were aimed at spreading the myth of the invincibility of the German Army and the superiority of their weapons and material, calls to surrender and cease resistance, stirring up dissension among the various nationalities, and so on. It is sufficient to state that during the period from June to October 1941 the fascists scattered 400 million leaflets in the areas where our troops were located.¹⁵ During the engagements near Stalingrad alone, 75 million leaflets were dropped.

Various forms and methods were used to counter enemy propaganda. The basic forms of the ideological struggle with the enemy were the following: printed and oral propaganda, radio propaganda, and visual agitation. Of these printed propaganda played the leading role. Mainly it took the form of leaflets, bulletins, circulars, newspapers, letters, brochures, magazines, and books.

Along with printed propaganda, oral propaganda was also widely used. It was carried out by the political organs using special loudspeakers. Radio propaganda was sent over our units' radios and those that had been captured and also over civilian radio stations in the cities at the front. Posters, transparencies, slogans, and boards with agitation calls were used in visual agitation. Our counterpropaganda used specific examples to demonstrate the weakening morale and combat fitness of the fascist army and the drop in their military production. It revealed the beastiality perpetrated by the Nazis on prisoners of war and the peaceful populace, and it inspired hate for the invaders. Our counterpropaganda was characterized by its assertive nature and was one of the most important areas of ideological-political work providing for raising the troops' morale, for strengthening discipline and organization, and for teaching political maturity, vigilance, and the personal responsibility of the troops for exemplary performance of their tactical missions.

The experience gained in the struggle against subversive fascist propaganda during the Great Patriotic War has not lost its significance, for the imperialist countries have taken into their arsenal every one of the main objectives, means, and methods used by the Nazis.

Notes

1. Lenin, XLI, 121.
2. Norman Copeland, *Psikhologiya i soldat* [Psychology and the Soldier] (Moscow: Voenizdat, 1958), pp. 21, 24. [The U.S. edition was published under the same title at Harrisburg by the Military Service Publishing Company in 1942—U.S. Ed.]
3. FM-33-5, *Psychological Operations*, 1968.

4. *Journal of the Royal United Services Institute for Defense Studies*, March 1972.
5. Napoleon, *Izbrannyye proizvedeniya* [Selected Works] (Voenizdat, 1941), I, 45.
6. Robert B. Rigg, *Boyevaya podgotovka voysk* [Troop Combat Training] (Moscow: Inostrannaya literatura, 1956), p. 13. [The U.S. edition is apparently *Realistic Combat Training and How to Conduct It*, published at Harrisburg by the Military Service Publishing Company in 1955—U.S. Ed.]
7. G. K. Zhukov, *Vospominaniya i razmyshleniya* [Memoirs and Reflections] (Moscow: APN, 1971), p. 383.
8. Lenin, XLI, 121.
9. A. A. Yepishev, *Mogucheye oruzhiye partii* [The Party's Mighty Weapon] (Moscow: Voenizdat, 1973), p. 264.
10. *Materials of the 25th Congress of the CPSU*, p. 74.
11. M. V. Zakharov, *O nauchnom podkhode k rukovodstvu voyskami* [On the Scientific Approach to Troop Leadership] (Moscow: Voenizdat, 1967), p. 59.
12. M. V. Frunze, *Izbrannyye proizvedeniya* [Selected Works] (Moscow: Voenizdat, 1965), p. 446.
13. Lenin, XXIX, 357.
14. Lenin, XLVII, 54.
15. Ye. Chernyak, *Khimery starogo mira* [Old World Illusions] (Moscow: "Molodaya gvardiya," 1970), p. 204.

Chapter 9. Monitoring During Preparation and in the Course of Combat Operations

1. Tasks and Methods of Monitoring

Tactical command and control is based on the commander's firm confidence that his subordinates will carry out the tactical missions assigned by him precisely and on time. This confidence proceeds from the premise that the subordinates bear complete responsibility for this. Therefore they should not have to follow detailed instructions, but rather have the opportunity to display initiative and thus gain confidence in their own resources 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. Placing his confidence in them, the senior commander constantly follows the progress of the battle and can at any time render them assistance with all the resources available to him. However, this assistance is possible only when the senior commander knows the progress and results of his subordinates' performance of their tactical missions. Hence, the unquestionable requirement: "Delegate and follow up." Still, this following up is not an extraordinary measure calculated to "catch" or "expose" someone.¹ His primary and "more complex task is to check the correctness of the work . . . check the system of organization of operations; to ensure the greatest *productivity* in the operation . . ."²

The general purpose of monitoring amounts to checking the combat readiness of the troops under one's command and the results of their performance of the tactical missions, while at the same time rendering them practical aid. The specific tasks and methods of monitoring are derived from the content of the tactical mission and the conditions under which it is carried out, especially the level of training of the subordinate commanders and staffs and the time available. In principle, monitoring is exercised in two areas. On the one hand, the commander monitoring the operations of the staff and the chiefs of branches of troops and services directly subordinate to him, while, on the other hand, the commander and staff and the chiefs of branches of troops and

services subordinate to him, jointly and according to a unified plan, check the activity of the subordinate troops. Each of these areas is characterized by special monitoring tasks.

The commander sees to it that the staff and the chiefs of the branches of troops and services are accurate and timely in maintaining constant troop combat readiness, planning and comprehensive support of combat operations, disseminating the tactical missions to the executive agents, and organizing coordination and setting up control posts and communications posts. As for the tasks involving monitoring subordinate troops, they are greater in volume and more varied in content. They take in the most important aspects of preparation and activity of the subordinate troops and their control organs. Usually and most importantly the following are checked: the state of combat readiness of the subunits; the timeliness of receipt and correctness of analysis of the tactical missions by the subordinate commanders; the conformity of their decisions to the senior commander's concept; the correctness and completeness of the subordinates' implementation of measures for coordination, for comprehensive support of combat operations, and for organization of control and communications posts.

Checking the state of combat readiness of the subunits is a primary mission. While this checking is going on, a determination is also made of the degree to which the subunits are supplied with personnel and various kinds of materiel, the extent to which they are provided with all the fighting and living necessities, the level of combat and political training of personnel, and other matters concerning the subunits' constant readiness.

It is quite obvious that all of the remaining monitoring tasks, especially those regarding support measures, are connected to one degree or another with checking and maintaining the combat readiness of the subunits. Thus, checking the readiness of the subordinates to defend against enemy nuclear weapons amounts to determining whether subunit personnel have individual protective equipment, the ability to use it correctly, and whether personnel know and are capable of observing safe dispersal standards and other protective measures. It is very important to verify the proper organization of reconnaissance, for which purpose one also checks on whether the executive agents know the reconnaissance missions and the times and methods of executing them; the thoroughness with which the reconnaissance units are prepared for operations; and the results of these operations in carrying out the assigned missions. It is no less important to check the correctness of implementing other types of support measures, especially camouflage, security, and electronic countermeasures.

The quality of the subordinates' work in planning combat operations and disseminating the missions is usually checked for a broad range of problems which cannot be limited to any single list. One thing is certain. It is necessary to find and indicate to the subordinates the best means of accelerating and improving the effectiveness of their particular work under actual conditions. As for monitoring the organization of control posts and communications posts by the subordinates, in a number of other matters there is a check of their readiness to restore command and control after the most serious kinds of enemy disruptions.

Organization, quickness, and secrecy of movement and operations by troops and control organs in combat depend to a great extent on the commandant's service. Therefore its timely and correct deployment and performance in the indicated areas or on the routes is checked. One also takes into account the fact that the commandant's service itself has a very broad and responsible monitoring function. It is entrusted with monitoring the procedure for the movement or deployment of troops, camouflaging them, and so on. Thus, the commandant's service is becoming one of the most important means of supervision and is directly involved with the monitoring methods selected by the senior commander (or staff) for checking on the subordinate troops.

In combat practice the most effective method was that of having responsible personnel of the superior control organ check the important problems directly with the subordinate units. This is understandable, for it is here that a well-known principle is fulfilled. Better to see once than to hear a hundred times. The effectiveness of this method is unquestionable. It makes it possible to confirm on the spot that one's subordinates have taken proper command and control measures, to provide the subordinates detailed situation information on the spot, to respond to problems that they have, and also to give them specific assistance. And so one investigates every opportunity for personal communications with the subordinates and for on-the-spot checking of the results of their activity.

However, in modern combat the conditions may not always be favorable for employing this method. Extremely limited time, a complex radiation situation, and the speed of development of events all limit and sometimes rule out the chance not only for the commander himself or even the staff officers to visit the subordinates to monitor them. Usually this method can be used when conditions are more or less stable, that is, when an engagement or a march is organized and also in the course of combat when the personal intervention of the chief or the staff officers is the only possible or expedient measure to correct a

serious situation that has developed. However, even in these cases it is necessary to weigh the question of the degree to which a visit to the subordinates will ensure fulfillment of monitoring tasks and whether some other method may be more efficient.

Monitoring is also achieved by studying the verbal or written reports of the subordinate commanders (or chiefs) or various written operations documents (orders, instructions, etc.) developed and sent by them to the superior staff. This method of monitoring can be used both in organizing and in the course of combat. Its virtue is that the monitoring tasks are carried out by studying data put in brief, clear language by the subordinates, which speeds up the monitoring process. Besides, putting the information in writing makes the subordinates take more responsibility for its accuracy, which increases the level of reliability of the data they report.

Documents, however, reflect events that have taken place, operations that have already been accomplished by the subordinates, so they quickly become obsolete, which detracts from their value. Use of this method is also restricted by the fact that it is not always possible and expedient to require that written operations documents be submitted by the subordinates. In addition, not all of the problems (or information) needed by the senior commander for monitoring can be dealt with in them. This whole situation is aggravated by the fact that deficiencies in the subordinates' operations that are revealed in the documents will often be difficult to prevent or eliminate, especially during combat, when there is little or no time for explaining and issuing appropriate instructions to the subordinates.

In such cases, direct conversations are held with the subordinates over communications channels during which they find out about the results of the subordinate commanders' and staffs' management of the troops and about how the tactical missions are progressing.

This method makes it possible to get the required information from the subordinates relatively quickly and to give them instructions for eliminating the deficiencies discovered in their decisions or operations. However, there are also bottlenecks even in this method. For example, the subordinates' oral reports may not always correspond to the objective state of affairs because the situation has not been capably or accurately evaluated. Not all of the tasks can be carried out as completely as one would wish. In particular, there is a limited opportunity for checking the subordinates' planning and support of combat operations because the scale and complexity is so great. In addition, because of the requirement for secrecy in the preparation of combat operations,

certain matters cannot be discussed at all over technical communications facilities. Therefore monitoring by exchanging messages with subordinates over technical communications facilities is used only for dealing with simple matters: checking the time of receipt of operation (or fragmentary) orders by the subordinates, the time of passing or occupying lines (or objectives) in combat, and so on.

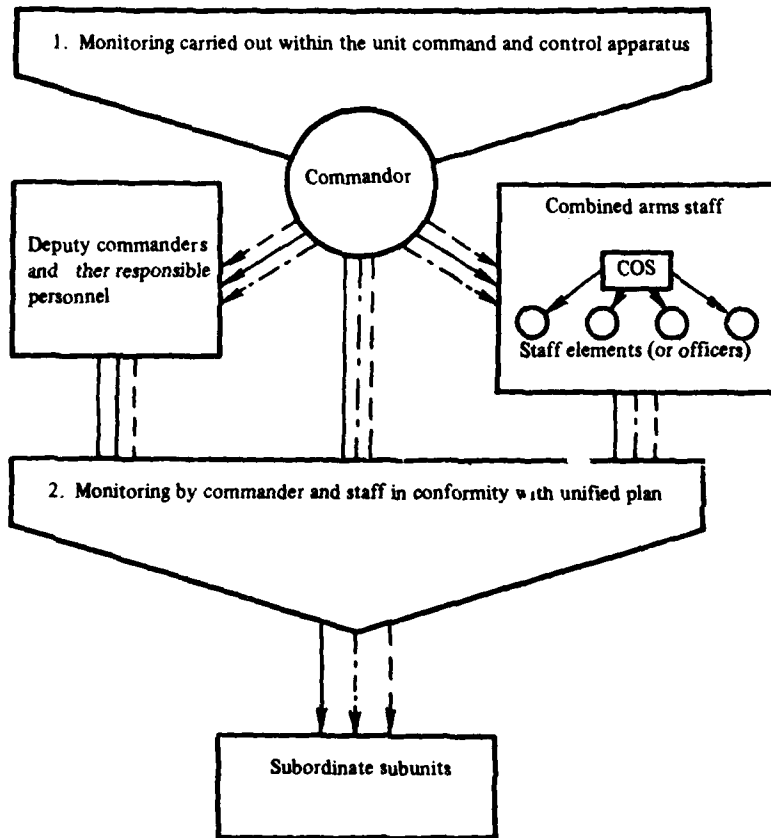
Inasmuch as each of the monitoring techniques in question has advantages and disadvantages, they are used in combination and in such ways as to make the best use of the virtues of each of them when setting up monitoring under actual conditions.

2. Organization and Implementation of Monitoring

The organization of monitoring includes determination of the objectives and tasks of monitoring, development of a monitoring plan, dissemination of the contents of this plan to the responsible personnel who implement it, training (instruction) of these personnel to perform the monitoring, and determination of the procedure and time for reporting the results of monitoring.

These problems are resolved on the basis of the actual conditions and the level of the troop unit. In command and control elements where there is no staff, monitoring is organized and conducted by the commander himself. Where there is a staff and other control organs, monitoring is performed somewhat differently (figure 32). Of course, even here the role of the commander is significant. He defines the tasks of monitoring the work of the subordinate commanders and staffs and gives instructions to his staff on when and how best to implement them. The commander participates personally in the monitoring, checking the precision of the subordinates' performance of the most important missions and measures. In addition, it is the commander's special duty to monitor the quality of the work of the subordinate command and control apparatus, especially that of the staff, the element that usually performs a significant volume of the work.

The staff plans the monitoring, disseminates monitoring missions to the responsible personnel participating, trains these personnel to implement monitoring, participates directly in monitoring, draws conclusions about the results of monitoring and assistance to the subordinates, and reports them to the commander.



Legend

- Personal contact (or observation)
- - - Analysis of documents and oral reports
- - - Using technical communications facilities

Figure 32. Organization of Monitoring.

The planning of monitoring includes specification and definition of the procedure for carrying out monitoring missions, that is, what to check, where, in what sequence, and when; what methods to use and which responsible personnel to call in to implement the monitoring; when and in what form to report the monitoring results to the commander.

The content of the monitoring plan is presented in the form of short jottings (notes) in the working notebook of the commander (or chief of staff) and, if there is time, then also in a special document in approximately the following form:

"Approved"

Unit Commander _____
(rank, surname)

Date

**PLAN FOR MONITORING
PREPARATION OF UNIT FOR OFFENSIVE**

In order of steps	Monitoring tasks	Who is monitored	Monitoring time	Who monitors	To whom, how, and when to report monitoring results
1	Occupation of initial position for offensive, etc.	3rd Motorized Rifle Battalion	1800 hours to 2100 hours 4 August	Unit deputy commander	Orally to unit commander, 2130 hours 4 August

Unit Chief of Staff _____
(rank, surname)

The requirements imposed on monitoring are as follows: purposefulness, that is, checking out the basic problems and those required by the situation; timeliness of monitoring, that is, carrying it out so as to forestall deficiencies in the work of the subordinates; combining checking the quality of the subordinates' work with practical assistance to them.

The planned monitoring tasks are executed by a combination of various methods. They are combined in terms of time so that the most important problems concerning the commander can be checked by various methods simultaneously or at different times and so that the subordinate commanders are not taken away from command and control of their subunits for too long. Let us assume that the commander has made the decision to make a fire strike against the enemy during the

course of an engagement, but he doubts the accuracy of the report of a subordinate subunit commander concerning the line he has reached. At the same time, knowledge of the subunit's true position is very important, since it is operating in the sector where the fire strike target is located. Several methods can be combined for checking and more precisely determining the position of the subunit in question: sending a staff officer out in a vehicle to make a visual observation; requesting additional information from the subordinate commander or staff over technical communications facilities, obtaining these data from the commanders or staffs of adjacent subunits.

In determining the monitoring times and participants, one must take into consideration that it will not always be possible to establish a special time and to set aside a special group just for monitoring. Most frequently, during preparation and especially in the course of combat, monitoring must be done at the same time that other command and control measures are being taken. Thus, at the same time that the tactical missions are being disseminated to the executive agents, the correctness of their analysis by the subordinate commanders is being checked. Then there is monitoring of their work in making the decision and in carrying out measures for support of combat operations.

The proper evaluation of the quality of the work of the subordinates and the discovery and elimination of deficiencies in it is a problem which can only be solved by competent and trained officers. Therefore monitoring, for example, of the preparation and the operations of artillery subunits or of subunits of special troops is carried out by the officers having the appropriate kind of job experience.

The problems resolved in the monitoring plan are linked to the monitoring measures of the next higher echelon so as to avoid duplication, that is, the simultaneous checking of one and the same subunits for one and the same problems. On the basis of the monitoring plan developed by the combined arms staff, the chiefs of the branches of troops and services can, if necessary, develop their individual monitoring plans, detailing in them the tasks and methods of monitoring the subunits of their branch of troops or services.

However well prepared the officer is in terms of his job experience, when he is assigned to monitoring, he must carefully prepare for this work. This especially important for officers who monitor using the method of personal contact with the subordinates. The officer who has come out to the troop units is an authorized representative of the senior commander. He must carry out the will of the commander, exhibiting persistence and decisiveness in his demand for precise execution by the

subordinate commanders and staffs of all of the planned measures. However, the authority of the officer who has come out for monitoring depends entirely on the quality of the work done by him and the assistance which he has rendered the subordinates in correcting deficiencies and imprecision 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 master the running of the affairs of this or that institution, enterprise, or department, etc; secondly, it is necessary to *institute* the required practical changes on time and actually implement them."³ It is precisely this point of view that is taken in *training officers for monitoring*.

When going out to the troop units for checking, each officer analyzes his special missions, studies the conditions, and plans the procedure for carrying out these missions. The initial information required is taken from the monitoring plan and disseminated in advance to the officers assigned to perform the monitoring so that they can be ready and coordinate their part in the monitoring with the other kinds of command and control activities. Usually as a matter of course this information is disseminated personally by the commander or chief of staff to the officers, first of all, to the ones who are sent out to the troop units to carry out the most important and urgent monitoring missions.

When one selects the procedure for monitoring, the following are established: the route that is convenient from the point of view of speed and safe movement; the time of arrival at the subordinate commander's control post; where the monitoring is to begin and in what order; when and where, considering the movement of his control post, he will return after carrying out the monitoring missions; and how to report the results. Underestimation of these problems leads to disruption of the monitoring plan with all of the ensuing consequences. Thus, failure to take into account the importance of selecting concealed, safe routes (directions) of movement to the locations to be monitored leads to unwarranted losses from enemy fire or the effects of their subversion and reconnaissance groups. And not knowing where the subordinate control posts are that they are going to monitor or not knowing where their own control post will be when they return to it from the subordinates' locations will cause officers to lose a great deal of time needlessly and thus not get to the work awaiting them in command and control.

Those who monitor prepare to do it in terms of the nature of the monitoring tasks. If, for example, it is necessary to evaluate the correctness of the decision of a subordinate commander, then the person doing the checking must first study the decision of his own

commander and analyze in detail the conditions of its implementation by the subordinate. An especially careful study is made of the situation at the front line of the subunit to which the officer is being sent for monitoring; here the situation is studied not only for the moment at hand but also considering the prospects for its change and development in the course of combat. Without this preparation he will not be able to deal with the problem of checking the expediency of the subordinate commander's decision and, of course, cannot be of specific assistance to him. Appropriate preparation is required also when checking the problems of more limited concern such as, for example, the development by the subordinates of measures for reconnaissance or other types of support. Striving to see that the checking is objective and complete, the officer conducting it studies all the instructions and information that serve 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 in terms of a single goal, such as for restoring combat capability, sending out a group of officers may be required. This group is usually given its instructions by the commander or chief of staff. The officers are first briefed on the content of the orders given to the subunit to which they are being sent for monitoring. They get a report on the possible procedure for the combat employment of this subunit after its combat fitness is restored. As a result they are given instructions as to how and about what to inform the commander of this subunit; what to check when and how and what assistance to render on the spot; and how to report the results of the work done. The efforts of the officers in the group are aimed at checking the subordinates' timely performance of the basic measures.

The monitoring is carried out in such a way as to avoid disturbing the subordinate commanders' work unnecessarily. When visiting the subunits to check them out it may be worthwhile in a number of cases to observe the course of the work of the commander or find out pertinent information from the chief of staff and other executive agents. When monitoring is carried out over communications channels it is also desirable to vary the procedures for obtaining and checking pertinent information. It is not always convenient to check and amplify a particular problem by carrying on direct conversations with the subordinate commander and staff officers. To save the subordinate commander's time one can confine himself to listening to his conversations with the commanders of the subordinate echelons by plugging in to their radio network.

In the course of monitoring one summarizes its results, which are recorded in the working notebooks of the responsible personnel brought in to do the monitoring. He also establishes the actual state of the problems checked, when and how they were checked, and the brief contents of the instructions given to the subordinates for eliminating the deficiencies discovered. All of this is reported in oral or written form to the commander or the chief of staff, both of whom must be constantly and always well informed of the following: the level of readiness of the troops for operations; what they have done and what remains to be done; what difficulties the subordinate troops are encountering and what must be done to eliminate them in the shortest possible time.

The evaluation of monitoring results is also carried out from the point of view of improving monitoring methods and achieving objectives for educating the subordinates. During the monitoring process, the real working qualities of the subordinates, their merits and their shortcomings are brought to light. At the same time the subordinates are trained to critically evaluate the results of their work. Thus there is a heightening of the sense of personal responsibility for the matter entrusted to them and of the consciousness of the necessity for raising the level of their knowledge. Therefore the significance of monitoring is greatly enhanced if the results are made known in an instructive and timely manner and the subordinates receive only what is conducive to improvement of command and control in combat.

Notes

1. Lenin, XLIV, 127.
2. Lenin, XXXVII, 339.
3. Lenin, XLIV, 127.

Chapter 10. Analyzing Combat Experience and Disseminating It to the Troops

1. Organization of Control Organ Operations in Analyzing and Disseminating Combat Experience

The significance of combat experience is determined by the fact that war is a rigorous and advanced education in checking the combat readiness of one's troops and the correctness of military theory developed in peacetime. Besides, it is *only in the course of a war* that it is possible to sufficiently bring to light and evaluate the enemy's true views and capabilities for conducting combat operations.

Thus, a comparative study of the true views and results of combat practice of the belligerents makes it possible to find the best means of improving the composition, organizational structure, and combat employment of one's troops. This is precisely what explains, for example, the fact that during the Great Patriotic War the composition and structure of the combined arms units of the Soviet Army were changed three times, by which their combat capabilities were improved. Accordingly the standards and methods of their combat employment were more precisely defined, as was reflected in the regulations, which were also revised three times during the war years.

Now, as we know, the means of armed combat have changed greatly, and, under their influence, the nature and the methods of combat operations, but there has been no practical combat experience in employing them. Therefore at the beginning and in the course of a war it will be more than ever before necessary to repeatedly refine, alter, and develop views on the combat employment of troops.

Control organs are trained in advance, in peacetime, for the analysis and dissemination of combat experience. The volume and content of this work vary and depend on the type of combat operations, the assigned mission, and the actual circumstances in which it is performed. However, whatever the circumstances, their efforts are distributed in such a way that the main problems will be solved as completely and

objectively as possible, which is a matter of discovering the following: the state of combat readiness of the enemy troops and by what means they maintain it; whether the enemy has nuclear weapons and the combat characteristics and principles for the use of these weapons; the composition, technical equipment, and organizational structure of the troops; new enemy methods of conducting and supporting combat operations and their strong and weak features; the system, methods, and means of enemy command and control; enemy capabilities and methods of operation for disrupting our command and control; the effect of the enemy's new means of combat and operations on the methods of operation of their troops, on their composition, on their organizational structure, on their command and control, and on support of their combat operations. These and other tasks are performed so that, as a result of the study and consideration of information from combat experience, surprise on the part of the enemy will be precluded.

All responsible personnel and control organs participate to one degree or another in the study and dissemination of combat experience in every echelon. All of the basic instructions will begin with the commander. In the command and control process, he takes into account everything instructive in the combat experience that he has already mastered. He notes and considers, in particular, everything that is new about the enemy, he plans what he will do and for how long to broaden his analysis of especially important information about the enemy. Everything positive and all the deficiencies in his own troops' operations are also noted by the commander. He finds out the causes for the deficiencies, notes the procedures and times for eliminating these deficiencies and for disseminating to the subordinates everything informative and valuable for improving their skill in combat. The commander gives the chief of staff instructions defining the aims of the analysis and dissemination of combat experience. He approves the plan for carrying them out and then follows up on the precision of planning and the staff's implementation of the measures for analysis and dissemination of combat experience, and he personally executes those that are particularly important.

The greater part of the work of analyzing and disseminating combat experience is done by the staff. The duties of the staff include the following: developing a plan for analyzing combat experience and disseminating the planned measures to the troops; collecting information on combat experience, drawing conclusions from it, and reporting them on schedule to the commander and the higher headquarters, passing new information to the staffs of the subordinate, coordinating, and adjacent units; keeping a written record of the commander's oral analyses and instructions on putting into practice the lessons of conclusions

drawn from combat experience; developing drafts of orders to the troops in accordance with the instructions of the commander and on the basis of available materials; keeping a combat operations log and developing other information and accountability operations documents; monitoring the subordinates' study and mastery of combat experience. These tasks are distributed among the staff officers by the chief of staff.

The staff's work in performing these tasks is distributed approximately as follows (figure 33). The greatest volume of it falls to the staff officers in charge of operations matters. The other officers' participation in the work is confined to special problems. Organizing their work, the chief of staff personally performs the most important and urgent tasks, approves and signs the information and accountability documents, draws conclusions, and makes reports and proposals to the commander regarding the problems being studied. He conducts oral analyses connected with disseminating combat experience to the troops and monitors the timely execution of the staff officers' work.

The work of the staff is organized so that the staff officers' main efforts will be concentrated on performing the primary tasks and so that subordinates will not be pulled away from command and control of the troops engaged in combat unless there is a special need. Provision is also made to make the analysis and dissemination of combat experience into a unified process in which the most valuable factual information is put to use by the groups as soon as it is received.

2. Analysis of Combat Experience

Analysis of combat experience includes the following: developing the officers' plan of work; gathering information from combat experience, drawing conclusions from it, and formulating it in the appropriate documents.

The plan for analyzing combat experience is developed for the specific type of engagement or for a more prolonged period of current (or forthcoming) actions, during which one may study the problems of interest. The basis of the plan is the instructions of the commander and the higher headquarters and also the combat mission and actual circumstances in which it is carried out. It is important here to foresee the development of the situation, to be able to bring up the most important problems, and to plan effective methods of studying them. The plan is formulated as a table. It depicts the most important problems of combat experience subject to investigation; who participates in this; the times and methods of solving the problems contemplated; what

No.	Types of operations	Staff officers (or elements) in charge of these matters					Chiefs of branches of troops and services
		Operations	Intelligence	Communications	Manning	Other matters	
1	Development of plan for analyzing combat experience and disseminating it to executive agents	█	▨	▨	▨	▨	▨
2	Gathering and analysis of information on combat experience, reports and conveying of information about combat experience	█	▨	▨	▨	▨	In terms of own troops
3	Providing for commander (or chief of staff) to conduct oral analyses of combat operations	█	▨	▨	▨	▨	▨
4	Keeping combat operations log	█	▨	▨	▨	▨	▨
5	Development and dissemination to troops of materials made up of conclusions drawn from combat experience and orders regarding introduction of these ideas	█	▨	▨	▨	▨	▨
6	Monitoring of measures taken to study and implement lessons from combat experience	█	▨	▨	▨	▨	▨

Legend

█ Fully responsible for performing the job

▨ Participates in the work, solves special problems

Figure 33. Distribution of Staff Work for Analysis and Dissemination of Combat Experience.

accountability documents must be developed when and to whom presented; which oral analyses of the combat operations or individual tactical examples are to be held by whom, when, where, and with whom; and other matters.

The content of the plan is disseminated to the executive agents in the form of extracts or instructions which define their individual tasks and when and by what methods to carry them out and in what form to report the results.

Success in analyzing combat experience depends primarily on the availability 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 there be as much of this information as possible, but systematization and interpretation are no less important.

Information is obtained from many sources and by various methods: (a) officers' visits and on-the-spot studies of combat experience or observation of the course of combat operations from control posts; (b) in the form of oral or written information for the higher headquarters, coordinating troops, and adjacent units; (c) by studying documents and models of equipment captured from the enemy, and by interrogating prisoners and the local populace; (d) holding conferences and meetings for the study and evaluation of the problems of combat experience; (e) study of oral reports, information and accountability documents and other operations documents that come in from the subordinate troops. Summarized materials kept by the staff on previous engagements are also used.

The work of the officers in direct analysis of combat experience at troop unit level is one of the main methods. It is used both before and during combat operations as well as after they have ended. This procedure produces the required effect, but only with appropriate preparation and careful instruction of the officers. They are given clear directions as to the following: what problems to study on the spot, what sources (materials) to use and how to use them, by what time to draw conclusions from the information obtained and to formulate this, to whom and when to report the information. Analysis of combat experience often can be combined with the performance of another task—providing command and control of the troops engaged in combat operations. In this case it is important to point out to the officers sent out to the troop units the sequence and methods to follow in carrying out these assignments without sacrificing the quality of each of them.

It is always necessary to take into account that enemy employment of new materiel and new methods and means of combat operations is experienced before everyone else by the troops participating directly in the engagement. It is they who accumulate advanced experience in operations, and it is on the gathering and study of this experience that the efforts of the officers detailed for this purpose are concentrated. While analyzing combat experience, they hold discussions with the participants in the engagement, studying the most instructive episodes and valuable information about the operations of the troops and the control organs, doing this in the field to the extent possible.

In order to study such especially important and complex problems as the structure of the enemy defense and other matters, special groups may be sent directly into the field after the battle. They include the representatives of the various branches of troops and special troops and also participants in the combat operations in question from among the officers, NCOs, and other enlisted personnel. The work of the groups is carried out according to a plan developed on a map and approved by the commander or the chief of staff. The plan indicates the following: the composition of the group and its equipment; the points (or route or sector); the procedures for solving especially important problems; the measures for supporting the work of the group (security, communications, and so on).

The information gathered from various sources is processed, plotted first of all on the officers' working maps, and entered on note pads (or in working notebooks) in the form in which it was collected. Questions occurring among the officers are also recorded. Thus, the facts, statistics and other information on the problems in question are systematically accumulated. When they are studied, not everything, of course, is taken on faith. For example, the accountability documents of the subordinates and various types of oral information (the stories of eyewitnesses and so on) must be carefully checked out, for there are probably inaccuracies and subjective evaluations in them. All duplicated information is sifted out, the doubtful is more carefully defined, and missing information is filled in. This is the continuous process of deriving conclusions from the information, which is completed in that in the end the reliability of the generalized information is established, as is its importance, the times for its formulation in accountability documents and their dissemination in terms of individual functions.

The results of studying combat experience are reflected in the information and accountability documents: the combat operations log, the wrap-up map, various types of summaries or wrap-up reports (or accounts) or simply on the officers' note pads (or notebooks) in the

form of notes and observations.

The *combat operations log* is the basic information and accountability document. It contains the *generalized material* to be used for studying and utilizing the experience of past engagements and provides a complete and objective evaluation of the course and the results of combat operations. It is kept by one of the officers in an ad hoc format. As a rule, the entries in the journal are preceded by the selection of the documents and the materials for the period described: the commander's decisions, operation (or fragmentary) orders, wrap-up reports of the subordinates, notes made of oral instructions and conversations over technical communications facilities. Carefully studying them, the staff officer keeping the log makes an analysis of how the combat operations took place and what new things (positive or negative) came to light in them that influenced the outcome of the engagement.

Precise entries are made on one side of the sheet and in the following sequence: date (day, month and year); general situation at the front of the unit; the enemy—his forces, composition, whether he has nuclear weapons, his grouping and tactical density, the characteristics of the defensive lines, the new weapons and new tactical procedures used by him; friendly troops—designation of all of the subunits that make up the unit, their disposition, effective combat strength and numerical composition; list of the unit control officers; position of adjacent units and the combat missions to be carried out by them, correlation of forces; level of logistical support of the troops with respect to main types of supply; political state and morale of friendly and enemy troops; data on the nature of the terrain and weather conditions; combat mission of the unit assigned by the senior commander; the unit commander's decision; description of the course of friendly and enemy combat operations in terms of the missions performed by the unit; and also the work of the control organs. Instructive combat episodes and heroic deeds of personnel, new procedures and methods of conducting conduct operations, and other data pertaining to the evaluation of the state and the operations of friendly and enemy troops are also entered in the log. The recording of entries in the log for the day of combat is completed with short conclusions pertaining to the results of the performance of the combat mission and a reference to the sources used. Wrap-up maps, diagrams of individual enemy fortifications (installations), photographs of outstanding heroes, copies of the necessary documents (operation orders, fragmentary orders, diagrams of combat formations, and so on) are attached to the log.

The entries in the log are systematically checked by the chief of staff. It is important that they be made fully and objectively, not

leaving any gaps. As he checks, the chief of staff gives instructions to the officer keeping the log on what problems to draw what kind of conclusions about, what to supplement and refine or develop, what annexes to attach to the log, and so on. At the end of a fixed time, a copy is made of the combat operations log and is presented to the higher headquarters.

The *wrap-up map* is an operations document which is used when filling out the combat operations log, when preparing analyses, accounts, and documents (orders) for the dissemination of combat experience. The following are depicted on it: the position and grouping of the resources of the unit two levels down, the units adjacent to it, and the enemy before the engagement begins; the combat mission of the unit and the units adjacent to it; the unit commander's decision; the course of the unit's combat operations with an indication of the main changes in the situation and the commander's decisions as they relate to them. In the course of combat various conventional symbols (in different colors) are used to indicate the main positions and operations of the unit and its subunits: the repelling of an enemy counterattack, the commitment to action of the second echelon, the counterattack, etc., in as much detail as is required to describe them in the combat operations log.

The wrap-up report (or account) of the results of drawing conclusions from combat experience is presented to the higher headquarters, which usually establishes the scope of the problems it contains and the times for distributing it. This report provides an assessment of the combat operations of the troops for a fixed time as follows: a brief description of the results of the unit's combat activity for the reporting period; on the enemy—a general description of his combat operations, the peculiarities of his organization and conduct of combat, methods of employment of nuclear weapons, of his branches of troops, and of materiel, new weapons models and their basic technical specifications, the peculiarities of the organization of his defense, the most heavily fortified enemy sectors, individual centers of resistance and strongpoints occupied by friendly troops; on friendly troops—the peculiarities of the combat operations of each branch of troops, new forms of structuring combat formations and methods of preparation and conduct of combat operations, new methods of command and control and of supporting troop combat operations that were employed during the reporting period.

Various types of diagrams, photographs, descriptions of instructive combat episodes, etc., are appended to the report.

In addition to the indicated information and accountability documents, data on combat experience are depicted in various types of routine and nonroutine wrap-up reports and summaries submitted to the higher echelons in the course of combat operations and also in the operations documents on command and control (working maps, operation orders, and so on).

All of them are studied in combination with other materials and information so as to discover everything valuable in combat experience and report it to the subordinates in a timely manner, reliably, and clearly.

3. Dissemination of Combat Experience to the Troops

Combat experience is disseminated to the troops by various methods, most frequently oral instructions, oral reports on the main results of the engagement, summary written orders, oral analyses of the results of the engagement, and drills with the subordinates that take account of combat experience. As a rule, these procedures are combined and are supplemented by the printed publications put out by higher elements for all personnel—newspapers, instruction pamphlets, news sheets, and so on.

The commander's oral directions to subordinates are the most quickly effective and so the most often used way of disseminating combat experience. They contain the basic information and requirements for the subordinates for putting positive combat experience to use. The commander gives these instructions during combat, combining them with command and control measures, or he does so before or after the engagement at working meetings, during visual reconnaissance, and at drills. The instructions are given to all subordinates face to face or over technical communications facilities. Brevity and clarity, the value of the content, which helps the subordinates to accomplish their mission successfully—these are the basic requirements which this kind of instructions must meet. Therefore, considering their necessity under actual conditions, the commander gives such instructions to the subordinates only after careful preparation.

Other methods of disseminating combat experience are used before and after combat operations when favorable conditions exist for assembling the subordinates and reading them the wrap-up report or oral analysis or for holding practical drills with them.

The *summary report* is designed to familiarize all the unit's officers with combat experience information obtained in the engagement. It presents clear and concise facts and conclusions from combat experience on some important phase of the engagement or on the engagement as a whole. Therefore the report may be general or particular and is made either for all categories of personnel or just for those directly concerned with the problem in question.

The content of the report is presented in *ad hoc form*, but its theme and purpose are taken into account. If its purpose is summing up the engagement as a whole, then the following problems are quite often briefly discussed in it: the content of the combat mission assigned and the conditions of its performance; the most characteristic special features of the engagement 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. Of course, the report may also treat a more restricted range of problems. This wrap-up briefing is usually given by the commander or the chief of staff.

The *oral analysis of the engagement* is made with the directly subordinate commanders and staffs only or with all of the unit (or subunit) officers.

The oral analysis can be constructed according to this plan

(1) The *general situation* that has developed at the front as of the time of obtaining the tactical mission and the conclusions drawn from it.

(2) The content of the tactical mission and the role of the unit (or subunit) in the engagement.

(3) The commander's decision and the content of the control organs' work carried out on the basis of the decision during organization of the engagement.

(4) The conduct of combat operations: the extent to which they correspond to the decision; the operations of the subordinate troops, what resistance the enemy offered them, when, and how; the operations of the control organs during the engagement; how well the subordinate subunits and control organs have taken into account everything positive and eliminated the deficiencies revealed in previous engagements.

(5) The general conclusions and instructions ensuing from the analysis: the results of the unit's (or subunit's) performance of the combat mission; what may be considered positive and negative in the operations of the friendly troops; how to counter the enemy's new combat techniques; what must be taken into account in training the troops and the control organs, what matters should be the basis for organizing drills with them and by what methods; what to pass on to

the subordinates and higher headquarters out of combat experience, in what form, by what method, and by what time.

This is just one analysis procedure of those possible. There may be more or fewer problems analyzed, and they can be examined with varying degrees of detail and, if necessary, in one sequence or another. It is important that the analysis be presented as concisely and clearly as possible. It includes only what is most important and informative. In analyzing command and control problems, for example, one puts stress on demonstrating how much effective timeliness has been achieved in developing the especially difficult measures and on revealing the main deficiencies in order to avoid repeating them in the future. The course of the engagement is presented not in the form of a simple description of troop operations, but in the form of an analysis of the operations of the subunits of the various branches of troops, commanders, and staffs, indicating what was instructive in their operations and in their use of fighting equipment and what lessons can be learned from it. The evaluation and the conclusions regarding troop combat operations and the work of the control organs must follow from the actual conditions which are analyzed in detail in the analysis process. In the analysis, in order to recreate the situation more graphically, photographs and movies, reports by the participants in the engagement, and graphic operations documents (friendly and those captured from the enemy) are used.

Preparations are made for the analysis so that it can be held soon after the engagement is over. The officers preparing the analysis, clarify the topic and the objective in advance, determine who will participate and when and where the analysis will take place, and they prepare the required point papers on the basic problems, illustrations, references, and so on.

Drills with the commanders and staffs of the subordinate troops to analyze combat experience are held by various methods: in the form of short skull sessions on tactics or practice exercises, command post exercises when the troops are in reserve or removed to rest areas, and, if possible, during preparation for combat operations.

Holding this type of exercise when preparing for combat operations, as the experience of the last war has demonstrated, is always worthwhile. However, the topics and the training objectives must be pertinent to the nature of the forthcoming combat operations, and the lessons learned from combat experience must be fully used in the drills. This is achieved by various methods. In one case, the drill may be based on an instructive situation in the engagement or some final stage

in it, and this situation can be used to develop certain training problems. In another case, an arbitrarily selected tactical setting is used for the drill, and, when working out the training problems and during the analysis, instructive examples from combat practice are presented. In addition, the subject of the drill can be an analysis of some instructive engagement or of individual episodes in it. Depending on the type of drill and its training purposes, one may also use a combination of the above methods.

A characteristic feature of modern combat operations is the fast and drastic changes in situation, the consequences of which can now be very serious for either of the operating sides, and overcoming these consequences, 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, for taking more extensive measures to ensure the safety of one's troops. This is why combat experience must be disseminated to the troops more quickly and effectively.

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 command and control by commanders and staffs at all levels. They have imposed new and increased requirements on command and control. The following have become especially important in this matter: a high level of combat readiness of commanders and staffs for command and control literally from the first minutes of the war unleashed by the aggressor, firmness, flexibility, continuity (stability), secrecy, and extremely quick effectiveness of command and control in any complex situation, including when the enemy launches nuclear attacks on the control posts and when he engages in massive jamming of our communications system.

In addition, practice and the studies made in this book have demonstrated that *meeting the cited requirements placed on command and control is a highly complex, multifaceted problem.*

For its solution it is considered necessary in all the modern armies to take a complex approach, to implement 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 may often include **equipping staffs with the latest technical command and control resources**, especially the means of mechanization and automation of command and control processes, which constitute the scientific-technical base of modern command and control. This opinion is quite well founded. Practice confirms that without the refinement of command and control equipment it is impossible to satisfy the requirements now imposed on it. Besides, the latest achievements of science and technology permit us to consider this opinion not only substantiated but also actually feasible. However, this way cannot be considered the only one. Commanders and staffs cannot wait passively until they have fundamentally new control technology. They have great opportunities for improving command and control on the basis of the already existing technical equipment.

Many researchers assign to the second group of measures, which are closely connected with the first, the **improvement of the structure of the**

troop control organs and posts in such a way that, with the use of the new equipment, they can be small in composition, mobile, stable, and viable not only when conventional weapons are employed by the enemy against them, but also nuclear weapons. This opinion also gives no cause for doubt. It is our opinion, however, that here also it should be pointed out that the practical implementation of this group of measures may only come after they are carefully checked in a great many training exercises. Above all this pertains to the structure of the control organs. Here special care and a scientific approach are required, for haste and inadequate substantiation of any reorganization of the control organs will inevitably 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 to the Central Committee of the 25th CPSU Congress, L. I. Brezhnev warned: "The Central Committee is against hurried, poorly thought-out reorganization of the administrative structure and of established methods of management. We have to measure not 7 times, as the saying goes, but 8 or even 10 times, before cutting. However, if we have measured, if we have understood that the continuously developing national economy has become cramped within the framework of the existing economic mechanism, then we must work resolutely to improve it." These instructions from the party unquestionably pertain also to improving the structure of command and control elements.

The third group of measures is comprised of further **refinement of the organization and methods of operation** of commanders and staffs in implementing each command and control function with already available control equipment and the existing structure of the control organs. The experience of past wars, postwar exercises, and the results of research demonstrate that with this approach each commander and staff has great reserves not yet fully exploited.

Thus, in *collecting and studying situation data* during preparations and in the course of an engagement, the greatest effect comes from a centralized collection method, establishment and precise execution of a scientifically sound periodicity of reports and degree of detail in the situation data, composite use and combination of available technical equipment, sources, and methods of obtaining this information, studying it in advance (before receiving the mission), the use of short reports (even to the point of using signals) and standard, ready-made forms, reduction of multistep operations and parallelism (excess duplication) in information transfer.

The following are extremely important for timely, sound *making* (or amplification) of the *decision* by the commander and planning of the troops' combat operations: a precise definition of the scope and the content of this decision, elimination of secondary problems from it, and a harmonious combination in the decisionmaking of one-man management and centralized control by the commander with the initiative, creativity, and independence of responsible personnel subordinate to him. In making the decision and planning the measures for comprehensive support of combat operations, political work, and organization of command and control it is necessary to sharply increase the role of the chief of staff and the chiefs of the branches of troops (and services), to extend the practice of the commander's working jointly with them in making the decision by creating a tactical command and control center at the command post, to reduce the number and the volume of combat planning documents, to skillfully combine logical methods with mathematical ones and the use of computer technology for calculations and quantitative substantiation of the decisions made. It is necessary to improve the very procedure for working out decisions and to teach the officers to make decisions considering the aggregate effect on them of all of the attendant circumstances.

Warning orders with a briefing of the subordinate commanders and staffs on the nature of the forthcoming operations have proved their value for *disseminating combat missions to the troops and organizing and supporting their coordination*. They make it possible for them to quickly join in the combat preparations and to carry out many of the measures for this preparation **concurrently** (almost simultaneously) with the higher commander and staff. The specific combat missions and the directions on troop coordination should be disseminated to the subordinates in brief fragmentary orders as they are determined by the commander. For speed of recording and transmitting them over communications facilities, it is advantageous to use ready-made standard forms. It is also important to skillfully combine various methods of disseminating missions and directions for coordination: the issuing of an oral operation (or fragmentary) order personally by the commander or its dissemination to the subordinates by staff officers going out to the field; the transmission of short orders (even to the point of using signals) over the radio by personal conversations with the subordinates; the delivery to the subordinates of textual or graphic orders or orders recorded on magnetic tape. The missions and directions should first of all be disseminated 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 for further improvement of command and control. Their successful implementation, however,

depends entirely on the comprehensive development of a specialized branch in the overall system of military science—the **theory of tactical command and 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 decisions of the 25th CPSU Congress on questions of control in all areas of social life of the country, this problem is one of the most urgent, since **without a scientific theory of control there can be no effective practice**, and it is impossible to successfully improve the technical equipment, structure, and operating methods of control organs. After it has been thoroughly mastered by the officers, this theory will become a material force threatening the enemy and will substantially improve the troops' combat readiness.

The study made in this book, the consideration of the requirements of practice, and the results of extensive discussion of this problem in our military press allow us to assert that the object of study for a theory of command and control must be the practical tactical command and control activities of commanders and control organs at all levels, and its subject must be the discovery of the laws and principles of this sort of control, the mechanism of their operation and also the means and methods for commanders and staffs of various levels to make practical use of them in a combat situation.

In terms of its content, a **theory of tactical command and control** must include a number of interrelated divisions of a general theoretical, technical, organizational, and applied (practical) nature.

The **first division** could be made up of the general and methodological principles of command and control theory. The following basic problems must be developed and elucidated in it: the general concept of control in technology, nature, and society; the objectives, content, and essence of tactical command and control; the development of the theory and practice of command and control in terms of the experience of the past wars and exercises; modern requirements placed on command and control and criteria for assessing its effectiveness; the laws and principles of command and control common to all levels; the peculiarities of command and control at strategic, operational and tactical levels and also in the various services of armed forces, branches of troops, and special troops; the state of command and control in the armies of allied states and in the armies of probable enemies. The object of investigation, the subject of the content, and the methods of investigation of the theory of command and control, its place in military science and relationship to Marxist-Leninist science and other sciences that study various aspects of control.

The **second division** of the theory of tactical command and control could consist of organizational problems such as the organization (structure) of modern control systems, the functions and authority of command, of control organs, and of responsible personnel; the principles of selection and deployment of cadre personnel; the organization of control posts and the work there of control organs of the various levels and branches of troops and in various kinds of combat operations; the structure of command and control systems in allied armies and in those of probable enemies.

The content of the **third division** of control theory could be technical command and control equipment, including its purpose, classification, operational-tactical characteristics and the procedure for its use in control organs and at control posts. Here must be reflected the prospects for the automation of command and control processes and also the characteristics of command and control equipment in foreign armies.

The three divisions listed constitute the methodological, general theoretical, and organizational and technical base for the next, the **fourth division** of control theory—the methods and the art of tactical command and control. In it, the classification and characteristics of these methods must be elucidated in detail, and, most importantly, it is necessary to give specific recommendations to the commanders and control organs at various levels regarding the skillful practical implementation of the functions (techniques) of control using current and prospective technical equipment: the collection and study of situation data; making sound decisions and planning combat operations; disseminating the missions to the troops, organization of their coordination, comprehensive support, political work, and monitoring; preparation of the troops for combat and also command and control in the course of combat operations. The most important problem of this division is the commander's procedure for making an optimum or sound decision, for this decision is the basis for the entire command and control process.

Since the practice of command and control is a dynamic, continuously developing process, it is mandatory to have a **fifth division** of this theory which brings to light the problems occurring at the current historical stage and possible ways of solving them by further improvement of the command and control system as a *single, integral organism*: its structure, state of technical supply, and the functioning procedure.

As we see, the range of problems which troop control theory must treat 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. Kolmogorov and other well-known Soviet scholars have emphasized many times, studies very broad control laws, independently of where the control occurs: in a living organism, in machines, or in human society. For the practical application of these general laws officers must have a thorough knowledge of the specifics of tactical command and control, and command and control theory is called upon to account for these specifics on the basis of a complex analysis of all aspects of this process: the ideological-political, morale and psychological, sociolegal, organizational-methodological, and purely military-technical aspects.

The study of these specifics together with the other problems of military art, as experience shows, cannot fully satisfy practical requirements today. This requires a special, more fundamental theoretical development of them that combines science and art into an integral whole and lights the path for practice in the work of commanders and staffs. The initial methodological and general scientific base for this development is the theory of Marxism-Leninism; laws of social development and armed combat; principles of military art; decisions of the CPSU and the measures taken in the country to improve administration of the national economy; advanced methods of command and control in past wars and in postwar exercises; achievements in the field of command and control by the armies of other socialist countries and of capitalist countries; and also the conclusions of such sciences as cybernetics, mathematics, psychology, sociology, law, and other sciences investigating the various aspects of control. **Consequently, there is not only a need but also the opportunity for the development of a theory of control.**

Along with a fundamental development of command and control theory it is necessary to improve the methods of its study and the inculcation in officers of practical control skills in all military educational institutions and in the system of command training in the field. *V. I. Lenin* pointed out that we "must stand the test of our knowledge of the fundamentals of the theory dealing with the question of our state apparatus and of our knowledge of the fundamentals of the science of control. . . ."2 These instructions of the leader have not lost their significance even in our time. "Control," L. I. Brezhnev noted, "is turning into a science, and this science must be mastered as fast and as thoroughly as possible; it must be studied persistently."³ Without question, this requirement of the party pertains also to our officers. For successful command and control in combat it is necessary for them first of all to make a creative study of Marxist-Leninist theory and to gain a thorough knowledge of materiel and the principles of conducting combat operations. Besides this, however, they need solid knowledge

and practical skills directly from the field of command and control.

The further development of the theory, refinement of the command and control system, and improvement of officers' training in the field of command and control will contribute to the enhancement of the combat readiness of our Armed Forces.

Notes

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3. L. I. Brezhnev, *Leninskim kursom* [Following Lenin's Course], II, 522.

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* [In the original Russian edition the first 12 bibliography items were not presented in alphabetical order, while items 13-89 were. The English translation rearranges the latter items, placing them in English alphabetical order but leaves the first 12 items as they occurred in the original, since this would appear to imply some kind of priority for these items—U.S. Ed.]

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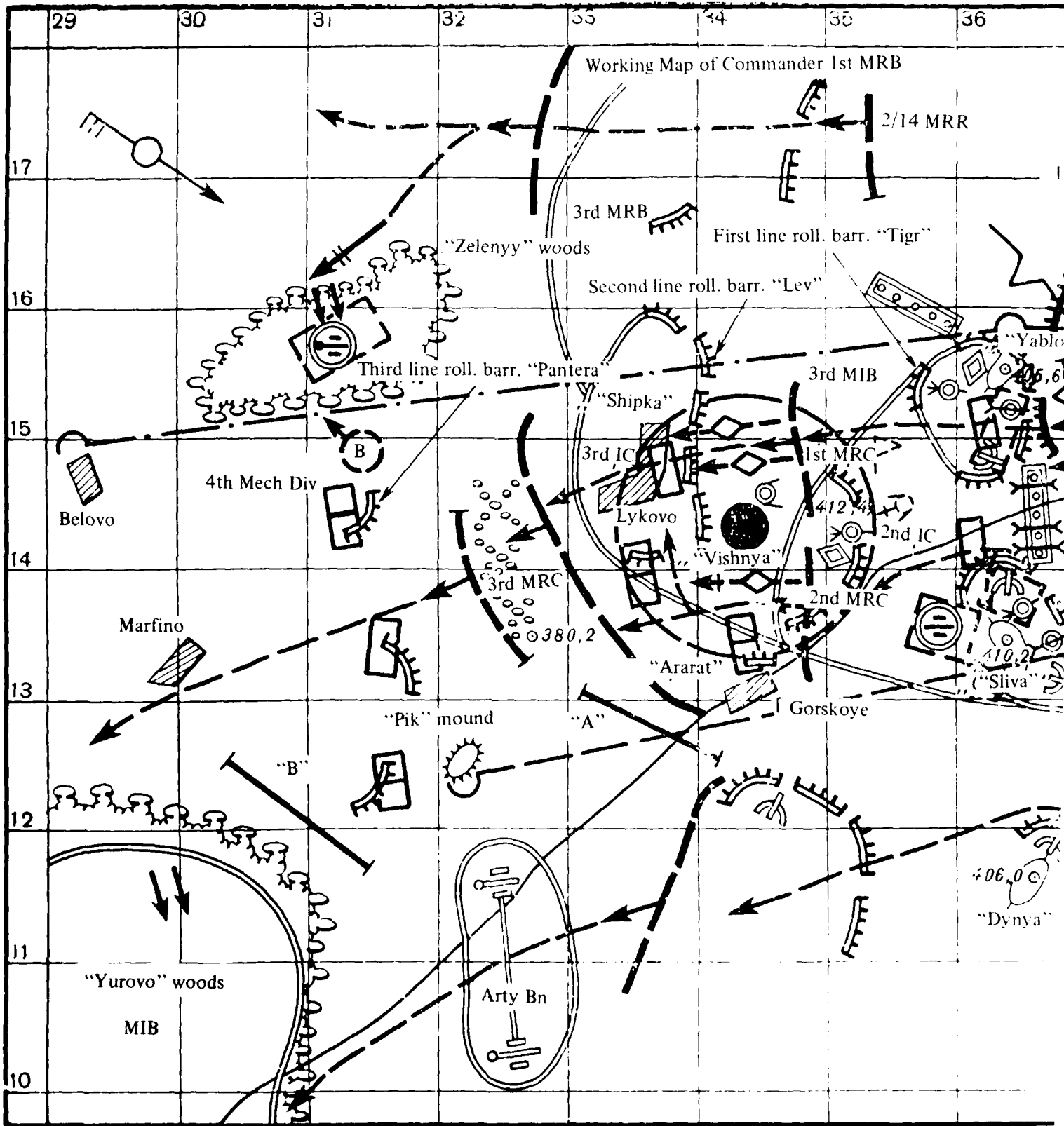
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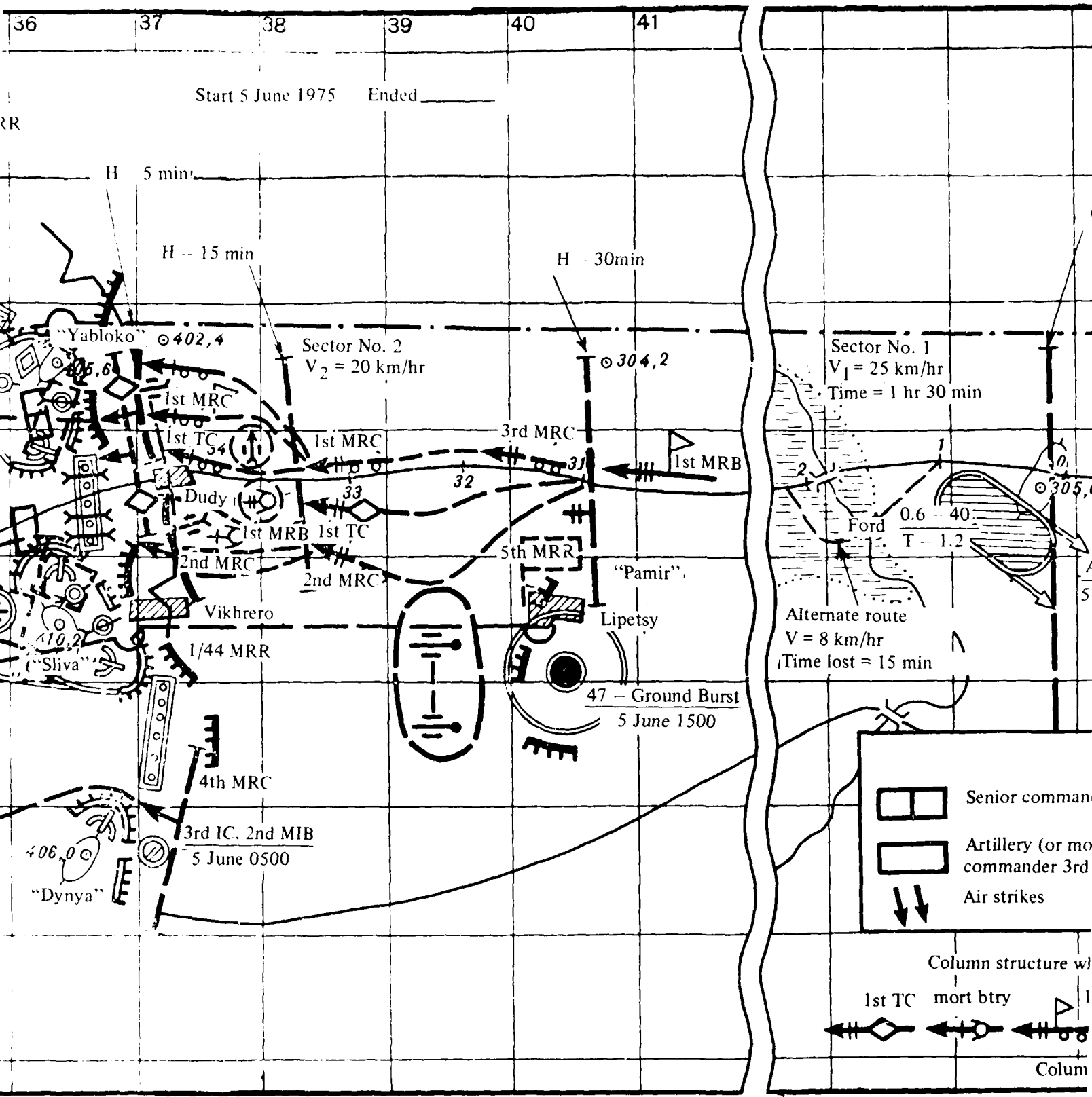
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* (Place names in quotation marks are simply temporary designations for the occasion. Those not in quotes are legitimate, permanent names - - U.S.

Figure 27. Reinforced Battalion Commander's Working Map With a Decision to Attack From



(... names - - U.S. Ed.)

Attack From the March (One Option)*

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