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Support of the Strategic Concentration

and

Deployment of the Armed Forces

in Respect to Transport

by

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Transportation support is one of the factors that exerts great influence on the strategic concentration and deployment of the armed forces. Nevertheless, in numerous works devoted to the theory of strategic concentration and deployment, the position and capabilities of transportation are not fully considered. While noting the direct dependence of the success of strategic concentration and deployment on the preparation and work of transportation and realizing the great probability of serious difficulties in carrying out shipments, many analysts do not, in their work, make even a cursory analysis of the conditions of transportation work during the period of threat; and at the beginning and during the course of a war, they do not arrive at any conclusions on the influence of these conditions on the organization of the strategic concentration and deployment of the armed forces in theaters of military operations and in internal areas of the country.

In this article, the dependence of deployment of the armed forces on the condition and work of transportation and also the basic requirements for preparing the transportation network for the purposes of carrying out shipments for strategic concentration are examined.

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The existing contradictions in individual theoretical problems give rise to the necessity for a preliminary clarification of certain initial positions.

First of all, it should be noted that the term "strategic concentration and deployment of the armed forces" in the following text refers to the concentration and deployment not only of operational formations, troop large units, etc., themselves, but also of materiel (for example, munitions and fuel). In accordance with this, shipments of troops and the materiel necessary for their support are also included in the concept of "shipments for strategic concentration".

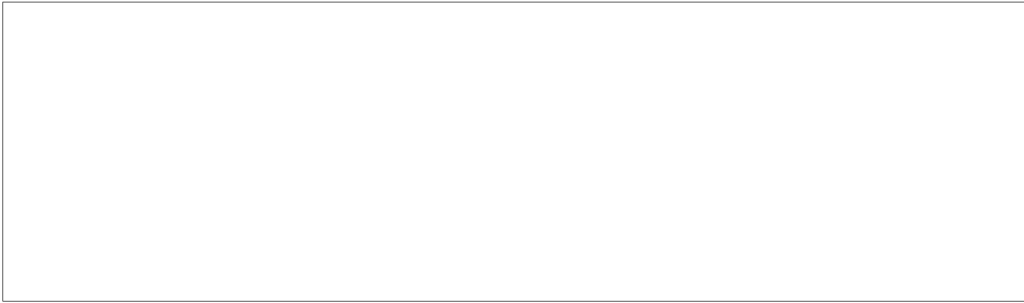
In speaking of strategic echelons, we mean that the first of these consist of the forces and weapons necessary for achieving the strategic aims of the initial period of a war; it is divided into several (not less than three) operational echelons. The first includes the troops and materiel that are in a full state of readiness for immediate operations, the second is the forces and weapons designated for increasing the efforts of the initial operations with readiness for proceeding to areas of concentration after several days, the third is the forces and weapons to be used only several weeks after the beginning of full mobilization, for the development of the subsequent operations of the initial period of a war.

In certain analyses,¹ three possibilities for the strategic concentration and deployment of the armed forces are considered. The first is most favorable, when it is executed in advance as the threat of war becomes more intense; the second, when concentration and deployment starts during the threatening period and terminates after the beginning of war; and the third and least favorable, when deployment takes place after the enemy has initiated military operations.

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1. Major-General Kh. Dzhelaukhov, "Strategic Concentration and Deployment". Collection of Articles of the Journal "Military Thought", Number 3, 1960.

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In this article, we shall consider transportation support of the strategic concentration and deployment of troops in the second situation, which is more convenient for analysis and is the most probable.

Many analysts distinguish the following periods in the course of the rise and development of military operations: the threatening (which may not even exist), the initial, and the subsequent. Certain authors emphasize the necessity for dividing the second of these into two parts: the actual beginning of a war and the subsequent phase of development of military operations during the initial period of a war.¹ This is motivated by the great difference in the composition of each of the phases of the initial period of a war. We share such a point of view and adhere to it in the following discourse.

To determine even approximately the conditions of the strategic concentration and deployment of the armed forces after the completion of initial operations is extremely difficult. Therefore, the following analysis of the problems of supporting strategic concentration and deployment in respect to transport is limited to the period of threat and the beginning of a nuclear/missile war.

* * *

In numerous analyses, the authors, while not rejecting the possibility of a sudden initiation of war, consider it no less probable that it will be preceded by a certain period of intensification of the immediate threat of war, a period of threat. It is necessary to use this period for increasing the readiness of the armed forces and the rear area of the country to repel the probable enemy attack and for creating conditions for the complete and final destruction of the enemy in a short period of time.

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1. General of the Army A. Gorbatov. "The Nature of Modern Armed Combat". Special Collection of Articles of the Journal "Military Thought", Third Issue, 1960.

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In regard to the armed forces, such measures include bringing the forces and weapons of the first operational echelon (first of all--missile troops, armored and PVO troops) up to full combat readiness and making appropriate changes in their operational formation. At the same time, bringing the troops up to full strength, their provision with materiel, the movement of the second operational echelon to areas of concentration and deployment, and the delivery of various supplies to these areas are carried out. Full mobilization and the formation of new troop large units, units, and rear establishments to be included in the composition of the third operational echelon will commence.

At the same time, during the period of threat a transfer of the national economy to satisfy the requirements of an approaching war is accomplished, including partial mobilization of industry and transportation, increasing materiel reserves for the most important industrial enterprises, protection of the population, etc.

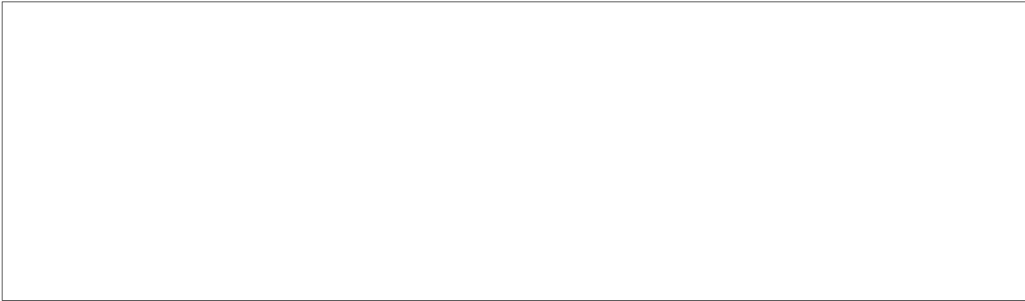
All of the enumerated measures are accomplished as secretly as possible, which narrows their scope. The period of time for carrying out these measures is directly dependent on the duration of the period of threat, which can presumably consist of several hours to several calendar days.

For an analysis of the capabilities of transport for supporting the strategic concentration and deployment of the armed forces, we are arbitrarily assuming an eight-day period of threat. During this time, it will be necessary to carry out a large volume of military (mobilization, for strategic concentration, operational, etc.) and national economic shipments.

The possible timing for commencing the shipment of any troop large unit (unit, establishment) depends on the readiness for this of both the troops and the transportation means. The estimated time for the completion of a shipment is determined by its volume, speed, distance, and the rate of movement on the given route.

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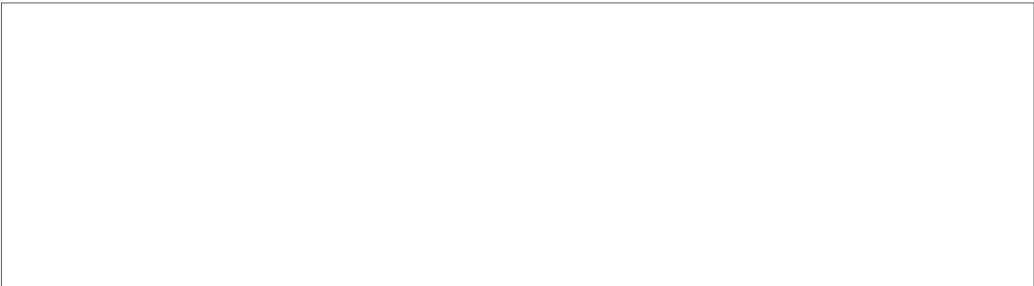
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Rail transport is best prepared for carrying out military shipments; 24 hours after the declaration of mobilization it is capable of carrying out very large military shipments while simultaneously continuing its former operations and coping with new national economic shipments. Military shipments of relatively small dimensions can start several hours after the declaration of mobilization.

It should be emphasized that the use of rail transport for shipping connected with the strategic concentration of troops depends primarily on two conditions: the observance of secrecy in these shipments and the magnitude of other shipments being carried out during the very same period. These conditions assume special significance in those instances when troops are shipped for strategic concentration to a foreign section of the theaters of military operations, on railroads with West European gauge. Along with the special difficulty of ensuring the secrecy of shipments, it is necessary to consider that they will be carried out simultaneously with national economic shipments between the Soviet Union and the other socialist countries. At the present time, the volume of the turnover of rail cars at transshipment areas at the junctions of railroads of Soviet and West European gauges is already so vast that it takes up from 30 to 60 percent of the total traffic capacity of the railway sectors in these areas (Brest, Chop-Mukachevo, Ungeny). In line with the development of industrial communications between the countries of the Socialist Camp, the volume of turnover is steadily increasing. It is not possible to cease these shipments during the period of threat, since this will impede the work of defense industry enterprises and, in addition, it will reveal preparations for war. Therefore, we feel that shipments for strategic concentration during the period of threat must be carried out at comparatively low rates, not exceeding approximately 30 to 35 percent of the traffic capacity of the railroad lines.

Since it requires considerably more time to prepare water transportation means (river and sea) for military shipping than railroads, it is advisable to ship by water transportation (when it is possible to use it) those troop large units and units that require several days to prepare for movement.



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The timing for beginning troop march movements on any vehicular road is dependent on the speed in deploying refueling points on it and the creation of sufficient fuel reserves. In order to support the march movement of a motorized rifle division for 100 km, up to 450 tons of fuel are required, and for a tank division, up to 530 tons. The march movement of troops for long distances requires a well organized fuel supply system. The requirement for secrecy should be considered in determining the route speeds of movement of large units and units on vehicular roads. Observation of this requirement can often necessitate the execution of a march only during the hours of darkness.

Let us consider what is the permissible distance for shipments for strategic concentration executed during the period of threat.

The maximum permissible (calculated) distance of shipments carried out in the course of a definite period of time is determined on the basis of the calculated rate of speed along the given route, the expenditure of time for preparatory loading, unloading, and other work, and also for the march movement of the troops.

The permissible expenditure of time for the movement of an echelon from a loading point to an unloading point (T_{dv})¹ is determined by the difference between the duration of the calculated (threatening) period and the expenditure of time for all other work, the march movement, etc., ($T_{up} - \Sigma T$).

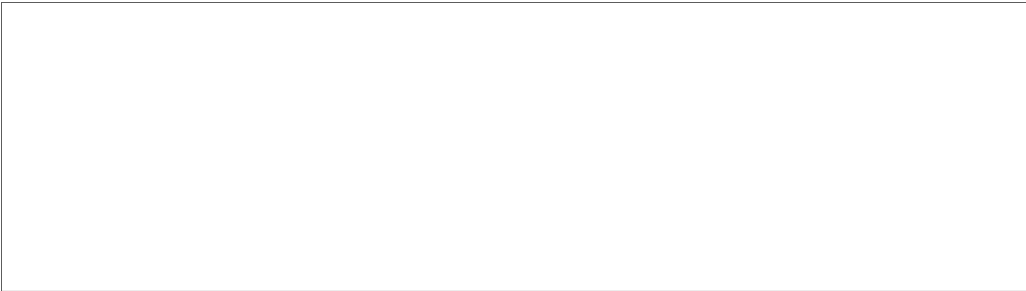
The results of the determination of the maximum permissible distance for shipping a troop large unit (unit, establishment) under various conditions are listed in the table.

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1. Comment. Probable meaning of T_{dv} - Time of movement of troops. See table on page 9 for probable meanings of subsequent symbols.

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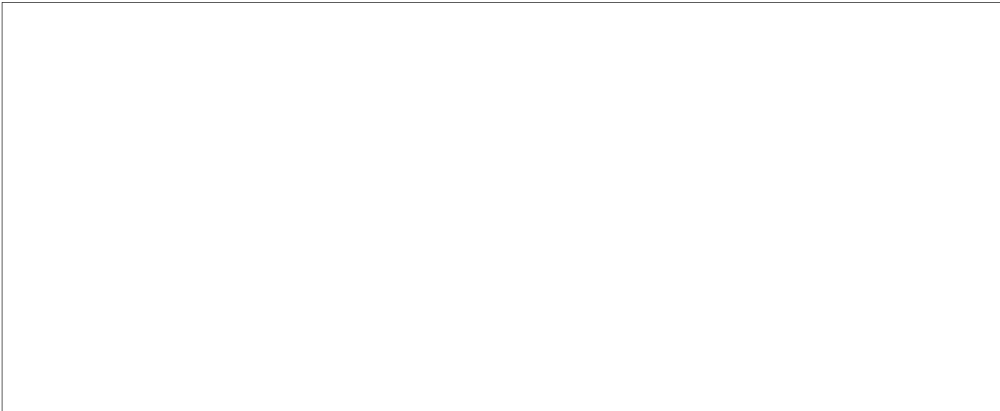


The expenditure of time for the preparation of troops and shipping means, for a march movement to the loading point, and for the loading of the first echelon (Tpd) is established as within the limits of from 1 to 4 calendar days.

The expenditure of time for the dispatch of all echelons of a large unit or unit being transported from the loading area (To) is assumed to be from 2 to 4 calendar days.

The expenditure of time for the march movement from the moment of the completion of unloading of the last echelon of a large unit up to the completion of its deployment in the appropriate area (Tsr) is assumed to be within the limits of 1 to 2 calendar days.

The route speeds of movement (V_m) are assumed to be within the limits of from 200 to 500 km per calendar day. The higher limit is for favorable conditions of shipment by rail transport and the lower is for difficult conditions of shipment by river transport.



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Table for Permissible Distances for a Shipment

	Expenditure of time in calendar days															
Tpd	1				2				3				4			
To	2	3	4	2	3	4	2	3	4	2	3	4				
Tsr	1		2		1		2		1		2		1		2	
ΣT	4	5	6	7	5	6	7	8	6	7	8	9	7	8	9	10
Tup -ΣT	4	3	2	1	3	2	1	-	2	1	-	-	1	-	-	-
Vm- $\frac{\text{Km}}{\text{calendar days}}$ Permissible distance for a shipment in kilometers																
500	2000	1500	1000	500	1500	1000	500	--	1000	500	--	500	--			
350	1400	1050	700	350	1050	700	350	--	700	350	--	350	--			
200	800	600	400	200	600	400	200	--	400	200	--	200	--			

1. Comment

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Probable meanings of symbols:

Tpd - Length of time for loading operations

To - Length of time for dispatch


Tsr - Length of time for strategic deployment

Tup - Length of time of period of threat

Vm - Route speed of movement.

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As can be seen from the table, the maximum permissible distance for a shipment does not exceed 2000 km. This distance can be achieved under conditions when the first echelon is dispatched from the loading area 24 hours after the start of the period of threat, the dispatch of all the echelons takes no more than two calendar days, and the time from the moment of completion of the unloading of the last echelon to the completion of deployment consists of no more than one calendar day with the route speed of movement of the echelons being transported being equal to 500 km per calendar day.

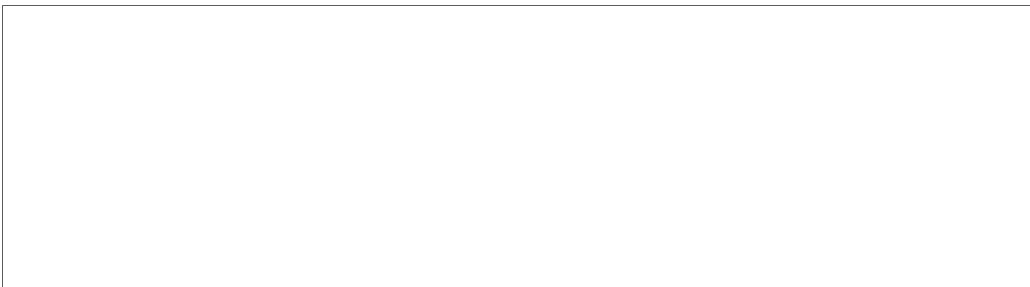
If, however, the total time expended for preparation, loading, dispatch of the echelons, unloading, and march movement consists of 5 to 7 calendar days, with the route speed averaging 350 to 400 km, then with a period of threat of 8 calendar days duration, the maximum permissible distance will be 400 to 1000 km. And since a decrease in the duration of the period of threat is more probable than an increase, it is advisable to consider the permissible distance for shipments to be 400 to 700 km.

Another computation will result in a similar conclusion. As is known, it is envisaged that the build-up of the efforts of the troops of a front during the first offensive operation will be achieved by means of maneuver by the nuclear/missile weapons and the commitment to the operation of the troops arriving from the zone near the front and the internal areas of the country. Let us consider the maximum distance from the border (front line) at which the operational formations and troop large units designated for increasing the efforts of the front during the progress of the operation can be located.

To explain this problem, we shall refer to the example shown on the diagram. The diagram is a graph of the movement of troops on which are indicated the possible time periods for "overtaking" ("nagon") the advancing troops of the front by the troop large units being transported.

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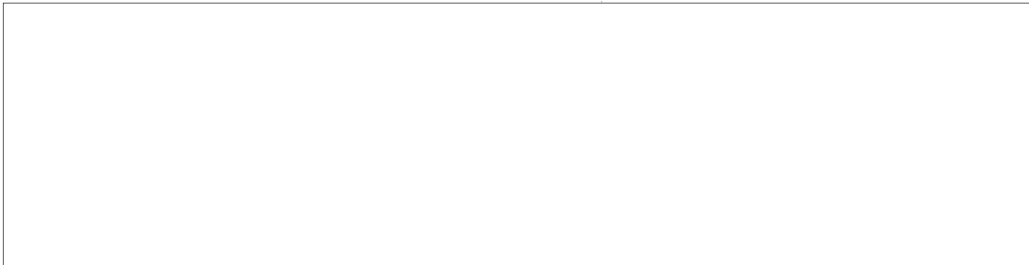
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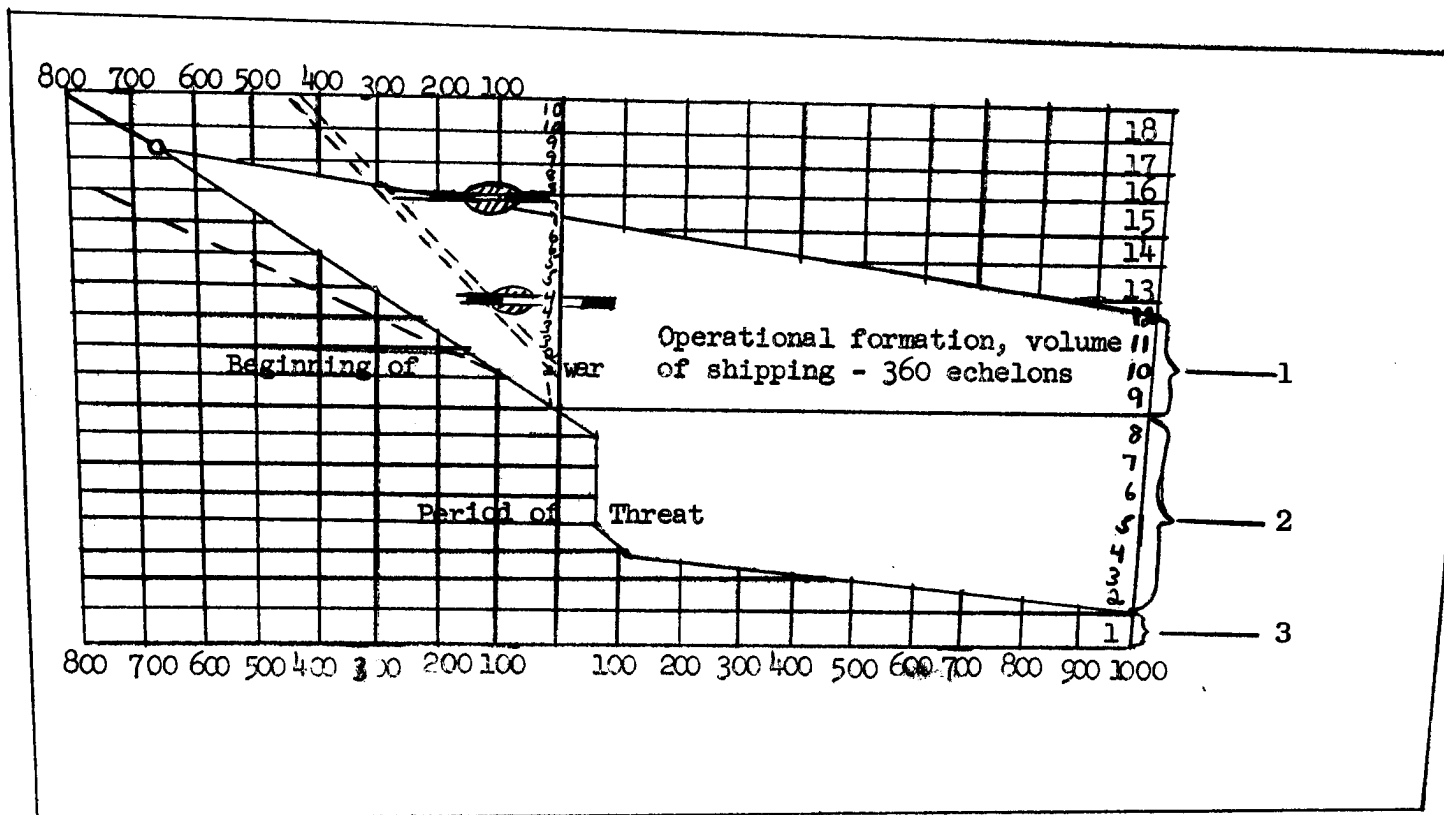
The distance of the disposition areas of the troops of an operational formation (combined arms army) designated for increasing the efforts of a front in an operation is approximately 1000 km. The first offensive operation must be carried out to a depth of about 800 km at a rate of 80 to 100 km per calendar day. The duration of the period of threat (calculated) is 8 calendar days. The duration of the operation is 10 calendar days.

The volume of shipment of an operational formation on available railways (West European gauge) consists of 360 troop trains (eshelon). The first troop trains can be dispatched on each of the railroad lines one calendar day after the start of the period of threat. The possible rate of shipment of an army during the period of threat is 30 trains (echelons) per calendar day, and at the beginning of the operation 60 troop trains. The possible route speed of movement of the troop trains during the period of threat is 500 km per calendar day, and 300 km per calendar day at the beginning of an operation, in view of disruptions of the work of the railroads. With this average route speed, troop large units can execute march movements following the advancing troops of a front. Reconstruction of railroads is carried out at a rate of 50 km per calendar day along each of the lines being reconstructed to the extent that the troops of the front move forward in an operation. Echelons of tanks and so far as possible other large units are dispatched to the forward unloading areas as they arrive. The march movements of troops are supported with everything necessary.

Thus, we create sufficiently favorable conditions for the execution of rail shipments and march movements of troops during the period of threat and during the course of the first operation. But even in this (see graph, diagram 2) during the period of threat, before the beginning of the operation, no more than 150 echelons will be able to reach the unloading areas, and the remaining echelons will arrive during the course of the operation and after unloading will proceed to "overtake" the advancing front troops by executing a march movement over long distances. The last echelons of the incoming large units will be able to "overtake" the advancing troops only on the ninth day of the operation.



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Graphic plan for shipment of a combined arms army in the threatening period and after the beginning of war

Conventional Signs

- — — Line of reconstruction of railways
- — — Lines of movement of rifle and tank troops
- ⊙ Unloading areas on reconstructed sectors of railways

Key

1. Rate of shipments: 60 echelons per calendar day, speed 300 km per calendar day.
2. Dispatch by rail: rate 30 echelons per calendar day, speed 500 km per calendar day.
3. The preparation of troops and transport means for shipment.

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Thus, even under favorable conditions, it will be possible to use only part of the troops that make up the complement of the combined arms army for increasing the efforts of a front in the first operation. The other part, consisting of no less than 50 percent of the troops, as may be seen from the graph, cannot be used for this in view of the great expenditure of time for their transfer from areas of initial disposition.

One should not count on the possibility of decreasing the expenditure of time by means of a still greater increase of the rates and route speeds for shipments and march movements of troops since there are no sufficient bases for this. Consequently, it is possible to decrease the time for movement and shipment only by means of bringing the initial disposition areas of the troops closer to the border (front line).

In order to commit the troops of a combined arms army to an operation on the third or fourth day, it is necessary to execute parallel troop march movements along with and at the same rate as rail shipments during the period of threat, and to have the troop disposition areas at a distance of 600 km from the border.

The calculated distance for the delivery of technical equipment by rail, motor vehicle, and water transport during a period of threat of 6 to 8 calendar days' duration is determined within approximately these same limits of 400 to 700 km.

Consequently, if prior to the beginning of war we will have a period of threat of the duration assumed by us, then during the course of this period the shipment of troops for strategic concentration can be carried out only on a small scale and at comparatively slow rates; the permissible distance for rail shipments of troops whose concentration and deployment must be completed prior to the expiration of this period will consist of 700 to 500 km (and less). The distance of troop march movements is limited by approximately the same restrictions. It makes sense to include in the number of large units and units being transported only those whose readiness will enable them to begin to move not later than during the first two or three days of the period of threat.

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All of the remaining shipments initiated during the period of threat will be in progress at the moment of the start of military operations. It will be necessary to complete them during the course of the war, under completely different conditions. We shall turn to an analysis of these conditions later.

In certain theoretical works it is proposed to consider the beginning of a war as a special phase of its initial period, after which (in case of lengthy combat) follows another phase which is characterized by a different content. This position is sufficiently valid.

The beginning of a war is distinguished by the highest possible intensity of operations. Each of the sides will be striving to achieve victory in the shortest period of time and will exert the greatest efforts for this. Mutually inflicted strikes will be of maximum power, and their results will be unprecedented devastation. But for this very reason, the period of the actual beginning of combat cannot be lengthy. After several days of a nuclear/missile war, both sides will sustain such great personnel and materiel losses that to continue combat at its previous intensity will be impossible. The resources of even the powers that are strongest economically and which possess a large territory will to some extent be exhausted. It will become intolerable to expend forces and weapons on the previous scale; on the contrary, in continuing combat, it will be necessary to accumulate them as rapidly as possible for delivering powerful new strikes against the enemy. This is the way the next phase of the initial period of a war will ensue: stubborn, fierce, but lengthy combat under sharply changed conditions of the situation.

In the beginning of a war, during its first hours and days, very major changes will occur in the strategic, economic, and political situation in the theaters of military operations and in the rear areas of the coalitions that are taking part in the combat. Can one assume that they will not reflect on the previously prepared plan for the strategic concentration and deployment of the armed forces? Obviously, such an assumption is not correct. Is it advisable to amend this plan during the first days of a war? In our opinion it is also necessary to give a negative reply to this question.

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The situation at the beginning of a war will be changing so sharply, substantially, and rapidly that it will be extremely difficult immediately to take into account the changes that are occurring, to evaluate them correctly, and to adopt a decision to change the strategic concentration and deployment of the armed forces. In addition, it is doubtful that this is necessary since during the course of the next days the situation can again change sharply.

Consequently, changes in the plan for strategic concentration and deployment will be unavoidable, but to adopt a final decision on these changes and to proceed to put them into effect will be advisable only after the termination of the actual starting phase of the war and the advent of the next phase of its initial period which will have different characteristics.

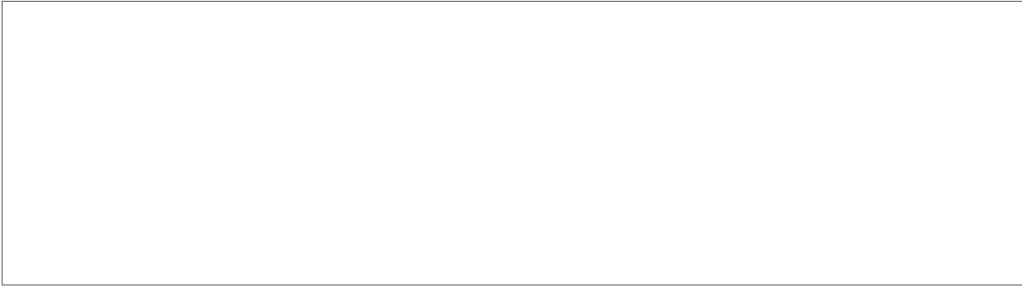
If one agrees with this conclusion, still another question arises: should troop movements be continued in the first days of a war according to the previous plan or is it advisable to suspend these until necessary modifications have been incorporated in the plan? We feel that a general suspension of the strategic concentration and deployment of the armed forces is unlikely at the beginning of a war. Such a measure is completely possible, however, on certain axes, or in certain areas, under especially complex conditions.

The success of strategic concentration and deployment of the armed forces under any conditions depends, to a large degree, on the condition and capabilities of transportation; but this dependence is especially intensified at the beginning of a war.

The beginning of a war immediately exerts the strongest influence on the condition and use of the transportation network in theaters of military operations and in the internal areas of the country.

Nuclear/missile strikes on major administrative, industrial, and power centers and on strategically important areas will bring about destruction of transportation centers and the annihilation of transportation installations and structures, shipping means, and reserves of fuel and materiel.

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Individual, most important elements of the rail network: (developed centers, transshipment areas at junctions of railroads of Soviet and West European gauges, large seaports, sectors of locks on river ways, and major man-made structures outside cities) may, in some cases, also be independent objectives for strikes. The enemy will also execute attacks on relatively small objectives on the territories of the fronts: stations and wharves, highways, airfields, etc. Through traffic on rail lines, main highways, and canals will be interrupted at many points, often for a long time. A number of sectors of the transportation network will be contaminated. Frequent and sharp changes in the condition on the network, disruption of communications and coordination between transport and other organs of control will strongly complicate the control of shipping. Thus, from the very first hours of war, the working conditions of the network will become very complex and difficult.

But, simultaneously with the rise of difficulties in the working of the transportation network and the significant curtailment of its shipping capability, demands for shipments will also be curtailed with the beginning of a war.

In the first days of a war, when entire areas in the theaters of military operations and in the rear of the country will be subjected to massed nuclear strikes, mass economic, local, and intercity passenger travel will be significantly curtailed. It is highly probable that during these days it will be advisable to curtail the sizes of mass military shipments also, both of personnel and of goods, in order to avoid increased losses.

The volume of shipments executed in the first days of a war must be strictly limited. Major shipments at high speeds must not be planned. This leads to an accumulation of personnel, equipment, and goods at the approaches to destroyed centers, man-made structures, and in areas of the junctions of various types of transportation.

Along with a strict limitation of the volume of shipments, their distance should also be limited. We believe that

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shipments by land and water transport in the first days of a war can best be carried out at distances of 600 to 800 km.

In organizing shipments, it is unthinkable to count on filling to a high degree the traffic and hauling capacity of the routes of communication. In order to ensure the flow of shipping and also to accomplish urgent unanticipated shipments, it is absolutely necessary to have reserves of transportation means.

Thus, it may be concluded that in the period of threat, as well as in the first days of a war, shipments for the strategic concentration and deployment of the armed forces can be accomplished in relatively small volumes, at low speeds, and at distances not exceeding 600 to a maximum of 800 km. >

Obviously, all this will exert an influence on the organization of the strategic concentration and deployment of the armed forces which, in our opinion, comes to the following.

1. In the period of threat, and even more in the first days of a war, it will be possible to accomplish shipments for strategic concentration and march movements of troops only at a small fraction of their overall volume and for relatively short distances.
2. In peacetime, the actual capabilities for accomplishing shipments and march movements of troops must be taken into account in determining the disposition of forces and weapons in the probable theaters of military operations.
3. Transportation capabilities must be strictly considered in determining permissible distances between the operational echelons of the strategic formation of the armed forces, between the areas of disposition, loading, unloading, concentration and deployment of troops and reserves of materiel in accordance with the plan for conducting initial operations.

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With the shift of military operations into the next phase of the initial period of a war, strategic concentration and deployment of the armed forces will continue, but then according to a plan which has been altered in one way or another to accord with the new conditions.

Success in the further conduct of a war will depend to a significant degree on the periods of time needed to ready our forces for active and decisive operations; tremendous influence on this will be exerted by the degree to which transportation has been prepared for work in wartime.

Advanced preparation of transportation for war, primarily for supporting strategic concentration and deployment, assumes especially great importance today. The preparation of transport should ensure the viability of the entire transportation network and the continuity of shipping; a shipping capability sufficient to accomplish previously planned military and economic shipments at the beginning of a war, with the retention of considerable reserves for the regulation of planned, and the execution of unplanned, shipments; a capability for the rapid movement of flows of shipments and of transportation reserves; the constant readiness of transportation for working under the conditions of a war which has begun.

The following are the basic measures directed at fulfilling these requirements: organization of the comprehensive use of all modern types of transportation for military purposes, an increase in the operational efficiency of the control of their joint work; prior development of the transportation network, ensuring this by special means for preserving the continuity of shipping and the rapid elimination of disruptions in traffic; protection of the network from contamination by radioactive and toxic substances.

The necessity for the comprehensive use of all types of transportation for carrying out shipments in wartime and the organization of their preparation and joint work according to a unified plan and under unified direction has now been generally recognized. However, in the proposed solutions to individual problems in this organization, considerable diversity of opinion is encountered.

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Certain analysts, in appraising the possibilities for using various types of transportation in a nuclear/missile war, believe that rail transportation is poorly suited for work in wartime in view of the great probability of lengthy interruptions of through traffic at many points of the railway network, and that water transportation can be used only on certain axes. To this, they add that on sea and river channels and river sectors with locks, still longer interruptions of through traffic will arise than on railroads. From this, it is concluded that the basic shipping work in ground theaters of military operations and in the zone of interior must be accomplished by motor vehicle and air transportation.¹

We consider such a conclusion to be incorrect. It is known that at the present time in our country, and in the overwhelming majority of the other countries of the Socialist Camp, rail transportation carries the greatest proportion of the overall freight turnover. It will play a leading role in the future also. According to the plan for the development of our transportation network in 1965, the specific proportion of rail transportation in the overall freight turnover will be 71.3 percent; sea, 10.5 percent; river, 5.1 percent; motor vehicle, 6.2 percent; pipeline, 6.8 percent; and air, 0.07 percent. Consequently, to shift the largest part of the shipping work to vehicular and air transportation in wartime will be simply impossible in view of their insufficient capacity for this.

In addition, on main vehicular highways and other important vehicular roads, the destruction of transportation centers, major bridges, etc., will also cause interruptions of through traffic. It will be necessary to conduct traffic along by-passes, to establish temporary passages and river crossings to overcome contaminated sectors of routes. All this will decrease the traffic-carrying capacity of vehicular roads and will increase the expenditure of vehicular transportation in carrying out shipping work.

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1. "Modern War", General Staff Academy (Akademiya GSh), Moscow, 1960, p. 71.

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The rise of lengthy interruptions of traffic at many points on the rail network does not at all mean that the undamaged sectors of the network remaining between these points cannot be used for shipping. On the contrary, it is completely possible to retain the working capacity of these sectors. The same also applies to sectors of interior water routes. Of course, destruction of centers, ports, major man-made structures, and the liquidation of part of the shipping means will lead to a significant lowering of the traffic and hauling capacity of railways and river routes. But, with proper preparation, they can carry out a considerable share of the shipping work in wartime, especially if it is considered that the required volume of shipping will decrease in comparison with prewar.

In wartime, the work of rail transportation in zones near the front both in theaters of military operations and in internal areas of the country must carry the greatest proportion. Because of this very condition, it is necessary to guarantee the comprehensive use of various types of transportation for military purposes.

A capability for their comprehensive use in wartime should be ensured beforehand both technically and organizationally.

The solution to this problem from the technical standpoint consists of mutual coordination in the development of various types of communications routes and their junctions, shipping means, means of transferring goods from one means of transportation to another and in the coordination of their joint work. Continuity of shipping is ensured by special measures in cases of destruction of transportation centers, power centers, major man-made structures, and other important objectives.

From the organizational standpoint, unified direction of the preparation and working of various types of transportation in wartime has the most important significance. As is known, in view of their specialization, not one transportation ministry or department and not one service of the armed forces can direct the comprehensive use of all types of transportation.

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Therefore, it seems to us that unified direction of the preparation of the transportation network and the use of it on the territory of each front and each district located in zones near the front and in the internal areas of the country should be accomplished by special organs. Obviously, the structure and functions of these organs can be determined only by governmental decisions.

Various solutions to the problem of securing unity of direction in the preparation and employment of the various types of transportation for accomplishing shipping on the territory of the front are proposed.

In certain works the idea is advanced of using for this purpose a control organization very similar to the one used during World War II. In view of the increasing complexity of directing shipments under the conditions of a modern war, it is envisaged to improve this organization by including the transportation department in the rear area staff of a front.

It is considered, however, that this department should direct only the use of various types of transportation, not for all types of shipments but only for transporting materiel and for evacuation.¹ Thus, direction of the preparation of all types of transportation for joint work and also of the execution of all types of shipments according to a unified plan are not included in the functions of the 3rd Department. As a result, neither unity in the preparation of the transportation network of a front as a whole nor unity in its working is ensured. The transportation services of a front will receive instructions on these problems from various control echelons. Obviously, such organization of direction cannot secure the comprehensive use of all the types of transportation of a front.

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1. "The Rear Area in Modern Operations," Rear Services Staff of Moscow District, Moscow, 1959, p. 293.

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Other authors consider that the 3rd Department of the rear area staff of a front is, by its very position, unable to resolve the practical problems of planning and coordinating the work of all the types of transportation of a front. Instead of this department, they propose the creation in a front of a unified transportation service (directorate) provided with the necessary authority for organizing the centralized use of all the types of transportation subordinate to the front and with appropriate powers for coordinating problems of military shipping with the necessary ministries and departments. To secure direction of military shipping, it is proposed to work out schedules and plans for shipping which are coordinated among the various types of transportation and to create a unified dispatcher control over shipments.¹ The given version of the organization of centralized direction of all types of transportation in a front, first of all, also does not provide a solution to the problems of preparation of the transportation network. Secondly, such a directorate is very unwieldy and inefficient: it will fetter the operations of the transportation services. Thirdly, the authors of the proposals do not indicate the subordination of the transportation directorate of a front, while the solution to this problem has considerable significance.

A third version of the organization of unified direction of the various types of transportation is proposed. The overall direction of the preparation and use of all types of transportation is centralized directly in the hands of the deputy to the commander of troops of the front for the rear area with the chiefs of the military transportation services directly subordinate to him. It is considered that the chief of the rear area of the front must be in charge of all types of shipments (including operational) and also of the march movements of troops along the military vehicular roads of the front.

1. Lieutenant-General I. Kovalev, Major-General P. Bakarev, Colonel K. Pavlovich. "Problems of Transportation in a Modern War," Special Collection of Articles of the Journal "Military Thought", 1960, Third Issue.

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It is proposed to accomplish the organization and control of mutual coordination of the preparation of the various types of transportation and their comprehensive use for supporting operations in the transportation directorate of the rear area staff of the front. Thus, unity of overall direction of the preparation and use of all types of transportation coincides with the known independence of each of the services, which are specialized according to types of transportation.¹

One can agree with such a version of the organization; however, in our opinion, the transportation directorate should not be directly subordinated to the chief of the rear area staff of a front. It is known that up to the present time, the organization of military shipments of various types (for example, operational and supply) is charged to various organs (the staff of a front, the rear area staff of a front). In this situation, it is advisable to have the transportation directorate immediately subordinate to the commander of troops of the front. This guarantees unity of direction of the preparation of the transportation network of the front for the support of operations and its use for carrying out all types of military shipping.

New means of action against the transportation network give rise to the necessity for changes in the methods and means of ensuring the continuity of shipping.

In a modern war, a wider dispersal of shipping is required --- i.e, dispersal of communications routes, of various technical installations, and of shipping means.

Parallel communications routes of various types should be dispersed so that in cases of lengthy interruptions of traffic on one of them, continuity of traffic on the others is preserved. Along with this, it is necessary to ensure a capability for transferring flows of shipments from a route put out of commission to those still operative.

1. Works of the Military Academy of Rear Services and Transportation, No. 43, 1959, p. 184.

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In order to prevent lengthy interruptions of through traffic of trains and motor convoys resulting from the destruction of major cities (and corresponding transportation centers), railway and vehicular bypasses should be prepared in advance at a sufficient distance from these cities. Moreover, provision must be made without fail for the use of these for national economic shipments in peacetime which will enable us to avoid immobilizing capital investments. It is also necessary to prepare in advance rail and vehicular road approaches to places at which temporary bridges and crossings over major river barriers are constructed in case permanent bridge crossings are destroyed.

In the period of threat, and even more at the beginning of a war, the greater amount of loading and unloading work, the preparation of shipping means, support of transported troops, etc., must be taken beyond the limits of transportation centers in the shortest period of time. For this, it is necessary to prepare in advance appropriate stations, wharves, and airfields at their approaches and to provide support for them with forces and means.

In order to have a capability of using for shipping undamaged sectors of railways and internal water routes bordering on destroyed installations, it is necessary constantly to maintain an undiminished quantity of rolling stock, fuel, and materiel at these sectors in wartime.

At the beginning of a war, in order to effect reconstruction and construction work on routes of communications, powerful, highly productive means, capable of accomplishing these tasks under conditions of mass destruction and in contaminated areas will be required immediately.

The primary efforts of reconstruction personnel, especially in zones near the front and in the rear area of the country, are required in order to concentrate on overcoming large "barriers" which obstruct transportation traffic. The main task in this will consist of restoring communications between the sectors of the network bordering on "barriers". This task can be accomplished most successfully by the comprehensive use of

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the reconstruction, construction, operational, and shipping resources of rail, vehicular, pipeline, water, and air transportation for overcoming obstructed areas. All work in the reconstruction, development, putting into operation and use of the transportation network in each area should be accomplished according to a unified plan and be continually coordinated.

A very important role in overcoming "barriers" can be played by special means of transporting railroad cars: trailers with a large load-carrying capacity (up to 100 tons), special ferries, ferries made from barges and pontoons with rails laid on them for carrying cars across large rivers when bridges have been destroyed, helicopters with a large load-carrying capacity, etc.

The existence of such means permits a sharp reduction in the volume of work in preparing temporary shipment areas, the avoidance of duplicate shipments, and a significant increase in the speed of restoring communications between railway sectors bordering a destroyed installation.

It is obvious that the preparation of transportation for war and specifically for supporting the strategic concentration and deployment of troops has now become much more complex than before and has acquired new peculiarities. Among the most important of these are the following:

1. In the initial period of a modern war, as in other periods, shipments for strategic concentration and deployment can be accomplished only by the combined use of various transportation means. Therefore, close mutual cooperation and continuous coordination of their preparation for working jointly in wartime has become absolutely mandatory. One of the most important conditions for success in preparing and using the transportation network for military purposes is the organization of unified operational direction of the work of all types of transportation on the territory of each front, district near the front, and internal area of the country.

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2. Paramount significance is acquired by the maintenance at the beginning and during the course of a war of the viability and working capability of the network and continuity of shipments in theaters of military operations and in the rear area of the country. In the prior development of the transportation network for military purposes, it has become essential first of all to ensure a capability for wide dispersal of shipments, for carrying out freight and other work from transportation centers, for the rapid transfer of a flow of shipments from one type of transport to others, and for the restoration in short periods of time of communications between sectors of the network bordering on destroyed installations.

3. The role of special (reconstruction, construction, shipping) means of overcoming major "barriers" bordering on communications routes in the very first hours of war as a result of nuclear strikes has sharply increased. The creation of such powerful and highly mobile means during the advanced preparation of the transportation network is now much more logical than prior development of installations within centers, increasing the number of permanent bridge crossings over major rivers, etc.

This means that in solving the problems of strategic concentration and deployment of the armed forces, it is absolutely essential to consider new indices of preparedness of the transportation network for work during the initial period of a war, the actual possibilities for the combined use of all types of transport, the maintenance of the necessary working capacity and mobility of the transportation network, and the continuity of shipping. Only on the basis of an analysis of these data can one make a correct estimate to provide for strategic concentration and deployment from the standpoint of transportation and derive from this estimate wholly valid conclusions.

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