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MEMORANDUM FOR: The Director of Central Intelligence

FROM : John N. McMahon
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Problems of Engineer Support for the Negotiation of Water Obstacles at High Speeds

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article is a three-part article commenting on an earlier article on the same subject. In the first part, the authors stress the importance of capturing enemy bridges for assault crossings, indicate the quantity of crossing means needed, and suggest ways to get more out of the available resources. In part two, the author discusses certain misconceptions that lead to poor planning, inadequate support, and ineffective traffic control, which would invite disaster in an actual fighting situation. The author of part three provides methods and charts for computing the necessary allocation of equipment and time for an assault crossing. This article appeared in Issue No. 5 (66) for 1962.

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned

John N. McMahon

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[redacted]

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SUBJECT

MILITARY THOUGHT (USSR): Problems of Engineer Support for the Negotiation of Water Obstacles at High Speeds

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Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 5 (66) for 1962 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought". This article, by S. Aganov, K. Babushkin, A. Salomadin, and G. Koreysh, all of the rank of General-Mayor of Engineer Troops, is a response to an earlier one on the same subject. In the first part, Generals Aganov and Babushkin stress the importance of capturing enemy bridges for assault crossings, indicate the quantity of crossing means needed, and suggest ways to get more out of the available resources. In part two, General Salomadin discusses certain misconceptions that lead to poor planning, inadequate support, and ineffective traffic control, which would invite disaster in an actual fighting situation. In part three, General Koreysh provides methods and charts for computing the necessary allocation of equipment and time for an assault crossing.

End of Summary

[redacted] Comment:

General Aganov also wrote "Negotiating Rivers in a Border Zone During the Movement Forward and Deployment of Front Troops" in Issue No. 1 (71) for 1964 [redacted] and contributed to "Predicting and Negotiating Zones of Destruction" in Issue No. 1 (77) for 1966 [redacted]

[redacted] The article which this one discusses was disseminated

[redacted]

[redacted]

Problems of Engineer Support for the Negotiation of Water Obstacles at High Speeds

by

General-Mayor of Engineer Troops S. AGANOV
General-Mayor of Engineer Troops K. BABUSHKIN
General-Mayor of Engineer Troops A. SALOMADIN
General-Mayor of Engineer Troops G. KOREYSH

The article by Colonel General of Engineer Troops A. TSIRLIN on the above topic is undeniably important.* Although we agree with its main points, at the same time we consider it necessary to state our observations.

The author casually mentions the capture of existing bridges. In our view, this is the most important measure for achieving high speeds when negotiating water obstacles and, for this reason, the organization and carrying out of this measure deserves more detailed treatment.

In offensive operations at the beginning of a war when the number of engineer units, which are still not fully mobilized, of the front and armies is extremely limited, it is impossible to count on high speeds in a troop crossing when only the organic crossing means and amphibious equipment of large units are used. At the same time, the possibilities of capturing existing bridges and crossings during these operations have increased substantially in comparison with the period of the Great Patriotic War. The destruction of enemy groupings, including deep reserves, by strikes of missile/nuclear weapons, the rapid advance of our troops at a rate of up to 100 kilometers per day, the absence of continuous fronts, and the development of the offensive along separate axes favor the capture of bridges and crossings.

To do this, however, efficient organization and thorough training are required on the part of the staffs of the front and armies. Unfortunately, measures for the capture of existing bridges are often omitted in actual combat and operational training. At best this is considered to be the task of the first echelons of the advancing troops, specifically the forward detachments of divisions; the front and armies organize only the landing (dropping) of operational and tactical airborne landing forces.

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* Collection of Articles of the Journal "Military Thought", No. 1 (62), 1962.

Calculations show that the capture of even one serviceable bridge in the zone for an assault crossing by an army of a river 200 meters wide can accelerate the crossing of the army's troops by a factor of approximately one and one-half in comparison with a crossing made only on organic crossing means. The capture of several (four to six) bridges on a wide water obstacle in a front offensive zone can, in fact, determine the success of an assault crossing at high speeds.

It is interesting to remember that on the average there is one bridge every ten to 20 kilometers on rivers in West Germany. For example, on the Rhine there is one railroad or highway bridge every 12 to 18 kilometers. Taking into account the preparation of additional crossings when combat actions begin -- and the enemy is preparing for this even in peacetime -- there may prove to be 35 to 40 operating crossings in a front offensive zone.

We believe that, in spite of the possible preparation of all the bridges and crossings for demolition, one should attempt to capture them in order to prevent their planned demolition by the enemy.

Can such a task be assigned and who should fulfil it? In our view, it can. The capture of bridges, crossings, and hydraulic engineering structures and the organization of their use on narrow rivers and canals should be entrusted to advancing first-echelon troops; those on wide and medium rivers and canals should be assigned to the front and armies.

Based on the concept of the operation, the grouping of its own troops, an analysis of possible enemy actions, and also on a thorough study of the hydrography of the combat actions area and of the availability and condition of bridges on the most important water obstacles, a front staff must develop specific measures for capturing bridges, crossings, and hydraulic engineering structures on the main axes of operation of the troops. Such measures can include reconnaissance, principally air reconnaissance, of the assault crossing area and aerial photography of the targets designated for capture; allocation of the required forces and means; establishment of the procedure for employing nuclear weapons and conventional means of destruction to destroy enemy groupings which interfere with the accomplishment of the proposed plan; and also distribution of targets to be captured among the executors, assignment of tasks to them, and organization of cooperation among all forces and means. In addition, the front staff must plan the procedure for using captured bridges and crossings.

The main forces for capturing bridges and other structures on major rivers can be operational and tactical airborne landing forces, specially formed detachments, forward detachments from advancing first-echelon divisions and also front and army sabotage-reconnaissance detachments operating in the enemy rear.

We do not share the point of view of some authors who contend that it is not advisable to allocate special detachments for capturing bridges, and that in all cases this task can be successfully accomplished by forward detachments. In our opinion, because of their composition and operating methods, the latter will not always be able to accomplish this task. Capture detachments, allocated from first-echelon divisions or formed in the armies with due regard for the characteristics of each target, stripped down as much as possible, and at the same time capable of independent actions, can capture bridges and hydraulic engineering structures even when the enemy is still putting up strong resistance on the approaches to the water obstacle.

It is more advisable to put such detachments into operation 50 to 60 kilometers from the river. Depending on the nature of the target, its guard and defense system, and also on the overall operational conditions on the axes of operation, the strength of the detachments can, in our view, range from a tank company to a tank regiment reinforced with subunits of combat engineers and chemical warfare personnel. Exploiting breaches and gaps in the battle formations without becoming engaged in combat with the enemy, the detachment swiftly approaches the target for capture, if necessary sends part of its forces across the river off to the side from the bridges, and captures it with a surprise attack from the front and rear. The detachments can receive data for selecting the most suitable approach routes to the river from front air reconnaissance. Combat engineer reconnaissance personnel outfitted with scuba-diving equipment can play an important role in the rapid capture and especially in the mine clearing of bridges and hydraulic engineering structures.

Support by front aviation, and in some cases also the delivery of missile/nuclear strikes against enemy units and large units moving towards the river, will be required to hold captured targets until the approach of the forward units of the advancing troops.

Of course, all that we have said does not preclude the assignment of the tasks of capturing bridges to the forward detachments of first-echelon divisions and especially the extensive use of tactical and operational airborne landing forces for this purpose.

Colonel General TSIRLIN is correct in directing his attention to the necessity of negotiating water obstacles on a wide front. However, experience shows that this can only be achieved by the decisive rejection of the old Great Patriotic War vintage sequence for the assault crossing of rivers first by forward detachments and then by the main forces of first-echelon divisions in the same sectors.

When an assault crossing is organized that way, whether we want them to or not, forces gradually accumulate on the opposite river bank at small bridgeheads. Such a situation was justified in the past by the small quantity of crossing means and the narrow assault crossing sectors. The crossing means presently available in the Soviet Army cannot be compared in any way, either quantitatively or especially qualitatively, with the equipment from the last war. They enable all the cargo of a modern division, including heavy tanks, to cross on self-propelled assault crossing means. The zones for the assault crossing of rivers by large units have grown considerably wider and usually extend 20 to 30 kilometers.

One would think that all capabilities needed to make assault crossings of rivers in wide zones and to quickly develop the offensive on the opposite bank are available. However, these capabilities are not exploited at all when, in a wide division offensive zone, the forward detachment first makes an assault crossing of the river along a four- to five-kilometer front; and then, after one and a half to two hours, a floating bridge is laid in the same sector and the main division forces begin to cross on the bridge and on the forward detachment's assault crossing means without extending the assault crossing front through the crossing of troops on the axes of operation of other regiments.

In our view, when possible it is advisable for several regiments of a division's first echelon simultaneously to make an assault crossing of the water obstacles along the entire division offensive zone, not only in the sector of the forward detachment. To fulfil this requirement it is necessary to reconsider the equipping of divisions with assault crossing means and to provide for the simultaneous crossing of two or three regiments in the same periods of time currently spent on the crossing of the forward detachment.

In calculating the assault crossing means needed by a division, it is not at all necessary to count up all of its nonamphibious equipment. In our view, it is sufficient to determine what in the first-echelon regiments must cross on these means in the first one and a half to two hours of the assault crossing, since all the remaining equipment of the division will

cross on bridges laid by the forces of the division or army and on the assault crossing means used by the first-echelon regiments. Let us cite some calculations.

A motorized rifle regiment has approximately 300 pieces of various combat equipment, of which more than 100 pieces are amphibious. All personnel in motorized rifle subunits are transported in amphibious armored personnel carriers; this already greatly expedites the task of making an assault crossing of rivers on a wide front and assures the regiments of independence during an offensive on separate axes. It now remains to ensure the crossing, first of all, of the tank battalion, artillery, and combat support subunits. Together these contain 120 to 130 (140 in a tank regiment) pieces of nonamphibious combat equipment.

In the simultaneous assault crossing of a river by two regiments of a division, 260 to 270 vehicle trips by assault crossing means (GSP tracked self-propelled ferries and PTS or K-61 tracked amphibians) will be required. Based on the requirement for all of this equipment to cross a river up to 150 meters wide in one and a half hours (on the average one trip takes 10 to 12 minutes), instead of 12 pieces of various organic assault crossing means, 22 to 29 will be needed in a division.

The possibility of tanks crossing along the bottom is not taken into consideration in the above calculation. If this is done by the second-echelon tank battalions of the regiments, then three first-echelon regiments of the division can cross simultaneously on the means mentioned in approximately the same amount of time.

In our view, it is advisable to have assault crossing means both in the regiments and at the immediate disposal of the division: a section of amphibious carriers (four K-61's or PTS's) in a motorized rifle regiment; a platoon of tracked self-propelled ferries (three ferries) in a tank regiment; and a company of tracked self-propelled ferries (ten ferries) in a motorized rifle division. This enables the regiments to have some independence in the crossing of nonamphibious equipment, and permits the division with its own means to influence the course of an assault crossing of water obstacles by the regiments while reinforcing those regiments which are accomplishing the most important task in the situation which has developed. In addition, a division must retain a pontoon bridge company for laying bridges over narrow and medium water obstacles.

The availability in a division of amphibious armored personnel carriers and the assault crossing means mentioned will also make it

possible to ensure the rapid crossing of the forward detachment, if one has to be allocated, and to have sufficient means within the main forces to organize the crossing of troops in other sectors along the entire assault crossing zone of the division.

It is still more important to have plenty of crossing means in a tank division, which at the present time is even less well equipped with them than a motorized rifle division.

It is necessary to have assault crossing means in the regiments and division also because of the high-maneuver nature of a modern battle and operation and the difficulty of maneuvering the assault crossing means of the armies and front -- both from one axis to another and also from the depth -- in order to reinforce the divisions during an offensive.

Naturally, the suggested quantity of crossing means will be required only for divisions operating in the most important theaters of military operations, primarily in the Western Theater of Military Operations.

The quantity of assault crossing means in the divisions can be increased mainly by eliminating the separate assault crossing battalions of the armies and front. Experience in employing these battalions at command-staff exercises and at exercises with the troops shows that in the European theaters of military operations they are never used in full strength, but are always distributed by company among the first-echelon divisions and then by platoon among the regiments. The commanders and staffs of these battalions cannot practically control their own subunits because the latter are scattered over the entire offensive zone of the army. The subunits of the army or front assault crossing battalion are actually controlled during an assault crossing by the unit engineers of the combined-arms units and large units to which they are attached.

In our view, it is necessary to have separate assault crossing battalions only within the engineer troops of the Reserve of the Supreme High Command which are used to reinforce fronts in order to support the assault crossing of wide rivers, particularly at their mouths, and to seize straits zones during actions on coastal axes, where these battalions can be used in full strength. In addition to tracked self-propelled ferries and amphibious carriers, it is necessary to include subunits equipped with general-purpose means (detachable equipment) for the crossing of tanks (PSTU individual flotation equipment for tanks) in these assault crossing battalions of the Reserve of the Supreme High Command.

General TSIRLIN mentions the higher traffic capacity of bridges in comparison with ferry crossings. In our view, we should not discuss this sufficiently well-known fact so much as the fact that, if the troops are not able to capture existing permanent bridges, under modern conditions floating bridges are the principal means of reducing (in comparision with other types of crossings) the time used in an assault crossing of water obstacles and of furthering the offensive of the troops at a rate of 80 to 100 kilometers per day.

As calculations indicate, in order to achieve the above average rate of advance by the troops, divisions must make an assault crossing of narrow and medium water obstacles in three to five hours. Even when a division has available the set of assault crossing means that we recommend, which permits the assault crossing of such obstacles by first-echelon regiments on a wide front in one and a half hours, it is possible to ensure the negotiation of water obstacles by an entire division in three to five hours only when the division's second echelon, divisional and attached units, and rear services cross on bridges.

But if ferries are assembled from equipment in the pontoon sets used to lay bridges and the entire division makes the assault crossing on assault crossing means and ferries, then, other conditions being equal, according to the same calculations not three to five but eight to ten hours will be required.

This gives us the right to state that, when assault crossing means are available in a division and when it is possible to organize the underwater crossing of tanks on the bottom of the river, narrow and medium water obstacles are negotiated two or three times as fast on bridges as on ferries assembled from the same number of pontoon bridge sets.

For a division to cross such a water obstacle in three to three and a half hours, it is necessary to have two bridges within its offensive zone; to cross in four and a half to five hours, one bridge is needed. For an army consisting of three divisions in the first echelon to cross under these conditions, four to seven bridges (one of which is a reserve) are required. If all of these bridges are laid for 60-ton loads, three to five sets of PMP pontoon bridges will be needed. Particularly in operations in the initial period of a war, an army can hardly count on such a number of pontoon bridge sets.

How can we avoid this situation? We believe that one method of solving this problem could be to switch to light 20-ton floating bridges in

combination with the crossing of heavy equipment on assault crossing means. Some difficulty is caused by the fact that approaching troop columns must be split up and their combat equipment sent to a bridge or ferry crossing. To some extent this complicates troop control and the subsequent actions of the troops on the opposite bank. In addition, because of the narrower lanes, the speed on a 20-ton bridge is slower than on a 60-ton bridge by a factor of approximately 1.5.

In our view, in order to avoid extensive formation changes in the troop columns which are crossing and to maintain the high speeds of the crossing, it is advisable to lay light bridges on those sections of the water obstacles where the crossing of tanks along the bottom can be organized or where a sufficient number of GSP tracked self-propelled ferries and ferries for crossing heavy loads can be deployed.

We must mention that tracked self-propelled ferries suitable for crossing tanks and self-propelled artillery are not adapted for crossing the remaining heavy combat equipment of the division. In connection with this, it is necessary to make design changes in them which would provide the capability to use tracked self-propelled ferries in a set with 20-ton bridges for crossing not only tanks, but any loads weighing more than 20 tons.

The availability of light bridges fully ensures the negotiation of water obstacles by first-echelon divisions in a short time if the heavy loads cross on organic assault crossing means. Thus, in a tank regiment, which has a greater amount of heavy equipment -- approximately 100 pieces -- compared to a motorized rifle regiment, unless the crossing of tanks on the river bottom is organized, the crossing cannot be carried out on light floating bridges. To cross this equipment amphibiously on 10 to 12 organic tracked self-propelled ferries will require one and a half to two hours; this time is covered by the overall time for crossing a division, which is estimated as three to three and a half hours.

Thus, the use of light 20-ton bridges together with the simultaneous crossing of heavy equipment on assault crossing and ferry means should be recognized as the most desirable method for the negotiation of wide and medium water obstacles by the first-echelon troops of the armies. In order to cross second-echelon large units and the reserves of the armies and front, there should be, if crossing means permit, heavy 60-ton floating bridges capable of crossing large units as a whole with all of their combat equipment. For this, after the first-echelon divisions of the army have made the assault crossing of the water obstacle, some light floating

bridges can be dismantled and the released pontoon bridge sets subordinate to the army can be used to lay one or two heavy 60-ton bridges in the army zone.

Incidentally, let us mention that recently we have had a tendency to replace heavy tracked vehicles in the troops with wheeled prime movers which can cross on light 20-ton bridges. This just confirms our opinion concerning their advantage over 60-ton bridges.

Of great significance for the successful negotiation of water obstacles by the troops from the march are the problems of ensuring the survivability of bridge crossings and also their operation under conditions of radioactive contamination.

For reliable and timely air coverage of crossings, air defense means must advance to the water obstacle at the head of the main forces of the first-echelon divisions in order to be able to deploy on the departure bank when the floating bridges begin to be laid and to provide air cover for the bridge crossing being built and, subsequently, for the troops which are crossing on it.

To ensure the successive assault crossing of a number of water obstacles, the pontoon bridge sets deployed on a river should be replaced more rapidly by low-level bridges on fixed supports or by composite bridges with the use of local watercraft. However, this will not always be possible since with the existing organization and equipment of the engineer troops the rate of building low-level bridges is not high. Twelve to 15 hours are required to lay a low-level bridge over a water obstacle 250 to 300 meters wide. Composite bridges can be built somewhat faster by using local river craft of the enemy (self-propelled and nonself-propelled barges with large load capacities). But, even using these, it is unlikely that one can count on the possibility of replacing floating bridges on a major water obstacle sooner than in 10 to 12 hours.

The necessity arises to have reserve pontoon bridge sets without personnel, even though these are outdated or have been removed from service or are simplified and inexpensive backup sets, available in a front to rapidly replace the organic pontoon bridge sets of engineer troops during an operation. The availability of such reserve sets is also extremely desirable for supporting the movement of the second echelons and reserves of a front when they enter an engagement since apparently we cannot count, as we have in the past, on the fact that a front second echelon can cross water obstacles on low-level bridges and composite bridges built by this

time by the first-echelon armies and front engineer units.

Finally, let us briefly dwell on the possibilities of using various crossing means in zones of radioactive contamination. Obviously, the engineer units must be the first to arrive at these zones in order to reconnoiter the river and prepare the crossings. While supporting the crossing they are compelled to remain there considerably longer than the troops which are crossing. Because of this, as material from war games and exercises demonstrates, the personnel of engineer units receive doses of radiation five or six times as great as those received by the troops they are supporting. Therefore, it is necessary to discover crossing methods with which, on the one hand, the time the combat engineers spend at the water obstacle would be reduced while, on the other hand, conditions would be established for better protecting them from radioactive irradiation.

Bridge crossings constructed from organic pontoon bridge sets also possess considerable advantages in this respect, not to mention the fact that, as a result of the faster crossing pace on a bridge, the troops which are crossing receive relatively smaller doses of radiation in comparison with a crossing made amphibiously and on ferries. After the bridge is laid, a large part of the personnel of pontoon bridge units can be removed from the contaminated area or sheltered in it in engineer structures, while during an assault crossing the personnel working on assault crossing and ferry means are forced to remain at the river in the zone of radioactive contamination during the entire assault crossing.

Because of the high speeds of laying floating bridges, the work of preparing bridge crossings from organic pontoon bridge sets for the crossing of the second echelons can begin approximately one hour before these begin to cross, when the level of radiation in this area has already subsided considerably.

In our view, the solution to the problems we have enumerated along with those outlined in the article under consideration, by Colonel General of Engineer Troops A. TSIRLIN, can help to achieve high speeds in negotiating water obstacles from the march.

* * * * * *

We agree with the statement by Colonel General of Engineer Troops A. TSIRLIN that "under conditions of missile/nuclear war, water obstacles will have a great influence on the conduct of operations and especially on the rate of advance of troops." Therefore, the desire sometimes expressed of

making an assault crossing without reducing the rate of advance, in our view, is still not totally feasible at present. One can speak only of a considerable increase in the speeds of an assault crossing and a troop crossing, not of an assault crossing of water obstacles at the pace of the offensive battle.

Theoretically, such a task could be proposed if all combat equipment and part of the motor transport were capable of independently (individually) negotiating water obstacles by one or another method. This is still not possible nor, one must assume, will it be in the immediate future. It is very difficult to technically solve the problem of flotation of basic combat equipment and, apparently, it is economically inadvisable.

First echelons still cannot make an assault crossing of a water obstacle in deployed battle formation. When approaching a river and then after making the assault crossing of it, the troops are forced to carry out the appropriate formation changes. The loading of personnel and equipment onto the crossing means and also their landing and unloading on the opposite bank take a definite period of time. The speed of crossing means and amphibious combat equipment is considerably less in water than on land. All of this causes a reduction in the overall rate of advance.

In training troops and staffs to make an assault crossing of water obstacles, we take into consideration the wealth of combat experience which the Soviet Army gained in the Great Patriotic War. But, with the passage of time, fewer and fewer of those who posses this experience remain in the army and, in addition, this experience cannot be used without a critical analysis which takes into consideration the modern conditions of the assault crossing of water obstacles.

It is often possible to meet a commander who, not having a clear understanding of the entire aggregate of problems to be solved when organizing the assault crossing of a river, simplifies the processes of preparing and conducting it, permits a number of routine methods, and sometimes turns an assault crossing into an ordinary troop crossing. Limiting the scope of their responsibilities, such a unit or even large unit commander and his staff often shift the main burden of planning and monitoring to a unit engineer. Not everywhere, unfortunately, is the proper struggle being carried on against this.

Plainly, therefore, it is not by chance that at exercises one can observe the bunching of troops at a water obstacle, especially immediately at the crossing points, the attempt to make an assault crossing in narrow

zones and sectors (It is simpler to control troops!), the absence of extensive maneuver by forces and means before and during the assault crossing, the unsatisfactory organization of the provost and traffic control service, and the neglect of combat and operational support measures.

All of this demonstrates that for the correct training of staffs and troops in the assault crossing of water obstacles, it is necessary to have a guide or manual which would give definite recommendations on what must be done, how, and by whom. In our opinion, it is time to achieve unity of views on the organization, planning, and conduct of an assault crossing, as well as on the terminology connected with this type of combat actions.

The draft "Guide to the Assault Crossing of Rivers" was good in its time. However, a number of its proposals have become outdated, and it was withdrawn from use. The troops have received nothing in exchange. One may object that there are the field service regulations and field manuals of the branch arms, articles are often written in the military periodic press on the problems of an assault crossing of water obstacles, and training texts are published for the military schools and academies. But field service regulations and field manuals are limited to only an enumeration of the basic tasks and measures which must be carried out during an assault crossing and do not give the commander and staff answers to the questions of how to make a decision, how to plan, and who organizes the carrying out of various measures and how. Obviously, it would also be incorrect to make such demands of the regulations. And the authors of articles published in the classified publications are far from unanimous in their recommendations on even the basic problems of the assault crossing of water obstacles.

Turning to the problem of assault crossing methods, we believe that the primary and only method in a modern war is assault crossing of water obstacles from the march. It may take place under the most diverse conditions. The most characteristic of these are an assault crossing of water obstacles during a battle between the advancing troops and an enemy defending himself immediately in front of the water line, when he will often be able to organize a defense also in back of this line, and an assault crossing when pursuing an enemy who offers only weak resistance with insignificant and isolated forces.

In the first case the battle formation of tactical echelons of the advancing troops will be drawn up on the basis of the conduct of a battle with the enemy on the approaches to a water obstacle. For a rapid assault crossing from the march under such conditions, it is more advisable to

designate forces, including also forward detachments, from the second echelons and reserves, reinforce them with crossing means, and prepare them in advance to fulfil this task. It is hardly appropriate to burden battle formations of the first echelons with crossing means and to expose the latter to the danger of being put out of operation while still on the approach to the water obstacle.

In the second case the assault crossing can be made entirely with the facilities of the withdrawing enemy. From the organizational point of view, this is the most advantageous and relatively simple variant of an assault crossing. In such a situation the existing crossings are most frequently captured by detachments and groupings which are formed specially for this purpose and can be airlifted into crossing areas when aviation means are available.

Also possible is the assault crossing of a water obstacle under conditions of immediate contact after a brief preparation (which is completely realistic for the initial period of a war if, for example, the first offensive operation begins with the assault crossing of a border river), but even then it is advisable to make a crossing similar to an assault crossing from the march since the troops will not occupy a departure position right at the water obstacle but will begin to operate from the depth.

It was stated in the draft 1962 Field Service Regulations of the Armed Forces of the USSR (Division-Regiment) that "if an assault crossing from the march is not successful, it can be made with preparation in a short period of time" (page 312). In our view, if the decision is made to repeat an assault crossing with preparation in a short period of time, evidently it should be prepared, not on the previous already compromised axis or sector, but on another new axis; then it should also be conducted as an assault crossing from the march. Taking the above into consideration, it is necessary to clarify the corresponding articles of the regulations and manuals of the branch arms.

The assault crossing of a water obstacle must be made along a wide front and the offensive must be developed nonstop on the opposite bank. In actual troop training, some view the second part of this requirement as a rejection of the idea of capturing a bridgehead. However, in our opinion, this is not completely true.

In the Great Patriotic War the requirement to immediately develop the offensive on the opposite bank also appeared, but it could not often be

entirely fulfilled. During that period the troops were forced to first seize a bridgehead, accumulate forces and means on it for going over to the offensive (so in a number of cases the bridgehead was expanded), and then attack. The process itself of crossing the troops and equipment usually proceeded continuously, but relatively slowly. The main reason for this was the lack of the required quantity and suitable quality of crossing means; it was not uncommon to rely mainly on improvised and various local means.

Under modern conditions the capabilities of organic crossing means have increased considerably. In addition, amphibious combat equipment -- armored personnel carriers and light tanks -- is being introduced among the troops in ever increasing quantities. All of this creates more favorable conditions for increasing the pace of an assault crossing and reducing the time spent by the troops in going over to the offensive on the opposite bank. However, we will hardly succeed, now or even in the immediate future, in completely eliminating the seizure and preparation of a tactical bridgehead or in totally discarding this term in the sense in which we use it when examining the problems of the assault crossing of water obstacles.

The minimum conditions required for the further deployment of crossing means and the development of the assault crossing and troop crossing of a water obstacle are attained by seizing an initial bridgehead. Even the delivery of nuclear strikes directly against the opposite bank and the employment of airborne landings do not exempt the troops from the requirement to seize such a bridgehead and ready it to receive new forces and means.

The troops can continue the offensive nonstop on the opposite bank when the enemy is not there, but then, obviously, this will simply be a crossing and not an assault crossing.

One must suppose that it was the fear of suffering losses from enemy nuclear weapons that made people seek to solve the problem of protecting troops on a bridgehead through an immediate nonstop offensive. In practice, during troop training the attempt to fulfil this requirement often leads to a chaotic, unprepared, and utterly unsupported offensive on the opposite bank. As a result of such a facile approach to the organization of the offensive by sometimes limited and isolated forces without carrying out the tasks of clearing the bank of obstacles and without the appropriate neutralization of the immediate enemy reserves, troops and staffs (particularly young officers having no combat experience) acquire a simplified view of the entire process of an offensive involving

the assault crossing of a major water obstacle.

Either completely forgotten or only perfunctorily worked out are such problems as preparatory fire, control of troops on the opposite bank and the correct structuring of their battle formations, air defense, accompanying engineer support for the troops, consolidation of captured lines, etc.

In the opinion of the NATO command, water obstacles are viewed as natural defense lines, before and behind which nuclear weapons can be effectively employed. In organizing a defense behind a water obstacle, one counts on the movement of forces from the depth to the threatened axes in order to deliver powerful counterattacks and counterthrusts. Only a limited number of forces are deployed right on the bank, but the extensive use of various obstacles is recommended.

In light of the above, at the beginning of an assault crossing and during the crossing of subunits of tactical first echelons, which capture and prepare tactical bridgeheads, one should expect that the most probable targets for enemy missile/nuclear strikes will be not these subunits but the main forces of the troops on the distant approaches to the water obstacle and immediately on their approach to the crossing points.

Consequently, tactical bridgeheads have not lost their importance. Operational and operational-tactical bridgeheads are a different matter. Unquestionably, the concentration of a large quantity of forces and means on these in close formations for a long period of time cannot be tolerated under modern conditions.

In conclusion, let us examine the problem of the provost and traffic control service. The bunching of troops, combat equipment and transport, which is often observed at exercises, is to a significant degree due to the absence of the provost and traffic control service or its poor operation.

In our view, the concept "provost and traffic control service during an assault crossing of water obstacles" must cover: traffic control on the distant approaches to the water obstacle, right at the crossings, and on the opposite bank as far as the closest lateral road, as well as in the siting areas of the rocket troops and artillery; emergency rescue and rescue-and-recovery services; and crossing security service.

The organization and control of the provost and traffic control service is one of the most important responsibilities of a combined-arms

staff. During the assault crossing of a major water obstacle, the army chief of staff must bear responsibility for the organization of the provost and traffic control service in the army zone, while its immediate organizers are primarily the chief of the operations directorate, the chief of the engineer troops, and the chief of the communications troops. It is not ruled out that the overall control of the provost and traffic control service will be entrusted to the army deputy commander. In a division offensive zone, provost and traffic control service is organized by the division staff in conjunction with the division engineer and chief of communications; it may be controlled by the deputy commander of the division.

A provost and traffic control service organized efficiently and in a timely manner assists to a considerable extent in reducing the effectiveness of the employment of missile/nuclear weapons and conventional means of destruction by the enemy against the troops, particularly when they approach the crossings.

In general, the provost and traffic control service must accomplish the following tasks: constantly regulate troop movement; let subunits and units pass through traffic control points according to the schedule established by the commander for the sequence of the assault crossing and troop crossing; monitor the observance of the rules for loading and unloading onto assault crossing means and ferries and the procedure of movement on floating bridges; prevent the delay of crossing means, particularly on the opposite bank; perform emergency rescue and rescue-and-recovery service at crossing points, including the underwater crossing points of tanks; observe the water level and water table; and also guard the crossings, especially the bridges, against floating mines and enemy sabotage actions. In addition to these tasks, the provost and traffic control service can also be charged with other additional tasks arising from the peculiarities of the assault crossing of a given water obstacle, for example, the task of quickly organizing traffic control on the maneuver routes when the assault crossing or troop crossing is being transferred from one sector to another.

The organic subunits of traffic control and of the provost and traffic control service are not sufficient for organizing the provost and traffic control service, particularly since in peacetime the majority of these subunits are numerically small and very poorly equipped with communications and traffic control means and motor transport. According to the experience of a number of exercises conducted in the Southern Group of Forces and in the Hungarian People's Army which involved the assault crossing of a major

water obstacle (including the April 1962 assault crossing of the Danube River), in addition to organic traffic control subunits and personnel assigned from engineer units and subunits to serve only at crossing points, personnel from motorized rifle subunits with communications means and transport were assigned to organize the provost and traffic control service. On the average 20 to 25 officers, 90 to 120 NCO's and enlisted men, 25 to 30 radios, up to 20 telephones, and a certain amount of telephone cable may be required for organizing the provost and traffic control service in a division zone.

Such a relatively large expenditure of forces and means for organizing the provost and traffic control service is repaid with interest. Those commanders and chiefs who economize on the provost and traffic control service apparently still do not understand its great importance under the modern conditions of the assault crossing of water obstacles.

* * * * *

In the article by Colonel General of Engineer Troops A. TSIRLIN, reference is made in a number of places to calculations of the pace of the negotiation of water obstacles during an offensive operation. Command-staff exercises conducted in the postwar period involving the assault crossing of water obstacles have demonstrated that calculations necessary in the staffs of the engineer troops of military districts and armies are made with the expenditure of a large quantity of forces and time.

The aim of this commentary is to recommend the simplest method of calculating the assault crossing of water obstacles. With appropriate preparation and training, one officer can make such a calculation in a few minutes.

In order to make the calculation according to the recommended method, the following initial data are necessary: the operational disposition of the troops of the army as they approach the water obstacle and the sequence of the assault crossing (according to the decision of the army commander); the width and depth of the water obstacle, the soil condition of the bottom and of the banks in the assault crossing sectors; the sequence for the negotiation of the obstacle by the first-echelon large units of the army, the second echelon, army units, and reserves; and the availability of engineer forces and means for supporting the assault crossing.

To clarify the proposed method, let us examine in overview a variant of calculation for the assault crossing of a water obstacle by a

combined-arms army with two motorized rifle divisions and a tank division in the first echelon and a motorized rifle division and a tank division in the second echelon. Let us assume that, according to the decision of the army commander, a forward detachment moves out from each first-echelon division and makes an assault crossing of the water obstacle amphibiously and on ferries, then the main forces of these divisions cross on floating bridges after the forward detachments, and the second-echelon large units of the army and the units subordinate to it cross on bridges after the first-echelon divisions.

The sequence of the calculation is determined in accordance with the accepted procedure for an assault crossing. Basically, the entire process of calculating the time spent by the troops of an army in negotiating a water obstacle from the march amounts to the compilation of three tables and the determination of the conclusions from these, which are drawn up as an assault crossing schedule.

The time used for the negotiation of a water obstacle by the three forward detachments from the first-echelon divisions of the army is determined according to Table 1. If two or three first-echelon regiments of a division, rather than a forward detachment, advance to the water obstacle, the method for calculating the time spent in an assault crossing remains the same as that given for a forward detachment.

The columns of Table 1 are completed in the following manner.

Table 1

Item #		Composition of forward detachments	K-61[1]	PTS[2]	GSP[3]	50- to 60-ton ferries
1	Number of trips required of crossing means	3rd MRR[4]				
		5th MRR				
		8th TR[5]				
		Total				
2	Number of crossing means allocated					
3	Number of trips required of available crossing means					
4	Duration of trip, minutes					
5	Time required for crossing of three forward detachments					

The requirement in crossing means for each of the three forward detachments (Item 1) is taken from a reference sheet prepared in advance and based on the T/O and the characteristics of the combat equipment of the units and large units of the army. It is taken into account here that light vehicles, ambulances, and trucks weighing up to five tons cross on K-61's; that special vehicles weighing five to ten tons cross on PTS's; that tanks, tank prime movers, and combat equipment based on tanks and ATT's[6] (MTU's[7], BAT's[8], BTM's[9]) cross on GSP's; and that artillery, all-road transporters, and vehicles with trailers cross on ferries.

[1]K-61 tracked amphibian (five-ton)
[2]PTS tracked amphibian (ten-ton)
[3]GSP heavy amphibious ferry
[4]Motorized Rifle Regiment
[5]Tank Regiment
[6]ATT heavy tracked artillery prime movers
[7]MTU bridge-laying tanks
[8]BAT heavy artillery tractor dozer
[9]BTM ditching machine

The reference sheet includes, in addition, the data needed for subsequent calculation of the length of the columns of the units and large units. The reference sheet can be compiled according to the following form.

Units and large units of army \ Trips required	K-61	PTS	GSP	50- to 60-ton ferries	Column length, km
Motorized rifle regiment					
Tank regiment					
Motorized rifle division					
Tank division					
Army missile brigade, etc.					

The number of crossing means allocated for the crossing of the forward detachments (Item 2 of the table) are entered in conformity with the distribution of these means according to the decision of the army commander on the following form.

Forward detachments of first-echelon large units of army \ Crossing means	Organic			Reinforcement				Total			
	K-61	GSP	50- to 60-ton ferries	Crossing units (submits)	PTS	GSP	50- to 60-ton ferries	K-61	PTS	GSP	50- to 60-ton ferries
Forward detachment of (No.) MRD[1]											
Forward detachment of (No.) MRD											
Forward detachment of (No.) TD[2]											
Total											

[1]Motorized Rifle Division [2]Tank Division

The data for Item 3 are obtained by dividing the Item 1 totals by the respective indices in Item 2.

Item 4 is completed with data drawn from the experience of tactical exercises and the standards arrived at during them for the duration of one trip on the amphibious means and ferries. For example, the time spent on the trip across a river up to 250 meters wide with a current of up to one meter per second may be characterized by the following indices.

	Time in minutes		
	K-61 & PTS	GSP	Ferries
Loading	2	2	3
Travel with load and mooring	4*	5	5
Unloading	2	2	3
Return of empty and mooring	4*	5	5
Duration of trip	12	14	16

*Exit onto bank

The time required for the crossing of three forward detachments amphibiously and on ferries (Item 5) is determined by multiplying the data in Items 3 and 4 of the same table. In calculation, as a rule, the crossing time on the different crossing means is not identical; the largest value should be used for the final total, but with account being taken of the possibility of crossing part of the equipment on other means that have been released and on bridges laid by this time.

The crossing time for the three first-echelon divisions of the army will depend on the length of the columns, the speed on the bridges, and the number of bridges, and it is determined according to the proposed Table 2.

Table 2

Designation of first-echelon large units of the army	Length of column				Traffic speed by bridge	Time for crossing		
	overall length	forward detachment	equipment to cross amphibiously and on ferries	equipment to cross by bridge		by one bridge	by two bridges	by three bridges
(No.) Motorized Rifle Division Reinforcement units								
(No.) Motorized Rifle Division Reinforcement units								
(No.) Tank Division Reinforcement units								
Total								

The overall length of the column is taken from the reference sheet compiled previously and is reduced by the length of the columns of the forward detachments which have crossed amphibiously and on ferries before the laying of floating bridges, and by the length of the column of combat equipment which has crossed amphibiously and on ferries after the crossing of the forward detachments. The numerical value for the length of the columns of combat equipment to cross amphibiously and on the ferries left after the forward detachments have crossed equals the product of the number of pieces of combat equipment to cross (amphibiously and on ferries within three to four hours, and of tanks crossing on the bottom) times an average distance between them, taken to be 50 meters. This calculation can be made in the following manner.

	K-61	PTS	GSP	50- to 60-ton ferries	Pieces of combat equipment
Means allocated for crossing of forward detachment	(From Item 2, Table 1)				--
Losses of crossing means (up to 20 percent) during assault crossing of forward detachment					--
Means left for crossing of the main forces					--
Duration of one trip	(From Item 4, Table 1)				
Trips which can be made by the remaining crossing means in 3 to 4 hours *					
Crossings of tanks on the bottom	--	--	--	--	--
Total which can cross amphibiously, on ferries, and on the bottom					

*The time 3 to 4 hours is taken on the basis of a simultaneous crossing of the main forces of a division by bridges and on amphibious means.

In calculating the number of tanks to cross on the bottom, it is necessary to take into account the time spent on reconnaissance and preparation of the underwater routes (based on the experience of special and tactical exercises), the speed of the tanks on the bottom (taken as up to 160 (?) meters per minute when the width of the prepared route is 30 to 40 meters), and the number of routes (taken as one or two routes per tank battalion on the average, depending on the bottom soil and the speed of the current). The standards indicated may vary; therefore, the averages achieved in tactical exercises are used in calculation.

The traffic speeds by bridge are taken in accordance with the type of bridge sets from which the floating bridges are laid, their load capacity, the time of day, and the skill of the drivers. In calculating for bridges built from TPP heavy pontoon bridge sets, the average speed can be taken as up to ten kilometers per hour during the day and up to seven kilometers per hour at night; on bridges constructed from the PMP pontoon bridge set, the speed doubles.

The time for a crossing over one bridge is determined by dividing the length of the column by the accepted speed; when the crossing is over two or three bridges, the time is correspondingly decreased by a factor of two or three. When permanent bridges are captured at a water obstacle, the pace of its negotiation by troops correspondingly increases. When several bridges are captured, the crossing means of the army need not be set up at this water obstacle but can remain in the reserve of the army.

The duration of the negotiation of a water obstacle by the first-echelon large units of an army is determined as the sum of the time needed for the three forward detachments to cross amphibiously and on ferries and the time for the main forces of these large units to cross by bridge (i.e., the totals from Tables 1 and 2); this may be reduced to Table 3.

Table 3

Elements of the operational disposition of the army	Types of crossings	Time expended on crossing
Crossing of the three forward detachments	Amphibiously and on ferries	_____ hours
Crossing of the main forces of the three first-echelon divisions	By _____ (one, two, or three bridges)	_____ hours
Total		_____ hours

If, because of the conditions of the operational situation, the bridges are not ready by the conclusion of the crossing of the forward detachments, then the time required to finish laying the bridges is added to the total time given in Table 3.

The calculation of the crossing time of the second-echelon large units of the army and the army units by bridge is performed like the calculation given in Table 2. The readiness of low-level bridges and the times needed to dismantle the floating bridges are calculated on the basis of the following consideration: the laying of floating bridges can be completed in 1.5 to two hours after the assault crossing begins; the engineer troops begin constructing low-level bridges immediately

after they finish laying the floating bridges; the construction time for permanent low-level bridges with a 60-ton load capacity when the units of the bridges are stored in the work area can be determined on the basis of the productivity of the bridge building companies achieved at tactical exercises; and when an assault crossing is made of a wide water obstacle more than five meters deep in the channel, instead of a low-level bridge it is advisable to build trestles from both banks in order to prepare a composite bridge crossing with a floating portion in the channel; this will permit the release of part of the pontoon bridge sets or an increase in the number of crossings.

When a wide water obstacle is negotiated without laying floating bridges (amphibiously and on ferries only), the calculation of the assault crossing time is also made like the calculation for the assault crossing of the forward detachments presented in Table 1.

The overall time required for the troops of an army to negotiate a water obstacle is the sum of the time needed for the assault crossing by the forward detachments and for the crossing of the main forces of large units of the first and second echelons of the army and the units (large units) subordinate to it.

The calculation method presented allows the chief of the engineer troops to determine the time needed for the negotiation of a water obstacle by the various echelons of the army's operational disposition; verify the correctness of reinforcing the first-echelon large units of the army with crossing units in order to assure an assault crossing at the set pace; provide for the establishment of a reserve of crossing means and for the necessary maneuver of them; establish the time for dismantling the pontoon bridge sets at the water obstacle and replacing them with permanent bridges; and also to indicate the axis on which it is advisable to place the army reserve of crossing means.

The calculation of the times needed for the troops to negotiate a water obstacle from the march is presented as a crossing schedule, the content, purpose, and form of which are generally well known.

During the conduct of a number of command-staff exercises on themes connected with the assault crossing of water obstacles, the necessity arose to have another table of cooperation of the branch arms during an assault crossing in addition to the crossing schedule.

At first such a table of cooperation was prepared separately; it was subsequently combined with the assault crossing schedule; the directors and participants in many exercises approved of this.

In our opinion, a crossing schedule combined with a table of cooperation of the branch arms during an assault crossing, when prepared according to the suggested format, can be recommended as a working paper for a combined-arms staff. Such a paper facilitates the organization of cooperation and the monitoring of the actions of the troops during an assault crossing.

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(when filled in)

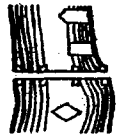
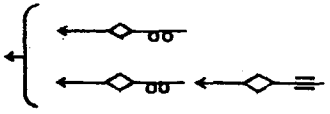
Crossing schedule and table of cooperation of the troops of the army during assault crossing of river _____ from the march (form)

+15 hr. +12 hr. +8 hr. +5 hr. +4 hr. +3 hr. +2 hr. +1 hr. H H -15 min. -30 min. -1 hr. -8 hr.

Missile units
Artillery
Aviation
Air defense troops
Bridge-taking tank detachments
Engineer troops

Nature of combat actions of the branches of the armed forces and branch arms with the start of the assault crossing

Nature of combat actions of the branches of the armed forces and branch arms before the start of the assault crossing

Crossing periods	Crossing types	Crossing means	Assault crossing and pontoon bridge units	Operational disposition of troops of the army
Main forces Forward detachment 1st MRD		K-61 - 8 TPP - 1/4 PMP - 1 GSP	1 separate combat engineer battalion 1/10 army pontoon bridge regiment 2/10 army assault crossing battalion	Forward detachment 1st MRD 
etc.	etc.	etc.	etc.	etc.
Readiness time of floating bridges H +2 hr.		Reserve of the army		Start of assault crossing 1st MRD ____ 2nd TD ____ 3rd MRD ____
Readiness time of low-level bridges H +3 hr. to H +10 hr.		PMP - 1	2/10 army pontoon bridge regiment	

Chief of Staff of the Army

Chief of Engineer Troops of the Army

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