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MEMORANDUM FOR: The Director, Defense Intelligence Agency
SUBJECT : ARTILLERY COLLECTION: "The Question of Fire Control of Missile Artillery"

1. Enclosed is a verbatim translation of an article which appeared in a Soviet Ministry of Defense TOP SECRET publication called Information Collection of the Artillery (Informatsionnyy Sbornik Artillerii).

2. In the interests of protecting our source, this material should be handled on a need-to-know basis within your office. Requests for extra copies of this report or for utilization of any part of this document in any other form should be addressed to the originating office.

FOR THE DEPUTY DIRECTOR, PLANS:

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Enclosure

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Richard Helms

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Original: The Director, Defense Intelligence Agency

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COUNTRY : USSR

SUBJECT : ARTILLERY COLLECTION: "The Question of Fire Control
of Missile Artillery"

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Following is a verbatim translation of an article entitled "The Question of Fire Control of Missile Artillery" which appeared in Issue No. 46, 1958 of the Soviet military publication Information Collection of the Artillery (Informatsionnyy Sbornik Artillerii). This publication is classified TOP SECRET by the Soviets and originates with the Artillery Headquarters of the Ministry of Defense. According to its preface, it is designed for generals and officers from Commander of artillery of a corps, commanding officer of an artillery division (commanding officer of an engineer brigade), and higher.

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The Question of Fire Control
of Missile Artillery

The employment of missile artillery in a modern operation ensures the destruction of the enemy in the entire depth of his operational formation and, just as in the employment of atomic and heavy rocket artillery, it depends largely on its skilful use in an operation, on the preparation for firing, and on fire control.

The control of fire of missile artillery includes the carrying out of the following measures: the determination of the position and nature of targets, the planning of fire, the organization of communications, the assignment of fire missions, geodetic and meteorological preparation, technical preparation for firing, the siting (opredeleniye) of launchers for firing, the organization of adjustment and the checking of the results of firing, and a number of other things.

In this article, from the large number of problems of fire control enumerated, recommendations are examined as a matter of discussion concerning the assignment of fire missions to missile artillery and the organization of adjustment and checking of the results of firing.

Missile artillery is used for destroying important and large objectives in the enemy's tactical and operational depth which have a strong antiaircraft defense (PVO) system, and which are out of the range of fire of conventional and heavy rocket artillery. For delivering mass strikes against especially important objectives, missile artillery can be used independently or combined with bomber aircraft and other means of destruction.

Depending on the nature of the target (objective) and firing conditions, missile artillery can carry out the following fire missions:

- the destruction of personnel and combat equipment;
- the neutralization of personnel and combat equipment;
- the destruction of military and military-industrial objectives;
- harassment of troops, hindering them from constructing defensive works, and also stopping work in military and military-industrial installations.

Destruction and demolition missions, as a rule, are performed by missiles with a special charge.

Neutralization and harassment of personnel and combat are the main missions when firing missiles with conventional charges.

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Depending on the nature of the target and the fire mission, missile artillery can deliver fire by missiles with conventional charges, with all batteries involved simultaneously or with a short time interval; methodical fire, in which an allotted number of missiles are launched in a given time (intervals of time between launchings of missiles must be irregular and may range from several tens of minutes to several hours); and also fire combining these types of fire.

The call for previously prepared fire, is carried out by the artillery commander in accordance with previously given orders. In calling for fire, brief, previously agreed upon commands are necessary, comprehensible both to the sender and to the receiver. An example of this may be the command transmitted by technical means of communication: "AKYORD" (the group callsign of artillery headquarters for missile artillery), "YUPIFER" (the designation of fire), "FIRE" (OOOH).

Having received such a command, the brigade commanding officer transmits it to the battalions, for which he calls the group callsign of the brigade, or when the call is for some battalions, only the callsigns of those battalions which are taking part in the delivery of fire. For example: "GASIA" (the group callsign of the brigade) or "DESWA", "SURA" (callsigns of battalions called on), "YUPIFER", "FIRE".

The assignment of fire missions of missile artillery during the course of an operation, depending on the time available, may be given verbally or by written combat order, and also by the transmittal of commands by technical means of communication.

A decision by the artillery commander on the number of battalions (batteries) taking part in carrying out the missions, and the determination of the method of delivering fire and expenditure of missiles precedes the call for fire in this instance.

When assigning fire missions during the course of an operation, the artillery commander or his headquarters indicates:

- the nature of the target, its size along the front and in depth;
- which brigades (battalions, batteries) are being called on to carry out the fire mission;
- the designation of the area of fire or target number;

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- the coordinates of the point (points) of aim or coordinates of the target (the center of the area or of the sector of fire), the height of the target and expenditure of missiles;
- the time of opening fire (the time of readiness);
- duration of delivery of fire.

Such an assignment of missions may also be given by sending a special enciphered order by technical means of communication.

Missile artillery fire is called for much more simply and quickly by brief commands worked out previously.

It is advisable to provide for the assignment of fire missions during the course of the operation according to three alternatives:

1. It is intended to deliver fire by all brigades (battalions, batteries) on one aiming point.
2. It is intended to deliver fire by brigades (battalions, batteries) on several points of aim, but at the headquarters of the brigades and battalions there are no aerial photographs, large-scale maps of the target area, or descriptions of the target.
3. It is intended to deliver fire by brigades (battalions, batteries) on several points of aim, and at the headquarters of the brigades (battalions) there are aerial photographs or large-scale maps and descriptions of the target.

Examples of commands are given below for the assignment of missions to missile artillery by the commander (by the headquarters) of artillery.

When calling for fire of brigades (battalions), the group call-sign of the artillery of the front for missile artillery and prearranged code names (call-sign) of brigades (battalions) called on to deliver fire, are given in the command. With a simultaneous assignment of fire missions to several brigades (battalions), commands relating to individual fire units are given, as a rule, after giving the general part of the command, indicated by the call-sign of the fire unit to whom this part of the command refers.

The nature of the target is indicated by the words: "CONCENTRATION OF TROOPS", "AIRFIELD", "RAILWAY JUNCTION", etc. Coordinates and

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height of target are transmitted immediately on their determination, so that the sequence of commands being given may not be continuous. When transmitting dimensions of the target the words "front" and "depth" are not given, for example: "3000 by 2000" (3000 m - front and 2000 m - depth of target).

The number of battalions (batteries) called on to deliver fire are given in the command by a number following the call-sign; for example: "DOM" - BY THREE, "VIBLA" - BY TWO. In the event of a call for fire by all battalions of the brigade (batteries in a battalion), the number of subunits called on need not be given.

The expenditure of missiles is allotted for each brigade (battalion) and also the type of missile is indicated by a special prearranged cipher.

For opening fire the command "FIRE" is given, and when it is necessary to open fire simultaneously, a preliminary command is given: "PREPARE FOR LAUNCHINGS", - and after readiness has been reported - "FIRE".

If an immediate opening of fire is not required, then the command is given: "READINESS AT SO MANY HOURS" or "READINESS AT SO MANY HOURS, FIRE ON SUCH A SIGNAL". In these instances the commander of artillery gives the commands "PREPARE FOR LAUNCHINGS" and "FIRE" in accordance with the time set.

The delivery of fire is discontinued on the command "STOP" or on the expenditure of the allotted number of missiles.

Let us examine several examples of calls for the fire of missile artillery.

Example 1. The commander of artillery of a front, having received the instruction of the commander of front troops to neutralize an enemy airfield (target No. 111) by missiles with conventional charges, has decided for this purpose to employ five battalions, concentrating their fire on one point of aim. The call-signs of the brigades are "DOM" and "NEVA". On the basis of the decision taken and the formulated fire plan, the commands are given: "DOM, "NEVA", ATTENTION: "DOM" - BY THREE, "NEVA" - BY TWO. AIRFIELD, TARGET 111, X = ... Y = ... HEIGHT 120. 3000 by 2000. EXPENDITURE: "DOM" - 9, "NEVA" - 6. "DOM" BATTERIES - METHODOICAL FIRE, EXPENDITURE - 4, READINESS 2300 10/8.

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Example 2. The commander of artillery of a front has made a decision to employ two brigades for neutralizing an enemy concentration. The task is being carried out by missiles with conventional charges with a distribution of fire on three points of aim. In the headquarters of the brigades and battalions there are no aerial photographs, large-scale maps, or descriptions of the target. The callsigns of the brigades are "VISLA" and "DNEPR". The area of concentration of fire is "LUNA".

The artillery headquarters determines the coordinates of the points of aim, their heights, the number of battalions employed on each point of aim, and the expenditure of missiles, after which the command is given: "VISLA", "DNEPR" ATTENTION! CONCENTRATION OF TROOPS. "LUNA", "VISLA" - BY TWO, X = ... Y = ... HEIGHT 240, EXPENDITURE 12. "VISLA", "DNEPR" - singly, X = ... Y = ... HEIGHT 200, EXPENDITURE: "VISLA" - 6, "DNEPR" - 6, "DNEPR" - BY TWO, X = ... Y = ... HEIGHT 190, EXPENDITURE 12. READINESS 1600 7/7.

Example 3. The commander of artillery of a front has decided to give a missile brigade the mission of neutralizing an enemy railway junction (Target No. 502) by missiles with conventional charges. At the headquarters of the brigade and battalions there are aerial photographs and descriptions of this objective, and the brigade commander can himself determine the method of carrying out the mission.

In this case the command may look approximately as follows: "DON" (the callsign of the brigade), ATTENTION! RAILWAY JUNCTION... TARGET NO. 502. NEUTRALIZE! EXPENDITURE 36, READINESS 1200 10/8, CEASE FIRE 2000 10/8.

Having received such a command, the brigade commander formulates a fire plan and gives commands to those directly carrying it out.

The most important problems of fire control of missile artillery are the adjustment of its fire and the checking of the results of firing.

The mission of adjustment of fire is the matching of the center of dispersion of missiles with the selected point of aim. The correction of the range and the direction of fire are determined by the results of the first shots, the number of which must be not less than three.

The determination of the position of the impact points of

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missiles may be effected by aircraft and radio sets checking (stantsiya radiokontrolya) trajectories (for a specific type of missile).

With these same means, checking is also carried out on the results of firing, the mission of which is the determination of how the fire mission has been carried out, whether the given degree of destruction of the target has been achieved, and what measures it is necessary to take for its fulfillment.

Fire adjustment and checking the results of firing by aircraft are carried out by visual observation and the aerial survey method.

The aerial survey method of adjusting fire and checking the results of firing consists of photographing the target area at the moment of burst of the missile (several missiles), or after the shots (all the firing).

The organization of the coordination of missile artillery with spotter aircraft (samolet-korrektirovshchik) is carried out by the commanding officers of brigades and battalions under the direction of artillery headquarters.

When adjusting fire, the working out of data and the determination of the deviation of the impact points of missiles from the aiming points is carried out by battalion headquarters. The adjustment of fire and checking the results of fire are effected according to the results of the determination of the position of the impact points of these missiles.

The commanding officer of a missile large unit (unit) must determine the most efficient ways of adjusting fire and checking the results of firing on each target, based on the conditions of the situation and the resources available.

In a number of instances, especially when destroying the most important enemy objectives, the artillery headquarters of a front (army) may organize the checking of the results of firing of the missile artillery.

It should be taken into account that sometimes a situation may arise in which it is impossible to carry out adjustment of fire.

For example, adjustment of fire by aircraft may be rendered

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impossible by a strong antiaircraft defense system. In this case, one has to limit oneself to carrying out a check of the results of firing.

When destroying several enem, objectives, it is sufficient to carry out the adjustment of fire only, not carrying out a check of the results of firing. For example, when carrying out harassing fire on an objective of medium size, it is important to determine the position of the central point of impact of the missiles, and the result of the firing will be determined by the subsequent manifestation of activity in the objective.

It is advisable to proceed from the order of firing at each objective when determining the methods of adjusting fire and checking the results of firing by aircraft.

When organizing adjustment and checking of firing, artillery headquarters must plan the operations of spotter-aircraft, and make a request to the air army for correction of fire and checking of the results of firing by reconnaissance aircraft on those objectives for which there is a lack of spotter aircraft.

At the same time, the following matters must be agreed upon with aviation:

- the time of firing by missile artillery against objectives and the time of bomber aircraft operations;
- the time of adjustment of fire and checking of firing;
- the necessary forces and means for adjustment of fire and checking the results of firing;
- the prohibited zone for flights of our aircraft in the period of firing on the objective.

When organizing the checking of the results of firing it is necessary to provide the measures for additional destruction of the objectives in case it should turn out that the missile artillery has not carried out some allotted mission.

The reasons for non-fulfilment of tasks may consist of the following:

In spite of calculations, an insufficient quantity of missiles has hit the vulnerable elements of the target, or the percentage of the destroyed target area has proved to be less than expected; the

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enemy, by destroying the combat formations of the missile artillery, disrupted the continuation of firing against the objective or completely disrupted all firing on a given objective; during the process of firing or immediately before it, it is discovered that the importance of the enemy objective from an operational or combat point of view has increased so much that it requires further destruction.

In all these instances additional firing should be organized by missile artillery both by the use of missiles from the reserve and by taking all or part of the missiles allocated for the destruction of objectives of secondary importance.

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