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CENTRAL INTELLIGENCE AGENCY
WASHINGTON 25, D. C

MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY NEWS: "Simulation in Troop Exercises", by Lieutenant-General of Engineer Troops A. Smirnov-Nesvitskiy

1. Enclosed is a verbatim translation of an article which appeared in the Soviet Ministry of Defense publication Collection of Articles of the Journal Military News (Voyennyy Vestnik). This publication is classified SECRET by the Soviets, and the issue in which this article appeared was distributed to officers from regimental commander upward.

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[redacted]

Richard Helms
Deputy Director (Plans)

Enclosure

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8 May 1962

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COUNTRY : USSR

SUBJECT : MILITARY NEWS: "Simulation in Troop Exercises", by Lieutenant-General of Engineer Troops A. Smirnov-Nesvitskiy

DATE OF INFO: January 1961

APPRAISAL OF CONTENT : Documentary

SOURCE : A reliable source (B)

Following is a verbatim translation of an article entitled "Simulation in Troop Exercises", by Lieutenant-General of Engineer Troops A. Smirnov-Nesvitskiy. This article appeared in Issue No. 34, 1961 of the Soviet military publication Collection of Articles of the Journal Military News (Voyennyy Vestnik). This publication is classified SECRET by the Soviets and is published by the USSR Ministry of Defense.

According to the Preface, Issue No. 34 was sent for typesetting on 14 December 1960 and released to the printer on 25 January 1961. The Preface states that articles express the opinions of their authors and are published as a form of discussion. Distribution of Issue No. 34 was to officers from regimental commander upward.

Simulation in Troop Exercises

by

Lieutenant-General of Engineer Troops
A. Smirnov-Nesvitskiy

In the Collection of Articles from the journal, "Military News", No. 28 of 1959, Lieutenant-Colonel K. Lantsetov, in his article "Simulation in Tactical Exercises," is right, on the whole, in suggesting that these questions should be reviewed. But the author reduces them only to the simulation of artillery fire and bomb strikes by aviation.

The problem of simulation during training has long been urgent and has not met the demands that have been placed upon it. Therefore, we should like to share our experience in conducting simulation in troop exercises in the Group of Soviet Forces in Germany (GSFG) where it is organized in a different manner. It should be noted that the method used earlier had one advantage--fundamentally it produced sound and visual effect. But does it make sense to spend so much energy and means for this? We think not. Everybody knows the picture. Before the start of the exercise a solemn silence reigns over the field. But then at the appointed time the "sapper artillery" (sapernaya artilleriya) thunders forth, producing tens and sometimes hundreds of thousands of explosions.

The cost of this type of simulation is very high. For instance, during one army exercise 80 tons of explosives and a corresponding rate of accessories for their detonation were used. Consequently, more than 600,000 rubles were spent for the simulation. Considerable expenditure was also required for the simulation of atomic bursts. The fuel expended on this purpose alone

was sufficient to run a "Pobeda" vehicle of the first category for five years. And how many such exercises take place in our army! It should be remembered that the cost of simulation involving the use of one ton of explosives is 8,130 rubles. This amount of explosives is generally expended by a division. Therefore, in addition to the other expenditure for training, simulation puts a heavy burden on our military budget. Several millions of rubles are spent on it every year and this money could be spent to greater advantage for the building of training centers and improving the whole training base (baza).

Sound and visual effects are a superficial and expensive feature of training. It not only does not justify itself economically, but neither does it satisfy the requirements of combat training of troops and their field familiarization. Therefore, we have rejected this type of simulation.

Modern requirements for troop training under conditions approximating those of battle have made it necessary to change the manner of training and have left an imprint on how simulation is conducted.

Usually the entire simulation was prepared in advance, but often the battle would develop away from the area where it had been prepared. In addition, in the interests of safety, the simulation fields were fenced in. This confined maneuvers and limited troop operations. On the whole, this type of simulation mainly assisted the breakthrough of the prepared defenses of the "enemy".

In our opinion, the simulation should now be done in accordance with the decision made by the commanding officer, i.e., in troop exercises it is necessary to create a picture of the battle which corresponds to the situation that is being created. That is why simulation must be mobile. Another

important defect is that in most cases only artillery fire and bursts of nuclear munitions are simulated, and much less often bomb strikes by aviation. This is not enough. It is time to look also at the general picture of the battle which should be produced by the simulation for the benefit of other arms of troops. On the battlefield it should be wider than a number of officers have understood it to be, and wider than has been the case in some exercises.

In our opinion, it is essential that the simulation should reflect those goals which the leader has set before the troops and should assist in the evaluation of their operations. Consequently, it should be directed toward the training of personnel of all units and subunits in their specialty and for improving that specialty during troop exercises; it should assist in the training of units and large units in coordination on the battlefield. Simulation must be mobile in the full sense of this word and must help to check the field training of troops during the exercises.

The application of these requirements to simulation, as practiced during exercises in the Group of Soviet Forces in Germany, has produced positive results. On the battlefield the troops began to make broader use of the equipment with which they were armed, to carry on reconnaissance in an improved manner, and to show initiative in accomplishing the tasks arising from the use of simulation.

What type of simulation should be used in the training of large units and units during troop exercises?

In our opinion, this may be the simulation of artillery and mortar fire, nuclear bursts, fires (pozhar), and bomb strikes; the simulation of the use of antipersonnel and antitank minefields; and the simulation of fire from tanks, guns, and other combat equipment of the enemy as well as of our troops. Such variety in the use

of simulation will permit the creation of a more complete picture of the battle and will force the troops to operate under conditions approaching those of combat.

Let us examine the use of mobile simulation in the experience of exercises in the GSFG.

The simulation of artillery and mortar fire is done with the purpose of testing the training of artillerymen for conducting reconnaissance and to see how accurately they prepare fire against planned and unplanned targets. The evaluation of artillery subunit operations is made by a combined-arms commanding officer according to the results of their firing (in the dynamics of battle the actual artillery fire is usually replaced by simulation).

In resolving the problem of who should be the organizer and ex cutor of such a simulation, we came to the conclusion that it should be the chiefs of artillery. The experience of exercises has shown that this leadership is the most fruitful. At army exercises the simulation was effected by the group (district) chief of artillery, at divisional exercises by the chief of army artillery, at regimental exercises by the chief of divisional artillery, and at battalion exercises by the chief of regimental artillery.

For simulation of artillery fire on divisional and regimental exercises, we organized one simulation group for a battalion, and at battalion exercises, one for a battery. Such a group was commanded by a fire umpire (ognevoy posrednik), an artillery officer. He has two or three enlisted men subordinate to him, who are trained to carry out this task, and one radio operator. They are issued a specially equipped vehicle with simulation shells. The group is subordinate to a troop umpire (voyskovoy posrednik) attached to the commanding officer of the artillery battalion and receives the task from him.

The number of simulation shells for the group is determined by the number of guns and mortars actually employed in the exercise. Usually one simulation shell represents 10 to 20, and sometimes even more rounds. Experience shows that 30 to 40 simulation shells are sufficient for a battalion (batalon) exercise, 100 to 120 for a regimental exercise, and 200 to 250 are sufficient for a divisional exercise.

For greater accuracy in simulation, the troop and fire umpires attached to the commanding officer of the battalion prepare uniform coded maps of the exercise area with the scale of 1:25,000 or 1:50,000. Control of the group is done by radio and the coded map.

During the exercises, the simulation group moves in combat formations of the opposing side, maintaining constant radio contact with the umpire attached to the commanding officer of the battalion, and it simulates fire in accordance with the operations of the artillery. After the bursts have been set off, the umpire attached to the commanding officer of artillery determines which targets have been destroyed and the losses suffered by the enemy, and he reports these data to the combined-arms umpire who passes it on to the leadership.

In this way, by the use of mobile means of simulation it is possible to determine the accuracy of data of artillery reconnaissance subunits, to establish the effectiveness of destruction delivered by the artillery fire, and, also, to some extent to determine the coordination of the artillery units and subunits participating in the exercises.

The use of simulation shells makes it possible to replace the expensive explosives by cheaper pyrotechnical devices.

The suggestion to employ mobile simulation, the fashioning of a shell for a motor vehicle, and the electrical circuit for detonating simulation shells were developed by Lieutenant-Colonel I. R. Rybalko.

Subsequently, these suggestions were improved upon by our efficiency experts (ratsionalizator).

Let us examine briefly what a simulation shell is. It consists of a cardboard directing cartridge case (gilza) with a wooden bottom, an expelling charge with an electric detonator, and an explosive charge with a delay element. The total weight is 1.1 to 2.2 kg (Figure 1).

The expelling charge (75 grams of black powder) is placed in a conical cartridge case made of several layers of paper painted with water resistant paint. There is an opening at the bottom of the cartridge case for the electric detonator. The explosive charge is placed inside a spherical casing also made of several layers of paper. Inside the casing is a charge of 235 grams of black powder with some aluminum powder added. The delay element is a time fuse 3 to 5 cm long. This ensures that the shell bursts at a height of 50 to 70 m.

The simulation shell is fired electrically. The sources of current are BAS-60 or BAS-80 batteries or storage batteries.

The shells are loaded, 30 at a time, onto a motor vehicle with good roadability in special cassettes made of boards 20 to 30 mm thick (Figure 2). To ensure safety from a possible detonation, the shells are packed so as to leave a nest filled with sand between them.

The electric circuit for firing the shells can be closed either by means of a switch mounted in the body of the motor vehicle (Figure 3) or by a "Broom" (Metelka) type contact (Figure 4).

Usually not more than 6 to 8 minutes are required to prepare the shells for firing.

In our opinion, the simulation of a nuclear burst should be carried out by subunits of the chemical troops in cooperation with the engineers. The main charge should consist of phosphorus flame thrower fuel (fosfornoye ognemetnoye goryuchiye?--FOG) with a suitable addition of smoke mixture. The shock wave should be simulated by a blast of an external charge (naruzhnyy zaryad) of explosives weighing 3 to 5 kg.

The use of heavy infantry flame throwers (tyazhelyy pekhotnyy ognemet--TPO) for this purpose has given good results. To simulate a blast we took three flame thrower barrels. One of them was loaded with an "S-4" smoke mixture and the other two with diesel mixture. To produce the explosion the barrels were erected vertically. The shock wave was also simulated by exploding 4 to 5 kg of explosives.

The simulation team does not require more than 10 minutes to prepare for a burst. To reload the barrels takes about 15 minutes. Barrels can be transported safely when loaded. We consider this method to be the most economical and sufficiently safe.

Simulation of a bomb strike can also be done by the use of simulation shells using a "Broom" type contact system. According to the decision of the commanding officer delivering the bomb strike, the simulation team arrives at its indicated place and sets up the shells 10 to 15 minutes before the aircraft arrive. The successive detonation of shells permits the creation of the complete effect of a bomb strike.

The simulation of antitank minefields with UTMD-B training simulation cartridges (uchebnaya tankovaya mina derevyannaya-B--wooden antitank training mine-B) gives its positive results in combat training of subunits and units. It forces them to carry out thorough engineer reconnaissance and obliges the commanding officer to make decisions in accordance with the situation that

is developing. Such simulation permits the practical solution of such problems as the evacuation of "blown up" tanks, the making and widening of lanes in "enemy" minefields, and also a number of other problems which are not being mastered in exercises because of the absence, or insufficient use, of simulation.

The use of antipersonnel minefields, employing UPMD-B (uchebnaya protivopekhotnaya mina derevyannaya-B?--wooden training antipersonnel mines-B) and UPOMZ-2 (uchebnoye protivopekhotnoye oskolochnoye minovzryvnoye zagrazhdeniye?--training antipersonnel fragmentation minefield) also gives more realism to the battlefield. These weapons make it possible to demonstrate the role of mobile obstacle detachments in modern combat and the organization of coordination when surmounting obstacles.

Also of no small importance in practical training is the role of antitank ditches and craters created during the battle by explosives. These are quickly made by engineer troops using mechanical means and explosives.

The creation of antitank ditches and craters by means of explosives in front of attacking tanks has rendered considerable assistance to the defenders. The experience of our exercises has shown that tank subunits, by stopping at the obstacles, lost up to 40 to 50 percent of their combat vehicles from "artillery fire" and from "blowing up" on simulated minefields.

The simulation of fires, tank and artillery gunfire, etc., is, as everyone knows, described in detail in the Military Camouflage Manual, Part II. Unfortunately, however, it is not used everywhere in exercises, and this is also reflected in their instructiveness.

Perhaps the question raised by us should be discussed further, and, in particular, the question of industrial production of the shells should be given

careful thought. We have reached the following conclusions based on the experience of our exercises:

--mobile simulation has fully justified itself; it requires the minimum amount of personnel and equipment, is safe and simple to carry out;

--the organization and preparation of artillery fire simulation teams must be assigned to artillery officers; the assistant leader for the exercises in simulation should be the artillery chief;

--it would be advantageous to add to the instructions on organization and conduct of combined-arms exercises the requirement of testing the skill of commanding officers and staffs of artillery units (groups) in carrying out fire and controlling it in mobile, maneuvering forms of combat;

--in exercises, the simulation not only of fire but also of other types of troop combat activity should be widely practiced; this gives more realism to the "battlefield", makes the exercises interesting and instructive, and develops initiative in all the participants; simulation should be a combined-arms matter and not the monopoly of one arm of troops;

--the time has come to exclude the use of expensive explosives for simulation and to replace them with more economical pyrotechnical means along the line of the shells suggested by us.

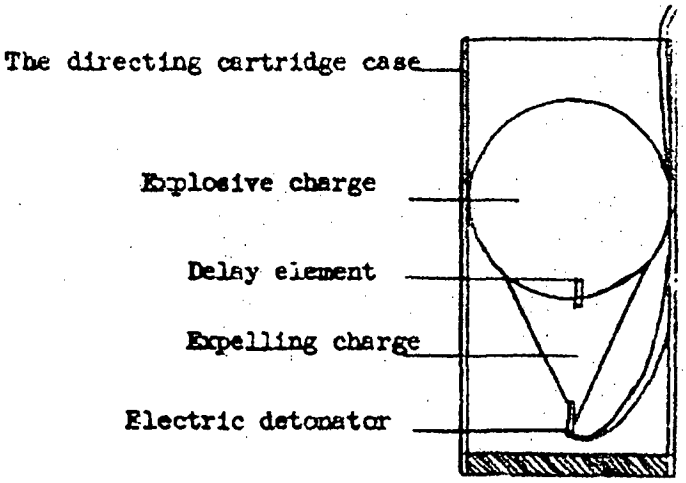

Figure 1 - Diagram of a Simulation Shell

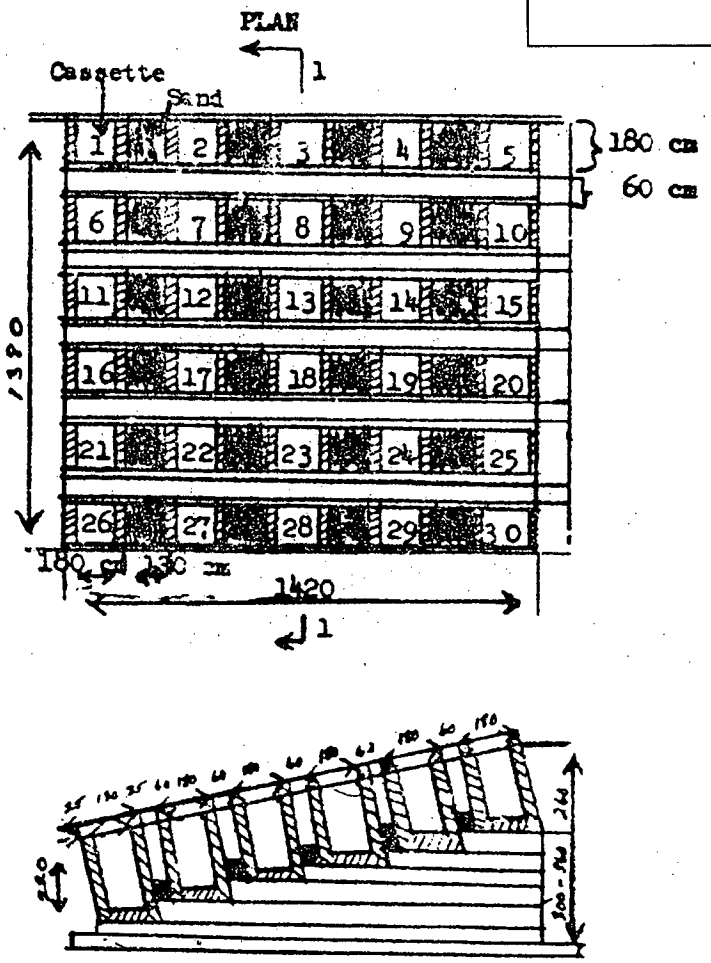

Figure 2. - Installation in a vehicle

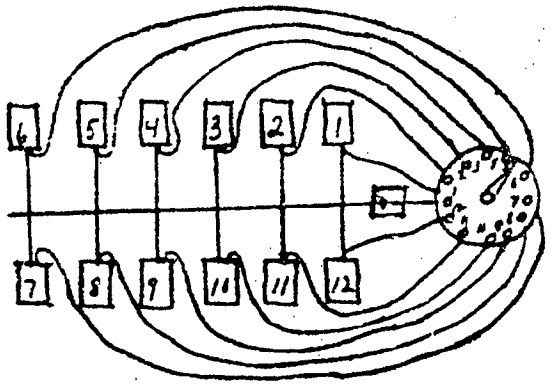

Figure 3 - Diagram of Circuit for Electrical Detonation with a Switch

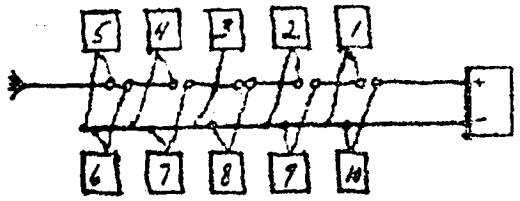

Figure 4 - Diagram of Circuit for Electrical Detonation with a "Broom" (Metelka) Type Contact