

THE PLACE AND IMPORTANCE OF THE DISCIPLINE OF "MILITARY TOPOGRAPHY" IN THE TRAINING OF OFFICER PERSONNEL FOR THE ARMED FORCES

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Xaydarov Baxodir Mamarajabovich

Lecturer, Department of Military Security and Defense, University of Tashkent

Abstract

This article highlights the role, importance and strategic value of the discipline "Military Topography" in the process of training officer personnel for the Armed Forces. Based on the analysis of modern armed conflicts, including the Russia-Ukraine war, military operations and combat operations in the Middle East, the decisive role of topographic knowledge in officer training is substantiated. At the same time, prognostic conclusions are made about the future development prospects of the discipline and its integration with innovative technologies (drones, GIS, digital map systems).

Keywords

Military topography, officer training, combat operations, navigation, geoinformation systems, coastal reconnaissance, digital map, modern warfare, drone reconnaissance.

The science of military topography is the most basic system of knowledge for a commander and staff officer in any army. This science allows an officer to analyze the geographical features of the terrain, relief, directions and strategic points, plan precise movements, offensive and defensive maneuvers. In modern wars, working with a map, obtaining landmarks on the ground, and using navigational devices determine the success of a military mission.

Military topography is the main scientific and practical foundation for a military serviceman, especially an officer, in correctly planning, managing and making management decisions in combat operations. This science studies issues such as the structure of the earth's surface, relief forms, methods of accurately determining distances and directions, working on maps, finding a way on the ground, and accurate navigation. Military topography is not limited to map reading alone, it is important in performing tasks such as analyzing the battlefield,

deploying forces and equipment, determining maneuver plans, choosing directions, and effectively controlling the movement of troops.

In modern military practice, an officer who has a deep knowledge of the topographic features of the terrain has a huge advantage in decision-making. Making the right conclusions about the slopes of the relief, valleys, hills, water obstacles, roads, infrastructure facilities directly affects the success of the combat situation. Therefore, special attention is paid to the science of topography in military educational institutions, and training aimed at strengthening the practical skills of cadets and trainees is widely used.

The main essence of the science of military topography is to teach a serviceman to correctly read, analyze real terrain conditions and use them effectively in performing combat missions. An officer who has a deep knowledge of the nature of the terrain can correctly deploy units in any situation, choose convenient defense or attack directions, and predict enemy actions in advance. This serves to ensure the covert movement of troops, proper camouflage, reconnaissance activities, and safe positioning.

Even in the era of developing digital technologies, the role of topography in military training programs cannot be underestimated. Although the possibilities of using GPS, GIS, drones and satellite images have expanded, the classic skills of working with maps in military practice remain important. Situations such as failure of electronic devices, signal jamming, and the use of radio-electronic warfare equipment require an officer to rely on traditional topographic knowledge.

The role of military topography in officer training is to provide them with the main source of geocoordinates for decision-making. Today, almost all military academies and higher military educational institutions teach this subject on the basis of a combination of theory and practice. Cadets and trainees master topics such as map scales, symbols, projections, direction angles, working with a compass, measuring the area, and creating a route. At the same time, they are taught the skills of assessing the landscape in a real area, identifying points of tactical importance, and working with operational maps.

The Russian-Ukrainian war (2022–2025) has become a vivid example of the importance of knowing the terrain, analyzing topographic data from drones, and coordinate-based artillery work. More than 80% of artillery strikes are carried out using precise coordinates. The hostilities in the Middle East and Karabakh have also shown that in-depth knowledge of the terrain is a key factor in offensive and defensive plans.

The importance of military topography is increasing in the context of the rapidly changing nature of modern armed conflicts, based on maneuver, relying on high-tech platforms and digital control systems. It should be noted that, unlike classic battlefields, today's armed conflicts are taking place in multi-layered terrain elements, artificial and natural obstacles, infrastructure networks, urban environments, and complex reliefs. In these conditions, topographic analysis has become the foundation of military decision-making.

First of all, in modern combat operations, determining the tactical significance of the territory is the main task of military topography. The relief of the battlefield - hills, lowlands, rivers, forests, transport routes and lines of communication - directly affects the movement of troops, the establishment of a defensive line and the choice of the direction of attack. For example, in the Ukrainian-Russian conflict, the details of the relief, especially control over hills and heights, have become a decisive factor in the course of the battle. In battles fought in urban environments, topographical data has been used to determine the floors of buildings, streets, tunnels and communication infrastructure, and the location of units and directions of movement have been clarified as much as possible.

Secondly, in modern military practice, it is impossible to use information obtained using drones, satellite images and GPS systems without topographic analysis. Digital cartography provides real-time changing information about the territory, but its adaptation to military use, tactical interpretation, identification of enemy hidden positions, determination of the optimal point of artillery or aviation strikes is carried out precisely through the science of topography. That is, modern technologies are only a tool, but their correct use depends on topographic knowledge and analysis.

Thirdly, in conditions of radio-electronic warfare, electronic navigation equipment malfunctions, signal distortions, and GPS reception jamming are widely observed. This requires the military to rely on classic topographic reference points, restore direction using a map and compass, and return to the skills of determining the location by relief. Especially in cases where central control centers are hit or communication is lost, unit commanders will have to make independent tactical decisions using the topographic features of the location.

Fourth, topography is an integral part of operational planning in modern armed conflicts. Determining the coordinates of artillery strikes, choosing a safe route for unmanned aerial vehicles, determining the possible directions of movement of armored vehicles, calculating potential hiding places of the enemy - all this requires a thorough study of the topographical features of the territory. For

example, in the Afghan operations conducted in mountainous areas, natural obstacles, passes and gorges in the relief had a serious impact on the movement of military units, and the success of operations largely depended on the correct analysis of the territory. The role of military topography in the analysis of modern armed conflicts is extremely large. Studying the territory, operational assessment of the terrain, predicting enemy movements, adapting information obtained through modern technologies to military analysis - all this relies on topographic knowledge and skills. Military topography is not just an auxiliary science in today's combat operations, but is a fundamental geostrategic basis for decision-making. In the future, military topography will be further integrated with GIS technologies, 3D maps, artificial intelligence analysis systems, drone reconnaissance and digital mapping. In conditions where GPS does not work, the skills of independent orientation and reading the terrain will become even more important.

The development of military topography is inextricably linked with the development of mankind in military art and encompasses a long historical process, from ancient expeditions to modern digital maps. The first military topographic maps appeared in the era of human settlement, and they mainly consisted of marking important points on the battlefield, recording information about roads and water sources. In the Middle Ages, the collection of information about military campaigns, routes of movement of troops and engineering structures laid the foundation for the formation of topography as a scientific direction.

In the 19th and 20th centuries, military topography developed rapidly as a science. As a result of the improvement of geodesy, cartography and precise measurement technologies, accurate scale maps were created, and topographic aerial photography technology appeared. During the First and Second World Wars, topographic support became one of the main factors determining the success of operations. Topographical information was crucial, especially for determining the front line, artillery positions, transport routes, and enemy positions. During this period, the special training of topographic officers, their skills in distance measurement, direction finding, rough calculations, and tactical analysis were especially valued.

By the 21st century, military topography had entered a new phase as a result of the digital revolution. Satellite navigation (GPS/GLONASS), GIS technologies, aerial photography and video from drones, and 3D modeling capabilities have accelerated the collection of topographic data and increased its accuracy. It is now possible to create topographic models of the battlefield in real time, monitor dynamic changes in the terrain, and quickly provide commanders with

information. However, threats such as radio-electronic interference, signal disruption, and cyberattacks can disable electronic equipment. In this regard, traditional topographic knowledge – working with a compass, determining the location on a map, and finding directions using relief landmarks – has not lost its relevance.

In the future, the importance of military topography will increase even more. First, automatic cartographic systems based on artificial intelligence will be able to analyze the territory themselves and provide tactical recommendations to commanders. Second, dynamic maps in 4D format (a terrain model with a time factor) will allow you to predict the combat situation. Third, space observation platforms, high-precision drones and micro-sensor networks will measure the details of the real terrain with millimeter accuracy. This will greatly facilitate the calculation of movement routes, covert approaches and dangerous zones. At the same time, modern hybrid wars, battles in urban environments, operations in mountainous areas require a more in-depth study of the science of topography. Future commanders will need to be able not only to read maps, but also to work with topographic information systems, analyze drone data, and predict enemy tactics based on terrain. For this reason, the topography teaching system in military educational institutions is also being improved in line with modern requirements.

In conclusion, the Officer remains one of the most important disciplines in the professional training of personnel. An officer who has mastered this discipline can correctly assess the combat situation, make favorable decisions, and effectively direct the movement of his subordinate unit. The ability to correctly read the terrain is an important factor in military success and becomes a reliable support for the commander in any conditions. Military topography is a strategic science inherited from the past, developing in step with the times, and determining military operations in the future. Its development increases the maneuverability of troops, accelerates the decision-making process, and creates a solid scientific basis for achieving combat success. Therefore, military topography is of paramount importance both in the training of officer personnel and in strengthening the country's defense potential. This discipline is of decisive importance in the planning and implementation of any combat mission. It forms the officer's tactical thinking, ability to make independent decisions, and accurate movement on the ground. Analysis of modern wars has once again confirmed the superiority of an officer who knows the topography well.

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