

LUDOVIKA – UNIVERSITY OF PUBLIC SERVICE

Doctoral Council

ZENTAI, Károly

The Sniper Capabilities on New Basis in the Hungarian Defence Forces

the author's resume and the official review of the PhD dissertation

Supervisors:

Colonel Csaba HORVÁTH (PhD)

Major Balázs FORGÁCS (PhD)

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Actuality and Introduction of the Research Topic

As a sports shooter I have been cultivating the „art” of the accurate shot since 1991. For the purpose of gaining professional experience, I took part in military and police sniper championships in 2004 and in 2006 as a competitor. In 2007 I was involved in the field tests of the Szép-type sniper rifle in Hódmezővásárhely. As a weapons-training instructor I created and tested ballistic calculations for different sniper weapons and ammunitions. In connection with these activities, I completed a basic police marksman course in 2010 at the Law Enforcement Training Centre of the National Police Headquarters. As a mentor, I took part in the preparation of the sniper instructors sent to Mali in 2014. I wrote my Master’s degree thesis in the same area with the title of *Sniper Capabilities in the Hungarian Defence Forces* in 2014.

As the captain of the Hungarian national team, I was present at the 50th Shooting World Championship of the International Council of Military Sports. According to my practical experience, the application of the technical innovations are more common among the civilian sports shooters since they need no protracted procedures of regularisation. It is possible to gain experiences at the precision rifle competitions and these knowledge must be injected into the system of the Hungarian Defence Forces. For instance, the „Long Range” rifle competition organised next to the garrison of Tata is such an occasion. The results of these competitions depend on the shooters’ abilities and the weapon-optics-ammunition combination used. If the Hungarian Defence Forces (HDF) does not innovate with these, it will also lose the initiative in the battlefield.

In the HDF, different types of sniper weapons have been issued from the 90’s but during the regularisations, many professional opinions and global weapon technology trends remained ignored. According to the experiences, the commanders of the infantry units did not always consider the snipers’ job as a profession.

Since the existence of warfare, along with the weapons used, the ways of their use and deployment have also developed. However, the genius of the military leaders, employing these, can only prevail within the limits of the parameters of the military equipment at their disposal. The HDF has a variety of sniper weapons, the parameters and tactical applications of which must be examined in relation to daytime and night-time optical sights, ammunition and weapon types that emerged in the wars of the 21st century, taking into account possible NATO (North Atlantic Treaty Organization), EU (European Union) and national defence operations.

Based on the above, it can be stated that it is timely to examine the applicability and performance of the available sniper weapons, optical devices and ammunition types and it is necessary to search alternatives for devices to be systematised in the near future and tactical principles to be used and to be applied in the organisation.

The Outline of the Scientific Problem

The wars of recent decades, as well as the experiences of ongoing military conflicts clearly show that the fight with kinetic forces – including small arms – has not lost its significance in the armed struggle. The emergence of small arms with ballistic and optical parameters and targeting capabilities, many times above the effective range of a fighter's individual weapon, has also generated changes in the principles of the use and organisation of subunits. These changes can also be observed in battles in urban, wooded, mountain, desert and jungle conditions. If commanders of combat subunits correctly recognised and applied the destructive, intercepting, or deterrent effect of precision rifle shots fired by sniper teams to long range, they created significant manoeuvrability for their own subunits and also prevented losses. The effective use of military snipers requires that tactical level decision-makers are aware of them.

I formulated the research problems along with the basics (theoretical background, equipment, organisation, application and training) of military sniper ability.

Problem: Until now, there has been no clear Hungarian definition of a military sniper, a sniper group and a military sniper capability.

Problem: In the HDF, the transition from post-Soviet weaponry and the emergence of Western-type weapons also caused that the parameters and capabilities of the necessary sniper weapons and equipment were not clearly defined.

Problem: It is necessary to define the methods and aspects of task planning for military snipers, taking into account the advantages and disadvantages of their use.

Problem: The HDF does not have a unified subject system established for the training of military snipers and a special/specialised course based on it.

Problem: No case study, dissertation, expert analysis or textbook has been published in Hungarian yet, which deals with the role, nature, functions, elements and application of military snipers in a coherent and focused manner. There have been several educational articles on the topic in Hungarian, but neither a comprehensive scientific work nor a work worthy of military regulations can be found on the use of military snipers.

The Research Hypotheses

During the study of the topic and my research, I faced several problems, so I formulated the following assumptions:

1. *hypothesis*: By examining the historical role of military snipers and their successful use in some countries, their nature and capabilities can be well defined.
2. *hypothesis*: By comparing the products and types of different manufacturers, the parameters that meet the tactical requirements can be determined, with the knowledge of which the decisions concerning the regularization can be successfully supported.
3. *hypothesis*: The target selection and impact analysis methods used for other weapon systems can also be used for military sniper groups.
4. *hypothesis*: By examining the military sniper courses of the Anglo-Saxon countries and processing and adapting their experiences, a model of Hungarian military sniper training can be created.
5. *hypothesis*: Nowadays, with regard to the Hungarian Armed Forces, there is a lack of a scientific-professional written material on the use of military snipers, which serves as a basis for the re-planning and organization of the military sniper capability.

The Objectives of the Research

The objectives of the research:

- defining and explaining the military sniper capability;
- determination of the parameters of the devices suitable for regularization;
- setting up a model of the Hungarian military sniper training;
- making recommendations on the selection of sniper weapons, equipment and ammunition types suitable for the application on the basis of the defined parameters;
- making recommendations on the organization and deployment of military sniper teams.

My personal goal is to form the dissertation to be a gap-filling scientific-professional source, as a contribution to the development of military sniper skills in the Hungarian Armed Forces with a theoretical background. To achieve the goals of the research, I completed the following tasks:

- at the beginning of the dissertation I reviewed and evaluated the literature on the topic;

- I analysed the employment, the organizational development and the weapon systems of military snipers with special focus on the Vietnamese battlefield;
- I examined the current role, armament, equipment and organization of military snipers;
- I examined the current role, armament, equipment and organization of snipers in the Hungarian Armed Forces;
- based on the results of empirical studies, shooting range experiments and ballistic software, I compared the accuracy and ballistic characteristics of different projectiles used by snipers;
- taking into account the parameters of the analysed equipment, I formed a picture about the combinations of weapons, sights and ammunitions that best meet today's tactical requirements.

I analysed the tactics of sniper groups, counter-sniper measures, and the military equipment used taken in consideration the experiences of military history, commanding thinking, and evolving military technology. In the course of my research, I processed the knowledge about the development of sniper weapons, with special focus on particular descriptions and ideas relating to their application. The result of my research is a comprehensive, conceptual system of suggestions, from which practical recommendations can be implemented.

The Applied Research Methodology

Regarding the research methods of a doctoral dissertation, the basic expectation is to reflect reality. I evaluate the completed research as partially applied research and as a gap-filling work. Much of the dissertation is applied research: I tried to solve the tasks related to the topic based on the already existing results, looking for utilization opportunities. The results may meet the practical need to prepare the armed forces.

In order to successfully fulfill the research goals, during the research of the topic, I used the general and specific methods together. Among the general research methods, I used observation, analysis and critical adaptation, while among the special methods, I used the systematization of my ballistics experiments done in shooting ranges.

In detail:

- content analysis of the printed literature, scientific publications, manuals, journal articles and studies concerning the topic;
- analysis of information on the Internet and other electronic databases related to the researched topic;

- systematization and scientific processing of my own professional experience;
- analysis of military organizations and combat procedures;
- comparison and analysis of the data of military equipment.

I used written sources to clarify the basic concepts and definitions, but it was unavoidable to use the Internet resources on the topic in order to present the rapidly evolving military technology.

The peculiarity of the dissertation is that I often use Anglo-Saxon and metric units alternately, as is typical of the sniper profession. Explanations for converting units of measure are given in parentheses. Based on my researches, I formulated results that can be used in practice, concluded on domestic and international experiences.

The Summary of the Research

In the first chapter of the dissertation I examined the concept of the military sniper and formulated the erroneous stereotypes that can twist the correct definition from its original meaning. In subchapter 1.2. I examined the historical presence of military snipers in typical conflicts, ending with the Vietnam War. I defined the concepts of platoon-sniper, two-men sniper team, and multi-person heavy sniper team. In subchapter 1.3. I defined the concept of sniper capability: I highlighted some of the benefits of using snipers that do not exist with other weapon systems, and grouped the targets that could be attacked by snipers. In the same subchapter, I examined and proved how the presence of snipers removes the burden of certain surveillance and insurance tasks from other friendly forces, allowing them to deal with their own tasks, thereby multiplying their effectiveness. In subchapter 1.4. I examined the place of military sniper groups in the hierarchy by comparing the organization of different subunits from the United States, Canada and Hungary. In connection with their leadership, I gave examples of commanding and leading positions in military organizations who make decisions about snipers or make suggestions for their use. In this subchapter, I also briefly analyze the current organization and equipment of the snipers of the infantry and special operations units in the HDF. In the second chapter of the dissertation, examining the accuracy requirements for military snipers, I established that with the development of various combinations of weapons, ammunitions and sights used today, their real effective range has exceeded the 1000 m distance. The tactical decision maker can consider the effective

range up to 1300-1600 m for medium-sized sniper rifles, while up to 2 km in the case of heavy versions in 12.7 mm caliber.

I described that the capabilities of precise, collective, close-range and self-defense weapons of the sniper teams can also be better utilized if the team has state-of-the-art day and night surveillance devices as well as measuring instruments. Not only will the observation as a task be more successful, but the shot itself will require less preparation in the presence of modern meteorological, rangefinding, or combined instruments. By comparing and evaluating weapons, optical devices, ammunition, and other equipment, I made it clear that a military sniper team cannot be built around one military sniper rifle and one type of ammunition.

The various weapons and devices must be available in comparison with the current task, so I declared that for establishing the military sniper capability in the HDF in the future is inevitable:

- to use designated marksmen per infantry platoon equipped with modern self-loading sniper rifle;
- to issue high power, .300 Norma Magnum, .338 Lapua Magnum or .375 SWISS-P caliber bolt action sniper rifles;
- to issue .50 BMG caliber precision sniper rifles;
- to systematize state-of-the-art measuring instruments in the sniper teams.

Examining the acquisition of sniper weapons by the armed forces of other countries and the supply of sniper weapons to other armed organizations, I have declared that the HDF needs such capabilities so that its soldiers can fight effectively in certain operations, even against an enemy equipped with similar weapons. After the acquisition of the tools presented in the chapter, the examination of their military usability and the decision-making about their regularisation is possible.

In the third chapter of the dissertation, I examined operations in which military snipers were employed. Based on the above, it can be concluded that military snipers perform their duties based on their two basic abilities:

- the ability for thorough and analytical visual and optical observation of all details;
 - the ability to fire an accurate single shot at an unexpectedly long distance for the enemy.
- These two abilities follow each other chronologically during the execution of tasks but there is also a gradation between the levels of aggression, the force applied: the process of observation may, at the discretion of the sniper or the commander connected with

them, be transferred to the use of lethal force to cease target activity. In the performance of a shot, the collateral destruction they cause to the civilian population and material property can in most cases be ruled out. There is also the possibility of obtaining real-time information and reacting immediately if a sniper team is present. Among other things, this combination allows the commander to take advantage of sniper abilities in all kind of operations. During their application, the observation and selection of targets, the appropriate timing and the use of their technical means can contribute to increasing the tactical possibilities of our own forces by demoralizing, fearing and destroying the enemy in the given area of operation and influencing the enemy's activities in our favor. An air strike or artillery fire consuming millions of forints is not necessary to render the enemy manpower and military equipment inoperable. Knowing the weaknesses of the assets, considering the risk to the executive staff, with the right weapon-ammunition combination, we can cause great damage to enemy operations with a relatively small financial investment. In my opinion, when selecting sniper rifles, ammunitions and optical devices to be standardized at the HDF in the future, it must be taken into account that accuracy, procurement costs, effective range and penetration data are in line with the area of use and expected tasks. Snipers should be organized and guided by principles that promote the effective and optimal use of this capability.

In the fourth chapter of the dissertation I formulate arguments in favor of the change of sniper weapons, optical devices and basic equipment present in the HDF. By defining technical parameters and properties, I set up theoretical models for certain types of weapons, optical devices and instruments. Among the products of international manufacturers there are a large number of types that meet the parameters I have defined. I formulated these parameters on the basis of flexible application, ballistic benefits in terms of ammunition types and interoperability within the federal (NATO) system, and applicability within the sniper team in terms of optical devices. In the case of weapons, the multicaliber technical solution could allow for longer-term usage and more gradual training. The parameters of the theoretical models of the combined surveillance and meteorological instruments are justified by the rapid production of data required for the first accurate shot and the interconnectivity of the instruments.

In the fifth chapter, I summarized the basic and sub-areas of the knowledge of military snipers, and I examined the essential material conditions of a military sniper training implemented in Hungarian conditions. It is proven by the results of British, Canadian and US military sniper courses that the course-system can provide an appropriate

framework for re-establishing the military sniper culture in Hungary as well. The most important subjects of the sniper courses I studied, which were typical from the First World War to the years 2010, have not been left out of the knowledge portfolio of military snipers to this day. The addition of additional topics and subjects was mainly caused by the expansion of technical possibilities. A military sniper, as an individual, must meet almost the same requirements as a hundred years ago. The aim, phases and subjects of the future Hungarian sniper course are determined by the requirements of the tactical role played by the designated marksman and the sniper teams. It follows from the current organization and leadership of sniper teams that their skills cannot be fully exploited. The version of the organizational structure I have outlined and recommended could allow for more flexible application and maintenance in practice, and the supervision and use of the equipment of military snipers would also be better solved.

The Confirmation of The Research Hypotheses

After examining the hypotheses related to the research objectives, I obtained the following results:

Hypothesis 1: By examining the historical role of military snipers and their successful application in some countries, their nature and capabilities can be well defined.

Conclusion: I confirmed the hypothesis. Examining the historical role of military snipers and the experience of their operational application, I determined the military sniper ability and formulated a definition for the military sniper and the military sniper teams.

Hypothesis 2: By comparing the products and types of different manufacturers, the parameters that meet the tactical requirements can be determined, with the knowledge of which the decisions concerning the systematization can be successfully supported.

Conclusion: I confirmed the hypothesis. Comparing the parameters of the analyzed devices and ammunition types, I made suggestions for sniper rifles, optical devices, and instruments that can serve as a basis for making decisions about real devices.

Hypothesis 3: Methods of target selection and impact analysis used in the case of fire support weapon systems can also be applied in the case of military sniper teams.

Conclusion: I partially confirmed the hypothesis. In my dissertation I analyzed with the CARVER matrix the applicability of a sniper team and the expected result of the rifle shots fired by them. More types of targeting and impact analysis methods need to be tested in the case of sniper weapons and teams.

Hypothesis 4: The model of the Hungarian military sniper training can be created by examining the military sniper courses of the Anglo-Saxon countries and by adapting their experiences.

Conclusion: I partially confirmed the hypothesis. I made a proposal on a possible Hungarian military sniper course, but its practical implementation is possible if the available resources and the will of the leader co-exist.

Hypothesis 5: Nowadays, with regard to the HDF, there is a lack of a scientific-professional dissertation on the use of military snipers, which can serve as a system of proposals for the redesign and organization of the military sniper capability.

Conclusion: I confirmed the hypothesis. The processing of the relevant literature, the comparison of the manufacturer's data and the dissertation written as a result of my own research can actually be considered as a gap-filling material. The focus of my research was on the complex system of sniper ability, so I reviewed all aspects of the ability.

New Scientific Results

- 1. For the first time in Hungary, I prepared a comprehensive, Hungarian-language, gap-filling professional dissertation on operational and tactical-technical knowledge related to military snipers, which can serve as a basis for strengthening the sniper profession within the Hungarian Armed Forces.**
- 2. I defined the concept of the military sniper and sniper team, and as a result of the historical study of the role of military snipers and the analysis of organizations in some countries, I defined the basic characteristics of a sniper ability.**
- 3. I systematized the equipment of the sniper teams and determined the relevant tactical and technical requirements for them. Based on my research, I proved the requirements for the regularization of weapons and organizational developments in the HDF in order to develop sniper capabilities.**
- 4. I have defined and verified through historical examples the typical tasks of the operational use of military snipers. I defined the aspects of mission-planning in case of military sniper teams and adapted the CARVER matrix as a possible method of planning.**
- 5. Adapting the experiences of the training of the military sniper teams from the Anglo-Saxon area, I made proposal for the main elements of a possible military sniper course in the HDF.**

The Possible Practical Application of the Research Findings

1. The research results can be directly reflected in the military basic and master's courses of the Faculty of Military Science and Officer Training, University of Public Service.
2. The dissertation can provide additional knowledge to the students of the tactical staff officer course for a deeper understanding of the operational application of the land force and can broaden the students' knowledge in this field.
3. The connections and knowledge revealed during my research can be applied and integrated into the system of operational preparation of the Hungarian Armed Forces.

In details:

The research can be used to gain a deeper understanding of the professional culture of a military sniper. It can help inform decisions about the acquisition of sniper rifles, ammunition, optical sights, surveillance instruments, and other equipment. The dissertation can help to understand the advantages and disadvantages of using snipers, as well as the limitations that arise from their properties as well as the parameters of their equipment. The results of the research can be used directly for the preparation of the training of military snipers, for informing staff officers about snipers, and for the training of BSc-level military cadets studying in the field of military leadership.

Possible Further Research Directions Connected to the Topic

During the processing of materials and experiences related to my research, I formulated the following possible new research directions:

1. Examining the establishment of a marksmanship school serving the needs of the units of the HDF. The research can also analyse the implementation possibilities of a shooting range serving the training of military snipers.
2. Thorough, scientifically demanding processing of the experiences of the Balkan, Iraqi, Russian-Chechen and Afghanistan wars in the use of snipers and putting the experience into practice.
3. Empirical analysis of sniper weapons, ammunition, silencers, optical mounts, optical sights and other instruments designed for systematization within a joint project with the organizations performing military technical research and development for the HDF. Taking into account the results of the tests before the regularization procedures.

4. Examination of other means used by military sniper teams to perform their duties. I list here the equipment needed for communication, camouflage, setting up firing stations, and ensuring survival.
5. To examine the use of reconnaissance and strike drones in terms of whether they can trigger functions currently performed by military snipers and the extent to which they pose a threat to sniper teams.

List of Publications by the Candidate Related to the Research Topic

Journal articles in Hungarian language:

Károly Zentai: Hangtompítók I. In: Haditechnika, 2015/4. 11-15.

Károly Zentai: Hangtompítók II. In: Haditechnika, 2015/5. 10-13.

Károly Zentai: Az információs műveleti képességek vizsgálata mesterlövészek alkalmazása során. In: Honvédségi szemle, 2016/4. 74-84.

Károly Zentai: Kézifegyverek jelenléte helyi konfliktusokban. In: Hadtudományi Szemle, 2017. X. évfolyam 3. szám. 219-226.

Zentai Károly: Speciális űrméretű precíziós fegyverek katonai és rendvédelmi alkalmazása. In: Hadtudományi Szemle, 2017. X. évfolyam 2. szám. 47-57.

Zentai Károly: Beszámoló „A mesterlövész képességek új alapokra helyezése a Magyar Honvédségben” című kutatási téma keretében választott és kidolgozásra tervezett értekezésről. In: Hadtudományi Szemle, 2017. X. évfolyam 2. szám. 58-75.

Zentai Károly: Katonai mesterlövészek alkalmazása. In: Honvédségi Szemle, 147. évfolyam. 2019/5. szám. 114-125.

Kállai Attila - Zentai Károly: Hordozható GPS vevők nem csak mesterlövészeknek: Nyúzópróbán a Garmin Foretrex 701 Ballistic Edition GPS vevőkészülék. In: Hadtudományi Szemle, 2019. XII. évf. különszám. 147-163.

Journal articles in foreign language:

Zentai Károly: Manhunters in Vietnam In: Defence Review, Volume 143. Special Issue 2015. 142-152.

Book chapters:

Zentai Károly: Lőelmélet. In: Demeter József, Isaszegi János (ed.): Honvédelmi alapismeretek, Budapest, Zrínyi Kiadó, 2019. 115-146.

Publications in conference proceedings:

Zentai Károly: Speciális űrméretű precíziós fegyverek katonai és rendvédelmi alkalmazása. In: A Hadtudomány és a XXI. század, Budapest, 2017.02.22-23.

Curriculum Vitae

- **Personal data:**

- Name: Károly ZENTAI; date of birth: 08. 16. 1977.
- Place of Service: Dean's Office, Faculty of Military Science and Officer Training, Ludovika – University of Public Service
- Position: Senior Officer

- **Education:**

- 2014- Doctoral School of Military Science, Ludovika – University of Public Service
- 2013-2014. Ludovika – University of Public Service , Military Leadership Master Degree
- 1995-1999. Lajos Kossuth Military College, Miklós Zrínyi National Defence University – Engineer officer

- **Professional experience:**

- 2012-2021. Instructor and Assistant Lecturer, Department of Joint Operations, Faculty of Military Science and Officer Training, Ludovika – University of Public Service
- 2011-2012. UN-observer mission, Western Sahara
- 2007-2011. Instructor, Infantry and Armored Department, Lajos Kossuth Faculty of Military Science, Miklós Zrínyi National Defence University
- 2001-2007. Company Commander, Cadets' Company, Miklós Zrínyi National Defence University
- 1999-2001. Instructor, Cadets' Company, Miklós Zrínyi National Defence University

- **Foreign languages:**

- English C1 (STANAG 3.3.3.3); French B1 (ARMA)

- **Scientific performance:**

- Number of publications: 11
- Conference participation:
 - The Military Science and the 21th century, Budapest, 2017.
- Erasmus participation:
 - Poland – 2014., 2015., 2016., 2017.,
 - Slovakia– 2018.