MIKLÓS ZRÍNYI UNIVERSITY OF NATIONAL DEFENCE

THE FEASIBILITY OF THE TRANSFORMATION OF THE TOPOGRAPHIC MAP SYSTEM

WITH A VIEW TO THE REQUIREMENTS OF THE HUNGARIAN DEFENCE FORCES AND HUNGARY's NATO MEMBERSHIP

THESIS

PhD Supervisor:

Dr. József Paskó, Senior Lecturer
Candidate in Military Science

Budapest
– 2004 –

SETTING THE SCIENTIFIC PROBLEM

Producing and supplying topographic maps is the number one priority in the geographic support of the Hungarian Defence Forces. The planning and execution of military operations is inconceivable without the appropriate quality topographic maps. However, there has not been considerable research done into the problem of topographic map making from the point of view of military science. This thesis is intended to explore the requirements of topographic maps and the topographic map system, taking into account the typical needs of our age and, to make a suggestion on what solutions can be found to meet them.

The transformation of the topographic map system is necessary because of three main factors:

- A significant change in the requirements of national defence and the need to meet NATO requirements;
- The 76th Act of 1996 on Surveying and Mapping Activities having taken effect.
- The radical transformation of the users' needs for spatial information and its supply as a result of the rapid development of technology and computerised information management.

National defence is undergoing considerable changes today and in the following years. Developing our defence capabilities and the responsibility to meet the requirements incident to the country's NATO membership set the Mapping Service big tasks. Producing topographic maps complying with NATO requirements is an organic part of the host nation support[1] and is an important element in creating the interoperability of the Hungarian Defence Forces. The mapping and military geographic support of the Hungarian Defence Forces fulfils the expected level of requirements but, at the same time, the mapping materials available do not satisfy the need of NATO interoperability[2]. Modernisation is also justified by the strategic revision concept regarding the whole of the national defence of the Republic of Hungary.[3]

In 1996, Hungarian Parliament accepted the 76th Act of 1996 on Surveying and Mapping Activities (hereinafter referred to as the Act), which provides for the creation of an integrated state topographic map system. The responsibilities for making and updating topographic maps were divided between the Ministry of Agriculture and the Ministry of Defence by their Joint Decree 21/1997. (12 March) FM-HM on the execution of the Act. Large scale (1:10 000) state topographic maps belong to the sphere of responsibility of the Ministry of Agriculture, whereas medium and small scale (1:25 000 - 1:250 000) state topographic maps belong to the Ministry of Defence. In order to fulfil the responsibilities statuted in the Act, the military and civilian topographic map systems have to be transformed jointly.

The rapid development in science and technology has an overall impact on all fields of life. „Built on the information networks evolving as a result of the convergence of telecommunication, computing technology and the electronic media (in one called info-communication technologies), the social order of the following century: **information society** is

---

[1] Task Force Goal (98) Point 4123.

[2] ON THE TRANSFORMATION AND CHANGING OF THE MAPPING MATERIALS OF HDF TO CONFORM NATO STANDARDS. - A proposal made for the HDF Military Council (HDF Mapping Agency, Budapest, May 2000)

[3] 2322/1999. (XII. 7.) Government Decree on the strategic revision concept regarding the whole of the national defence of the Republic of Hungary.

taking shape.[4] It is of primary importance for Hungary to react to these new challenges in the appropriate way and at the right time. In doing so, the fact that most of the information is of local reference must not be ignored. Analogue topographic maps are not always sufficient to satisfy the needs any longer. The development of modern computerised systems to handle spatial information, the so called Global Information Systems (GIS) based on data gained from digital maps has started the world over. These days and, moreover, in the future, the demand of the Hungarian Defence Forces for topographic information is going through dynamic changes. The mapping support for modern automated command and control systems require new solutions in the field of topographic information servicing. In the future, with the modernisation of military technology of the army speeding up, requirements will increase both in quality and in quantity. **The military and civilian topographic maps existing in Hungary today do not comply with the above mentioned requirements, so it has become necessary to establish a new system of topographic maps.**

The present thesis is intended to review this problem with the claim of scientific accuracy. In it, the results of previous activities have been systematised and a number of new aspects have been examined. Among these are the up-to-date interpretation of modelling the real world, the connection of topographic and military geographic information, the legal background of carrying out mapping tasks and the relationship between the topographic map system and GIS infrastructure.

The researcher's hypothesis

The research work has been led on the basis of the following work hypotheses:

1. The topographic map system in its present form and content does not satisfy the requirements of our age. These requirements cannot be met with the methods applied in the past decades, i.e. solely by the revision of the content of the existing mapping materials.

2. The new topographic map system must be suitable to fulfil complex and multifold user's needs both in the military and in the civilian sector. Within this point, the fulfilment of the overall needs of defence and the ensurance of NATO interoperability is of first priority. The products in the system are supposed to function as a basic infrastucture of spatial information, providing consistent, accurate, up-to-date and reliable data for different applications.

3. The new topographic map system must serve as a complex database and a system of maps which, beside the mapping products and services, includes the production system necessary to make them and keep them up-to-date.

4. In creating the new topographic map system, the potentials of modern technology must be taken into account to the uppermost in the respect of the systems to be supported and the products and services.

Research goals

The primary aim of my research work is to elaborate a proposal for the transformation of the topographic map system. I have set up the following supplementary targets:

---

[4] A Hungarian response to the challenges of information society in red. Zöldné Roska Marietta – The Prime Minister's Office, Budapest, 1999. p. 3.

1. The creation of an up-to-date definition of topographic maps, the exploration of the process and content of creating models with reference to the topographic map system.
2. The exploration and analysis of the reasons for the need to transform the topographic map system as well as, based on the analysis of users' requirements for topographic information, the definition and systematisation of the requirements of a modern topographic map system, with special regard to requirements of the mapping support of defence responsibilities and ensuring the mapping criteria incurred by the country's NATO membership.
3. Setting up a proposal for the transformation of the topographic map system and for the content, form and possible methods of the topographic products to be made, by making use of state-of-the-art technology.

Research methods

My research work has fundamentally consisted of the study and assessment of the literature on the subject and the analysis of my own existing experiences. Apart from examining the literature in print, I have extensively used the opportunities offered by the Internet as a new source of scientific information. It has been a great help to me to have participated in workshops, along with several prestigious civilian and military map making experts, in the development of specifications and national standards regarding the transformation of the topographic map system. My research work has been helped by the fact that, for three years from 1998, I was representing Hungary in the Interservice Geographic Working Group of the NATO Standardisation Agency. I am president of the "Mapping and Geodesy" working group of the Military Standardisation Co-ordination Committee of HDF and vice-president of the GIS Special Committee of the Hungarian Standards Institution. I have also had the opportunity to plan two pilot projects in this field and process their results.

In the research work mainly general methods have been used. The analysis of the problem was done by a comparative method. By this means it became possible to explore the contradiction between the existing system and the new requirements of topographic map making and data servicing. This method has also been suitable to help reveal the potentials for the solution of the problem by comparing the most advanced practice (NATO, US Army, United Kingdom) and the practice in Hungary. The method of synthesis has been used to include the requirements of the topographic map system into one integrated system, taking both military (MoD, NATO) and civilian (domestic, EU) viewpoints into account.

A short description of the work carried out

My thesis is divided into three chapters. In the **first chapter** I have reviewed the development of the notion of a map and that of a topographic map. I have found that the appearance and development of Global Information Systems (GIS) handling spatial information make it necessary to specify the notion of a map more precisely. Accordingly, I am making a suggestion for a new cognitive definition of a map and a topographic map. Furthermore, I have summed up the different views on mapping (cartographic and spatial data) modelling and I am making a proposal for the process of model making in the topographic map system. I have pointed out the special significance of the semantic model in assuring interoperability. In the

same chapter I have reviewed Hungary's topographic mapping programmes after World War II and the present status of topographic mapping in Hungary.

I have shown the place and role of topographic maps in the mapping support system of the Hungarian Defence Forces, with regard to modern NATO principles and the status of topographic map systems. I have come to conclusions on the need of transforming the topographic map systems (military and civilian).

In the second chapter I have analysed the place and role of topographic information in servicing information of local reference for military and civilian users. I have put the military and civilian requirements of topographic maps into a system. I have paid special attention to the requirements specified in NATO and its allies' specifications. I have examined the relevant international best practice. In this process, I have looked into the topographic map-making practices of a number of countries (United States, United Kingdom, the Netherlands and the Czech Republic). I have analysed in depth the work of various national and international standardisation boards and I have reviewed the standardisation tasks in connection with the assurance of NATO interoperability. Based on the comparison of the requirements and the situation shown in Chapter 1, I have drawn conclusions for future mapping tasks.

In the third chapter I have reviewed the steps taken so far in the matter of the transformation of the topographic map system. Special attention was paid to the exploration of the deficiencies of the preparatory work and the established criticism of previous proposals. I have studied the modern mapping technologies with special regard to remote sensing and field data collecting procedures. On the basis of the research work, I have made a proposal on the components and contents of the topographic map system and the potentials of modern technology in topographic mapping. I have approached the questions of the transformation of the topographic map system and supply of products in a complex way.

The thesis is complete with the **Amendments** containing background information, the Features and Attributes Catalogue of the Digital Topographic Database that I had prepared and my recommendations for the execution of the pilot project.

Summary of the results of the research

In my research, I have found that the production of topographic maps complying with NATO standards is an essential part of the receiving country support and is a very important element of assuring the interoperability of the Hungarian Defence Forces, whereas the existing mapping materials do not fully meet the requirements set for them. The 76th Act of 1996 on Surveying and Mapping Activities provides for the establishment of an integrated system of state topographic maps, for which the Ministry of Defence and the Ministry of Agriculture are jointly responsible. This task can only be solved by the transformation of the existing topographic map systems. The technical developments and the birth of the information society taking place in the past few years have also set a lot of new requirements for topographic data servicing. The demand for topographic information within the Hungarian Defence Forces is going through a dynamic change. The mapping support of the modern automated command and control systems requires new solutions in the field of topographic data servicing. In the future, with the acceleration of the modernisation of military technology in the Army, the requirements will be

higher both in quality and quantity. The topographic maps (military or civilian) existing today in Hungary do not satisfy the above mentioned requirements and so it has become indispensable to create a new system of topographic maps.

In my research I have **reviewed** the development of the notion of maps and topographic maps. I have **found** that the creation and development of spatial information systems (GIS) make it necessary to specify the notion of a map more precisely. I have made a proposal for a new cognitive definition of a map and a topographic map. I have **examined** the views on mapping (cartographic and spatial data) modelling and I have found that it is practicable to distinguish between four levels of model making in the field of the topographic map system. I have **shown** the special significance of a semantic model in the process of model making and the assurance of interoperability.

I have **analysed** the place and role of topographic maps in the system of mapping support of the Hungarian Defence Forces, taking into account the modern NATO principles and the condition of the Hungarian topographic map systems. As a result of the examination, I have **found** that the civilian and military topographic map systems currently existing side by side in Hungary do not form a unified system and do not comply with NATO requirements either in content or form. The existing topographic maps are out-dated in content and their value in use is low. The digital topographic products available only partially meet the modern needs of spatial information servicing. I have **demonstrated** that the problem can be solved exclusively by the total transformation of the topographic map system and the creation of a new Hungarian topographic map system that is capable of meeting the requirements of the Hungarian Defence Forces, NATO interoperability, the national economy and other civilian functions.

I have **analysed** the requirements of topographic maps and the topographic map system, the relevant laws, standards and regulations. I have **demonstrated** that the production of topographic maps and their supply has remained a decisive element of mapping support. I have **shown** that meeting the demands is only possible by establishing a database system built on up-to-date digital grounds. It will have to include the digital mapping products representing the terrain into an integrated system: vector format databases, raster format digital maps, digital surface and terrain models, digital remote sensing materials and will also have to enable the production of traditional hardcopy maps further in the future.

I have systematised all the laws that have to be taken into account in the transformation of the topographic map system. I have **found** that the existing laws do not assure the avoidance of parallel data collection of the different sectors. This is why, in the course of the transformation of the topographic map system, the legal and technical (financial) conditions of collecting data that originate from non-mapping state organisations and that is important from the point of view of topographic map making, has to be provided for here.

On analysing the standardisation environment, I have **pointed out** the significance of elaborating new product standards and the importance of taking into account the requirements that are set by the Internet (WEB-mapping, GML) and the developments in GIS (object-oriented systems).

Based on the analysis of international experience I have **proved** that the intelligence preparation of the battlefield, the terrain analysis, the visualisation of the battlefield, the simulation of operations and the modern military technological systems cannot do without the appropriate mapping background. Within that, the significance of digital mapping materials like digital relief models and remote sensing materials, vector and raster format databases has increased.

Based on international experience, I have **demonstrated** that at the revision of the content of materials, apart from orthophoto screen digitisation, stereo-photogrammetric interpretation and field surveying, the significance of data supply by non-mapping organisations, new radar location and laser remote sensing procedures and the application of satellite images is growing rapidly. **I have examined** the connection of the National Spatial Data Infrastructure and the topographic map system and pointed out how cost-effective their co-ordinated foundation can be.

In the third chapter, after analysing the work that has been done so far in order to transform the topographic map system, I have **found** that, instead of the Hungarian Topographic Programme prepared in 1997, which was treating the state topographic map system as a whole, the realisation of sub-programmes (minimum programme of transforming military maps and the up-dating programme of 1:10 000 scale EOTR maps) started only. I have **shown** that for the lack of a unified concept and co-ordination, the programmes running synchronously entail a lot of extra cost. I have **proved** how untenable it is that the planning of the products of the topographic map system was done without the wide-ranging and concrete assessment of demands.

I have **revealed** the most important drawbacks of the technical preparations already realised, with special attention to the fact that the semantic (principle) model has not been prepared; the relationship of the topographic and other data systems describing objects on the earth surface (e.g. military geographic databases, forestry maps etc.) has been ignored and the financing of the preparatory work has been insufficient. I have **put forward a proposal** for the content of the technical regulatory tasks. I have **worked out** the technical document "*The Object Tables of the Digital Topographic Database, the Definition of Features, General Instructions for Data Collection and Technology"*, which contains the definitions of the features (semantic model), their data tables, their general data collection instructions in accordance with the specifications of the DIGEST VRF vector-relation database as well as a technology recommendation for the realisation of a pilot project for the creation of Digital Topographic Database.

I have **worked out a proposal** for the differential aerial survey of the territory of the country and also suggested that modern remote sensing methods (LIDAR, IFSAR, HRSC) be used as soon as possible emphasising its significance from the point of view of defence (improving NATO co-operation capabilities). I have also made a proposal for the methods of continuous change reports (data originating from data hosts and on-going field data collection). I have **pointed out** the need to establish the legal background for the management of spatial information. I have shown that it would be useful to form Digital Cartographic Databases, like Digital Topographic Database, by applying the object-oriented database model and the GIS system, which assures multiple geometry and automated map generalisation.

I have **put forward a proposal** for the structure of the topographic map system, its components and the creation of the topographic production and servicing system. Accordingly, I have added new elements to the ones already involved in the system (Digital Topographic Database, Digital Cartographic Databases, Digital Surface Model, Digital Terrain Model, Digital Contour Lines, raster format maps, printed maps and orthophotos): a database of stereophotos, a gazetteer, a metadata database and online Internet topographic database. I have pointed out how important it is that the system to be created, apart from serving peace duties, should assure the capabilities that make it possible to fulfil current demands of the troops and staffs in conflict situations.

After analysing the procedures and instruments in modern mapping technology, I have emphasised the need for continuous change reports in the field of digital databases and I have

made a proposal for its feasibility (data originating from data hosts and on-going field data collection). I have **demonstrated** that it is advisable to create the DITAB and DIKAB databases by applying an object oriented database model and GIS system with a long-term perspective. I have **examined** the close relationship between the transformation programme of topographic maps and the National GIS Infrastructure. I have shown how important the assessment of users' demands is and made a suggestion for the making of its organisation background on a national level as well as in the defence sector.

Study results

On the basis of the research work I have completed, I consider the following to be the results of my own scientific efforts:

1.) Based on the results of technical development and model-theory considerations I have **made up a proposal** for the notion of a map and a topographic map reflecting the scientific view of our age. Analysing the modern trends of model-making by spatial information I have **demonstrated** the decisive significance of the semantic model in assuring interoperability.

2.) I have **revealed** the defence and civilian demands to be taken into account in the transformation of the topographic map system, the requirements indicated in laws, standards and specifications (Enclosures 1 and 2) along with the most advanced international experiences. I have paid special attention to the analysis of the system of requirements and experiences of NATO and allied countries, I have **shown evidence** that, from the point of view of defence, the transformation of the topographic map system cannot be separated from the

the intelligence preparation of the battlefield, the terrain analysis, military geography, the visualisation of the battlefield, the simulation of operations and the geographic support of the application of up-to-date military technology systems, whereas from a civilian point of view from the establishment of the National GIS Infrastructure. I have examined in depth the procedures used in modern mapping technology. Based on all this, I have **made a proposal** for the following:

- The requirements of the topographic map system with special regard to specifications on geometric accuracy;
- The structure of the topographic map system;
- The components of the production and servicing system;
- The content of the technical regulatory tasks to be carried out;
- The differential aerial survey of the territory of the country and the methods of real-time change detection.

3.) Taking the requirements of interoperability into account to the utmost, I have **worked out** the technical document "*The Object Tables of the Digital Topographic Database, the Definition of Features, General Instructions for Data Collection and Technology",* which contains the definition of features (semantic model), their data tables, their general data input instructions according to the description of DIGEST VRF vector relation database. The document drawn up serves as a firm basis for the data content and structure of Digital Topographic Database to enable the creation of NATO standard databases.

4.) I have **worked out** the technical document "*A description of a Pilot Project for the creation of a digital topographic database"*, which was used in the experimental work of the Ministry of Defence Mapping Company in 2002.

Recommendation for making use of the results of the research work

For the future, I reckon that the desirable direction of research is the finalisation of the contents of the Digital Topographic Database and then, based on that, the elaboration of the technical documentation and prototypes of the Digital Cartographic Databases and new topographic maps. In my opinion, in the course of research into the topographic map system and other mapping products and services, special attention has to be paid to the exploration of both the military and the civilian users' demands in the future.

My thesis in the subject serves as a good basis for the preparation of teaching aids (model-theory, standardisation, modern digital topographic and cartographic mapping technologies).

Practical applicability of the results of the research

The results of my research were already used in practice during the preparation of the thesis at the Ministry of Defence Mapping Company. The finished features and attributes catalogue and the technology recommendation that I prepared constitute a basis for the total map transformation programme to be started at the Hungarian Defence Forces in 2004 and of the creation of the digital topographic database. I am convinced that my work will be a good theoretic foundation of the further work in the transformation of the topographic map system.

Detailed List of Publications

Articles published in periodicals

1. The Hungarian Topographic Programme at the start line. Geodézia és Kartográfia 2/1999, p. 43-44. - Startvonalon az MTP. Geodézia és Kartográfia 1999/2, p. 43-44.
2. ALABÉR, László: New challenges for military mapping. Geodézia és Kartográfia 3/1999, p. 28-34. - Alabér László: Új kihívások előtt a katonai térképészet. Geodézia és Kartográfia 1999/3., p. 28-34
3. The renewal of topography and GIS infrastructure. Geodézia és Kartográfia, 11/2001, p. 26-32. - A topográfia megújulása és a térinformatikai infrastruktúra. Geodézia és kartográfia, 2001/11. p. 26-32.
4. NYÁRI, Gyula – ALABÉR, László: One step forward to the realisation of the Hungarian Topographic Programme. Térinformatika Volume 13, No. 4 (80), June 2001, p. 23-25 and Volume 13, No. 5 (81), September 2001, p. 23-25. - Nyári Gyula - Alabér László: Egy lépéssel közelebb az MTP megvalósulásához. Térinformatika XIII. évfolyam 4. (80.) szám 2001. június p. 23-25. és XIII. évfolyam 5. (81.) szám 2001. szeptember p. 23-25
5. The activities and services of MoD Mapping Co. – in Acta Agraria Kaposváriensis (2002) Vol 6 No 3, University of Kaposvár, Zoological College, Kaposvár, ISSN 1418-1789; pp. 121-137, - A HM Térképészeti Kht. tevékenysége és szolgáltatásai – in Acta Agraria Kaposváriensis (2002) Vol 6 No 3, Kaposvári Egyetem Állattudományi Kar, Kaposvár, ISSN 1418-1789; pp. 121-137

Other publications and studies

1. The Hungarian Topographic Programme and the application of relevant standards in the digital transformation of 1:10 000 scale topographic maps (FÖMI, Budapest, 1999, p. 30.) - A Magyar Topográfiai Program és a vonatkozó szabványok felhasználása az 1:10 000 méretarányú topográfiai térképek digitális átalakításában
2. ALABÉR, László – PASKÓ, Attila – Dr. BAKÓ, Zoltán: Experimental features and attributes catalogue. (MH TÉHI, Budapest, 1999, p. 137.) - Kísérleti objektum és attribútum katalógus.(MH TÉHI, Budapest, 1999.p. 137.)
3. Dr. MIHÁLY, Szabolcs - Dr. MÉLYKÚTI, Gábor – ALABÉR, László: The definition of the digital topographic database – draft standard - A digitális topográfiai adatbázis meghatározása – szabvány tervezet (HUNGIS- A Magyarországi Topográfia Forráskönyve (The source book of topography in Hungary), Budapest, 1999, p.63.)
4. Dr. MIHÁLY, Szabolcs – ALABÉR, László: Tasks of the preparation and realisation of the Hungarian Topographic Programme and questions of co-operation. - A Magyar Topográfiai Program előkészítésének és végrehajtásának feladatai, az együttműködés kérdései, Budapest, 1999
5. A DITAB pilot project, tasks of the preparation of the Hungarian Topographic Programme. - A DITAB pilot projekt, a Magyar Topográfiai Program előkészítésének feladatai – HUNGIS- A Magyarországi Topográfia Forráskönyve, (The source book of topography in Hungary) Budapest, 1999, p.12-18.)
6. ALABÉR, László – Dr. MIHÁLY, Szabolcs – IVÁN, Gyula: The Digital Topographic Database (DITAB) Database structure and data exchange format specification (draft) – A

Digitális Topográfiai Adatbázis (DITAB) Adatbázis szerkezet és adatcsere formátum szabályzat (tervezet), FÖMI-MH TÉHI, Budapest, 2000. November, 129 p.

7. Dr. SZÁNKI, László – ALABÉR, László – VÁRSZEGI, Lajos: Special instructions for the mapping and military geography support of the Hungarian Defence Forces, draft, - A Magyar Honvédség Térképészeti és Katonaföldrajzi Biztosításának Szakutasítása, tervezet, Budapest, 1998.
8. The role of mapping support in depiction of a battlefield (In Kard és toll; The role of space in modern combat, Material of a conference held on December 13rd 2000; - A térképészeti támogatás szerepe a harctér megjelenítésében (In Kard és toll; A tér szerepe a korszerű harcban, a 2000. december 13-án megtartott konferencia anyaga; HM Oktatási és Tudományszervező Főosztály; Bp., 2001; ISBN 963 7037 46 2, ISSN 1587-558X; p. 47-58.)

University notes

1. Supply of troops with thematic maps and photo documents – A csapatok ellátása tematikus térképekkel és fotódokumentumokkal - in Térképészeti biztosítás, egyetemi jegyzet in red. Dr. Paskó, József– ZMNE Budapest, 2000, p. 69-95.
2. Mapping support in NATO – Térképészeti támogatás a NATO-ban - in Térképészeti biztosítás, egyetemi jegyzet in red. Dr. Paskó, József– ZMNE Budapest, 2000, p. 123-167.

Other publications

1. MSZ K 1121:1999, Marginal information on ground, aeronautical and photo maps, made by the 2nd issue of STANAG 3676. – (Kereten kívüli információk a szárazföldi, léginavigációs és fotótérképeken, készült a STANAG 3676 2. kiadása alapján)
2. MSZ K 1121, 2nd issue (draft) Marginal information on ground, aeronautical and photo maps, made by the 2nd issue of STANAG 3676/3, MSZ K 1121, 2. kiadás (tervezet) Kereten kívüli információk a szárazföldi, léginavigációs és fotótérképeken, készült a STANAG 3676 3. kiadása alapján
3. MSZ K 1120:1999 Geodetic reference systems and projection plane co-ordinate systems, made by STANAG 2211 5th issue. - 1999 Geodéziai vonatkozási rendszerek és vetületi síkkoordináta rendszerek, készült a STANAG 2211 5. kiadása alapján
4. MSZ K 1120 2nd issue (draft) Geodetic reference systems and projection plane co-ordinate systems, made by STANAG 2211 6th issue. - 2. kiadás (tervezet) Geodéziai vonatkozási rendszerek és vetületi síkkoordináta rendszerek, készült a STANAG 2211 6. kiadása alapján
5. Technical requirements of the realisation of the Hungarian Topographic Programme. Researcher's report to subject 10 of MH 1998 year HM 4. - A Magyar Topográfiai Program megvalósításának műszaki követelményei. Kutatói jelentés az MH 1998. évi HM 4.10 témához
6. Application of modern mapping methods in the technical preparation of the creation of the digital topographic database - Korszerű térképészeti módszerek alkalmazása a digitális topográfiai adatbázis létrehozásának műszaki előkészítése során (ZMNE, kutatói szeminárium: „A korszerű térképkészítés folyamata és módszerei" tantárgyból, 1999, p.29.)

7. The SWOT analysis of the Mapping Service of the Hungarian Defence Forces - A Magyar Honvédség Térképészeti Szolgálatának SWOT-elemzése (ZMNE, katonai vezetéselmélet dolgozat, 2000, p.17.)
8. The problems of quality assurance of the digital topographic database - A digitális topográfiai adatbázis minőségbiztosításának kérdései (ZMNE, A minőségügy és az üzemfenntartás minőségbiztosítása dolgozat, 2000, p.29.)

Presentations

1. Mapping Agency of the HDF[5] (AFCENT, Brunssum, 1998. december 04.)
2. The document catalogue of the digital topographic database - A digitális topográfiai adatbázis objektumkatalógusa (Magyar Földmérési Térképészeti és Távérzékelési Társaság Topográfiai Szakosztály ülése, 1999. január 19., Budapest)
3. The Hungarian Topographic Programme - A Magyar Topográfiai Program ("GEODÉZIA '99" konferencia 1999. február 25., Göd);
4. The status of the Hungarian Topographic Programme, Tasks - A Magyar Topográfiai Program helyzete, feladatok (Az MH TÉHI vezető állományának továbbképzése, 1999. május 18.);
5. The status of the preparation of the Hungarian Topographic Programme - A Magyar Topográfiai Program előkészítésének helyzete (Magyar Földmérési Térképészeti és Távérzékelési Társaság Topográfiai Szakosztály lése 1999. június 1.)
6. The DITAB pilot project, Tasks involved in the preparation of the HTP - az MTP előkészítésének feladatai (Magyar Földmérési Térképészeti és Távérzékelési Társaság vándorgyűlése, Pécs, 1999 július 1-3.);
7. The Hungarian Topographic Programme and GIS data economy - A Magyar Topográfiai Program és a térinformatikai adatgazdálkodás (Térinformatikai konferencia, Szolnok, 1999. szeptember 22-24.);
8. Essential questions of the standardisation of the Hungarian Topographic Programme - A Magyar Topográfiai Program szabványosításának alapkérdései (Térinformatikai konferencia, Szolnok, 1999. szeptember 22-24.)[6];
9. the Hungarian Topographic Programme - A Magyar Topográfiai Program (MH térképész szolgálatfőnök továbbképzése, Lovasberény 1999. október 5.);
10. The status of the preparation of the Hungarian Topographic Programme - A Magyar Topográfiai Program előkészítésének helyzete (A Magyar Földmérők és Térképész Vállalkozások Egyesülete, Zalakaros, 1999. október 7.);
11. the Hungarian Topographic Programme - A Magyar Topográfiai Program (Hadtudományi Társaság ülése, 1999. november 16.);
12. The transformation of the topographic map system - A topográfiai térképrendszer átalakítása (Hadtudományi Társaság ülése, 2000. március 28.).
13. NATO's mapping policy and the GEOSTAR report - A NATO térképészeti politikája és a GEOSTAR jelentés (MH térképész szolgálatfőnöki továbbképzés, Erdőbénye 2000. május 16.);

[5] English language presentation

[6] Dr. Mihály Szabolcs úrral közös előadás.

14. The establishment of the DITAB national standard – A DITAB nemzeti szabványának létrehozása (Topográfiai Ankét 2000. május 30.);
15. The status of the preparation of the Hungarian Topographic Programme - A Magyar Topográfiai Program előkészítésének helyzete (X. Országos Térinformatikai Konferencia Szolnok, 2001. szeptember);
16. The role of mapping support in the depiction of a battlefield - A térképészeti támogatás szerepe a harctér megjelenítésében ("A tér szerepe a korszerű harcban" című konferencián elhangzott előadás – Budapest, 2000. december 13);
17. Szűcs Attila – Alabér László: Multimedia GIS of Central Training Area ("GIS in Military 2001", Brno, 2001. március 21-23.)
18. The renewal of topography and the GIS infrastructure - A topográfia megújulása és a térinformatikai infrastruktúra (MFTTT vándorgyűlése, Szombathely, 2001. július);
19. The contribution of military mapping to the creation of GIS infrastructure - A katonai térképészet hozzájárulása a térinformatikai infrastruktúra megteremtéséhez (XI. Országos Térinformatikai Konferencia Szolnok, 2001. szeptember 26-28.);
20. Alabér László: Modern technologies in topographic map making - Korszerű technológiák a topográfiai térképkészítésben (Magyar Földmérési Térképészeti és Távérzékelési Társaság Topográfiai Szakosztály lése, 2002. február 19.);
21. Today is tommorrow' yesterday or is the technology vision a mere illusion? - Ma van a holnap tegnapja, avagy illúzió-e a technológiai vízió? (GIS OPEN 2002 konferencia, Székesfehérvár, 2002. március 11-13.);
22. Digital databases and other mapping materials available for the GIS foundation of the "Tisza Project" - A „Tisza Projekt" térinformatikai alapjához felhasználható digitális adatbázisok és egyéb térképészeti anyagok (A nemzetközi „TISZA-projekt" első munkaértekezletén 2002 március 25-én Debrecenben megtartott előadás);
23. Mapping challenges at the turn of the millennia - Térképészeti kihívások az ezredfordulón (Magyar Térképbarátok társasága, Budapest, 2002. március 26.);
24. The activities and services of the MoD Mapping Co. - A HM Térképészeti Kht. tevékenysége és szolgáltatásai (A Kaposváron 2002. május 30-án „A térinformatika szerepe az agrárstruktúra átalakításában és a vidékfejlesztésben" címmel megrendezett konferencián elhangzott előadás);
25. The Role of the Military Mapping Organisations in the Creation of the Hungarian National Spatial Data Infrastructure (6th Global Spatial Data Infrastructure Conference, Budapest, Hungary, 16-19 September 2002.[7]);
26. The activities of the MoD Mapping Co. - A HM Térképészeti Kht. tevékenysége (A Veszprémben 2002. szeptember 30-án a megyei főjegyzők számára tartott TEIR ankéton elhangzott előadás);
27. The role of military mapping in the creation of GIS infrastructure - A katonai térképészet szerepe a térinformatikai infrastruktúra megteremtésében (Az MH térképész szolgálatfőnök továbbképzésén, Göd, 2002. október 29. elhangzott előadás);

[7] English language presentation.

28. Experiences in the DITAB programme - A DITAB-program tapasztalatai („Digitális topográfiai programok tapasztalatai” című topográfiai ankét 2003. február 25. Budapest);
29. Modern technology procedures in map making - Korszerű technológiai eljárások a térképkészítésben (Magyar Földmérési, Térképészeti és Távérzékelési Társaság Vándorgyűlése, 2003. július 11-13. Debrecen);
30. Modern remote sensing procedures - Korszerű távérzékelési eljárások (XIII. Országos Térinformatikai Konferencia 2003. szeptember 25-26. Szolnok);
31. Prajczer Tamás - Alabér László: Hungarian Map Website - Magyar Térképportál (XIII. Országos Térinformatikai Konferencia 2003. szeptember 25-26. Szolnok);
32. Prefabricated mapping products vs. products made under operational conditions, international trends and domestic potentials - Előregyártott és hadműveleti körülmények között előállított térképészeti termékek, nemzetközi trendek és hazai lehetőségek („A térképészeti és katonaföldrajzi támogatás jelene és jövője” konferencia, 2003. december 17., Budapest);
33. Questions of GIS model making and standardisation in the mirror of the topographic map transformation programme - A térinformációs modellalkotás és szabványosítás néhány kérdése a topográfiai térképátalakítási program tükrében (A Magyar Tudományos Akadémia Geodéziai Tudományos Bizottság ülése, 2004. február 26. Budapest);
34. NATO’s mapping standards - A NATO Térképészeti szabványai (Magyar Földmérési Térképészeti és Távérzékelési Társaság vándorgyűlése, Pécs, 1999 július 1-3.).

CURRICULUM VITAE

I was born on 5th February, 1957 in Tarján, Hungary.

I accomplished my secondary school studies at József Attila Grammar School, Budapest. After my final exams in 1975 I started my studies as a cadet at the Leningrad Military Mapping Commanders' College. In 1980 I was created lieutenant. I spent the first four years of my service as a CO at the Szolnok Mapping Battalion where I served in various subunit commanding posts. Between 1984 and 1987 I studied at the Mapping Faculty of the Moscow Military Engineering Academy. Following my graduation I worked at the Mapping Service Headquarters of the Hungarian Defence Forces. From 1991 on, I worked at the Tóth Ágoston Mapping Institute of the Hungarian Defence Forces and its legal successors in the fields of map compilation, scientific research and topographic map making. Since 1st January 2001 I have worked for the Ministry of Defence Mapping Company as technical advisor.

In 1996 I obtained an intermediate level certificate of the attainment of English language. I accomplished training courses in computer application and project management at the Institute for Postgraduate Training of Engineers of the Budapest University of Technology. Besides, I have taken part in training courses in preparing applications for competitions and in internal quality auditing. I have always endeavoured to acquire the latest knowledge. The positions I have filled in during the past few years (a researcher, topographic programme deputy manager, technical advisor to the managing director of the MoD Mapping Co.) have offered me favourable conditions to carry out independent research work.

I have actively participated in assuring the mapping conditions for NATO interoperability. My research work has been greatly helped by the fact that from 1998 I represented Hungary in the Interservice Geographic Working Group of the NATO Standardisation Agency for three years. I have also filled in the position of president of the "Mapping and Geodesy" working group of the Military Standardisation Co-ordination Committee of the HDF. At present, I am vice-president of the No. 818 GIS working committee of the Hungarian Standards Institution. I have taken on an important role in the preparation and implementation of the introduction of the NATO Standardisation Agreements in the field of military mapping. Commissioned by the Hungarian Standardisation Board, I was one of the people to elaborate both issues of the Hungarian National Military Standards MSZ K 1120 and MSZ K 1121 and did the specialised revision of the Hungarian National Standard MSZ 7772-2. I have prepared a number of reference materials and presentations for teaching the use of regular mapping materials of NATO. I have given lessons in the subject for the staff of the Mapping Service, the staff participating in NATO exercises as well as for soldiers and police force taking part in peacekeeping missions as part of their mapping instruction.

I am member of the Photogrammetry, Remote Sensing and GIS Sub-committee of the Geodesy Committee of the Earth Sciences Department of the Hungarian Academy of Science.

I actively participate in the activities of the Mapping and Military Geography Group of the Society of Military Science. From January 1998 I was secretary of the Topography Group of the Hungarian Geodesy, Cartography and Remote Sensing Society and since May 2003 I have been president of the above mentioned. I am member of the Hungarian Society of Map-lovers.

I participated in the organisation of the topographic conferences "The finishing of the revision of the 1:10 000 scale EOTR topographic map (second cycle)", held in November 1999, „The preparation of the Hungarian Topographic Programme", held on May 30th 2000 and "Experiences obtained in digital topographic programmes", held on February 25th 2003. I took

part in the creation of the publication “The Source Book of Topography in Hungary” (published by HUNGIS – foundation for Hungarian GIS).

I have gained a lot of experience in the 30 conferences and 19 other specialised events where I have taken part during my research work. Furthermore, I have had the opportunity to work in the planning of two pilot projects in the subject and in processing their results. Since autumn 1998 I have given 34 presentations at professional conferences, training courses and other events, three of them in English. I have published 22 further publications.

My direct professional aim now is to obtain a PhD degree. I also intend to improve my knowledge of English.

In the long run my aim is to continue my research work in connection with the transformation of the topographic map system and putting the results into practice. I am taking steps to pass my knowledge to young colleagues working in research or production.

My accessibility: e-mail 1: alaber.laszlo@mhtehi.gov.hu
e-mail 2: alaber@vnet.hu
phone 1: (+36) 1-336-2031
mobile phone: (+36) 20-555-1752

Made on 30 of Mart 2004

Lt Col László Alabér (Eng.)