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## **Mega map of Dubrovnik-Neretva County – largest map in the world**

### **Introduction**

Map had always presented specific record for one time period. The State Geodetic Administration (SGA) from Zagreb, Croatia is a state administrative organization in charge of administrative and expert works from the field of geodesy, mapping, cadastre and photogrammetry. On the occasion of the Seventh General Assembly of the top officials of national in charge of mapping, cadastre and land registers in Dubrovnik, SGA, as responsible institution for producing and maintaining the spatial data, made and publish large-scale printed topographic map for Dubrovnik-Neretva County. With this mega map SGA applied for, and finally broke, a Guinness world record in the “Largest Printed Maps” category. The map was put up on the city wall near the Pile entrance to the old city of Dubrovnik, Croatia in the period between 3 October 2007 and 3 December 2007, at the initiative of the SGA. The map, or as the journalists called it the “mega map” has awakened great interest from the general public, tourists and tourists professionals because of its dimensions 11 x 6 meters and scope of display that clearly and realistically showed all topographic objects that are also visible on the topographic maps of average scale.

Farther article will describe production of Topographic maps in the scale 1:25 000 (TM25), which were used for producing large map. Secondly will be explained how the map was created, and finally procedure for insertion this epochal work in Guinness world record.

### **Topographic map scale 1: 25 000 (TM25) production**

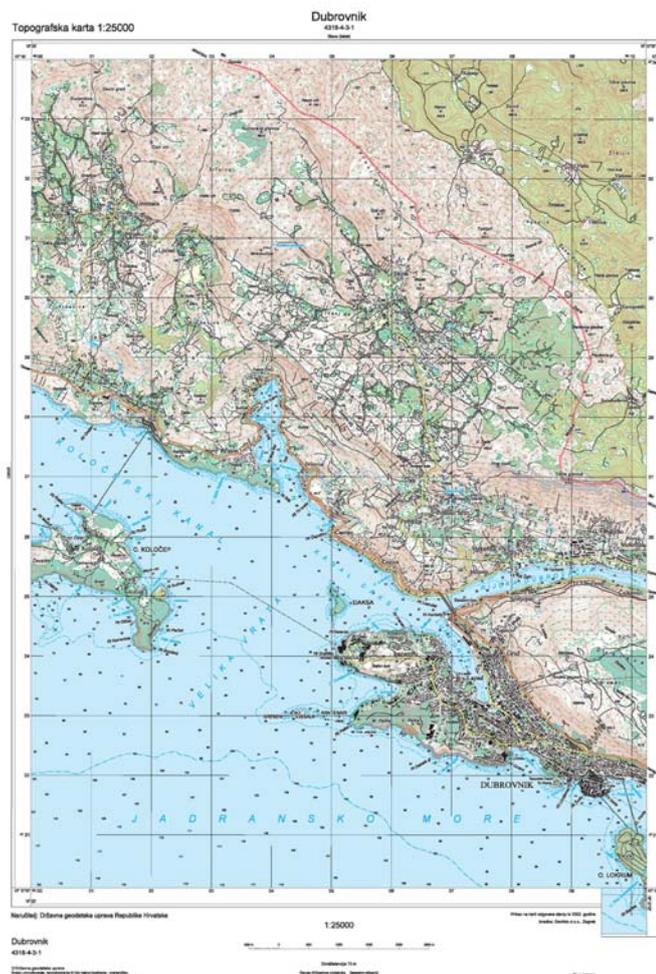
Mapping and map production of topographic map in scale 1:25000 (and smaller) were in the former federal state reserved for the federal military administration. The Military Geographical Institute from Belgrade produced topographic map in scale 1:25000 (TM25) in two editions, first from 1947-1967, and second from 1968-1986. As the map was considered as a military secret, Croatian republic administration and companies could only order printed sheets with reduced contents (so called “civilian” maps).

After the collapse of federal state, only these printed maps were available, because all the printing originals (films) were kept in Belgrade. To fill the requirements of the military operation in

1991 and 1992, a lot of map sheets were copied, scanned and printed, but the results were poor in quality. Much better results were gained by the Ministry of Defence in 1992, when all map sheets (in scale 1:25000 and 1: 200 000) were scanned, some minor changes were made; the raster files were divided in CMYK pallet of colours and printed in offset procedure.

SGA started a production of TM25 from existing maps by dividing the scanned maps (civil edition) in colours used by original print. These prints were better than the ones made by Ministry of defence, but there was no updating of topographic contents, only some minor lexical changes.

In the same time from 1994 to 1996, some studies were started by SGA setting new foundation for the topographic-cartographic system in Croatia – the Study and the General Design of the Official Topographic-Cartographic Information System (STOKIS) and the Study of the Replacement of the reproduction originals and updating of the contents of the topographic maps. Soon after these studies, the first contract for mapping and production of topographic map in scale 1: 25000 in region Istria was signed with three Croatian surveying companies. Although Croatian companies had no experience in topographic mapping in scale 1:25 000, through the work on this first job they established working procedures, cartographic key (version 1.3.), internal control system and managed to solve most of the mapping process problems. In the same time, SGA started a project by the name Croatian Topographic Information System (CROTIS). The work on this project goes along parallel and combined with the mapping process, so that the mapping process (accuracy, data model ...) is compatible with CROTIS. CROTIS data model has been approved by SGA in year 2000 (State Geodetic Administration of Croatia, 2003), and became the base for establishing fundamental topographic database. The fundamental topographic database is the base for producing topographic maps different scales (1:25000, 1:50000, 1:100000, 1:250000) with methods for modelling spatial data and cartographic generalization. Spatial topographic data which are stored in topographic database are planimetry and photogrametric mapping highly data, are result of TM25 map production (State Geodetic Administration of Croatia, 2000). TM25 consists of 594 map sheets covering the whole territory of Republic of Croatia. One map sheet covers an area of 7.5 by 7.5 geographic minutes and it is presenting with picture (see the Picture number 1). SGA is planning finished all TM25 maps by the end of 2009.



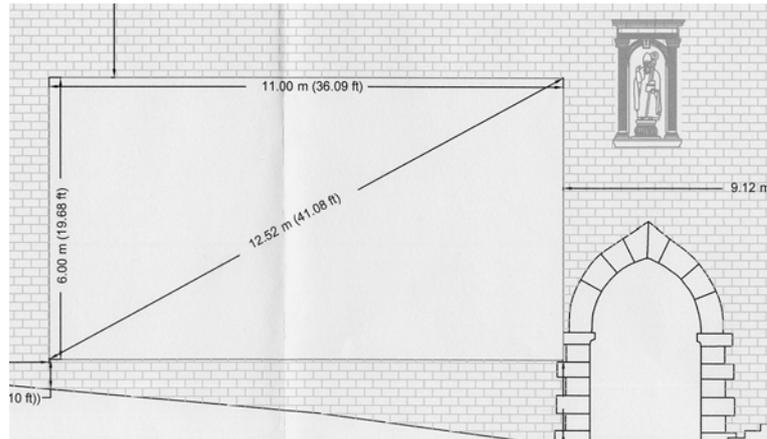
**Picture number 1: Topographic map in the scale 1:25000 (TM25)**

## **Mega map production**

Mega map or we called map wall is group of topographic maps which are covering one or more territorial unit or county, and are connected into one unique entirety presented in hugely scale.

On the occasion of the Seventh General Assembly of the top officials of national in charge of mapping, cadastre and land registers in Dubrovnik, SGA made and published large-scale printed topographic map for Dubrovnik-Neretva County. The map was put up on the city wall near the Pile entrance to the old city of Dubrovnik, in the period between 3 October 2007 and 3 December 2007.

The topographic review of Dubrovnik County was made from 40 TM25 maps, described before, connected into large-scale map size 11 x 6 meters (see the Picture number 2).



**Picture number 2: Large topographic map for Dubrovnik–Neretva County**

Because of good layout the review of topographic maps was enlarged from scale of 1: 25 000 to scale 1:15 500. The production is made with ESRI ArcGIS software, and except of topographic maps other data from different SGA registers was used for producing mega map. After loading raster files of TM25 maps and other cartographic processing the review from computer monitor was necessary translated into form suitable for printing. The whole map wall has been divided into eight PDF files, so each file composed area of 1.375 x 6 meters.

Printing on awning and joining (glue) the parts of large map was committed two companies, which are specialist for these jobs. For printing was used the Hewlett Packard DesignJet 10000 SF large resolution Printer which has 2.54 meters withdraw. Print was implemented on waterproof 560 grams heavy awning and preparation of PDF files for printing or raster image processing (RIP) was made with Onix Photoshop. The map wall had weighted 35 kilograms.



**Picture number 3: The large topographic map installation**

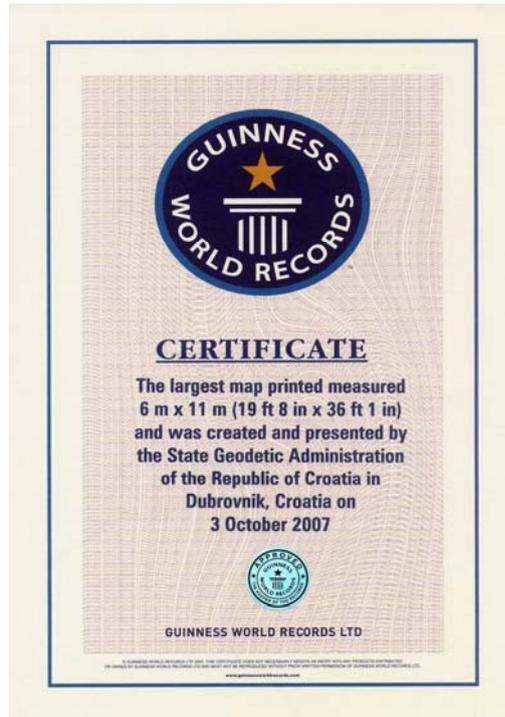


**Picture number 4: The large topographic map installation**

The large map, printed on awning, allocated on the walls near the Pile entrance to the old city of Dubrovnik, daily could see thousand domestic or foreign tourists as well as Dubrovnik-Neretva County inhabitants. Banner awning is waterproof and could totally protect colours and the contents more than two years, since the guarantee also existing for that long.

### **Successful Guinness world record breaking attempt**

Because of the size of mega map, SGA has started the procedure for attempt of knocking down the Guinness world record in the “Largest Printed Maps” category. After few months of expectation, on the fifth of June year 2008 on the SGA address arrived the official letter with congratulations and confirmation: **the mega map for Dubrovnik-Neretva County created and presented by State Geodetic Administration of the Republic of Croatia in Dubrovnik is the largest map printed. With this product SGA break a world record** (see the Picture number 5).



**Picture number 5: Guinness world records certificate**

Before SGA large map, the current largest map printed record was created by Stiefel Eurocart (Germany) in Lenting, Germany, in December 2006 and measured 4,35 x 3,09 meters (14 ft 3 in x 10 ft 1 in).

The authors of this project are gentlemen Željko Bačić, Ivan Landek, Igor Vilus and Pero Ljubić.

## **Conclusion**

With finishing the big project of making the new topographic map in scale 1: 25 000 (TM25) for whole country, and with producing the large map for Dubrovnik-Neretva County, SGA presented only the one of possibilities, which we have with homogenized spatial data.

Map wall in Dubrovnik became famous and the certificate of Guinness world record contributed to the promotion cartographic profession (branch).

The activities of making map wall are continuing, so after Dubrovnik the large maps was created for Krapina-Zagorje County and soon the same activities are planning for all other counties in Croatia.

Official cartographic reviews, spatial database and upgraded spatial data are the foundation for starting all economical activities, and they are the base for project of establishing National spatial data infrastructure (NSDI) in Republic of Croatia.

The largest printed maps or map wall in Dubrovnik is the first in series of mega maps, which will be made for each of counties in Croatia, and also the crown for project of making TM25 maps, started up before twenty year.

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## **Abstract**

Map had always presented specific record for one time period. On the occasion of the Seventh General Assembly of the top officials of national in charge of mapping, cadastre and land registers in Dubrovnik, State Geodetic Administration (SGA), as responsible institution for producing and maintaining the spatial data, made and publish large-scale printed map for Dubrovnik-Neretva County. With this mega map SGA applied for, and finally broke, a Guinness world record in the “Largest Printed Maps” category. The map was put up on the city wall near the Pile entrance to the old city of Dubrovnik, Croatia in the period between 3 October 2007 and 3 December 2007, and became tourist attraction.

The article will also describe how the map was created, which data were used for producing large map and also procedure for insertion this epochal work in Guinness world record.

**Keywords:** map wall, large map, Guinness, topographic map in the scale 1:25 000.

## **Sadržaj**

Karta od davnina predstavlja svojevrsni zapis jednog vremena. Za vrijeme održavanja sedme generalne skupštine EuroGeographicsa, kao odgovorna institucija za izradu i održavanje prostornih podataka Državna geodetska uprava je izradila i postavila veliku kartu Dubrovačko-neretvanske županije. Ta karta je prijavom u Guinnessovu knjigu rekorda postala i službeno „Najveća otisnuta karta na svijetu“. Karta je bila postavljena na ulazu u staru jezgru grada Dubrovnika u periodu od 03.10. do 03.12.2007. godine i postala svojevrsna turistička atrakcija.

Članak će između ostalog opisati kako je karta nastala, koji su podaci korišteni za izradu iste te proceduru koju smo morali proći za uvrštenje ovog epohalnog dijela u Guinnessovu knjigu rekorda.

**Ključne riječi:** kartoizid, mega karta, Guinness, topografska karta mjerila 1:25 000.