THE CREATION OF THE OFFICIAL MAP OF THE ENLARGED EUROPEAN UNION

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In the summer of 1992, the Office for Official Publications of the European Communities issued an invitation to tender for the production and printing of a publication entitled "Map(s) of the European Community"

This paper will detail the development of this project to accommodate the need to generate a new digital cartographic database which would allow for the inclusion of the candidate countries of Austria, Finland, Sweden and Norway and be suitable for the creation of a range of derived products.

Apart from the purely cartographic tasks, the paper will also describe some of the sensitivities involved in the production of a political map acceptable to existing member countries and the candidates for membership.

1 Introduction

In July 1992, the Office for Official Publications of the European Communities issued an invitation to tender No 1237 for a Publication entitled "Map(s) of the European Community". The invitation to tender was responded to by over 100 companies throughout the European Community as the Union was then named. The tender indicated that the new map should be produced by the use of digital technology but did not set down any hard and fast rules in any technical specification. The call for tender was, however, very specific for the printing and finishing elements of the contract.

In June 1993, Lovell Johns were informed that they had been awarded the five year contract and preliminary discussions began on the precise details for the technical specification.

2 Technical Specification

The technical specification for the production of the 1:4 000 000 map was drawn up by Professor Jean-Paul Donnay of the University of Liège on behalf of the Head of Publications Division of Directorate General X of the European Commission, who were commissioning the project.

It was implicit in the contract that the new map would have to be generated in such a way that subsequent thematic and other derived smaller scale mapping could be produced from the same database.

2.1 The Compilation

The compilation of the map had to be produced by digital methods and the use of any existing datasets (e.g. Digital Chart of the World) had to be indicated and any copyrights acknowledged. Lovell Johns' own digital database of Europe contained the majority of data that would be required for the project. Since this database, in common with the Lovell Johns World Database, was built and maintained in ARC INFO, it was a simple task to re-project the data to the required projection.

2.2 The Projection

For this project the selected projection was Postel's Azimuthal Equidistant applied in oblique aspect to a sphere (R=6371 km). The point of zero distortion was fixed to a projection centre Latitude 53° 00' 00" N, Longitude 10° 30' 00" E.

2.3 Geographical Limits

The geographical limits of the map were specified by physical locations at the extremities of the required coverage. In addition, the Latitude and Longitude and xy coordinates expressed in kilometres were defined for the corners of the rectangle containing the map at that scale and projection.

2.4 Overseas Territories

The overseas territories of the member countries had also to be shown in an inset panel on the map. Wherever possible these locations were to be shown at the same scale as the main map (1:4 000 000). In practice the only exception to this rule proved to be Guyane which was inset at a scale of 1:10 000 000.

2.5 Scale

The previous map of the European Community had been drafted at a scale of 1:4 000 000 and although the geographic area of the enlarged Community was about to be extended dramatically, it was felt that the same scale should be preserved. The physical size of the map at 1:4 000 000 is 107.4cm x 114cm allowing for inset and title panels. The option of reducing the scale of the map to 1:5 000 000 was considered but to show an enlarged Community at a smaller scale was not considered appropriate and the smaller scale was not capable of supporting the level of detail required.

2.6 Borders

The boundaries specified to be shown on the map were as follows:
E.C. external border
National borders
Administrative division borders where they exist:
Levels 1&2 in the E.C. and candidate countries
(Regions and sub Regions)
Level 1 in non member countries

Since there had to be a common representation of all member and applicant countries there were a number of problems to resolve. The administrative tiers vary considerably from one country to another. The United Kingdom for example, does not have Regions in the same sense as, say, France and Germany. The Bezirks of Austria are small and numerous yet all have to be shown and named, though in this case in an inset panel.

2.7 Text

The levels of text on the map are limited to National, Regional and sub Regional capitals in the official toponomy and or regional languages. Varying point sizes were to be used to differentiate according to the administrative levels. The hydrographic network and other water bodies were also to be named.

2.8 Languages

The map had to be printed in a separate language version for each member and candidate country. Though most of the information on the base map was maintained in the official toponomy of each country, descriptive names such as Atlantic Ocean and Mediterranean Sea had to be translated.

The title, legend, statistical and other inset panels similarly had to be produced in all languages. Though there were a total of sixteen countries involved common languages meant that 12 language versions had to be produced:

English	French	Spanish	German	Portuguese	Italian
Greek	Dutch	Danish	Finnish	Swedish	Norwegian

In addition to the use of roman and Greek alphabets, the base map included Arabic and Cyrillic scripts for those areas outside of the Community but appearing on the map.

3 The Database

As mentioned previously, Lovell Johns started from a position of having an existing cartographic

database. The levels of detail maintained in this database exceeded that of the proposed map and the various layers required were therefore extracted accordingly. The relevant layers of data were then cartographically reprojected in ARC INFO into the specified Postel's projection. Similarly, the NUTS data which had been supplied in an ARC export format was similarly reprojected.

Within the existing countries of the European Community the administrative boundaries were available in a digital format in the SOEC NUTS (Nomenclature des Unites Territoriales Statistiques) dataset. This dataset was imported in an ARC Export format and was verified against other sources and additional information collated for border information outside of the Community. The NUTS data was then reprojected and merged with the Lovell Johns database.

An editorial overlay was produced to bring the boundary information up to date from the best sources available and to provide a source from which all additional information could be accurately digitised.

Since PC ARC INFO does not have a particularly good graphics interface, the raw data was transferred down the network into Intergraph Microstation for the accurate position of text. Microstation has the advantage that it is possible to simulate on screen the approximate size and space that a font will take up when output as a graphic image.

4 Design Specification

With the opportunity to view the cartographic content fully for the first time serious thought could now given to design. From the clients viewpoint the main criteria was that it should be a beautiful map with a harmony of colour denoting the political and administrative infrastructure of the existing and proposed member countries.

4.1 Political Colouring

What is normally one of the easiest problems to solve, became the most problematical. In the previous version of the map, the political colouring had achieved a common acceptance among the member states. With the prospect of four new countries joining, a complete rethink was needed.

As part of the equality of the European Union (which the Community became during the production of the map) no one country should visually dominate by the strength of colour. Although the smaller countries such as Luxembourg have to be shown in a strong colour in order to stand out, countries such as France and Germany must be shown in an equal weight of colour.

Similarly, the new members must not stand out but appear straight away as an integral part of the Union. At that time with three Scandinavian countries as candidates, their political colouring must not appear as a "bloc".

The use of combinations of process colours did not prove acceptable and it became clear that we would have to print in a combination of process and pantone colours. A number of colour tests were run and approval ultimately gained.

Though at this stage the final colours were being chosen for publishing a new map after each country's referendum and subsequent ratification, in the first map to be produced, the candidate countries were to be shown in a common colour.

4.2 Inset Panels

The design of the inset panels was complicated by the fact that the format dictated that each panel would have to be portrait and governed by the fold of the map. On earlier versions of the map the statistical comparisons were drawn landscape and positioned on the face of the map covering up large parts of eastern Europe and the former Soviet Union. It was now felt politically correct not to obliterate these countries in view of the new political climate that exists.

It became a part of the design brief that there were to be no inset panels on the face of the map. This however had to be ignored in the case of the panel listing of the 99 Bezirks of Austria which had to be placed as close to that country as possible and practical.

The design of the title panel and overseas territories panel were similarly governed by the folding format and like the statistical panel were produced entirely on an Apple Macintosh using the Freehand graphics software. These files were subsequently output to film on a Linotron image setter.

5 Graphic Output

Once all the design specifications for the map had been agreed, it was time to apply these to the database and produce the first colour proof. Lovell Johns methodology is to import the data from the database into the Apple Macintosh and output to film on a Linotron Image setter.

5.1 Mapscript

"Mapscript" is Lovell Johns' own developed software which transforms data from either Unix or MS DOS environment and imports it into an Adobe Illustrator format which can be opened up on an Apple Macintosh.

The Mapscript software assigns all the line styles and text fonts to the data and, still in the PC environment, processes this automatically filling polygons and transferring the data down the network arriving on the Macintosh fully styled. More importantly the data is still in it's vector format layered as it was in the database.

This process enables the use of the Apple Macintosh as a final edit station and at this stage it is still possible to change colour and fonts, correct any typographic clashes and have a very clear idea of the final appearance of the map.

Once in the Apple Macintosh environment it is a simple process to output to any Postscript printer for a colour proof or to go to Lithographic films. Since the map was intended to be printed in a combination of process colour and pantone colours, the nearest four colour process equivalent was displayed on screen to simulate the final result.

5.2 Printing Films

The printing films for the inset panels and the map were planned up and combined together to create the final printing films. Separate plates were generated to accommodate the language variations which would be introduced during the lithographic printing.

6 Printing

The printing of the first 1:4 000 000 map was planned for the summer of 1994. Due to the pressure of the forthcoming Austrian referendum it was decided to produce a 1:10 000 000 simplified version in time for distribution before the referendum. This temporarily put the production of the main map on hold. For this smaller version it was decided to produce only a four colour process version but still in the twelve languages of the member and candidate countries.

The printing of the 1:10 000 000 map took place in May 1994 when 603,000 copies across the twelve language versions were delivered to Luxembourg. In June of 1994 the 1:4 000 000 map was printed in a total of twelve printing colours. 13,000 copies were printed as a stop gap until the decisions of the referendum of the candidate countries was known and a major print run undertaken.

An omen for the future came when at the last minute with printing plates already made, Norway decided ahead of the referendum that which ever way they voted, Spitzbergen would not be joining and had to be deleted from the map.

7 Postscript

This paper set out to chart the progress of the map of the enlarged European Community. During it's evolvement, the Community became the European Union and the candidate countries had their referenda.

Since the map was designed to show the new Europe it is worth looking at how the map finally ended up. The design of the map had been agreed and all that remained was to see which way the countries would vote.

Austria voted first followed by Finland and then Sweden. All voted to join. The Norway vote was always going to be close. Since Norway held their referendum at the end of November and ratification was due on the 1st of January 1995 it did not give a lot of time to have maps printed and ready for ratification.

To cover this eventuality, two sets of films were produced one showing Norway in, one showing Norway out. As soon as the results of the referendum were announced, printing commenced on the current version of the map.

The print runs were increased considerably from the map showing the candidate countries, 1,900,000 copies of the 1:10 000 000 were printed and 60,000 of the 1:4 000 000.

In the time between printing the map showing the candidate countries and the map of the enlarged European Union, Lionel Koechlin a design consultant was appointed to redefine the political colours of the map and thereby reduce the number of printing colours. By using warm red instead of magenta and process blue instead of cyan a more suitable nuance of colour balance has been achieved and the printing colours reduced to eight. In the period between January and April 1995, over 2,000,000 copies of the 1:10 000 000 map have been reprinted and the 1:4 000 000 is currently being revised.

The database sitting behind the new map of the European Union was always designed for the creation of a derived series of maps and currently in production or planning stages are versions of the 1:4 000 000 map showing the Information Relays of the European Union and separate maps of Agriculture and Forestry.