NEWSLETTER

INSTITUT CARTOGRÀFIC DE CATALUNYA

YEAR 4 ■ DECEMBER 1999 ■ NUMBER 10

19th International Cartographic Conference of the ICA
PARTICIPATION OF THE ICC

In August 1999, the 19th International Cartographic Conference and the 11th General Assembly of the International Cartographic Association (ICA) were held in Ottawa (Canada).

Among other Spanish and international organizations present, the ICC played an active part in this conference. It presented the paper *Automatic generalization for the Mapa topogràfic de Catalunya 1:10 000* (topographic map), which aroused considerable interest, and in addition to this, it received an award for the *Atles Universal* (presented in the ICC Newsletter No. 9), acclaimed as the best atlas to have been produced world-wide during the period 1998-99.

It is of note that the members of the ICA have now awarded prizes to cartographic products of the ICC at the last four consecutive meetings.

Furthermore, J. Miranda, Director of the ICC, was presented with the certificate confirming him as an Honorary Fellow of the International Cartographic Association, in recognition of his notable contribution to the field of cartography. This award was made by the Executive Committee of the ICA.

Below is a summary of the paper presented, which describes the automatic generalization of the new topographic series of the ICC.

AUTOMATIC GENERALIZATION FOR THE *MAPA TOPOGRÀFIC DE CATALUNYA 1:10 000*

In 1999 the ICC began production of the series *Mapa topogràfic de Catalunya 1:10 000* (topographic map - MTC 10M), which will cover all of Catalonia with a total of 1 070 sheets.

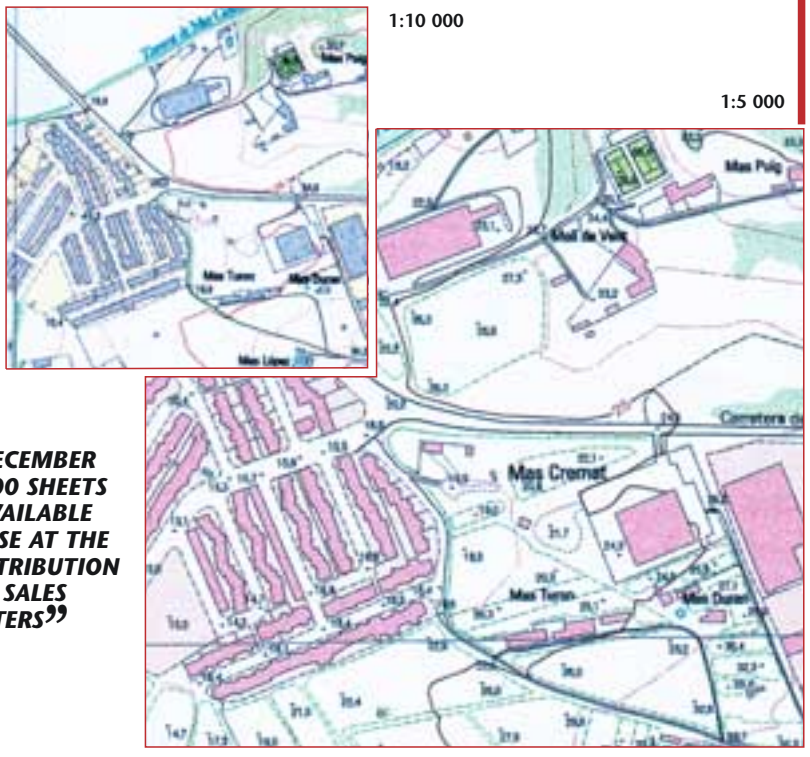
"THE SERIES IS DISTRIBUTED IN PAPER FORM"

The MTC 10M is obtained from the generalization of the Topographic database of Catalonia 1:5 000 by means of automatic and manual processes (see ICC Newsletter No. 9).

In outline, automatic processes are employed to merge four sheets of the MTC 5M into one single MTC 10M sheet, to remove the information that does not have to be included, to select the toponymy and adapt it to the typography established, to scale the symbols and the texts, to create the marginal information (coordinates, administrative boundaries, geodesic information), to add the adjacent polygons between sheets and simplify them, to reconstruction of the topography, to symbolization and to plotting process (the process of automatic symbolization is applied during the plotting process). Since this is a smaller scale, there is less detail, and therefore it is necessary to apply cartographic generalization.

Manual interactive editing is employed for aesthetic purposes and to improve legibility, and it is necessary for the correct symbolization of the elements represented on the map: selective elimination of some elements (for example, spot heights), breakdown of polygons to a lines or points, simplification and grouping of elements, etc.

The use of automatic generalization tools enables the MTC 10M to be obtained from the Topographic database of Catalonia 1:5 000 with a considerable increase in efficiency when compared with manual generalization. This means that the MTC 10M can be immediately produced from the Topographic base 1:5 000.



"IN DECEMBER 1999 100 SHEETS ARE AVAILABLE PURCHASE AT THE ICC'S DISTRIBUTION AND SALES CENTERS"

SUMMARY

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Generalitat de Catalunya
Institut Cartogràfic de Catalunya

CARTOTOPOGRAPHY FOR PUBLIC INSTITUTIONS IN CATALONIA

The ICC produces base cartography at large scales with the aim of meeting the demand of various public and private institutions in Catalonia. Among the public institutions, mention should be made, due to the high number of projects commissioned, the Departament de Política Territorial i Obres Públiques (regional planning and public works) and offices of the Generalitat de Catalunya (autonomous government), and the regional councils, city councils and the Catalan metropolitan areas.

***"THE CARTOTOPOGRAPHIC PROJECTS UNDERTAKEN BY THE ICC ARE LISTED AT:** http://www.icc.es/mapserver/"*

A type of cartography and a scale are established according to the purpose of each project:

– Road network cartography (1:500-1:2 000), employed for road, canal and railway route projects.

– Urban cartography (1:500-1:2 000), for town planning (town planning maps, inventories of urban furniture, introduction of new land uses).

– Cartography for specific projects. The scale varies according to the type and the specifications of each project (marking out work relating to hydraulic infrastructure and irrigation systems, route of the railway network, drawing up land consolidation projects, conversion of dry farming land to irrigation land).

– Architectural photogrammetry projects (1:50-1:200), for outstanding façades or buildings of cultural/historical/artistic interest (walls, façades of castles, of churchs, etc.).

The production of the cartotopography includes the completion of photogrammetric flights in color or in black and white; topographic suport, scanning of the photograms and digital or analog aerial triangulation of the flights; photogrammetric stereoplotting, field checking and publication and formatting of the maps.

The resultant maps are not printed, but copies on paper in five colors, original output on unbendable polyester material and digital information are provided.

Technical specifications of large scale 3D cartography

The essentially local territorial range of large scale cartography projects and the varying circumstances and rhythms of development of the institutions that promote and use cartography in Catalonia are factors that have led to the creation of a great number of cartographic documents of similar content, but these documents are technically very different and sometimes incompatible. This is particularly true in the case of digital cartography that is necessary for the development of information systems with a spatial component.

The ICC and the Diputació de Barcelona (regional council), in a bid to standardize the technical criteria applied to this cartography and to publicize these, in order that they may serve as a reference for other institutions, have jointly drawn up the "List of technical specifications for the production of 3D cartography at 1:1 000 and 1:2 000 scales", which seeks to establish standards for the production of maps and the creation of digital cartographic databases by applying homogenous criteria with respect to content, accuracy, structuring of data and quality. Moreover, production methods based on the technology available at the end of the 1990's are described, without the exclusion of alternative techniques that enable the specified coherence and quality to be obtained.

This list of specifications, the first of a more extensive set, will be complemented and updated with further contributions from both institutions and from other organizations that are committed to promoting cartography in Catalonia.

RESEARCH AND

RTK VIA DAB

In July 1999 the ICC completed the first tests of transmission of GPS differential phase corrections by means of DAB technology (Digital Audio Broadcast).

The differential phase corrections enable the user to be positioned with a relative precision of 2-10 cm, once certain parameters known as cycle ambiguities have been resolved. The user with a GPS receiver that can measure phase observations and a DAB receiver with the capacity to receive data will be able to obtain precision positioning in real time, RTK mode (Real Time Kinematic).

The DAB system is the new digital audio broadcasting system designed to complement the present AM and FM systems. This system offers improved use of the radio spectrum and increased performance with respect to the power transmitted, adding the possibility of error correction in the transmission, both for audio and data.

The system can transmit data using residual capacity of the PAD audio programs (Program Associated Data) or assigning a capacity of its own to transmit data in NPAD mode (Non Program Associated Data).

This application is being developed at the ICC in collaboration with the Centre de Telecomunicacions, and the data is transferred in the NPAD service by means of the TDC (Transparent Data Channel), developed, under requirement of the ICC, by Robert Bosch Multimedia.

The service will start the experimental stage in December 1999, with initial coverage of the metropolitan area of Barcelona.

OFFICIAL NOMENCLATURE OF CATALONIA

The Parlament de Catalunya (parliament), in its Resolution 563/V of 1998, approved the preparation of official nomenclature, whereby the official names of the basic toponymy of Catalonia are to be collated and established.

The aim is that in all official and private cartography, and in all reference works, the names of the toponyms should coincide with those of the Official nomenclature of Catalonia.

The latter will comprise approximately 35 000 toponyms (an average of 30-40 toponyms per municipality) referring to names of *comarcas* (administrative divisions in Catalonia), municipalities and their capitals, population nuclei, isolated buildings of note, orography, hydrography, the basic road network, main paths, protected areas, tourism-related toponymy and urban toponymy (districts of Barcelona).

A committee has been established to undertake this project, formed by members of the departments of the Generalitat de Catalunya with responsibilities relating to the subject matter concerned (regional planning and public works, interior, culture and economy and finance), and by members of the Institut Cartogràfic de Catalunya, the Institut d'Estudis Catalans (catalan studies), the Associació Catalana de Municipis i Comarques (catalan association of administrative divisions), the Federació Catalana de Municipis (catalan federation of municipalities) and the Consorci per a la Normalització Lingüística (consortium for linguistic standardization).

The ICC is providing the base cartography and the toponymic database created and constantly updated by field work.

It is anticipated that the project will be completed by June 2000.

DEVELOPMENT

ROAD NAVIGATION SYSTEM

The ICC, the Departament de la Presidència (presidency) (both of which are dependent on the Generalitat de Catalunya) and the Fundación Airtel Móvil have signed a collaborative agreement for the development of a prototype Road navigation system.

This is an integrated system that enables the user to obtain the optimum itinerary between a starting point and a destination within Catalonia. The system has a GPS receiver prepared for RASANT (the network for broadcasting corrected GPS signals that the ICC put into operation in 1997, which provides positioning precision of 5 meters in real time), information about points of interest across Catalonia and cartography on CD-ROM.

The first stage in the project consists of a pilot test covering the city of Barcelona, for which the urban cartography at 1:2 000 scale that already exists at the ICC has been transferred to GDF format and the software package needed for generation of the routes and calculation of the distances has been developed. Once this stage has been completed, the definitive project will be commenced, which will cover the entire area of Catalonia.

The cartographic information is drawn from the digital databases of the ICC. Navigation through built-up areas is based on cartography at 1:1 000-1:5 000, scales at which the streets can be viewed in detail, while for the rest of Catalonia the scale for navigation will be 1:50 000, preference being given to road information.

This georeferenced system is a first step towards providing the citizens of Catalonia with a latest-generation tool that will make it easier to drive in Catalonia.

NEW

ENVIRONMENTAL ATLAS OF THE MEDITERRANEAN

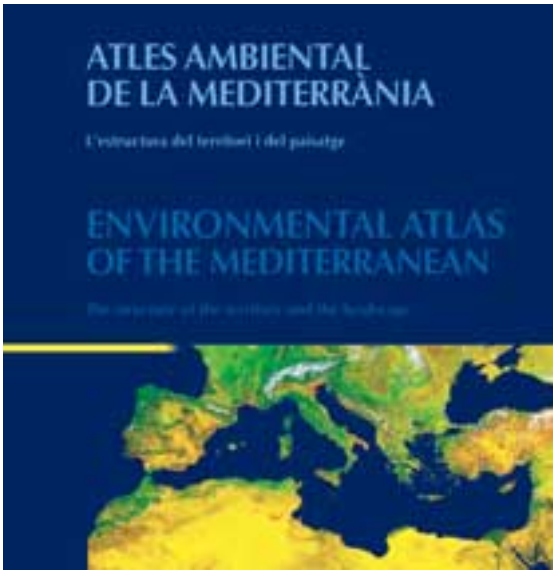
The ICC, in collaboration with the Institut Català de la Mediterrània d'Estudis i Cooperació (mediterranean studies and cooperation) and Estudi Ramon Folch SL, has recently published the *Environmental atlas of the Mediterranean*, a project commissioned by the Agencia Española de Cooperación Internacional (spanish international cooperation) and the continuation of the study entitled *The Mediterranean environmental landscape. The ecolandscape structure of the western Mediterranean*, published in 1997.

The purpose of this atlas is to define the characteristics of the entire Mediterranean, both eastern and western, and to explore the environmental bases of the socioeconomic functioning of the Mediterranean area with the focus on its ecolandscape structure, working on the hypothesis that the socioecological landscape reflects the history of human activity and the potential of the area itself.

"A STUDY THAT DESCRIBES THE STRUCTURE OF THE MEDITERRANEAN LANDSCAPE WITH THE HELP OF SATELLITE IMAGES"

In this attempt at a global analysis of the Mediterranean, the participating organizations have harnessed their respective talents to produce a single product that, by dint of an interdisciplinary approach, combines knowledge traditionally within the domains of cartography, remote sensing, ecology, urban development and sociology.

The atlas consists of a map obtained by a mosaic of NOAA-AVHRR images at 1:5 000 000 scale, surrounded by additional information relating to climatic, ecological and sociological aspects, and a note, illustrated with remote sensing images, that explains the various characteristic features of the Mediterranean landscape. It is published in Catalan, Spanish, English and French.



Environmental Atlas of the Mediterranean

Institut Cartogràfic de Catalunya, Institut Català de la Mediterrània d'Estudis i Cooperació and Estudi Ramon Folch SL
1st edition: Barcelona, November 1999
30 x 29 cm. 220 pages. 6 950 PTA including IVA (41,77 euros)

BRIEF NOTES

PRESENTATION OF THE NEW SEISMIC NETWORK OF CATALONIA

On 17 June 1999, the new seismic network of Catalonia, which will transmit in real time (see ICC Newsletter No. 8), was duly presented in the assembly hall of the ICC. The presentation was presided over by the Minister of Regional Planning and Public Works, Mr. Pere Macias i Arau.

At this event an introduction to seismicity and seismic risk in Catalonia was given, the criteria for the renovation of the seismic equipment currently in operation were explained and the project was presented together with a demonstration of how the system works.

FINAL COURSE ON HISTORY OF CARTOGRAPHY

The final course in the series of lectures on the history of cartography (see ICC Newsletter No. 5) has been programmed for 21-25 February 2000. This series, organized by the ICC and the Department of Geography of the Universitat Autònoma de Barcelona (autonomous university), is composed of eleven courses and was begun in 1990.

The course will focus on the approaches and challenges of the global history of cartography, and it will be given by prestigious world specialists in the subject.

The lectures will take place at the headquarters of the ICC. For further information, please contact:

Institut Cartogràfic de Catalunya
Cartoteca de Catalunya
Tel. 93 425 29 00
E-mail: mgalera@icc.es

We look forward to seeing you there!

IV GEOMATIC WEEK

The IV Geomatic Week will be held on 3-6 April 2000 to Sitges (Barcelona), organized by the Institut Cartogràfic de Catalunya (ICC), the Institut de Geomàtica (IG), the Escola Universitària Politècnica de Barcelona (EUPB) and the Col·legi Oficial d'Enginyers Tècnics en Topografia (COETT), Catalonia division. This event will be a meeting-point for technicians, scientists and students in the field of geomatics and navigation.

In the course of the Geomatic Week, the ICC will present the "Jordi Viñas i Folch" award to a piece of research work on cartography and navigation in the field of geomatics, and the COETT will present the "Luis Martín Morejón" award to an end-of-course project of technical topographical enginneering.

For further information about the IV Geomatic Week and the award competitions, please contact:

Institut de Geomàtica
Tel. 93 425 29 00
E-mail: info4sg@icc.es

We look forward to seeing you there!

STRUCTURE OF THE ICC FLIGHTS

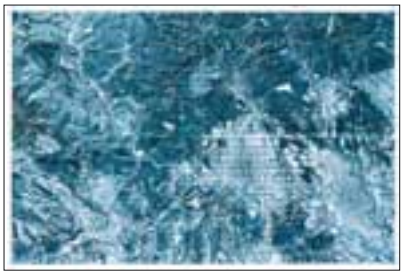
The ICC carries out various types of flights (photogrammetric, using oblique photography, multispectral sensors, etc.), in order to cover its own cartographic needs and to satisfy the needs of external clients and other institutions within the Generalitat de Catalunya.

Type of flight	Scale	Example of projects	Aeroplane
Global coverage of Catalonia			
Flights at high altitude	1:60 000	Catalonia, color and infrared color	Cessna Citation I
Flights at medium altitude	1:32 000 1:15 000	Catalonia, b/w and color Catalonia, b/w	Cessna Citation I Partenavia P-68
Specific territorial coverage			
Planning flights	1:8 000-1:5 000	Flights for the DGOTU, b/w Flights for other Generalitat institutions	Partenavia P-68
Flights for road network cartography	1:5 000	Flights for the DGC, b/w Flights for GISA, b/w	Partenavia P-68
Flights for urban areas and for municipal cartography and urban cartography	1:20 000 1:10 000 1:5 000 1:5 000-1:3 500	Barcelona, color Terrassa, color Villages and towns in Girona, color Flights for municipal cartography, b/w and color	Partenavia P-68
Flights outside Catalonia	1:60 000 1:60 000 1:40 000 1:7 500	Asturias, color Republic of Venezuela, b/w Aragonese Pyrenees, b/w and color Rivers of Castilla, color	Cessna Citation I Partenavia P-68
Non-photographic flights (CASI)		Flights with multispectral sensor	Cessna Citation I Partenavia P-68

The undertaking of a flight involves the following stages:

- Flight project. Technical specifications, authorization of the flight (CSG-CECAF), pre-planning of flight and economic evaluation.
- Design of the flight plan. Design of the flight with CCNS-4 and on a cartographic base, and control cartography.
- Completion of the flight. Daily consultation with Meteo, flight report and post-flight plotter with CCNS-4. The flight is made with the Cessna Citation I or the Partenavia P-68, according to the characteristics of the project. In general terms, the equipment that these aeroplanes can carry is: Wild RC-30 camera or double camera; Zeiss RMK Top 15 camera; CASI sensor or CASI and RC-30; onboard GPS and PC, and CCNS-4 assisted navigation.
- Having completed the flight, the films are developed or the GPS data is extracted and filed. Film development includes checking the roll developed, ordering the negatives and filling in the flight control report: coverage and overlaps, checking the photogram centers, definition of the gaps between each run, image quality and geometry of the flight.
- Before handing over the information collected during the flight, the prints are developed and ordered, the flight chart is drawn and the GPS data is ordered.

In the last few years a considerable number of photogrammetric flights have been completed for the provincial, regional and local councils, among others. These are flights over urban, municipal and built-up areas for the purpose of producing large scale topographic cartography.



Flight plan design on a cartographic base

Final flight index

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