

VIII. "Turnkey" systems

Photogrammetric and cartographic production lines

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Orthoimage in color of Barcelona.

Photogrammetric production lines

The first step in the photogrammetric production line consists in data acquisition. The data can be acquired with airborne sensors fitted in photogrammetric airplanes or with images taken from Earth observation satellites.

At present, the ICC has the following image acquisition sensors:

- Photogrammetric cameras (optical sensors: analog and digital).
- Compact Airborne Spectrographic Imager CASI (a multispectral sensor). It captures the visible spectrum and near infrared.
- LIDAR (laser sensor). A high precision laser altimeter.

Furthermore, projects have been carried out with other types of sensors, such as airborne radar, and digital photogrammetric cameras are currently being developed with our own technology.

The capture of information with these sensors is carried out in a synchronized way with GPS receivers and inertial systems.

The information received from these optical sensors (photogrammetric cameras) has to be developed and then scanned. These steps can be omitted if digital information is available.

The orientation of the sensors makes use of the ICC's own software, combining different types of observations: photogrammetric, terrestrial support (terrestrial GPS data), kinematic aerial support (airborne GPS data), attitude data provided by the inertial system and all the information necessary to guarantee the consistency of the results.

The orientated images can be used as the basis for two processes:

- Generating digital terrain models through the use of automatic correlation programs (for the subsequent creation of orthoimages).
- Photogrammetric stereoplottting and editing through digital workstations. Photogrammetric stereoplottting leads either to the generation of topographic databases (from which topographic maps at different scales are extracted) or to the DTM obtained from elements drawn photogrammetric stereoplottting, such as profiles, spot heights, slope break lines or contour lines.

In the case of flights with the CASI sensor, the flight produces digital spectral information which can be orthorectified, once it has been orientated and the digital terrain model of the zone has been applied.

Once the information from the laser altimeter has been orientated and after a specific process, it can be used to generate both the digital surface and the terrain models with an error of around 15 centimeters in the Z coordinate.

Upon completion of these processes, it is necessary to "form the map" through the generation of the cover sheet and the incorporation, as a minimum, of the place names.

Cartographic production line

Initially, it is necessary to define the document that it is wished to prepare (topographic, thematic or derived map), the scale, the information to be included and the area to be represented. It is also necessary to know the output format (digital or hard copy).

Applying the cartographic and toponymic standards of both the ICC and international institutions, the design of the document is finalized. The information is classified and prioritized with the aim of offering the maximum quantity of easily interpretable data.

Cartography is formed from primary data from various sensors and data obtained through subsequent processes (rectification, photogrammetric stereoplotting, edition, etc.), enriched with vertical aerial photography, existing topographic and thematic maps and orthoimages. These tasks are documented with field work, alphanumeric bases (statistics, listings, etc.), a range of bibliography and data from official organizations (diverse thematic information).

Once the document is finished, it is necessary to carry out the preparatory tasks for the output format, be this in paper or digital format. In the case of digital format, the information can be enriched with additional multimedia information and visualization tools.

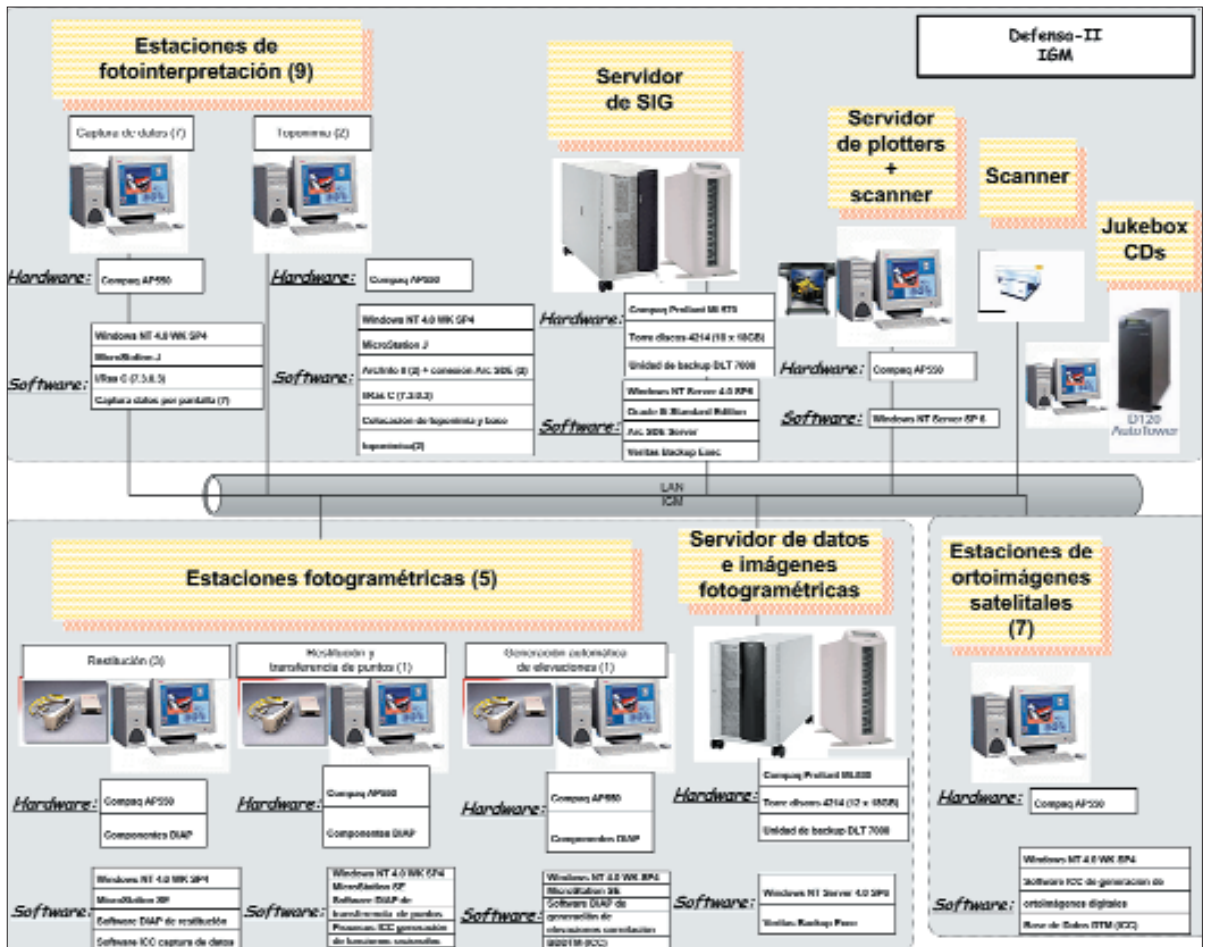


Diagram of the hardware installation for the topographic cartography project at 1:100 000 for the Argentinian Republic.