

Observation of Second Order National Geodetic Network with GPS

C. MARTINS, H. RIBEIRO¹

Summary

The Geodetic Portuguese Network has about 9 000 Geodetic Pillars, grouped in 3 different orders. The first order Network has about 120 Pillars, with distances between 30-60 km. These pillars were build and observed for the first time in the XIX century (see fig. 1). The average distance between the geodesics of the second order network is 15 km. The third order is much denser with a pillar each 10 km square.

The IPCC started to observe the National Network to have good geocentric co-ordinates, to make a complete adjustment of the network (first, second and third order). Between 1997 and 1998 the IPCC observed all the first order network with GPS. The second order started to be observed in 1998, by the end of 2001 we have about 40% of the 2nd Order Network observed. For the third order we will try to use the classical observations with some GPS observations, because it would be practically impossible, for us, to observe all the third order with GPS (about 7 000 pillars).

This poster pretends to give an idea how these observations are being developed.

1. Observation of the 2nd Order

The observation of the 2nd Order began in 1998, we had a few observations in 1999 for financial reasons it was stopped during the year 2000. Restarted in 2001, the total of 40% of the Portugal mainland. In the total, 386 geodesic pillars were observed.

The processing is to be accomplished with the program GeoGenius. The main purpose is to obtain precise geocentric co-ordinates, but it will also be good for the revision of our National Data.

1.1- Criterion

- 2nd order: begin 1998
- Static observation of 2 hours; 15 seconds; 10 degrees cut off angle
- Groups with 4 receivers in simultaneous
- 2 Geodetic Pillar of 1st Order; 2 Geodetic Pillar of 2nd Order

End of 2001: 40% observed



Fig. 1 - Geodetic Pillar of 2nd Order

1.2- 2nd Geocentric Order

The criteria for the selection of the 2nd Geocentric Order were:

- Close to big Towns
- Good accesses
- Uniform distribution

Concentrated close to the border and in the marine coast

2. Processing Results

- Processed Baselines	992
- Activated Baselines	922
- Not Used Baselines	70
- Fixed Baselines	922
- Maximum Value Planimetric	4,8 mm
- Maximum Value Altimetric	8,5 mm

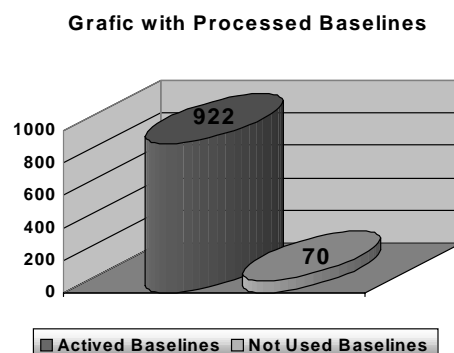


Fig.2 - Number of Processed Baseline

¹ Carla Martins, Helena Ribeiro, Departamento de Geodesia, Instituto Geográfico Português, R. Artilharia Um 107, Lisboa, Portugal, cmartins@igeo.pt / hribeiro@igeo.pt

GRAFIC WITH PROCESSING SOLUTIONS

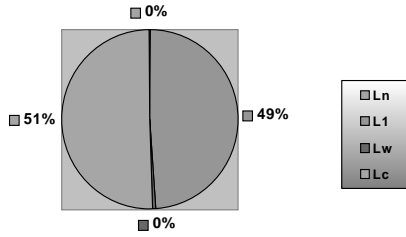


Fig.3 - Fixed Solutions of Process

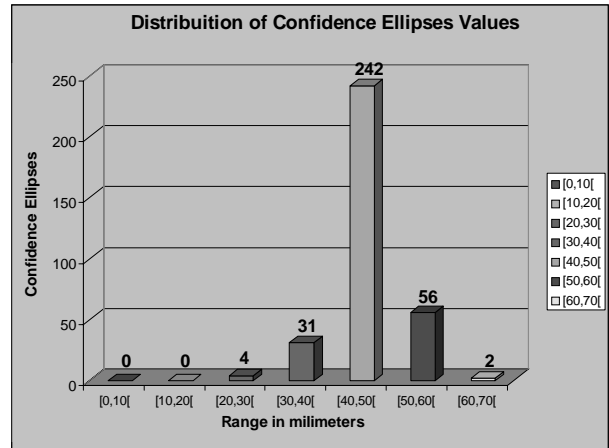


Fig.5 - Values of Confidence

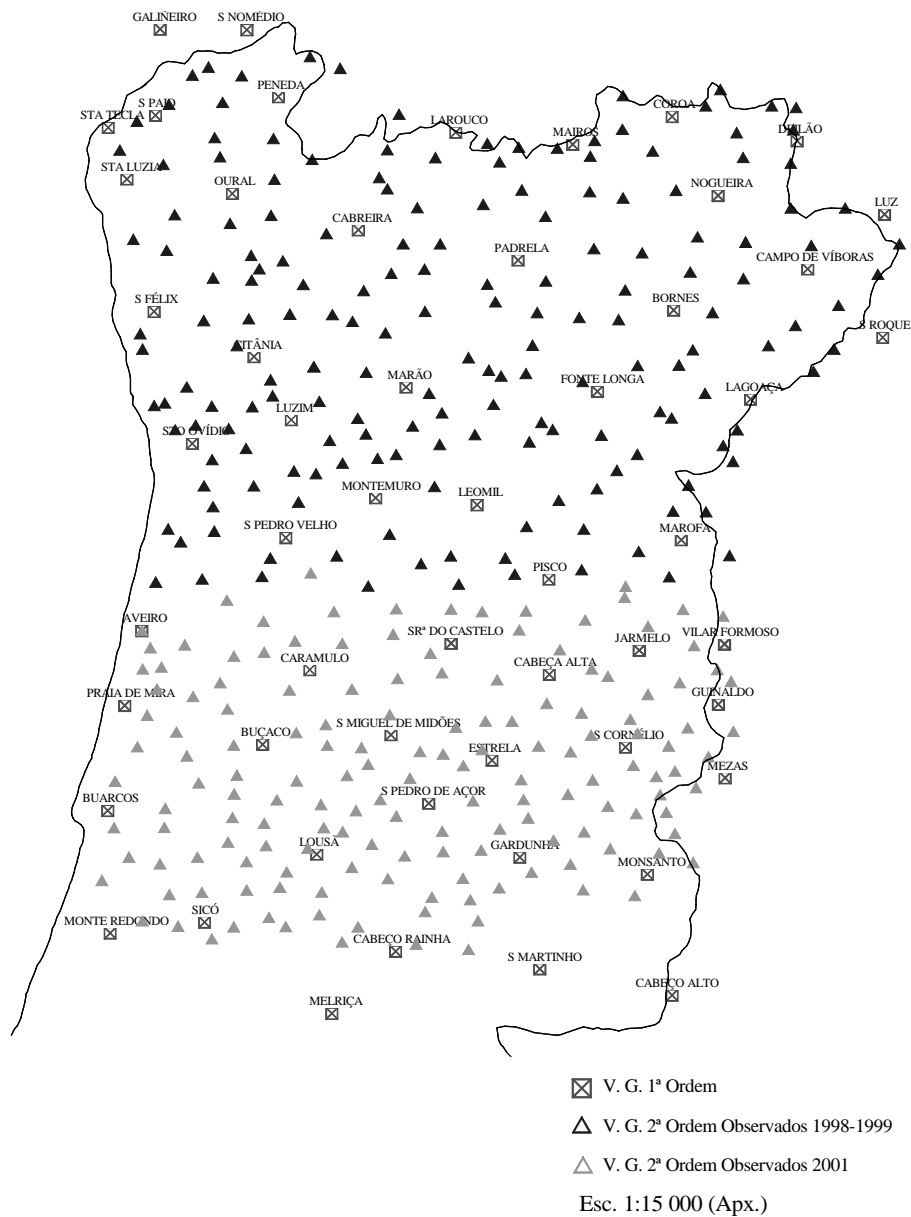


Fig. 4 - 2nd Order National Geodetic Network observed with GPS until 2001 Ellipses