SOME ASPECTS ON THE IMPLEMENTATION OF GPS SUPPORT NETWORK FOR CARRYING OUT THE SEWERAGE SYSTEM IN TIUR PLACE, ALBA COUNTRY

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Abstract: *This paper aimed was to support the achievement of network performance of the sewerage network in Tiur place, Alba County. Tiur place is located in western of Tarnavelor Plateau, so called Plateau of Glajului, near the confluence of Little Tarnava with large Tarnava. It includes some of the interfluve between the two Tarnave, the South - West of Lopadea Hills and northern of Secaşelor Plateau. To achieve the support network, static method with five dual GPS equipment frequency was used. For determination, three fixed references were used: Alba Iulia, Mures and Sibiu. For determination, three fixed references were used: Alba Iulia, Mures and Sibiu. On the whole route, were fourteen pairs of terminals located in protected places, easily accessible by car, outside the areas of private property. For all terminals, there have been two sessions of measurements, with three references and four rovers on new points. To get more accurate results, and to ensure stability and confidence in solutions, will be use a specialized software in GPS data processing provided by Swiss company Leica, named Leica Geo Office COMBINED. This program allows data processing and network compensation. At the same time points determined by GPS, will be converted to STEREO-70 coordinates, using TRANSDAT program, version 4.01, official implemented by ANCPI Bucharest, respectively for control with Helmert parameters determined locally. New points coordinates (x, y, z), will form the basis of the design and execution works for sewerage network in the territory of Tiur place. During the campaign of GPS measurements, to achieve the support network in Tiur place, Alba County, has been confirmed once again the performance of GPS technology and its advantages compared to conventional surveying methods. In carrying out GPS measurements it is proposed to use dual frequency receivers, which allow reception of satellite signals on two frequencies L1 and L2. Due to the advantages of GPS technology, we propose its use in the measurement and remeasurement of the support networks in our country.*

Keywords: *dual frequency equipment, rovers, support network, sewerage network.*

INTRODUCTION

In an effort to meet the requirements imposed by European and international standards through developing a network of GPS support, we chose the theme of this paper to be, "Carrying out a GPS support network for accomplish the sewerage system in Tiur place, Alba County ", thereby emphasizing the importance of GPS technology in the measurement of support networks in our country [1].

MATERIAL AND METHODS

Measurements were performed by qualified personnel, using the dual frequency GPS, total station MOTORIZED Automatic Target Recognition (ATR) Leica 1201, compatible with GPS (SMART STATION) and 03 DNA DIGITAL LEVELS, which allow to reducing distances to those of the project plan. The method used was "static method" with five dual frequency GPS equipments, three fixed references and four mobile rovers.

GPS measurement processing was done using specialized software LEICA GEO OFFICE COMBINED - program, which allowed processing and clearing network at the same time [2].

RESULTS AND DISCUSSIONS

Before planting terminals on the ground, was made a thorough reconnaissance of the land. On the whole route, were placed 14 pairs of terminals [8]. Terminals were located in areas accessible by car and outside the areas of private property.

For determination, were used three fixed references (Table 1.1) and measuring the three vectors for each point (figure.1.1).

Table 1.1.

Table for old points coordinates

No.	Signal name	Coordinates (Projection system stereographical 1970 Altitudes System Black Sea 1975)		
		X	Y	H
1	ALBA	509666.325	389244.915	265.588
2	MURES	562148.695	466894.207	327.228
3	SIBIU	476134.189	433729.926	452.693

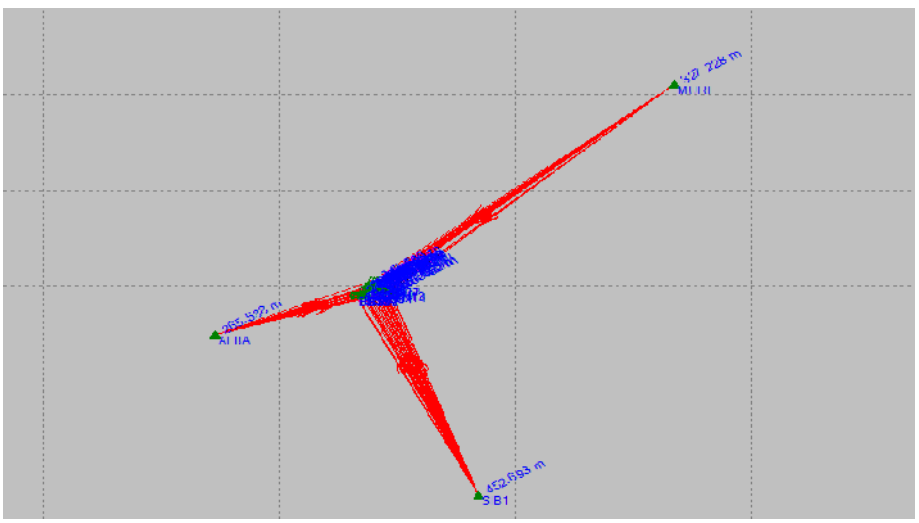

Figure 1.1. Network outline

For all terminals were made two sessions of measurements using three fixed references and four rovers on new points.

To get as accurate results and to ensure stability and confidence in solutions were used a specialized software in GPS data processing provided by Swiss company Leica, named Leica Geo Office Combined. After processing was checked if it was fixed the ambiguity at the points where stationary was made, and reports concerning the stationary points were prepared.

Determined GPS points were transformed into coordinates STEREO-70 using TRANSDAT program version 4.01 (Fig. 1.2).

For network compensation, was used a conditional adjustment retaining fixed three-dimensional coordinates of permanent stations: Alba Iulia, Mures and Sibiu.

Stereographical coordinates 1970 of determined points are presented in Table 1.2.

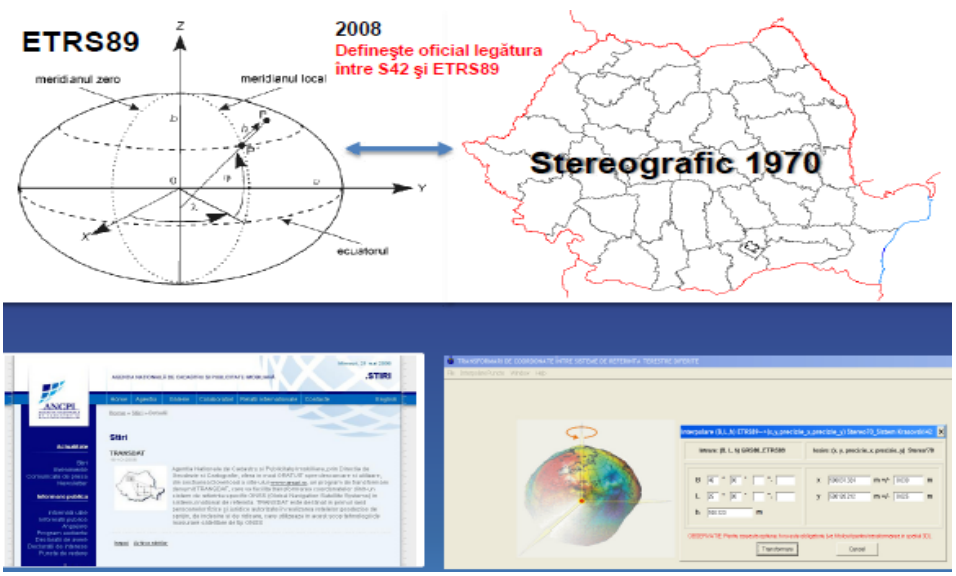

Figure 1.2. TRANSDAT Version 4.01

CONCLUSIONS

During the G.P.S. measurement campaign for carrying out the support network in Tiur place, Alba County has been confirmed once again the technological performances of GPS and its advantages compared to conventional surveying methods.

Accordingly, we propose the use of GPS determined support points, during the design and execution of the sewerage network on Tiur locality.

Due to the advantages afforded by GPS technology, we propose its use in the measurement and remeasurement of support networks in our country.

BIBLIOGRAPHY

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3. WWW.LEICA GEO-SYSTEM.COM.

Table 1.2.

Table for new points coordinates

Nr. Crt.	New point denomination	Coordinates (Stereographic Projection system 1970, Altitudes System Marea Neagră 1975)		
		X(m)	Y(m)	H(m)
1	BN1	520.096.213	415.380.963	247.622
2	BN2	520.025.756	415.525.667	243.616
3	BN3	520.348.971	416.284.495	251.783
4	BN4	520.414.498	416.427.084	251.658
5	BN5	521.173.952	416.187.732	246.160
6	BN6	521.299.402	416.199.816	247.606
7	BN7	520.263.641	417.185.306	262.202
8	BN8	520.341.920	416.941.504	262.846
9	BN9	519.614.635	416.920.413	249.458
10	BN10	519.468.057	416.904.148	246.993
11	BN11	520.023.190	417.963.584	253.230
12	BN12	519.916.037	417.888.731	247.786
13	BN13	519.022.241	418.728.777	254.958
14	BN14	518.755.746	418.901.438	255.452
15	BS1	518.480.780	418.026.490	258.508
16	BS2	518.614.937	417.844.809	248.036
17	BS3	519.305.613	416.164.903	269.355
18	BS4	519.322.208	416.408.347	258.007
19	BS5	519.553.282	415.187.199	243.544
20	BS6	519.460.579	414.980.719	243.311
21	BS7	519.231.759	414.579.631	242.969
22	BS8	519.187.552	414.462.240	242.187
23	BS9	518.269.079	413.903.177	246.463
24	BS11	518.018.429	414.774.243	278.543
25	BS12	518.047.502	414.485.405	251.733
26	BS14	517.951.357	414.244.735	269.601
27	BS15	517.978.819	413.147.206	242.069
28	BS16	517.994.373	412.994.619	241.295
29	BN1	520.096.213	415.380.963	247.622
30	BN2	520.025.756	415.525.667	243.616
31	BN3	520.348.971	416.284.495	251.783
32	BN4	520.414.498	416.427.084	251.658
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