ANALOGICAL EQUIPMENT - ASSISTED DIGITAL DATA EDITING

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ABSTRACT

For a long time, the Institute for Geodesy, Photogrammetry, Cartography and Land Management has been concerned in using its photogrammetric analitical equipment as efficiently as possible. Having this aim in view, stereometrograph has been assisted by pheripheal devices to edit digital data. A general digital data presentation is firstly made to point out its efficiency in any GIS development. This paper describes harwares assisting the stereometrograph. All the equipment has been manufactured in our country except the process computer. At the same time, a software using this data in a GIS development for the general cadastre also given. Finally, an example as graphs and tables covering a certain area is shown, as well.

KEY WORDS: Digital Data, Data Processing, GIS.

1.INTRODUCTION

The main objective of this articol is the constitution of a digital data-base as a support of specified functions of cadaster which has at its base the analogical stereorestitution.This is used to obtain a topographical map with a double function: on the one hand a function of storing up and on the other hand a function of displaying. The both functions are simltaneously involved on the topographical map and this aspect causes great difficulties in practical using of the topographical plan.

For this reason we have to pass to a new conception of creating a new topografical map. The digital topografical map is considered to be a data base because it contains all the necessary informations for this plan. Indifferent of the structural form of data the digital map is formed by a lot of card indexes, containg graphical informations (those which refer to the form and size of entities which will be represented) and also text informations (which refer to the qualitative characteristics of these entities).

The constitution of the digital data base, from the data which results that stereometrograph, on an analogical way, involve the endowment of this with hardware equipments, which allow the storage of these data. Our system was conceived and achieved by ADIPA s.r.l. Bucuresti company, on the basis of technological requirements imposed by author[1].

[1] For this purpose we cooperate with ing. Visescu I. and ing. Vasilescu V. from I.G.F.C.O.T. Bucuresti

This system can be interconected, not only with the stereometrograph, but also with any sort of analogical measurements system, which contains electro-mechanical systems with selsyne.

2. THE HARDWARE DESCRIPTION OF SPECIALISED INTERFACE

Generally are used instruments with optico-mechanical projection, Zeiss-Jena like:

- stecometer (4 coordinates), with precision : ~ 0.001 mm;
- dicometer (4 coordinates), with precision : ~ 0.001 mm;
- stereometrograph (3 coordinates), with precision : ~ 0.01 mm;
- topocart (3 coordinates), with precision : ~ 0.05 mm,

what have in its composition optical-mechanical systems of precision and electrical-mechanical systems with selsyne (fig.1).

The specialised interface is composed, concerning hardware, by two execution modules. The first module is refering to the digitizer-box, which is an integrate device or is out of photogrammetric system which has the role of analog-digital converter for electric dimensions with proportional values with the translation of mobil part of instrumens. This has 4 groups of A/D conversion equiped with selsyn receiver, mechanical systems of gearwheels with a resolution from 500 to 2000 impuls of rotation. The second module is a bearing

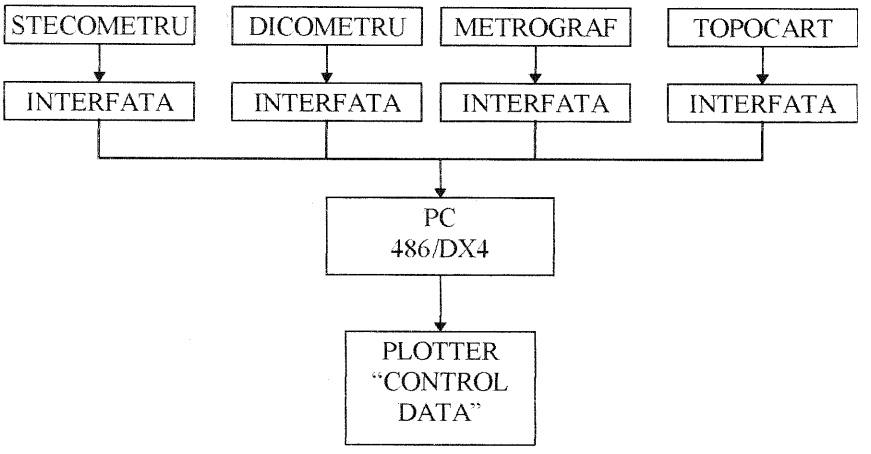

Fig.1 System for 3D data collecting and processing

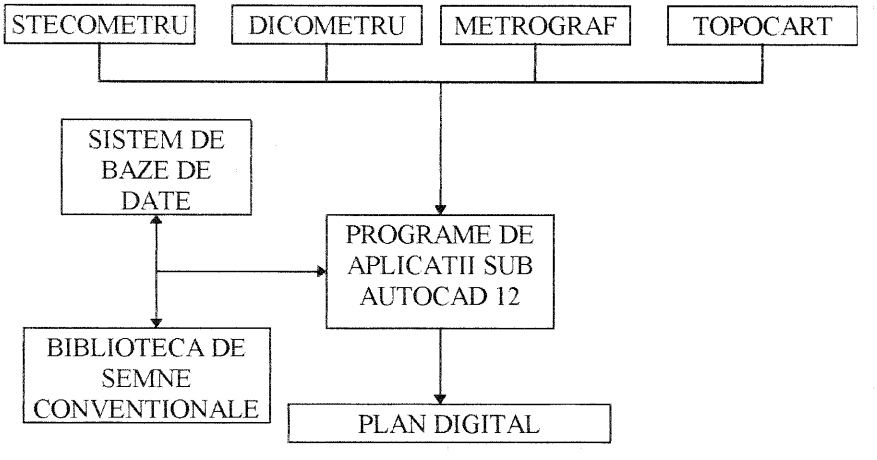

Fig.2 The software nucleus of the system for data collecting and processing

integer systems of the CMOS / HCMOS - VLSI technology which have as components, four channels for the data collection from the four incremental positioning transducers, a data processing block, an inteface block with pheriphrical devices and a process computer.

Among the more important characteristics of the equipment we mention:

- measuring field ~8288608 steps;
- the freqensy of the entrance signal: max 500 kHz/channel;
- the number of measuring pathes: 1-4;
- the speed of comunication for two fields:
  1200 - 19200 bauds
  19200 - 110000 bauds

The processing computer must be a compatibil IBM PC with the following minimal configuration:

- processor 486 DX4
- RAM>16 M
- HDD>600M
- a interfaced network

3. THE PROPOSED SOFTWARE

The applications program write for AUTOCAD has a lot of modulus as following:

- the absolute orientation modulus (OABS) which allow the storage and data processing in geodetical coordinates;
- ON LINE modulus allow the storage, data processing and graphical and numeric editation from measuring equipments in coordinates;

  The storage can be realised in 2 ways :

  - ♦ point by point;
  - ♦ in continuous flux depending on time and space;
- EDIT modulus - which allows the fast editation of graphical informations and atributes;
- the mode of conventional signs application (ASC) which allows the semi-automatic conventional signs application in acordance with the actual atlases;
- the IMPORT/EXPORT modulus, which allows the processing or the import of varied compatible card indexes;
- the interface modulus with varied systems of data bases which is possible thanks to known medium AUTOCAD 12 specialised on photogrametric works;
- the interaction modulus: computer-operator, it is realised with the windows and menues in AUTO Desk form, specific to photogrammetric applications.

4. PRACTICAL APPLICATIONS

There are a lot of technical and economical problems, which require a dinamic functional knowledge, that is a evidence specialised cadaster evidence. One of this specialised cadaster is the urban cadaster, where I used the technology wrote up date. It's about a town, in which the specific data of urban cadaster were stored and procesed at the photogrametric exploatation instruments, like stereometrograph.

On the basis of stored data, the entities: point, line, polygon were changed on cadaster entities: sqare, lot, building, atributes specified of the urban cadaster.

References:

*** - The technical instructions of the Stecometer, Dicometer, Metrograph and Topocart - Karl Zeiss Jena, Germany;

I. Sion, O. Balota, Gh. Corcodel - The realisation of the production system for digital maps Revista de Geodezie nr.2/1994, Bucuresti;

G. Petrie - The hardware aspects for the realisation of the digital map Ph.Eng. and R.S. nr.3/1981;

M.Mihaila, Gh.Corcodel, I.Chirilov -Cadastrul general si publicitatea imobiliara Editura Ceres, Bucuresti 1995.