(5) Aerial Triangulation and Digital Plotting in BiH

Referred data: Photo data and control point data of the sample areas

The referred data of the sample areas were of Derventa sheet (Block4) and Bijeljina sheet (Block8). Bijeljina's data was used only for ortho - photo generation. (See Figure 2 - 15.)

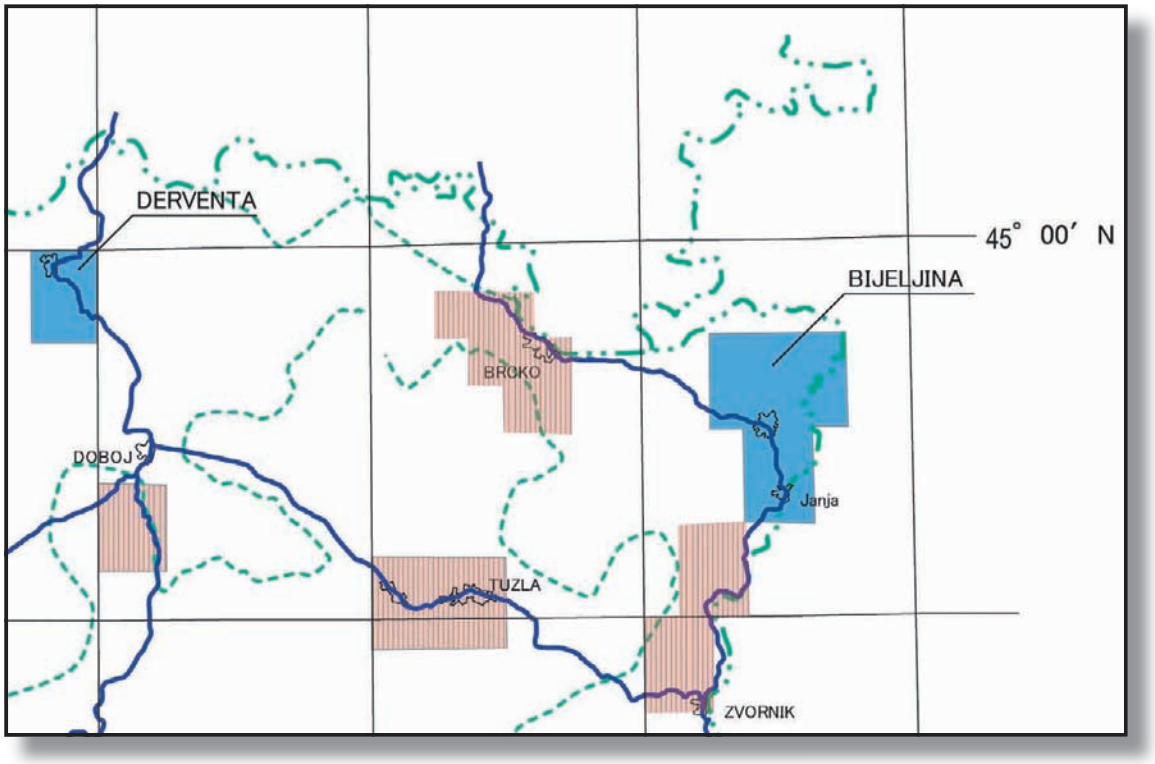


Figure 2 - 15 Areas of Training Material

The general flow of the training sessions were as is the following diagram:

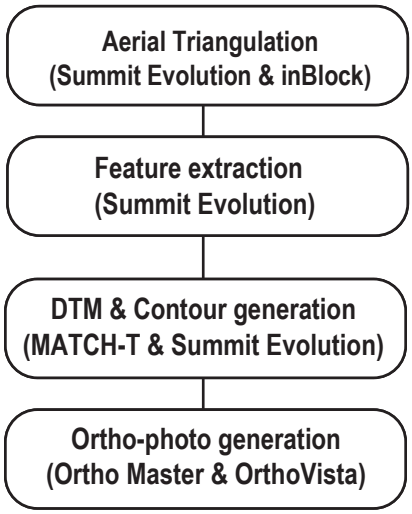


Figure 2 - 16 General Flow of Traning Sessions

a.	Aerial Trinagulation

Summit Evolution software was used for measurement of control points and tie points, and In Block software was used for Bundle block adjustment calculation. The number of photos and control points used are:

Aerial photos - 16 photos in 3 courses
Horizontal and vertical control points - - - - - - - - - - - 5 points
Vertical control points - 63 points

Distribution of principal points of photos and XYZ - control points are shown in Figure 2 - 17.

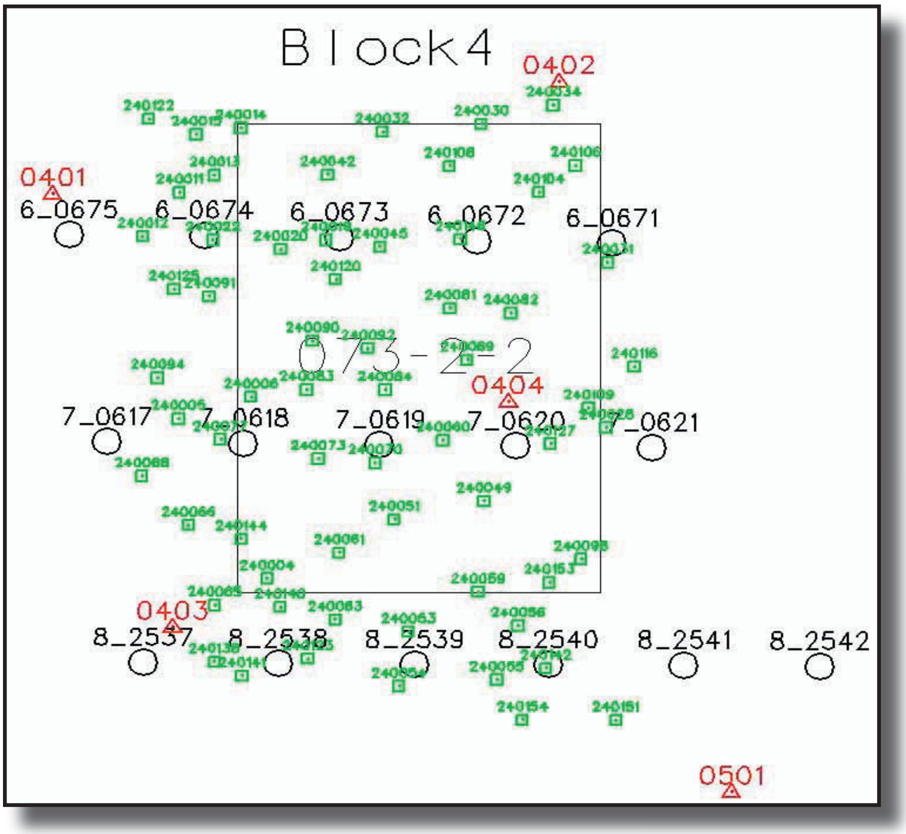


Figure 2 - 17 Principal Points of Photos and XYZ - control Points

Processing of point measurement by Summit Evolution software

i.	Import of photo images
ii.	Generation of camera file
iii.	Generation of control point file
iv.	Interior orientation
v.	Measurement of tie points
vi.	Measurement of control points
vii.	Export the measurement coordinates and control point data to In Block software

Processing of block adjustment calculation by In Block software

i.	Setting
	Setting of camera parameter and GPS sensor
	Definition of work unit and weight

ii. Import of data
Import of the measurement coordinates, control point data and Airborne GPS data

iii. Block adjustment calculation
Calculation of approximation, Bundle block adjustment calculation

iv. Analysis of calculated results

v. Export of calculated results
Export of the exterior orientation elements to PAT - B format

b. Digital plotting

The 3d data extraction was performed using Summit Evolution software and Autodesk MAP through the following processes.

i. Generation of project file
Setting of camera file, photo images and control point file

ii. Import of the exterior orientation elements
Import of the exterior orientation elements calculated by triangulation

iii. Setting stereo model

iv. Generation of symbols for plotting
- Definition of layers, colors, line types and symbols by Autodesk MAP according as the map symbol regulation.
- Generation of Keypad for Summit Evolution software

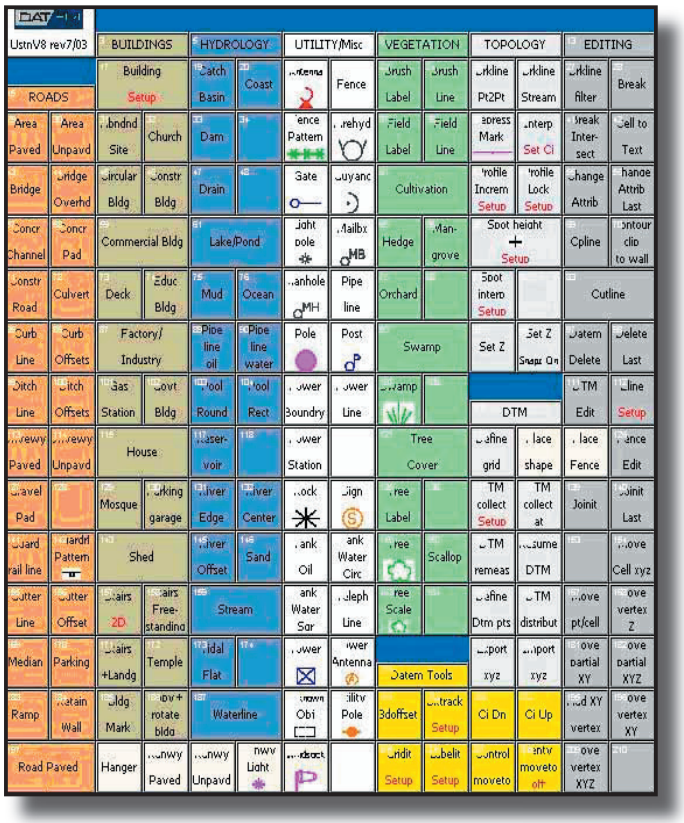


Figure 2 - 18 Example of Keypad Menu

v. Data extraction by 3 dimensional plotting
- Extraction of roads, rails, etc.
- Extraction of rivers, water body, etc.

- Extraction of built - up areas, building, etc.
- Extraction of vegetation and vegetation boundaries
- Extraction of contour lines
- Extraction of spot heights

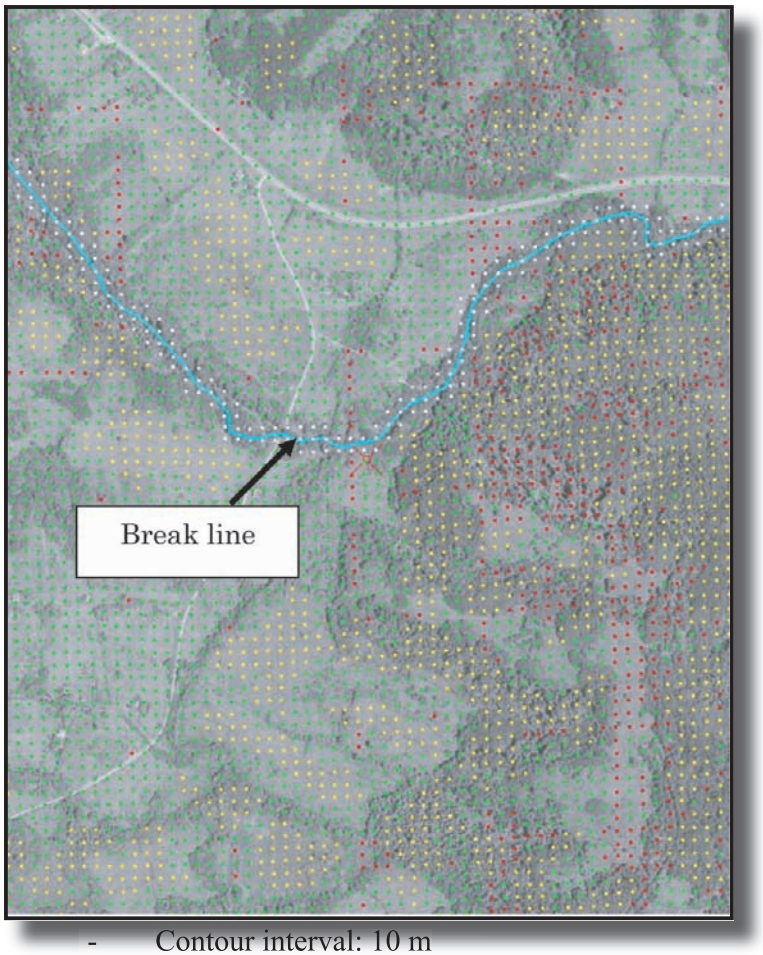
vi. Saving of extracted data

The extracted data were saved as DXF format and used in the next processes, namely the digital map symbolization or the preparation of GIS data.

c. Generation of DTM and contour lines

DTM and contour lines were generated using Summit Evolution software and MATCH - T & Capture Contour software in the following conditions.

- Break line acquisition
- Grid interval: 20 m



- Contour interval: 10 m

Figure 2 - 19 DTM and Break Line

d. Generation of ortho - photos

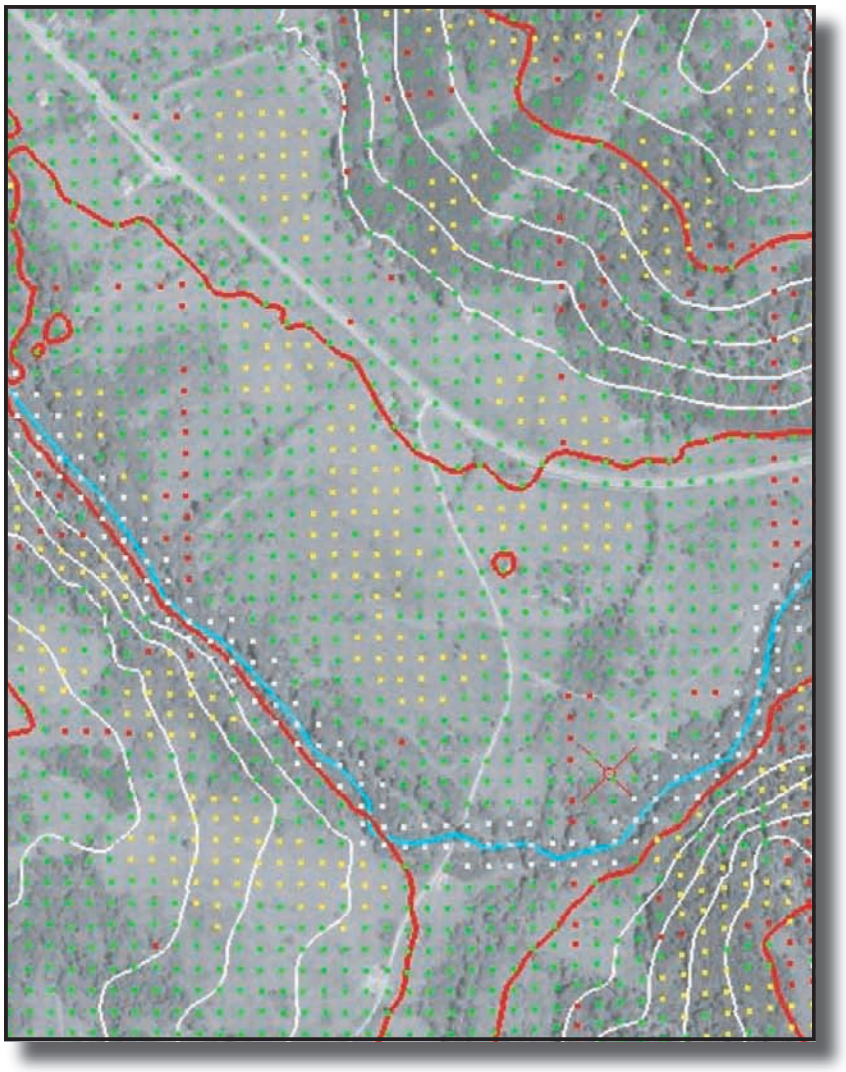


Figure 2 - 20 Contour Lines Generated Using DTM and Break Line

Generation of ortho - photos was performed using OrthoMaster software and OrthoVista software in the following process.

OrthoMaster software

i. Import of the project file of Summit Evolution software
ii. Import of DTM data
iii. Definition of an area for ortho - photo generation
iv. Setting of pixel size, output file type, etc.
v. Generation of ortho - photos

OrthoVista software

i. Selection of images for mosaic processing
ii. Definition of mosaic area
iii. Setting parameter of color valance etc.
iv. Execution of mosaic processing

Figure 2 - 21 Ortho - photo around Bijeljina City Prepared by the Counterparts

e. Additional Training of digital plotting

During the field completion process, in response to the request from the BiH side, the Team gave supplementary instructions on digital plotting to the BiH counterparts in Sarajevo and Bijeljina in November 2004. After the instruction, they tried to complete the sheet of Banja Luka.