Peculiarities of photogrammetrical processing of ground stereo images of common survey in PHOTOMOD

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During the ground stereo photogrammetrical survey performed to develop measure blueprints of architectural constructions, certain problems occur due to the site surrounding vegetation and existing buildings. More than that, usually a convergent method of survey is used to raise the accuracy of point data, which leads to common inability to see the images in stereo.

To ease the process of photogrammetrical processing of images with high values of mutual angles of tilt and rotation, it is better to preventively transform them in a stereogram with values of tilt and rotation close to zero.

You can perform such transformation in PHOTOMOD with the following technique. In the first place you determine the elements of outer orientation of each image using the control points. As control points you can use the coordinates of the object outline points of the image in the coordinate system of the image, which are measured in the image with the values of the outer angle elements of orientation close to zero in the reference to the plane of the surveyed object. This image has to be done additionally in the process of survey. The values of point's altitude are being held as common to all the points and are set at will.

After determination of elements of outer orientation you start to transform the images. This process is similar to the standard transformation process. But you still have to set the altitude values and pixel size for stereo images identical to the same values of transformation plane. Pictures 1 and 2 respectively depict the stereogram of initial and transformed images.
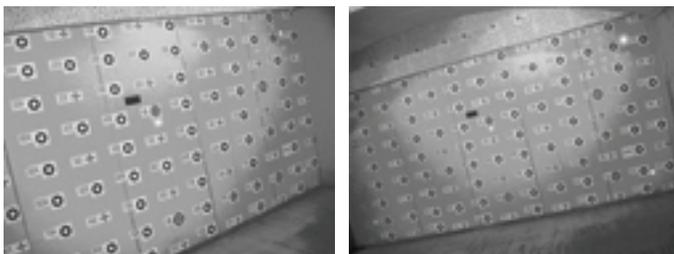
Pic.1. Stereogram of initial images

Elements of inner orientation are determined based on the values of outer orientation of the initial images, altitude of transformation plane and coordinates of point #3 (of lower left corner) in the geotagging file of the transformed image. The value of focal point of the transformed image is calculated as a difference between the altitude of photo center and transformation plane. The coordinates of the main point are calculated as the difference between the coordinates of the center of projection and the lower left corner of the image.
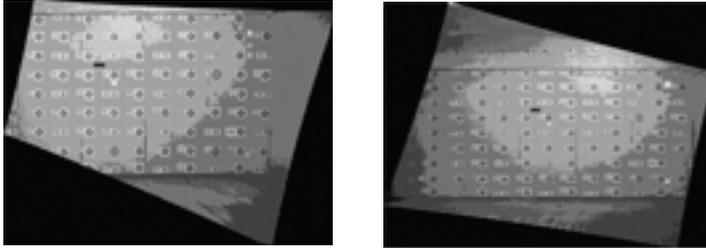
Pic. 2. Stereogram of transformed images

The further processing of the stereogram is done with a standard method. The use of the depicted above technology allows easing and improving the process of photogrammetrical processing of the images. As an example, the transformation of the images of the same inclination survey allows to faster produce measure blueprints of architectural constructions in the stereo mode.

It is necessary to say that this technique allows creating same scale stereograms of different scale images. Though, processing in "PHOTOMOD" after the orientation of the images, such called "epipolar stereograms" are created in the photogrammetrical coordinate system where the axis X is parallel to the horizontal distance, so the object of survey will be rotated around the axis X. To prevent this you have to predetermine the elements of mutual orientation in the coordinate system of the left image of the stereogram b_y, b_z, $\omega 2'$, $\alpha 2'$, $\aleph 2'$.