VERNAGT- AND GUSLARFERNER, AUSTRIA, 1:10,000

(Colour orthophoto map)

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The development from analytical to digital photogrammetry involves the
integration of many conventional photogrammetric and cartographic tasks
into digital photogrammetric systems. A good example is the orthoimage
(digital orthophoto, cf. Kreiling 1975). Today, orthoimages are becoming
standard products of digital photogrammetry and can be computed rapidly
and inexpensively. They form the basis of orthophoto maps and are also
increasingly introduced into the data bases of geo-information systems.
In comparison to line maps, orthophoto maps contain a large variety of
topographic information, and details are perceived much more realisti-
cally. The example presented is intended to serve mountaineers and sci-
entist as an easy-to-use guide.

The input for the orthoprojection consists of a digital image, the para-
meters of interior and exterior orientation of this image and a digital
terrain model (DTM) of the area. For the presented example, a strip of
analogue colour images at a scale of 1:32,000 was acquired in August
1990. The aerotriangulation was carried out on the analytical plotter
Zeiss Planicomp P1. Subsequently, one image was scanned in three colour
bands at a resolution of 30 μm each using the Zeiss Photo Scan PS1. Ap-
proximately 12,000 breakline points and 37,000 grid points were measured
interactively on the Planicomp using the data acquisition program PROSA.
From these data, a DTM with a 20 m - grid was produced, including an ex-
act representation of the geomorphological information (breaklines) as
generated using the DTM program package HIFI (Ebner et al. 1988).

The area for which the orthoimage has to be computed (6.1 x 4.9 km^2) is
divided into square orthoimage pixels of constant predefined size. The
so called pixel-by-pixel method (Mayr and Heipke 1988), which can pre-
serve the high DTM accuracy including the representation of the geomor-
phological information, was chosen for this project. As a next step, the
printing master copies were produced using the Hell Scanner Cl X 330 of

the Bayerische Landesvermessungsamt, Munich. Finally the colour ortho-
photo was superimposed with contour lines being digitally derived from
the DTM and combined with common cartographic information in a conven-
tional photomechanical process.

One general problem of photogrammetry is present by occlusions. In or-
thoprojection these lead to wrong image contents, a problem which can be
overcome in the digital domain if occluded areas are determined before-
hand from the DTM and the orientation parameters. These areas can then
be filled with image information from a different image, which is gener-
ally available. In the present example, however, this was not carried
out. Another problem encountered was the fact that the high dynamic
range of the analogue image was not reflected in the scanned version.
Brightness and contrast adjustment partly compensated for this deficien-
cy.

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