Relief Displacement

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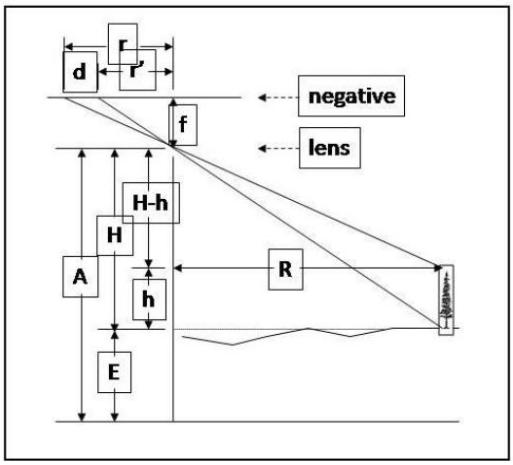
Relief displacement is the shift in an object's image position caused by its elevation above a particular datum. A vertical object (such as a building or tree) will appear to be lying along a line radial to the image nadir point. This deformation is called relief displacement.



Here,

r = distance on the photo from the nadir to the displaced landscape feature.

r' = actual place on the photo where the landscape feature should be located.

d = relief (topographic) displacement.

f = focal length.

h = height of the landscape feature.

A = altitude of the aircraft above sea level.

E = elevation of the landscape feature.

H = Flying height above the base of the landscape feature at nadir.

R = distance from the nadir to the landscape feature.

Example: Estimation of Tree Height

Suppose we have the measured displacement of a tree, on flat ground, or d = 2.1 mm. The distance from the top of the tree to the nadir of the photograph is 79.4 mm, or r = 79.4 mm.

The flying height of the aircraft, A, above sea level is 10,000 feet. The elevation of the area, E, from a topographic map is 2,000 feet.

Then what is height of the tree?

h =$[(A-E)dr]$

h =$[(10000\ feet - 2000\ feet)21.mm79.4]$

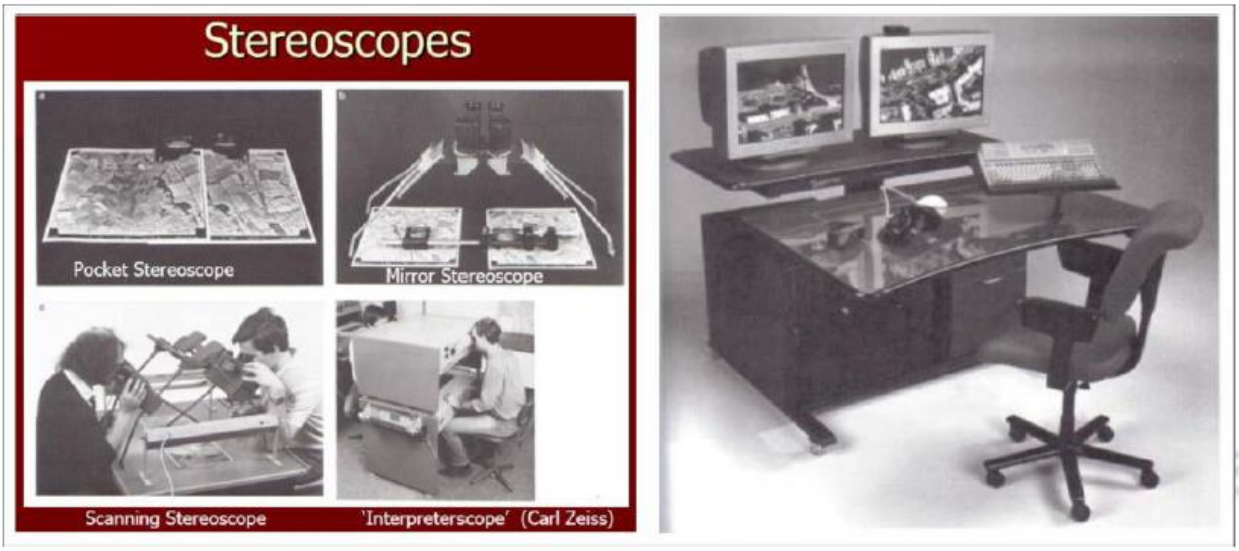
h =$[(8000\ feet)2.1mm79.4\ mm]$

h = 211.6 feet

Air Photo Interpretation:

The identification and extraction of meaning of objects from photo is known as photo interpretation. Once corrected, and georeferenced, photos can be used for topographic mapping and as a mapping layer, with map data overlain on top. With careful interpretation, air photos are an excellent source of spatial data for studying the Earth's environment.

Air Photo Interpretation Equipment:



Photogrammetric Workstation:

Photogrammetric workstation involves integrated hardware and software systems for spatial data capture, manipulation, analysis, storage, display and output of softcopy images.

These systems incorporate functionality of analytical stereo plotters, automated generation of DEM, computation of digital ortophotos, preparation of perspective views and capture @D and 3D data for use in a GIS.