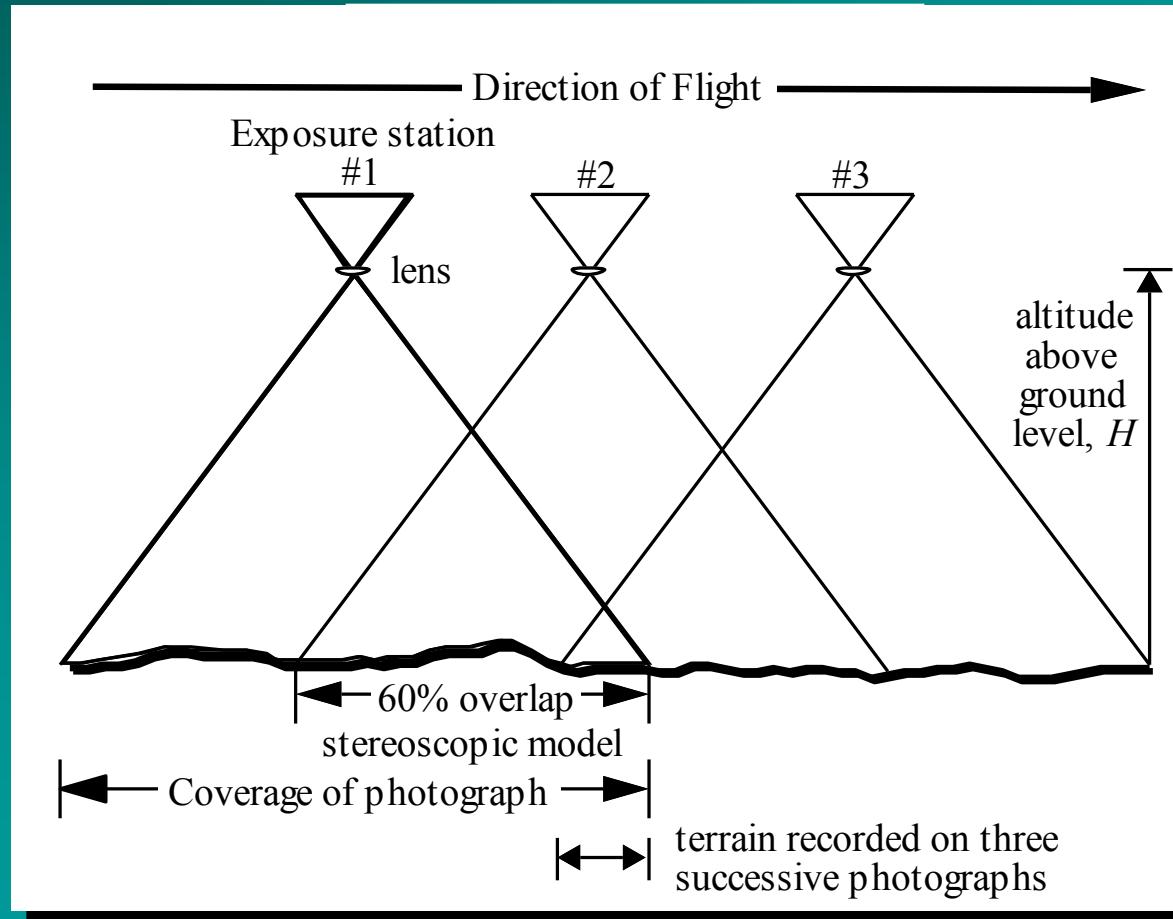


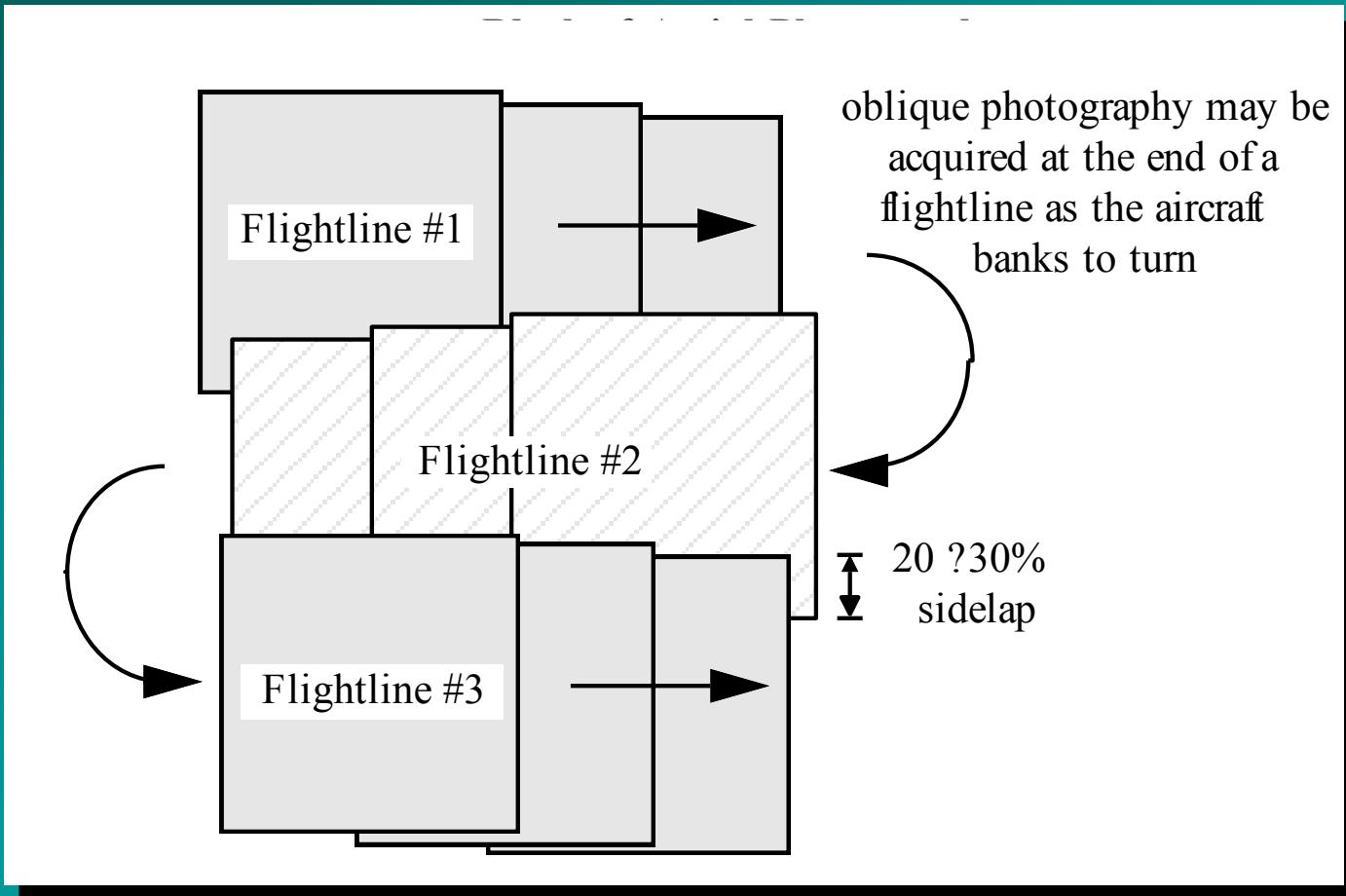
Chapter 6. Photogrammetry

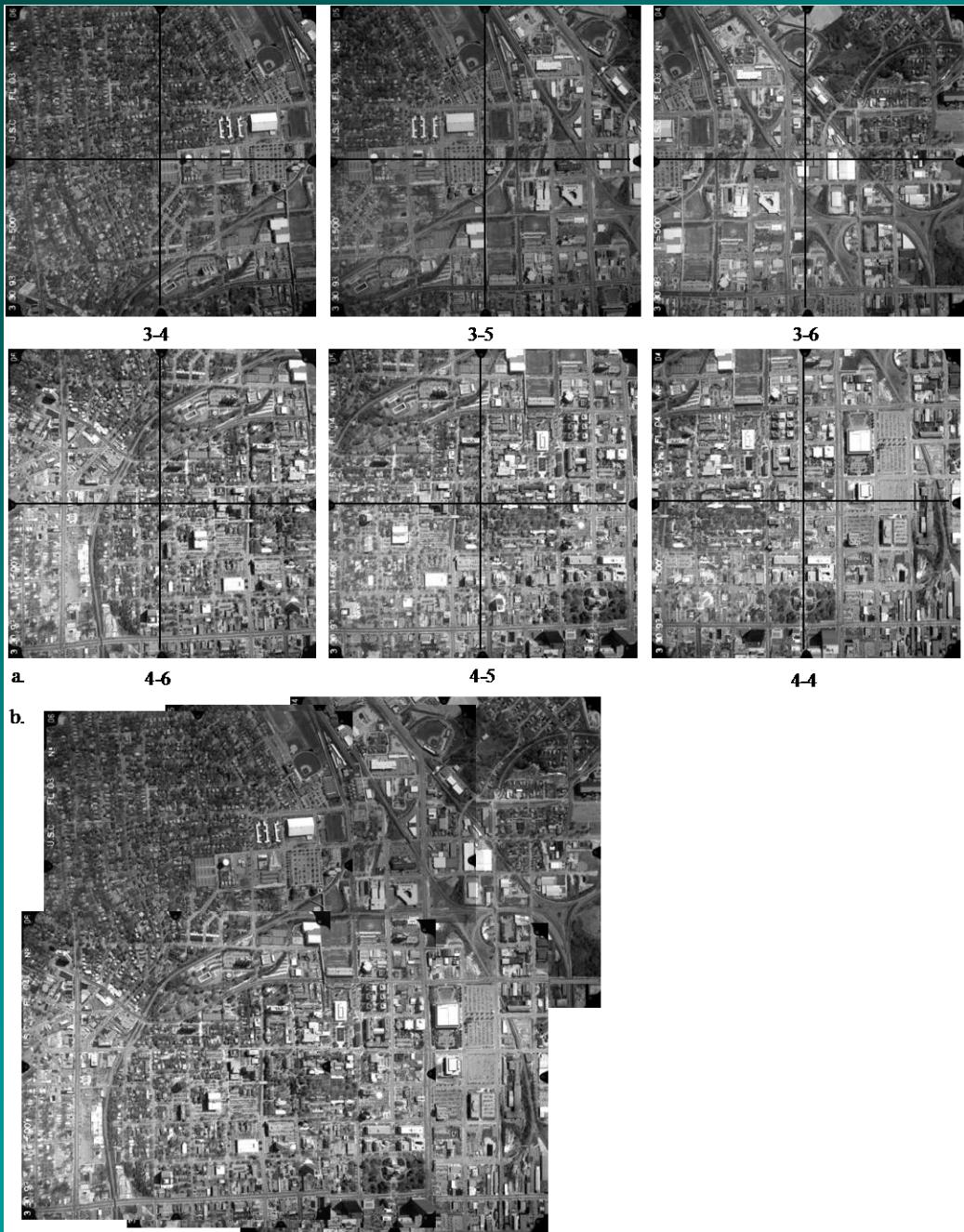
Carolina Distinguished Professor
Department of Geography
University of South Carolina
Columbia, South Carolina 29208
jrjensen@sc.edu

Flightline of Vertical Aerial Photography



Block of Vertical Aerial Photography





Block of Vertical Aerial Photography Compiled into an Uncontrolled Photomosaic

Columbia, SC
Original scale = 1:6,000
Focal length = 6" (152.82 mm)
March 30, 1993



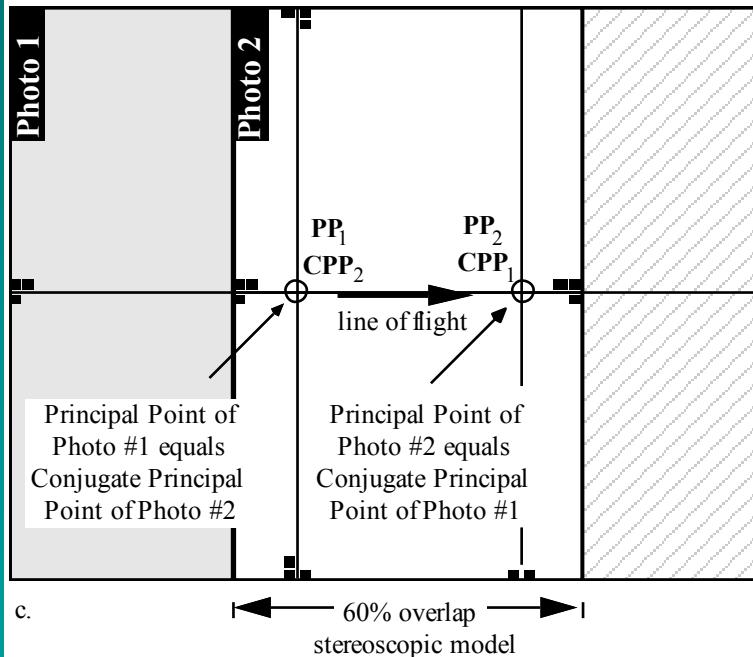
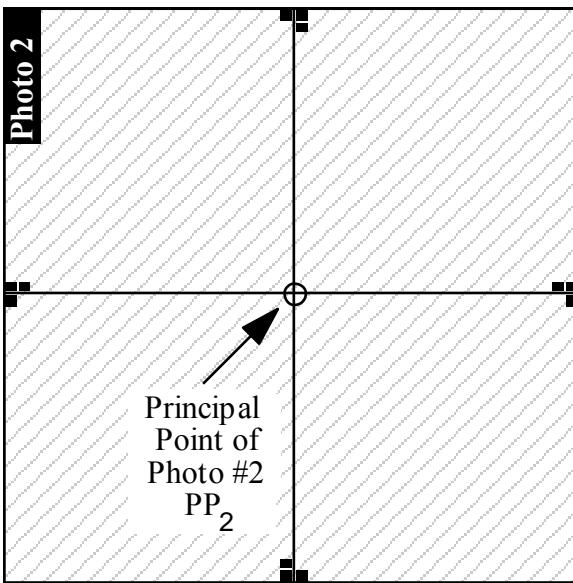
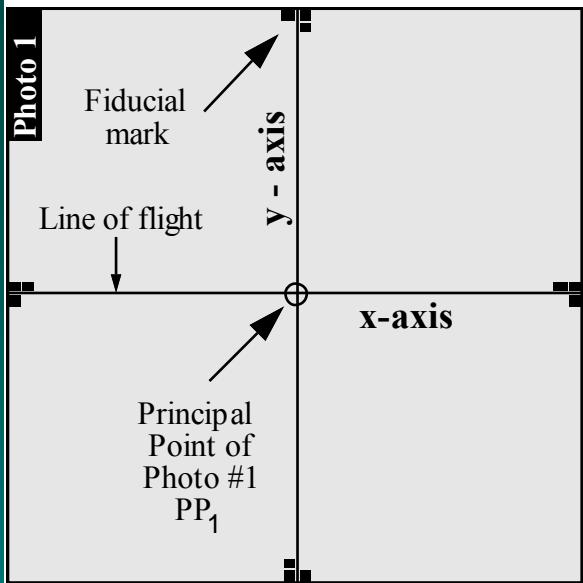
Flightline #4 Photo #5

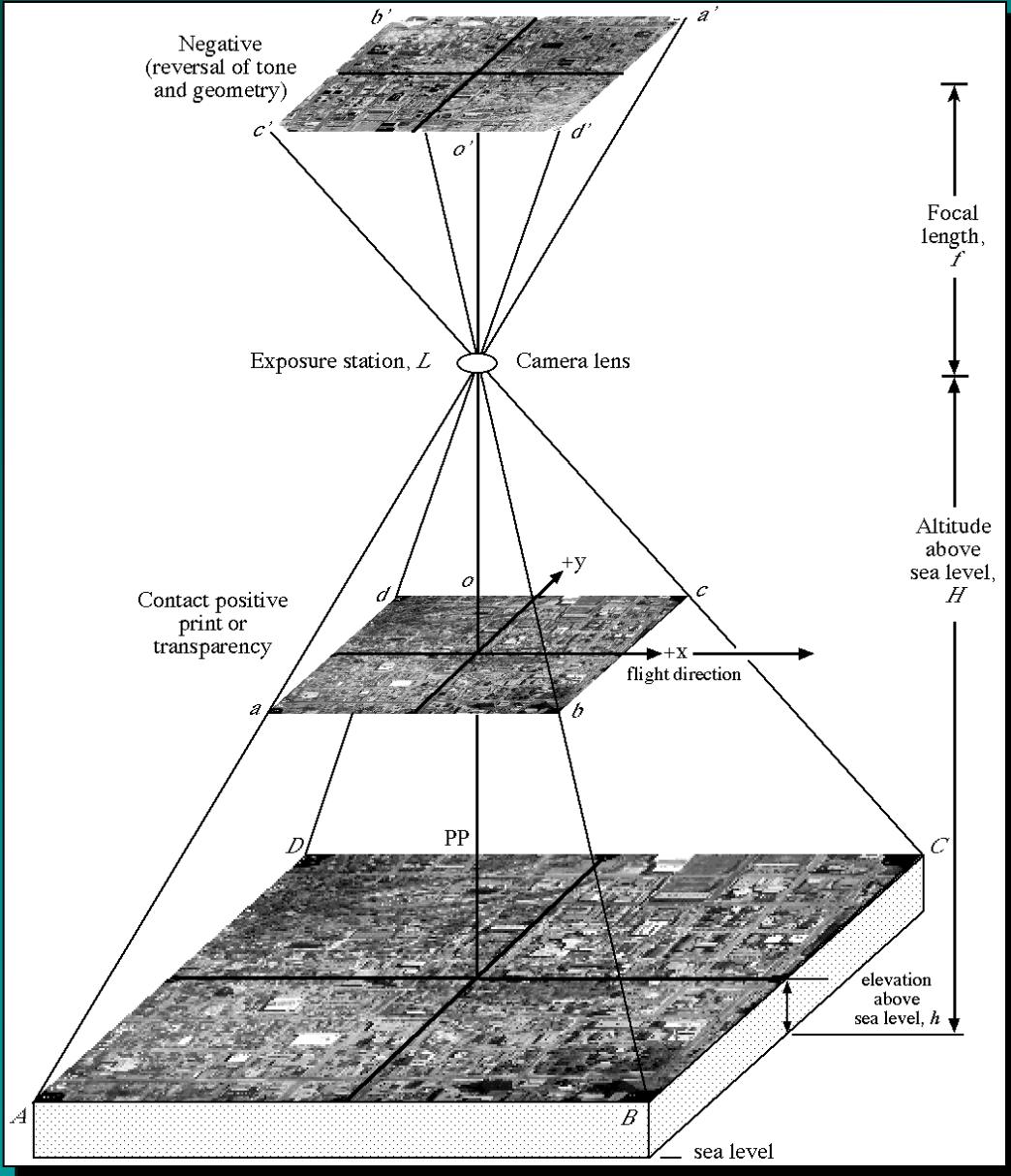
Columbia, SC
Original scale = 1:6,000
Focal length = 6" (152.82 mm)
March 30, 1993

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Geometry of Overlapping Vertical Aerial Photographs

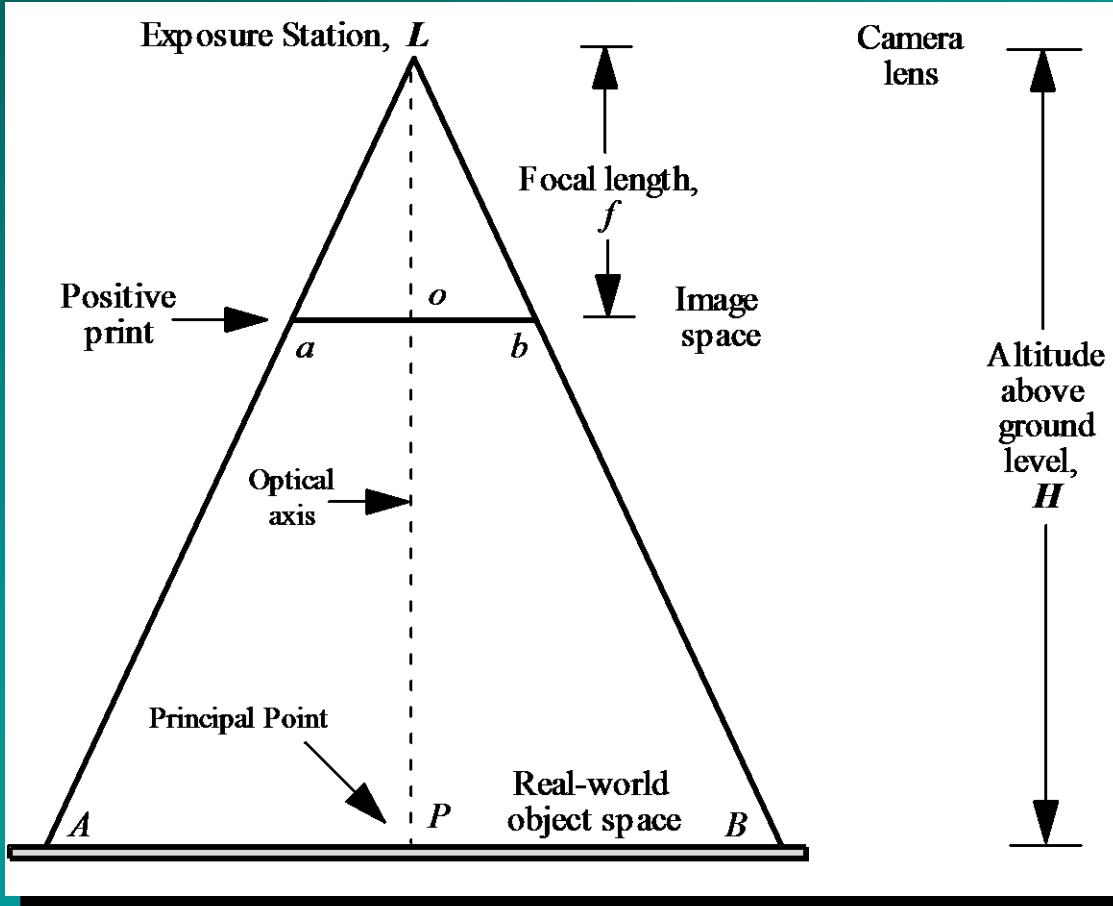
- Principal Points
- Conjugate Principle Points





Geometry of A Vertical Aerial Photograph Obtained Over Flat Terrain

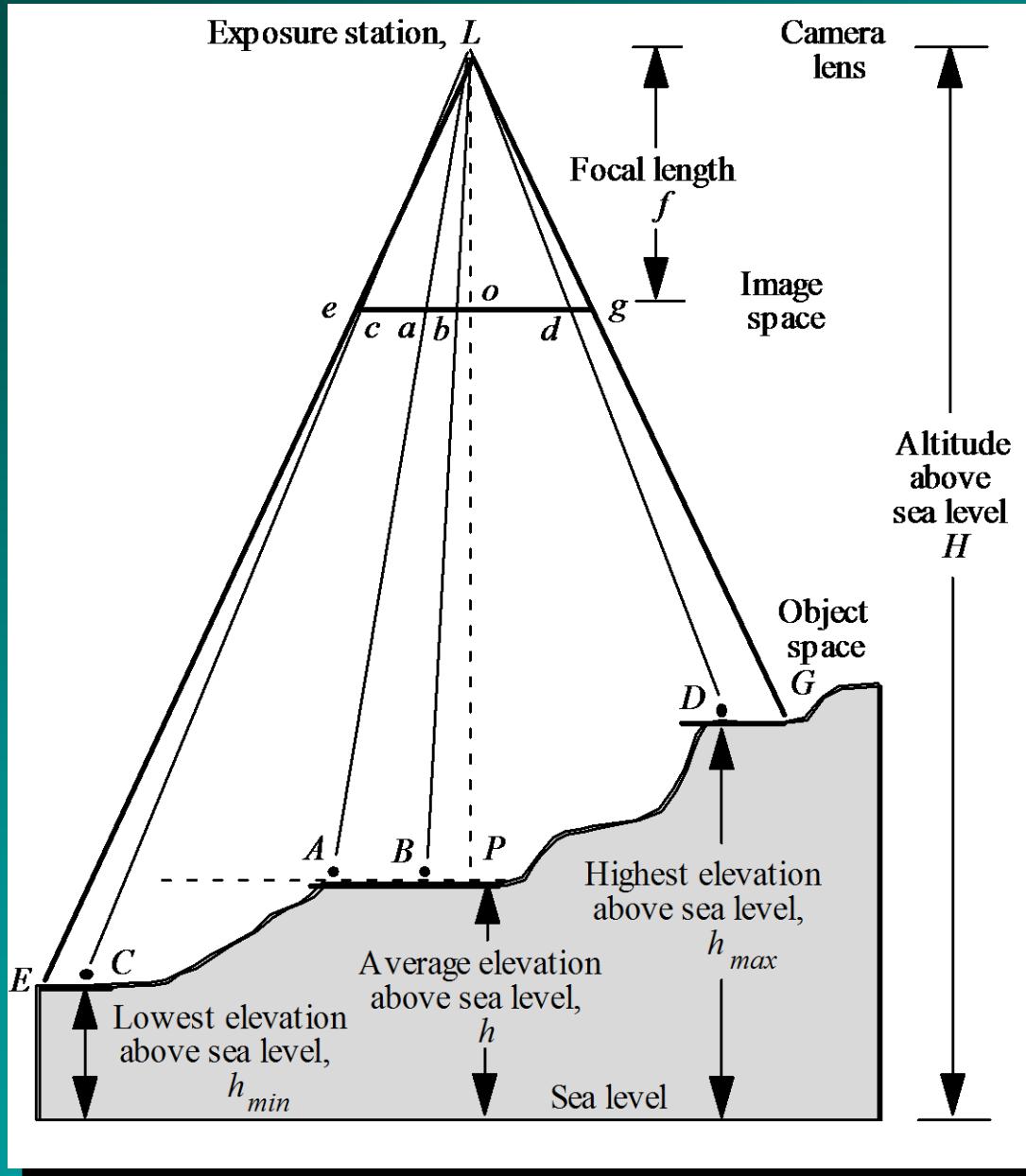
Geometry of A Vertical Aerial Photograph Collected Over Flat Terrain



Enlargement of A Portion of Flightline #4, Photo #5



Jensen, 2000



Geometry of A Vertical Aerial Photograph Collected Over Variable Relief Terrain

Measurement of Object Height From A Single Aerial Photograph Based on Relief Displacement



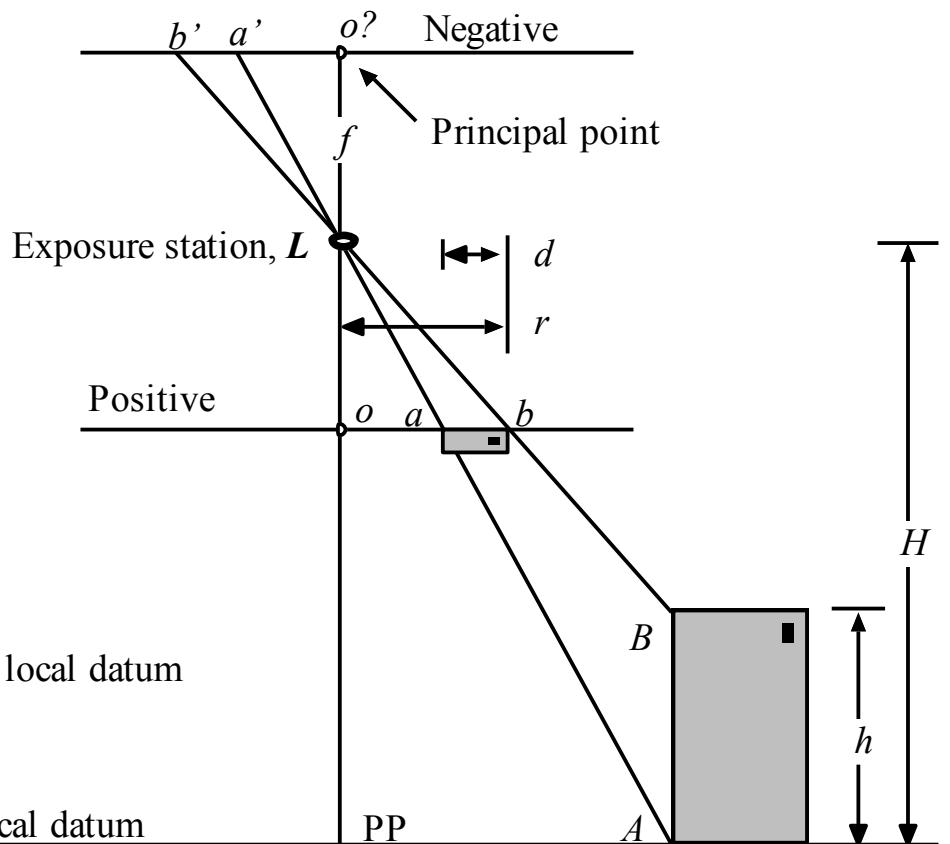
Jensen, 2000

Measurement of Object Height From A Single Aerial Photograph Based on Relief Displacement

$$\frac{h}{H} = \frac{d}{r}$$
$$\therefore h = \frac{d \times H}{r}$$

$r = 2.23$ in.
 $d = 0.129$ in.
 $H = 2978.5$ ft above local datum
 $h = 172$ ft

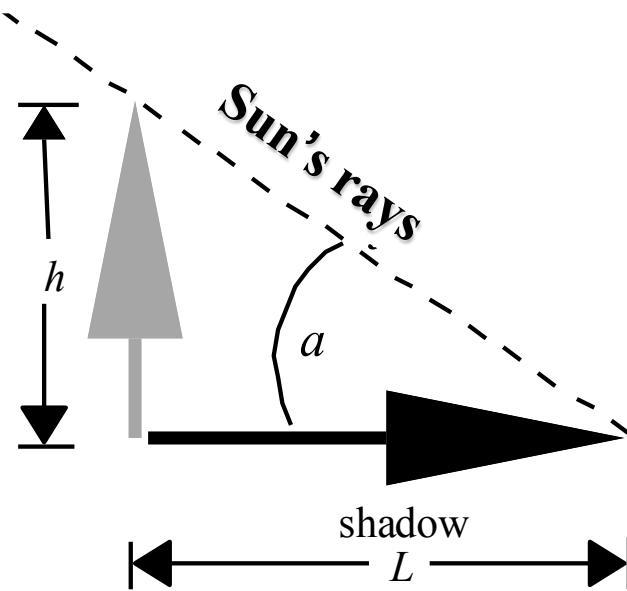
local datum



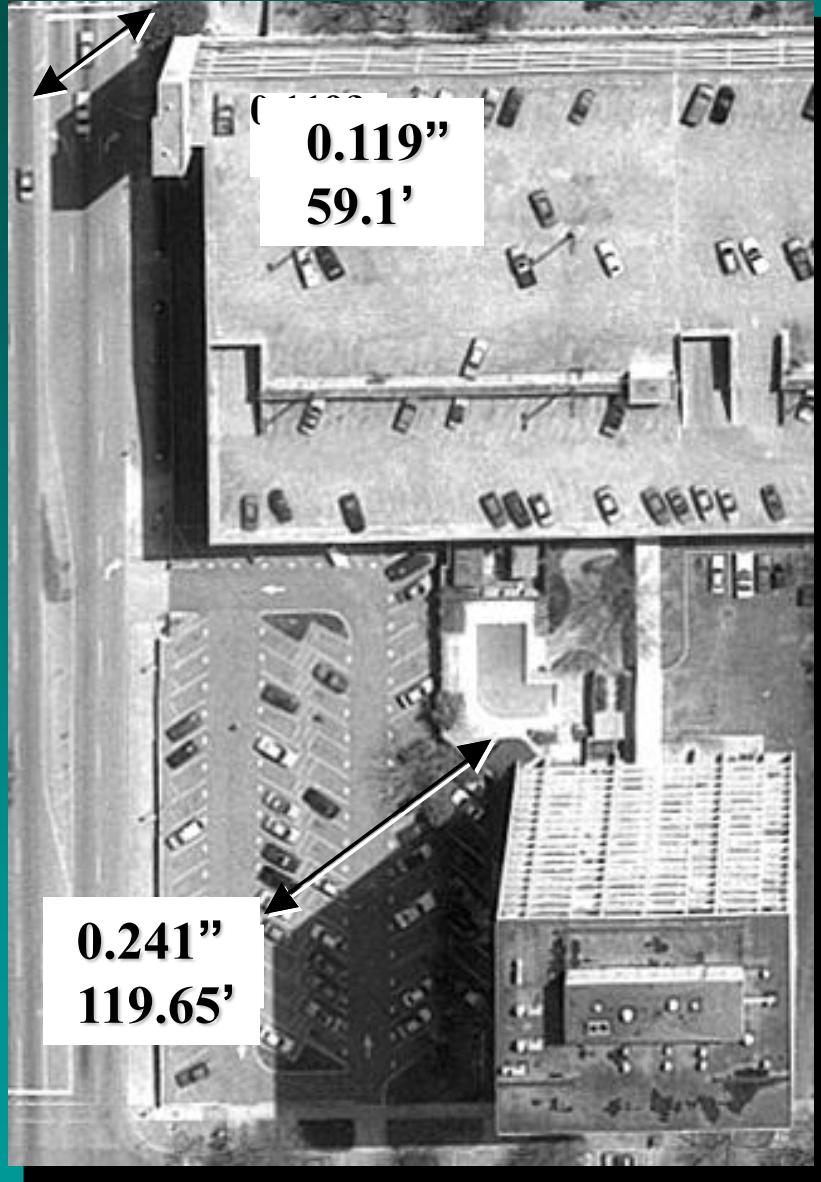
Jensen, 2000

Measurement of Object Height From A Single Aerial Photograph Based on Shadow Length on Level Terrain

$$\begin{aligned}\tan a &= \frac{\text{opposite}}{\text{adjacent}} \\ &= \frac{\text{height, } h}{\text{shadow, } L} \\ h &= L \times \tan a\end{aligned}$$

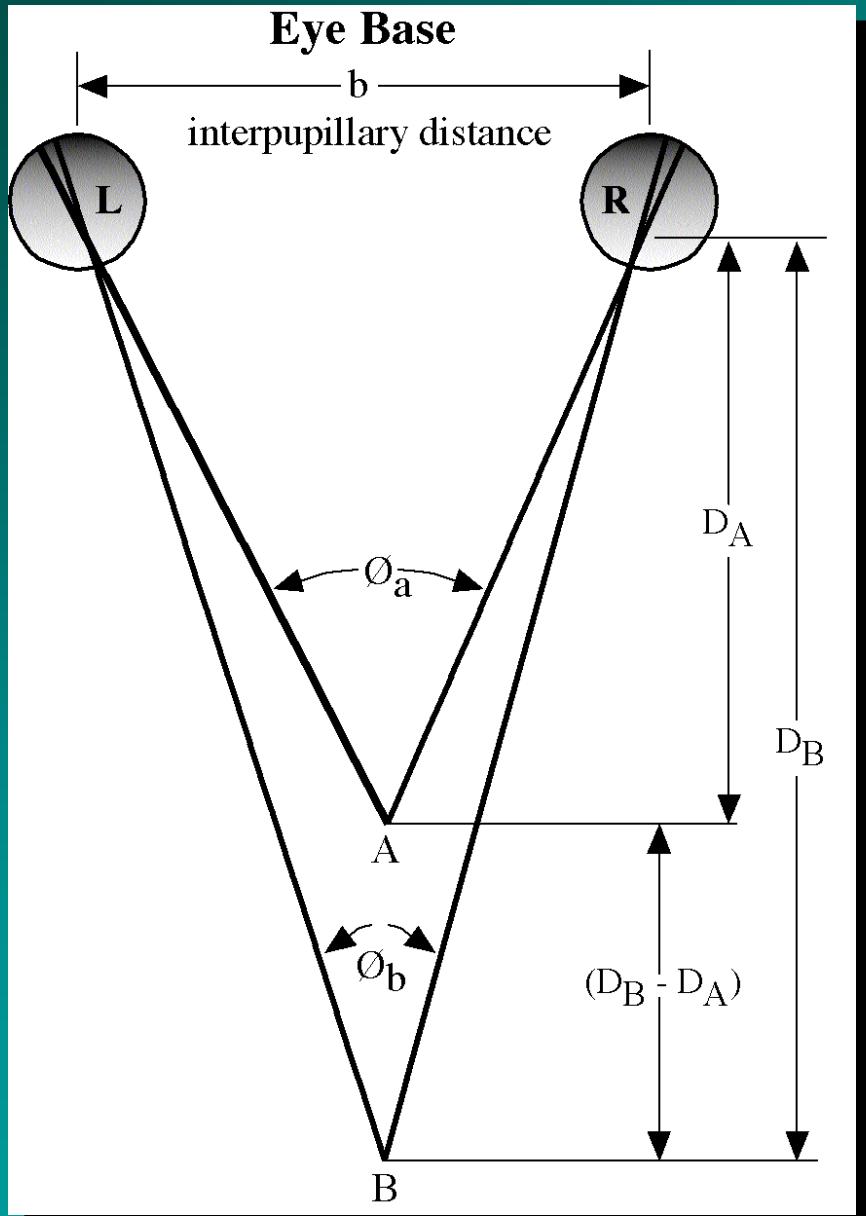


Jensen, 2000



Object Height
Determined by
Shadow Length

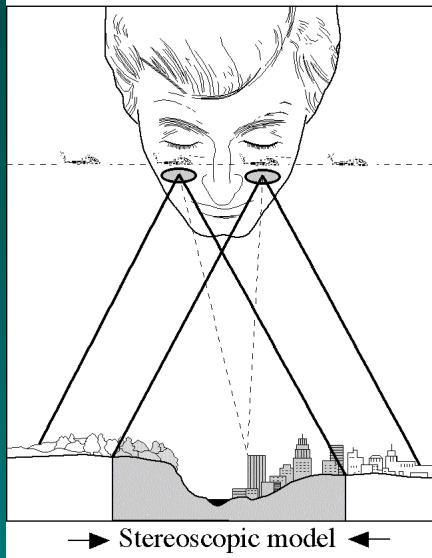
Jensen, 2000



Parallactic Angles Used During Depth Perception

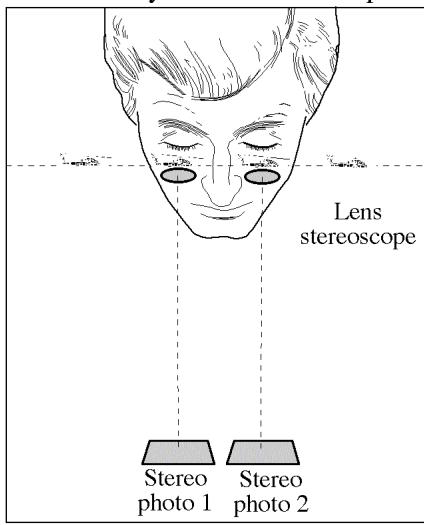
Jensen, 2000

Stereoscopic Viewing Methods

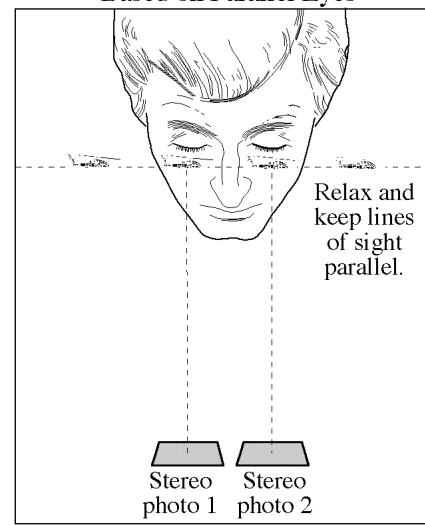


→ Stereoscopic model ←

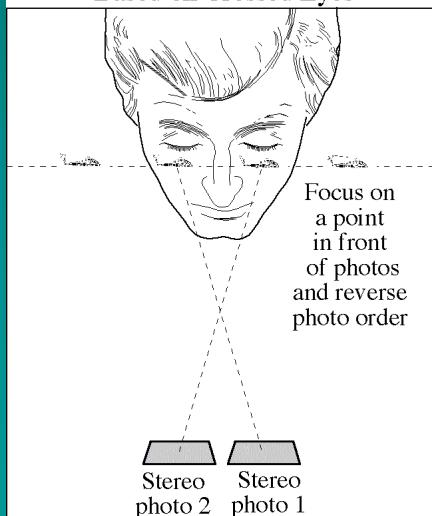
a.



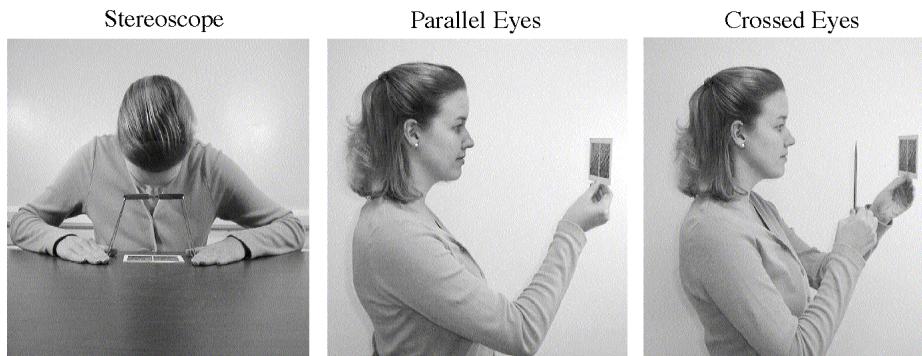
b.



c.

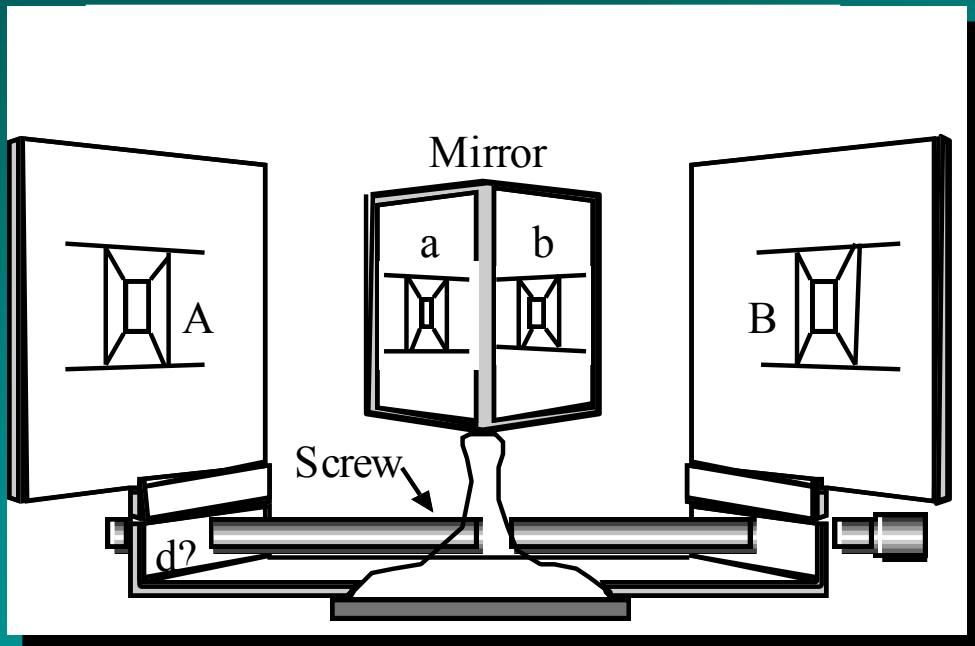


d.

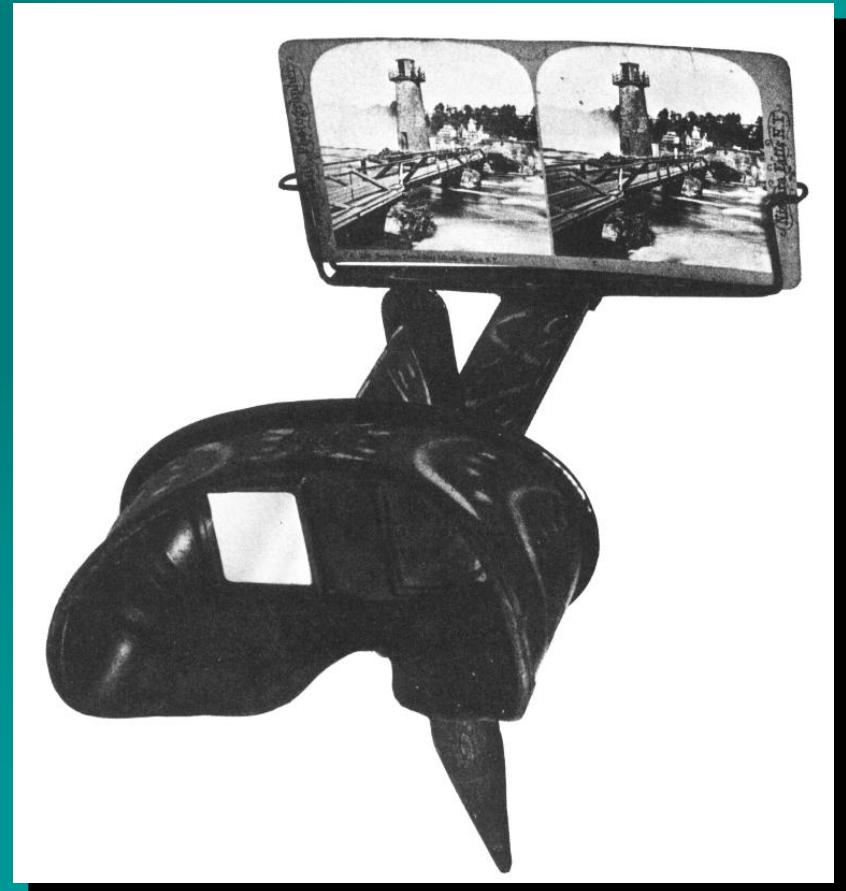


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Logic of Wheatstone's Mirror Stereoscope

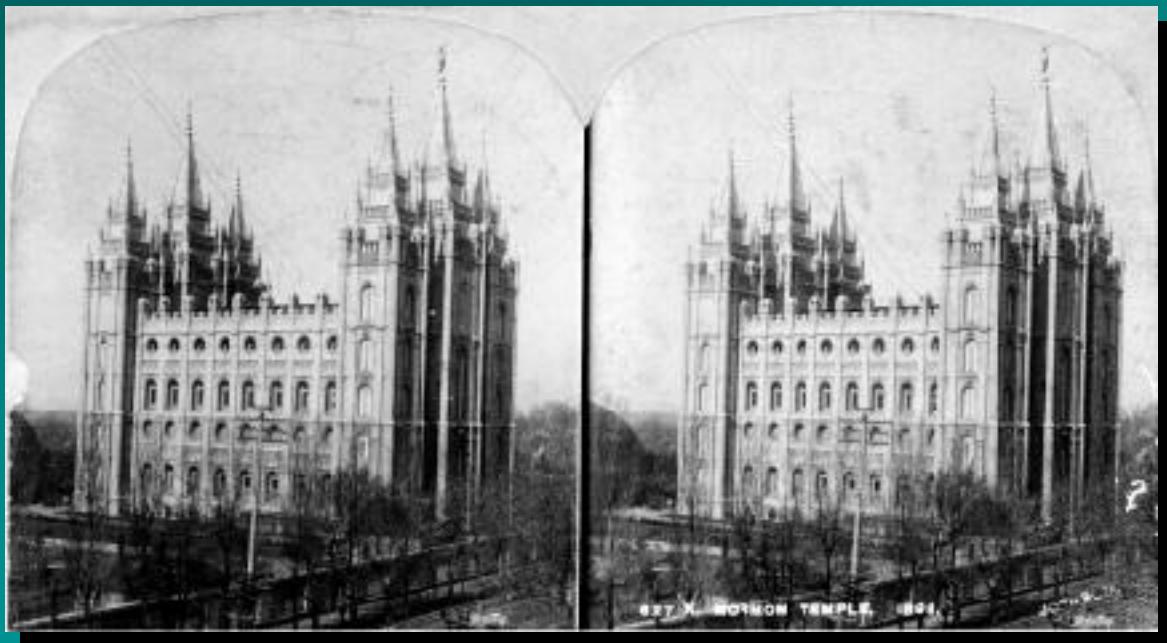


Wheatstone's Mirror Stereoscope



Jensen, 2000

Terrestrial Stereogram of the
Temple in Salt Lake City, Utah

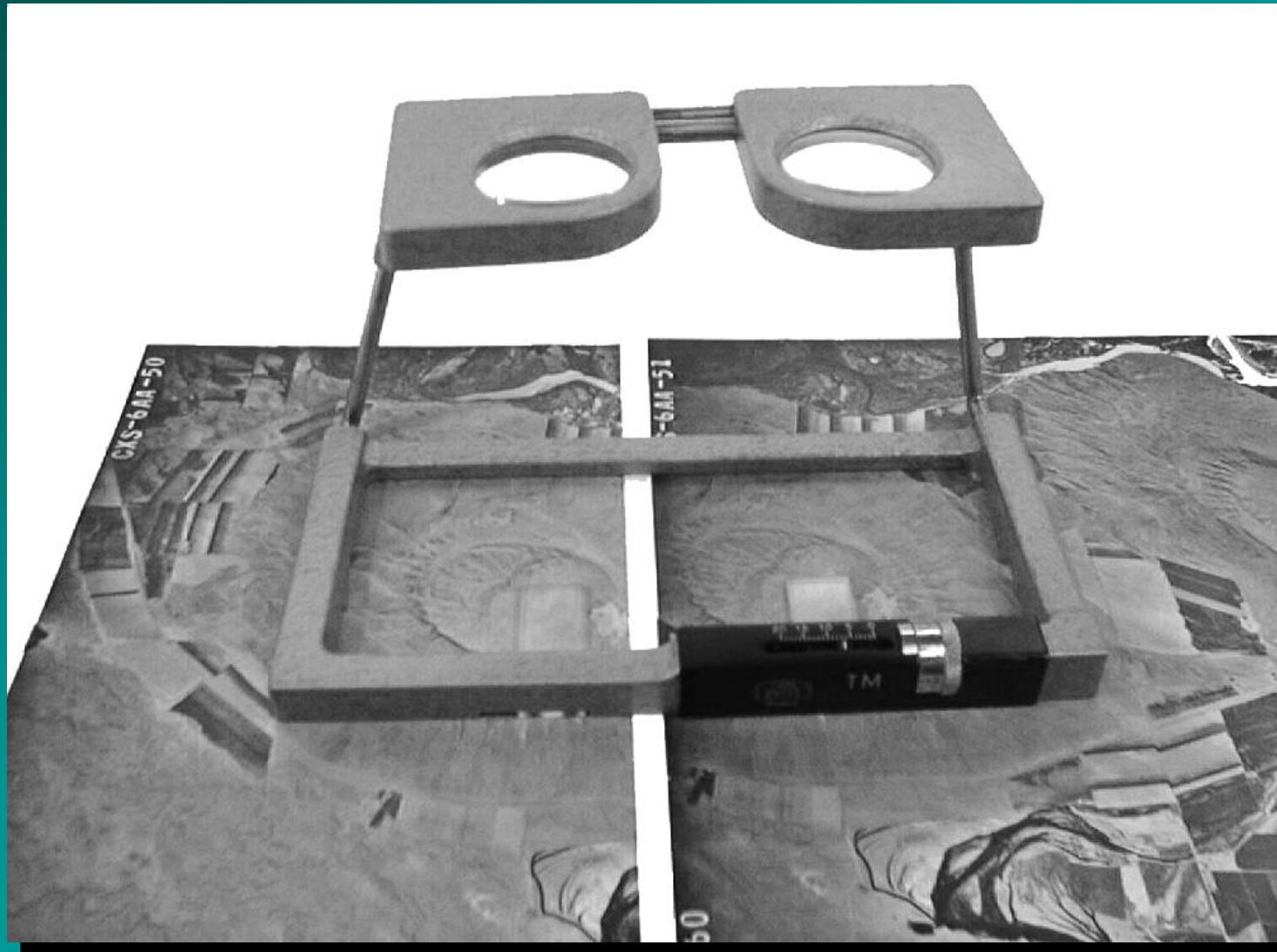


A Vintage Stereo
Camera



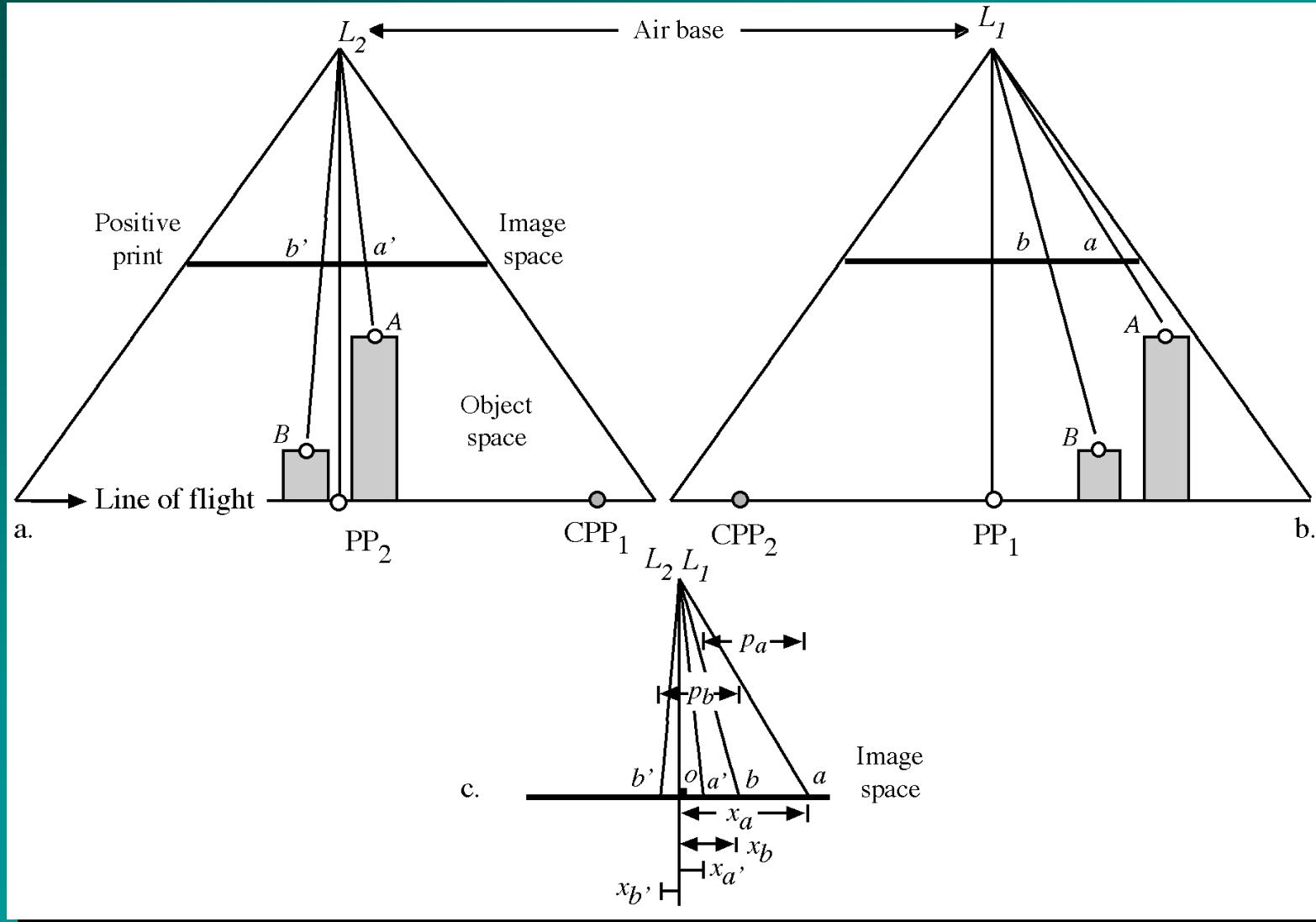
Jensen, 2000

Lens Stereoscope with Parallax Bar

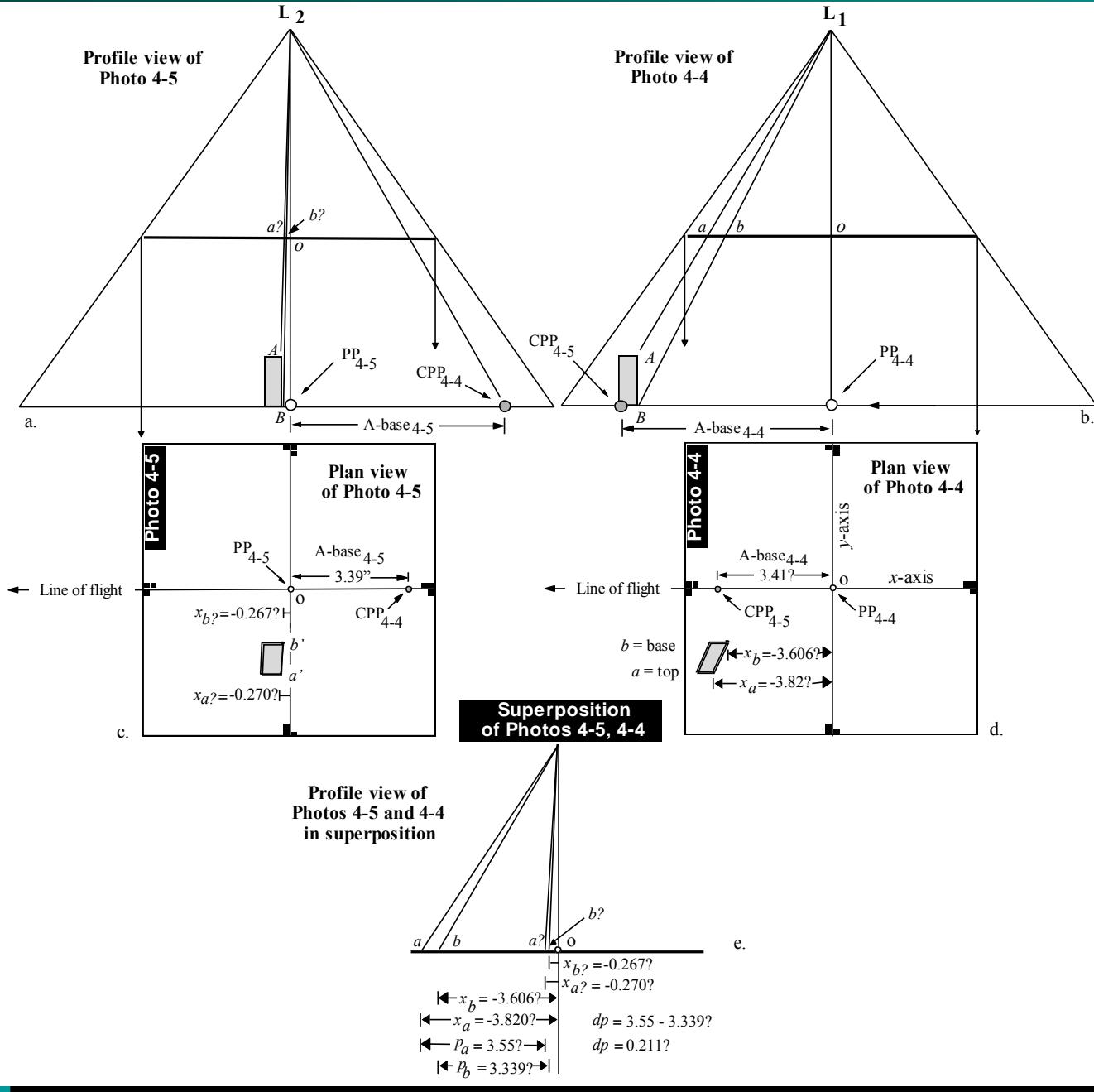


Jensen, 2000

Stereoscopic Parallax Principles



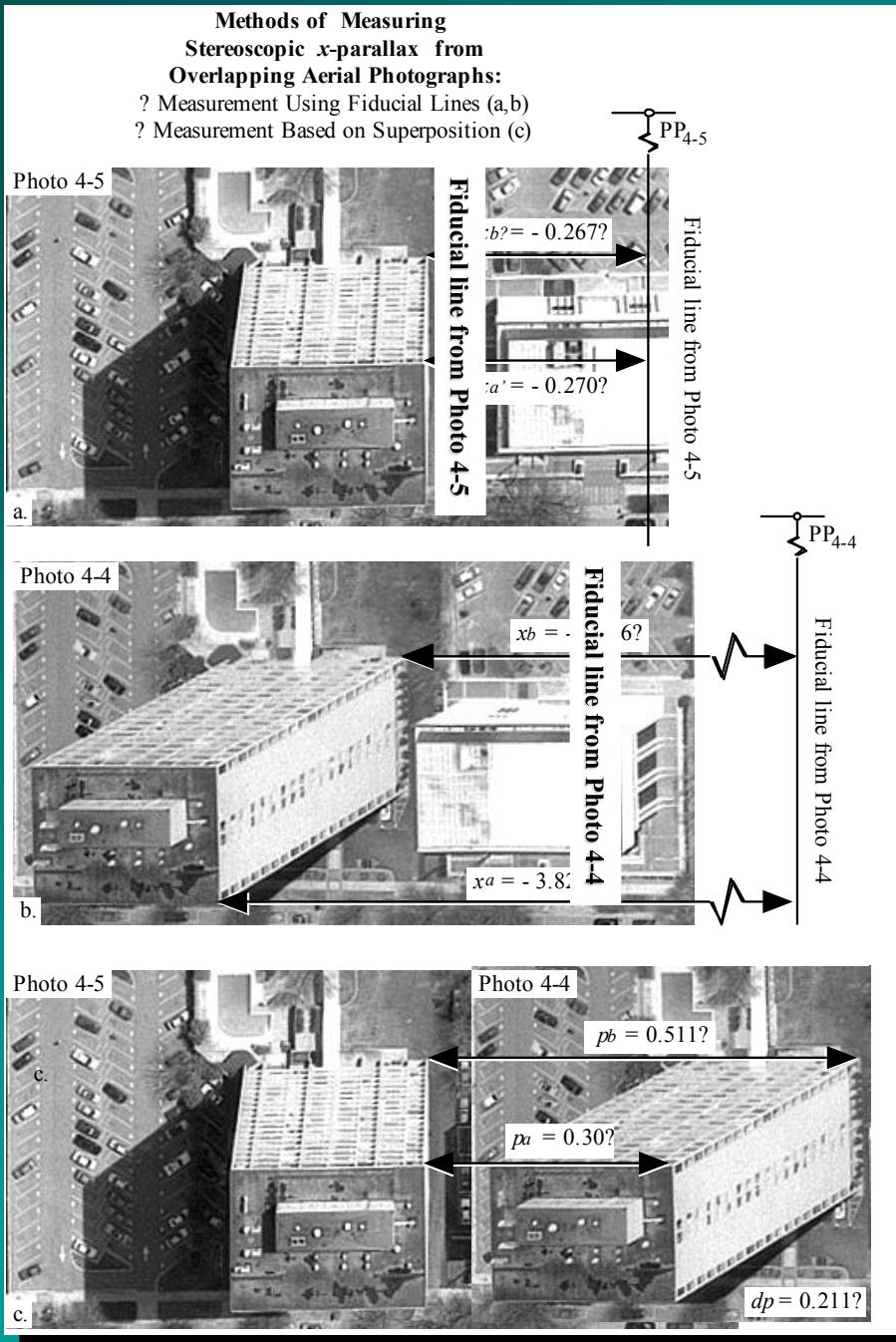
Jensen, 2000



Computing the Height of the Senate Condominium in Columbia, SC Using Stereoscopic Parallax Measurements

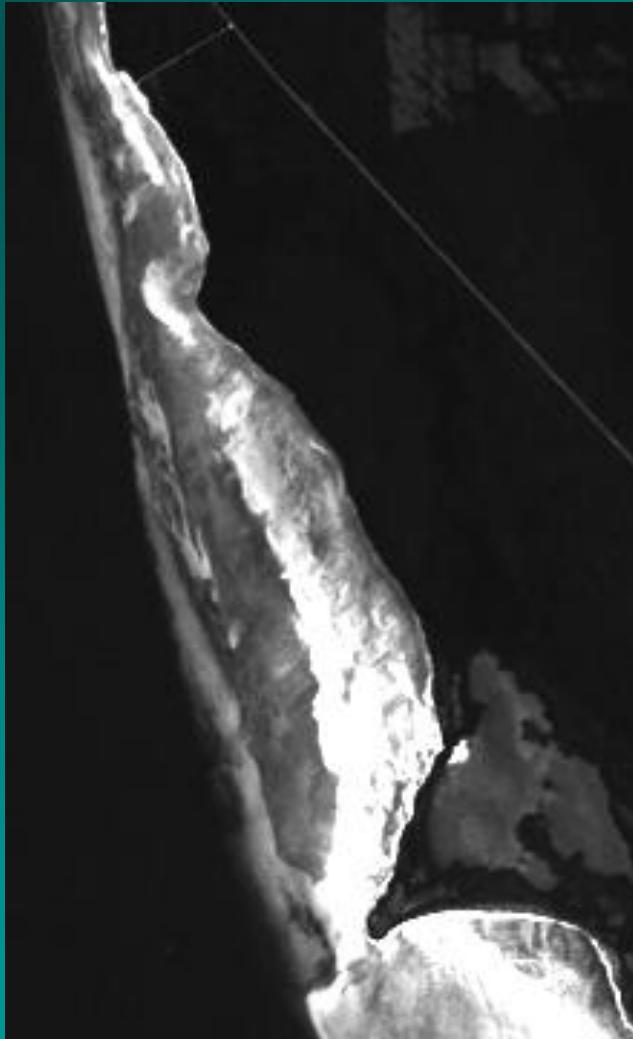
Jensen, 2000

Computing the Height of the Senate Condominium in Columbia, SC Using Stereoscopic Parallax Measurements

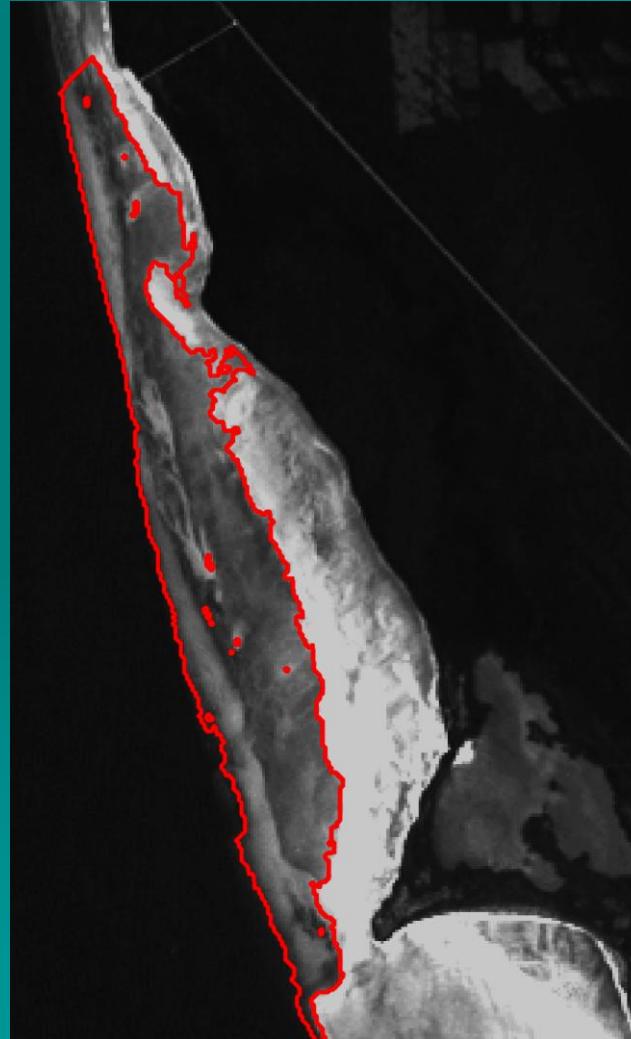


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Columbia Reef on Cozumel Island, Mexico



SPOT XS Band 1 (0.50 - 0.59 μm)
April 19, 1988



Perimeter = 80,880 ha
Area = 398 m²

Sun City near Hilton Head, South Carolina



NAPP photography (0.70 - 0.90 μm) acquired on January 22, 1994 scanned at 2.5 x 2.5 m

Sun City near Hilton Head, South Carolina

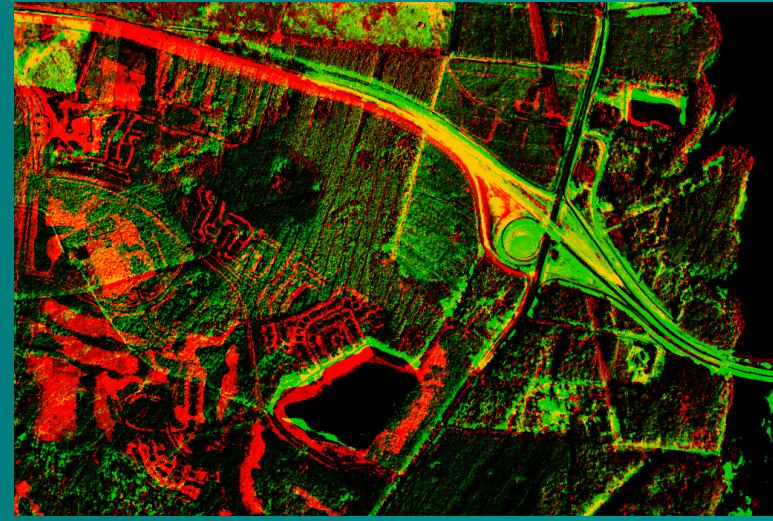


CAMS Band 6 (0.76 - 0.90 μm) data acquired on September 23, 1996 and scanned at 2.5 x 2.5 m

Sun City near Hilton Head, South Carolina



Scanned NAPP (0.70 - 0.90 μm) at 2.5 x 2.5 m
January 22, 1994



Color composite
RGB = CAMS, NAPP, none



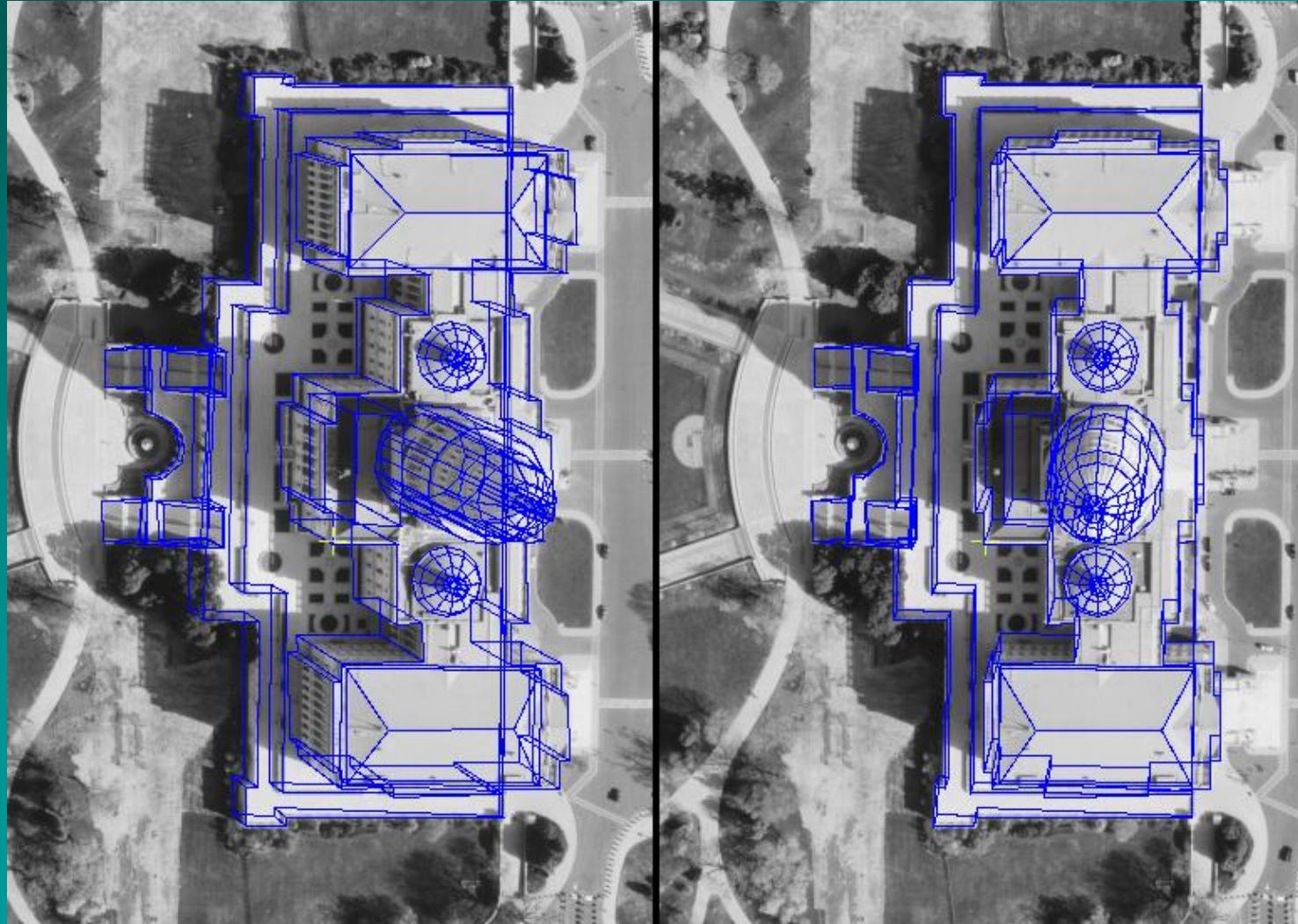
CAMS Band 6 (0.76 - 0.90 μm) at 2.5 x 2.5 m
September 23, 1996



AVIRIS Imagery of Boca Chica Key and Key West, Florida

Color composite
RGB = 646.7 nm, 547.6 nm, 449.1 nm

Extraction of Building Infrastructure Using Soft-Copy Photogrammetric Techniques



Urban Infrastructure of Rosslyn, Virginia Derived Using Soft-Copy Photogrammetric Techniques

