

INTRODUCTION TO PHOTOGRAMMETRY

Center for Photogrammetric Training
Ferris State University

RCB

DEFINITION

✦ Art, science, and technology of obtaining reliable information about physical objects and the environment through processes of recording, measuring, and interpreting photographic images and patterns of recorded radiant electromagnetic energy and other phenomenon

Photogrammetry

- ✦ Ideal technology when measuring objects such as
 - ◆ Irregular shapes
 - ◆ Moving shapes
 - ◆ Inflated shapes
 - ◆ Objects that are too
 - Hot or cold
 - Soft
 - Delicate
 - Inaccessible
 - Toxic
 - Radioactive to touch

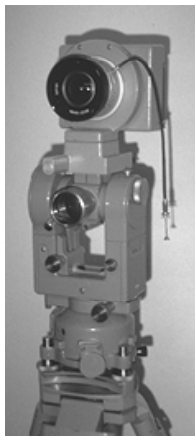
METRIC PHOTOGRAMMETRY

- ✦ Making precise measurements from photos and other sources to determine relative location
- ✦ Three basic applications
 - ◆ Aerial
 - ◆ Terrestrial
 - ◆ Extra-Terrestrial

INTERPRETATIVE PHOTOGRAMMETRY

- ✦ Recognizing and identifying objects and judging their significance through careful and systematic analysis
- ✦ Two main applications
 - ◆ Photographic interpretation
 - ◆ Remote sensing

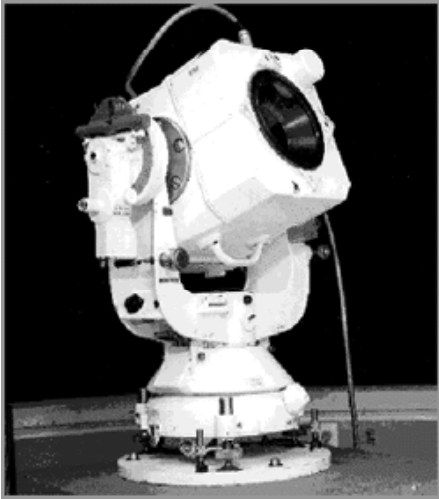
TERRESTRIAL PHOTOGRAMMETRY



- ✦ Taken with ground-based cameras
- ✦ Position and orientation often measured



BC4 BALLISTIC PLATE CAMERA



TERRESTRIAL PHOTOGRAPHIC STEREOPAIR



AERIAL PHOTOGRAPHY

- ✦ Vertical – camera axis as nearly vertical as possible
- ✦ Oblique – camera axis intentionally tilted
 - ◆ Low oblique
 - ◆ High oblique

VERTICAL
PHOTO



HIGH OBLIQUE



LOW OBLIQUE



EXTRATERRESTRIAL PHOTOGRAPHY

Extraterrestrial – pictures taken from space-based cameras

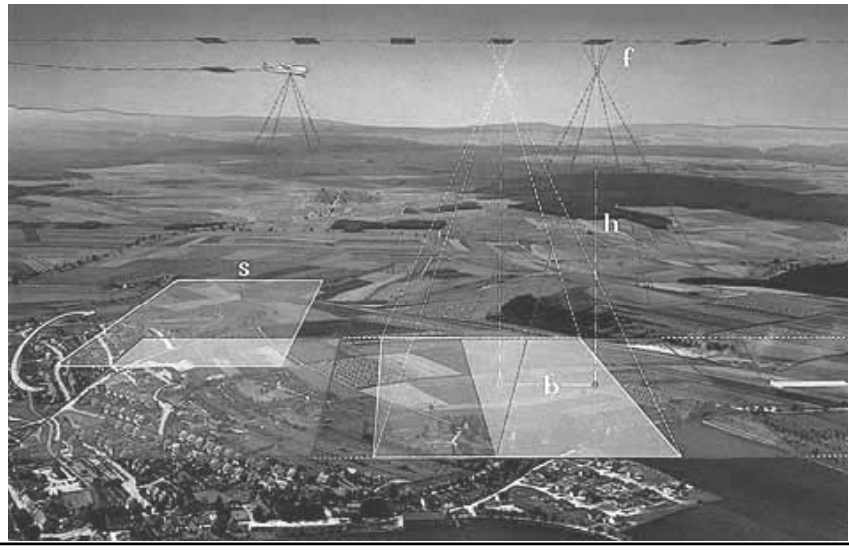


Apollo-Saturn 4

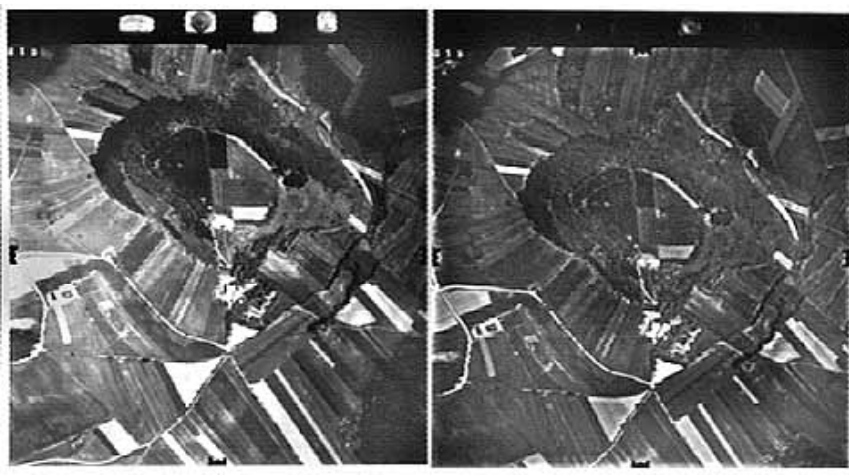
TAKING VERTICAL AERIAL PHOTOGRAPHS

- ✦ Photos taken in parallel flight strips
- ✦ Each successive photograph overlap previous photo
 - ◆ Called end lap or overlap – usually 60%
 - ◆ Area of common coverage called stereoscopic overlap area
 - ◆ Overlapping pair of photos called a stereopair

TAKING VERTICAL AERIAL PHOTOGRAPHS



STEREOPAIR



TAKING VERTICAL AERIAL PHOTOGRAPHS

- ✦ Position of camera at each exposure called exposure station
- ✦ Flying height – altitude of camera
- ✦ Adjacent flight strips overlap
 - ◆ Called side lap
- ✦ Block of photos – photos of 2 or more side lapping strips

APPLICATIONS OF PHOTOGRAMMETRY

- | | |
|--|---------------------------------------|
| ✦ Topographic mapping | ✦ Astronomy |
| ✦ Orthophotography <ul style="list-style-type: none">◆ Equivalent to planimetric map | ✦ Mapping (tax maps, soil maps, etc.) |
| ✦ Digital elevation model (DEM) <ul style="list-style-type: none">◆ Numerical representation of topography | ✦ Architecture |
| | ✦ Archaeology |
| | ✦ Traffic accident investigation |
| | ✦ Medicine/dentistry |
| | ✦ GIS |
| | etc... |