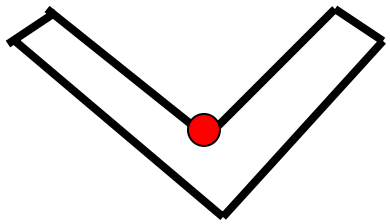
Homework 2

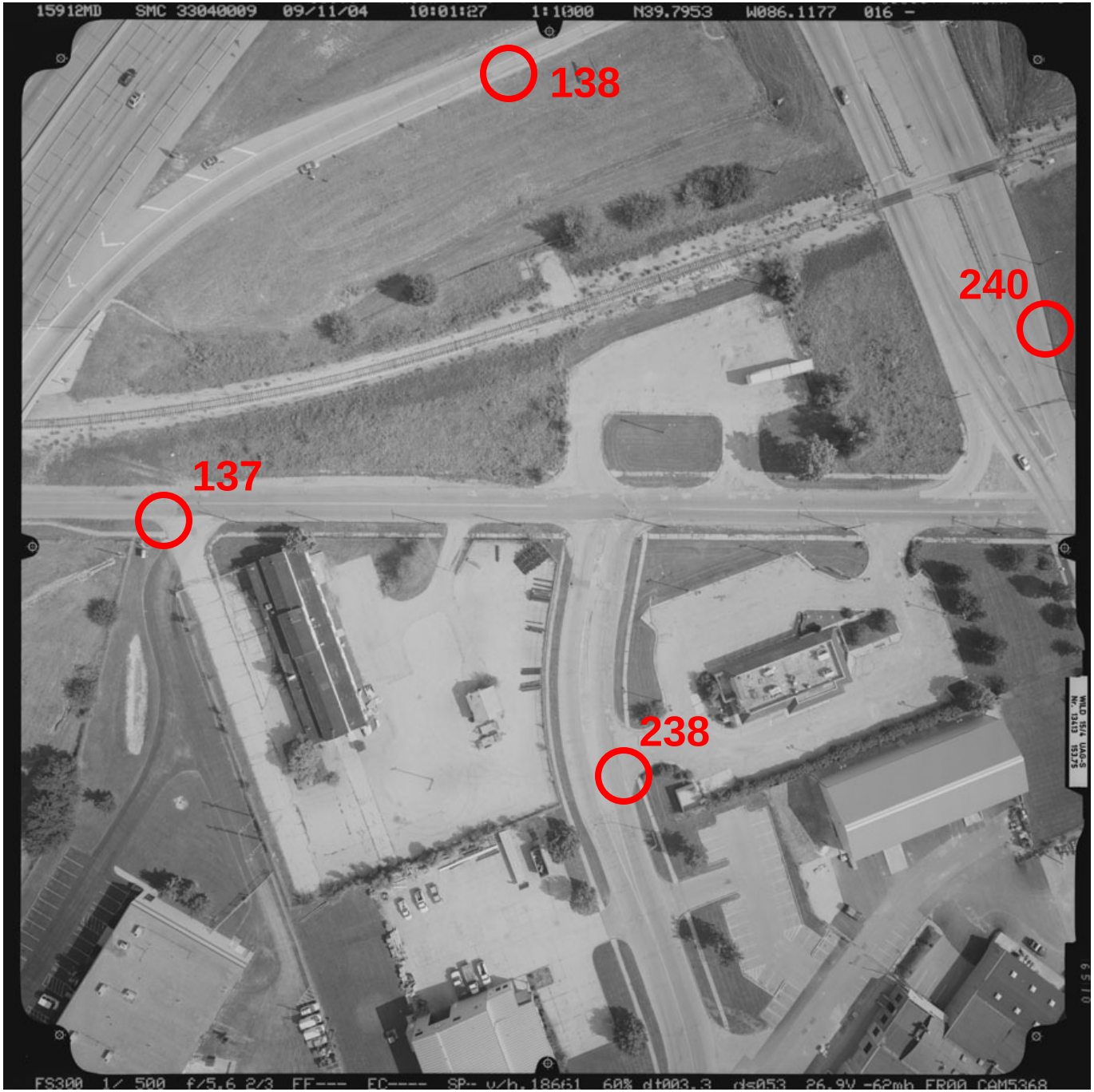
•Retrieve the photo 16_3.tif by anonymous ftp at ftp.ecn.purdue.edu , then go to folder “bethel” – or map the drive \\geomatics.ecn.purdue.edu\data, and go to folder share\bethel\ce503\i70

•Find an application where you can view an image, zoom, pan, and measure image coordinates (photoshop is a good one: make sure to set measurement units to PIXELS). The scanned image has same orientation as the drawing at the back of the USGS calibration report.

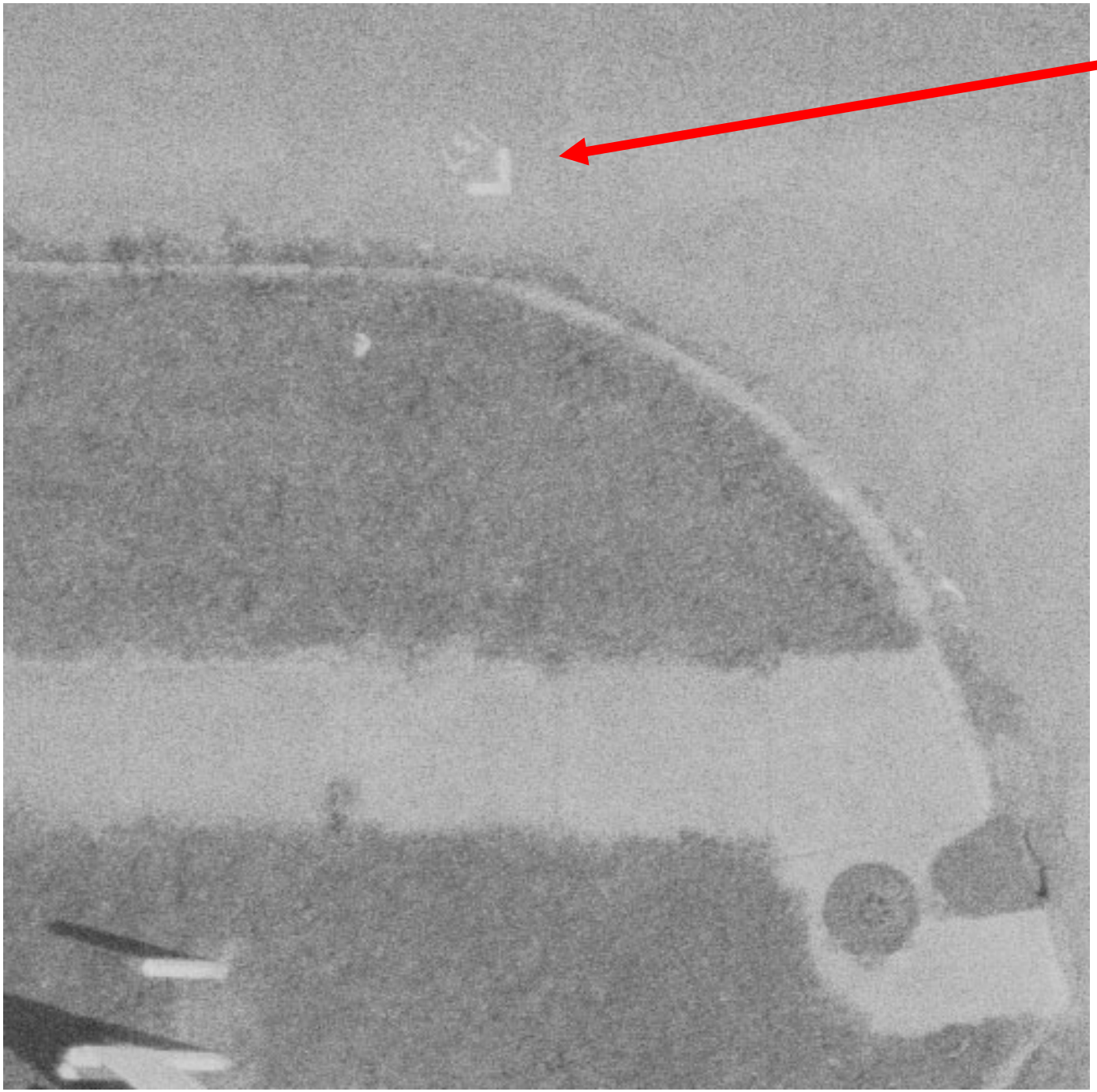
•Measure the 8 fiducial marks

•Using the approximate photo locations shown on the following page, measure the 4 control points which fall on this photo. Note the targets (“pre-marked” or “signalized”) are small painted chevrons usually on asphalt surface. The point is the INSIDE corner of the chevron.




15912MD SMC 33040009 09/11/04 10:01:27 1:1000 N39.7953 W086.1177 016 -
138
240
137
238
FS300 1/ 500 f/5.6 2/3 FF--- EC---- SP-- v/h,186&1 60% dt003.3 d=053 26.9V -62mb ER00 CAM5368

Ground views of point 137

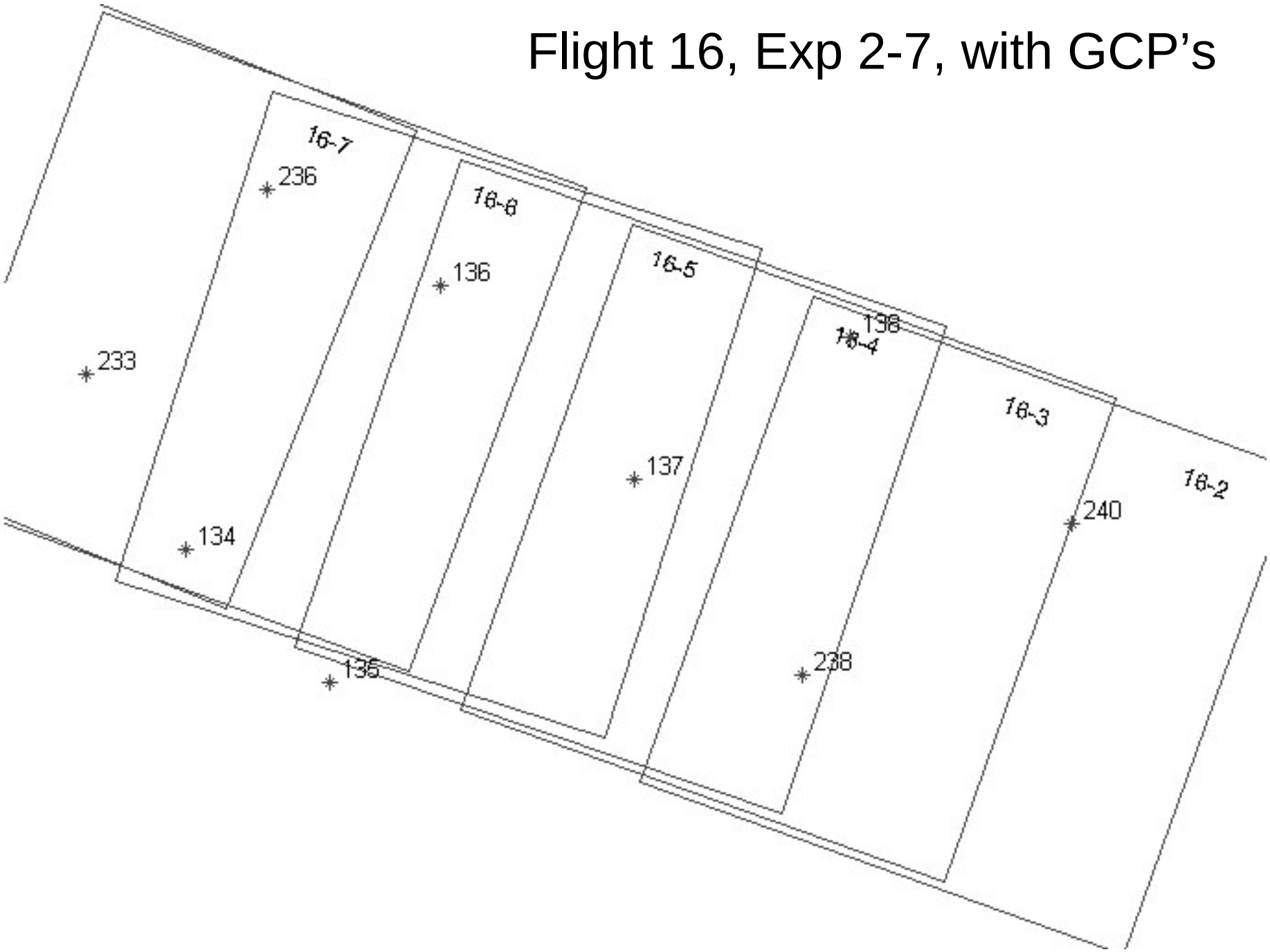


Zoomed
view of point
137 from
image 16-3

Computations

- Make a least squares estimate of the 6 transformation parameters, transforming calibrated fiducial coordinates into observed pixel coordinates
- Invert the transformation and apply to the measured values to put them into the fiducial system.
- Apply offsets to the point of symmetry
- Compute corrections for radial lens distortion, decentering lens distortion, and atmospheric refraction (mean terrain elevation = 800 ft., flying height = 500 ft. above terrain)
- Apply corrections to obtain refined image coordinates in units of millimeters
- Next part will be projecting the ground coordinates into the image to check consistency of your work.
- See the tutorial about image coordinate refinement under Notes.

Flight 16, Exp 2-7, with GCP's



Homework 2, 2nd part

- Find the files *i70_expsta_m.txt* and *i70_gcp_m.txt* in the *i70* folder on the *geomatics* drive. Note that all dimensions are now in meters.
- Get the ground coordinates of the 4 control points, get the exterior orientation elements for photo 16-3, and, using the collinearity equations, project the 4 points into image space.
- Compare this result with result from first part of this homework. Comment on the size of the discrepancies.
- This second part due on Friday, 23-Sep.