Block Processing

Project specs, flight plan, CP plan

Image Acquisition, CP Surveying

Pass point selection

Measurement: fiducial marks, pass points (mono/stereo), control points

Image coordinate refinement: pixel-fiducial transformation, lens dist., atmos. refr.

Debug: minimally constr. Bundle, partial block, single iteration, L1, IRLS

Edit / Remeasure

Final Adjustment: constrain with all C.P.'s, error propagation

Applications: stereo extraction (terrain, features, maps, coordinates), rectifications (simple, orthographic, "true" ortho), controlled mosaics, visualization products (perspective view, image drape), image / vector overlay, GIS

Flight Map for Campus Photos

Altitude 2000 ft. above terrain
2620 ft. above MSL

4 LINES
12 Exp. per Line
80% Forward Overlap
60% Side Overlap
Photo Scale $\frac{1}{4000}$ OR 1" = 333'

North →

need: Color diapositives
color prints
— J. Bethel 494-6719

Scale: 1:4000

$f = 152.4$ mm

220 mm

$0.4 \times 880 = 352$

352 m

40%   60%

880 m

Overlap Calculations

60% side overlap

176 m

220 mm

$0.2 \times 880 = 176$

20%   80%

880 m
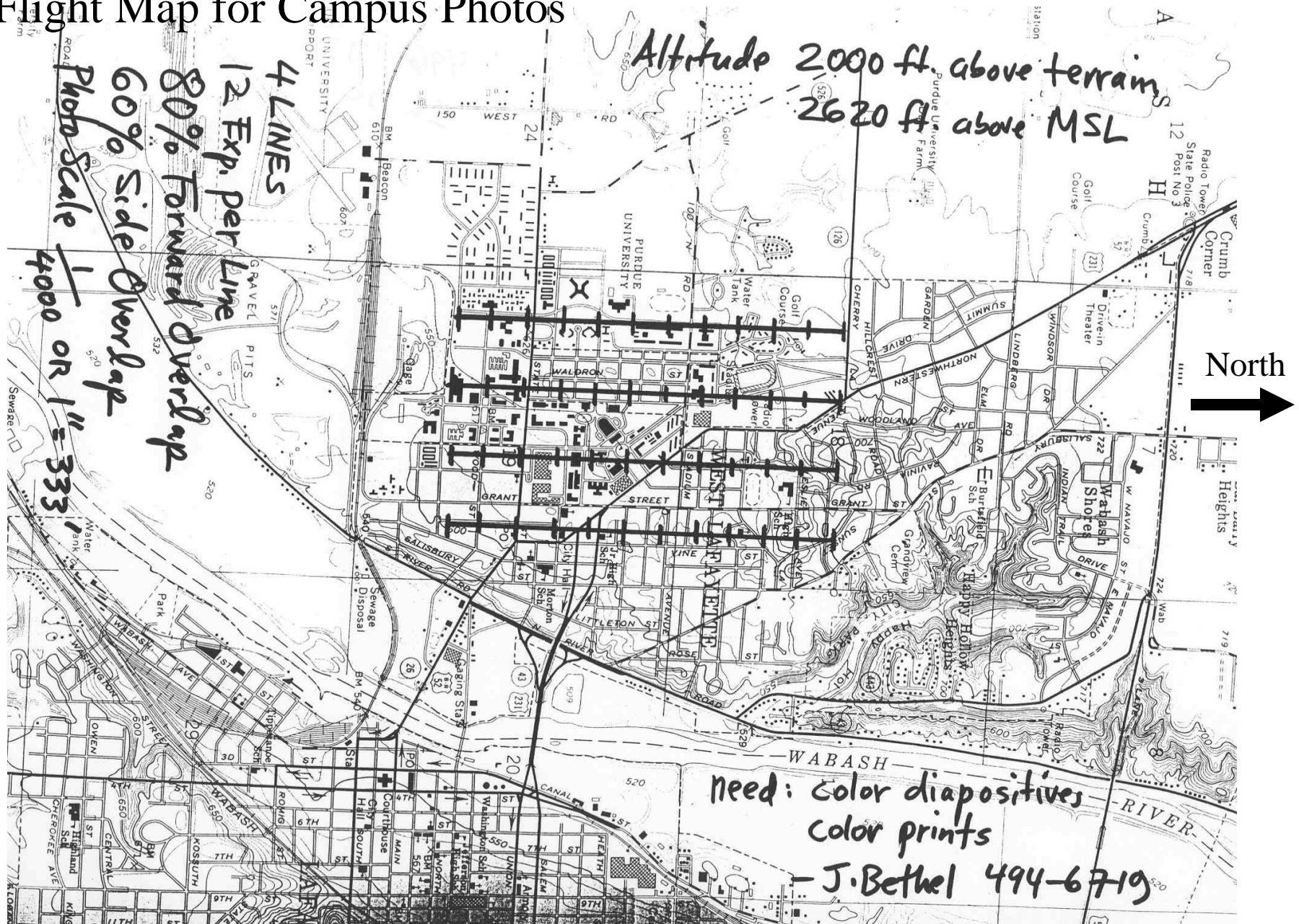
80% forward overlap
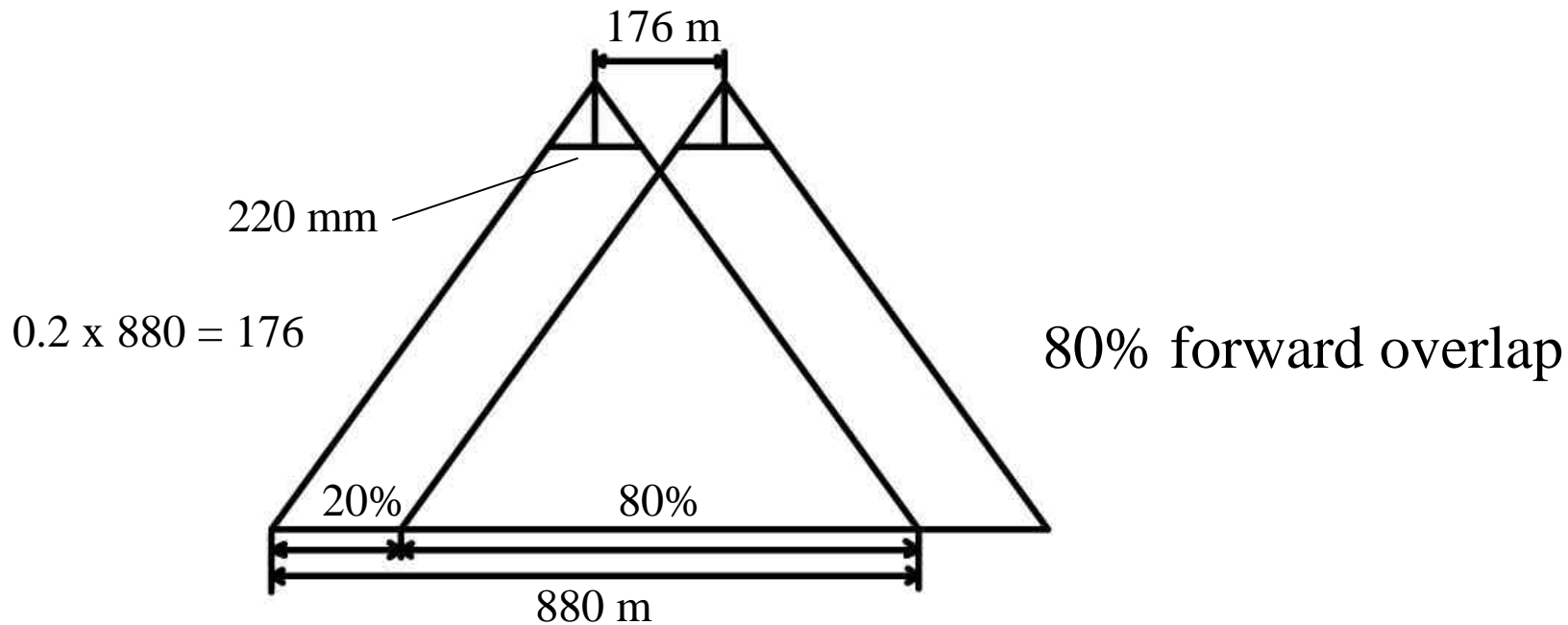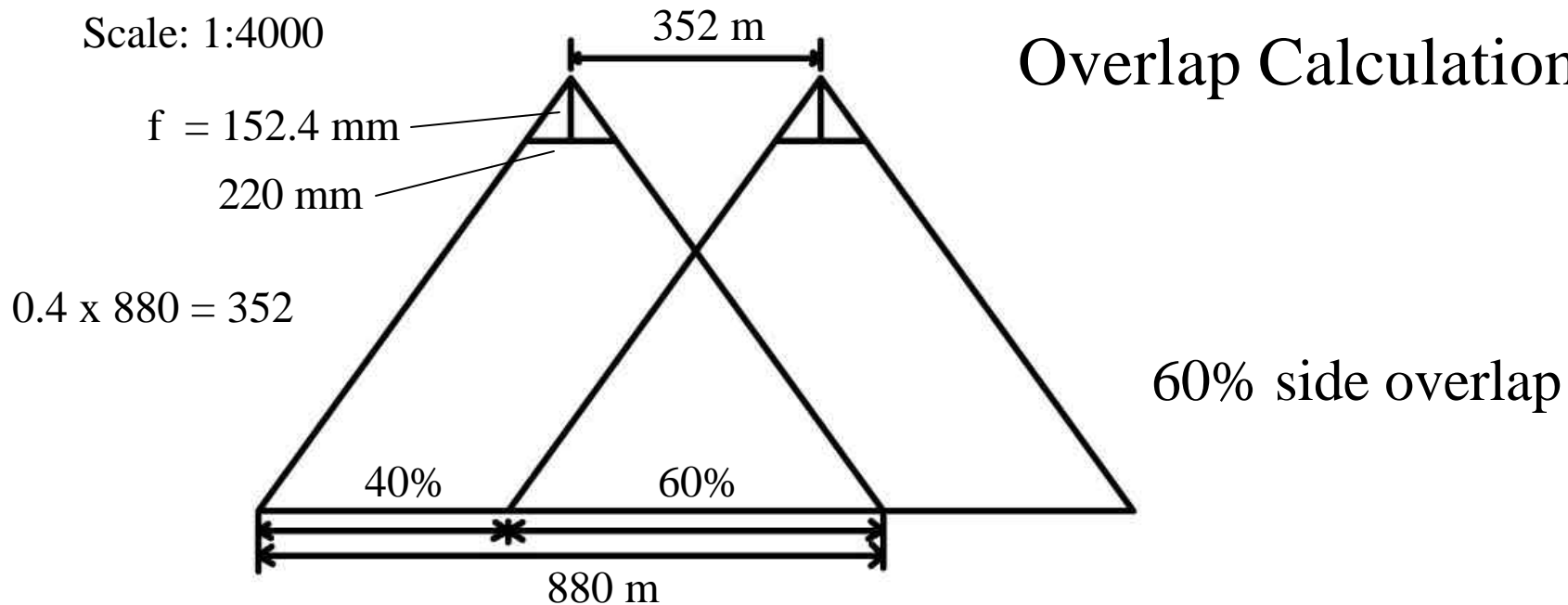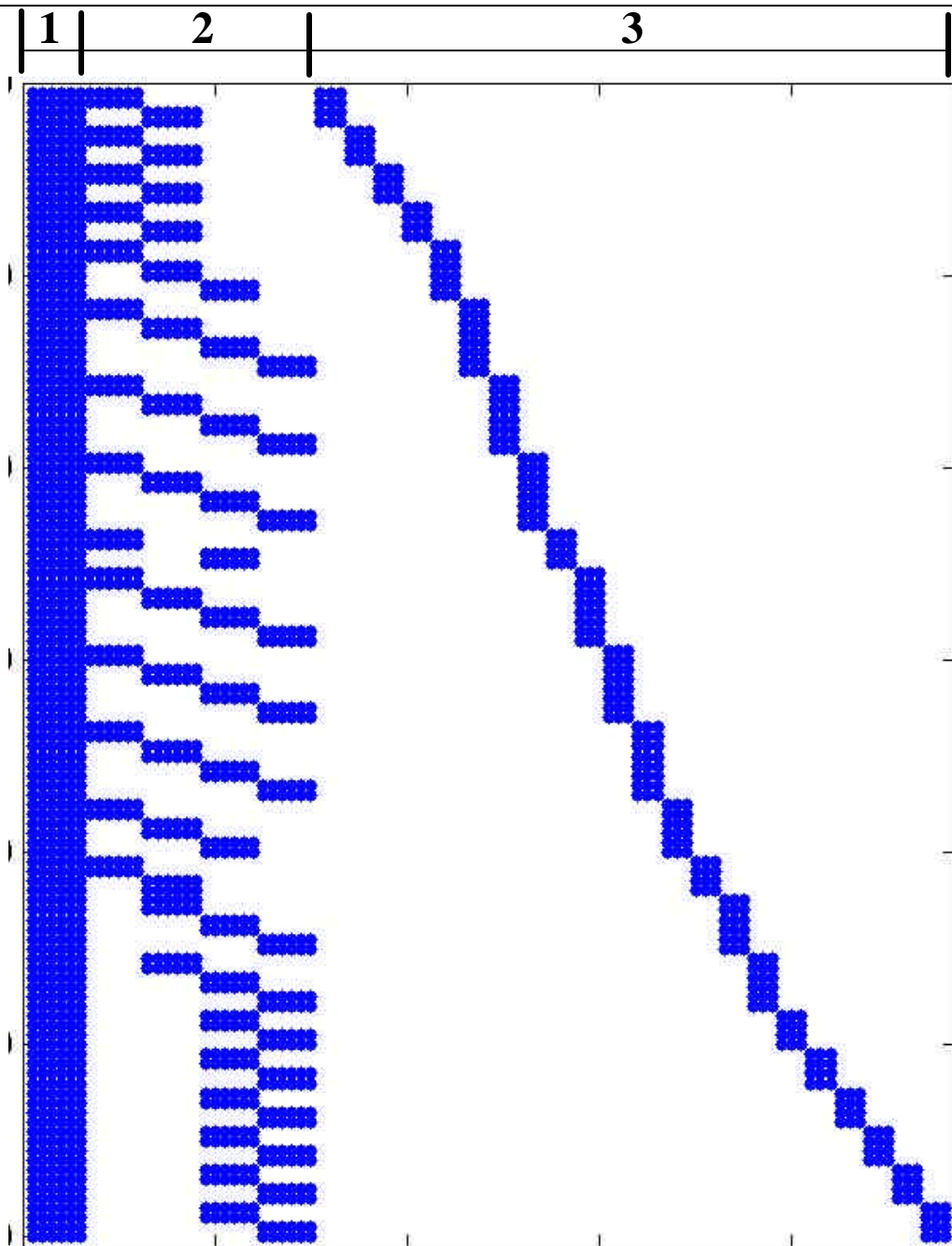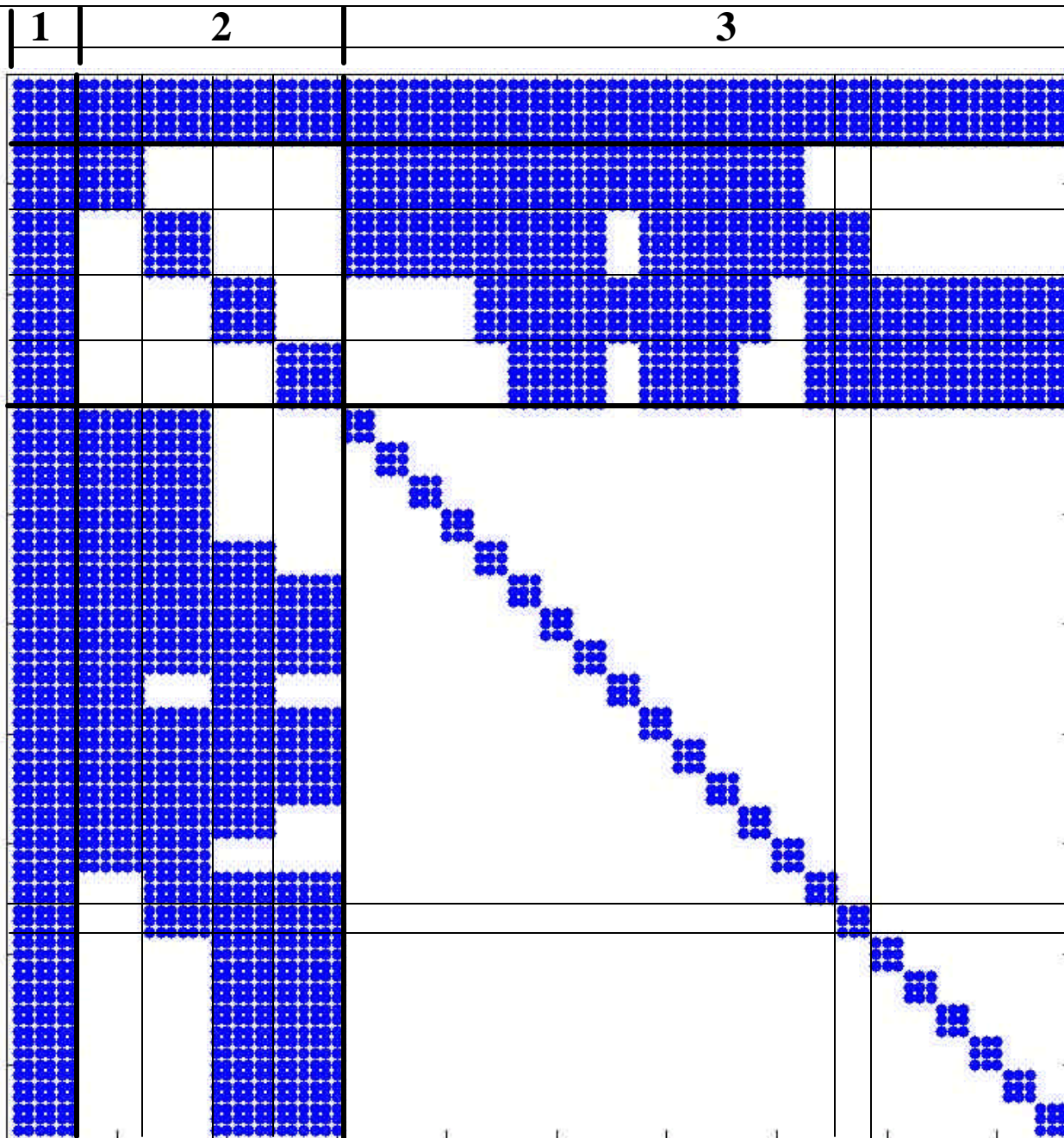
Leica (Wild) RC-10

Newer versions RC-20, RC-30 have useful features such as forward motion compensation (FMC), shutter event signal for GPS, and software controlled film labeling.

Structure of B-matrix,

4-photos, 22-points

Parameter Groups

1. Internal camera parameters

2. Exterior orientation parameters, 6 per photo
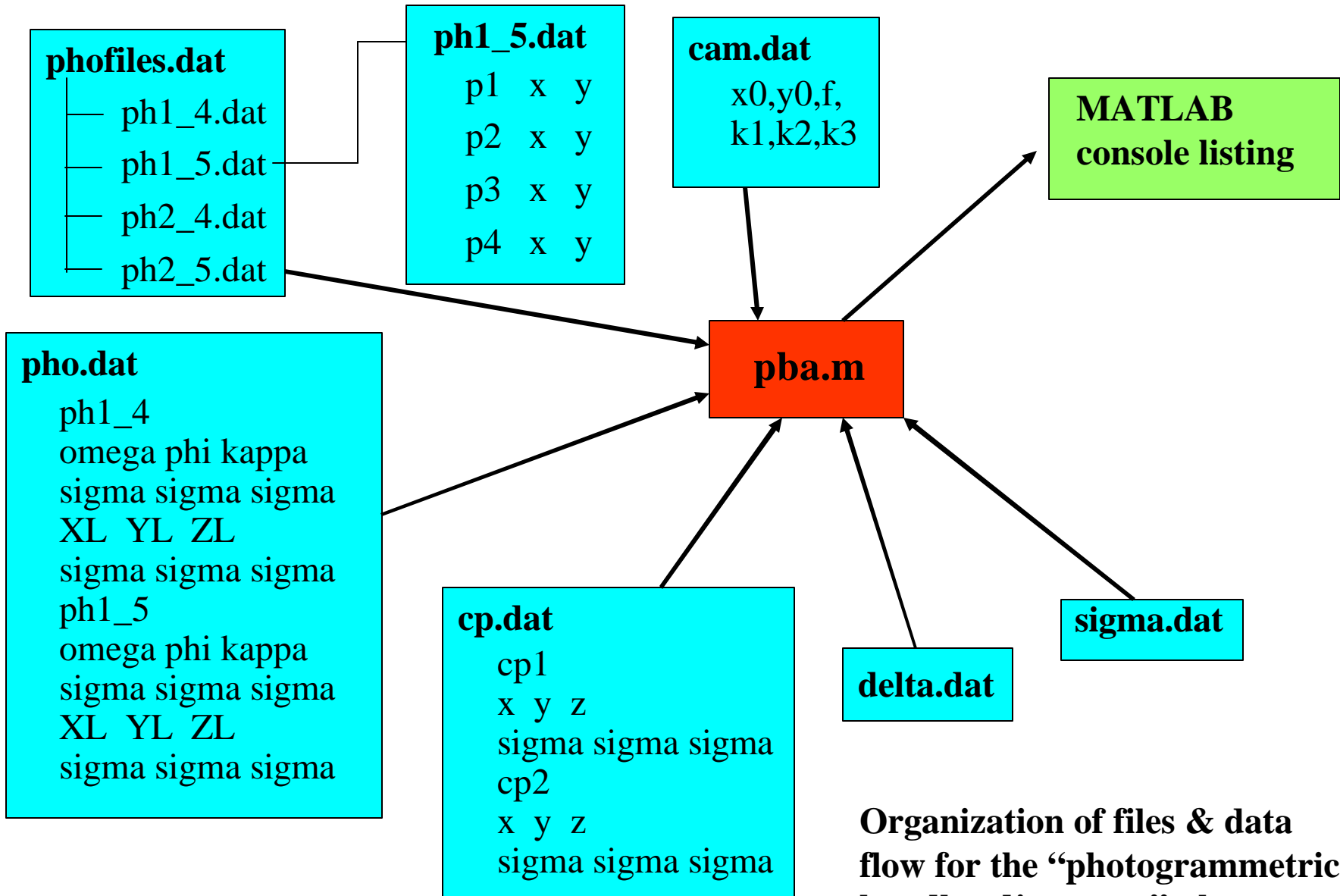
3. Object point parameters, 3 per point

Structure of N-matrix

(B^TWB)

Same parameter groups

6 x 6 photo blocks

3 x 3 point blocks

6 x 3 off-diagonal block
if that point occurs on
that photo

phofiles.dat
— ph1_4.dat
— ph1_5.dat
— ph2_4.dat
— ph2_5.dat

ph1_5.dat
p1　x　y
p2　x　y
p3　x　y
p4　x　y

cam.dat
x0,y0,f,
k1,k2,k3

MATLAB console listing

pba.m

pho.dat
ph1_4
omega phi kappa
sigma sigma sigma
XL　YL　ZL
sigma sigma sigma
ph1_5
omega phi kappa
sigma sigma sigma
XL　YL　ZL
sigma sigma sigma

cp.dat
cp1
x　y　z
sigma sigma sigma
cp2
x　y　z
sigma sigma sigma

delta.dat

sigma.dat

Organization of files & data flow for the "photogrammetric bundle adjustment" pba.m program