

# New Features in TerraScan

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# Version 006.xxx

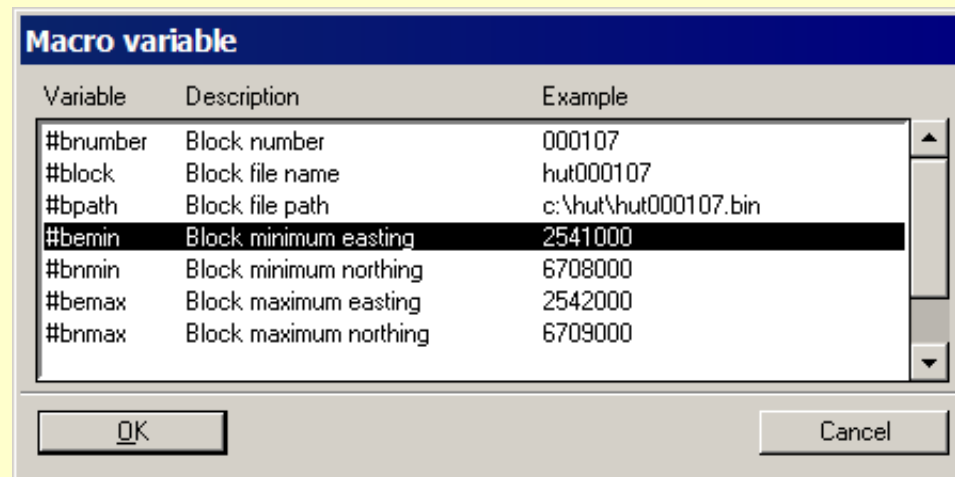
- Released at start of January 2006
- Requires new license keys
- All applications

# Various improvements

- *Classify Using Brush* fixed not to leave a trail
- **Only every** setting in **Draw into design** for drawing only every n:th point
- *Load Airborne Points* and *Load Ground Points* keyin command accept a parameter specifying file to load
- Increased maximum number of attachments per cross arm from 8 to 12
- **Output points** in macros allows selection of multiple classes
- **Tools / Renumber trajectories** menu command for renumbering trajectories with increasing numbers

# Coordinates into output file name

- **Output points** action in macros can incorporate block bounding coordinates as part of file name



The image shows a dialog box titled "Macro variable" with a table of variables. The table has three columns: "Variable", "Description", and "Example". The row for "#bemim" is highlighted.

Variable	Description	Example
#bnumber	Block number	000107
#block	Block file name	hut000107
#bpath	Block file path	c:\hut\hut000107.bin
#bemim	Block minimum easting	2541000
#bnmin	Block minimum northing	6708000
#bemax	Block maximum easting	2542000
#bnmax	Block maximum northing	6709000

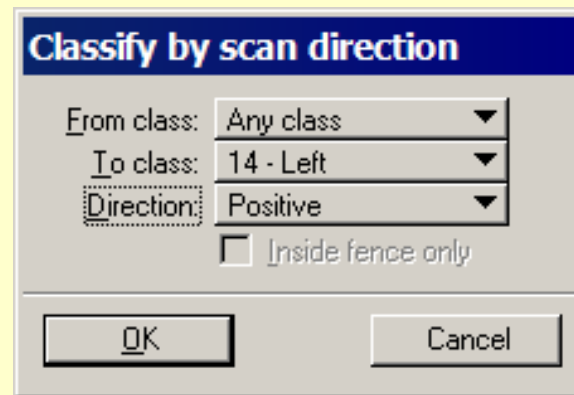
At the bottom of the dialog box, there are two buttons: "OK" and "Cancel".

# Sorting in control report

- Sort control points:
  - By deviation – most different first
  - By dz – largest positive dz first
  - By magnitude – largest absolute dz first
  - By number – numbering order
  - By easting – easting order
  - By northing – northing order
- Find unusable control points fast

# Classify / By scan direction

- Classifies points in negative scan direction, positive scan direction or edge points
- Requires LAS format as input



# *Create Span Tiles* tool

- Creates tile rectangles for powerline tower spans
- Options for both orthonormal and rotated tiles

**Create Span Tiles**

Draw rotated tiles Level: 21 ■

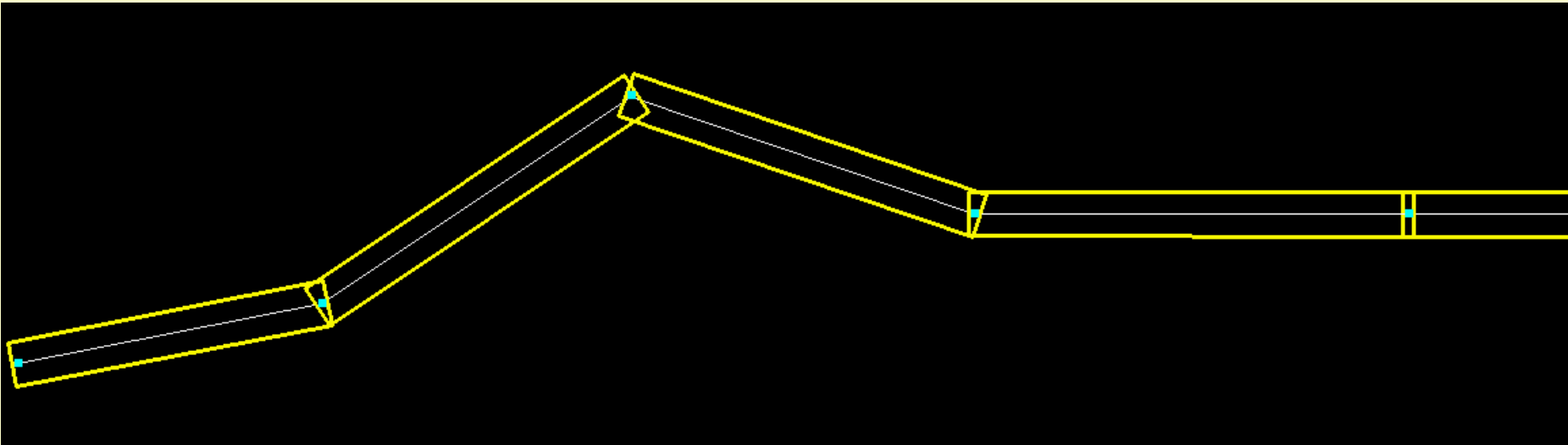
Draw orthonormal tiles Level: 22 ■

Width: 20.00 m on both sides

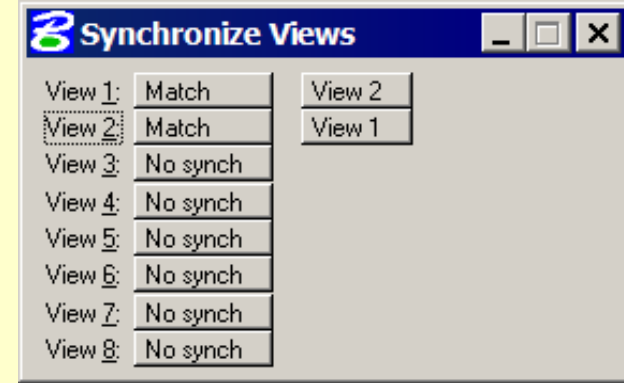
Extend: 5.00 m past tower

Pixel size: 0.100 m

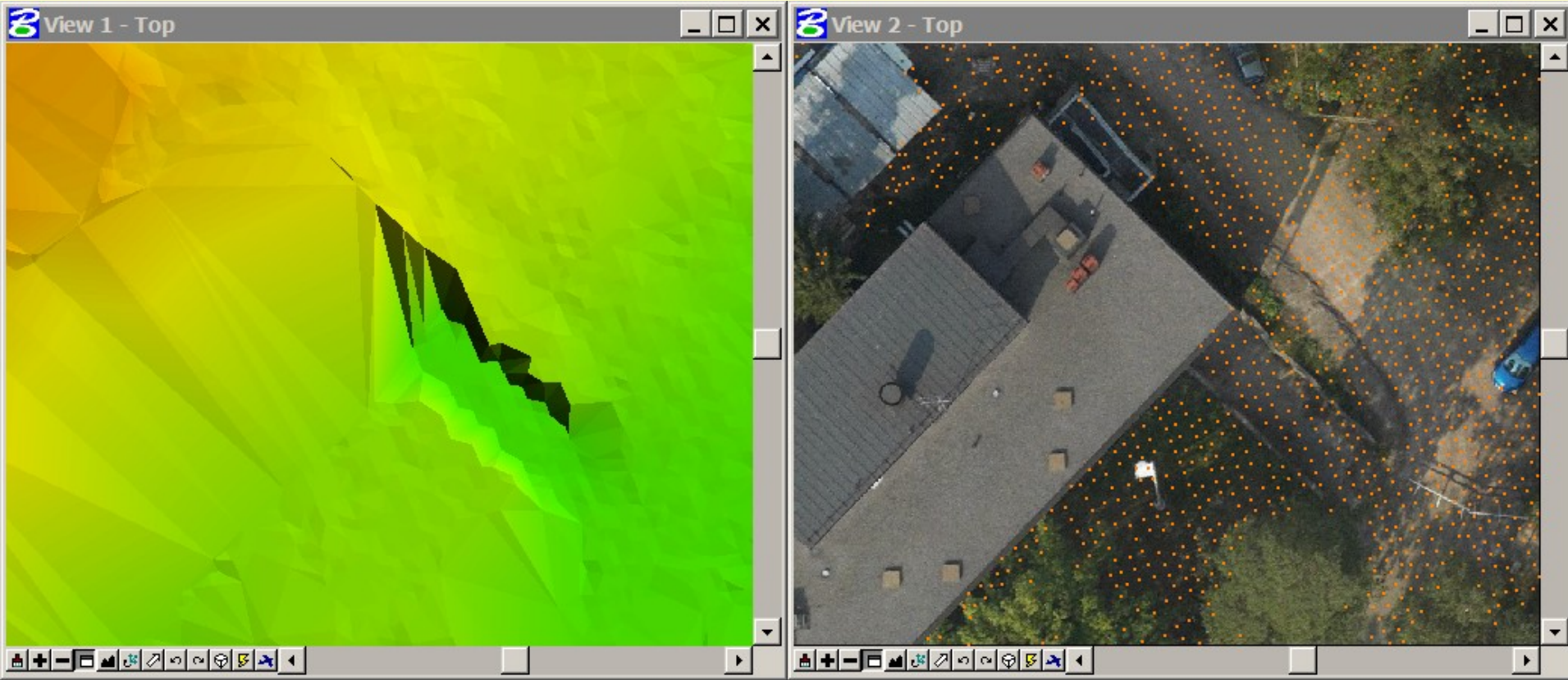
OK Cancel



# *Synchronize Views* tool



- Set up views to automatically display the same location possibly using different view rotations





# *Define Project* improvements

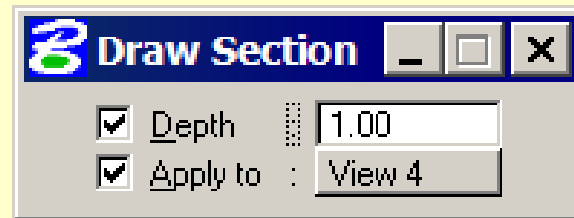
- Two window sizes: **Short list** or **Long list** from **View** pulldown menu
- **Draw boundaries** can place block number or name as text element
- Ability to import points into selected blocks only
- **Identify** pushbutton lets you select multiple blocks graphically (CTRL key down)
- **Identify** can select blocks overlapping selected polygons (select polygons before clicking **Identify**)
- Sort project blocks **By name**, **By number**, **By point count**, **North to south**, **South to north**, **West to east** or **East to west**
- **West to east** and **East to west** numbering directions

# *Define Project* improvements

- Upto 5000 vertices for block boundaries
- Project definition can specify a trajectory directory to be loaded automatically together with the project
- **Transform boundaries** menu command for applying a coordinate transformation to project block boundary vertices
- Support for read only blocks
- Support for block files located in different directories
- **Deduce using time** option for assigning flightline numbers when importing into project

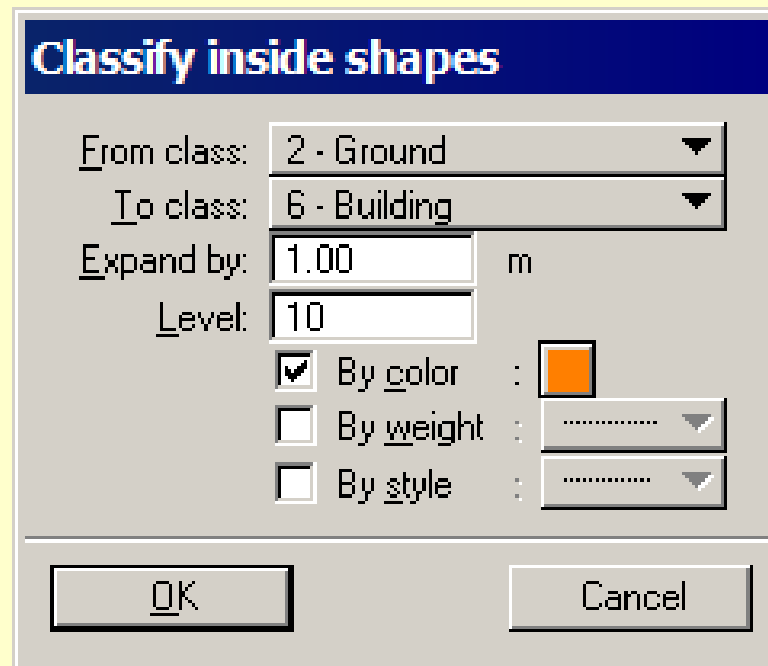
# *Draw Section* improvement

- **Apply to** option reduces one mouse click when repeatedly drawing a cross section into same view



# Classify / Inside shapes macro step

- Classifies points inside closed elements on a given level in the active design file
- Optional element filtering by symbology



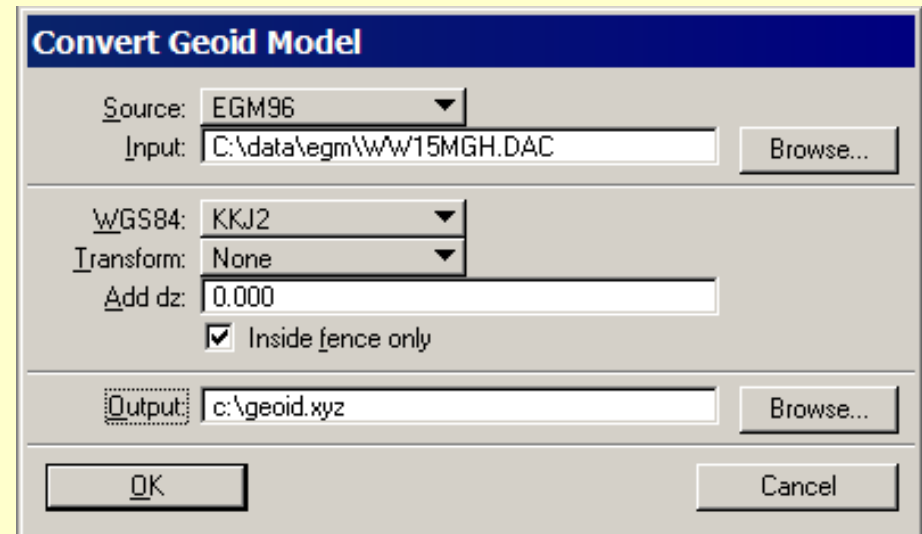
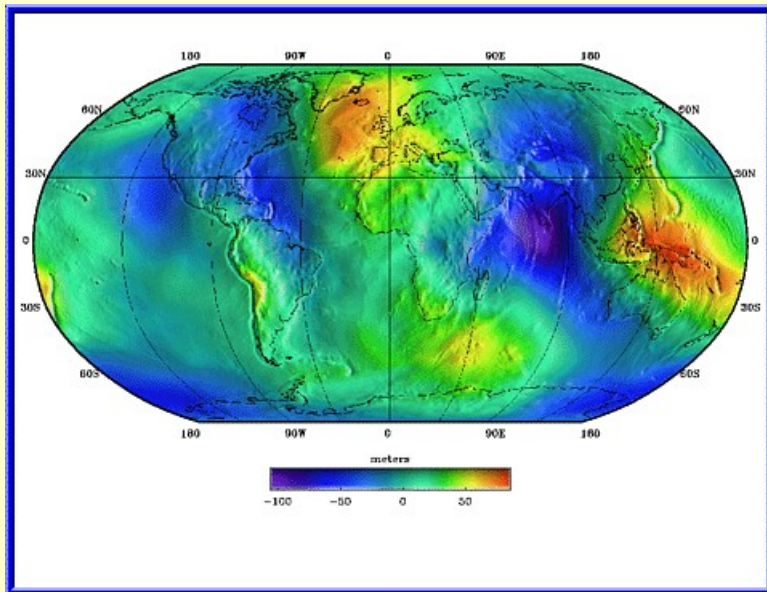
# Classify Inside shapes keyin

- Classifies points inside selected shapes

`Classify Inside Shapes from=5/to=6/expand=1.0`

# EGM96 support

- **Tools / Convert geoid model** extracts geoid correction information from EGM96
- **Download ww15mgh.dac** from <http://earth-info.nima.mil/GandG/wgs84/gravitymod/egm96/binary/binarygeoid.htm>

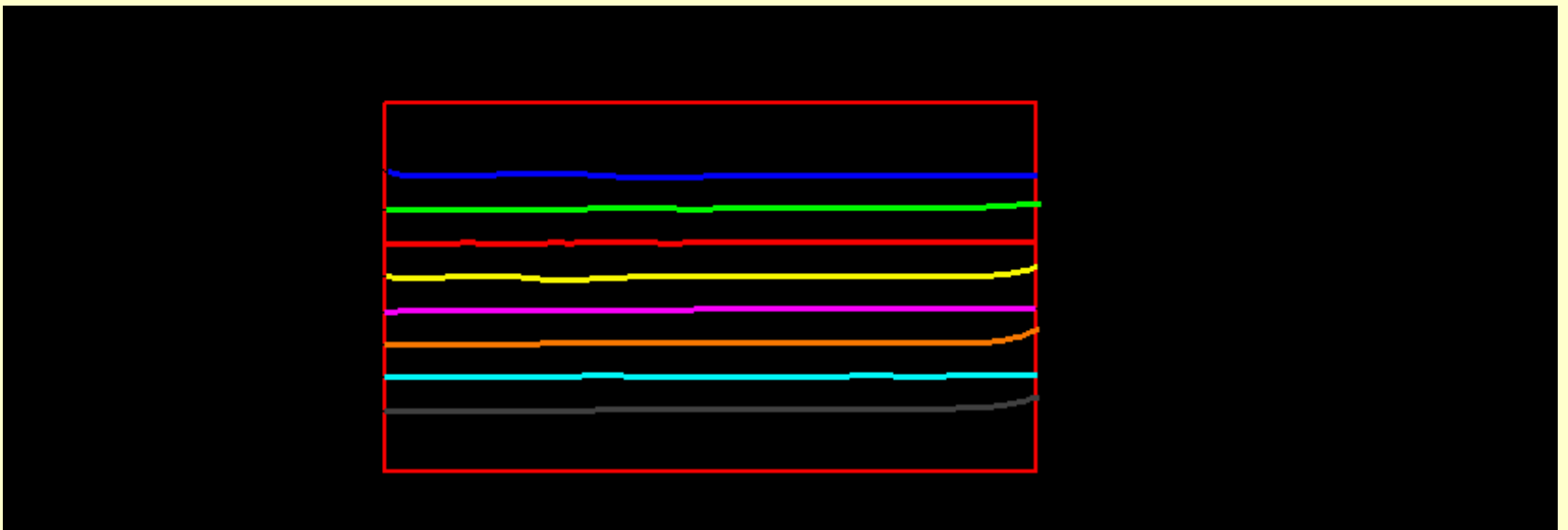
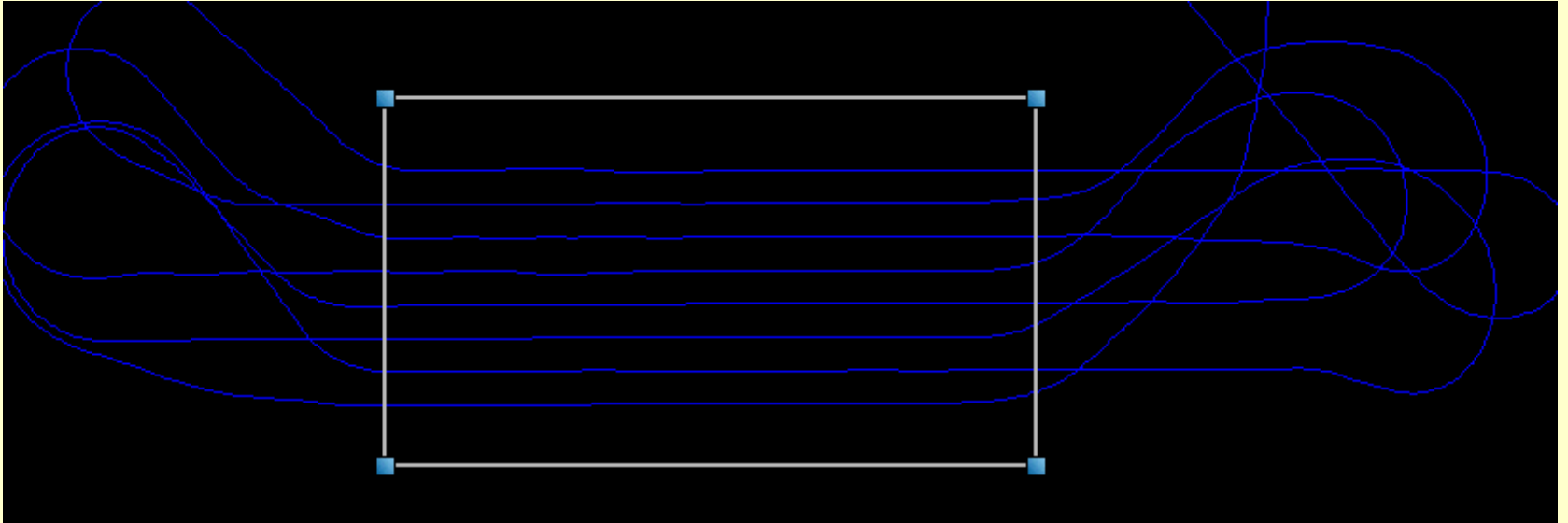


A screenshot of the 'Convert Geoid Model' dialog box. The dialog has a blue title bar and a grey background. It contains the following fields and controls:

- Source:** A dropdown menu set to 'EGM96'.
- Input:** A text box containing 'C:\data\egm\ww\15MGH.DAC' and a 'Browse...' button to its right.
- WGS84:** A dropdown menu set to 'KKJ2'.
- Transform:** A dropdown menu set to 'None'.
- Add dz:** A text box containing '0.000'.
- Inside fence only:** A checked checkbox.
- Output:** A text box containing 'c:\geoid.xyz' and a 'Browse...' button to its right.
- OK** and **Cancel** buttons at the bottom.

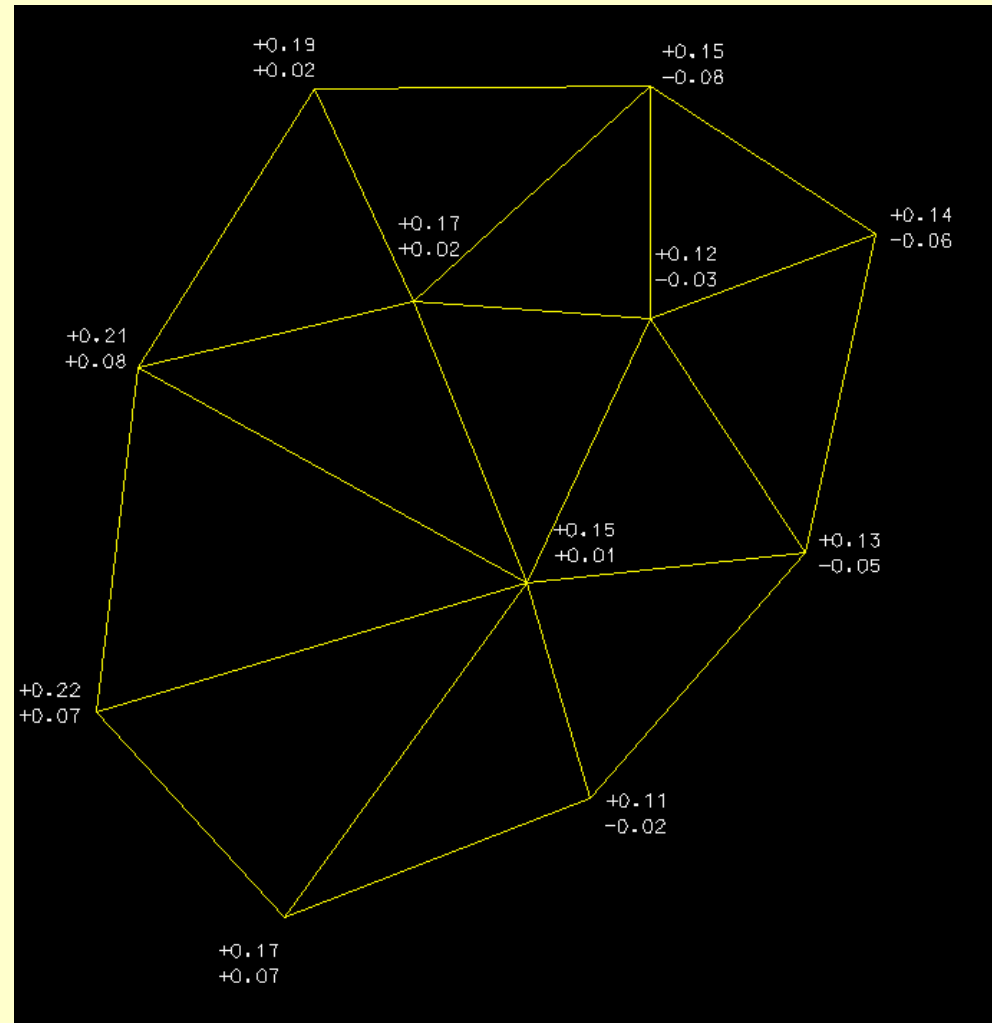
# Cut outside polygons

- Splits trajectories using bounding polygons



# Adjust xyz

- **Adjust xyz** command in project window for applying a varying xyz correction
- Correction model is defined by a text file containing rows with five fields: X Y dX dY dZ
- Same step in macros as **Transform points** action with **Dxyz** type





# Improved building classification

- More reliable results
- Classifies hits on the roof
- Does not classify hits on walls, antennas etc
- **Z tolerance** most important parameter --> planarity
- Set **Use echo information** on if you see echo coloring

**Classify buildings**

Ground class: 2 - Ground ▼  
From class: 5 - High vegetation ▼  
To class: 6 - Building ▼

Inside fence only

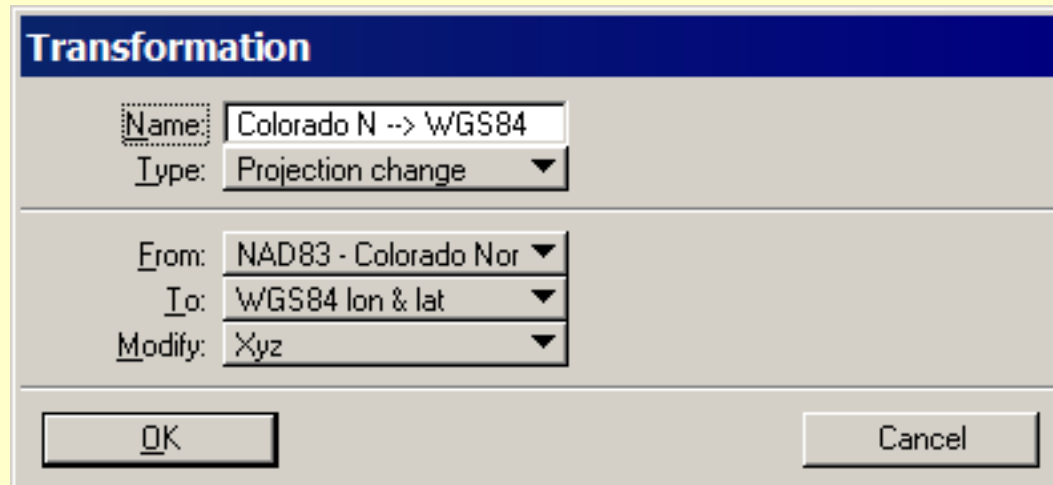
Minimum size: 40 m<sup>2</sup> building  
Z tolerance: 0.12 m

Use echo information

OK Cancel

# Conversion to longitude & latitude

- User defined file formats:
  - longitude and latitude field types
  - degree format selection: dd.ddddddd, ddmms.ssss or dd°mm'ss.ssss
- **Projection type** transformation can have WGS84 as target



**Transformation**

Name: Colorado N --> WGS84  
Type: Projection change

From: NAD83 - Colorado Nor  
To: WGS84 lon & lat  
Modify: Xyz

OK Cancel

# First point ID

- For producing output where each point in a project has a unique identifying number (64 bit integer)
- Used when outputting using:
  - Id E N Z
  - Id E N Z Pulse
- Pulse value is:
  - 1 = first of many / only echo
  - 2 = intermediate echo
  - 3 = last of many echo

**Project information**

Description

Scanner: Airborne

Description: Otaniemi 200m

First point id: 1

Storage: Scan binary 8 bit

Store time stamps

Store color values

Require file locking

Data file location

Data in: Project file directory

Directory: C:\data\hut200\laserout\

Point classes and trajectories

Load class list automatically

Class file: C:\data\hut200\hut200.ptc

Load trajectories automatically

Directory: C:\data\hut200\trajectory\

Block size

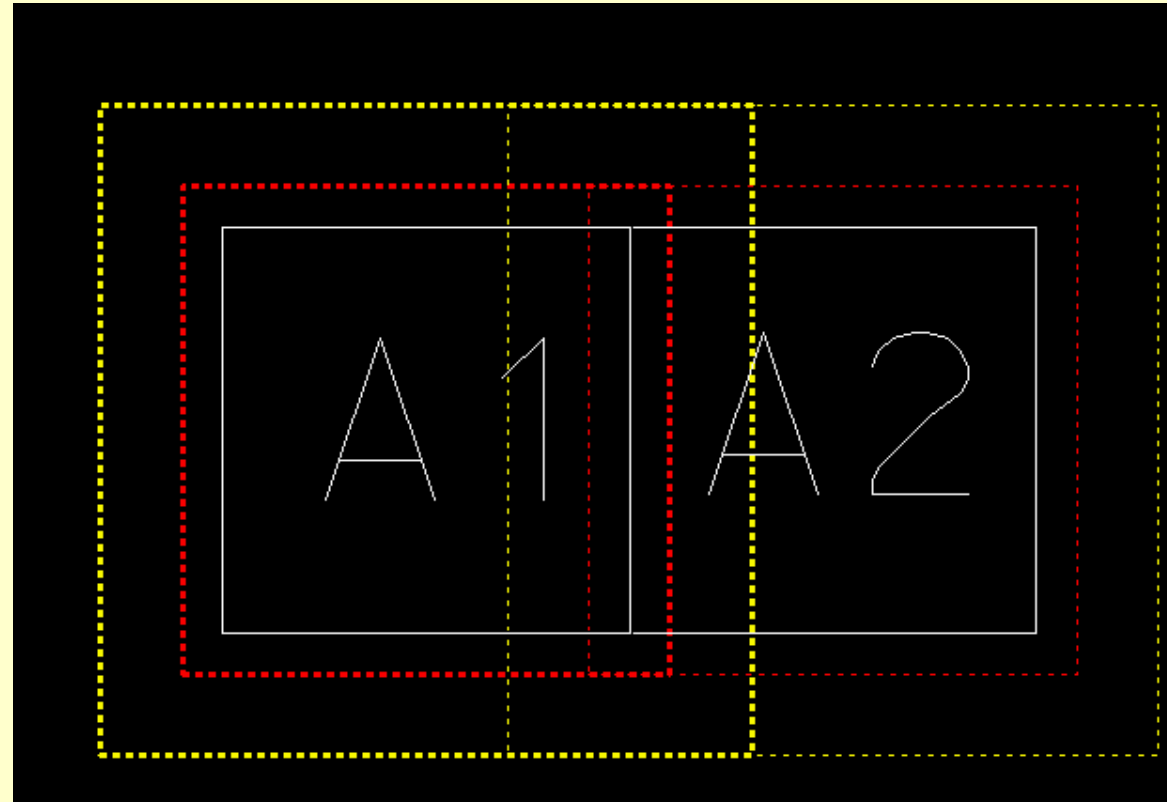
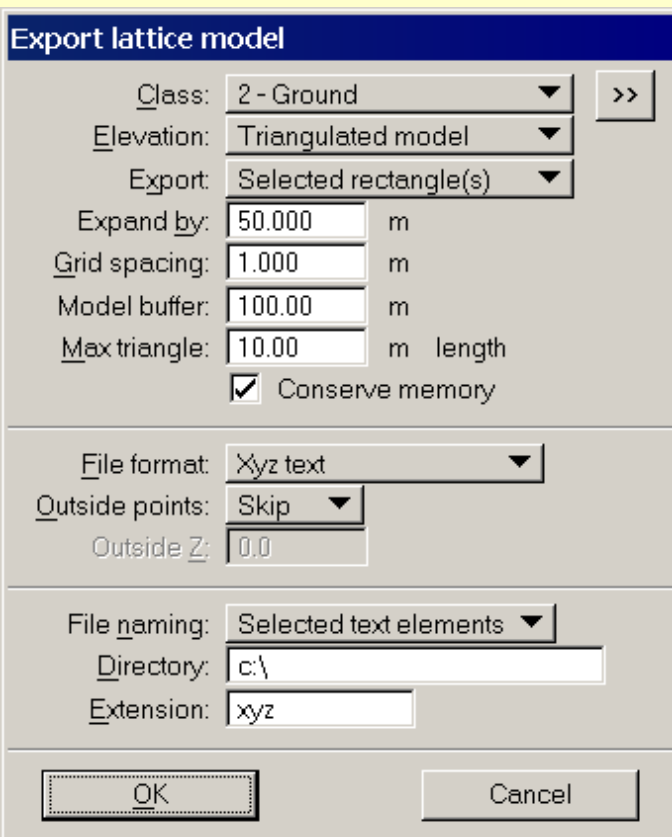
Default: 500 m

Preferred: 4000000 - 6000000 points

OK Cancel

# Lattice output from project

- **Conserve memory setting**
  - Runs slower
  - Less likely to run out of memory
- **Model buffer** setting when using triangulated model



# Full waveform

- Waveform data stored in separate read-only files
  - easy to support different manufacturer specific formats
- TerraScan uses flightline number and time stamp of a laser point to find waveform data
  - trajectory specifies waveform files for that flight pass

**Trajectory information**

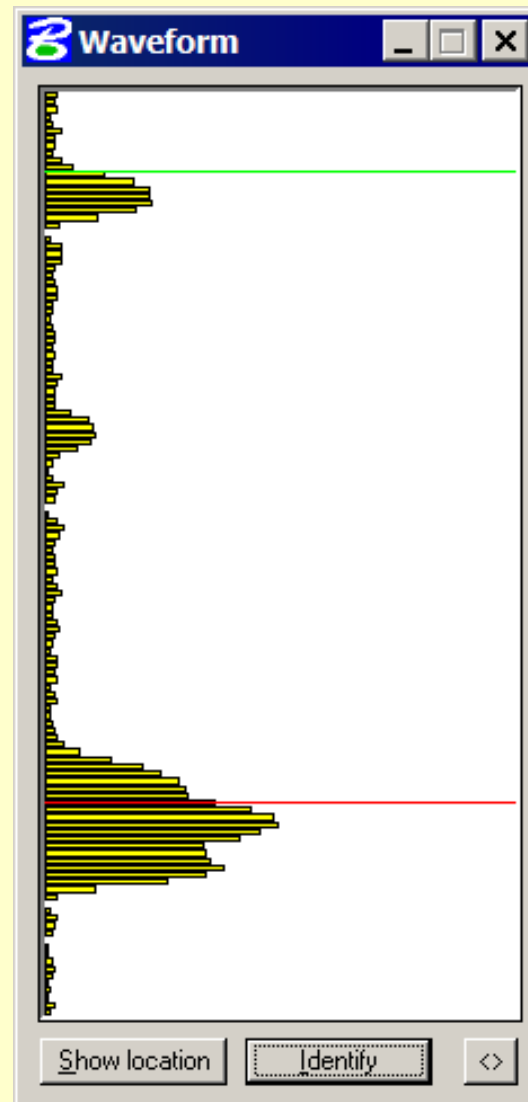
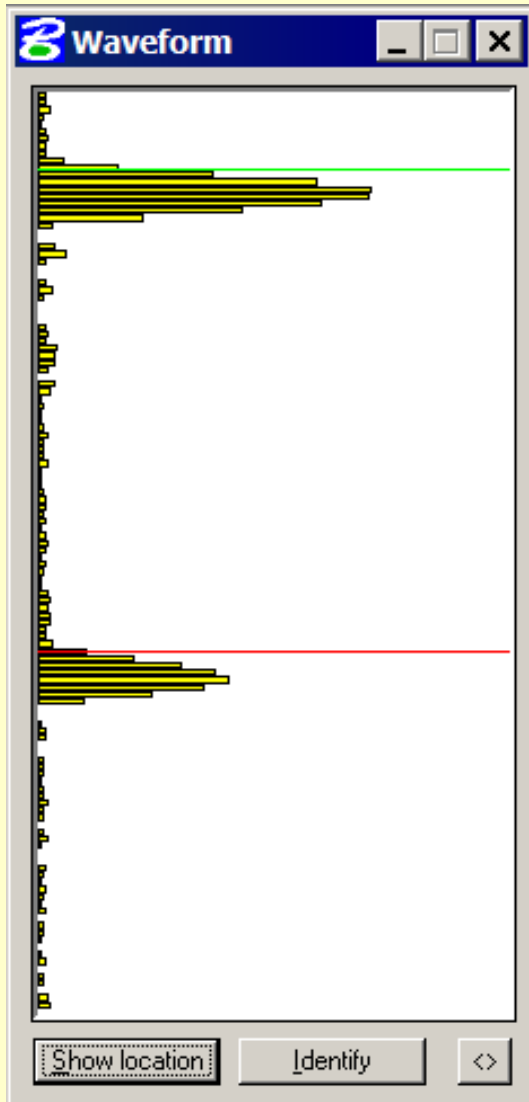
Number: 1  
Quality: Normal  
Description: 041028a\_4\_07f02.cte  
Start time: 392900.9998 sec  
End time: 393041.9998 sec

Video 1:   
Start time: 0.0000 sec   
End time: 0.0000 sec

Video 2:   
Start time: 0.0000 sec   
End time: 0.0000 sec

Waveform: ..\waveform\20041028\_151011\_\*.tew

# Full waveform



# Full waveform benefits

- Generation of additional points
  - user selects an area where more points are needed, for example a powerline location lacking wire hits
  - software analyzes waveforms and uses a more eager routine to extract points
- Generation of more accurate points
  - user selects an area and a surface material specific echo extraction logic
  - software generates new points or modifies the coordinates of system extracted points