

Quick Terrain Reader™

Getting Started

Introduction:

Consider the following multiple choice question:

Large 3-D LiDAR terrain models are:

- A.) Extremely valuable sources of geospatial information
- B.) Too large to view in their entirety and in real time.
- C.) Impossible to share with a large audience.
- D.) Exclusively in the domain of technical experts.
- E.) All of the above.

Unfortunately, many geospatial experts would answer E.) to the question above. While the analytical value of large terrain models is a given, these models are notoriously difficult to work with and to share. Applied Imagery would like to eliminate these preconceived notions one by one.

Too large?

The Quick Terrain Reader exists for one purpose: to visualize enormous 3-D models. Typically, these models are a result of LiDAR or SAR terrain surveys and are comprised of millions of points in 3-D space. The Quick Terrain Reader can load surface models up to 200 million points, (200km² at 1 meter spacing) or point clouds up to 100 million points in seconds and navigate through them in real time. Note: Models run in RAM, so maximum model sizes and performance will be dependent upon PC configuration.

No Sharing?

The Quick Terrain Reader is a free tool which is used in conjunction with Applied Imagery's Quick Terrain Modeler. Any model you create with the Quick Terrain Modeler can be visualized with the Quick Terrain Reader (Assuming comparable PC configurations).

Engineers Only?

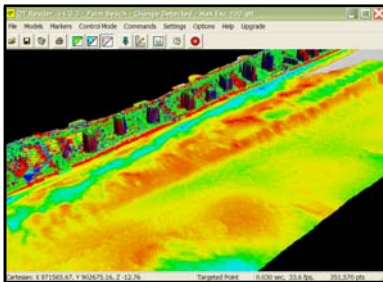
The Quick Terrain Reader is simple to use and runs on standard PC's and laptops. Users of any technical skill level can navigate through models within five minutes of downloading and installing the Quick Terrain Reader.

The Correct Answer?

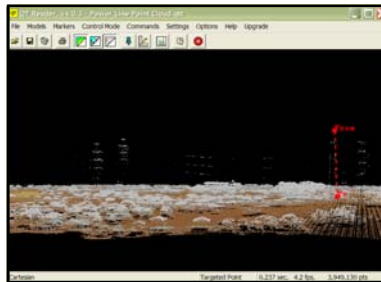
The correct answer to the question is A.), LiDAR terrain models are extremely valuable sources of geospatial information. The Quick Terrain Reader and the Quick Terrain Modeler make sharing these models with a broad and diverse audience possible.

Applications

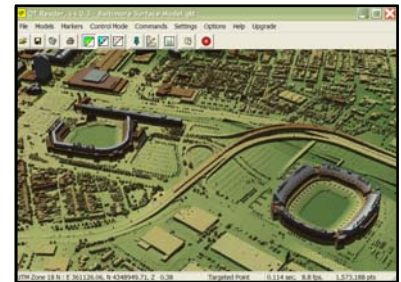
LiDAR terrain models can be used for a wide variety of applications. The examples below illustrate a few.



Change Detection: The model above is a continuous coloration change detection model of Palm Beach County, Florida. The model was generated in the Quick Terrain Modeler and shows the impact of a hurricane on the coastline.



Obstruction Detection: The measurements above are being taken of power transmission towers in a point cloud generated by the Quick Terrain Modeler. The measurement will show the height of the obstruction above ground.



Urban Modeling: The model of Baltimore above has altitude coloration and shows Baltimore's Camden Yards and M&T Bank Stadium.

APPLIED IMAGERY

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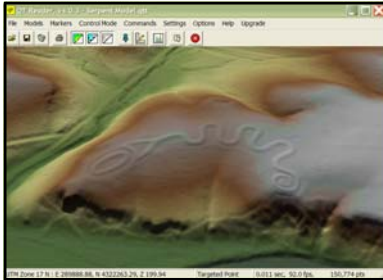
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Quick Terrain Reader

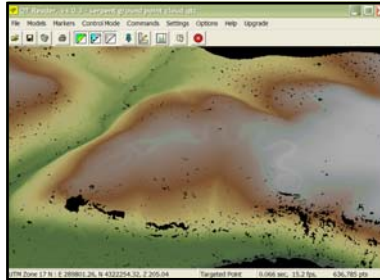
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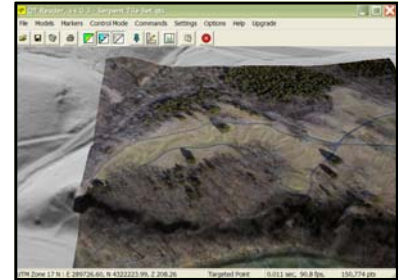
1. Download the Quick Terrain Reader from www.appliedimagery.com/download.htm or from any other source.
2. Install per instructions in Quick Terrain Reader installation file.
3. Start the Quick Terrain Reader.
4. Load a model by clicking on the "Open Model" button and selecting the desired model. To open a tile set, select "Load Tile Set" from the "File" menu. The Quick Terrain Reader can load several different types of model as shown below:



Surface Model: A surface model builds a continuous surface from collected LiDAR data points. A surface model gives users a very intuitive feel for the terrain. The Quick Terrain Reader can load Applied Imagery's .QTT surface model format or the open standard GeoTIFF DEM format.



Point Cloud: A point cloud model is comprised of actual collected LiDAR data. Because it does not have an interpolated surface, a point cloud model is an excellent tool for accurately measuring raw data points. The Quick Terrain Reader can load Applied Imagery's .QTC point cloud format.



Tile Set: A tile set is a combination of a model and an overlaid image. The Quick Terrain Reader can load Applied Imagery's standard .Quick Terrains tile set format. For the Quick Terrain Reader, tile sets must consist of one or two models and one image. (Note: The Quick Terrain Modeler can create tile sets of multiple models and multiple images.)

5. **Navigating through the model:** Navigation can be performed from your keyboard or the mouse. The following are the basic model mode navigation controls:


Mouse Controls:

- **Rotate:** Hold down left mouse button and drag the mouse.
- **Zoom:** Hold down both mouse buttons and drag the mouse
- **Zoom (Alternate Method):** Use the wheel on your mouse to zoom in and out.
- **Move/Pan:** Hold down right mouse button and drag the mouse.
- **Reset Lighting:** Hold down the control key and right mouse button and drag the mouse. Moving the mouse around will display a variety of lighting conditions.

Keyboard Controls:

- **Rotate:** Use the Arrow keys. Each key has a different effect.
- **Zoom In:** Use the Home key.
- **Zoom Out:** Use the End key.
- **Move/Pan:** Use the Control key and the Arrow keys.
- **Transport:** Press the T key. This feature is used in conjunction with the mouse. Simply locate the mouse over a target area, then press T to zoom in on that area very quickly.
- **Reset Lighting:** Hold down the control key and right mouse button and drag the mouse. Moving the mouse around will display a variety of lighting conditions.

Helpful Hints:

- It may take a few attempts to get the "feel" of model mode navigation. It may help to think of a terrain model as a table top that pivots about its center.
- If you get "lost" or get "under" a model, go to the Commands pull down menu and select Reset Viewer. This will return you to the starting point. Clicking the "Reset View" button does the same thing. 

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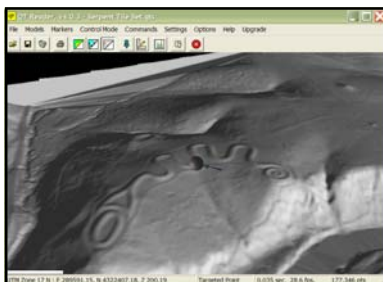
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Quick Terrain Reader

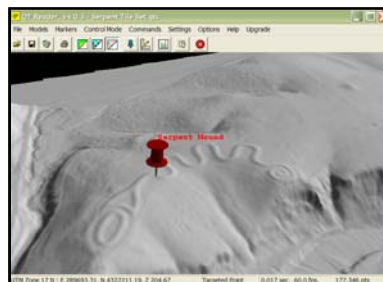
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Getting Started (Continued)

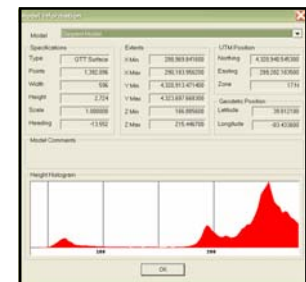
6. **Set Lighting:** It is frequently necessary to adjust lighting. The reasons for this vary, but it could be to increase the overall brightness of the model or to adjust the direct lighting to increase the visual relief of the model. It may be necessary to increase lighting after overlaying imagery or adding altitude coloration. Basic lighting adjustments are found in the Settings Menu: Set Lighting. Use the sliders to adjust lighting as necessary. Another way to adjust the direction of the lighting is to hold down the "CTRL" key while moving the mouse. This will adjust the direction of the lighting and increase the relief in the terrain (See Figure Below). Using the Set Lighting button achieves
7. **Basic Measurements:** The Quick Terrain Reader has a very fast and useful measurement tool that allows the user to draw a line on the model and quickly assess its length, change in altitude, and a variety of other information. To use it, simply choose an area to measure. Then:
 - Click on the desired beginning point of the line.
 - Type "S" (as in Start).
 - Drag the mouse to the desired end point of the line, then left click again.
 - You will see a red dashed line appear with the words "From" and "To" at either end.
 - A window will pop up giving information about that line segment.
8. **Markers:** Markers highlight locations in a terrain. The Quick Terrain Reader is able to place markers in a model. Go to the Markers Menu to edit, show, hide, load or save markers. Once markers are placed in a terrain, they can be saved and reloaded with the load and Save commands. Markers can also be exported as ASCII text files or ESRI shape files.
9. **Model Statistics:** Pressing the "View Model Statistics" button will display a great deal of information about the model.
10. **Save View/Position:** It is often desirable to save a particularly useful perspective of a model. The Save View/Position tool in the Commands menu allows users to save these perspectives and share them with other users.
11. **Play QMV Movies:** Like the Save View/Position tool, the QMV movie takes a user through a full motion sequence in a model. The Quick Terrain Reader can play back .qmv movies, but not record them.



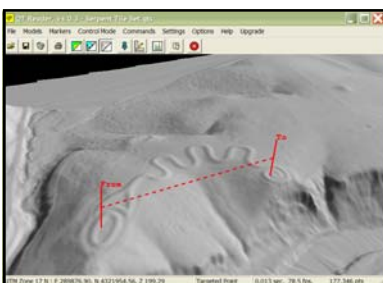
Lighting: Setting the direction of lighting by holding down the control key and moving the mouse.



Markers: Placing a marker in the terrain. The marker above has been edited to change the text.



Model Statistics: The Model statistics window displays a variety of model information.



Measurement: Point to point measurement in the terrain.

Mensuration Points			Delta	Vector Length
Start	End			Length
Northing	4322522.1698 m	4322388.7663 m	-133.4034 m	136.4123 m
Easting	289556.8112 m	289584.9424 m	28.1313 m	Vector Direction
Altitude	190.3678 m	202.8926 m	452.49 m	Azimuth
Latitude	39° 1' 35.1629"	39° 1' 30.8635"	-0° 0' 4.2994"	Elevation
Longitude	-83° 25' 51.7569"	-83° 25' 50.4399"	0° 0' 1.3171"	UTM Zone
				17N 17N

Measurement: The Mensuration Data window, showing a variety of data about the mensuration line.