Question

How do I install a geoid model in LGO/SKI-Pro so that I will have the ability to use orthometric heights?

Background

A geoid model is required to compute geoid separations which enables LGO to derive orthometric heights.

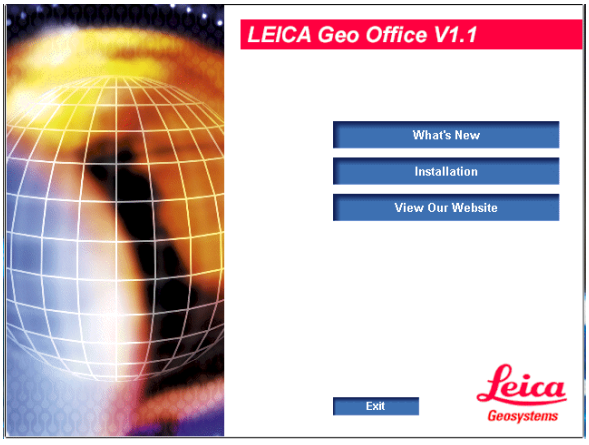
You must attach a geoid model to a coordinate system and then attach that coordinate system to your project. Once this is done, you will able to compute geoid separations that will provide orthometric heights.

First we must copy Geoid03 from the LGO or SKI-Pro CD to our computer's hard drive. Then in LGO or SKI-Pro we'll create a geoid model from the files we copied from the CD, attach it to a coordinate system, and then attach that coordinate system to a project. Finally we'll compute geoid separations so we can see orthometric heights

Answer

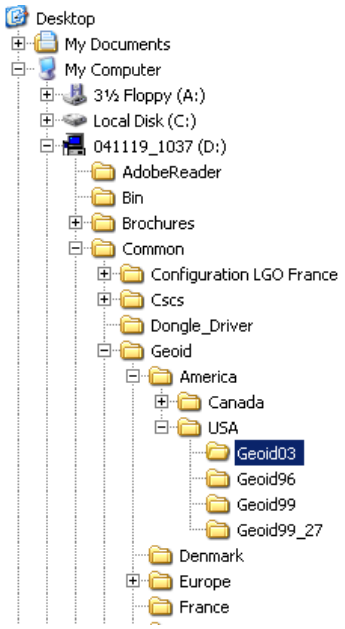
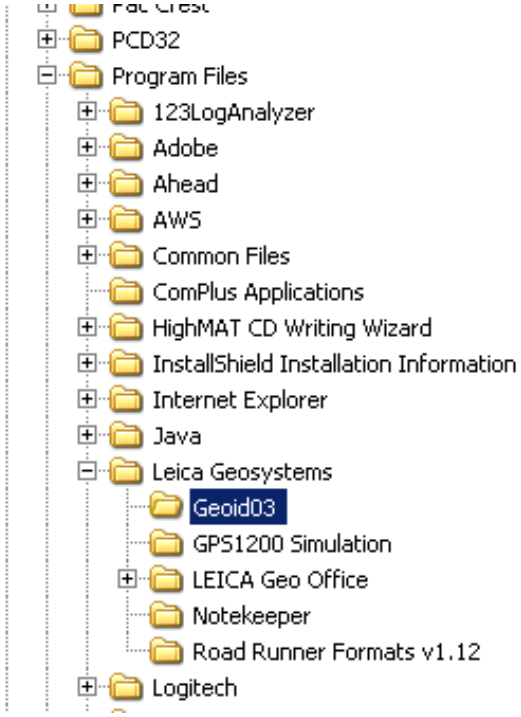
Follow the directions below to install a geoid model in LGO or SKI-Pro, compute geoid separations, and view orthometric heights.

For the remainder of this document, we will be using the term "LGO" as a replacement for the term "LGO or SKI-Pro".

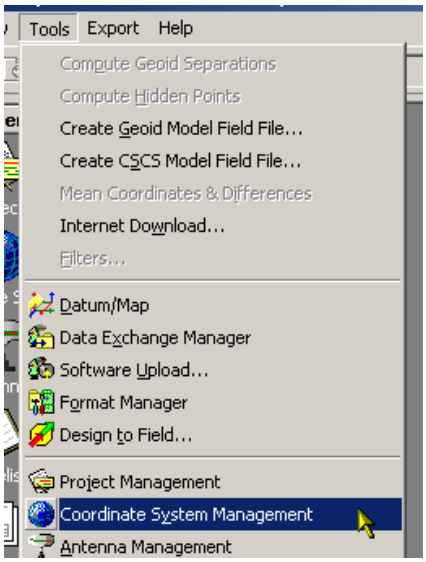
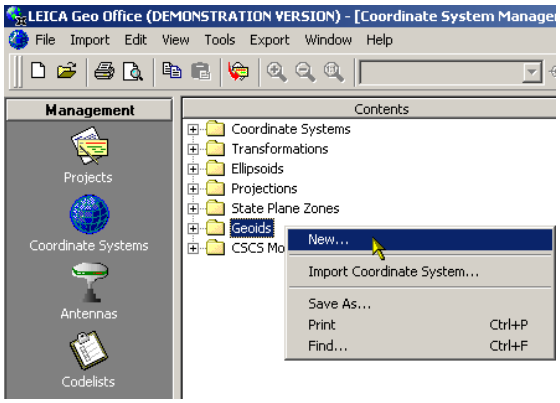
Step	Action	Display
1	From within Microsoft Windows: • Insert the LGO CD into your CD drive. The auto-run software installation process will begin. When you have an opportunity to stop or cancel this, do so. • Press the **Exit** button. This stops the installation procedure and closes the window.	

Continued on next page

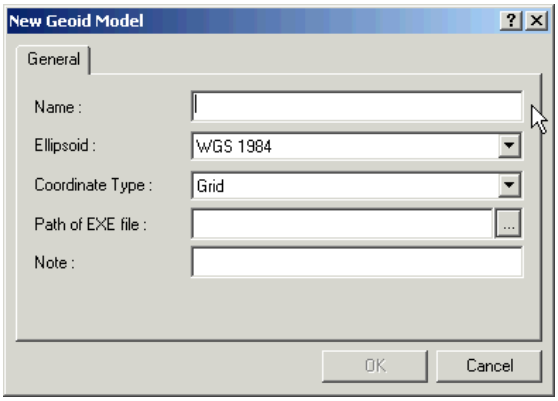
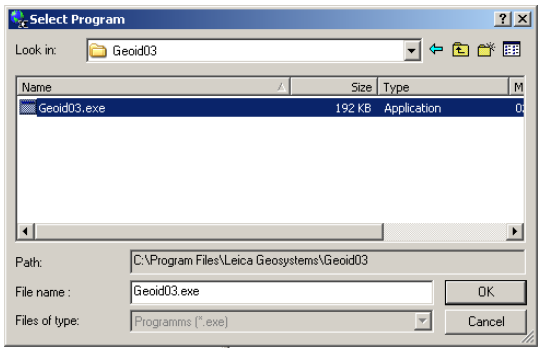
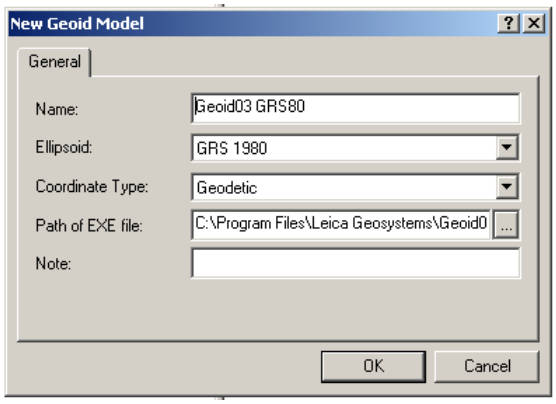
Leica Geosystems

Step	Action	Display
2	From within Windows Explorer: • Navigate to your CD drive. In this example it is the “D” drive • Open the **Common** folder. • Open the **Geoid** folder. • Open the **America** folder. • Select the **GEOID03** folder. • Copy this folder. We now want to paste this folder into the **Leica Geosystems** folder on your computer’s hard drive.	
3	Continuing in Windows Explorer: • Navigate to your C: drive. • Open the **Program Files** folder. • Open the **Leica Geosystems** folder. • Paste the **GEOID03** folder into the **Leica Geosystems** folder. **Note**: Do not be concerned if you do not have the same folders in your Leica Geosystems folder as in the image on the right, but you should have the newly copied **GEOID03** folder. We have copied the Geoid03 geoid model folder to your hard drive. Now we must create a geoid model in LGO and attach it to a coordinate system.	

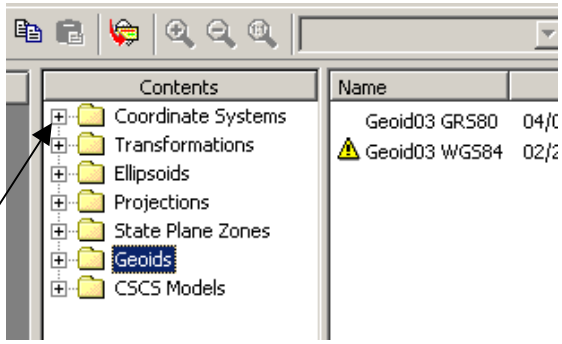
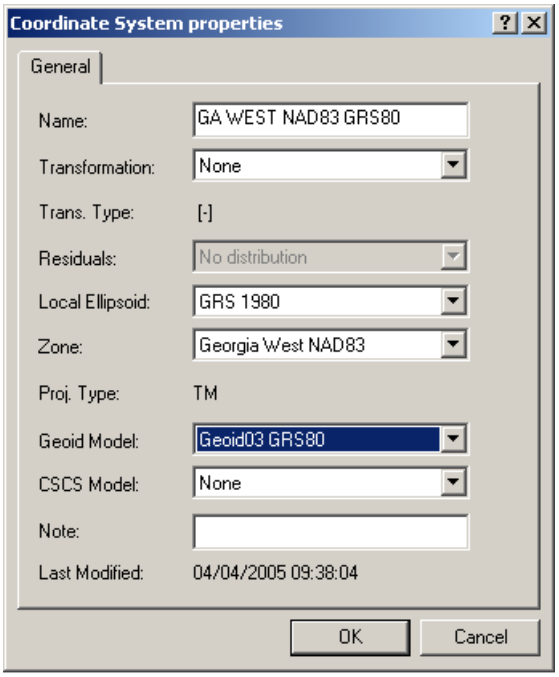
Continued on next page

Step	Action	Display
4	From within Microsoft Windows: • Start LGO. • Click on the “Tools” pull-down menu within LGO. • Select “Coordinate System Management”. This open the “Coordinate System Management” view.	
5	From within the “Coordinate System Management” view: • Right-click on the “Geoids” folder. • Select “New…” from the pop-up window. This opens the “New Geoid Model” window.	

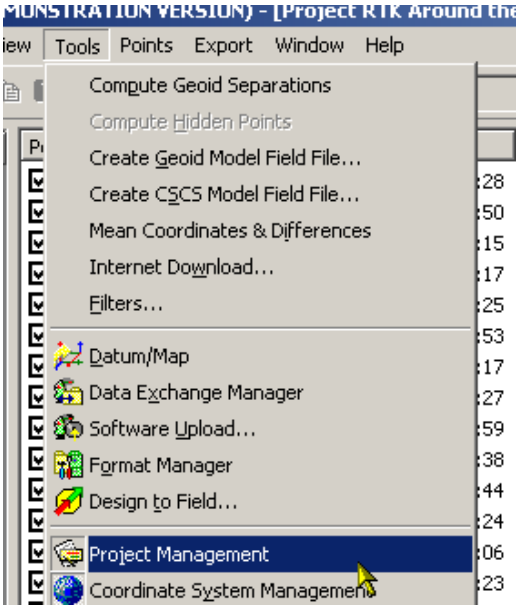
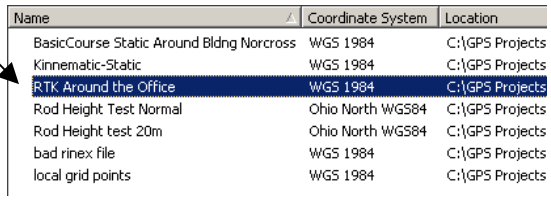
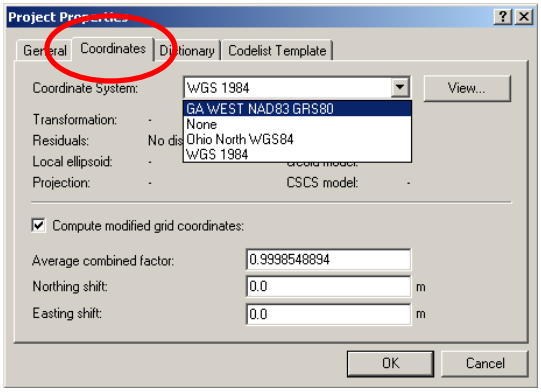
Continued on next page

Step	Action	Display
6	From within the “New Geoid Model” window: • Enter a name for the new Geoid model. • Select “GRS 1980” as the ellipsoid. **Note**: We are using the GRS 1980 ellipsoid for this particular geoid model because this model will then be attached to a NAD83 state plane coordinate system that uses a GRS 1980 ellipsoid. **It is imperative that the ellipsoid for the geoid model match the ellipsoid for the coordinate system!** • Select **Geodetic** as the coordinate type. • Click on the  button. This opens the “Select Program” window. • Navigate to where the “GEOID03” folder is stored. • Open the “GEOID03” folder. • Select “Geoid03.exe”. • Press the **OK** button. This closes the “Select Program” window and returns you to the “New Geoid Model” window. You have the option of entering a note but it is not required. • Press the **OK** button. This closes the “New Geoid Model” window and creates the geoid model.	  

Continued on next page

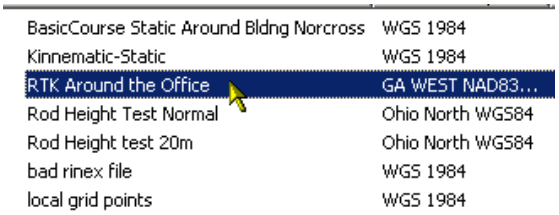
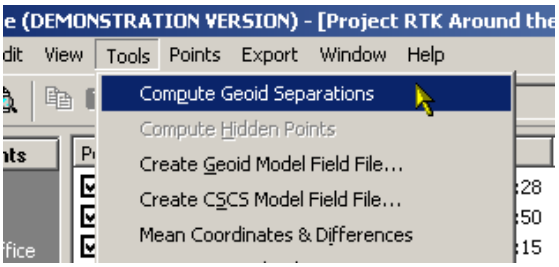
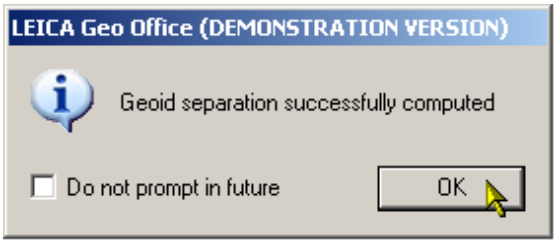
Step	Action	Display
7	Continuing within the “Coordinate System Management” view: We can now see the newly created geoid model in the **Geoids** folder. The next step is to attach this geoid model to a coordinate system. • Open the “Coordinate Systems” folder. If you do not have any coordinate systems created, see this FAQ: http://www.leicaatl.com/support/gps/gps_faqs/faqs/SKI_Pro_Questions/How%20do%20I%20create%20a%20coordinate%20system.pdf to create one.	
8	In the “Coordinate Systems” folder: • Right-click on an existing coordinate system. • Select “Properties” in the pop up window. This opens the “Coordinate System properties” window. In this example we are editing the “GA West NAD83 GRS80” coordinate system. Notice the term “GRS80” is in the name. This is to keep clear which ellipsoid was used with this coordinate system. • Click on the down arrow in the **Geoid Model**: field. • Select **Geoid03**. • Press the **OK** button. This attaches the geoid model to a coordinate system.	

Continued on next page

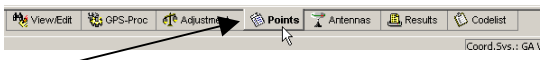
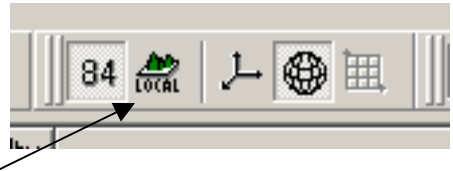
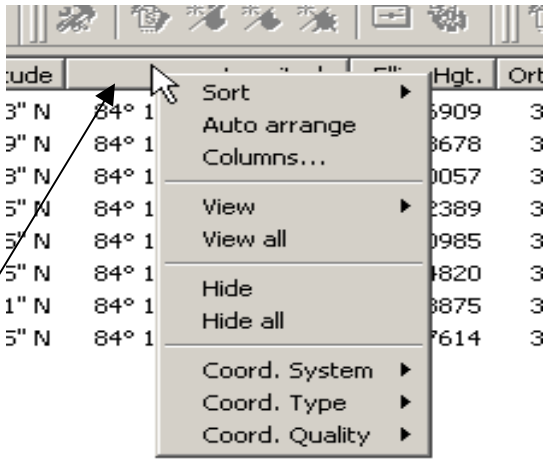
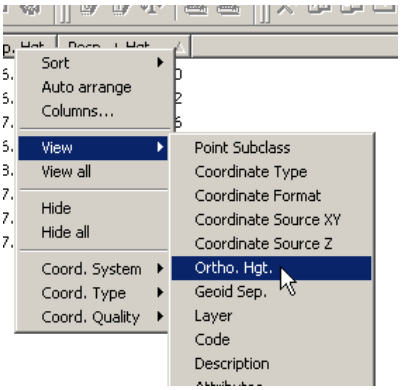
Step	Action	Display
9	We now have a geoid model attached to a coordinate system. Now we must attach this coordinate system to an existing project. • From the “Tools” pull down menu: • Select “Project Management”. This takes you to the “Project Management” view. Continuing in the “Project Management” view: Select a project to attach a coordinate system to. In this example we’ll use “RTK Around the Office”. • Right click on the project. This opens a pop-up window. • Select “properties”. This opens the “Project Properties” pop-up window. • Click on the “Coordinates” tab. In the **Coordinate System** field: • Select the coordinate system containing the newly created geoid model. • Press the **OK** button. This attaches the coordinate system to the project.	  

Continued on next page

Leica Geosystems

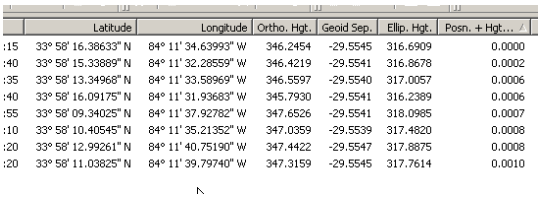
Step	Action	Display
10	Continuing in LGO: We have created a geoid model, attached it to a coordinate system, and then attached it to a project. We now need to compute geoid separations and view the orthometric heights. • Open the project with the coordinate system attached by double-clicking on the project name. This opens that project.	
11	From within the opened project: • Click on the “Tools” pull down menu. • Select “Compute Geoid Separations”. This computes the geoid separations. When the computation is complete a pop-up message appears. • Press the **OK** button to accept the message. This closes the pop-up box.	 

Continued on next page

Step	Action	Display
12	Continuing in LGO: We just computed geoid separations. Now we would like to view the orthometric heights. • Click on the **Points** tab at the bottom of the screen. This opens the “Points” view. You may not see orthometric heights or geoid separations. If you do not see them: • Click on the Local icon. • Click on the grid icon. If you still do not see an “Ortho. Hgt.” column or a “Geoid Sep.” column, you may not have them displayed. To turn on their display: • Right-click on the column heading. This opens a pop-up window.	  
13	In the pop-up window: • Select “View”. This opens another pop-up window. In the new pop-up window: • Select “Ortho Hgt.” • Select “Geoid Sep.”. You should now be able to view the geoid separations and orthometric heights.	

Continued on next page

Leica Geosystems

Step	Action	Display
14	Continuing in the SKI-Pro “Points” view: The orthometric heights and geoid separations are now displayed.	

	Latitude	Longitude	Ortho. Hgt.	Geoid Sep.	Ellip. Hgt.	Posn. + Hgt...
:15	33° 58' 16.38633" N	84° 11' 34.63993" W	346.2454	-29.5545	316.6909	0.0000
:40	33° 58' 15.33889" N	84° 11' 32.28559" W	346.4219	-29.5541	316.8678	0.0002
:35	33° 58' 13.34968" N	84° 11' 33.58969" W	346.5597	-29.5540	317.0057	0.0006
:40	33° 58' 16.09175" N	84° 11' 31.93683" W	345.7930	-29.5541	316.2389	0.0006
:55	33° 58' 09.34025" N	84° 11' 37.92782" W	347.6526	-29.5541	318.0985	0.0007
:10	33° 58' 10.40545" N	84° 11' 35.21352" W	347.0359	-29.5539	317.4820	0.0008
:20	33° 58' 12.99261" N	84° 11' 40.75190" W	347.4422	-29.5547	317.8875	0.0008
:20	33° 58' 11.03825" N	84° 11' 39.79740" W	347.3159	-29.5545	317.7614	0.0010

Conclusion

In order to compute orthometric heights, a geoid model must be attached to a coordinate system. This coordinate system must then be attached to a project. Then you must compute geoid separations which simultaneously computes orthometric heights.