

Getting Elevations from FAST Survey

MobileMapper CE – FAST Survey – Geoid03 – NAVD88

If part of the objective is getting elevations in the coordinate file in FAST Survey a good way to get from ellipsoid heights based on the NAD83 to orthometric heights based on NAVD88 is to use the Geoid03 model that comes with GNSS Solutions.

The process may seem a little tricky. Make it less complex by looking at a process that begins with the connection to the PC using ActiveSync using the procedures described in the MobileMapper CE Getting Started Guide.



Making the connection to ActiveSync is as simple as connecting the USB cable from the MobileMapper CE I/O module to the PC. Once the hardware connection is made ActiveSync will find the MobileMapper CE and ask what you want to do.

In this example the choice is **No**. A partnership is not required to do this job.

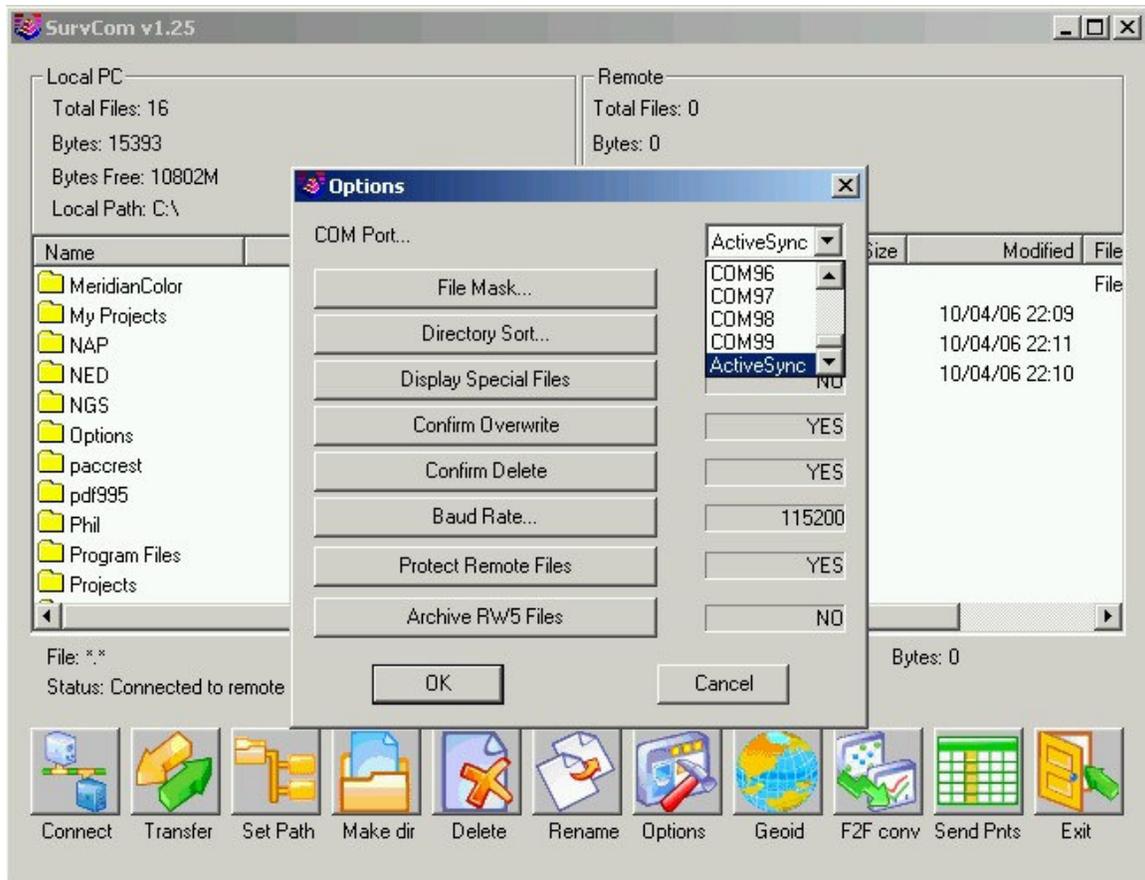


With the ActiveSync connection established it is time to configure SurvCom to communicate with the MobileMapper CE. SurvCom can be started from the

Start → Programs → GNSS Solutions → Tools →

or from within GNSS Solutions. See Appendix H in the GNSS Solutions Reference Manual for SurvCom instructions and details about what the buttons represent. These instructions presume that you are familiar with the manual.

The **Options** button brings up a dialog box that allows a choice of many COM ports with ActiveSync at the bottom of the list. In the window on the right side of SurvCom navigate to the place on the SD card where the geoid separation file will be written.

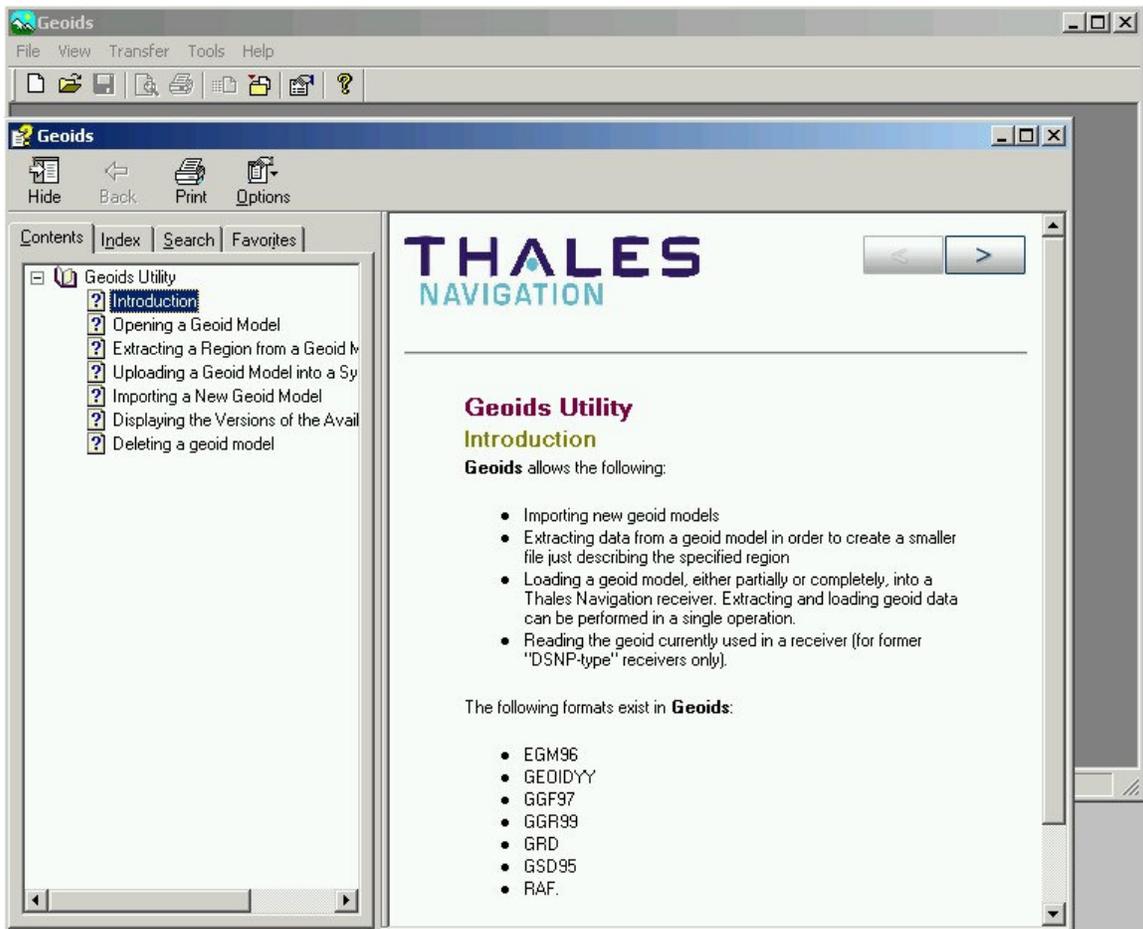


With everything ready for the gsf file to be written to the data collector just click on the **Exit** button to close SurvCom.

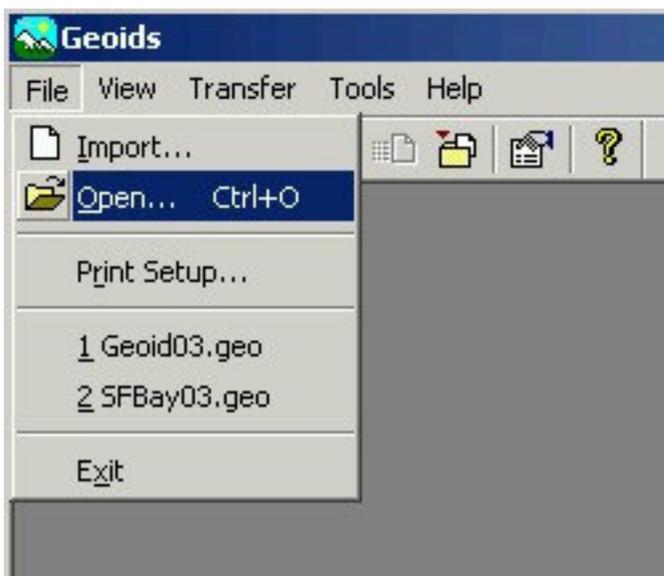
It is time to start the Geoids program. With the Start button the path is

Start → Programs → GNSS Solutions → Tools →

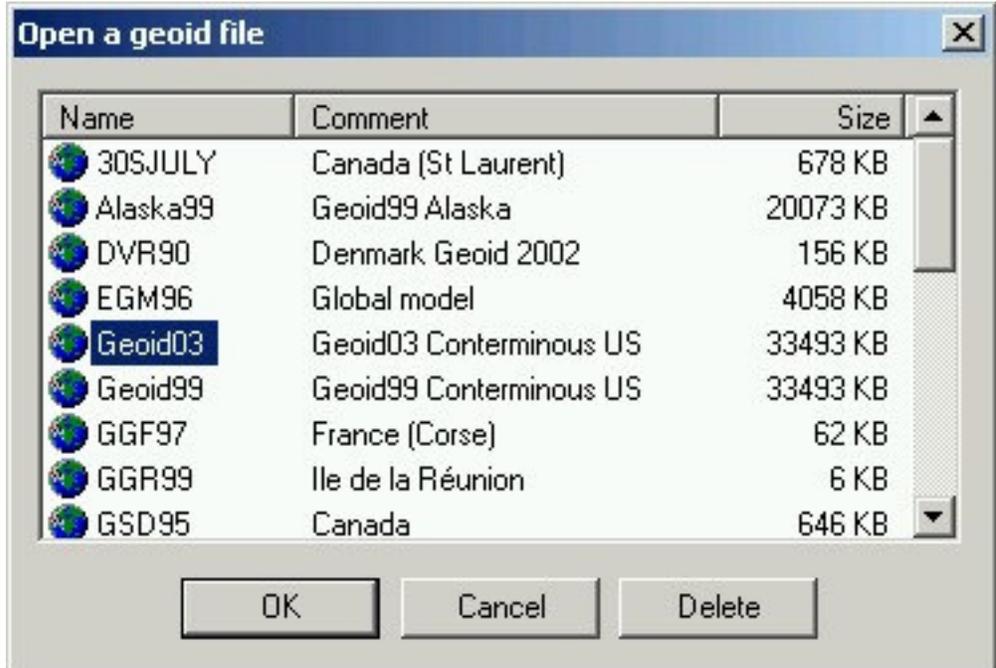
A click on the **Help** pop down menu offers a chance to take advantage of the **User's Guide** that is like a slide show that will walk through the process of using the Geoids program. Please use that User's Guide because this document will take advantage of familiarity with the User's Guide and Appendix C in the GNSS Solutions Reference Manual.



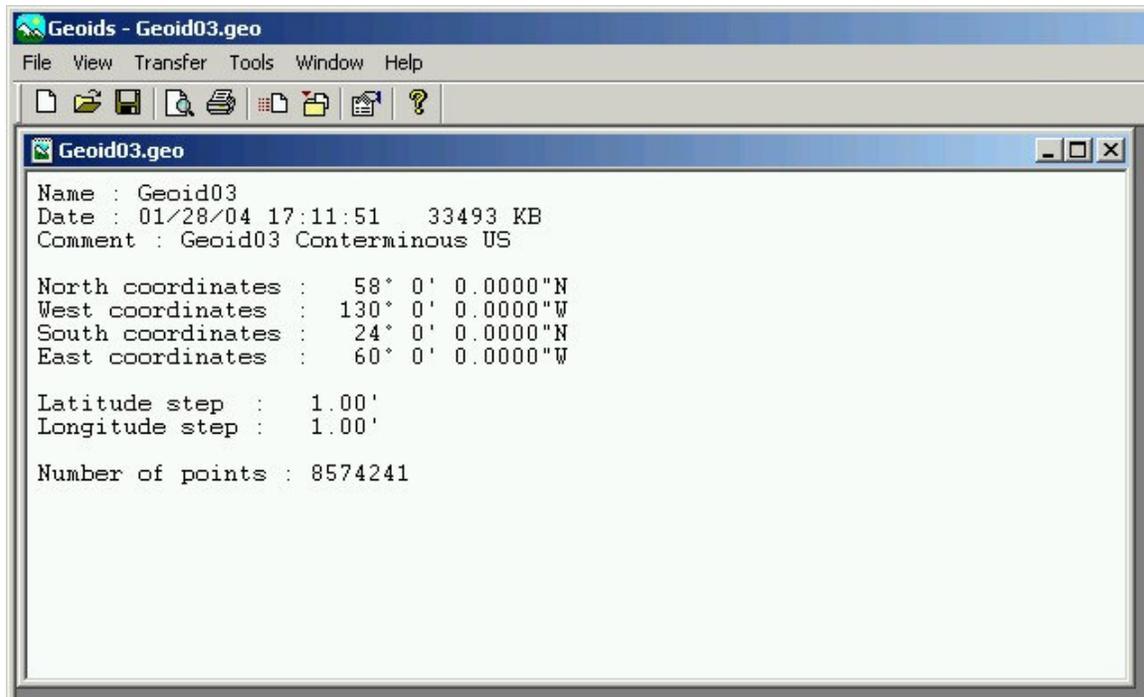
The Geoids program opens with a blank screen. It cannot know what model needs to be used. Choosing the Geoid03 model as the starting point is simply a matter of opening the file. Choose **Open...** from the **File** menu.



With many models to choose from a little search will locate the Geoid03 model file.



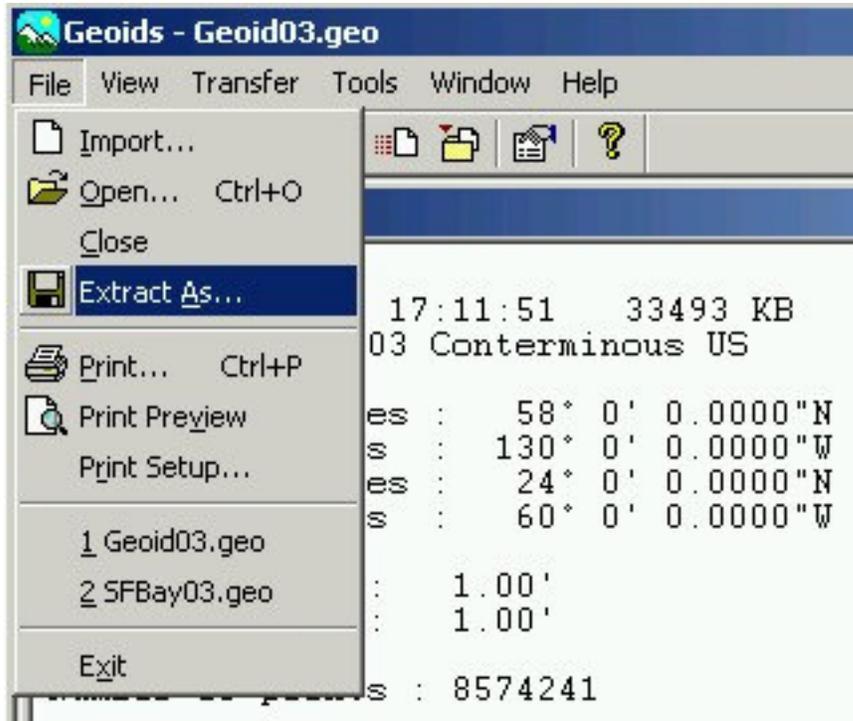
After selecting Geoid03 click the OK button.



The entire Geoid03 model file is much too large for the data collector. It is not appropriate to transfer the entire file to the data collector. Extract a segment of the model based on the area where the GPS work will be done.

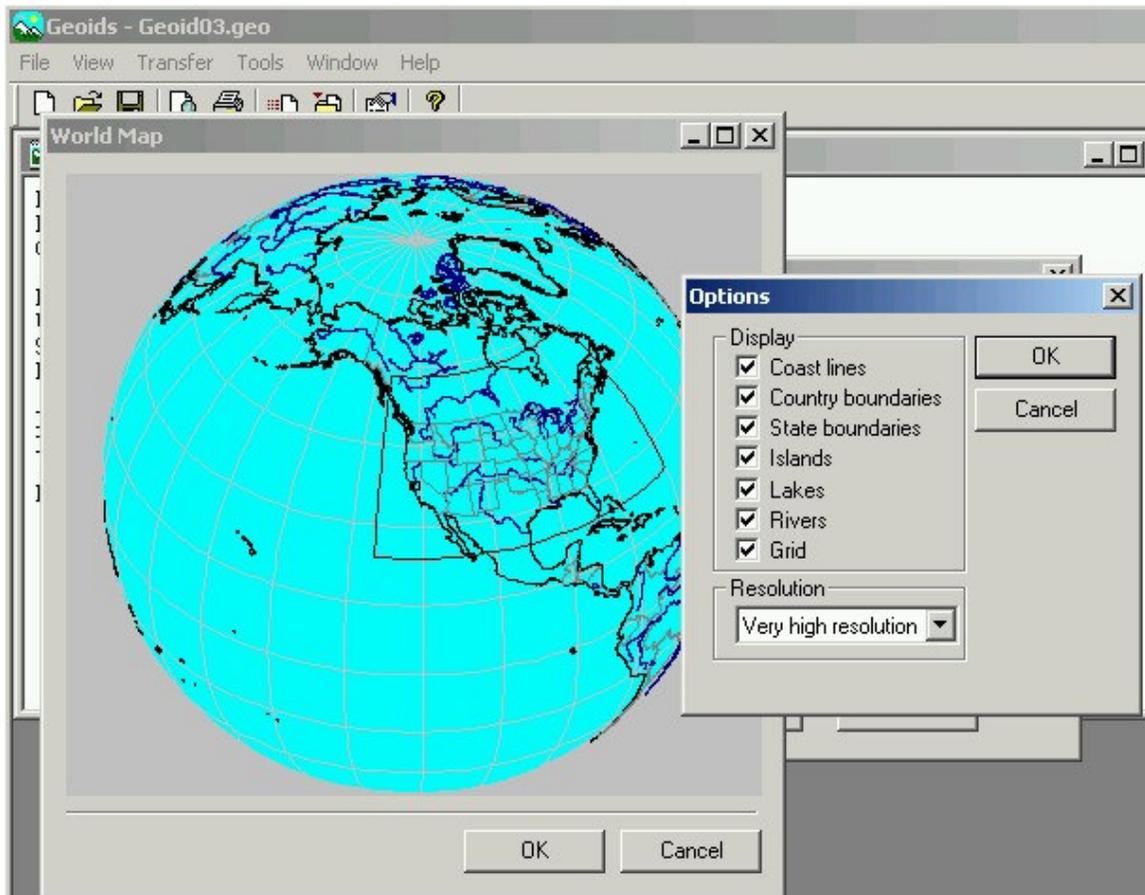
A model that is too small will limit where it can be used. A model that is too large will bog down the data collector.

Begin the process of defining the work area with the **Extract As...** on the **File** menu.



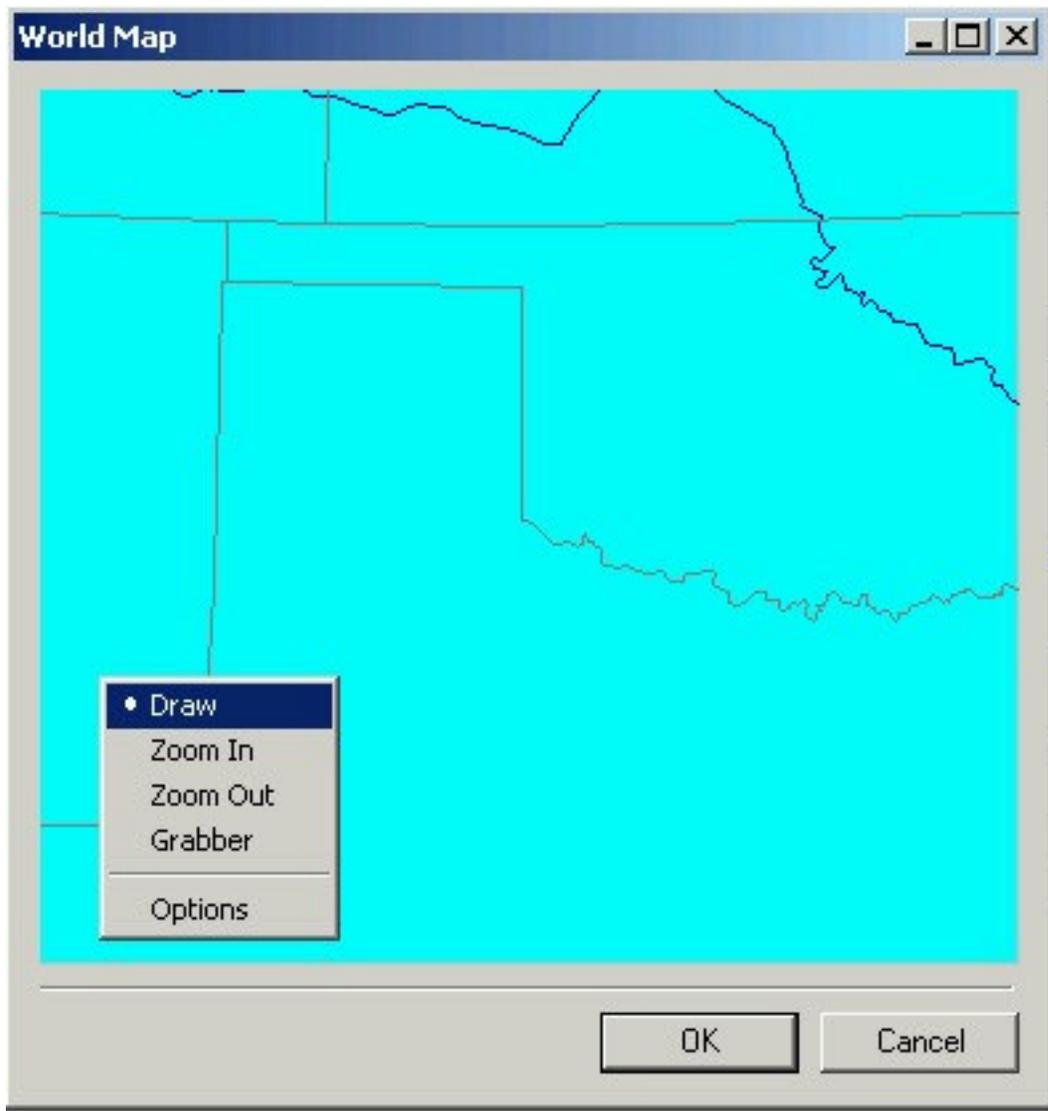
A first look at the map reveals the coverage area of the Geoid03 model. It will not extract a model file that is located outside of the box shown on the map.

My own preference is for as much map information as it will provide. Every box gets a check mark so the geography on the screen will help mark the box.



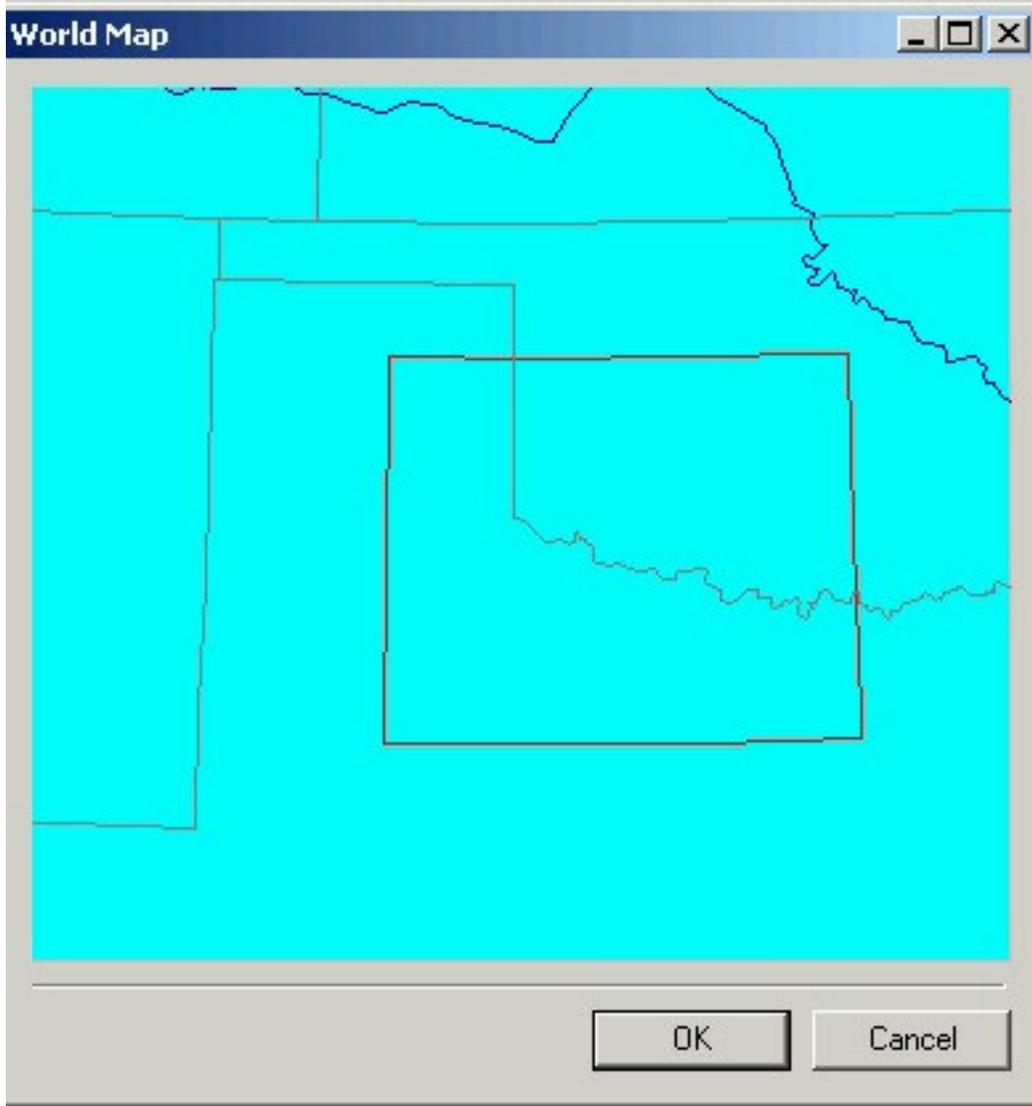
This is too much map for accurate selection. The right mouse button offers a menu for zoom and pan. Choose Zoom In and drag a box over the desired area using the left mouse button



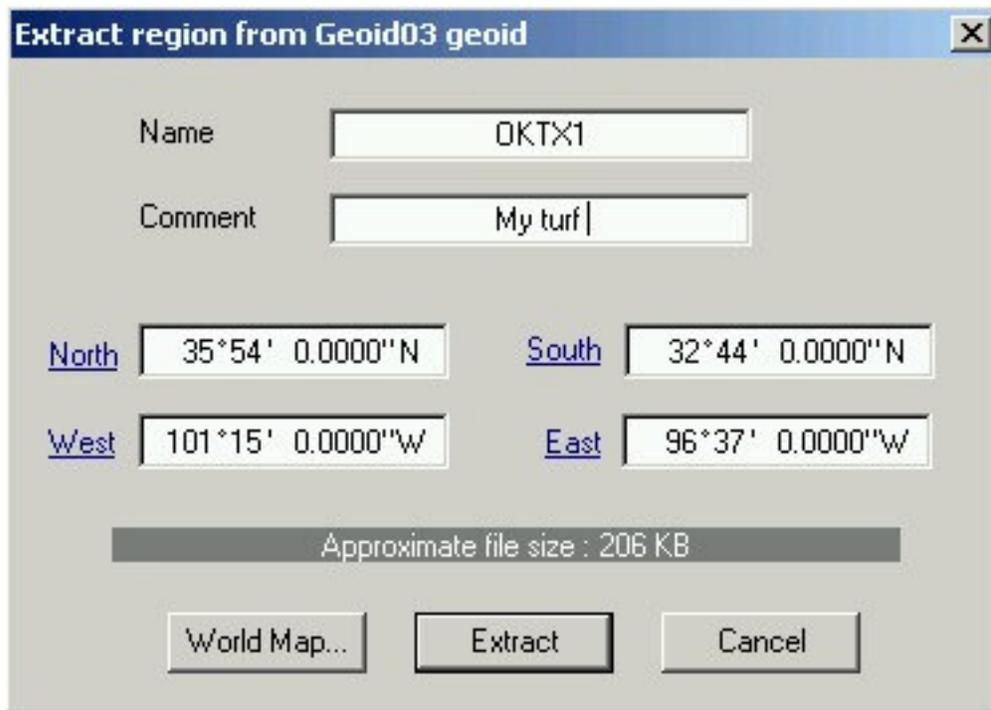


With the general work area shown on the map it is time to draw a box that will enclose the area that will be included in the geoid separation file.

A right mouse click on the map brings up the menu. Draw a box with a click and drag of the left mouse button.



The work area is now defined and limited to what is enclosed by that box. There is one more chance to make adjustments after a click on the **OK** button.



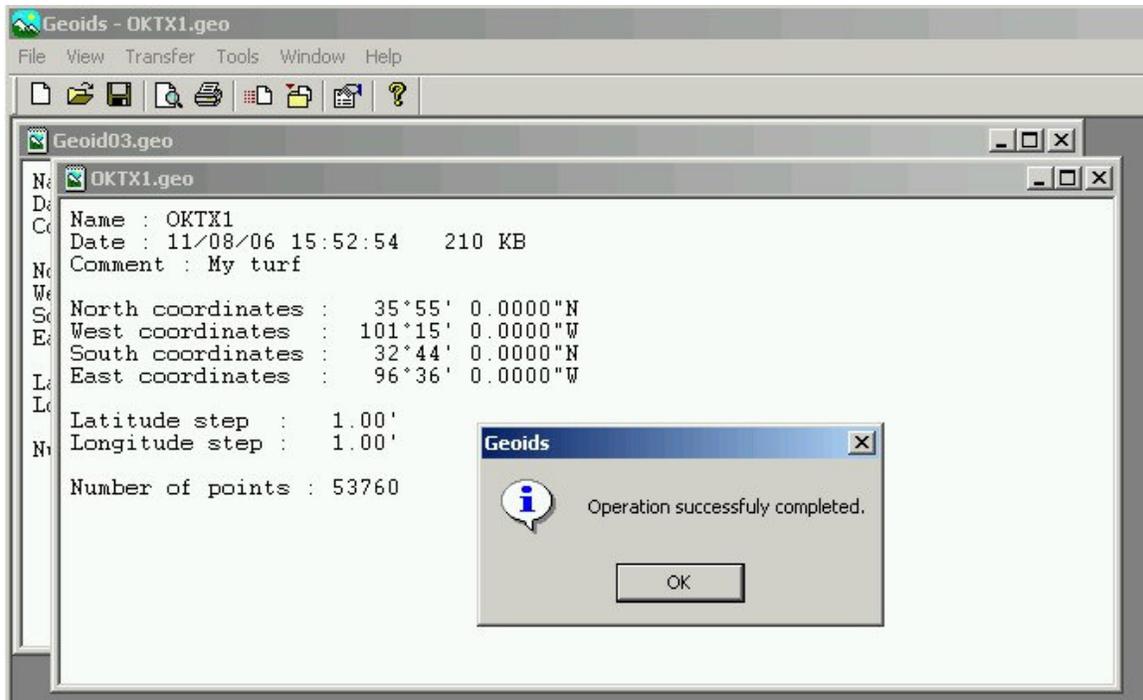
A meaningful name and comment will help make effective use of the geoid separation file as time goes by.

The latitude and longitude shown in the dialog box can be adjusted based on what is known about the boundaries of the work area.

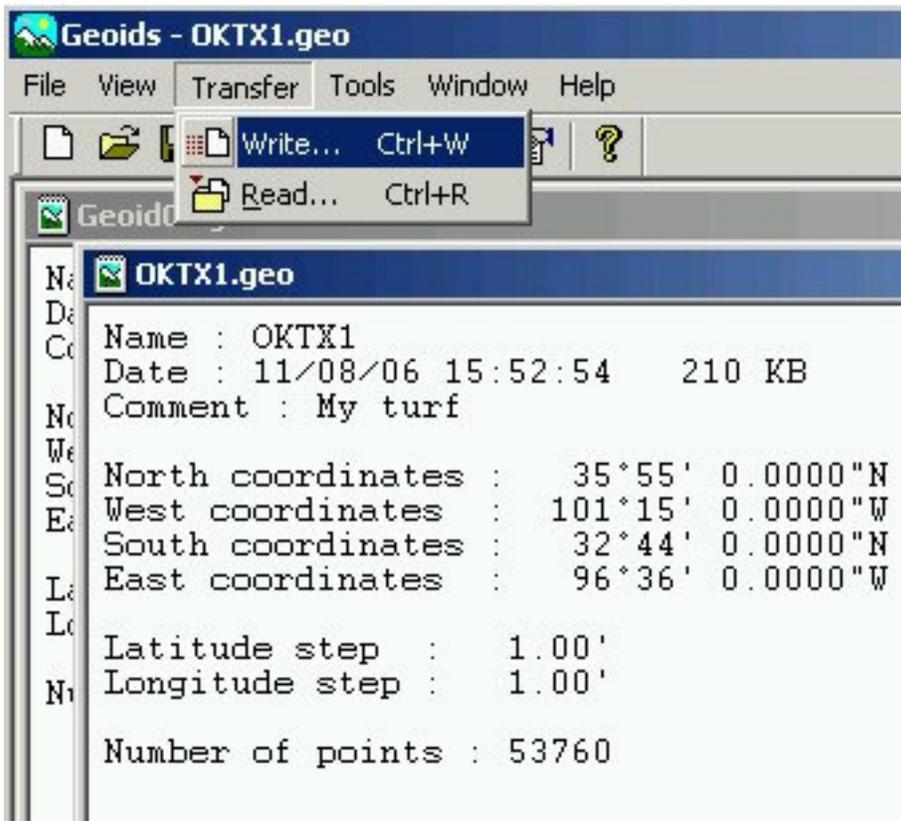
Avoid choosing limits that will cause a failure when a measurement is made outside the limits of the box. A little bit too much is better than an area too small. The data collector will provide ellipsoid heights for the points when a measurement is made outside the limits of the geoid separation file.

The larger the area the longer it will take the data collector to search the file. Some experimentation might be needed to figure out what works best. Avoid choosing city sized geoid separation files. Get some miles across that box. Trying to put the whole state of Texas in one file might result in long waits while the data collector searches for the geoid height.

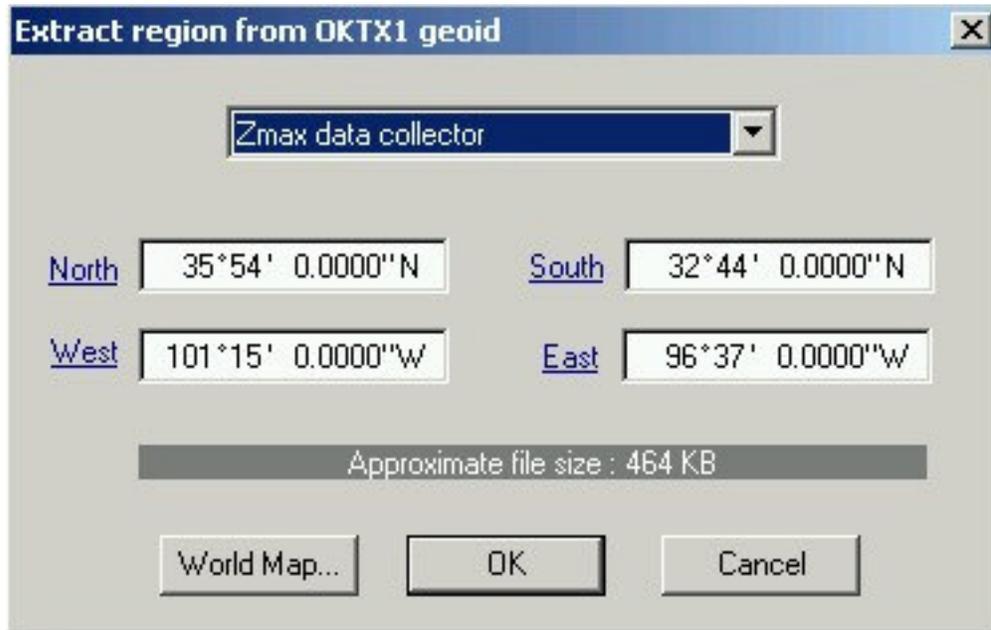
With the choice made it is time to click on the **Extract** button to see the results of the effort.



The area is now added to our list of available geoid models with a click of the OK button. The time has come to **Transfer** the model to the data collector and **Write...** the GSF to the SD card in the MobileMapper CE.



The effort made to prepare SurvCom for the file transfer pays off. The choice is a **Zmax data collector** as the destination for the file.

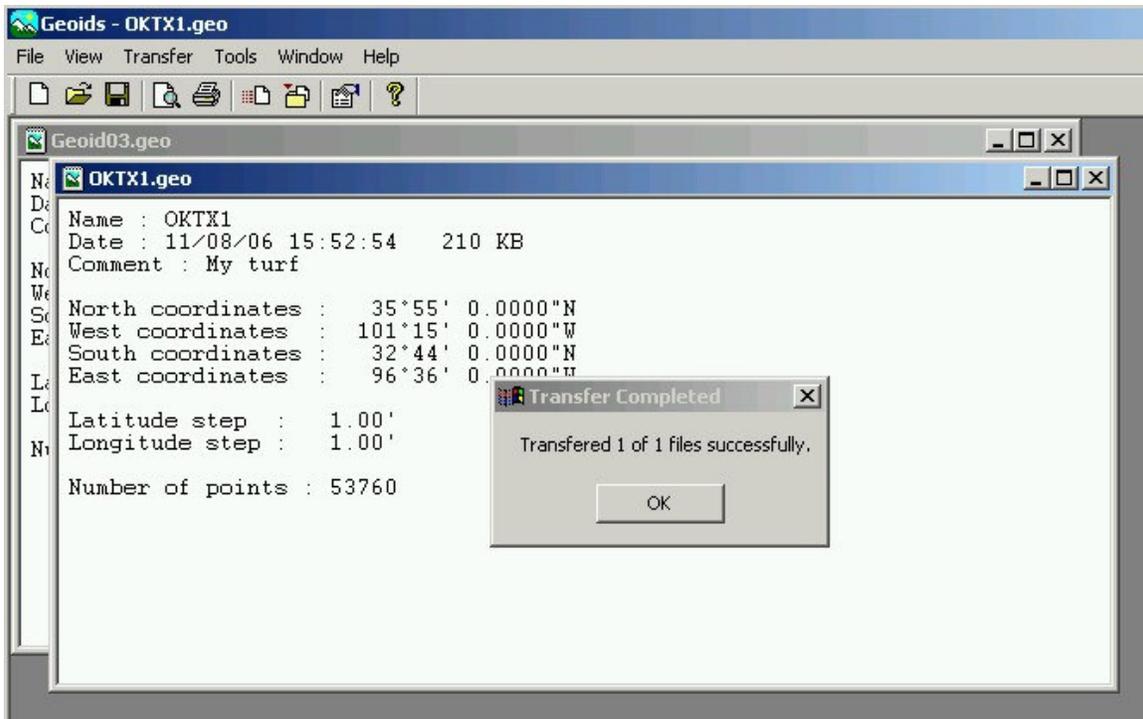


A click on the **OK** button reminds us to make the connection that has already been done in preparation for this procedure. The file is ready to be transferred if the ActiveSync connection is working.

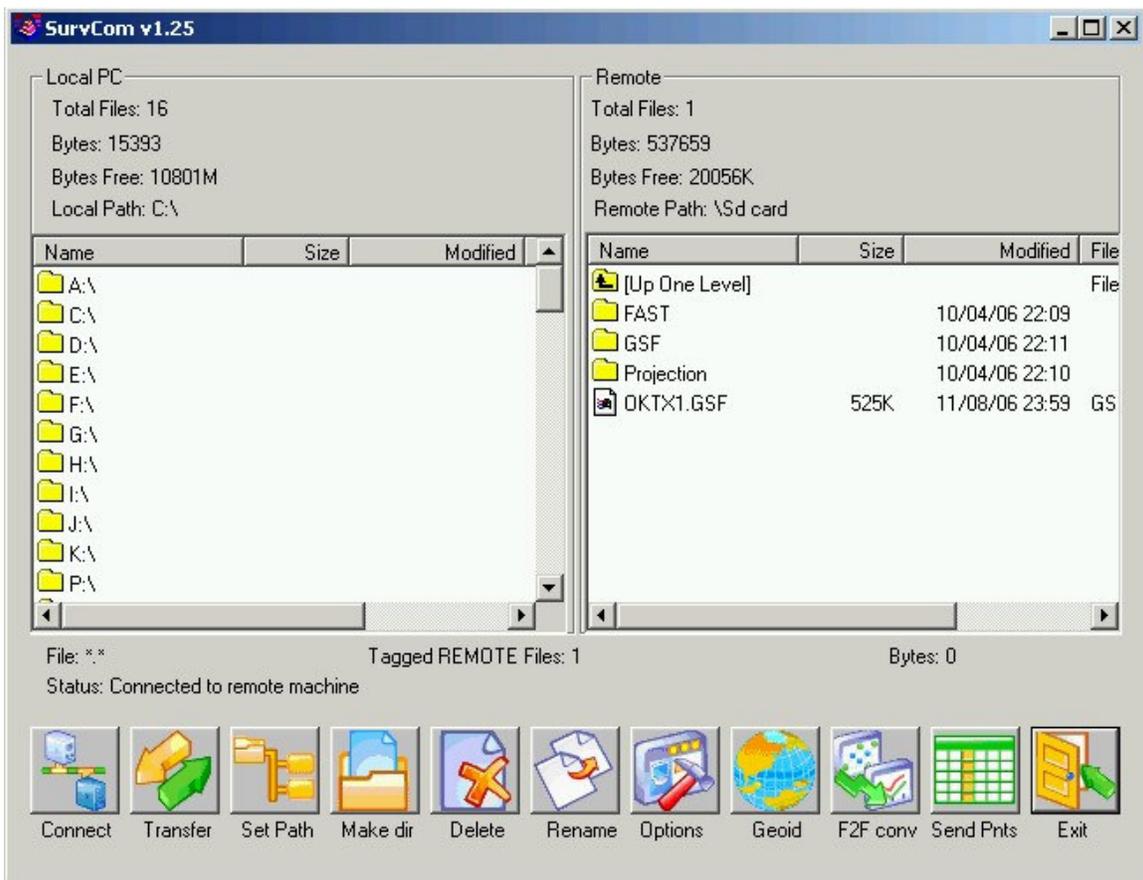


A click on the **OK** button transfers the file.

The Geoids program reports successful transfer of the GSF to the data collector.



How can we tell for sure?



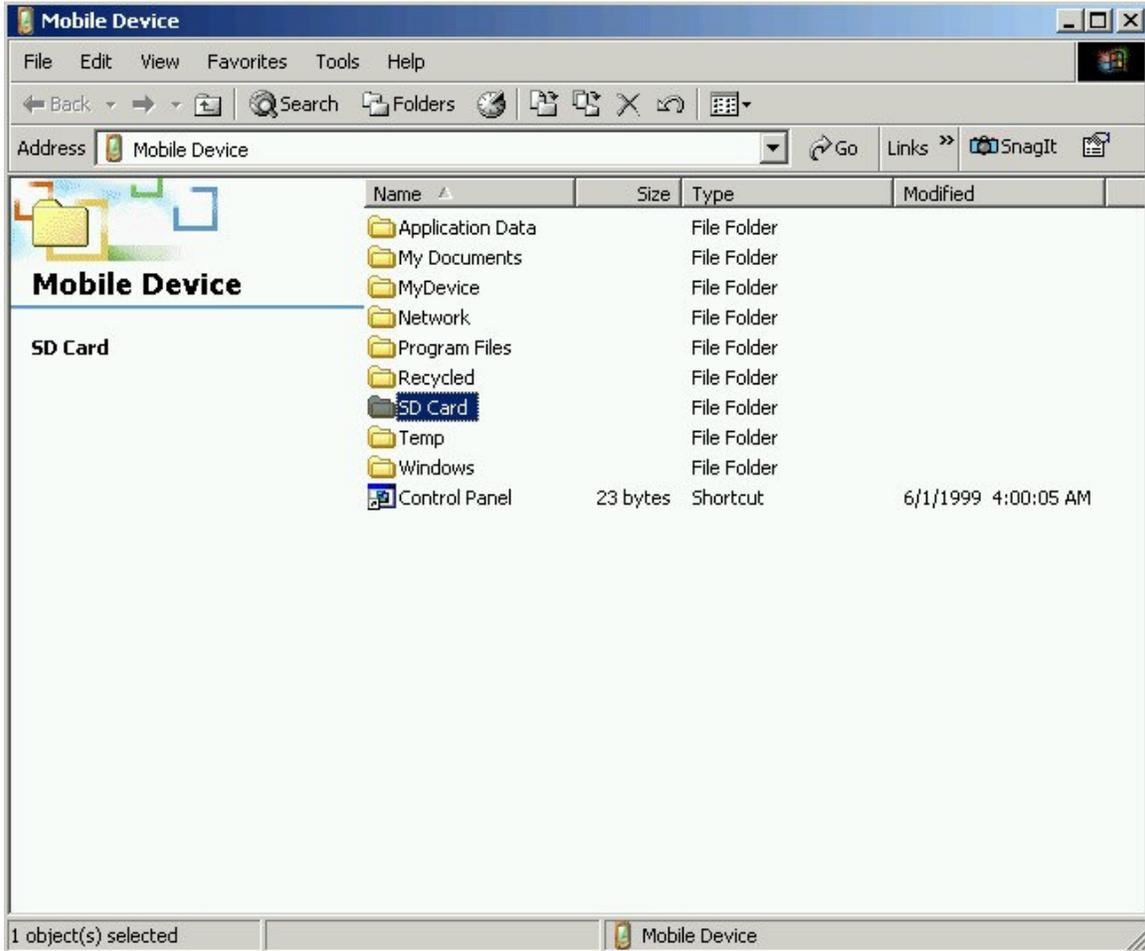
Start SurvCom and notice that the file is right where it is supposed to be with one little problem. It was supposed to be in the GSF folder but only if we had opened the GSF folder to receive the file when SurvCom was setting this up for the transfer.

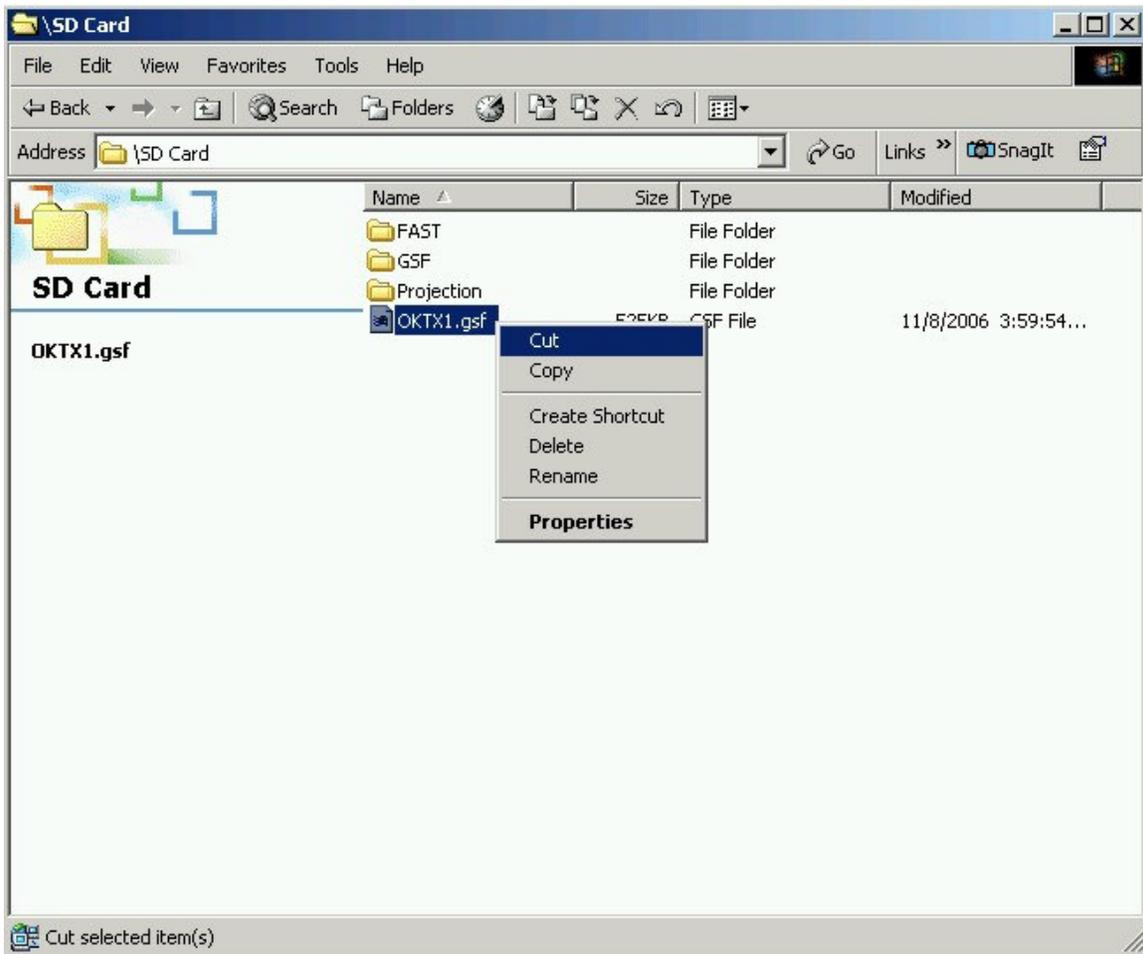
No problem. The **Exit** button will close SurvCom.

The Explore tool in ActiveSync provides the means to move the file to the GSF folder on the SD card.

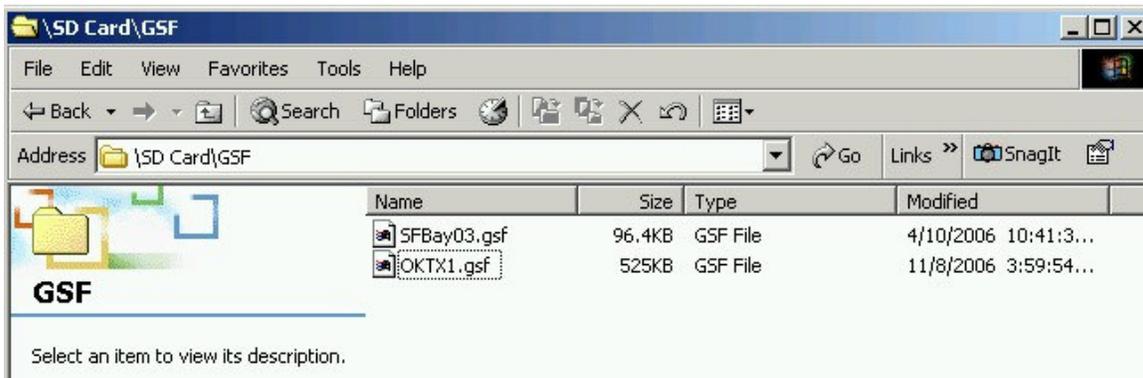


Open the SD card on the MobileMapper CE with the Explore tool.





Select the file and use the right mouse button to bring up the menu to Cut the GSF from the root folder of the SD card.



Open the GSF folder and paste the GSF where it needs to be.

This GSF is now ready for use with FAST Survey as described on pages 45 through 47 of the FAST Survey Reference Manual. See the topic heading Geoid Separation File.

Copy the GSF from the SD card to the hard drive on your PC in order to share it with other FAST Survey users or to replace a file that is lost when a GSF is inadvertently deleted from the SD card.

The Geoids program does not write the GSF to the hard drive on the PC. Copy the file from the data collector using the Explore tool in ActiveSync.

For more information get the Z-Max.Net Reference Manual and read pages 272 through 274 in the Appendices.

Be an informed user:

For more information about geoid models and how they are used see the NGS web page at

<http://www.ngs.noaa.gov/GEOID/>

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