

# How To: Localize (Calibrate) with Carlson SurvCE

This document is intended to assist users with the recommended localization method for Carlson SurvCE. Other methods can be used and is up to the individual user to determine which is best for them.

## ***File Extensions***

Localization File	*.dat
Geoid Model File	*.gsf
Coordinate File	*.crd
Raw Data File	*.rw5

## ***Projections***

It is essential that the proper plane coordinate projection is selected prior to creating a localization file. This should be the first step performed during the creation of the job file and be performed easily through *File* → *Job Settings* → *GPS*.

## ***Geoid Model***

An important item to note is if the user intends to use a geoid model (typical for localization that contain less than 3 control points), the geoid model must be applied prior to the creation of the localization file.

A local portion of the geoid grid must be extracted from the Carlson Geoid Model using Carlson X-Port, SurvCOM, Survey or SurvCADD and the geoid model file must be installed prior to the creation of the local geoid file. It is also highly recommended that the local geoid file grid size does not exceed 100 miles.

## ***Web Link to the Geoid Files***

<http://update.carlsonsw.com/public/CarlsonGeoidGrids.exe>

## ***Transfer or Enter the Known (local) Points***

It's a good idea to simplify the process by transferring the known (local) points to the data collector prior to going to the field. Conversely, the user can keyboard enter the known coordinates for these points into the CRD file, one at a time, using *File* → *List Points* → *Add*. It is not recommended that the user keys in the local coordinates from within the localization process as transpositions can occur easily. However, this can be done as well.

## ***Collect the GPS Locations with Averaging***

Using the *Surv* → *Store Points* routine, specify your point ID. It is usually a good idea to use something that will relate to the original known point. Example, if the known point for the first control point is 1, then you may want to collect the measured location as 1001.

Use the average reading icon <A> to collect several epochs of data at each point. Typically when using a 1 Hz receiver, 10 to 30 readings will be collected to ensure that the RTK solution is consistently reporting the same position for 10 to 30 seconds. On a 5 Hz receiver, the user may want to collect 50 or more readings as 50 readings would be 10 seconds.

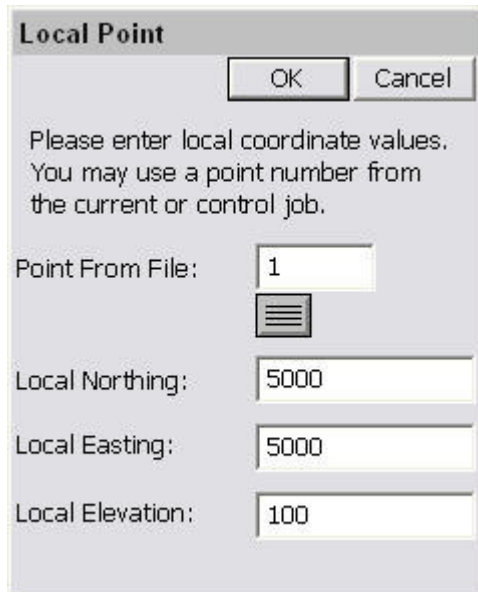
### **Create the Localization File**

Once the data collector has points that represent the known (local) coordinates and the measured data for these points, the localization file can be created.

Select *Equip* → *Localization* → *Add* to enter each point into the localization file.

### **Local Point**

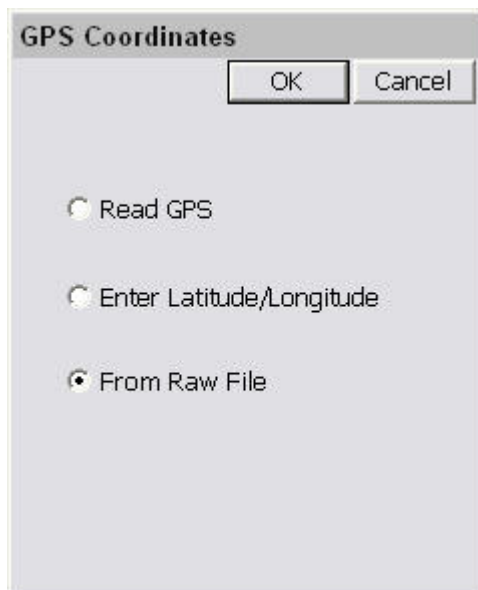
The first dialog presented to the user will be the *Local Point* dialog shown below. Enter the known (local) coordinate point ID or coordinates. If the point does not exist in the CRD file and coordinates are entered into this dialog, do not enter a point ID. Select *OK* when the known (local) position has been defined.



The screenshot shows a dialog box titled "Local Point". At the top right are "OK" and "Cancel" buttons. Below the title is the instruction: "Please enter local coordinate values. You may use a point number from the current or control job." There are four input fields: "Point From File:" with a text box containing "1" and a list icon below it; "Local Northing:" with a text box containing "5000"; "Local Easting:" with a text box containing "5000"; and "Local Elevation:" with a text box containing "100".

### **GPS Coordinates**

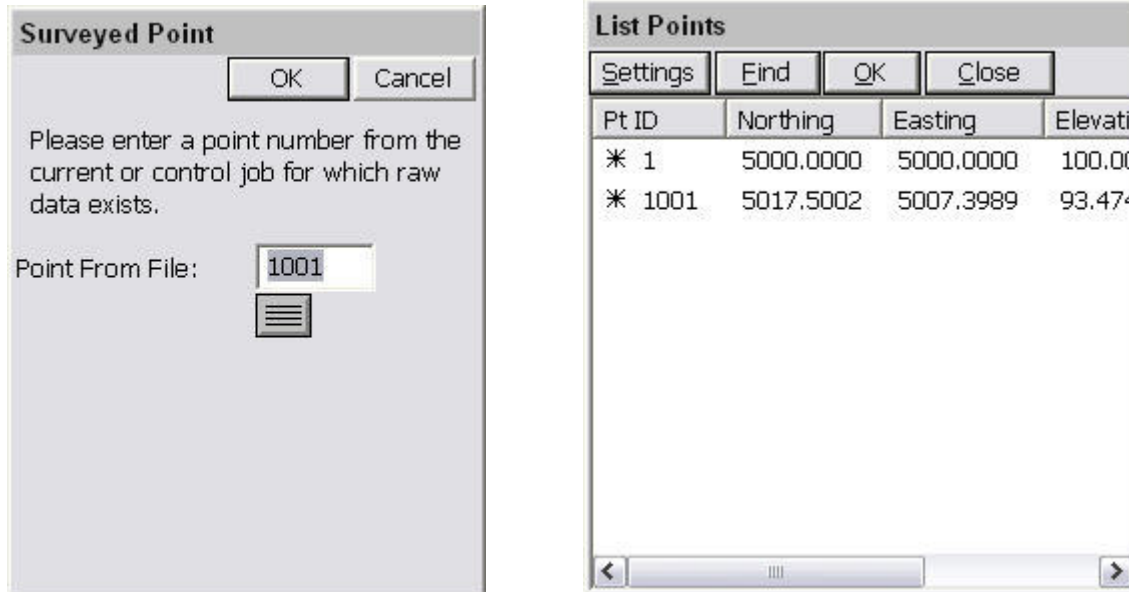
The next dialog presented will be the *GPS Coordinates* dialog shown below. Since the measured locations for each point has already been recorded, the user will want to use the option *From Raw File* in this dialog. Select *OK* to continue.



The screenshot shows a dialog box titled "GPS Coordinates". At the top right are "OK" and "Cancel" buttons. Below the title are three radio button options: "Read GPS", "Enter Latitude/Longitude", and "From Raw File". The "From Raw File" option is selected with a filled radio button.

### ***Surveyed Point***

Next, the user will be presented with the *Surveyed Point* dialog shown below (left). This dialog allows the user to select or enter the GPS measured point that represents the known (local) point. If the user selects the GPS measured point using the list icon, they should ignore the current coordinates displayed in the *List Points* dialog shown below (right), as they only reflect the non-localized position at this point. The important thing to remember is that if the local point was 1 and the GPS measured point was 1001, the user must enter 1001 in this dialog.



### ***Save the Localization File***

Once all of the points have been added to the localization dialog, save the localization file before exiting using the *Save* button.

### ***Reprocess Raw File and Update Coordinates***

At this point all of the coordinates in the CRD file that represent the measured positions need to be updated to reflect the newly created localization. To do this, select *COGO* → *Process Raw File* and process the raw file through the localization file. This will update the previously measured GPS points. Verify that the positions look valid by viewing the points in *File* → *List Points*. You should be able to compare the known and measured positions to see if they look right. Depending on the localization method, the measured values may not be exactly the same as the original known positions due to error that may have existed in the original positions.

### ***Additional GPS Measurements***

Once the localization is defined, all of the GPS points measured after its creation will be recorded to the CRD file based on this localization.

### ***Changing the Localization***

If the user determines that they want to redefine the current localization during a job, they must reprocess the entire raw file after making any changes to the localization file. It may be prudent to simply define a new localization file from scratch, leaving the original intact, and reprocess the raw file through this new localization file. Just remember that the last localization loaded, will be the current localization.