## FIELDGenius 2007 1/31/2007 Quick Reference - GPS Local Transformation.doc

## **GPS Local Transformation Using FieldGenius**

Note: You do not need to be connected to the instrument to perform this operation. Note: This procedure is for the circumstance described below. It is usually more efficient to use the process described in the helpdesk article: Quick Reference: Multi Point GPS Transformation in the Field.

Please use this article as a guide to performing a GPS transformation in FieldGenius when:

1. You have a range of points > 🦻 🔊 🏂 downloaded into FieldGenius that are in an assumed coordinate system: <No Line> <No Desc: 2. You have collected GPS observations It is best to have **>** 9 🔎 🗩 🔎 on some of the corresponding locations four or five reliable in the field. These observations are in a observations to UTM or State Planes coordinate system. choose from that You need to compute transformation are distributed parameters so you can continue to work widely around the 8 m at this site using your assumed job site. SA <No Line> coordinate system with GPS equipment. dent ID dia Decc

### Important Terms:

Local Coordinates in this case, are the points that you have measured in the field using GPS observations.

**Control Coordinates** are typically defined by an assumed or published coordinate system. These points will not be transformed by the transformation parameters.

Here we can see the map view of the job before the transformation. I have zoomed to extents. The cluster of points at the top of the screen represents the **Local**, or GPS observed points. The cluster at the bottom represents the **Control** points, which are in the assumed coordinate system you will want to continue working in.



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Currently the Transformation Parameters are at their default values. Any GPS measurement taken at this stage will be stored with no transformation applied. Pick "Edit Control" to start the process of calculating the parameters: Use the "GPS Local Transformation" utility found in Survey Tools or Settings.

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GPS Local Transformation <sup>12</sup> 3			0
Edit Control	Calculate Scale (GPS)	Adjust Points	
Origin Not Modify	Calibration Points		^
Origin East	0.000m		
Trans North	0.000m		
Trans East	0.000m		
Rotation	0°00'00''		
Scale	1.0000000000		
Trans Height	0.000m		
Slope North	0.00000		~
X	Close		

Pick on "Add Control" to start the process of matching **Control** to **Local** points.

See p. 341 in the FieldGenius 2007 manual for an explanation of the two checkboxes. Settings shown are typical.



Enter a point number or double click and select the **Control** Point from the map view:

You can select whether to use this point for horizontal or vertical control while you are in this dialogue.

GPS Local Transformation	123 😮
Control Point	
🔽 Horizontal 🔽 Vertical	
Local Coordinates	
Select Point	
Northing	
Easting	
Elevation	
V OK 💦 🗶 Cance	I

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Pick on "Select Point" to select the Corresponding **Local** Point from the Map View:1

Click on "OK" and "Add Control" repeatedly until all necessary points are "paired up."

GPS Local Transformation	123 😯
Control Point	
🔽 Horizontal 🔽 Vertical	
Local Coordinates	
Select Point	
Northing Select Point for Loc	al Coordinates
Easting	
Elevation	
🖌 ок 🔀	Cancel

As you add points you will see a list of Control points. The dN and dE values express the difference between the Control and corresponding Local Northing and Easting.

Pick on "Calculate Parameters" to view the residual measurements:

After you pick "Calculate Parameters" the new residuals will be displayed. The listed residuals indicate the amount of error that will be introduced at each **Control** Point if the transformation is applied now. You have the option of Highlighting a point and picking "Edit Control" to check or uncheck points to be used to compute the transformation. Note that point 2 will be used as the benchmark in this case. You can pick "Add Control" to add more pairs of **local** and **control** points.

Pick on "Close" to display transformation parameters:



GPS Local Transformation				1 <sub>23</sub> 😲	
Calcula Paramel	ate ters	Edit	Centrol	Add C	iontrol
Do not calculate scale Do not calculate vertical slopes					
Ctrl Pnt	Horz	Vert	dN	dE	dH
1	1	×	0.011	0.015	423.33!
2	V.	s 🗸	-0.001	-0.007	0.000
4	1	×	-0.011	-0.008	523.33!
<					>
X Close					

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These are the transformation parameters:

GPS Local Transformation		1 <sub>2;</sub>
Edit Control	Calculate Scale (GPS)	Adjust Points
Origin North	5620003.183m	
Origin East	690002.936m	
Trans North	5003.189m	
Trans East	5002.934m	
Rotation	0'06'53''	
Scale	1.0000000000	
Trans Height	523.335m	
Slope North	0.00000	
×	Close 📐	

Any further GPS measurements will now be transformed so that they appear in the same neighborhood as the **control** points in the map view.



#### OPTIONAL:

If you wish your **Local** points to appear in their transformed locations, you can pick on "Adjust Points." FieldGenius will go through the raw file and apply the transformation parameters to every point that was measured using GPS. In the end, zoom extents should show only the neighborhood of your **control** points with the corresponding **local** points very near.

GPS Local Transformation		12 <sub>3</sub> 💡
Edit Control	Calculate Scale (GPS)	Adjust Points
Origin North	39927m	Adjust Point
Origin East	16537m	
Trans North	1085m	
Trans East	-10187m	
Rotation	0'00'01''	
Scale	0.9999312083	
Trans Height	Om	
Slope North	0.00000	~
X	Close	

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