Guide to Trimble Juno SB GPS with Terrasync

This *Guide* provides the essentials for using the Juno GPS to collect data points and other features using Terrasync. The Juno provides 3-5 m accuracy under good conditions. Data can be post-processed, and the setup can be configured to accept a Laser Rangefinder with Compass for offset shots. This guide documents its use with TerraSync software to collect points, lines and polygons.

For more information, see the *Terrasync Software Getting Started Guide* (224 pp) which you can download from:
http://www.trimble.com/terrasync_ts.asp and the Juno manual
http://www.trimble.com/junosb_ts.asp.

Contents:

Physical Layout of the Juno

(Figures from Trimble Juno manual). Note that the unit is inside an Otter Box, so it looks a bit different, and the buttons are inside black rubber covers. The Power button can be pressed by pushing on the black rubber cover at the right place.
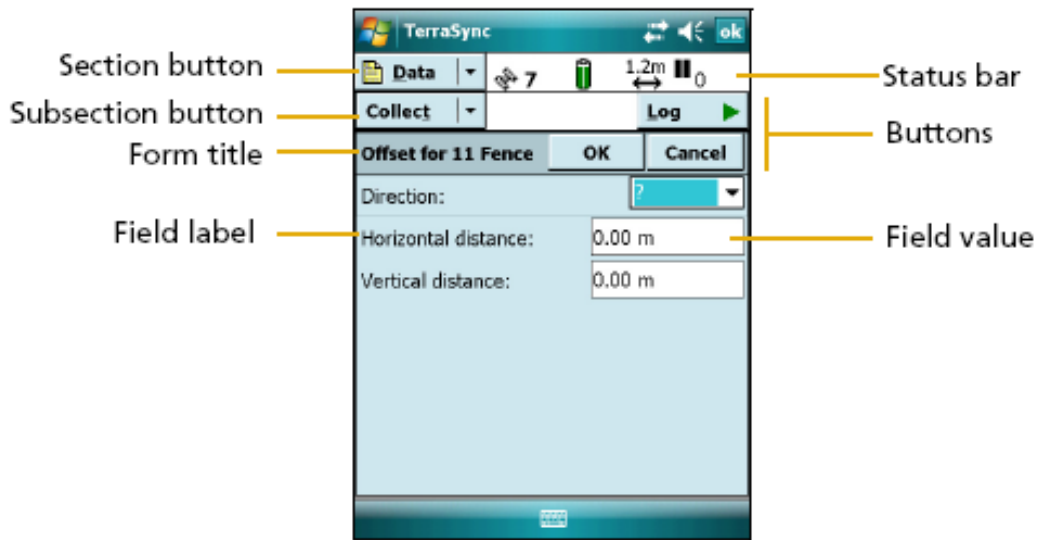
Basic Process of Using the Juno with Terrasync

The basic process of using the instrument, with TerraSync, is as follows:

1. Charge it the night before you plan to use it. When fully charged a light on the side (a bit hard to see) goes to solid green.

2. Make sure you have all of the equipment, taking care to maintain all equipment carefully. For the Juno, this means:

    - The unit, in its Otter Box. *Note: this unit is not waterproof.*

    - A wall charger.

    - USB cable for downloading data to a PC.

3. Start TerraSync from the Start menu. Tap the window icon, then select Programs/TerraSync.

4. Move to where the receiver has a good sky view.

5. Check the **Status** (p. 3) to make sure everything's working, and to see what satellites are available. If GPS is disconnected, go to setup.

6. Change the **Setup** as needed to get the GPS connection and differential correction working.

7. Configure the **Map** view to display map and background layers.

8. Use the **Data** area to create files and and capture features with the GPS. Ideally, prepare a data dictionary in advance to facilitate efficient and accurate feature collection. You can also create a data dictionary in the field.

9. Download the data to your computer, and remove it from the Juno.

10. Return all parts in good condition, and organized in the box as you received it.

Terrasync Screen Layout

Section button — 🔲 Data ▾   📶 7   🔋   1.2m ⇄ ⏸ 0 — Status bar
Subsection button — Collect ▾   Log ▶ — Buttons
Form title — **Offset for 11 Fence**   OK   Cancel

Direction: [?] ▾
Field label — Horizontal distance: [0.00 m] — Field value
Vertical distance: [0.00 m]

The user interface in Terrasync is reasonably clear, consisting of a couple of menus, a status bar, various buttons, and a display area that varies with the choice.

The **Section button** is a menu pull-down giving access to the primary subsystems of the software:

- **Map**: Displays a map with any background layers and captured GPS points.
- **Data**:   For opening or creating new data files. Use this to start collecting points. Once initiated, you can go to the map view to collect features into an open file.
- **Navigation**: We won't be using this, but allows you to navigate to saved points.
- **Status**: For determing the satellite configuration, planning time to collect, and checking the status of satellites, external sensors, etc.
- **Setup**: For reconnecting the GPS or differential correction inputs, setting coordinate systems, etc.

Status Bar
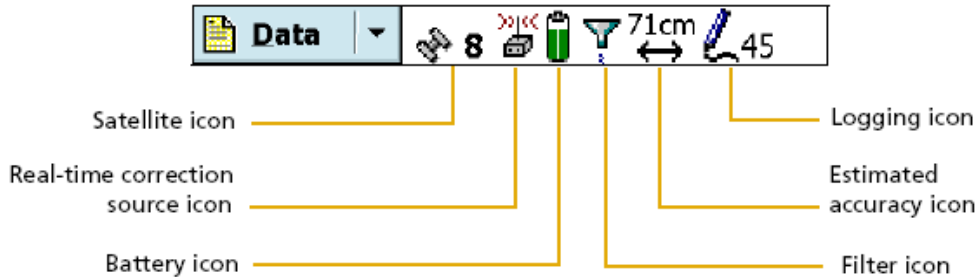
The status bar remains visible in all screens, and provides you with constant information on the status of satellite reception, accuracy, etc. It includes many icons, including:

Satellite icon: shows the number of satellites being tracked, and flashes when the PDOP is poor. The number flashes when not enough satellites are available. If the GPS is not connected, the connection icon ⬆⬇ will animate.

Real-time correction source icon: The SBAS icon shows that it is receiving real-time corrections from the SBAS satellite. You can also see an icon for this satellite on the sky chart.

Battery status: Left half shows the charge level of the GPS receiver batter; right side shows the status of the field computer's battery. For the Juno, these are both in one unit. Yellow means the power level is low, red means it's critical.

Estimated Accuracy icon: The type of accuracy depends on the settings in the *Accuracy Settings* form (in Setup/Logging Settings/Accuracy Settings button). By default, the accuracy is the field accuracy. Tap the number to temporarily display a post-processing accuracy estimate.

Logging icon: Shows that you're logging a feature with code accuracy (Carrier accuracy would also display the carrier time.) The number displayed is the number of positions logged so far. A red bullseye symbol is shown for when logging multiple vertices for a line or a point feature ⊚4.

Other icons are documented in the *Getting Started* guide.

Terrasync sections: **Status**

Skyplot:
- Select **Status** in the Section (upper) menu. The *Skyplot* should display as shown here; if not, select **Skyplot** in the subsection (lower) menu.
- At the top is the status bar, described above.
- The satellites in white boxes (e.g. 27, 20, and 03 in the figure) are being tracked but not being used to compute positions. The satellites in filled (black) boxes are being used to compute positions. The width of the bars represents the signal strength of that satellite
- The red circle shows the minumum elevation angle required to use a satellite.
- The overall satellite geometry (PDOP) is shown on the right as a vertical bar, with the configured minimum quality as a horizontal mark.   The bar will be black if above this mark.
- The current positions, datum, and PDOP values are displayed.
- For the Juno, the GPS settings are displayed at the bottom, with MaxPDOP, Min Elevation, etc. These cannot be changed in the Juno, but you have other means of limiting collection based on **Accuracy-based logging**.
- For the higher-end Trimble units, like the GeoXH, a slider bar allows you to favor productivity vs precision. Finer precision requires a lower PDOP. If you need to work in areas with interference, you may need to boost the productivity, degrading the precision. You can see the effect of this setting on the overall satellite geometry setting.
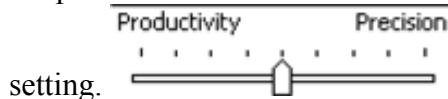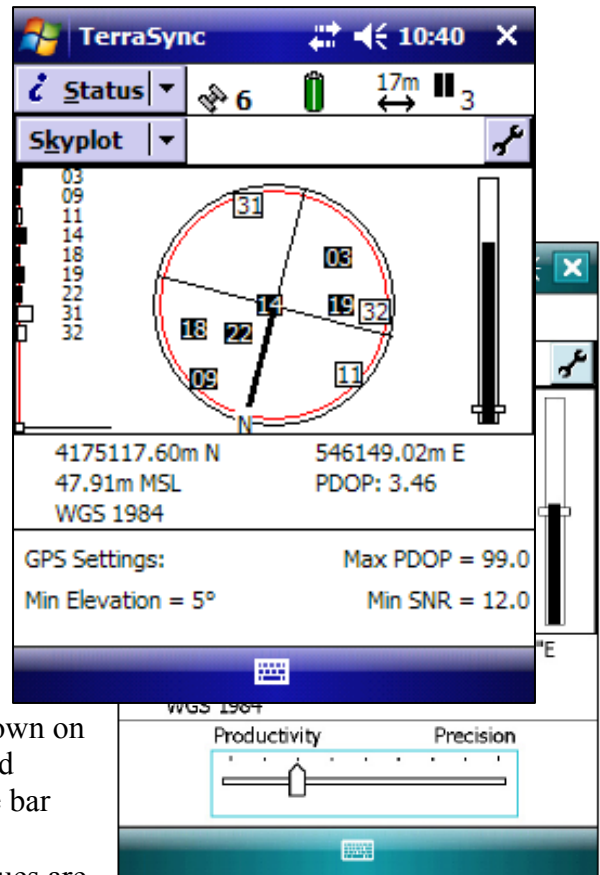
Other Status Sections:
- Satellite info: more info on each satellite
- Receiver
- Real-time
- Plan: for mission planning. Shows more info about satellite availability.
- Sensor
- Comms: shows com port use.

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Terrasync sections: **Setup**

Probably the most common use of Setup is to connect the GPS, needed if the map or data display shows 'GPS is disconnected.' Assuming GPS settings are correct, this simply means to click the **GPS** button.

Get to **Setup** from the Section menu. Some common settings:

- Logging Settings. One of these settings is the default antenna height.
- GPS Settings, if necessary, to change which GPS you're talking to, and maybe to change settings like maximum PDOP, minimum 'elevation' (angle above the horizon to require satellites to be), RTK.
- Real-time settings, to select a GeoBeacon or choose other real-time correction signals like WAAS. Using real-time correction however makes it more accurate for navigation to stored locations, like previously sampled sites. The real-time settings allow you to choose a real-time differential correction source and organize them hierarchically. Recommendation: Choice 1 "Integrated SBAS" (WAAS in the US); Choice 2 "Use Uncorrected GPS". SBAS will get you to submeter accuracy with the XH, but not with the Juno. Note that (with the XH) you can also post-process the data to get to better accuracy ~ 10-50 cm.
- Coordinate system, if you want to use something other than lat-long WGS84, HAE, for display. May want to set to UTM perhaps. I usually prefer UTM WGS 84 with elevation set to MSL (mean sea level) or UTM NAD83 if using a background image in this datum.
- Units, to change distance, velocity, type of lat/long etc.
- External Sensors, for selecting the Laser Rangefinder.
  You may be prompted to select the GPS device. If you want to use a laser rangefinder, this should be attached, with either the serial cable or bluetooth.
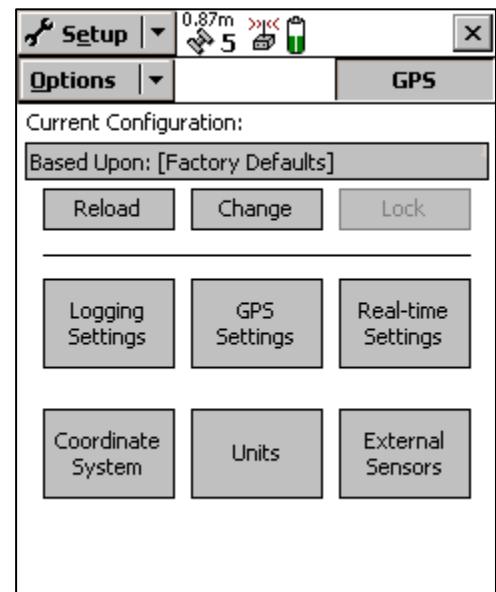
➢ Sometimes you may want to limit your collected positions to a maximum accuracy estimate. Go to **Setup/Logging Settings/Accuracy Settings** 🔧 and set **Use Accuracy-based Logging** to Yes, change the Required Accuracy to 5 m.   Then capture some more features to see the effect.
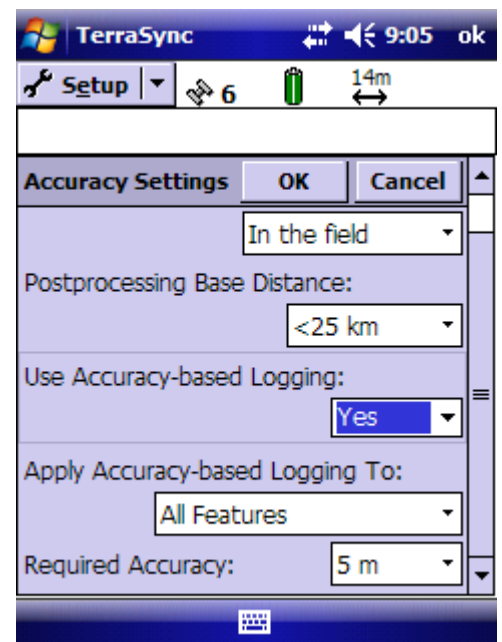
Terrasync sections: **Data**

To collect a series of GPS points as a new file:
1. Go to Data view.
2. On lower pull down, select **New**.
3. Set the location folder, provide a file name, select a dictionary if you have one created, and make any other selections on that screen. (The default data dictionary is ok for generic points, lines and polygons.)
4. Click **Create**.
5. Specify the antenna height. For a handheld unit, you may want to estimate how high you will hold it above the ground, but the vertical accuracy is probably at least 5 m, so this isn't so critical.
6. You should see a Create buttonwith a round blue symbol, and also a selection of feature types: **point**, **line** or **area**. *Once your GPS is positioned and steady (use the bubble level) at a point you want to collect,* you can either click the
   button or double-click the feature type to create a new point.
7. At this point data will start to collect (unless you have *Log Later* set) – you'll see positions accumulating in the top bar with a pencil drawing thing and a count of positions – also displaying the post-processing accuracy to expect.
   - While you are collecting data, shown as numbers incrementing to the left of the window close X button, you can enter in a Comment, or any other attributes, in the fields shown. You probably want to collect a lot of positions to average for accuracy, so you probably have plenty of time to enter useful attributes.
   - If you're not at the point, unless you are using *log later* you may want to pause right away if you're not ready to collect positions. You can then press the same button to start or resume logging when you're ready for the positions.
   - You can collect data in the Map View as well as the Data View. In the map view, the create feature button will just be a small blue solid circle.
   - Note that the unit will continue to log between features collected. You can pause and restart this as you go.
8. Use the map view to see what you're collecting, while you're collecting it. You can create new feature objects while in the Map View, though the data interface is less complete than the Data interface. See the map section below...
9. **Close the file.** There's a close button. Pretty obvious. There's also a window closing X that exits the whole program.

Create : New feature
Log : "Go"
Pause : "Stop" temporarily
Ok : "All done"

8
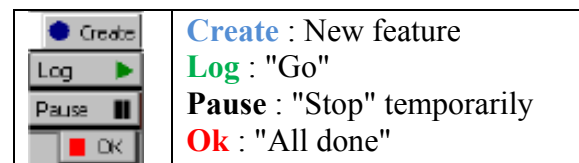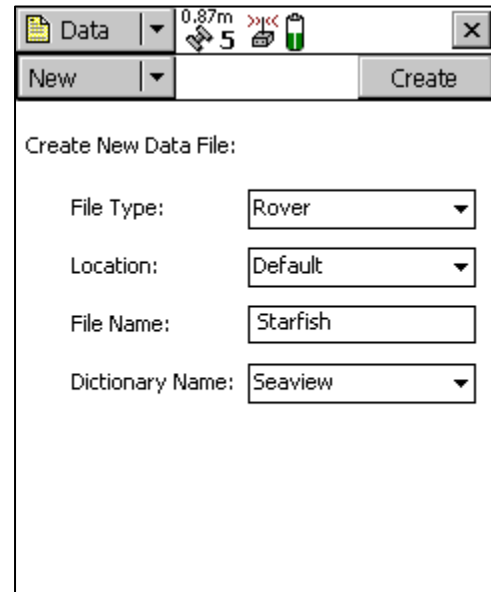
Terrasync sections: **Map**

While we could use the GPS without a map display, it's nice to be able to see where we are in relation to existing map or image layers.

Tools: The map display includes options and display tools. You can pan and zoom, and get information about features.   Typically panning to include the GPS points is automated.

You can also digitize features on the map display. These use the same data files you create for GPS points. If no feature is open, you can tap the blue 🔵 Create Feature icon, but make sure that GPS data collection is paused. Use the digitize tool ⊕.

Creating manual positions: you can enter coordinates directly. A file must be open (see Data section), with GPS paused, and the digitize tool selected; then go to Options and select Enter coordinates.

If you have a file open and your GPS is hooked up and receiving positions, you can also use the 🔵 Create Feature to capture points in this view. This is a little nicer than in the Data view since you will see a map.

Background Layers: It's very useful to include a background map or orthoimage. Use the Layers button to access this. To add one previously loaded onto the unit, identify the Location, File Type, and File.

To load a file, first get it into JPEG format and in UTM coordinates. Then connect the unit to a PC with the USB cable, and let Microsoft ActiveSync start up. (If this doesn't happen, you may need to download ActiveSync first.) Then use its explore button to access folders on the unit. Then copy the files you want (e.g. campus image files in P:\Courses\Exted\G9010\data) into the TerraSync folder on the unit.

Supported Orthoimages

At this version of TerraSync, only BMP or JPEG files seem to be supported. You should save both the jpg (in UTM) and the jgw (world file) in the TerraSync folder, then it will appear as available as a background file. *Note*: be careful to set the coordinate system to that of the orthoimage.
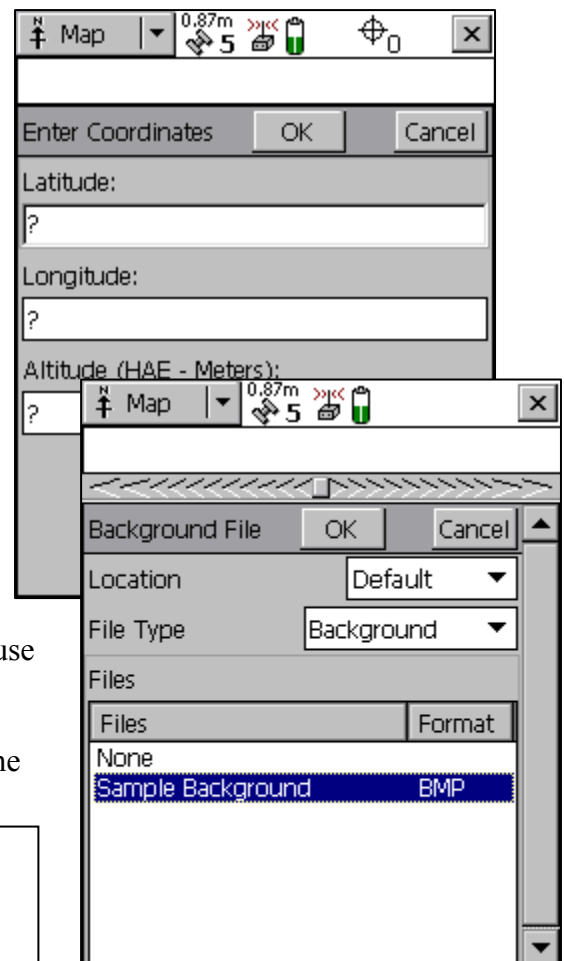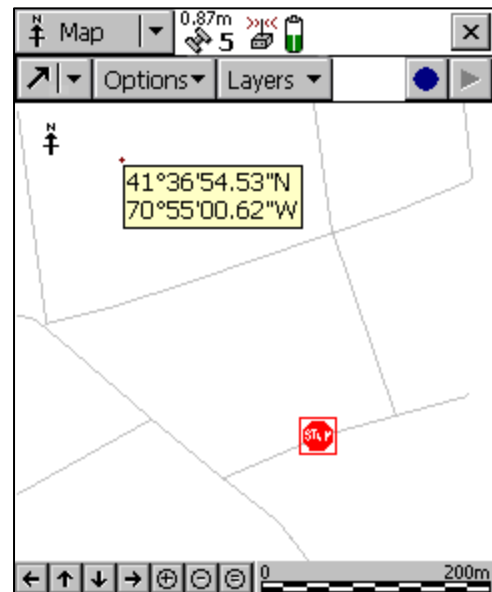
Capturing a Feature with GPS Positions

Capturing points are simple, lines and polygons simply add multiple vertices. First, understand that any time you collect a GPS point feature with Terrasync, you will be using a data dictionary. You can either use one you've created or use the generic data dictionary. This page describes capturing generic points, lines and polygons, with one 'comment' attribute, but the same process applies to capture features with more elaborate data dictionaries.

To capture a point:

> In the **Data** area, create a new data file, naming it what you want and pressing the **Create** button. In the *Confirm Antenna Height* screen, set the antenna height to about a meter, figuring that's close enough to the height you're holding the unit above the ground location (and figuring that the vertical accuracy is at least 5 m). Make sure the subsection menu is set to **Collect Features**, then choose the Point_Generic feature type and push the ● Create button to start collecting positions for the feature. Note that the blue circle symbol will also be used when in a map view, and means 'create new feature'. Note that positions will start to collect, and you'll see a red target symbol ⊚ 4 with the number of positions collected displayed in the upper right. A comment field will appear that you can fill in with data. Enter some text that you want to associate with the point, and wait until you have 10 or 20 positions collected before you press OK. On the table below, leave the Easting and Northing cells blank for now, but record the temperature data.

To capture a line (or polygon):

- Recommendation (for either method): before pressing the Create button, select **Log Later** in Options – then you can add the parameters before starting to log points. Enter the parameters, but don't press Ok – the same as with Log Now, this would close the features. There's a green Log button for when you are ready to start. Press the red square stop button when you're finished with the feature.
- *Positions as vertices:* Normally when you log a line or area feature, every position can potentially become part of the feature as a vertex. Start by selecting a new feature of **line_generic** or other line type. You can log a series of positions while walking. You can control which positions to use by pausing the position logging, then restarting.
- *Points as vertices:* Capture the path as a series of vertices, waiting at each one. For each vertex, stand at a location and use **Options/New Vertex** method to initiate the vertex, and capture it like you captured a point, with averaging. A message will be displayed: "Vertex 1 open   Remain stationary". *The red stop square button refers to the vertex.* Wait at each vertex until you have at least 20 points averaged, then press the red stop button to close the vertex. Note that when you stop it, another red stop button appears – this refers to the feature. Since it's not logging features unless you tell it to, you can move to the next vertex and repeat the process. After you've Ok'd the last vertex, Ok again to close the feature.

Create a data dictionary in the field

Purpose of a Data Dictionary

A dictionary is handy when collecting feature data that may have attributes. We could use a field notebook for this, but you can avoid errors and speed data collection by creating an efficient dictionary. Data dictionaries allow us to create a variety of different attribute types, including the ability to select from lists of possibilities. We might, for example want to record tree types selected from a list of "pine", "oak", "elm", etc., or maybe we know how to identify them to species and want to select from "*Pinus ponderosa*", "*Quercus agrifolia*", "*Abies concolor*", etc. Data dictionaries support quite a few data types, including images such as photographs you take with the Juno of features you want to georeference with the GPS.

You need to first create this dictionary, which you can use Pathfinder for, but you can also create in the field with TerraSync, which we'll do here. The basic process is:

1. Go to the file manager, then Options to specify a **New Dictionary**.
2. Create "features" (really feature classes, since you'll be saving multiple feature records in the file) of points, lines or areas. Each feature will eventually saved as separate GIS files.
   - For example, in the Edit Dictionary window, use Edit to create a New Feature called **stream crossing** (point or line) or **tree** (point) or **gully head** (point) or **vegetation patch** (polygon) or **trail** (line).
3. For each feature, create its attributes (numeric, text, date, time, menu). In the case of menu attributes, enter the possible values to select. For example, for trails, you might have a **surface** menu attribute, with values "paved", "dirt", and "gravel". For tree, you might have **tree type** with choices "White Fir", "Ponderosa Pine", etc. One interesting attribute is a picture, selected as a **file**.
4. Save the dictionary.
5. To use the dictionary, when you are creating a new data file, you choose the dictionary. Note that if you want to change the data dictionary, you can do so, but you would need to create a new data file to capture additional features.
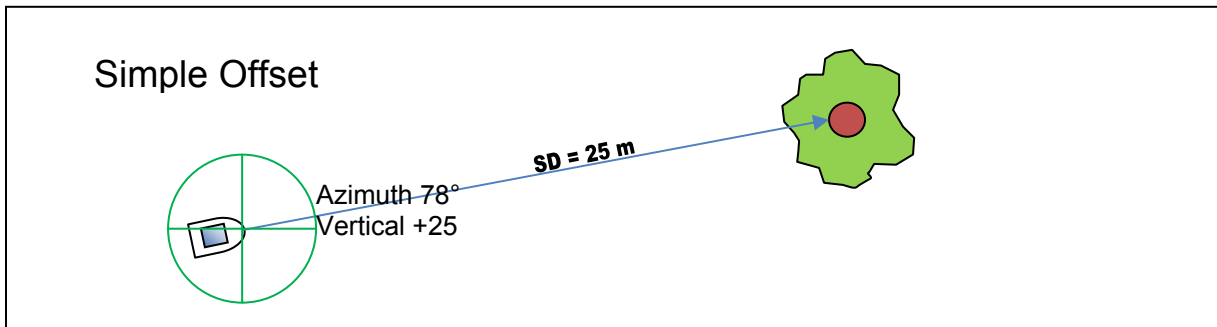
Offsets

If you cannot occupy a desired feature with the GPS, but can see it from a location where you can get GPS, you can use various offset methods:

- Simple Slope/Inclination offsets with distance, compass direction, and vertical angle.
- Complex offsets with more than one GPS point and some combination of distances or compass directions.

An offset can be recorded with a collected point or vertex, and this is retained with the data. The actual GPS point might get real-time differentially processed or post-processed, and then the saved offset is applied to the feature you are after. The offset is always *from the GPS* toward the feature. This convention makes it easy to use solo methods where the user is holding the GPS and might be using a laser rangefinder to shoot distances to a desired feature.
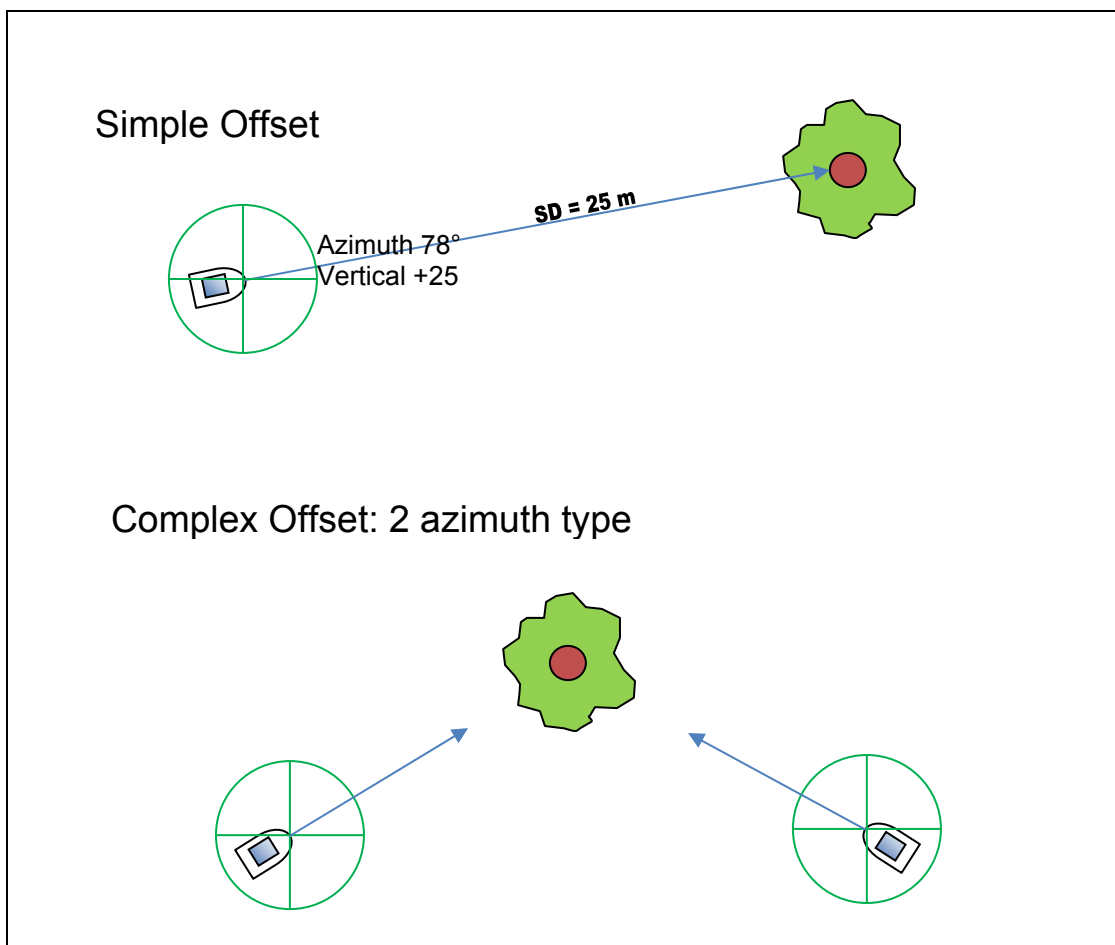
Simple Offset – with Distance, Compass Direction and Vertical Angle

Simple Offset

Azimuth 78°
Vertical +25

SD = 25 m

➢ First we need to set up the GPS to use the offset format we are going to provide. In **Setup ... Units** set the **Offset Format** to **Slope/Inclination** (instead of Horizontal/Vertical where we would need both of those distances); and set the **North Reference** to **Magnetic** (since our compasses read magnetic directions.) Also make sure the Distance Units are set to **Meters**.

➢ Open your data file, and go to **Collect Features** mode, and survey a feature that you can't stand next to and get a decent point. Measure the slope distance, vertical angle and compass direction (for best accuracy, do a backsight of the compass direction), and while (or before, if log later is set,) collecting your GPS point, use the **Options** button to go to **Offset**, and enter the compass bearing in degrees, the slope distance and the inclination (make sure to enter negative or positive as appropriate).

➢ Collect some more. Try staying at one GPS point, and "spraying out" to multiple tree features. Each point needs to be collected as a GPS point, since only one offset is saved with each point, but this will illustrate a process we will use with submeter GPS.

If you are using a connected rangefinder, you can fire it any time to bring in an offset. If it gets a valid offset, a special offset display will appear, asking if you want to use it. *Notes:*

❖ You can also enter in an offset by using **Options**/**Offset** and entering the azimuth, horizontal distance and vertical distance, or slope distance and vertical angle, depending on the **Offset Format** settings in the **Units** area of **Setup**.

❖ The Laser Rangefinder may be set to provide true azimuths. *You don't want to convert these twice, so make sure the settings are correct.*

❖ Your GPS point being collected is probably set to the base of the rod, your GPS, assuming you've entered a rod height. So your vertical angle is from the base of the rod to the feature. But your rangefinder probably isn't positioned there, so you need to shoot to a height above your target equivalent to the height of your rangefinder above the base of the rod you're holding.

Magnetic Declination Settings

Using a compass that does not correct for declination (Suunto):
- Setup/Units: Magnetic Declination set to **Auto** or a known declination

Using the rangefinder or a compass that is correcting already:
- Setup/Units: Magnetic Declination set to **0.0**

Complex Offsets

TerraSync also has the capability of doing "complex offsets" where you use two or three GPS positions together with *either* distances or compass bearings. These are handy in two situations:

1. You don't have a compass or clinometer with you, but you either (a) have a distance device like a tape or a rangefinder; or (b) you know how to pace your distance. You can use **trilateration**.

2. You can't physically get to the point you need to locate, but you have a compass and can see the point from three surrounding GPS points, using **triangulation**.

Offset Options	GPS pts	Requires
Distance - Bearing	1	1 Slope distance and 1 compass bearing
Distance - Distance	2	2 Distances and left vs. right setting
Triple Distance	3	3 Distances
Bearing – Bearing	2	2 Compass bearings
Triple Bearing	3	3 Compass bearings – must have an error check

Pacing Distances
For the 3-5 m accuracy of the handheld GPS, pacing accuracy is sufficiently accurate. First, we need our pace distance.

- Count your extended paces over the 100-m course that the instructor specifies. Note that a pace is two steps, so starting with your left foot it's each time you put your right foot down. Extended paces are stretched out, more consistent than normal walking. Do this four times, back and forth twice, and record the number of paces here:

  _____ _____ _____ _____ sum = _____

- Go to the calculator program on the Juno, add them up and divide 400 by this number to get the length of your pace in meters, and write this down, to two decimal places: _____

Considerations for complex offsets
Using more than one GPS points to find a desired feature point employs triangles, either using triangulation or trilateration methods. Triangles work best when they are not too skinny, with the ideal shape being equilateral with each corner at 60°.

So, in creating either a single triangle with two GPS points and a feature, or creating multiple triangles, you should try to spread your points out. With three points, you should try to surround your feature on all sides. This is the same issue as with GPS where we minimize the PDOP by collecting when satellites are spread apart.
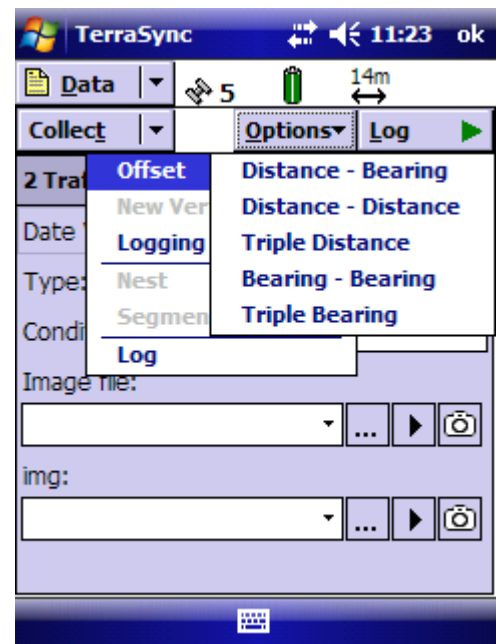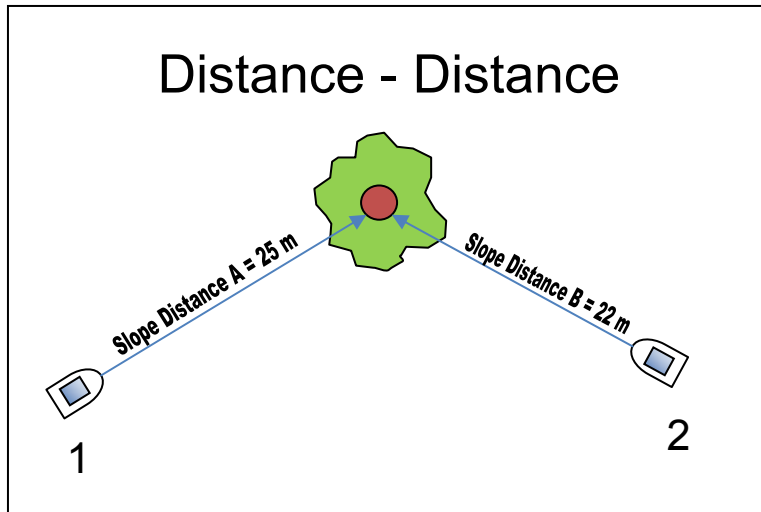
Distance - Distance

To capture features using the Distance-Distance method:

1. **Setup/Units**: Offset format: **Slope distance/Inclination**.
2. Before creating a point, when in collection mode, select the **Log Later** option (Options).
3. Create a point feature, but before starting logging, use the Options button to change the **Offset** method to **Distance - Distance**.
4. This will start up a process which is somewhat self-explanatory on the screen:
   a. Move to a suitable GPS point (**1**) and press Log to start logging the reference position.
   b. Press **Next** (and the position collection) and you will be prompted to enter the first distance (**A**): you'll pace the distance, and use the calculator to multiply your paces by your pace distance, then enter the result in the **slope distance** field. Leave the Inclination at zero.
   c. Press **Next** and follow instructions to move to the next GPS point (**2**) you'll probably be pacing from the feature, so go ahead and figure out the distance.)
   d. **Resume** to collect that second GPS point, then **Next** to enter the distance.
   e. After the last point, you will also need to enter the direction of the feature from the line you travelled between **1** and **2**. (In the above figure, it would be **Left**.)
   f. Ok the result and close the feature the normal way, once you've entered any necessary attributes.
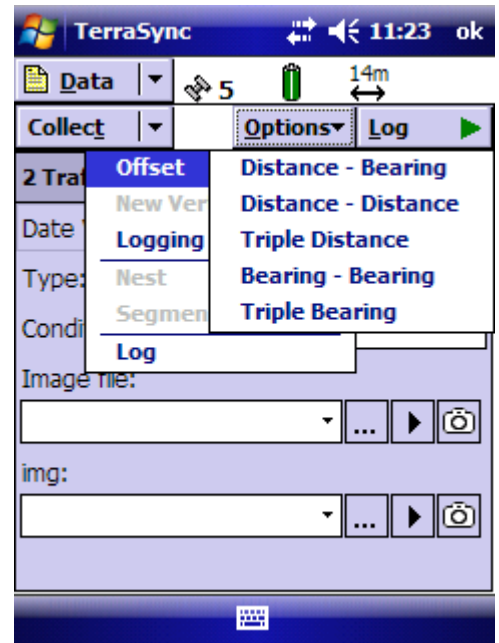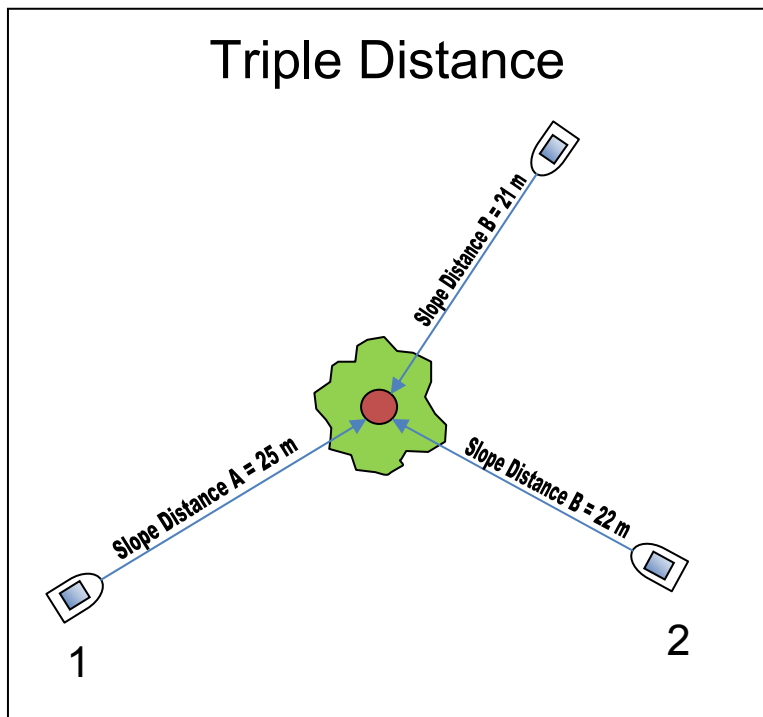
To capture features using the triple distance method:

1. **Setup/Units**: Offset format: **Slope distance/Inclination.**
2. Before creating a point, when in collection mode, select the **Log Later** option (Options).
3. Create a point feature, but before starting logging, use the Options button to change the **Offset** method to **Triple Distance**.
4. This will start up a process which is somewhat self-explanatory on the screen:
    a. Move to a suitable GPS point and press Log to start logging the reference position.
    b. Press **Next** (and the position collection) and you will be prompted to enter the distance: you'll pace the distance, and use the calculator to multiply your paces by your pace distance, then enter the result in the **slope distance** field. Leave the Inclination at zero unless you've measured it.
    c. Press **Next** and follow instructions to move to the next GPS point (you'll probably be pacing from the feature, so go ahead and figure out the distance.)
    d. **Resume** to collect that second GPS point, then **Next** to enter the distance.
    e. Repeat for the third point. You'll want to pace from the feature to that point: all three distances are from the feature to the GPS point in question, or vice-versa.
    f. Ok the message saying the position has been calculated.
    g. You should be back at the feature creation point, where you can close it once you've entered your attributes.

Bearing – Bearing
&
Triple Bearing
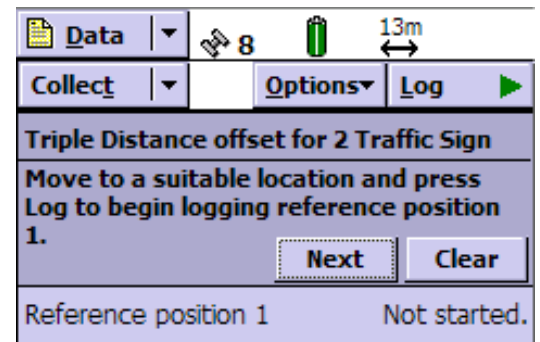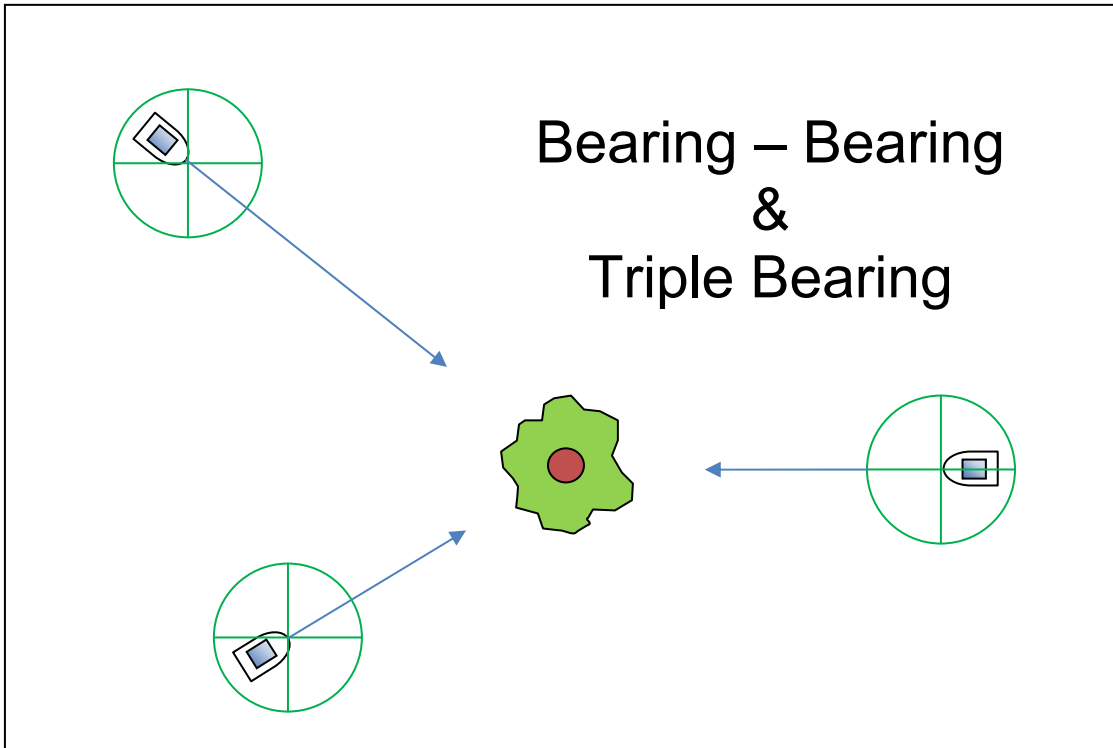
Bearing-Bearing and **Triple Bearing Offsets** are handy when you can't actually get to the point in question. Maybe there's too much poison oak, or there are monsters or steep cliffs between you and the feature. The only limitation is that compass measurements are not very accurate, though they are probably as accurate as pacing. To capture other features using either the Bearing-Bearing or the Triple Bearing method, you use the compass to shoot from the GPS points to the feature. Note that with three points it is able to detect errors, and it may not like the accuracy of the bearings you read if they don't intersect well.

1. **Setup/Units**: Set the **North Reference** to **Magnetic** unless you are working with a compass that provides true azimuth.
2. Before creating a point, when in collection mode, select the **Log Later** option (Options).
3. Create a point feature, but before starting logging, use the Options button to change the **Offset** method to **Bearing – Bearing** or **Triple Bearing**, depending on how many points you'll be using.
4. This will start up a process which provides pretty clear steps on-screen.
   a. Move to a suitable GPS point and press Log to start logging the reference position.
   b. Press **Next** (and the position collection) and you will be prompted to enter the azimuth, so measure this and enter it.
   c. Press **Next** and follow instructions to move to the next GPS point.
   d. **Resume** to collect that second GPS point, then **Next** to enter the azimuth from this point.
   e. If doing Triple Bearing, repeat for the third point. After the last point, you will see a message that the position has been calculated, and you can Ok it.
   f. Close the feature after entering attributes.

Downloading & Postprocessing Points using Pathfinder

Whether or not you post-process, you will need to download your data to bring it into a GIS. We'll use Pathfinder to do this.

1. The computer needs Microsoft ActiveSync working and current.

2. Attach the unit with the USB cable. You should hear a happy sound when ActiveSync starts up and detects the unit.

3. Start GPS Pathfinder Office, and either open an existing project you created earlier, or create a **New...** project – specify a 'workspace' folder (it will create a new one if you provide a path that works. Note that it will create the folder you name, and within that folder will create a Backup, Export and Base folder.

4. Utilities/Data Transfer. Check the connection in the devices area, then with the Receive tab, click **Add** ... **Data File** then specify the file(s) to **Open** from the field computer/GPS, then **Transfer All** to get all of the data from this file. Close your way back to the main GPS Pathfinder window.

5. Open the file you transferred and you should see it displayed in the map. Note that some 'features' may be messages that you lost the carrier signal, etc., but the ones you've captured as features should have the attributes you've assigned. To scroll through them, use **Data/Feature Properties** or **Position Properties** to display a list you can scroll through. You can also select features with the mouse.

   Offsets: Note that features with offsets retain their GPS coordinates – this must be the case since they must be post-processed as GPS data. The offset information is thus stored with the feature, and can be seen by clicking the **Offset...** button.

6. Export data to shapefile. **Utilities/Export...**
   Select **Sample ESRI Shapefile Setup**
   Go to **Properties** to set the coordinate system and select a projection file. You can also change which attributes to export, etc.
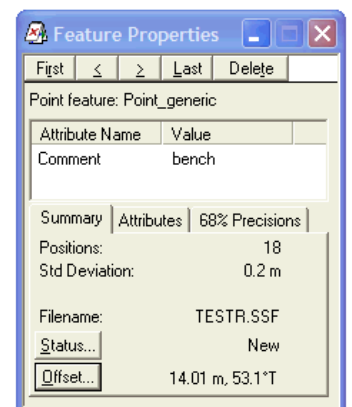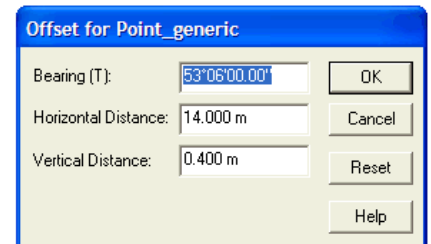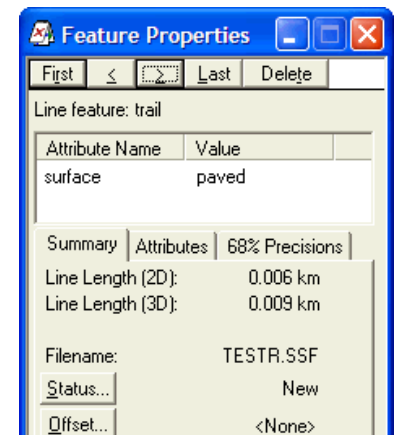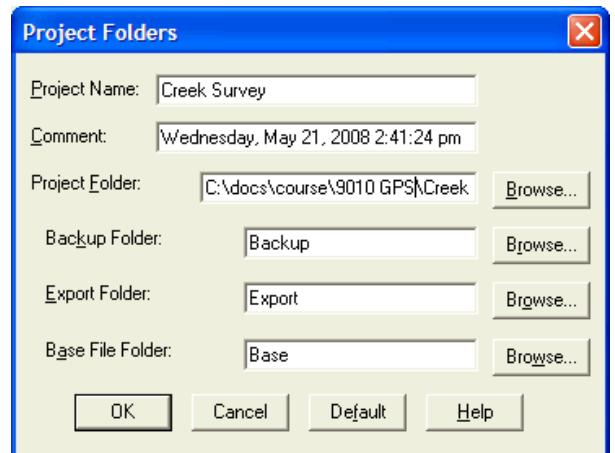
7. **Utilities/Differential Correction** to start the Differential Correction wizard, to correct files with nearby public base stations.
   - You may need to wait a day or so before the files are available.
   - You can probably use the default settings. The Junos use code, not carrier phase, so you could specify to do Code Processing Only, but the Automatic Carrier and Code Processing seems to work.
   - You can create a Base Provider Group, or select an existing one you created earlier, that is composed of nearby stations. Each station has a distance attribute set from the positions you're trying to collect. The **Integrity Index** is a quality indicator ranging from 0 to 100, with 100 being the highest, and is based on bias, precision and reliability, resulting from a variety of factors, combined with the baseline distance from the rover to the base station. I'm not completely sure why there are so many '?'s or what to do with them.
   - Select base stations as close as you can find to your field area.
   - The Junos use code, not carrier phase, so you could If you were using real-time SBAS differential, you probably can't improve on this by post-processing.