

## **Landscape & Stakeout**

### **Help**

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## **Overview**

The Landscape & Stakeout app is loaded with a multitude of functions that operate on Points, Lines and Areas that represent land features. In particular, it provides various tools for creating regular land feature shapes as well as specific types of shapes that are useful for landscape designs. It also provides the Stakeout functions to help you get to particular spots on the map or walk along a boundary line.

A typical scenario of using this app involves the following steps:

1. Import the boundary shape or digitize it within this app. This could be for your backyard or for a golf course.
2. Add Landscape Shapes to the landscape mapping job. Reposition and/or resize the landscape shapes as necessary. (You could create a grid to help with placing the shapes.)
3. Export the completed layout design to a PDF file or a DXF file.
4. Use the stakeout functions to help you get to the actual locations on the ground

to install the layout per the design.

The function highlights of this app are:

- \* Draw various types of scalable Landscape Shapes.
- \* Move landscape shapes to desired locations on the drawing.
- \* Import Feature shapes from a Shapefile or a DXF file.
- \* Precisely digitize Point, Line and Area Features over the built-in Map.
- \* Move existing nodes to fine-tune the map drawing.
- \* Tag the regular Features with pre-defined Attribute/Values.
- \* Attach one or more photos to the selected Feature or Landscape Shape.
- \* View position, length and area values for the Features.
- \* Create grid points or grid lines over an Area Feature.
- \* Label the Line Features with segment lengths and directions as well as corner angles.
- \* Label the Area Features with size in acres and square feet or hectares and square meters.
- \* Measure distances and areas without saving the shapes.
- \* Create a Point from the entered address or coordinates.
- \* Create a Point or record a node by picking the GPS location.
- \* Save the job data file for later use.
- \* Export the Feature data to DXF.
- \* Output the drawing and the coordinates to PDF.
- \* Email the job data files and the PDF files to your colleagues.
- \* Use GPS to stake out Points or nodes on a Line or Area.
- \* Use GPS to guide you along a specified Line or Area boundary.

Please follow the examples provided in this document to become familiar with these functions so that you will be able to apply the mapping methods to your own job tasks.

This Help document is divided into three main sections. The first section discusses the general mapping functionality pertaining to the regular Point, Line and Area Features. The second section describes the Landscape Layout functions that apply to the special scalable Landscape Shapes. The third section describes the stakeout functions.

## **Map View**

The **Map View** is the main screen that shows any spatial data and/or background map present in the currently active job. The spatial data can be Point Features, Line Features, Area Features or the special scalable Landscape Shapes.

You may select a displayed **Feature** or **Landscape Shape** by tapping on it in Map View. When you do so, the selected map element will be highlighted in the default orange color. The ID and the location coordinates will pop up in Map View.

You may also select a Feature by tapping on the corresponding Feature record in the spread-sheet called the **Sheet View**.

After selecting a **Point, Line** or **Area Feature**, you may tap the **Feature Properties** tool icon to assign a different symbol to represent it. You may also

enter a description for the Feature or assign a pre-defined description to it via Feature Properties or Sheet View.

On the other hand, when you select a **Landscape Shape** and tap the **Feature Properties** tool icon, you will be taken to the Landscape Layout screen to view or modify the parameters for the shape.

You may zoom into the map by double-tapping, or by pulling two fingers apart on the screen. You could zoom out of the map by tapping two fingers on the screen simultaneously, or by pinching two fingers on the screen.

The map scale is displayed at the lower-right corner of the Map View.

Displayed across the top of the **Map View** are the following tool icons.

Tap the **Main Menu** tool to see a menu of functions for working with jobs, maps and system setup. Tap the **pull-down arrow** to reveal the map tools.



The **Topic Menu** provides functions to create, edit, move, delete or set up automatic labeling for the Feature Topics:



The **Map Tools Menu** lists the digitizing tools as well as the functions for entering **deed calls**, creating a **grid** over an area and doing **landscape layout**. The icon for the currently active map tool is displayed. For example the **Add Point manually** icon is initially displayed by default:



The **Utilities Menu** provides access to functions for measuring distances and areas, as well as locating a point by address. Initially, the **Measure Distance** utility is shown:



Tap on the **Zoom Fit** icon on the Toolbar to display all map elements:



The **GPS Menu** provides access to GPS-related functions:



With a Feature selected, you will be able to view its coordinates as well as assign Attribute and Values to the Feature by using the **Feature Properties** tool:



Tap the **Topic View** toggle to select an active Topic:



Tap the **Sheet View** toggle to display data in a spreadsheet:




Additional tool icons may be displayed when you work with a specific function.

### **On-screen keyboard**

An on-screen keyboard will automatically pop up when the focus is on a data entry screen. After entering data, tap the **Return** button on the pop-up keyboard. If a **Next** button is displayed in the data entry dialog, then tap that button to go to the next step. To hide the keyboard, tap the **Hide Keyboard Key** on the pop-up keyboard.

When you tap on an existing value in a data entry field, if one character is highlighted, you may replace it by entering a different character. If the cursor is displayed, you may insert characters at that location. To replace the entire text or numeric value in the field, first swipe the field to highlight all the characters then enter the new data.

When entering numeric data, you will notice that there is a **Separator Key**  showing several symbols on it. This key will facilitate data entry in several ways.

To enter a distance value with a fractional part, tap this key to put in the decimal point.

To enter angles in **DMS** (Degrees- Minutes-Seconds), if your data value will not fill in all the places, then tap the separator key after entering the desired value. For example, to enter the longitude of 91°09'26.082"W, you could type in 0910926.082W. Or, you could type 91, tap the special key, type 9, tap the separator key, then enter 26.082W.

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### **Set up a Job**

The application software requires a job file to be open for it to work with. The **Job Menu** under the **Main Menu** provides functions for opening a job, saving a job, importing a set of Shapefiles, as importing/exporting a DXF file, exporting to PDF, emailing files as well as transferring files via ftp.

#### **Opening or Creating a Job File**

To open an existing job file, tap the **Main Menu** icon, select **Job** then select **Open Job** . Select a job file to open, such as **farm.lnd**. (The job files for this app have the **.lnd** file name extension.)

To create a new job file, tap the **New** button. Accept the proposed file name or enter a unique file name then tap the **OK** button. (Yes, it's okay to type over the displayed file name.)

You may select a Feature List to be associated with the job. Doing so will permit

you to assign pre-defined Attribute/Values to a Feature that you have imported or digitized. The procedure for defining a Feature List is provided under **Set up Feature List**.

Once the proper files have been selected and any optional information has been entered, click on **OK**. If you have selected an existing job, the job data will be displayed.

If you are working with a job file and want to open another job file instead, select **Main Menu**, select **Job**, select **Open Job** then select the desired file name. This action will automatically close the previously opened file.

If you are not sure which job file you are working on, select **Main Menu**, select **Job** then select **Open Job** to view the File Dialog screen. The name in the **File Name** box is that for the currently open file.

To cancel out of the screen for opening a file, simply tap the **Cancel** button.

### **Saving the Job File**

To save the data in the currently open file, tap the **Main Menu**, select **Job** then select **Save**. The file extension will be **\*.lnd**.

To save the data under a different file name, tap the **Main Menu**, select **Job** then select **Save As**. Enter the new file name.

Let's save the **farm.lnd** example file that you have just opened under a different name, such as "myfarm". This way, you can work with **myfarm.lnd** and keep the original sample file intact for later reference. You do not need to enter the "lnd" file name extension.

The newly saved file will be the active job file.

### **Accessing the Documents Folder**

The data files, such as the \*.lnd job files, will reside in the **Documents** folder for the application. To access your data files outside of the application, first sync your device with the iTunes® program. Then you should see an **Apps** tab across the top of the screen. Click on that tab then scroll down to the **File Sharing** section. Click on the **Landscape & Stakeout** app name. After a while, the data files associated with this app will show up on the right-hand side.

You may copy files between the Documents folder for the app and your desk-top computer. You can drag files into or out of this Documents folder. You may use the **Add** button on the iTunes® screen to select and add files from your computer to the Documents section.

**Make sure the job file you are copying from the app is not the working job file.** In other words, open a different job file to make it the working job file.

Try saving a copy of Layout01.lnd and farm.lnd as well as farm.fbr in a folder on

your PC.

To delete a file, first highlight it then press the **Del** button on your computer.

**Caution: A deleted file cannot be recovered.** Always make sure you really want to delete a file before proceeding.

**Please note:**

Before updating to a new version of **iOS**, first back up all you apps and data files. Also, should you decide to remove an application software for some reason, beware that all the associated data files will be deleted. If you wish to save the data files, please save a copy to your desk-top computer before removing the app.

**Importing Shapefiles**

You may import the data from Shapefiles for use within this app. As each set of Shapefiles has several files associated with it (e.g. the .shp, the shx, the .dbf, and the .prj files), please make sure all these files are present in the **Documents folder** for this app.

To import Shapefiles, first open the desired Job file, or create a new Job file. Choose **Job** then select **Import Shapefiles**, select the desired Shapefiles name then tap the **OK** button.

Select the Datum, Coordinate System, Unit and Region in which the data was saved in the Shapfiles then tap the **OK** button. If the selected Datum and Coordinate System do not match those in the Shapefiles, the data may fail to come in or it may not be properly displayed.

If a GSB file (Canadian grid file) is to be used, tap the **Load** button then select the appropriate file. Use the **Unload** button to remove the GSB file.

The imported data will be converted to WGS84(1150) ITRF00, METERS, and Epoch 01/01/2014.

**Importing a DXF file**

You may import the shapes from a DXF file and work with them in this app.

To import a DXF file, first open the desired Job file, or create a new Job file. Choose **Job** then select **Import DXF**. The Import DXF screen will list all the DXF files present in the **Documents folder** for this app. Select the desired DXF file then tap the **OK** button.

Select the Datum, Coordinate System, Unit and Region in which the data was saved in the DXF file then tap the **OK** button. If the selected Datum and Coordinate System do not match those in the DXF file, the data may fail to come in or it may not be properly displayed.

If a GSB file (Canadian grid file) is to be used, tap the **Load** button then select the

appropriate file. Use the **Unload** button to remove the GSB file.

The imported data will be converted to WGS84(1150) ITRF00, METERS, and Epoch 01/01/2014.

### **Exporting a DXF file**

The Features in the working job file may be exported to a DXF file. The exported DXF file will reside in the **Documents folder** for this app.

To export the Feature data to a DXF file, choose **Job** then select **Export DXF**. Mark the Topics that are to be exported and select the desired options then tap the **OK** button.

Mark the **3D** checkbox if the elevation values are also to be exported.

Select the **In Block** option if you wish to export the Features in block format into the .DXF file. Then you may mark the **With Attributes** checkbox if you wish to have the Features exported along with their attribute values.

The app will create a DXF layer for each Topic marked for export. If you wish to export the selected Topics to the same layer, then mark the **Export to one layer** checkbox and enter the name of that layer in the **Layer name** box.

Data will be exported in the active coordinate system. The distances will be exported in the active distance unit.

### **Set up Coordinate System**

To change the coordinate system for importing, exporting or displaying Feature data, first tap on **Menu**, select **Setup** then select **Coordinate System**. Select the desired system and distance unit then confirm.

Please note that if you export the Features to Shapefiles or DXF using a certain coordinate system and distance unit, you will need to use the same coordinate system and distance unit to import the Features into this app.

This app can work with a user-defined coordinate system that you have defined using the optional PC-GIS software. After defining the user-defined coordinate system, use iTunes to copy the user\_cor.sys file (in lower-case letters) from the PC to the Documents folder for your Utility Data Collection. From the Main Menu of this app, select Setup then select Coordinate System then select **User Defined** to access the new coordinate system.

### **Set up Units and Angle System**

Select the **Unit and Angle System** under **Main Menu - Setup** to specify the desired length unit for displaying distances and line segments. The areas will be computed in the metric or British system accordingly.

Available choices for displaying angles are **Azimuth** and **Bearing**. If Azimuth is chosen, also specify the **Angle System**: North or South. Angles will be displayed



in Degrees, Minutes and Seconds (DMS).

This setup screen will also let you select the elevation system used for displaying, importing or exporting elevation values. Select **Orthometric(MSL)** when working with Mean-Sea-Level elevations. Select **Ellipsoidal(HAE)** when working with elevations based on the ellipsoid.

### **Set up Default Grid**

You can specify the default parameters for creating a grid. These default values will be applied when you create a new grid. To get to the setup screen, select **Default Grid** under **Main Menu - Setup**.

### **Set up Color/Pattern**

You can specify the default point symbol, line style and area pattern for representing the regular Features. To get to the setup screen, select **Color/Pattern** under **Main Menu - Setup**.

### **Set up Feature Labels**

This app gives you the option of labeling the line segments, areas and corner angles for the selected Feature when feasible. (See **Feature Properties**.)

You can define the font color and size for the labels after selecting **Feature Labels** under **Main Menu - Setup**.

Mark the **Show white background** checkbox if you wish to have the labels displayed on a white background to make them stand out better over a satellite map.

### **Set up Auto Label**

You will also have the option of having all the Features in the selected Feature Topic labeled with their ID information and/or Attribute Values.

You can define the default font color and size as well as the placement of these labels with respect to the Features after selecting **Auto Label** under **Main Menu - Setup**.


These settings will be applied to newly created labels. They will not affect any existing labels.

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## **Display Map and Turn GPS On/Off**

Whenever you are connected to the Internet and your location can be determined, the default built-in Map for your device can be displayed as the background map for your job data.

You may select one of the following view modes after tapping the **Main Menu**

icon  then choosing **Map**:

**Show Standard** - Show a map of streets, landmarks, and bus stops.

**Show Satellite** - Show satellite photos.

**Show Hybrid** - Show street names on satellite photos.

To turn off the Map display, tap **Close Map** on the Map menu.

### Load Map

You may select **Menu/Background Map/Load Map** to load a **.pmp** file for use as a background map. The **.pmp** is the job file format used by PC-GIS X and a number of our other iOS apps.

### Load Registered Image

You may select **Menu/Background Map/Load Registered Image** to select a geo-referenced image in the **.pim** format to be loaded as an off-line background map for the job.

The Raster images (\*.tif, \*.jpeg, \*.sid, \*.ecw) to be used with this app must be converted into the proper format (\*.pim) before they can be loaded into the app. You can use PC-GIS X to do so. PC-GIS X is an optional mapping software program designed for use on a PC or on a Mac operating in PC mode.

Click on the file you wish to load into Map View then click **OK**.


A sample DRG file named **corvallis.pim** is included with this app. You could open the Layout01.lnd Job file then load this registered image. Zoom out (to a scale of about 1 inch to 1000 ft) to view the location of the landscape design in relation to the background map. Now, use **Menu/Background Map/Close Background Map** to turn off the display of this background map.

### Where am I?

When you start a new job, the app does not know where you are.

1. With the Map turned on, you can find your continent then zoom in to your country, your city, hence your neighborhood. You may zoom into or zoom out of portions of the graphical view by using your fingers to pull or pinch on the display, respectively.

2. When Map is turned on, you could use the **Locate a Point by Address** function to enter your address or your coordinates to locate your position.

3. If your device is equipped with GPS or has Location Service, then you can tap the **GPS** icon  to turn on GPS. When prompted, confirm to allow the app to use Location Service to find your location. This will permit the app to immediately zoom to your location. (Make sure the **Location Service** is turned on for this app

under Settings on your device. With iOS6 and iOS7, Location Service setting is placed under Settings - Privacy.)

To view your current position and GPS accuracies, select **Position Info** after turning on the **GPS**. Wait 5 - 10 minutes to let the GPS stabilize. If your device is set to Auto-lock after a number of minutes then when it turns off, GPS will also turn off. You will need to unlock your device to continue working.

To nail down your location, you will need to digitize at least one Point location.

In the section titled **Digitize Features**, we will show you how to digitize a Feature.

Go ahead and turn on **Map** in the **Show Satellite** mode.

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### **Set up a Feature List**

In this app a geographic feature is regarded as an object at a location. Such an object is called a Feature, which can be one of three types: **Point Feature**, **Line Feature**, **Area Feature**. For example, a barn could be represented by a Point Feature, a stream could be represented by a Line Feature, and a farm tract could be represented by an Area Feature. Besides recording the position information for a Feature, we usually also want to record a description and other relevant information for that Feature.

Having a Feature List associated with a job makes it a lot easier to tag the Features with pre-defined attributes. (If you won't be recording descriptions for the Point, Line and Area Features in the job map, then you could skip reading the information associated with Feature Lists.)

### **Features, Attributes and Values**

A good data organization practice is to place Features of the same type that share the same characteristics together into one group. Such a group of Features is called a **Feature Topic**, or simply a **Topic**. Each Feature Topic is placed on a separate GIS map layer. This will permit certain operations to be carried out on the entire map layer when so desired. For example, if there are three barns on a farm, we would put those three Point Features under the Feature Topic named "Barns". When we don't want those barns to show on the map, we could simply turn off the "Barns" Feature Topic.

A **Feature** can be described by a set of **Attributes** and **Values**. An Attribute is the name of a specific descriptor. The Value is the actual quantitative or qualitative description.

**Example:** A tree may be recorded as follows:

Feature: Tree  
Attribute: Species  
Value: Fir


The app will automatically record the position data for the Feature.

You can set up one or more **Feature Lists** to pre-define the Feature/Attribute/Value database. When you associate a job with a Feature List, you will be able to add Feature Topics from that Feature List along with the pre-defined Attribute and Values. This will speed up the process of tagging the Features with descriptions. Instead of typing all the descriptions, you will simply pick and choose the appropriate description for each Feature.

A Feature List can be used by one or more jobs. Therefore, if you will be doing a number of similar jobs, you could define a Feature List containing Features, Attributes and Values that can be shared by all of these jobs.

The file name extension for Feature Lists is **.fbr**.

### Viewing a Feature List

To use the Feature List function, first tap on the **GPS** Menu icon . Select **Feature List** then tap on **Open**. If there is a Feature List associated with the active Job, its contents will be displayed. Otherwise, the **Select Feature List** screen will pop up to display the existing Feature List files.

Your app comes with the sample Feature List named **farm.fbr**. Tap on farm.fbr then tap on the **OK** button to display the Feature List definition screen.

Tap the **Save As** button then enter "myfarm" to save the Feature List as **myfarm.fbr** to work with. This way the original farm.fbr will remain intact should you want to view it again as an example in the future. The **Save As** function is very useful if you need to create a new Feature List that has a similar setup as the currently active Feature List. Instead of adding all the Attributes and Values again, you will only need to make the necessary changes.

The Feature List screen contains three main sections for entering data. The active section is colored greyish blue.

For the **myfarm.fbr** Feature List, the **Feature section** shows two Feature Topics . The "**Well**" Topic will contain Point Features. Therefore it is assigned a Point Type and a representative point symbol. The "**Fence**" Topic is assigned a Line Type and a representative line style.

Tap on "**Well**" to highlight this Topic. In the **Attribute section** below, you can see three Attributes that have been defined for this Topic.

Tap on "**Condition**" to see the three pre-defined Values for the well head in the **Value section**. Similarly, there are two pre-defined Values for "Contamination". Having pre-defined Values for an Attribute facilitates assigning descriptions to a Feature. Instead of having to enter the description for a Feature, you can simply select it from the displayed list. Feature attribution can be performed via the **Sheet View** or the **Feature Properties** function.

We did not define any Values for the "**Last checked**" Attribute because this could

be any date.

In the same way, you can tap on the "**Fence**" Topic in the **Feature** section to view its Attributes and the corresponding pre-defined Values.

Below the Value section, there is a checkbox named **Activate Pattern**. When this checkbox is marked, a column titled **Pattern** is displayed in the **Value** section. This gives you the option of assigning a different symbol for each Value to help differentiate the Features in the Map View. In the farm.fbr example, we are making use of this capability to use symbols of different colors to represent the various conditions of the well heads and the different types of fences.

Please note that Activate Pattern can be active for one Attribute only. If you had this check box marked for an Attribute then decide to mark a different Attribute, the first Attribute will lose its Activate Pattern status. The currently active color/pattern scheme will apply automatically to newly added Features. However, you will need to take care of updateing the color/pattern assignment for any existing Features if they have been previously assigned a different set of color/patterns.

The **Type** box below the Value section is for specifying the data type of the Values. The "**Text**" type is for text descriptions. You may specify in the **Width** box the maximum number of characters that can be entered for the text description. For the "Last checked" Attribute, we set the width to "10" as we expect to enter dates in the mm/dd/yy format.

For numeric Values, you would select "**Integer**" if all the pre-defined Values for an Attribute will be whole-numbers. You could select "**Decimal**" if the pre-defined Values for an Attribute will be decimal values. You can specify the **Dec. Digits** box the number of decimal digits that can be entered.

### **Editing a Feature List**

You may open an existing Feature List and change it as appropriate. The following commands are shared by the **Feature**, **Attribute** and **Value** sections:

**Add:** Add a new blank record at the end of the list.

**Insert:** Add a new blank record above the currently highlighted record.

**Delete:** Delete the selected record.

Let's add a new Feature Topic to the **myfarm.fbr** file that we saved in the previous subsection, and define its Attributes and Values. To do so, first open myfarm.fbr if it is not already open. Tap anywhere in the **Feature section** to activate it then tap the **Add** button.

The Feature Topic you will be adding is an Area Topic that represents farm plots. Enter "**Plot**" as the Feature name and select **Area** as the Feature Type. Double-click in the cell for **Pattern** then choose an area pattern to represent the farm plots on the map. The second pattern on the first row looks like a nice pattern to use.

With the "Plot" Feature Topic selected, tap anywhere in the **Attribute section** to activate it. Tap the **Add** button then enter "**Crop**". Tap the **Add** button again then enter "**Yield**". Tap the **Add** button again then enter "**Yield/acre**". If you need to edit a data field, first **double-tap** that cell then type over or change its contents. Leave the **Type** field as **List** for all of the Attributes in this example.

Tap the **Save** button from time to time to save what you have entered.

Now select "Crop" then tap anywhere in the **Value section**. To populate the List of pre-defined Values, tap the **Add** button then enter "**Beets**". Tap the **Add** button again then enter "**Cabbage**". Tap the **Add** button again then enter "**Carrots**".

Mark the **Activate Pattern** checkbox to see the **Pattern** column displayed in the **Value section**. Double-tap the pattern for Beets and assign a deep purple color to it. Assign a blue color to Cabbage, and assign a red color to Carrots.



Leave the "Yield" and "Yield/acre" Attributes without pre-defined Values. You will be entering the yield value at harvest time, and we will let the app calculate the yield per acre based on the acreage of the plots.


As we will be entering numeric values for the "Yield" Attribute, such as 27630.5 (lbs.), tap on "Yield", select **Decimal** for the **Type** box, and enter "**1**" for **Dec. Digits**. As we expect the computed yield per acre to be a decimal value, tap on the "Yield/acre" Attribute, select **Decimal** for the **Type** box, and enter "**1**" for **Dec. Digits**.

Tap on **OK** to save any changes and close the Feature List function. If you tap the **Cancel** button, then the screen will close without saving the last changes to the data.

### Creating a New Feature List

Now you can try and create a Feature List of your own after thinking about what types of Features you will be recording and what Attributes and Values might be

useful to store with these Features.

Tap on the **GPS Menu icon** , select **Feature List** then tap on **Open**. If there is no Feature List associated with the active Job, the **Select Feature List** screen will pop up to display the existing Feature List files. If there is a Feature List associated with the active Job, its contents will be displayed. In that case, tap the **Open** button at the bottom to display the **Select Feature List** screen.

Tap the **New** button then enter a meaningful name in the “FileName:” box, then press the **OK** button.

The **Feature** section will be active in your new Feature List. Tap the **Add** button to add the Feature Topics you wish to define. You may define the Attributes and Value for each Feature Topic immediately after adding the Feature Topic, or you may add all the Feature Topics then define the Attributes and Value for each.

In the **Attribute** section, tap the **Lock** checkbox for an Attribute if you wish to lock the Values associated with this Attribute. When this option is chosen, you may only select from the defined Values and not enter just any Value to tag the Feature.

For the **Type** column in the Attribute section, select **List** if the Values to be defined are a group of discrete numbers or names. Select **Range** if the Value entry will be a number between a lower limit and an upper limit. If you select **Range**, then the **Lock** checkbox will be automatically marked for the Attribute. This means that the Values entered will always be checked against the defined Range for data validity.

You will also be able to mark one of the Values as the **Default** Value. If most of the data you collect will have the same description, it will save time if you specify this as the default description for that Attribute in the Feature List.

If the Attribute is of **Range** type, enter the **Min** (lower bound) and **Max** (upper bound) Values. You will also be able to enter a **Default** Value to be displayed during data collection.


After defining the Attributes and Values for the Feature Topic that you have added, if you need to define another Feature Topic with a similar Attribute and Value setup, then you can save time by using the **Duplicate** function. You will need to change the duplicate Feature Name to a new unique name yourself. To do so, **double-click** on one of the duplicate Feature Topic Names then type over it.

Tap the **Save** button from time to time to save what you have entered so far.

After completing the Feature List, tap on **OK** to save any changes and close the screen. If you tap the **Cancel** button, then the screen will close without saving the last changes to the data.

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**Topic View**

The Features in your map are organized into Feature Topics, or Topics for short. To see a list of all the Feature Topics you have in the currently active job file, tap the **Topic View** icon . This icon is a toggle tool for turning the Topic View **on** or **off**.


When you tap on one of the Topics in the Topic View, that Topic becomes the **active Feature Topic**.

Also, when you to **tap on one of the Features in Map View**, the Topic, to which that Feature belongs, becomes the active Topic.

You can toggle the **display** of a Topic layer ON and OFF by clicking on the mark box to the left of each Topic name.


For example, open the **myfarm.lnd** job then tap on  to display the Topic View panel on the left side of the screen. Zoom out a bit. Tap on the check box for the "Corner" Topic to remove the check mark. The blue dots at the corners of the triangular land plot disappear. Tap on the check box for the "Corner" Topic again to mark it. Now you can see the three blue dots again.

You can change the **symbol** assignment for a regular Feature Topic such as the "Corner" Topic. To do so, simply double-tap the existing symbol displayed by the Topic name in Topic View then select the new symbol or pattern.

The **Topic Menu**, represented by the **Topic Menu icon** , provides the function to create a new Topic as well as a number of other functions that operate on the currently active Topic.

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## Topic Menu

The **Topic Menu** contains functions that operate on the Feature Topics. It is accessed by tapping the **Topic Menu icon** .

## Creating a New Feature Topic in a Job

Before adding a Feature to the map by digitization, you will need to select the appropriate Feature Topic into which that Feature will be placed. If such a Feature Topic does not exist, then you will need to create it.


If you have not already done so, please open the sample job file named "**farm.lnd**" and save it as "**myfarm.lnd**". Select "**myfarm.fbr**" as the Feature List to associate with the new job. (If you did not work with the myfarm.fbr file, then use farm.fbr instead.) Tap on **OK**.

As the Features in the "**myfarm.lnd**" job are located in Oregon, USA, you will want to tap on  and select **Turn GPS Off** for now. Otherwise, the app will always zoom to your current location, which most likely is very far away




from the sample job location.

To create a new Feature Topic in a job file such as **myfarm.lnd**, tap the **Topic**

 **Menu** icon then select **New Topic**. Because the **myfarm.fbr** **Feature List** is associated with the active job, you can tap on the down arrow for the Topic Name field and see a list of the pre-defined Feature Topics. You may select one of these pre-defined Topics to include in the active job.

If there were not a Feature List associated with the active job, then you would enter a Topic Name, such as **Tree** into the Topic Name field. Since trees are regarded as point objects, select **Point** for the **Type** field. You can add one or more **Attribute Names** (title of description) for this Topic and specify the data type and parameter.



Notice the little pull-down arrow in the **Field Name** cell after you tap the **Add** button? This app comes with a number of **Built-in Attributes** that you may incorporate into a Topic as an Attribute. To add such an Attribute, tap on the pull-down arrow then select the desired item. If you select the Elevation attribute, the MSL or HAE elevation will be used depending on what you've selected for the Unit and Angle System Setup.



For the **myfarm.lnd** job, tap on  then select **New Topic**. Tap on the pull-down arrow for the Topic Name field to see the available Topics to add from myfarm.fbr. Select the "**Well**" Topic then tap the **OK** button to confirm. In the same way, add the "**Fence**" Topic and the "**Plot**" Topic.

If you have not followed the instructions to add the Plot Topic to the myfarm.fbr Feature List, you could add it to the job by entering "Plot" as the Topic Name and selecting Area for the Type field. You will also need to add a few Attributes for this Topic. Tap the **Add** button then enter "**Crop**" as the Field Name. Select Text as the Field Type. Tap the **Add** button again then enter "**Yield**" as the Field Name. Select Decimal as the Field Type. Tap the **Add** button again then enter "**Yield/acre**" and select Decimal as the Field Type.

When done, tap the **OK** button to close the Sheet Update screen.

## Editing a Feature Topic

To edit an existing Topic, first tap on  and select that Topic from the Topic View panel. Tap the **Topic Menu** icon  then select **Edit Topic**. You may make changes to the **Topic Structure**, such as by adding more Attributes to the Topic. Or you may tap the **Sheet Setup** tab and change the order in which the Attributes will be displayed in **Sheet View**.

Let's add a built-in Attribute to the "**Plot**" Topic in the **myfarm.lnd** job. Tap on  then tap on "**Plot**" in Topic View. Tap on  then select **Edit Topic** to display the Sheet Update screen.

Tap the **Add** button then tap on the pull-down arrow by the highlighted "Name1" to display the built-in Attributes. Select "**Area\_Acres**" and accept the "2"

displayed for Decimal Digits. Tap **OK** to confirm. This Attribute will automatically compute the acreage of an Area Feature you place in the Plot Topic.



If you will be attaching photos to the Features and want the photo file name to be included as an Attribute, then you will need to add the built-in Attribute **Photos**. The data field for displaying the photo file name(s) is limited. If the string of file names is too long, it will be truncated. Therefore, it is advisable to keep the photo file names short.

## Defining a Formula

While creating or editing a Feature Topic, you may enter a formula for an Attribute based on the Values of other Attributes for the same Feature Topic.

The reason we added the "**Area\_Acres**" Attribute to the "**Plot**" Topic in **myfarm.lnd** job is so that we can compute the yield per acre for each vegetable crop. In other words, we want to define for the "**Yield/acre**" Attribute the following formula:

### **Yield / Area\_Acres**

To do so, first tap on  then tap on "**Plot**" in Topic View. Tap on  then select **Edit Topic** to display the **Sheet Update** screen.

Highlight the **Yield/acre** Attribute then tap the **Formula** button.

Tap the **Select Attribute** button and select "**Yield**". Tap on **OK**.

Enter the division operator "/" then tap the **Select Attribute** button and select "**Area\_Acres**". Tap on **OK**.



The resultant formula will be displayed in the Formula box.

Tap on **OK** to save the formula. Tap on **OK** again to return to Map View.

Specifying a formula for an Attribute means that the Value for that Attribute will be automatically computed from the Values of the Attributes used in the formula .

## Moving a Feature Topic

In general, you will want to have Point Feature Topics and Line Feature Topics placed above the Area Feature Topics so that the Area Feature layers won't block out the Points and Lines underneath.


You can **change the order** of the Topic layers. To do so, first tap on  then tap on  and select **Move Topic**. Now grab a Topic on the right side and drag it to a different location in the Feature Topic List.

## Deleting a Feature Topic

To delete an existing Topic, first tap on  and select that Topic. Then tap on  and select **Delete Topic**. This will delete the Topic definition as well as all the Features on that Topic layer.

**Caution: A deleted Topic and the Features in that Topic cannot be recovered.**

### **Auto Label**

If you wish to have the Features displayed in Map View along with one or more of its identification labels or descriptions, first tap the **Topic Menu** icon  then select **Auto Label**.

You may opt to show the Feature's **Topic Name**, **Sequence#** or **Feature ID**.

You may select one or more **Attributes** to be displayed.

Select **Delete Labels** if you wish to have the labels deleted.

Select **Hide Labels** if you only want to hide the labels but not delete them.

Tap on the **Font** tab to change the font size, font type face, or the **Freeze label size in zoom** setting.

You can set the default size, color and placement of these labels with respect to the Features by using **Main Menu - Setup - Auto Label**.

The settings under **Main Menu - Setup - Auto Label** will only be applied to newly created labels. They will not affect any existing labels. If you wish to have the new settings applied to all existing auto labels then you should use the **Delete Labels** button to remove all existing auto labels then create the auto labels again.

You may adjust the placement of an auto label by tapping on it to select it in **Map View** then dragging it to the desired location.

You may change the properties of an auto label by tapping on it to select it then tapping on the **Feature Properties** icon.

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### **Digitize Features**

You may manually add new Features to the active Job file. GPS is not needed, but if you wish, you could pick the GPS position for adding a Point Feature or for adding a node for a Line or Area Feature.


Let's turn off GPS and open the **myfarm.lnd** job, to which we have previously added a few Feature Topics.

## Adding a Point Feature


The first step in digitizing a Point Feature on the displayed Map is to create or activate a Point Topic.


In the **myfarm.lnd** job map, tap the **Topic View** icon  then select the Point Topic named **"Well"**. Tap the Topic View icon again to toggle the list of Topics off.


Zoom out so you can see the buildings on the east side.



Now, tap the pull-down arrow beside the **Map Tools** icon. Select **Add Point Manually** .

Tap once on the satellite Map near the houses with red roof tops to drop a point in the field. Tap on the Map again in the area between the triangular plots and the larger plot on the right side.

To help with placing a dot precisely on the map, tap once on the donut-shaped **Node tool** . A larger donut with crosshairs at its center will be displayed on the map. Touch on the purple area of this tool and drag the crosshairs to the desired location. Then tap once in the donut hole to drop the node. (You could also keep holding down on the purple donut and use another finger to touch outside of the donut area to drop the node.)

The **Add** tool  at the top is a toggle switch that you can use to halt the point digitization and reactivate the regular **touch-screen** mode so you may zoom or pan the screen. Tap on this toggle again when you are ready to add more points.

If there are existing Features on the map and you want a new point to snap to one of the existing Features, then tap the **SnapToNode tool** . When the SnapToNode toggle is on, the point you add will be dropped on top of the nearest Point or node.


If your device has GPS capability, you could add a point right at the current GPS position. To do so, first tap the **GPS** icon  to turn on GPS then tap the **Pick GPS** icon  to add the Point Feature. (Do this in another job file as we do not wish to add a very distant point to this sample job file.)

When done with the point digitization, tap the **Back** icon to end the digitizing session and go back to Map View.

As an exercise, select the "Corner" Topic, and select the **Add Point Manually** tool. Tap on the Node Tool and use it to help you place a point by Corner003 at the tip of the triangular plot.

## Add Point by Coordinates

If you know the coordinates for the point you wish to add to the map, you may add

the point by using this information. To do so, first create or activate a Point Topic. Then tap the pull-down arrow by the **Map Tools** icon and select **Add Point by Coordinates** .

Enter the known coordinates then confirm the screen. Make sure you specify the correct North or South Latitude, and the correct East or West Longitude.


You may tap on the **Pattern** button to select a different symbol and color for the Point Feature to be created.



The Orthometric height is the elevation based on mean-sea-level. The ellipsoidal height is based on the ellipsoid.

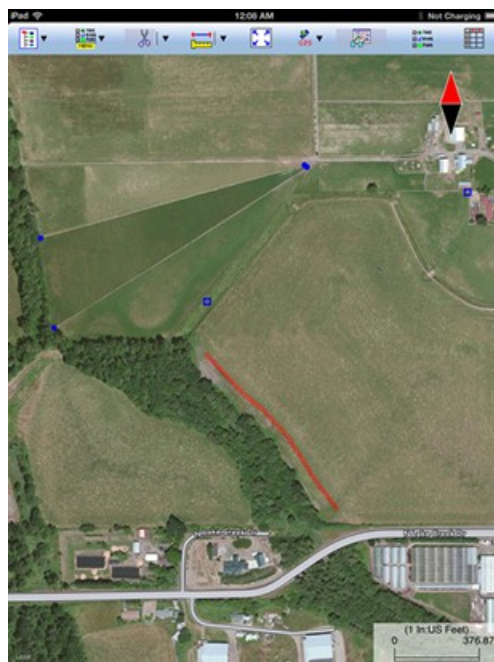
### Adding a Line Feature



To digitize a Line Feature, first select an existing Line Topic or create a new Line Topic.


In the **myfarm.lnd** job map, tap on  then select the Line Topic named "Fence". Tap the Topic View icon again to hide the list of Topics.

When a Line Topic is active and you tap the pull-down arrow for the **Map Tools** icon, you will see that the **Add Line manually** tool is active. Tap this selection, and the Add Line manually tool icon  will be displayed as the active Map Tool.

Now, tap along the left border of the larger field to add a fence line. Use the **Node** tool  to add nodes and make a line that looks very close to the one shown below. Turn off the **Add** tool icon  before attempting to zoom out. Turn it back on when you are ready to digitize the line.




The **Add** tool , the **SnapToNode** tool , and the pick GPS position function work in the same way as for digitizing Point Features.

Turn on  **Snap to Line** when you wish to snap your new line to an existing Line or Area Feature. Then when you tap close to that Line or Area Feature, your new line will snap to the nearest node on the existing Line or Area Feature.



**Include Boundary** is a powerful tool that lets you incorporate all or part of a line or an area boundary in the new Line Feature you are digitizing. After turning this tool on, first tap on the line or area of interest then tap on the starting and ending nodes of the section you wish to include in your new line. Tap on the **Finish** button to finalize this action. Then you may select another boundary line to include, or continue to tap on the screen to drop nodes for the new line.


You may tap the **Undo** icon  to back-step and remove the last added node, if necessary.


When you have digitized the last node for the Line Feature, if you wish to add another Line Feature, then tap the **Next Line** button. Otherwise, tap the **Back** button to exit this screen.

When you tap on the Line Feature on the main screen, its Point ID and coordinate information will pop up briefly.

### Adding an Area Feature


To digitize an Area Feature, first select an existing Area Topic or create a new Area Topic. Digitizing an Area Feature works the same way as digitizing a Line Feature, except that the Area Feature forms a closed region.

In the **myfarm.lnd** job map, tap on  then select the Area Topic named "**Plot**". Tap the Topic View icon again to hide the list of Topics.

When an Area Topic is active and you tap the **Map Tools** pull-down arrow, you will see that the **Add Area manually** tool is active. Tap this selection, and the Add Area manually tool icon  will be displayed as the active Map Tool.


In the screen for digitizing an Area Feature, you may tap on the **Area Pattern** button to select a different pattern and color for the Area Feature you digitize.


Let's create an Area Feature by joining the Point Features at the four corners of the nearly triangular land plot.

With the **Snap to Node** icon  turned on, tap close to each of the four Point Features in the clockwise or counterclockwise direction. You don't need to tap on the first point again. Tap the **Next Area** button to close the **Plot001** area you have

just formed.


Now let's digitize the larger plot by the fence. Since the fence lies along one side of this plot, we can save some time by making use of the **Include Boundary** tool. In

the screen for digitizing an area, tap the **Include Boundary** icon . Tap on the Fence feature to display its nodes. Select the lowest node as the Start Node then

select the uppermost node as the End Node. Tap on  to turn it off. Then use


the **Node** tool  to help complete **Plot002**, which should look very close to the one shown below:



You may tap the **Undo** icon  to back-step and remove the last added node, if necessary.

When you have digitized the last node for the Area Feature, tap the **Back** button. The software will automatically close the gap between the first and the last digitized nodes and return to the main Map View.

### **Adding Description for Digitized Features**

To be able to enter descriptions to a Feature that you have digitized manually, you must have Attributes set up for the Feature Topic to which the Feature belongs. If you have not set up the Attribute Names while creating the Feature Topic, you can do so after tapping on  then selecting **Edit Topic**.

Once the Topic/Attribute structure is in place, the Attributes can be presented in a spread-sheet format and you will be able to enter the corresponding Values into the cells. Please see **Sheet View** (discussed later) for details.

Another way to add or change the description for a Feature is through the Feature



Properties screen. Please see **Feature Properties** for details.

## **Labeling the Features**

There are two ways to display labels for the Features in a job.


1. Label all the Features in a Topic by using **Topic Menu - Auto Label**. This function is described under **Topic Menu**. Try labeling the areas in the Plot Topic in **myfarm.lnd** with the name of the Crop.
2. Use **Feature Properties** (discussed later) to label a selected Feature with its corner angles, segment lengths and directions, and/or area with units. Some of these labels may not display because of the large map scale used or because there is not enough room to display them in the map.


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## **Move Node**


The **Move Node** tool on the Map Tools Menu will let you adjust the position of an existing Point Feature or a node on a Line or Area Feature.


The steps for moving a node of a Feature are as follows:


1. Tap on the Feature to select it then tap on the Tools Menu and select **Move Node**. If the Move Node icon  is already displayed, then simply tap on that icon to get to the Move Node screen.

If you've tapped on the wrong location, you may tap the **Reset tool** icon  to reset the selection then select the correct location.

2. Drag the **Crosshairs** to the node you wish to move then tap once in the center of the donut to mark the node.
3. Drag the **Crosshairs** to the new position and tap once in the center of the donut to affix the node there.

When you wish to snap to an existing Point or node by tapping in its vicinity, remember to first tap on the **Snap to Node** icon  to turn it on

If the Crosshairs have moved off the screen, you could tap on the  icon to bring the Crosshairs back to the center of the screen.


You may turn off the instruction text by tapping the **View Hint** icon . This will free up more screen space for displaying the job data, especially when you are using your device in landscape mode.

Tap the **Back** button to exit this screen.





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## Sheet View





After activating a Topic either by selecting it from the Topic View or by selecting one of the Features in that Topic, you may tap the **Sheet View** icon  to list all the Feature records in that Topic. The Sheet View presents the Features and their Attributes in a tabular format based on the Feature Topic setup.


As an example, select **Main Menu - Job - Open Job**. For **File Name** select **myfarm.lnd**. For the **Feature List** box, select **myfarm.fbr** then tap on **OK**.

Tap on  then tap on the "Well" Topic name in Topic View. When you tap the **Sheet View** icon , you will see the spread sheet for this Topic.

Sheet View provides an alternative way for you to select the desired Feature for viewing or editing. Simply tap a record in Sheet View and watch the corresponding well get highlighted in the map.

Normally only a few records will be visible along with the map display. You may click on the **Full Sheet View** icon  to have the entire screen dedicated to Sheet View. To return to the normal view, tap on the  icon.

You may change the order of Features in a Feature Topic by highlighting the Feature record in the Sheet View and then using the , ,  and  icons.

To delete a Feature, first highlight it then tap the **Recycle Bin** icon .

**Caution:** Always make sure you really want to delete a Feature before confirming the deletion action. **A deleted Feature cannot be recovered.**

## Feature Attribution

Sheet View provides a convenient way for you to add or change the description for each Feature record. You may edit the displayed Value if it is not a Value computed by using a Formula, or a Value for a built-in Attribute (such as ID and Area\_Acres).

To change a Value displayed in a cell of the Sheet View, double-tap on the cell then type over the existing data. You may do so as soon as each Feature has been added. Or, you could enter the descriptive data after you have added all the Features for a Topic layer.

If a Feature belongs to a Topic added from the Feature List currently associated with the job, then the pre-defined Values will be available for you to select. For an Attribute of the **List** type, you may click on the pull-down button in the cell to select the desired value. If the Attribute is not locked, then you may also enter any Value. For an Attribute of the **Range** type, you may only enter a Value within the

allowed range.


In the Sheet View for the **myfarm.lnd** job, go ahead and enter data in the empty cells for the Features in the **Well** and **Fence** Topics. Because you have associated this job with the **myfarm.fbr** Feature List, which contains pre-defined Values for some of the Attributes, you will see a pull-down arrow for the cells in those columns, and you will be able to select the appropriate Value instead of having to type in the data.

Notice how the "Corroded" well shows up in red color, and the "Wood" fence is displayed in brown? These are exactly the colors we have assigned in the Feature List to the symbols representing those Values. Similarly, a "Cabbage" plot will be colored blue, and a "Carrot" plot will be colored red.

For the **Plot** Topic, notice how the "Area\_Acre" field is automatically populated with the acreage of the vegetable plots. Also, as soon as you have entered a value for the "Yield" Attribute, the yield per acre is automatically computed and displayed in the "Yield/acre" column.

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## Feature Properties

With a Feature selected in the Map View, you may tap the Feature Properties icon  to view the relevant information.

A few pages are provided for displaying the Feature properties.

Tap on the **Coordinates** button to see the Latitude-Longitude -Elevation information for the Feature. MSL is the Mean-Sea-Level value, and HAE is the elevation referenced to the ellipsoid.

Tap on the **Attribute** button to see the Attribute/Value information for the Feature.

For a Line or Area Feature, tap on the **Area and Length** button to see the line length or the perimeter and acreage of the area in the currently active units of measurement.

Tap on the **Photos** button to attach one or more photos to the active Feature.

## Assigning a Feature Symbol or Pattern

By default, a Feature added to a Topic will assume the same symbol and color as those for the Topic. However, you may use a different symbol to represent an individual Feature if you choose to do so.

On the **Coordinates** page of the Feature Properties screen for the selected Feature, you may pick a symbol or pattern and a display color after clicking on the **Pattern** button. You may also specify a line style as well as the color and size for the border of an Area Feature.

After making the desired changes, click on the **OK** button to accept the settings.

### **Area Transparency**

You can adjust the transparency of an Area Feature within the Area Pattern Dialog.

To do so, simply enter a percentage value into the **Transparency** field, or tap the little arrows to scroll either way.

### **Show Segment, Area and Corner Angle Labels**

For Line and Area Features, you may opt to have the segment, area and corner angle labels displayed on those Features when feasible. On the **Coordinates** page, mark the checkbox for the labels you wish to see:

**Show Corner label**




**Show Segment label**

**Show Area label** (for Area Features only)

You can change the size and color of these labels by using **Main Menu - Setup - Feature Labels**.


### **Edit Feature Attribution**

If a Feature has Attributes associated with it, the Attributes and the corresponding Values will be automatically displayed when you tap the **Attribute** tab. To change the Value for an Attribute, double-tap that cell then type over any existing Value. Alternatively, place the cursor at the appropriate position then change a few characters as needed.

In the **View mode**, with the  icon displayed, the cells are not editable until you double-tap on them. To switch to the **Edit mode**, represented by a  icon, tap on the  icon. In the **Edit mode**, each cell is ready to receive input unless that Attribute is non-editable, such as a built-in Attribute or an Attribute with a Formula defined for it.

If a Feature belongs to a Topic added from the Feature List currently associated with the job, then the pre-defined Values will be available for you to select. For an Attribute of the **List** type, you may click on the pull-down button to select the desired value. If the Attribute is not locked, then you may also enter any Value. For an Attribute of the **Range** type, you may only enter a Value within the allowed range.

### **Auto Label Text Setup**

With an Auto Label selected in the Map View, you may tap the Feature Properties icon  to view the relevant information.

You may change the label properties such as the font size and orientation. Specify

the label orientation in degrees in the clockwise direction.

### **Link Photo**

To attach one or more photos to the Feature, tap on the **Photos** button. You may link photos from the Photo Library or a folder on your device. And, you may tap the **Camera** button to snap a picture and have it automatically linked to the Feature.

If you would like the app to show the file name of the attached photo in Sheet view, you must add the built-in Attribute **Photos** in the Topic Structure page for the Feature Topic. If you have not yet added this Attribute, you can use **Topic/Edit Topic** to get to the Sheet Update screen to do so. The data field for displaying the photo file name(s) is limited. If the string of file names is too long, it will be truncated. Therefore, it is advisable to keep the photo file names short.

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### **Create Grid**

Suppose you wish to install sprinkler heads at fixed intervals in both directions to irrigate your vegetable farm. You could use the Create Grid function to create an array of **Grid Points** in the Area Feature that represents the vegetable farm. Grid points are also useful for recording soil sampling results such as the pH variation across the plot.

If you wish to have a set of parallel lines drawn over the Area Feature to represent the location of irrigation pipes, then you could use the Create Grid function to create such a set of **Grid Lines**.

You could also create grid lines over a base area to help you place your Landscape Shapes more precisely.

The Grid you create for a selected Area Feature is placed in the **Non-Spatial Data** Topic layer. To place a grid over an Area Feature, first click in that Area Feature then tap the pull-down arrow for the **Map Tools** menu and select **Create Grid**.

You can try it out using an Area Feature that you created in the **myfarm.lnd** job.

The **Start Point** section lets you specify the reference location for the grid. You may enter the coordinates for that point or tap the **By Pick** button to select the location from Map View. If the reference point is a known point but you want to shift the grid a distance from it then tap the **Offset** checkbox to display the relevant data entry fields. The software will compute the new grid reference point.

You can change the default **grid spacing** and **grid orientation** to those appropriate for your application. You may define the grid orientation by using an existing line segment or two existing nodes.

Select the **Grid Nodes** option if you wish to see the grid nodes. If you wish to see the grid lines then select **Lines**. You will have the option to create Grid Lines in

the X-direction, the Y-direction, or in Both directions.


In the **Boundary** section, you may specify the boundary line style and line width.


You may also dictate whether Point Features should be created from the grid nodes, or Line Features should be created from the grid lines.


If you selected the **Grid Nodes** mode, you have the option to mark the **Create Points from Grid** checkbox to have Point Features created at the grid nodes. Accept the default Grid Points Topic, or select another point topic in which to store the new Point Features.

If you selected the **Lines** mode, you have the option of marking the **Create Lines from Grid** checkbox to have Line Features created at the grid lines. Accept the default Grid Lines Topic, or select another line topic in which to store the new Line Features.

Tap the **Preview** tab to view the grid. When you confirm the **Grid Property** screen by tapping the **OK** button, you will see the grid points or the grid lines displayed in the map.


To avoid confusion, it's best to just keep one grid for an Area Feature. To delete an unwanted grid, first tap the **Topic View** icon  and select **Non-spatial Data**.

Then tap the **Sheet View** icon , select the unwanted grid then tap the **Delete** button. The grid records are all named the same. Newer records are added at the end of the list by default.

You may edit an existing grid by tapping on it in Map View or by selecting it from Sheet View then tap on the Feature Properties icon .

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## Link Photo

Another way to attach one or more photos to a Feature is to first tap on the Feature to highlight it, then select **Link Photo**  from the **Tools** menu. You may link photos from the Photo Library or the app's Documents Folder on your device.

To snap a photo on the spot, tap on the **Camera** button. When the photo you've just taken looks fine, tap the **Use** button to have it automatically linked to the Feature. If you decide not to use that photo, then tap the **Cancel** button.

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## Export to PDF

To export the job data to a PDF file, tap the **Main Menu** icon, select **Job** then select **Export to PDF**.

You may accept the displayed default name in the **FileName** field for the PDF

output file, or you may type over it the name you wish to assign to the PDF file. Please pay attention to the file name in the **FileName** field so as to avoid unintentionally overwriting an existing file.


After you have tapped on the **OK** button to complete the PDF export, the contents of the PDF file will be displayed. The first page will show the drawing of the Features as they are displayed on the screen. If you wish to have all Features included in the drawing then first zoom out sufficiently to have the Features displayed on the screen before exporting to PDF.

The built-in Map on your device cannot be exported to the PDF file. However, if you have loaded the .pim background map prepared by using the optional PC-GIS X mapping software, then that background map can be output to the PDF file. Same with the .pbm Basemap prepared using PC-GIS X. If you have entered any deed calls,

The additional page(s) will show the boundary coordinates and areas of the Area Features as well as the coordinates of the Point Features or the starting and ending nodes of the Line Features. For the Landscape Features, the app will display the defining parameters of the shapes.

If you wish to overwrite an existing PDF file, then select that file from the list. **Beware that doing so will erase all the existing contents of the selected PDF file when you tap on OK.**

To make sure you really want to overwrite an existing PDF file, tap on the **View File** check box then select the file you wish to view. In this mode, instead of the **OK** button, you will see a **View** button. Tap the **View** button to display the contents of the highlighted PDF file. Then tap the **Back** button to return to the File Dialog. When you are ready to overwrite the file, unmark the **View File** check box then tap on **OK** to overwrite the file.

If you have an AirPrint Printer, you may tap on the **Printer** icon  then confirm to print the contents of the PDF to that printer.

The exported PDF files will reside in the Documents folder for the application. To access the PDF files exported from the application, first connect to the iTunes® program then look in the Documents folder for the **Landscape & Stakeout** app.

**To delete a PDF file**, use the iTunes® program to access the Documents folder for this app then select the file and hit the **Delete** button on your desk-top computer.

**Warning:**

**A deleted file cannot be recovered.**

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**Transfer Files**

Besides using **iTunes®** to copy files between this app and your computer, there are a couple other ways to transfer files between the two machines.

### **Email Files**

You may email Job files (\*.lnd), Feature Lists (\*.fbr), PDF files (\*.pdf), Photos, PDF files (\*.pdf), DXF files (\*.dxf) and Shapefiles (\*.shp). To do so, first tap the **Main Menu** icon, select **Job**, then select **EMail Files**.

Enter the destination email address and select the file type. The files listed in the displayed table depends on the file type selected. Mark the checkbox for the files you wish to send, then tap the **Send** button.

When the email is displayed with the attachments, tap the **Send** button at the top to send the email, or tap **Cancel** to cancel the action.

### **Get/Send Files via FTP**

You could use this app to transfer files over the Internet using **File Transfer Protocol (FTP)**. FTP file transfer requires a FTP server and a ftp client. This app will use an **FTP client** to let you send or get files to or from the PC running the FTP server.

To access the FTP function, select **Main Menu/Job** then select **FTP**.

Enter the IP address of the ftp site you want to connect to. If a user name and password for accessing the ftp site is required, then enter them into the corresponding boxes. For an FTP site that provides anonymous FTP access, simply mark the Anonymous checkbox, and the User Name will be automatically filled in with "anonymous".

You may select the FTP Path and have it point to the desired folder on the PC. The files on the iPad and the files on the ftp site will be listed separately.

Select the files you wish to send from one side to the other then tap the corresponding large arrow button to complete the transfer.

Some versions of CMT PC mapping software, such as PC-GIS X, provide an **FTP Server** to let an FTP Client get or send files from your computer. For example, you may use this app to transfer files to and from your PC-GIS X via FTP.


The steps for making an FTP file transfer using the CMT FTP Server are as follows:

1. In PC-GIS X run **Utilities/FTP Server**, and select the IP if you have more than one network card. The FTP Client will connect with the FTP Server via this IP. If you don't want to allow the client to login as Anonymous, you should set User Name and Password.
2. Specify the FTP Path, i.e. the desired folder on the PC.



3. Click the "Start" button to start the FTP server.
4. In the iOS app enable the FTP function under Menu/Job then log in to the ftp site.
5. In the iOS app select the files to be sent, then tap the corresponding arrow button.


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## Measure Distance

If you would like to know the distance between two or more map locations, first tap on the **Measure Distance** icon  on the **Utilities** pull-down menu. Then tap on the map locations to have the distance calculated. The total distance as well as the length and direction of the last segment added will be displayed.

Whenever you need to place a node precisely, tap on the **Node tool** then use the crosshairs to zero-in on the desired location.

If your device has GPS capability, you could tap the **GPS** icon  to turn on GPS then tap the **Pick GPS** icon  to add a node for the line to be measured.

Tap on the **Snap to Node** icon  to turn it on when you wish to snap to an existing Point or node by tapping in its vicinity.


To back-step, tap the **Undo** icon . To delete all the nodes made in this measurement session, tap the **Reset** button .

Please note that the Measure Distance tool will not retain the **temporary** shape you have delineated for computing the distance.



When you no longer need the displayed information, tap the **Back** button to close this screen and discard the temporary shape.

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
## Measure Area



The **Measure Area** tool  on the **Utilities** pull-down menu will compute the area enclosed within a boundary that you form by tapping on the map.

Whenever you need to place a node precisely, tap on the **Node tool** then use the crosshairs to zero-in on the desired location.

If your device has GPS capability, you could tap the **GPS** icon  to turn on GPS then tap the **Pick GPS** icon  to add a node for the area to be measured.



Tap on the **Snap to Node** icon  to turn it on when you wish to snap to an existing Point or node by tapping in its vicinity.


To back-step, tap the **Undo** icon . To delete all the nodes made in this measurement session, tap the **Reset** button .

Please note that the Measure Area tool will not retain the **temporary** shape you have delineated for computing the area.

When you no longer need the displayed information, tap the **Back** button to close this screen and discard the temporary shape.

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### Locate a Point by Address


To look for a location on the displayed built-in Map by address or coordinates, tap on the pull-down arrow of the **Utilities Menu** icon  then select **Locate a Point by Address**.


This function will only work when **Map** is turned on.

If you know the address of the location of interest, tap the **By Address** tab then enter the address.

If you know the coordinates of the location of interest, tap the **By Coordinate** tab then enter the coordinates. Make sure you have entered the correct N/S and E/W designations.

After tapping the **Go** button, you will see the target location marked on the screen. You may search additional locations by address or by coordinates. All the locations you searched for will stay marked before you exit this screen.

If you can recognize the desired location on the displayed Map, you could select that location by tapping the **Pick** icon  then tapping on the target location. The relevant address information will pop up on the screen, and when you tap the **Go** button, that location will be marked. You can view its coordinates by tapping the **By Coordinate** tab.

When you tap on a marked location, the corresponding marker will turn orange. If you wish, you may save that location as a Point Feature by tapping on the **Save Result** icon . You may change the Feature ID and the symbol used to represent the new point before tapping on **OK** to create the Point Feature.

When you no longer need the displayed information, tap the **Back** button to close this

[Back to TOC](#) screen.


## Adding a New Landscape Shape


The Landscape Shapes are a special type of map elements that share some properties with the regular Features but also have their own special characteristics. Therefore, some of the functions that you've been using to work with the regular Features also apply to the Landscape Shapes, whereas some other functions do not. For example, you can store the Landscape Shapes to specific Topic layers, but you will not be able to change their representative symbol via Topic View. Rather, the type of Shapes and the area pattern assignment are handled via the Landscape Layout module. Also, if you call up the Feature Properties function for a selected Landscape Shape, you will be referred to the Landscape Layout page.


No matter how large or small a Landscape Shape you add to the map, it is considered an Area. Unlike the regular Features, the Landscape Shapes are pre-defined shapes of various types. You can modify an existing Landscape Shape by changing the dimensions that define the shape. Some Shapes can be scaled. Some Landscape Shapes have movable nodes that can be used to modify the shapes.

Please open **Layout01.Ind** job file and save it as **mylayout.Ind**.

We will use the **mylayout.Ind** job file to show you how to work with the Landscape Shapes. As the Landscape Shapes in this job are located in

Oregon, USA, you will want to tap on  and select **Turn GPS Off** for now. Otherwise, the app will always zoom to your current location, which most likely is very far away from the sample job location.

From the **Tools** menu select **Landscape Layout**. When the Landscape Layout tool icon  is displayed on the toolbar at the top of the screen, you can simply tap on it to call up the Landscape Layout screen.

As the built-in Map will not let you zoom in to a small scale, if you are working with small landscape elements, please tap the **Map** icon  then select **Close Map** to turn off the built-in Map.

If you are using a background map loaded from a **.pmp** file or a **.pim** file prepared by using PC-GIS X, there is not an issue with zooming in to a very small scale.

To add a new Landscape Shape, tap on the **New Feature** tab.

### Types of Landscape Shapes

The Landscape Shapes are grouped into various types. Besides a number of specific shapes ( as Rectangle, Round, Pie, Polygon, Plant, Sprinkler, Pipes), there is also a group of Free Form shapes.

Most Shapes are localized and have a fixed center point. After selecting a localized Shape, you may **tap on the Landscape Layout screen to specify the center point** for placing the shape at a general location on the map. Later on, you may move the


shape to a different location if you wish.

There are a couple Free Form shapes that let you digitize their length. Suppose you would like to add a curvy path that leads to the colorful layout in the **mylayout.Ind** sample job. You might select "Free Form" for the **Type** field. Tap on the shape on the second column and the third row then tap on the **Next Page** button to go to the **Description** page.



**Please note:** The digitizable Free Form shapes must have compatible length and width for creating a curved path or a path with bends. If the width is too large, you may get strange shapes when you digitize or modify the shape. In that case, please delete the shape then redo the shape using compatible length and width values.

### **Description of a Landscape Shape**

On the Description page, select Landscape as the Topic Name. Enter "5" into the Width field then tap on the "**Digitize**" button.

Tap somewhere outside the existing design then tap a few more times to create a path going toward the existing design. To back step, tap the **Undo** icon .

Other types of shapes may be defined by a **center point**, a **width** and a **length**. A round shape would be defined by a center point and a **radius**.

If you haven't specified a center point for a localized shape, you can do so now by tapping the **Pick** button then tapping the desired location on the map. If you wish to snap to an existing node, then tap the **SnapToNode tool**  to turn it on. You may wish to use the **Node tool**  to help you place the center point more precisely.

When GPS is turned on, you could tap the **Pick GPS** button to add a GPS fix as the center point.

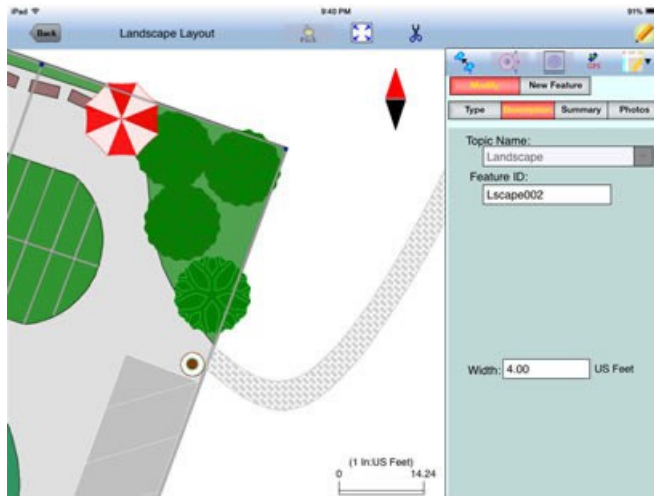
For some types of Landscape Shapes, you may also specify the **Orientation** for the shape.

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### **Modifying an Existing Landscape Shape**

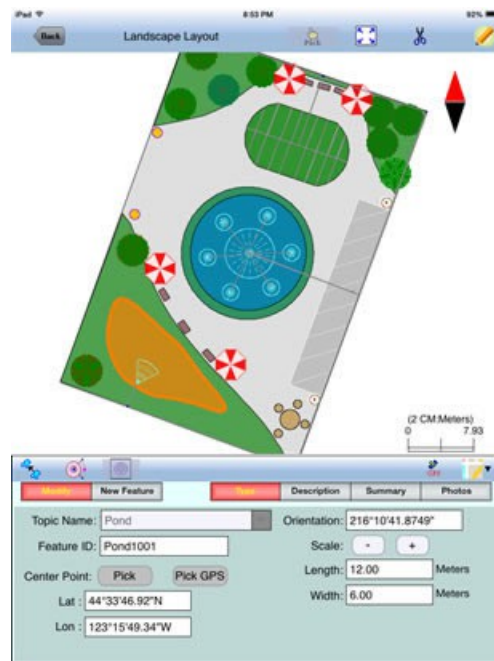
After you have added a Landscape Shape, you may modify some of its properties. The very first step is to tap on the Landscape Shape you wish to modify so that it is highlighted.


Suppose you would like the path that you previously added to be 4 ft wide instead of 5 ft wide. First tap on that path shape, then tap the **Description** tab. Enter "4" into the Width field. You will see that the path is now somewhat narrower. If you would like to change the color or fill pattern of the path, then tap on the **Type** field and tap on the **Pattern** button.




Please note that the active color/pattern assigned to a Type will be applied when you create a new Shape of the same Type. You can use the Modify function to select a different color/pattern for an individual Shape after it has been created.

Some of the Landscape Shapes may be scaled after they have been created. For example, tap on the Pond near the southwest corner of the design. Then each time you tap the "+" button, the shape will be scaled up by 5%. Each time you tap the "-" button, the shape will be scaled down to about 95.24 % of the original size.



With an existing shape highlighted, you can reposition it by using the **Recolate** tool . As you drag the donut around, the shape will move along with it.

You may use the **Move Node** tool  to change the shape of some of the Landscape Shapes. Place the tool at the node to be moved and tap once near the center of the Move Node tool. Drag the tool to the new position then tap once at

the center.

After using **Recolate** tool or the **Move Node** tool, tap on the icon again to return to the main Landscape Layout screen. If you tap the **Back** button, you will be taken to the Main Map View screen.

### **Summary Information**

Tap the **Summary** tab in the Landscape Layout screen to view information about the selected Landscape Shape, such as the Type, the defining parameters and the area of the Shape. The relevant coordinates are will also be displayed.

The summary information will be included when you export the job data to PDF.

### **Link Photos**

To attach one or more photos to a Landscape Shape, first tap on the Landscape Shape then tap on the **Photos** tab. You may link photos from the Photo Library or a folder on your device. And, you may tap the **Camera** button to snap a picture and have it automatically linked to the Feature.


If you would like the app to show the file name of the attached photo in Sheet view, you must add the built-in Attribute **Photos** in the Topic Structure page for the Feature Topic. If you have not yet added this Attribute, you can use **Topic/Edit Topic** to get to the Sheet Update screen to do so. The data field for displaying the photo file name(s) is limited. If the string of file names is too long, it will be truncated. Therefore, it is advisable to keep the photo file names short.

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### **Point Stakeout**

The **Point Stakeout** function will display your distance and direction to a target location and in this way help guide you toward the target location.

You may add the stakeout targets to your job map in one of the following ways:



1. Enter the coordinates to create each point. Please refer to **[Add Point by Coordinates](#)** under **Digitize Features**. If the elevations also matter to you, then include the correct elevation in the target coordinates.
2. Import a DXF file or Shapefiles containing the target shapes. Please refer to **Set up a Job**.
3. Digitize a Point Feature, a Line Feature or an Area Feature.
4. Create Grid Points for an Area Feature.
5. Store GPS Features by using  **Pick** in the screen for adding a Point, Line or Area Feature. Please refer to **Digitize Features**.

After finding a desired location, you may optionally stake it and store its

coordinates. The Point Stakeout function can be used to stake out individual points, or points along a line or area.


The accuracy of the stakeout will depend on the accuracy of the GPS receiver used. Keep in mind, though, that GPS elevation errors are usually twice or three times the horizontal position errors.

You must activate GPS before you can access the Point Stakeout function.

Tap the GPS Menu icon  then select **GPS On** to turn the GPS on. Then tap on  again and select **Point Stakeout**.

With the cursor in the Target Feature field tap on the target **Point, Line** or **Area Feature** of interest. You may tap the **Browse** button to select a target Feature ID in the active Topic.

If the selected Feature is a Line or Area, you can select which Node you would like to stakeout. Select the the desired Point Feature. Or, for a Line or Area Feature, type in the desired Node #, or tap the little right arrow button to change the Node # to another node in the same Feature.

If you have tapped the  icon to disable Feature selection (so as to return to the normal touch screen mode), make sure you tap this icon again to turn it on before selecting a Feature for a data field.

In the **Antenna Height** field, enter the height of your antenna above the ground.

Click the **Settings** button to set up or change the settings for stakeout. In the **Stakeout Setup** screen you may turn off the **Navigation Beep**, if you wish. You may also specify the **Tolerance** range as well as the type of notification you wish to receive when you get within the tolerance range of the target.

If you mark the checkbox for **Display Message**, then when you are inside the target range, the "Target!" message will flash on the screen.

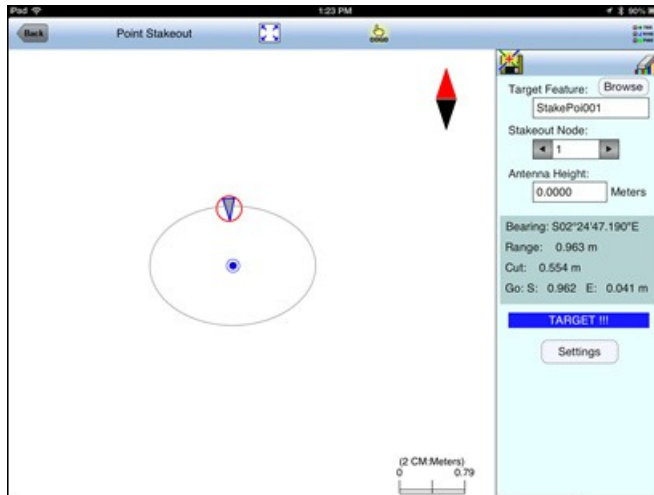
If you mark the checkbox for **Target Beep**, then when you are inside the target range, beeps will be sounded.

To use the tolerance range for checking only the horizontal distances, select **2D** for **Stakeout Mode**. If the the tolerance range is to be applied for checking the elevation, then select **3D**.

You can also specify how to keep the screen focused on your location by selecting an option for the **Stakeout Zoom Mode**. In the **Autoscroll** mode, the job map will scroll to keep your position displayed on the screen while you are moving along. The map scale will not change. In the **Autozoom** mode, when you hit the border of the screen, the app will automatically zoom out to let you see more of the job map.

If you mark the checkbox for **Display Message**, then when you are inside the

target Tolerance range, the "Target!" message will flash on the screen.



If you mark the checkbox for **Target Beep**, then when you are inside the target Tolerance range, beeps will be sounded.


Your position is represented by the GPS marker on the screen. The app will report your GPS position in relation to the target location.

**Bearing** or **Azimuth** is the direction from your GPS location to the specified Target Stake Point or Node.

**Range** is the direct distance from the GPS location to the Target Stake Point or Node.

**Cut** or **Fill** is the difference in elevation from the current location to the Target Stake Point or Node. "Cut" indicates that your current position is higher than the Target. "Fill" indicates that your current position is lower than the Target.

You may use the values displayed in the **Go** field to help you reach the target. On the GPS marker, the solid grey arrow points in the direction you are moving, and the hollow blue arrow points in the direction of the Target. When you are moving in the right direction, these two arrows will coincide.

After you have successfully reached your target location, you can drive a stake into the ground at this location. Tap the **Save Result** icon  to store the GPS position as a stake point.



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## Line Stakeout


You may use **Line Stakeout** to find your position relative to a **Line Feature** or the boundary of an **Area Feature**, and to optionally stake and/or store the location. This function can be helpful when you need to stakeout a larger landscape layout. The accuracy of the stakeout will depend on the accuracy of the GPS receiver used.

You must activate a GPS Receiver before you can access the Line Stakeout



function. Tap the GPS Menu icon  then select **GPS On** to turn the GPS on. Then tap on  again and select **Line Stakeout**.

With the cursor in the Target Feature field tap on the target **Line** or **Area Feature** of interest. You may tap the **Browse** button to select a target Feature ID in the active Line or Area Topic.

If you have tapped the  icon to disable Feature selection (so as to return to the normal touch screen mode), make sure you tap this icon again to turn it on before selecting a Feature for a data field.

Select or enter the **From Node** and **To Node** on the target Line or Area Feature.

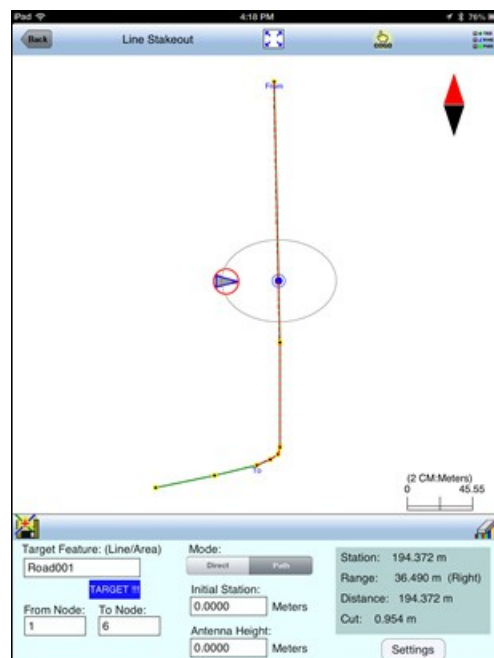
If you are interested in the direct line between the beginning and ending nodes, then select **Direct** for the **Mode** field. On the other hand, if you are interested in the line segment on the Line or Area Feature, then select **Path**.

Your position is represented by the GPS marker on the screen. The **Target** for Line Stakeout is the projection of your GPS position on the selected line segment. As you move along in the vicinity of the line or area feature, you will see information displayed about your position relative to the target line segment. Such information will not be displayed if your position cannot be projected onto the target line segment.

In the **Antenna Height** field, enter the height of your antenna above the ground.

Click the **Settings** button to set up or change the settings for stakeout. The **Stakeout Setting** screen is described under **Point Stakeout**.

If you mark the checkbox for **Display Message**, then when you are inside the target Tolerance range, the "Target!" message will flash on the screen.





If you mark the checkbox for **Target Beep**, then when you are inside the target Tolerance range, beeps will be sounded.


The first stakeout location on the target line segment is called the **Initial Station**. Enter the distance of this initial station from the From Node.

The **Range** field shows your perpendicular distance from the line segment, ie. the distance between your GPS and the Target. Therefore, you could use the Line Stakeout function to help ensure that you are always moving parallel to a line or boundary at the desired distance.

**Station** is the distance between the From Node and the Target.

**Distance** is the distance between the Initial Station and the Target.

**Cut** or **Fill** is the difference in elevation from the GPS location to the target. "Cut" indicates that your current position is higher than the target. "Fill" indicates that your current position is lower than the target.

To store the GPS position as a stake point, tap once on the **Save Result** icon .

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