Stakeout iCMT

Help Document

http://www.cmtinc.com

Q&A Blog Site:
http://icmtgis.wordpress.com

Please email suggestions for enhancements to:
support@cmtinc.com

Overview

The Stakeout iCMT app provides the folloiwng functionality to facilitate the

task of creating Point, Line and Area
Features and staking them out:

* Import the shapes from a Shapefile
or a DXF file.
* Precisely digitize Points, Lines and
Areas over the built-in Map.
* Move existing nodes to fine-tune the
map drawing.
* View position, length and area
values for the Features.
* Label the Lines with segment lengths
and directions as well as corner angles.
* Label the Areas with size in acres
and square feet or hectares and square
meters.
* Measure distances and areas without
saving the shapes.
* Move existing nodes to fine-tune the
map drawing.
* Create a Point from the entered
address or coordinates.
* Create a Point or record a node by
picking the GPS location.
* Use GPS to stake out Points or nodes
on a Line or Area Feature.
* Use GPS to guide you along a
specified Line or Area boundary.
* Save the job data file for later use.
* Output the drawing and the
coordinates to PDF.
* Email the job data files, the PDF
files and the DXF files to your
colleagues.

GPS capability is required for the
Point Stakeout and Line Stakeout
functions.

Map View

The **Map View** is the main screen that
shows any spatial data (Features)
and/or background map present in the
currently active job.

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

coordinates will pop up in Map 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 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.

Main Menu (pull-down list)

Tap the Main Menu icon to display the list of functions on the Main Menu.

Map Tools Menu (pull-down list)

The above **Add Point manually** icon is initially displayed by default.

Utilities Menu (pull-down list)

Tap on the inverted arrowhead to show the tools for measuring distances and areas and locating a point by address.

GPS Menu (pull-down list)

Tap on the inverted arrowhead to show the menu options for turning GPS On or Off, Stakeout Setup, GPS Position Information as well as **Point Stakeout** and **Line Stakeout**.

Zoom-Fit

Tap on the **Zoom Fit** icon on the Toolbar to display all Features on the same screen.

Feature Properties

With a Feature selected, you will be able to view its coordinates as well as assign a symbol for the Feature by using the **Feature Properties** tool.

On-screen Keyboard

An on-screen keyboard will automatically pop up when the focus is on a data entry field, such as the hinge-cut area. After entering data, tap the **Return** button on the pop-up keyboard. To hide the keyboard, tap the **Hide Keyboard** icon on the keyboard, or tap in an area outside the keyboard.

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 angles in **DMS** (Degrees-Minutes-Seconds), if your data value will not fill in all the places, then tap the special key after entering the desired value. For example, to enter the longitude of 91º09'26.082"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

Opening or Creating a Job File

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 well as importing/exporting a DXF 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 **corners.pmp**. (The job files for this app have the **.pmp** 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** icon ✓. (Yes, it's okay to type over the displayed file name.)

Once the proper files have been selected and any optional information has been entered, click on **OK**. If you have selected an existing job, your 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** icon ✕.

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 ***.pmp**.

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 **corners.pmp** example

file that you have just opened under a different name, such as "mycorners". This way, you can work with **mycorners.pmp** and keep the original corners.pmp file intact for later use.

The newly saved file will be the active job file. Therefore, if you wish to work on the original file, then open that job file before proceeding.

Whenever you open another job, the program automatically saves the data in the current job and closes the current job.

Accessing the Documents Folder

The data files, such as the *.pmp 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 **Stakeout iCMT** 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 is not the working job file**. In other words, open a different job file to make it the working job file.

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 Shapefile 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 the application.

To import a Shapefile, first open the Job file into which you wish to import the Shapefile data, or create a new Job file. Choose **Job** then select **Import Shapefiles**, select the desired Shapefile then tap the **OK** button. (It is not advisable to import Shapefiles into a job located very far away from the Shapefile data as it would be cumbersome to zoom to to the widely separated areas to work with them.)

Select the Datum, Coordinate System, Unit and Region in which the data was saved in the Shapfile then tap the **OK** button. If the selected Datum and Coordinate System do not match those in the Shapefile, 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 (one layer per Topic) into the .DXF file.

Mark the **With Attributes** checkbox if the Features are to be 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 WGS84(1150)ITRF00, and Epoch 01/01/2014. The distances and angles will be exported in the active distance and angle units.

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 Feature Label

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 **Label Setup** 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.

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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.

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 under **Utilities** 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 Menu** icon then select **Turn GPS on** to turn the GPS on. 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 the Stakeout iCMT application software under Settings on your device. With iOS6, 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 in the **mycorners.pmp** job file. As the points in this job are located in Oregon, USA, you will want to tap the **GPS Menu** icon then select **Turn GPS Off** to turn the GPS off. Otherwise, the app will always zoom to your current location, which most likely is very far away from the sample job

location.

Please note that when GPS is turned on, Auto-lock is disabled for your iPad, and power consumption will be higher.

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

Digitize Features

You may manually add new Features to the current 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 open the **mycorners.pmp** job and turn on the Map in the Show Satellite mode.

<u>Adding a Point Feature</u>

To add a Point Feature manually, tap the pull-down arrow beside the **Map Tools** icon.

Select **Add Point Manually** ● .

Zoom out a little then tap once near the houses with red roof tops to drop a point. Tap on the screen again in the area between the triangular plots and the larger plot to their right. These Point Features could represent the wells on this farm plot.

The **Add** tool ADD 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 GPS Menu icon and

select 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 Menu icon and select

Turn GPS On 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.)

Tap the **Back** button to return to the
main Map View.

There are already three Points marking
three corners of a triangular plot of
land. If you look carefully, you will
notice that the right-most corner of the
plot is actually clipped off and is not
represented by a single apex. Let's add
another point at the fourth corner of
this land plot.

To accomplish the daunting task of
placing a dot precisely at the desired
location, tap 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 fourth corner of the
land plot. 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 dounut area to drop the node.)

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

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, 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. Otherwise a point may be created very far away from your job site.

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.

Tap on **Cancel** if you decide not to create the new point.

Adding a Line Feature

In the **mycorners.pmp** job map, tap the pull-down arrow for the **Map Tools** icon to see the **Add Line manually** tool. Tap this selection, and the Add Line manually tool icon ∿ will be displayed as the active Map Tool.

In the screen for digitizing a Line Feature, you may tap on the **Line Style** button to select a different line style color for the Line Feature you digitize.

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 closely follows the border of the field.

The **Add** tool ADD , the **SnapToNode**

tool , and the **Pick GPS** position functions work in the same way as for digitizing Point Features. Please note that with Add Line Manually, you can turn GPS on or off by simply toggling the GPS icon . Also, the **SnapToNode** tool is directly accessible from the digitizing screen.

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** button to back-step and remove the last added node, if necessary.

You may tap the **Edit** icon to toggle to full-screen view when you wish to see more of the map.

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 **mycorners.pmp** job map, tap the **Map Tools** pull-down arrow to see the **Add Area manually** tool. 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 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 the area.

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

You may tap the **Edit** icon 🖊 to toggle to full-screen view when you wish to see more of the map.

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.

Labeling the Features

You may use the **Feature Properties** function 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.

Move Node

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

1. Tap on the Feature to select it then tap on the Digitizing Tool 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.

Feature Properties

With a Feature selected in the Map View, you may tap the Feature Properties icon to view the Latitude-Longitude -Elevation information for the Feature. MSL is the Mean-Sea-Level value, and HAE is the elevation referenced to the ellipsoid.

For a Line or Area Feature, you will also see the line length or the perimeter and acreage of the area in the currently active units of measurement. Tap the left or right arrow for the **Node#** field to scroll through the nodes in the Line or Area Feature to view their coordinates.

Please open **veggies.pmp** and save it as **myveggies.pmp** to work with.

Changing the Feature ID

You may have noticed that the Point Features you add automatically assume the Feature ID: UserPtnnn, where nnn represents a numeric value. Similarly, the Line Features assume the Feature ID: UserLinennn, and the Area Features assume the Feature ID: UserAreannn.

You can change the Feature ID in the Feature Properties screen. For example, for the nearly triangular Area Feature that you have created previously by joining the four Point Features, you could change UserArea001 to Plot001.

Assigning a Feature Symbol or Pattern

In 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. To do so, first tap the **Labels Setup** tab, then mark

the checkbox for the labels you wish to
see:

Show Corner label

Show Segment label

Show Area label (for Area Features
only)

For example, in **myveggies.pmp** job,
tap on one of the two vegetable plots

then tap on ![icon] and mark the **Show
Area label** checkbox under Labels
Setup. Do the same for the other
vegetable plot.

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

Measure Distance

If you would like to know the distance
between two or more map locations,
first tap on the **Measure Distance** icon
![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** ![icon]
then use the crosshairs to zero-in on
the desired location.

If your device has GPS capability, you

could tap the **GPS** icon GPS to turn on

GPS then tap the **Pick GPS** icon Pick
to add a node for the line to be
measured.

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

vicinity.

To see more of the map for delineating the line to be measured, tap on the

Full-screen View toggle to hide the measurement values.

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

If you wish to convert the shape you have delineated to a Feature, then click on the **Convert to Line** icon on the lower tool bar. Otherwise, the temporary shape will be discarded when you tap the **Back** button to close this screen.

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 see more of the map for delineating the area to be measured, tap on the

Full-screen View toggle ⬚ to hide the measurement values.

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

If you wish to convert the shape you have delineated to a Feature, then click on the **Convert to Area** icon ⬆ on the lower tool bar. Otherwise, the temporary shape will be discarded when you tap the **Back** button to close this screen.

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Locate a Point by Address

To look for a location 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 screen.

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Point Stakeout

Suppose there is an old survey marker that you need to locate on your farm. You could use the **Point Stakeout** function in conjunction with GPS to help you find it. You could use the same method to locate an old well overgrown by brushes if you have a record of its coordinates. For this reason, it is helpful to use GPS to record the coordinates of important locations or structures for future reference. The Point Stakeout function could also be used to stake out a fence or a boundary line if you are using an accurate GPS device.

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**.

2. Import a DXF file or Shapefiles

containing the target shapes. Please refer to **Set up a Job**.

3. Store GPS Features by using in the screen for adding a Point, Line or Area Feature. Please refer to **Digitize Features**.

If the elevations also matter to you, then include the correct elevation in the target coordinates.

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 **Turn GPS on** to turn the GPS on. Tap the same icon again then select **Point Stakeout**.

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

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.

When you wish to select an item from the screen, hide the keypad to reveal

more of the screen.

Tap the icon to turn it off when you need to perform gestures on the screen. Tap this icon to turn it back on when you wish to select a Feature from the screen.

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

Click the **Settings** button to setup how the stakeout will be graphically displayed. In the **Stakeout Setup** screen 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 don't like to hear the constant beeping when GPS is turne on, you can un-mark the **Navigation Beep** option.

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.

Your position is represented by the GPS marker on the screen. The app will report your GPS position in relation to the target location. Tap on the **Message** tab to display this information.

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 ou 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.

Any time you wish to see more of the map, tap on the **Full-screen View** toggle .

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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 will come handy when you need to blaze a trail across thickets or to layout pipelines where landmark references are lacking. The accuracy of the stakeout will depend on the accuracy of the GPS receiver used.

You must activate GPS before you can access the Line Stakeout function. Tap the **GPS Menu** icon then select **Turn GPS on** to turn the GPS on. Tap the same icon again then 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.

Tap the icon to turn it off when you need to perform gestures on the screen. Tap this icon to turn it back on when you wish to select a Feature from the screen.

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 setup how the stakeout will be graphically displayed. In the **Stakeout Setup** screen 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.

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.

Tap on the **Message** tab to display the information about your location relative to the target Line or Area Feature.

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.

If the GPS location cannot be projected on the target Line or Area Feature, then the data fields on the Message page will be blank.

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

Any time you wish to see more of the map, tap on the **Full-screen View** toggle .

Export to a PDF File

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

You may accept the displayed default name for the PDF output file, or you may type over it the name you wish to assign to the PDF file.

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.

Tap 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 fit them all on the screen by tapping the Zoom-Fit icon .

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.

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 **Stakeout iCMT** app.

To delete a PDF file, use the iTunes® program to access the Documents folder for the app then select the file and hit the **Delete** button on your desk-top computer. **A deleted file cannot be recovered.**

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Email the Files

You may email Job files (*.pmp), PDF files (*.pdf) and DXF files (*.dxf) files. To do so, first tap the **Main Menu** icon and select **EMail Files** then select the file type.

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.

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