Deed Calls & Stakeout

Help Document

http://www.cmtinc.com

http://icmtgis.wordpress.com

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

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Overview

Deed Calls & Stakeout is a universal application software that can be used on an Apple® iPhone®, iPod touch® or iPad® device. It will let you input calls from a legal metes and bounds description, title deed or other text description of a parcel of land to map out the boundary and create a deed drawing in your map as well as view the perimeter and enclosed area.

You will be able to specify the location of the first node then enter angles and distances to draw each segment of the property boundary, which could be displayed over a Map when the latter is available.

This app also provides a Point Stakeout function and a Line Stakeout function to help you approach a node on the deed plot or to help you move parallel to the deed plot boundary.

When you start this application, you will see a number of tool icons displayed across the top of the screen.

 Main Menu (pull-down list)

Tap this icon to display the list of functions on the Main Menu:

Job provides the options to open or save a job file.

Export to PDF provides functions for saving the deed plot data to a PDF file and for viewing or printing an existing

PDF file.

Export to DXF provides the function for saving the deed plot shape to a DXF file.

Map provides the Map display options as well as the function to close the Map.

Email Files provides the function to email the Deed Calls file.

Setup provides options for units and label properties.

Help displays this help file.

About Deed Calls & Stakeout shows the application software name and version.

 Measure Tool

 GPS Menu

> **GPS On/Off**
> **Position Info**
> **Point Stakeout**
> **Line Stakeout**

 Zoom-Fit

 Node Selection Toggle

 Edit Mode Toggle

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 entering numeric data, you will notice that there is a **Special 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 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 special key, then enter 26.082W.

Similarly, to enter angles in **Decimal Degrees**, instead of filling in the leading zeros, you could tap the special key after entering the desired number of digits in the integer part of the value. For example, if you wish to enter the slope angle of, say 10, for a Traverse or Side-shot Point, remember to tap the special key after entering the 10. Otherwise, you will have entered a slope angle of 100. Alternatively, you could enter "010" to fill all the integer places.

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Open a Deed Calls File

Tap the **Main Menu** icon , select Job, select **Open Job** then select an existing Deed Calls File to open. A file named **example.dcf** has been included as a sample Deed Calls File.

To create a new Deed Calls File, enter a new file name then tap on the green check mark . (Yes, it's okay to type over the displayed file name.)

Please go ahead and create a new file

called **test1.dcf**.

To cancel the action of opening a file, tap the red cross mark ✕.

If you wish to save the job data under a different name, you can use the **Job**/**Save As** function to do so.

Display Map

Whenever you are connected to the Internet and your location can be determined, Map can be displayed as the background map for your deed drawing. This may help in locating the first node for your deed drawing. (Make sure the **Location Service** is turned on for the Deed Calls & Stakeout application software.)

You may select one of the following view modes after tapping the **Menu** button then choosing **Map**:

Show Standard - Show a map of streets and landmarks.
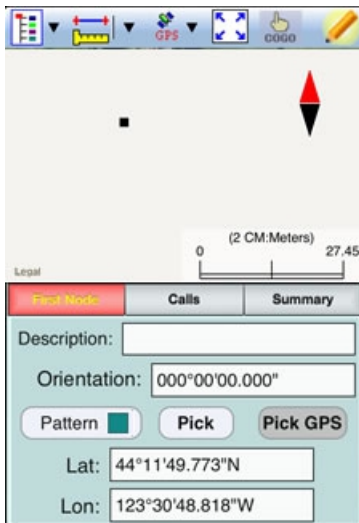
Show Satellite - Show satellite photos.

Show Hybrid - Show street names on satellite photos.

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

Set First Node and Symbolism

Tap the **First Node** tab to specify the starting point in one of the following ways:

a) Tap the **Pick** button then tap a location on the screen to use it as the first node. If you just want to see what the deed plot will look like, you may select any spot on the screen as your initial node. However, if you wish to place the deed plot on a geographic location then turn on Map then pan and pull to display the map area showing your location. Then tap the spot that best represents the point of beginning for your deed plot.

You could make use of the donut-shaped Node Tool to place the point more precisely on the Map. To do so, first tap on the **Node tool**. A larger donut with crosshairs at its center will be displayed on the screen. Touch on the purple area of this tool and drag the crosshairs to the desired position. Now tap once in the donut hole to drop the point. You could also keep holding down on the purple donut and use another finger to touch outside of the dounut area to drop the point.

b) If you know the coordinates (**Latitude and Longitude**) of the first node, then enter these into the corresponding fields to pinpoint the first node.

If you don't know the location of the point of beginning at the time you are entering the deed calls, you may just tap a location on the screen and use it

as the first node for the drawing. Later, when you have the exact coordinates of the first node, you may tap the First Node tab and enter that information. In that case, the entire Deed Calls drawing will be automatically moved to the new location.

c) If you are using an iPad® equipped with GPS or a compatible external GPS receiver, and you are doing the angle and distance measurements on the spot, you could tap the **GPS** icon to turn on the GPS to help you position yourself at the point of beginning. Then tap the **Pick GPS** button to use the GPS position as the First Node. Enter the measurements as they are made, and you will have a completed drawing on the spot. (Make sure the **Location Service** is turned on for the Deed Calls - Perimeter - Area application software.)

Please note that the position accuracy depends on the GPS receiver that you are using.

If your deed document refers to the magnetic north, you could enter the magnetic declination into the **Orientation** field then enter the deed calls. Alternatively, you could enter the calls with Orientation set to 0 then enter the magnetic declination into the **Orientation** field to rotate the plot.

You may optionally enter a **Description** for the deed drawing you are about to create.

You may also specify the line style and area pattern for your deed drawing by tapping the **Pattern** button then selecting the desired symbols and colors. The area pattern will be used to represent closed areas only.

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Set up Units and Angle

Tap the **Menu** icon ⊞, select **Setup** then select **Unit and Angle** to specify the appropriate length unit and angle system to use. If using U.S. units of measurement, be sure to check the box **US Survey Unit**.

Specify the **Angle Unit** with choices of: DMS, Decimal Degrees (Degree), Mils or Grads.

Specify the desired **Angle System** for the calls. Available choices are: **Azimuth** or **Bearing**. If Azimuth is chosen, also specify the **Azimuth System**: North or South.

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Set up Feature Labels

The **Deed Calls & Stakeout** app will label the line segments and arcs of your deed drawing. It will let you specify the font size and the decimal digits to display in the labels.

Tap the **Menu** icon ⊞, select **Setup** then select **Feature Labels** to specify these parameters.

You will also have the choice of showing either the direction angle or the length value above the line segment. The other value will then be shown below the line segment.

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Enter Deed Calls

The following example illustrates the procedure for entering bearing and distance calls for each segment of a boundary to create the deed drawing.

Assume that we have created a new file named **test1.dcf**, and that we have picked a location on the screen as the **First Node** for our deed drawing. We will be using METERS as the length

unit, and we will be entering each angle as a BEARING in DMS format.

Now tap the **Calls** tab to go to the calls list page that lists the existing deed calls records. Initially there are no records shown.
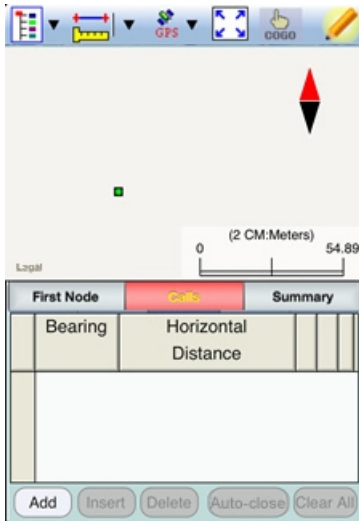
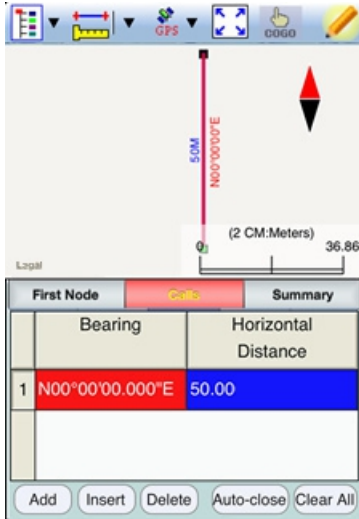Tap the **Add** button to add a new call record and display the data entry screen.
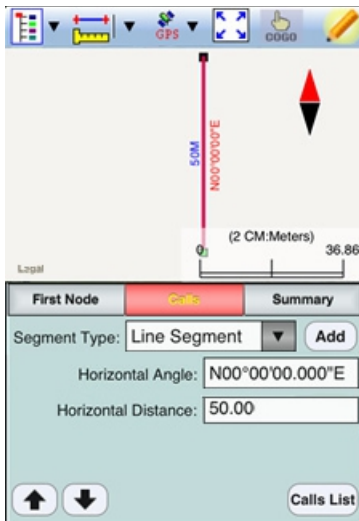
First, specify the type of segment you will be adding. Choose between **Line Segment** for straight lines or **Arc Segment** to define an arc.

Our first call is a straight **Line Segment**. We enter the horizontal distance of 50 meters from the **green** starting point and also specify the
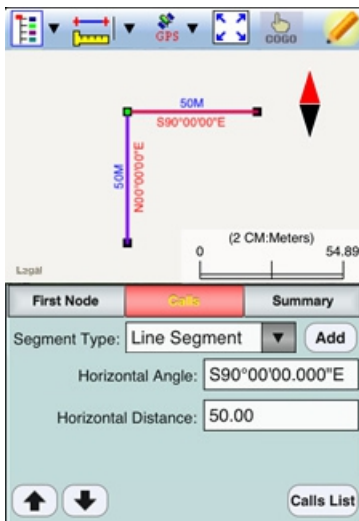
bearing of N 0 E.

Tap the **Calls List** button to return to the listing of the Deed Calls records.
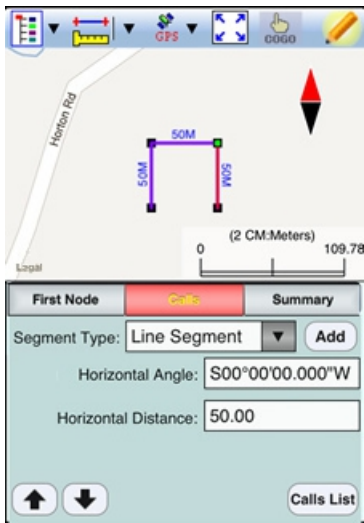

If you need to change the data entered for any record, simply double-tap on the record to call up the data entry screen then enter the correct data.

Tap **Add** and enter the second Line Segment as shown below.

Tap the **Add** button to add the third Line Segment as shown below:

The **Add** button on this screen permits you to quickly add one segment after another without having to go back to the Calls List screen.

The last entered segment is highlighted in red in the graphical view.

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. To fit the drawing to the screen, simply tap the **Zoom-Fit** icon. When **Map** is turned on, you may not be able to zoom to a really small scale. In that case, turn off the Map then pull to zoom into the map.

Now that you've gotten the hang of it, we will throw in a curve. For an Arc Segment, specify the size and length of the arc by entering a combination of the **Radius** and one of the following: **Arc Length**, **Chord Length**, **Central Angle**. Also specify the orientation of the curve by entering the **Chord Direction**, the **Tangent Direction** or the **Radial Direction** (from the first node of arc to the center of the circle, of which the arc is a part) . Select the **Continuous** option if the curve is to continue in the direction of the last defined curve or line segment. Finally, specify the **Curve Direction** to indicate whether the arc turns left or

right.

Below is the arc we will enter next.
Tap the pull-down arrow for each field
to select the appropriate option.
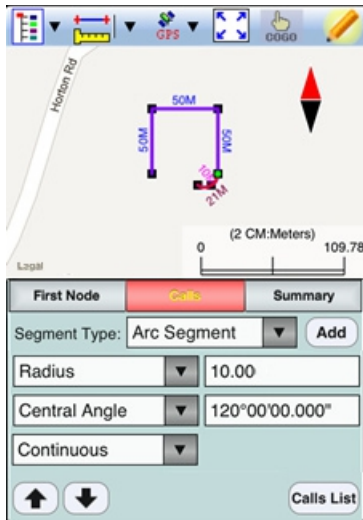
Tap the **Calls List** button to see the
Deed Calls records. You may tap the
Insert button to insert a record before
the highlighted record, tap the **Delete**
button to delete the highlighted record,
or tap the **Clear All** button to clear all
existing deed calls from the list and
start a new deed call drawing.

Caution: Make sure you really want to
delete a record or clear all records
before confirming to do so. Deleted
records cannot be recovered.
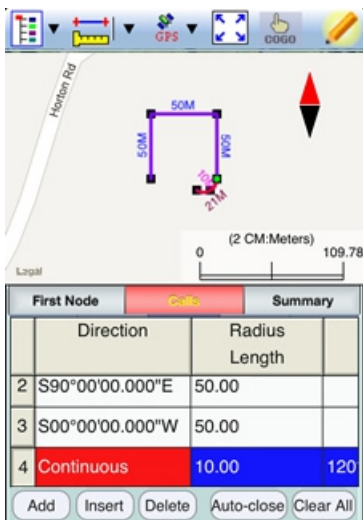
As there could be line segments as
well as curve segments in your deed

drawing, please note that the column titles for the list of deed calls records correspond to the highlighted record in the list.

When you tap the lit **Edit** icon to turn it off, any drawing you have made so far will be displayed in **full screen**.

Complete the drawing by entering the following data:

Line Segment
Horizontal Distance: 15
Horizontal Angle:
S00º00'00.000"W

Arc Segment
Arc Length: 25
Central Angle: 120º00'00.000"
Chord Direction:
N90º00'00.000"W
Curve Direction: Right

Line Segment
Horizontal Distance: 15
Horizontal Angle:
N00º00'00.000"E

Arc Segment
Chord Length: 10
Arc Length: 15
Radial Direction: N90º00'00.000"W
Curve Direction: Right

Line Segment
Horizontal Distance: 9
Horizontal Angle:
N00º00'00.000"E

Line Segment
Horizontal Distance: 4
Horizontal Angle:
N90º00'00.000"W

If you are unsure about the last call and want the **Deed Calls & Stakeout** software to automatically close the loop for you, simply tap the **Auto-close** button. A Line Segment will be generated to snap to the First Node, and the deed plot will be represented

as an area. This is illustrated in the following two screens:
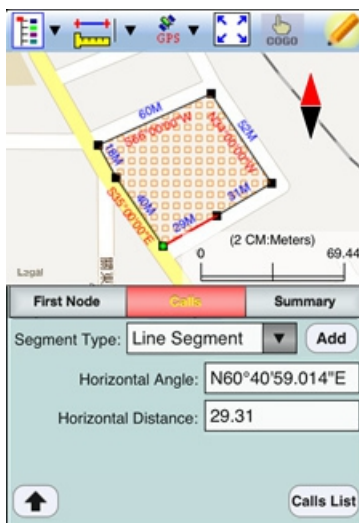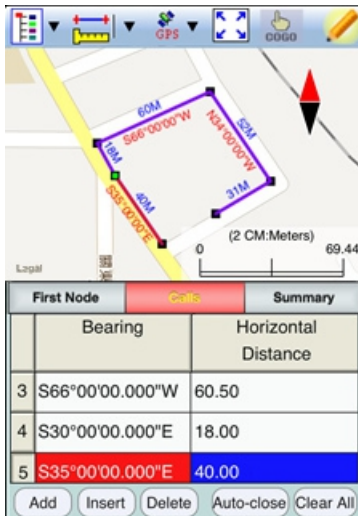
View/Edit Deed Calls

To view or make changes to a deed call that you have already entered, first tap the **Calls** tab then **double-tap** the deed call of interest from the list of deed calls to bring up the data entry screen. You may change the data as appropriate or simply tap the **Calls List** button to return to the list of deed calls records.

While in the data entry screen, you may tap the **UP** or **DOWN** arrow button to view or change the corresponding data record, if you wish.
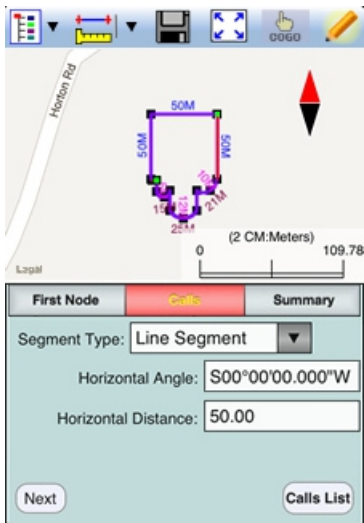
When you are at the last deed calls record, you may tap the **Add** button to add a new call.

To return to the list of deed calls records, tap the **Calls List** button.

In the Calls List screen, tap the **Insert** botton if you wish to insert a record before the currently highlighted record.
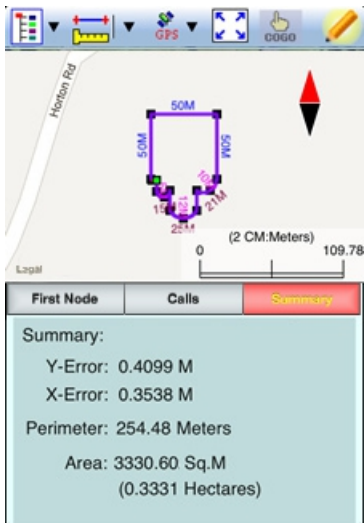
Tap the **Delete** button to delete the currently highlighted record. **Beware that deleted data canot be recovered.**

To let the software automatically close the area for you, tap the **Auto-close** button.

View the Summary

After entering all the deed calls, tap on the **Summary** tab to view the closure error, the perimeter and the enclosed area.

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

icon ![icon] .

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.

Measure Area

The **Measure Area** tool ![icon] on the **Measurement Tools** 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** ![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 icon] to turn on GPS then tap the **Pick GPS** icon ![Pick icon] to add a node for the area 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 back-step, tap the **Undo** icon ![icon] . To delete all the nodes made in this measurement session, tap the **Reset** icon ![icon] .

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.

Save the Deed Calls File

Please note: The data you have entered is not saved until you use the **Save** or **Save As** function to save it to a .DCF file.

To save the deed calls that you have entered into the currently open file, tap the **Main Menu** icon, tap on **Job** then tap on **Save**. The file extension will be ***.DCF (Deed Call file)**. This is an ASCII text file which may be opened and viewed with any text editor.

If you wish to save the data to a different file name then use **Save As** under **Menu/Job** and enter a new file name for saving the data.

The *.DCF files will reside in the Documents folder for the application. To access your *.DCF files outside of the application, first connect to the iTunes® program then look in the Documents folder for the **Deed Calls & Stakeout** app.

The *.DCF files created by the **Deed Calls & Stakeout** app are compatible with the current releases of the PC-GIS X, PC-GPS, PC-MAPPER and CMT-SURVEY mapping software produced by Corvallis Microtechnology, Inc.

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.

Export to PDF

To save the Deed Calls drawing and data records as a PDF file, select **Export to PDF** from the Main Menu.

To export to a new PDF file, tap on the **New** button. Rename the file, if you wish then tap on the green check mark to confirm

The first page shows the deed drawing. The following page(s) will show the deed calls, the perimeter and the enclosed area.

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 **Deed Calls & Stakeout** app.

Export to DXF

The deed plot shape 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.
The DXF file can be used with exernal
programs such as PC-GIS PRO and
AutoCAD® .

To export the deed plot to a DXF file,
select **Export to DXF** from the **Main
Menu** .

Select the name of the file into which
to export the deed plot then tap on the
OK button. If you wish to export the
data into a new file then tap on the
New button. You may confirm the
displayed new file name or overwrite it
with your own new file name.

The two-dimensional deed plot shape
will be exported in LLA
WGS84(1150)/ITRF00 and Epoch
01/01/2014.

Email Files

You may email one or more files by
tapping the Main Menu icon then
selecting **EMail Files**. Select the PDF
or DXF file type then mark the files
you wish to email.

Enter the recipient's email address then
tap the **Send** button. The selected files
will be attached to the email.
Optionally add a message then tap the
Send button to send out the email.

Point Stakeout

The **Point Stakeout** function in
conjunction with GPS can help you
locate the individual nodes along your

deed plot.

As this app will let you enter the coordinates of the first node, you could use this capability to locate an old survey marker on your property. 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 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 icon to turn the GPS on. Tap the pull-down arrow for the **Stakeout Menu** icon then select **Point Stakeout**.

The Target Feature field will show the Feature ID of your Deed Plot.
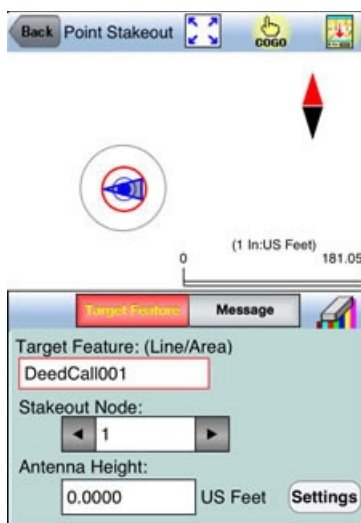
You can select which Node you would like to stakeout. Type in the desired Node #, or tap the little right arrow button to change the Node # to another

node in the same Feature.

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 Node from the screen. Please note that you can only select a node from the deed plot when the cursor is in the Stakeout Node field.

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 turn off the Navigation Beep if the constant beeping bothers you.

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.

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 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.

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Line Stakeout

You may use **Line Stakeout** to find your position relative to your deed plot. This function will come handy when you need to lay out fences along the property boundary or install irrigation heads parallel to the property boundary. 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 icon ![GPS icon] to turn the GPS on. Tap the pull-down arrow for the **Stakeout Menu** icon then select **Line Stakeout**.

The Target Feature field will show the Feature ID of your Deed Plot.
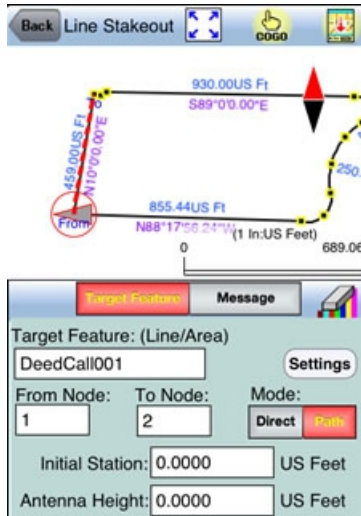
Select or enter the **From Node** and **To Node** on the deed plot.

Tap the ![COGO icon] 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 Node from the screen. Please note that you can only select a node from the deed plot when the cursor is in the Stakeout Node field.

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.

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.

Again, 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.

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