Area - Distance

Help Document

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Overview

The **Area - Distance** universal application software is a handy tool that lets you digitize **Point**, **Line** and **Area Features** and view point location, line length as well as the area and perimenter of an enclosed region.

You may digitize the points manually or by entering their geographic coordinates.

If your device has **GPS** capability, you could pick the GPS position to use as a node for the Point, Line or Area Feature that you are creating. The Features can be displayed over a **Map** when Wi-Fi is available and Location Serivce is turned on.

To help improve point location accuracy, the **Area - Distance** app provides a method for using a crosshairs symbol to pinpoint each node, thus taking the guesswork out of tapping the screen with your fingertip. It also provides a **Move Node** tool to let you fine-tune the position of an existing node.

A drawing will be automatically created on the screen for the digitized Features. Whenever feasible, you can view the segments labeled with distances and directions, the corners labeled with angle values, and the Area Features labled with area values.

The **Area - Distance** app also lets you measure distances on the displayed map. You will be able to tap around the boundary of a region and measure its area as well.

Besides the digitization and measurement functions, the app also provides the ability to locate a point of interest based on its address or geographic coordinates.

You will be able to output the coordinates of the Features to a text file. You will also be able to save your job data to a PDF file. In addition, you will be able to email your job files to yourself or a colleage.

When you start the **Area - Distance** app, you will see a number of tool icons displayed across the top of the screen. Other tool icons may be displayed on various screens, depending on the function being used.



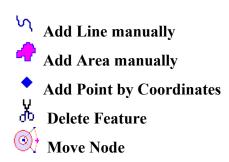
Tap the Main Menu icon to display the list of functions on the Main Menu:

Job
Coordinates text file
Export to PDF file
Map
Email Files
Unit and Angle System
Help
About Area - Distance



Tap on the inverted arrowhead to show the following tools:







Tap on the inverted arrowhead to show the following tools:



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 Special Key showing several symbols on it. 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 91°09'26.082"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.

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Open a Job File

Tap the **Main Menu** icon, select **Job** then select **Open Job**. Select an existing job file to open, such as **test.pmp**.

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

If you are working with a job file and want to open another job file instead, use **Open Job** to 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, use **Open Job** to look at 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.

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Save the Job File

To save the data in the currently open file, tap the **Main Menu**, select **Job** then select **Save**. Or, you could tap the icon to save the data at any time. The data 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 **test.pmp** example file that you have just opened under a different name, such as "mytest". This way, you can work with **mytest.pmp** and keep the original test.pmp file intact for later use.

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

The *.pmp files will reside in the **Documents** folder for the application. To access your *.pmp files outside of the application, first sync your device with the iTunes® program. Select your device then scroll down to the **File Sharing** section. Click on the **Area - Distance** app name. After a while, the data files associated with this app will show up on the right-hand side.

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

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.

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Set up Units and Angle System

Select the **Unit and Angle System** under the Main Menu to specify the desired length unit for displaying 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).

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Display Map

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. If you have 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.

If your device is equipped with GPS or has Location Service, then you can **tap on the GPS icon GPS 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 the Area - Distance application software under Settings on your device. With iOS6, Location Service setting is placed under Settings - Privacy.)

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

following sections, we will show you how to digitize a couple points, a line and an area in the **mytest.pmp** job file. As the points in this job are located in

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

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

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Add Point Manually

A few Point Features have already been added to the sample job **mytest.pmp**. Let's add a couple new **Point Features** to this job. To do so, first tap on the Digitizing Tools Menu then select **Add Point manually** from the pull-

down list. If the Add Point Manually icon is already displayed, then simply tap on that icon.

When the **Add** icon is lit, whenever you tap on the screen, a point will be added.

Tap on to toggle it off when you wish work in the standard touch-screen mode. For example, you may wish to zoom into a map to make it easier to place your node more accurately. When **Map** is turned on, you may not be able to zoom to a really small scale. If the background Map is not necessary, you could turn it off then reverse-pinch (pull) to zoom in further. To fit the drawing to the screen, simply tap the **Zoom-Fit** icon.

We will tap on him to toggle it off then pinch the screen to zoom out somewhat to bring the tree to the right of the three points into view, as shown below.



Now we will tap on hon to toggle it on then tap on the tree to digitize its approximate location. A **blue dot** will be displayed to represent the new Point Feature.



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 GPS to turn on GPS then tap the **Pick GPS** icon Pick to add the Point Feature. (Do this in another job file as we do not wish to add a very distant point to the mytest.pmp file.)

If you made a mistake in digitizing a point, you may tap the Undo icon '7 to

back-step.

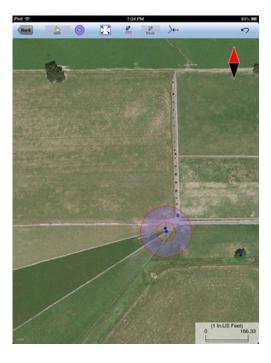
Caution: Use the Undo icon with discretion. It will remove the last created point regardless of whether that point was added in the current or a previous Add Point Manually session.

If you look carefully, you will notice that the right-most corner of the displayed triangular plot of land is actually clipped off and is not represented by a single apex. Your task is to 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.



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.



If you were to add a point on top of an existing point, or on one of the nodes of an existing Line or Area Feature, then tap on the **Snap to Node** icon to turn it on. When this icon is lit, a point will only be created when you tap close to an existing point or node.

Tap the **Back** button to exit the Add Point Manually screen and return to the main screen.

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

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Add Line Manually

A Line Feature is made up of a series of nodes. You can digitize a line by tapping at the location of these nodes on the screen. You could draw a smoother line by dragging on the screen. The app will drop the necessary number of nodes to represent the line.

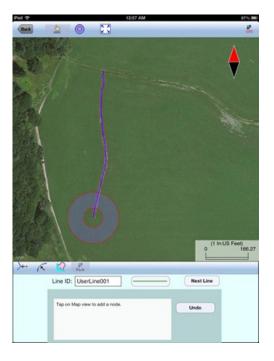
Let's scroll down somewhat on the map displayed for **mytest.pmp** and try to digitize one of the paths in the lush green field.

To add a Line Feature, tap on the Digitizing Tools Menu then select **Add Line manually** from the displayed menu. If the Add Line Manually icon is already displayed, then simply tap on that icon.

You may tap on the **Line Style** button to select a different line style and color for digitizing your Line Feature.

You could do a line quickly by tapping on the path to drop a few nodes. Or, you could make a more faithful reproduction of the path by using the **Node tool**

described previously under Add Point Manually.



If you want the line to snap to an existing Point Feature or a node on an existing

Line or Area Feature, then tap on the **Snap to Node** icon to turn it on. Then
when you tap close to an existing node, your new line will snap to that node. If you
wish to drop a node wherever you tap on the screen without snapping to a node,
turn off the **Snap to Node** icon by tapping on it and making sure it is not lit.

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.

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

Tap the **Add** icon icon to turn it off if you need to zoom or pan the map.

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 your current position as a node for the line.

To remove a node that you have just added, tap once on the Undo icon $^{\checkmark}$.

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

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Add Area Manually

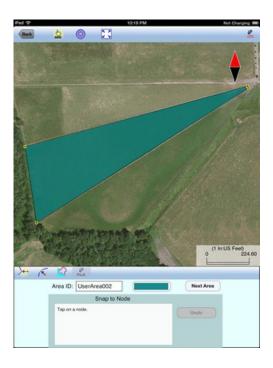
To digitize an Area Feature, tap on the Digitizing Tools Menu then select **Add Area manually**. If the Add Area Manually icon is already displayed, then simply tap on that icon.

You may tap on the **Area Pattern** button to select a different pattern and color for the Area Feature you digitize.

You can digitize an Area Feature by tapping along its boundary. For example, if you wish to make a triangular shape, you would tap on the screen at the three corners of the shape.

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

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.



Tap the **Add** icon icon to turn it off if you need to zoom or pan the map.

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

If you want the line to snap to an existing Point Feature or a node on an existing

Line or Area Feature, then tap on the **Snap to Node** icon to turn it on. Then when you tap close to an existing node, your new line will snap to that node. If you wish to drop a node wherever you tap on the screen without snapping to a node, turn off the **Snap to Node** icon by tapping on it and making sure it is not lit.

Turn on Snap to Line when you wish to snap the boundary of your new area to an existing Line or Area Feature. Then when you tap close to that Line or Area Feature, the boundary of your new area 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 Area Feature you are digitizing. After turning this tool on, tap on the line or area that you wish to make use of. Then tap on the starting and ending nodes of the section you wish to include in your new area. 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 area. You

can use the **Node tool** in conjunction with the Include Boundary function. In this case, move the Crosshairs to the line or area of interest then tap in the donut hole to select that Feature. The remaining steps are the same.

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 your current position as a node for the area.

As another exercise, tap the **Add** icon icon to turn it off then pan to the right to find the tree that we digitized before under Add Point Manually. Try digitizing the larger land plot to the south of that tree. Whenever you need to place a node precisely, tap on the **Node tool** then use the crosshairs to zero-in on the desired location.



Tap in the center of the donut to drop the node.



Repeat the process to drop the second node.



Drop additional nodes around the boundary of the area to complete the Area Feature.



If you wish to add another Area Feature, then tap the **Next Area** button. Otherwise, tap the **Back** button to exit this screen.

When you tap on an Area Feature on the main screen, its Point ID, location and area information will pop up briefly. You can view this information as well as the perimeter of the selected Area Feature by using the Feature Properties tool discussed later in this document.

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Add Point by Coordinates

If you know the geographic coordinates of a point, you can add the point to the map by entering its coordinates after tapping on the Digitizing Tools Menu then

selecting **Add Point by Coordinates**. If the Add Point by Coordinates icon is already displayed then simply tap on that icon to display the data input screen.

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

Make sure you specify the correct North or South Latitude, and the correct East or West Longitude.

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

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Delete Feature

To delete any Feature displayed in the main Map View, first tap on the Feature to highlight it. Then select Delete Feature from the Digitizing Tools Menu. Confirm to delete the selected Feature only if you really want to have it deleted.

When you see the Delete Feature icon displayed as the currently active function, you may select a Feature then tap on this icon to delete that Feature. Confirm to delete the Feature only if you really intend to so do.

Once a Feature has been deleted, it cannot be recovered.

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Move Node

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

Let's open the **lakecreek.pmp** sample job. A perfectionist looking at the corner near the dot by the road would wish to move a couple nodes on the Area Feature to improve the alignment with the boundary of the actual land plot.

To move a Feature, first tap on it 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 reset the selection then select the correct location.

Assume you have selected the Area Feature shown below, and you have activated the Move Node tool and zoomed in and panned to the corner of interest. Drag the **Crosshairs** to the node you wish to move.



Tap once in the center of the donut to mark the node to be moved.



Then drag the **Crosshairs** to the new position and tap once in the center of the donut to affix the node there.



After adjusting the next node to the right in a similar way, the shape is in good agreement with the land plot.



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 HINT. 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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Feature Properties

To view the properties of a Point, Line or Area Feature, first tap that item on the map screen then tap on .

The Feature Properties screen will show the coordinates of the selected **Point Feature**, the coordinates of the selected **Line Feature**, or the perimeter and area of the selected **Area Feature**.

You may change the symbol for the selected digitized Point, the line style for the selected Line Feature, or the area pattern for the selected Area Feature by tapping the **Pattern** button in the Feature Properties screen. Select the desired symbol or pattern from the built-in symbols library and select the desired color and size. For the Area Feature, you may also adjust its level of **Transparency**.

For Line and Area Features, you may specify the type of labels to display on those Features when feasible. Mark the checkbox for the labels you wish to see:

Show Corner label

Show Segment label

Show Area label (for Area Features only)

Following is an example showing all the labels turned on for an Area Feature. Please note that if an angle is smaller than 90 degree (acute angle), it will be labeled on the opposite side. Also, some labels will not be displayed when you have zoomed out too much or if there is not enough space to display the labels.

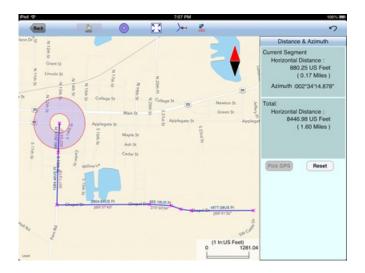


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Measure Distance

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



If your device has GPS capability, you could tap the GPS icon 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 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 $^{\mbox{\tiny 1}}$. 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.

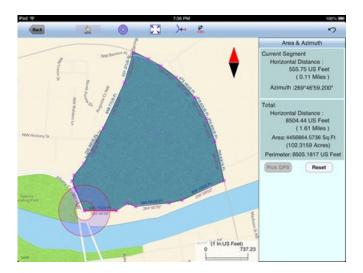
When you no longer need the displayed information, tap the **Back** button to close this screen and discard the temporary shape.

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Measure Area

The **Measure Area** tool on the **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** 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 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 by address or coordinates, tap on the **Measurement and Location Tools Menu** 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 Pick 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

Point 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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Coordinates Text File

To output the coordinates of the Features in the currently open job to a text file, tap the **Main Menu** icon, select **Coordinates Text File**, then select **Export**.

The file name will default to be the same as the job name. If you would like to use a different name then tap the **New** button and enter the desired file name. The file name extension will be *.txt.

Each record in the text file follows this format:

Feature_ID,TYPE,X,Y,Z

Feature_ID: Maximum 11 characters TYPE: POINT, LINE or AREA

X: Longitude Y: Latitude

Z: MSL (Mean-Sea-Level elevation)

The following sample text file contains 2 Points and 2 Lines. LINE001 has 3 nodes, and LINE002 has 2 nodes.

POINT001,POINT,121^10'12.00"W,44^10'01.00"N,0.00 POINT002,POINT,121^11'00.00"W,44^02'00.28"N,0.00 LINE001,LINE,121^20'15.14"W,44^15'05.12"N,0.00 LINE001,LINE,121^21'00.25"W,44^15'22.45"N,0.00 LINE001,LINE,121^22'10.23"W,44^16'45"N,0.00 LINE002,LINE,121^30'06.81"W,44^20'50.35"N,0.00 LINE002,LINE,121^35'20.50"W,44^25'06.20"N,0.00

The Coordinates Text File function also provides the ability to import the coordinates of Features into a job. To do so, choose **Import** and select the text file you have prepared according to the format described above. Please make sure that you have pressed ENTER after the last line of text before saving the text file.

A sample text file is provided with the Area - Distance application. To try the coordinate text file import process, tap the **Main Menu** icon, select **Job** then select **Open Job**. Tap the **New** button to create a new job as you don't want the imported data to be mixed with the data in your currently open job file. Tap on **OK** to confirm.

Now tap **the Main Menu** icon, select **Coordinates Text File**, then select **Import**. Tap on the file name **example.txt** to select it. When you tap the **OK** button, the data will be imported and you will see the Features displayed in the map.

To delete a coordinate text 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 job file cannot be recovered.**

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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 **Area - Distance** 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 a PDF file (*.pdf) or a Job file (*.pmp) by tapping the **Main Menu** icon then selecting **EMail Files**.

To output a file to email, first enter the destination email address, select the file type, mark the checkbox for the files you wish to send, then tap the **Send** button.

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

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