Utility Data Collection

Help

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Overview

The Utility Data Collection app provides functions for recording the locations and conditions of utility assets and equipments as well as for meter reading data

collection. It can be used by the utility company employees to perform a number of different tasks.

The planning department can make use of the digitizing functions to design the placement of utility poles on the displayed map.

The GPS/GIS data collection functions are used for recording the GPS coordinates and conditions of existing utility poles and meters. They can also be used for mapping land plots owned by the utility company. You can attach one or more photos to each Feature that you survey.

The functions for importing Shapefiles, DXF files and text files make it easy to set up meter routes. You can customize the Feature List database to meet the requirement of your organization. You can lock out certain data fields to prevent the meter reader from accidentally changing them.

Once the meter routes are set up, the meter readers will use the Meter Reading function to enter the meter readings and any observations or remarks.

This manual is organized into a number of Chapters. Chapter I describes the GPS GIS data collection and mapping functions provided by this app. You can use these functions to record the location and descriptions for existing utility pole and other equipments. Chapter II describes the functions for measuring distances and areas as well as for locating a point by address or GPS coordinates. Chapter III provides an example for setting up a meter route. Chapter IV provides instructions to the meter readers on how to select a meter route and enter meter readings. With the meter routes properly set up by their manager, the meter readers only need to read this chapter to be able to perform their meter reading tasks.

A few sample files are provided with this app to illustrate various software functions. You may use these sample files as templates and customize them for your own GPS/GIS utility data collection applications.

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.

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

After selecting a Point, Line or Area Feature, you may tap the **Feature Properties** tool icon to assign a different symbol to represent it. You may also enter a description for the Feature or assign a pre-defined description to it via Feature Properties or Sheet View.

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

simultaneously, or by pinching two fingers on the screen.

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

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

Tap the **Main Menu** tool to see a menu of functions:

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

The **Map Tools Menu** lists the digitizing tools as well as the functions for deleting a Feature, moving a node and linking photos to a Feature. Tap the **pull-down arrow** to reveal the map tools. The icon for the currently active map tool is displayed. For example the **Add Point manually** icon is initially displayed by default:

The **Utilities Menu** provides access to functions for reading utility meters, measuring distances and areas, and locating a point by address. Initially, the Meter Reading utility is shown:

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

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

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

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

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

Additional tool icons may be displayed when you work with a specific function. All of these functions will be covered in this document. To gain a good understanding of the basic mapping functions provided by this app, please read the first ten sections of this document in the order presented.

On-screen keyboard

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

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

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

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

To enter angles in **DMS** (Degrees- Minutes-Seconds), if your data value will not fill in all the places, then tap the separator key after entering the desired value. For example, to enter the longitude of 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 & Import Feature Data

The application software requires a job file to be open for it to work with. You can specify the default settings for the coordinate system and units to be used for displaying the GPS/GIS Features, for labeling the Features and for GPS data collection.

If you have geographic features (points, lines or area shapes) in Shapefiles or DXF format, you may import them into the active Job map.

Opening or Creating a Job File

To open an existing job file, tap the **Main Menu** icon, select **Job** then select **Open Job** . Select a job file to open, such as **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** button. (Yes, it's okay to type over the displayed file name.)

You may select a Feature List to be associated with the Job. Doing so will permit you to easily assign pre-defined Attribute/Values to a GPS Feature that you are recording. You may also copy predefined Topics from the Feature List associated with the Job so that you may easily assign pre-defined Attribute/Values to imported or digitized Features as well. The procedure for defining a Feature List is

provided under **Set up Feature List**.

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

Saving the Job File

To save the data in the currently open file, tap the **Main Menu**, select **Job** then select **Save**. The file extension will be ***.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 to a different name, such as "mypoles". This way, you can work with **mypoles.pmp** and keep the original corners.pmp file intact for later use.

It's a good idea to save your job under a different name as a back-up. **The newly saved file will be the active job file. Therefore, you will need to remember to open the original file to continue working with it.**

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 **Utility Data Collection** 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.

Set up Coordinate System

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

Caution: Make sure the **coordinate system** and **distance unit** are correct before tapping on **OK** to confirm. For UTM, make sure the UTM Zone is correct. For SPC, make sure the State, Region and Zone are correct. For a user-defined coordinate system or a local NEZ plane, be sure to select the name of the proper system to use.

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

This app will let you calibrate a local NEZ coordinate system. To do so, first select Setup from the Main Menu then select Coordinate System. Tap on **NEZ** then tap on OK.
Tap on **Edit** then enter a name for the coordinate system into the Plane Name field..
Mark the **Control Point** option. Select **Reference Point** and enter the corresponding GPS and NEZ coordinates. Then select **Control Point** and enter the corresponding GPS and NEZ coordinates. You may use the **Pick** button to select an existing GPS point as the Reference Point or the Control Point, and its coordinates will be automatically entered. The resultant calibration angle and scale will be displayed.

If you know the angle and scale for calibrating the local coordinate system against the LLA system, then unmark the **Control Point** option and enter these parameters directly.

Please note that the "N" direction (or Y-axis) of the NEZ system is in the "up" direction on the screen.

Set up Elevation and Angle

Select **Elevation and Angle** under **Main Menu - Setup** to specify the desired angle unit (**DMS**, **Degree**, **Mils**, **Grads**) and azimuth system (**Azimuth** or **Bearing**). If Azimuth is chosen, also specify **North** or **South**.

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 GPS Data Collection

You may set up the **default data collection parameters** for Point, Line and Area Features by tapping the **Menu** button, selecting **Setup** then selecting **Data Collection**.

Set up Navigation

Under Setup/Navigation Settings, you can also specify how to keep the screen focused on your location by selecting an option for the **Navigation Zoom Mode**.

In the **Auto Scroll** 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 **Auto Zoom** 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 **Move Map** mode does not apply to the built-in Map, which is fixed in the "up" direction. If you have used PC-GIS to prepare a geo-referenced image (*.pim) for use as an off-line background map, that background map will re-orient itself to align with your direction of motion in the Move Map mode.

Set up Color/Pattern

You can set up the default symbols and colors to be used for displaying the Point, Line and Area Features.

Selection Color is the color that will be used for displaying the currently selected Feature. The orange color makes the selected Point, Line or Area stand out from the other Features in the job map.

Default Point Pattern is the symbol/color that will be used by default for displaying newly added Point Features.

Default Line Pattern is the line style/color that will be used by default for displaying newly added Line Features.

Default Area Pattern is the pattern/color that will be used by default for displaying newly added Area Features.

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 **Feature Labels** under **Main Menu - Setup**.

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

Set up Auto Label

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

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

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

Set up iCloud

To specify which types of files to enable iCloud® storage for, mark the check boxes for the corresponding file types:

Job: **.pmp** files and Shapefiles

Feature List: **.fbr** files

TXT: .txt files

Basemap/Registered Image: **.pbm** Basemap files and .pim registered images

PDF: **.pdf** files

Photo: **.png** photo files

Importing Shapefiles

You may import the data from Shapefiles for use within this app. As each Shapefiles job 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 Shapefiles, first open the desired Job file, or create a new Job file. Choose **Job** then select **Import Shapefiles**, select the desired Shapefiles then tap the **OK** button.

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 Shapefiles, the data may fail to come in or it may not be properly displayed.

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.

Display Map and Turn GPS On/Off

This app is able to load various types of background map into a Job file.

Built-in 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.

Job Map

You may select **Menu/Background Map/Load Map** to select another **.pmp** job file to be loaded as the background for the new job.

Registered Image

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

The Raster images (*.tif, *.jpeg, *.sid, *.ecw) to be used with this app must be

converted into the proper format (*.pim) before they can be loaded into the app. You can use PC-GIS, PC-GPS or PC-MAPPER to do so. These are optional mapping software programs designed for use on a PC or on a Mac operating in PC mode.

Before loading a .pim file, make sure the correct coordinate system and distance unit have been selected under **Menu/Setup/Coordinate System**.

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

A sample DRG file named **squawcreek.pim** is included with this app. You could open the cvoarea.pmp Job file then load this registered image to view the Features displayed on top of this background map.

Basemap

You may use **Menu/Basemap/Load BaseMap** to select a CMT BaseMap (*.pbm) to load into this app. Click on the desired **.pbm** file then click **OK**. A sample basemap file called **benton.pbm** is included with this app for you to look at.

The CMT Basemap to be used with this app must be converted into the proper format (*.pbm) before they can be loaded into the app. You can use PC-GIS, PC-GPS or PC-MAPPER to do so. These are optional mapping software programs designed for use on a PC or on a Mac operating in PC mode.

Where am I?

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

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

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

3. If your device is equipped with GPS or has Location Service, then you can tap the **GPS** icon to turn on GPS. When prompted, confirm to allow the app to use Location Service to find your location. This will permit the app to immediately zoom to your location. (Make sure the **Location Service** is turned on for this app under Settings on your device. With iOS6, 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 **mypoles.pmp** job file. As the points in this job are located in Oregon, USA, you will want to tap on to **turn GPS OFF for now**. Otherwise, the app will always zoom to your current location, which most likely is very far away from the sample job location.

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

Set up a Feature List

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

To facilitate data collection, you can set up one or more **Feature Lists** to define the data collection parameters for each type of Features as well as the database containing the descriptions with which you can tag each Feature.

Features, Attributes and Values

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

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

Example: A tree may be recorded as follows:
Feature: Tree
Attribute: Species
Value: Fir

The app will automatically record the position data.

The Feature List serves as a "look-up" table that makes it very easy to attach descriptions to the GPS position information you collect.

You can set up one or more **Feature Lists** to pre-define the Feature/Attribute/Value database. When you associate a job with a Feature List, you will be able to add Feature Topics from that Feature List along with the pre-

defined Attribute and Values. This will speed up the process of tagging the Features with descriptions. Instead of typing all the descriptions, you will simply pick and choose the appropriate description for each Feature.

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

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

Viewing a Feature List

To use the Feature List function, tap on the **GPS** Menu icon then select **Feature List**. The "**New**" option is fo creating a new Feature List. The "**Open**" option is for opening an existing Feature List to view or modify.

Tap on **Open**.

If there is a Feature List associated with the active Job, its contents will be displayed. Otherwise, the **Select Feature List** screen will pop up to display the existing Feature List files.

As you have not yet associated a Feature List with mypoles.pmp, you will see the **Select Feature List** screen.

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

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

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

For the **myutil.fbr** Feature List, the **Feature section** shows a number of Feature Topics.

The "**Pole**" Topic will contain Point Features. Therefore it is assigned a Point Type and a representative point symbol. Its GPS data collection mode is "Static Time" with a session duration of 20 seconds.

The "**R1-**" and "**R2-**" Topics are also of Point Type and each is represented by a point symbol. The GPS data collection mode is "Static Time" with a session duration of 20 seconds.

The "**Fence**" Topic is assigned a Line Type and a representative line style. Its GPS data collection mode is "Dynamic Time" with an interval of 1 second between the

nodes.

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

Tap on "**Condition**" to see the three pre-defined Values for the utility poles in the **Value section**. Having pre-defined Values for an Attribute facilitates assigning descriptions to a Feature. Instead of having to enter the description for a Feature, you can simply select it from the displayed list. Feature attribution can be performed during GPS data collection or via the **Sheet View** or the **Feature Properties** function.

We did not define any Values for the "**Last checked**" Attribute as you will be entering the actual date in this field. Similarly, we did not define any Values for the "**Remark**" Attribute as the observations will vary. However, if the observations usually fall into a few categories, then you could set them up as Values for the Remark field. We've made this field of **Text** Type, with a **Length** of 127 characters.

In the same way, you can tap on the "**Fence**" Topic or the "**R1-**" Topic in the **Feature** section to view their Attributes and the corresponding pre-defined Values.

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

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

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

If the pre-defined Values for an Attribute will be decimal values, you should select "**Decimal**" and specify in the **Dec. Digits** box the number of decimal digits that can be entered.

For the "**R1-**" and "**R2-**" Topics, we have set the Type for the "**Reading**" Attribute to be "**Range**", and defined a subrange of blank values to assume a purple symbol. We have set the Value Type to be "**Integer**" and the corresponding **Int. Digits** to be "**6**". An unread meter on the meter route will be represented by the purple symbol. Once a reading has been entered for a meter, its symbol will change to the

default blue color for the Features in the meter route Topics.
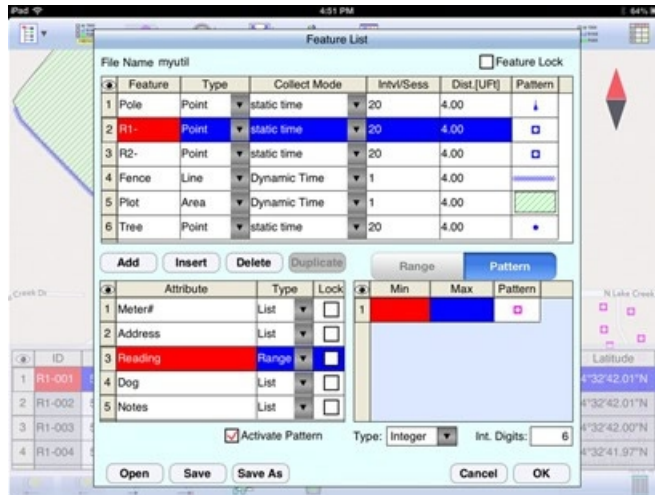
Editing a Feature List

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

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

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

Delete: Delete the selected record.

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

The Feature Topic you will be adding is an Area Topic that represents land plots. Enter "**Plot**" as the Feature name and select **Area** as the Feature Type. Double-click in the cell for **Pattern** then choose an area pattern to represent the land plots on the map. The second pattern on the first row looks like a nice pattern to use. Accept "Dynamic Time" as the Collect Mode and "1" as the Intvl/Sess value.

With the "**Plot**" Feature Topic selected, tap anywhere in the **Attribute section** to activate it. Tap the **Add** button then enter "**Zone**". Tap the **Add** button again then enter "**Price**". Tap the **Add** button again then enter "**Price/acre**".

If you need to edit a data field, first **double-tap** that cell then type over or change its contents. Leave the **Type** field as **List** for all of the Attributes in this example.

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

Now select "**Zone**" then tap anywhere in the **Value section**. To populate the List of pre-defined Values, tap the **Add** button then enter "**Farm**". Tap the **Add** button

again then enter "**Industrial**". Tap the **Add** button again then enter "**Residential**".

Mark the **Activate Pattern** checkbox to see the **Pattern** column displayed in the **Value** section. Double-tap the pattern for Farm and assign a green color to it. Assign a blue color to Industiral, and assign a hot pink color to Residential.

Leave the "Price" and "Price/acre" Attributes without pre-defined Values. You will be entering the prices of the land plots, and we will let the app calculate the price per acre based on the acreage of the plots.

As we will be entering numeric values for the "Price" Attribute, such as 900,000.00 (dollars), tap on "Price", select **Decimal** for the **Type** box, and enter "**2**" for **Dec. Digits**. As we expect the computed price per acre to be a decimal value, tap on the "Price/acre" Attribute, select **Decimal** for the **Type** box, and enter "**2**" for **Dec. Digits**.

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

Creating a New Feature List

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

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

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

The **Feature** section will be active in your new Feature List. Tap the **Add** button to add the Feature Topics you wish to define. Assign a representative default symbol

for the new Feature Topic.

You may define the Attributes and Value for each Feature Topic immediately after adding the Feature Topic, or you may add all the Feature Topics then define the Attributes and Value for each.

You may set up the **default data collection parameters** for Point, Line and Area Features by tapping the **Menu** button, selecting **Setup** then selecting **Data Collection**.

You may also define the **data collection parameters** for each specific Feature Topic in the Feature List. These parameters are described as follows:

Type: Point, Line or Area.

Mode: Select the mode of data logging.

Static Time: Logs a stationary Feature for the specified **Time Session** in seconds. This is the default for Point Features.

Lines and Area Features may be collected in Static mode. In this case, you would let the GPS receiver stay at each node of the Line or Area Feature for the duration of the Time Session. The software will join these nodes or vertices with straight lines.

Dynamic Time: Logs a Line or Area Feature at the specified **Time Interval** in seconds.

Dynamic Distance: Logs a Line or Area Feature based on the specified **Distance Interval** in the active distance unit. The result will be a Feature with equally spaced nodes.

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

For the **Type** column in the Attribute section, select **List** if the Values to be defined are a group of discrete numbers or names. Tap on the Values section then use the **Add** button to add each Value to the list. You will be able to mark one of the Values as the **Default** Value. If most of the data you collect will have the same description, it will save time if you specify this as the default description for that Attribute in the Feature List.

Select **Range** if the Value entry will be a number between a lower limit and a upper limit. When you select **Range**, the **Lock** checkbox will be automatically marked for the Attribute. This means that the Values entered will always be checked against the defined Range for data validity. Enter the **Min** (lower bound) and **Max** (upper bound) Values. You will also be able to enter a **Default** Value to be displayed during data collection.

If you mark the **Activate Pattern** checkbox for an Attribute of Range type, you

will be able to use the **Add** button to add the subranges after tapping on the **Pattern** button. The subranges must be between the minimum and maximum values for the main range and not overlap each other. You will be able to assign a different color for each subrange as well.

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

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

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

Topic View

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

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

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

For example, in the **mypoles.pmp** job, there is one Topic named "Corner" that contains three Point Features represented by the blue dots. When you tap on , you will see "Corner" listed in the Topic View panel on the left side of the screen. You can tap on "Corner" to highlight it and make it the active Topic.

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

To change the **symbol** assignment for a Topic, simply **double-tap** the existing symbol displayed by the Topic name in Topic View then select the new symbol.

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

Topic Menu

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

Creating a New Feature Topic in a Job

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

To create a new Feature Topic in a job file such as **mypoles.pmp**, tap the **Topic Menu** icon then select **New Topic**. Enter a Topic Name, such as **Tree**, on the **Topic Structure** page. Since trees are regarded as point objects, select **Point** for the **Type** field. You can add one or more **Attribute Names** (title of description) for this Topic and specify the data type and parameter. Let's tap the **Add** button, double-tap on the blank cell and enter "Species" as the (Attribute) Field Name. This Attribute is a Text descriptor. We can leave the **Width** at 23 to accommodate certain long species names.

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

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

Please note: A Topic copied from a Feature List will inherit the associated predefined Attributes/Values. However, the copied Topic is not related to the Featrue List. Therefore, if you add a new Attribute to the Feature List for that Feature Topic afterwards, the change will not be reflected in the Topic in the Job. If you would like the Topic to have the newly added Attribute/Values, you may use the **Edit Topic** function discussed below to do so. After you add a new blank Attribute record on the Topic Structure Page, you may select the new Attribute from the pull-down list. The pull-down list will include all the Attributes from the Feature List associated with the Job.

Tap on **OK** to close the Topic Structure screen.

We have previously created a Feature List named **myutil.fbr**. We will associate this Feature List with our sample job. To do so, select **Job** from the Main Menu then select **Open Job**. For File Name select "**mypoles**". For Feature List select "**myutil**". Tap the **OK** button to confirm and return to Map View.

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

"Pole" Topic from myutil.fbr.

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

Editing a Topic

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

The **Sheet Setup** table provides a **Lock** checkbox that you could use to prevent accidental changes to certain data fields. **For example, you would normally lock the meter number and address fields for a meter route, and just make the meter reading data field available for the meter reader to enter data.**

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

Tap the **Add** button then tap on the pull-down arrow by the highlighted "Name1" to display the built-in Attributes. Select "**Area_Acres**" and enter "2" for Decimal Digits. Tap **OK** to confirm. This Attribute will automatically compute the acreage of an Area Feature you place in the Plot Topic.

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

Defining a Formula

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

The reason we added the "**Area_Acres**" Attribute to the **"Plot"** Topic in **mypoles.pmp** job is so that we can compute the price per acre for each land plot. In other words, we want to define for the "**Price/acre**" Attribute the following formula:

Price / Area_Acres

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

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

Tap the **Select Attribute** button and select "**Price**". Enter the division operator "/"

then tap the **Select Attribute** button and select **"Area_Acres"**. The resultant formula will be displayed in the Formula box.

Tap on **OK** to save the formula.

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

Moving a Feature Topic

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

You can **change the order** of the Topic layers. To do so, first tap on ⬛⬆TREE ⬛ROAD ⬛PARK then tap on ⬛⬆TREE ⬛ROAD ⬛PARK MENU and select **Move Topic**. A handle will appear by each Topic Name. Now grab a Topic by the handle and drag it to a different location in the Feature Topic List. As an exercise, move the Tree and Corner Topics to be above the Plot Topic.

Deleting a Feature Topic

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

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

Auto Label

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

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

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

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

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

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

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

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

Labels button to remove all existing auto labels then create the auto labels again.

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

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

Goto a Feature

The **Goto** function on the Topic Menu will let you search on the active Topic layer for a Feature that meets the specified search criterion. A successful search will result in the Feature being highlighted in Map View and the corresponding record being highlighted in Sheet View.

If you select **Feature ID** as the search criterion, you cannot select another criterion at the same time because the Feature ID is a unique entity.

To select some other Attribute as the search criterion, first tap on the checkbox for Feature ID to unmark it. Then select the desired Attribute Name and enter the Value you are looking for. You may use up to five Attrbiutes as search criteria. If you select multiple Attribute as search criteria, the app will take you to the Feature that meets all of the specified criteria. If there are several Features that satisfy the search conditions, then you can tap the **Find Next** button to go to the next one. You will also have the option to start the search from the Top (first record) or from a Start Number (record number).

Sort Features

This function will sort the Features by its Attributes. You may select a single Attribute as the basis for sorting the Feature records. If there are multiple records that share the same Attribute Value, you may wish to select an additional Attribute by which to sort each subbroup. The Index number denotes the sort level. If you wish to change the sort levels, tap on the Index button, then tap on the Attribute to be used for the highest sort level. When the Index button changes to Index (02), tap on the Attribute to be used for the second sort level, and so on.

If you wish, mark the **Descend** checkbox for a descending sort order.

Erase Values

In some cases you may wish to blank out all the values for a certain Attribute. For example, after the meter reading data has been downloaded to your PC, you may wish to erase the reading for each meter, but keep the meter number and address information intact.

The Erase Values function will blank out all the data stored for the selected Attribute. After you have selected that Attribute and tapped the **Go** button, you are given one chance to confirm the action or to abort it.

Warning:

If you select Yes, the data will be erased and cannot be recovered.

Import Text File

This function will let you import data for a Point Feature Topic from a text file containing comma separated values. This is a very useful function for setting up a meter reading route in this app if you already have the meter records set up on your desk-top computer and are able to export it as a text file. It can also serve as a quick way to update the Attribute data for a Topic layer.

Select the text file you wish to import after selecting the file name extension **.txt** or **.csv**. This text file must reside in the Documents folder for this app.

If the text file contains **angles in degrees-minutes-seconds format**, the caret symbol (^) should be used to represent degrees. The minutes are to be represented by a single striaght quote ('), and the seconds are to be represented by a double straight quote (").

If you would like the location data fields to be interpreted as geographic coordinates (such as longitudes and latitudes), you must give them the field names **Position_X** and **Position_Y**, respectively.

Based on the text file you are importing, mark the checkbox for **First line contains field names** if the first line in the text file indeed contains the field names.

If the data for each field is wrapped between double quotes in the text file, then inform the app by marking the check box for **Data is wrapped in double quotes (")**.

Tap on **Next Step** to continue.

You will need to name the **Topic** into which the data will be imported. The Topic name will default to the text file name. You may give the Topic some other name, or you may select a Topic from the drop-down list. All the Point Topics in the active Job and the associated Feature List are available for selection.

If you wish to make use of the Attribute assignments for a Topic in the Feature List associated with the active Job, make sure you select that Topic name from the drop-down list during the import process. If you import the data under a different Topic name and later rename it to be the same as the one in the Feature List, it won't be possible to relate that Topic to the Feature List.

Depending on the case (as discussed below), you may or may not be prompted to select a **Relation Key** and to specify whether or not to **Overwrite** the existing data.

Depending on the case, you may need to specify the field names in the Data Format table.

You will be asked to select the correct **Coordinate System** for importing the points in the text file.

The **Preview** screen will show the data in the form it will be imported.

Tap on **OK** to import the points into the active Job. The coordinates of the Point Features will automatically be converted to the active coordinate system.

There are a number of cases to consider.

1. First line contains field names

A. If the Topic name you specify for the imported data is a new one that does not exist in the active Job nor its associated Feature List, the Data Format table will be populated with the field names, field types and field lengths based on the text file. You will select the proper coordinate system then preview the data to be imported. When you tap on **OK**, the data will be imported immediately. The new Topic will show up in Topic View, and the tabulated data will be displayed when you turn on Sheet View.

B. If you have selected the name of a Topic that exists in the active Job, but the Topic does not contain any Features, the app will import the data from the text file as in the previous case.

C. If you've selected the name of an existing Topic that contains one or more Features, this indicates that you may wish to modify or add to the existing Topic. The app will prompt you to select a **Relation Key** to correlate the incoming data with the existing data. The relation key is an Attribute that exists in both databases and that has unique values (no duplicates). For example, if you have a list of people with their occupations, and the same list of people with their favorite hobbies, you will be able to use the peoples names as the relation key to find out both the occupation and hobby of a certain person on the list.

If you don't select a Relation Key, the app will ask you if you wish to add all new fields and data from the import text file. If you answer No, then the app will return to the screen for selecting the Relation Key. You can cancel out if you wish.

If a Relation Key is selected, the app will let you choose whether or not to replace the existing data with the new data.

If you select **Overwrite**, the incoming data will replace the existing data for the records with matching relation key value. This will happen to the shared Attributes in the two databases. Any extra records in the incoming database will be added to the existing database. Any Attribute in the incoming database that is not in the existing database will be added to the Topic.

If you select **Leave intact**, the existing data will not be replaced. For matching Attributes, the data records in the imported text file will be added to the existing database. Any new Attributes will be added to the existing database.

Then you will select the correct coordinate system and preview then import the data..

2. First line does not contain field names

A. If the Topic name you specify for the imported data is a new one that does not exist in the active Job nor its associated Feature List, the Data Format table will show a default name (Name1, Name2, etc.) for each field in the text file. You will enter an appropriate name for each field. You will select the proper coordinate system then preview the data to be imported. When you tap on **OK**, the data will be imported immediately. The new Topic will show up in Topic View, and the tabulated data will be displayed when you turn on Sheet View.

B. If the Topic that you've selected is in the active Job but it does not contain any Features, you may select one of its Attributes from the dropdown list when you tap on the **dropdown arrow** for each **Field Name** record in the **Data Format** table. The app will import the data from the text file after you have selected the correct coordinate system and previewed the data to be imported..

C. If the Topic that you've selected is in the active Job and it contains one or more Features, you may select one of its Attributes from the dropdown list when you tap on the arrow for each Field Name record in the Data Format table. And you will be prompted to set a **Relation Key** and choose whether or not to **Overwrite** the existing data with the new data. Then you will select the correct coordinate system and preview then import the data..

D. If the Topic that you've selected is not in the active Job but is defined in its associated Feature List, then the dropdown list for each **Field Name** will be populated with the Attributes for that Topic in the Feature List. The app will import the data from the text file after you have selected the correct coordinate system and previewed the data to be imported..

<u>Export Text File</u>

This function will export the data from the currently active Point Feature Topic to a text file that you might later import into a database management program. The text file will contain comma separated values. The exported file name will have the file name extension **.txt**.

The text file name will default to the active Topic name, but you may tap the **New** button and enter a different file name if you wish.

If you wish the first line in the exported text file to contain the field names (i.e. the Attribute names), the mark the checkbox for **First line contains field names**.

If you wish to include the Feature ID field in the exported text file, then mark the checkbox for **Export Feature ID field**. The Feature ID is a unique identifier for each Feature in a Topic and can serve as a key in sorting, earching and updating a Feature/Attribute/Value database.

If you wish to have the data in each field wrapped between double quotes in the text file, then mark the check box for **Wrap data in double quotes (")**. Please note that if any data value contains a comma or a quotation mark, you must select this option. Otherwise, the data will not be correctly parsed by the importing software.

When exporting angles in **degrees-minutes-seconds** format, the app will use the

caret symbol (^) to represent degrees.

If you do not want to export all the Attribute data for the selected Feature Topic, tap on the "**Select Attribute**" tab, then mark the check boxes for the Attributes you wish to export. If there are lots of Attributes for the Topic, you can use the "**Select None**" button to deselect all of them, then select the few Attributes you wish to export.

Tap the Export Preview to see how the text file will look like.

Digitize Features

You may manually add new Features to the active Feature Topic in 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 **mypoles.pmp** job, to which we have previously added a few Feature Topics.

<u>**Adding a Point Feature**</u>

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

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

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

Zoom out somewhat then tap once on the satellite Map by the road near the houses with red roof tops to drop a point. Add a couple more poles along this road near the larger residential area on the east side.

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 **SnapToNode tool** . When the SnapToNode toggle is on, the point you add will be dropped on top of the nearest Point or node.

If your device has GPS capability, you could add a point right at the current GPS position. To do so, first tap the **GPS** icon 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 this sample job file.)

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

Now we wish to add a Point to the **"Corner"** Point Topic. First tap on then select **"Corner"** in the Topic View panel. Tap the Topic View icon again to toggle the list of Topics off.

On the corner Topic layer 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. Our 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, first zoom in somewhat then tap on the Add Point icon. Now 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 donut 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.

If you wish, you could select the Tree Topic that you have added to this job previously and digitize a couple trees on this Topic layer.

Add Point by Coordinates

If you know the coordinates for the point you wish to add to the map, you may add the point by using this information. To do so, first create or activate a Point Topic. Then tap the pull-down arrow by the **Map Tools** icon and select **Add Point by Coordinates** ◆ .

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

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

Topic.

In the **mypoles.pmp** job map, tap on [icon: TREE / ROAD / PARK] then select the Line Topic named "**Fence**". Tap the Topic View icon again to hide the list of Topics. Zoom out to see more of the map.

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

Now, tap along the left border of the larger field to add a fence line. Use the **Node** tool [icon] to add nodes and make a line that looks similar to the one shown below:

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

Turn on [icon] **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.

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

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

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

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

<u>**Adding an Area Feature**</u>

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

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

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

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

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

Now let's digitize the larger plot by the fence. Since the fence lies along one side of this plot, we can save some time by making use of the **Include Boundary** tool. In the screen for digitizing an area, tap the **Include Boundary** icon . Tap on the Fence feature to display its nodes. Select the lowest node as the Start Node then select the uppermost node as the End Node. Tap on to turn it off. Then use the **Node** tool to help complete **Plot002**, which should look similar to the one shown below:

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

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

Adding Description for Digitized Features

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

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

Another way to add or change the description for a Feature is through the Feature Properties screen. Please see **Feature Properties** for details.

Labeling the Features

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

1. Label all the Features in a Topic by using **Topic Menu - Auto Label**. This function is described under **Topic Menu**. Try labeling the areas in the Plot Topic in **mypoles.pmp** with the name of the Crop.

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

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

1. Tap on the Feature to select it then tap on the 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 👓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.

Sheet View

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

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

Tap on then tap on the "Plot" Topic name in Topic View. When you tap the Sheet View icon , you will see the spread sheet for this Topic. You may drag the border of a heading filed to adjust the displayed field width. To expand the cells to show their full contents, double-tap on a column heading then tap on OK.

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

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

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

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

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

Feature Attribution

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

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

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

Go ahead and enter data in the empty cells for the Features in the **Pole** and **Fence** Topics. Because the **Pole** and **Fence** Topics were copied from the **myutil.fbr** Feature List associated with this job, which contains pre-defined Values for some of the Attributes, you will see a pull-down arrow for the cells in those columns, and you will be able to select the appropriate Value instead of having to type in the data.

Notice how the pole you mark with "Danger" shows up in red color, and a "Wood" fence is displayed in brown? These are exactly the colors we have assigned in the

Feature List to the symbols representing those Values. Similarly, a "Farm" land plot will be colored green, and an "Industrial" land plot will be blue.

For the **Plot** Topic, notice how the "Area_Acre" field is automatically populated with the acreage of the land plots. Also, as soon as you have entered a value for the "Price" Attribute, the price per acre is automatically computed and displayed in the "Price/acre" column.

Feature Properties

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

Three pages are provided for displaying the Feature properties.

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

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

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

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

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

Assigning a Feature Symbol or Pattern

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

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

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

Area Transparency

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

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

Show Segment, Area and Corner Angle Labels

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

Show Corner label

Show Segment label

Show Area label (for Area Features only)

For example, in **mypoles.pmp** job, tap on one of the two land plots then tap on and mark the **Show Area label** checkbox. Do the same for the other land plot.

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

Edit Feature Attribution

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

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

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

On the **Photos** page, you can view any photos that have been attached to the currently selected Feature. You may also use the Link Photo function on this page to add one or more photos to the Feature.

The **Link Photo** function can also be accessed from the Map Tools menu. It is

represented by the Link Photo icon 📷 .

Auto Label Text Setup

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

You may change the label properties such as the font size and orientation. Specify the label orientation in degrees in the clockwise direction.

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Collect GPS/GIS Data

This app will let you create a Job and select a **Feature List** to use, collect location data for Point, Line, and Area Features, and tag them with descriptions. Point Feature data may also be collected in the **Offset** or **Traverse** mode.

Within the data collection function, you will select a Feature Topic for which to collect data. You may select a Feature Topic from the Feature List associated with the Job. In this case, the data collection parameters are predefined in the Feature List, but you can overwrite them by entering new parameters if you wish. You could also select any existing Point, Line or Area Topic layer for which to collect GPS data. Or, you could have a new Feature Topic created on the go. In the latter two cases, you will need to specify the desired data collection parameters.

Job Setup

After tapping the **Menu** button, select **Job** then select **Current Job**.

You can select an existing Job in your area to open it.

If this is a new job you are starting, tap the "**NEW**" button and accept the default Job name or enter the desired Job name, such as "utilpoles".

You may select an existing Feature List, such as "myutil" to be associated with the Job.

Press **OK** to confirm the screen.

Turn the GPS ON

Tap on the **GPS** icon then select **GPS On**. To save power, turn the GPS off when you are not actively collecting GPS data.

Position Information

To view your current position, click on the **GPS** icon then select **Position Info**.

Navigation Setup

Under **Setup/Navigation Settings**, you can change the way the screen focuses on your location. Select **Auto Scroll** if you would like the job map to scroll to keep your position displayed on the screen while you are moving along. Select **Auto Zoom** if you would like the map to zoom out and let you see more of the job map whenever you reach the border of the currently displayed portion of the job map.

Select a Feature Topic

Tap the **GPS** icon then select **Collect**.

Tap the **New** button to call up the **Store Feature** screen.

Select the desired Feature Topic (such as **Pole**) from a list of the predefined Feature Topics. Or enter a new **Feature Topic** name and specify the **Topic Type**.

The fields for **ID** (for the individual Feature to be logged, e.g. **Pole001**), Feature **Type**, **Log Mode** and **Time Session** or **Time Interval** are automatically filled. You may override these default settings, if you wish.

When done specifying a Feature Topic for which to collect data, tap on **OK**.

If you need to define a new Attribute for the Feature Topic, tap the **Attribute tab** at the bottom of the screen.

Feature Attribution

If a **Feature List** is active for the Job, the Attributes associated with the Feature will be automatically displayed.

For an Attribute of the **List** type, click on the pull-down button to select the desired value.
For an Attribute of the **Range** type, enter a Value within the allowed range. If the Attribute is not locked, then you may enter any Value.

If the Feature Topic is not from a Feature List, you may manually enter the Values for the Attributes created in the Topic Editor to characterize it.

If you wish to assign a specific symbol or color for the Feature, then click on the **Pattern** button and make the desired choices.

Data Logging

To log GPS data, press the **Store** button from the **Collect** screen. Data will be recorded per the Feature type and the data logging parameters specified for the Feature.

To halt data logging temporarily, tap the **Pause** button. When ready to continue, tap the **Continue** button.

Plotting Position Data on Screen

The Map View is always "North" oriented. If the position moves off the screen, the

screen will automatically scroll to show the current position.

Storing Static Points

Each Static Point is a stand-alone Feature.

> 1. Stay at the feature location and **do not move around** while you are logging data for a Point Feature.

> 2. Select or enter the description for the Feature.

> 3. Press the **Store** button to log GPS data.

> 4. When the time is up, the Point Feature is recorded and the Feature ID advances by 1.

> If necessary, you may press the **Stop** button to stop the data logging process at any time. The point will be recorded with fewer coordinate fixes to average.

> 5. Go to the next Feature then select the description, and press the **Store** button to log a second Point for the same Feature Topic.

> 6. Repeat Step 5 for any additional static points you wish to log.

> To start collecting data for a different Point Topic, first tap the **New** button then go to Step 1 above.

If you incorrectly logged a Point Feature and wish to correct it, first select the Point Feature in question from Map View or from Sheet View. Tap the **Feature Properties** icon then tap the **Update** button. Specify the desired time session then tap the **Start** button to record the correct position.

Storing Static Line or Area

For a Static Line or Area Feature, you would occupy each vertex (node) for the duration of the Time Session to record its location. And nothing will be recorded while you walk or drive from one vertex to the next. The nodes for the Static Line or Area will be automatically connected by the software.

> Go to the beginning node of the Static Line or Static Area Feature. Stay there and **do not move around** while logging data for this node.

> Press **Store** from the **Collect** screen to record the Feature descriptions and GPS data for the Feature. The steps are identical to the Static Point data logging procedure described above, except that pressing the **Stop** button will just stop the data logging process for the current node, and will not end the data logging for the Static Line/Area Feature.

> When the first node has been collected, move to the next node of the Static Line/Area Feature, then press **Store** again to log data for that

point.

Repeat Step 3 until you have finished logging data for all nodes of the Static Line/Area Feature.

Tap **New** if you wish to collect data for another Topic.

## Storing Dynamic Line or Area

For a Line or Area feature logged in Dynamic mode, data will be collected while you are moving along the Line feature or the perimeter of the Area Feature. There are two options for the dynamic mode.

Dynamic Time: Log a position based on the specified time interval.

Dynamic Distance: Log a position based on the specified distance interval.

1. Go to the beginning node of the Line or Area Feature for which you wish to collect data. Assign Feature information to the new Feature (Feature name and description).

2. Press **Store** from the **Collect** screen.

3. Start moving (i.e. walking, driving) along the Line Feature or the perimeter of the Area Feature.

4. Press the **Stop** button when you have reached the ending point of the Line feature or the beginning point of the area feature. You may also use this button to abort the data logging process at any other time.

Tap **New** if you wish to collect data for another Feature Topic

To end the GPS data collection, tap the **Exit** button. Tap the **Zoom Fit** icon at the top to see all the Features displayed on the same screen. If you wish to zoom only to the Features that belong to a specific Topic, then select that Topic from Topic View then use the Zoom-to-Topic icon from the zoom-tool drop-down menu.

Nested Points

This app allows you to interrupt a Line or Area Feature (without terminating it) to record a nearby Point Feature. This kind of Point Feature is called a **Nested Point**. The procedure for logging a Nested Point is similar to that for logging a regular Point Feature.

1. Begin logging a Dynamic Line or Area Feature.

2. From the **Collect** screen, press the **Nested** button. A list of Point Topics in your Feature List will be displayed.

3. Highlight the appropriate Point Topic or create a new one. When

done, press **OK**.

4. Optionally select or enter descriptions for the selected Nested Point Feature.

5. Press the **Store** button. Stay at the Point location and do not move around while you are logging data.

If necessary, you may press **Stop** to stop the data logging process for the Nested Point Feature.

6. When data has been logged for the Nested Point Feature, you may choose to log another Nested Point or to continue logging the original Line or Area.

If you need to log another nested point, press the **Nested Point** button.

To continue with logging the Line or Area, depress the **Continue** button and start moving again along that Feature.

Offset Mode

For a Feature that is not directly accessible, you can log data for one that is accessible and record the offset information along with the Feature data.

To access the **Offset** function and enter an offset for a Feature, press the **No Offset** button from the **Collect** screen. ("No Offset" indicates that there is currently no offset associated with the Feature.)

This app provides for two types of offset computations.

Left/Right Offset

You can offset a **Line** or **Area** Feature to the left or to the right.

Slope Distance:
Enter the horizontal distance from where you are collecting GPS data to the target. This distance should be parallel to the ground, perpendicular to the direction of motion.

Direction:
Select "Left" or "Right" to indicate whether the target is to the left or right, respectively, of where you are collecting GPS data.

Point Offset

You can offset a **Point Feature** to another point location.

Slope Distance:
Enter the slope distance from where you are collecting GPS data to the corresponding point on the target.

Azimuth:
Enter the azimuth of the target.

Slope:
Enter the slope angle to the target.

After specifying the offset information, tap on **OK** then log the GPS data as described above.

Append Coordinates

If you wish to add GPS data to an existing Line or Area Feature, press the **Existing Line/Area** button from the **Store Feature** screen.

Then click on the pull-down menu under "Name" and choose the Feature Topic that contains the Line or Area Feature to which you want to append coordinates. Next, click on the pull-down menu for the "ID" field then select the ID for the specific Line or Area Feature to which you want to append coordinates.

After you press the **OK** button, proceed to collect data as described above.

Traverse Mode

The **Traverse** function lets you continue mapping **several** Point Features when GPS signal is not available. The application will record the following information that you enter for each traverse leg:

SLOPE DIST: The slope distance from the reference position to the location of the new traverse point.

AZIMUTH: The direction from the reference position to the new traverse point (0 to 359 degrees).

SLOPE: The slope from the reference position to the new traverse point (-90 to 90 degrees).

You may record traverse points in two different modes, as described below.

Side mode: Use this method to perform a radial traverse by taking multiple "side shots" from the same reference point. The following diagram refers to a known GPS reference point.

Traverse mode: Use this method to traverse to a new point that will then be used as the reference point for the next traverse point. This method can be used for storing lines or area boundaries.

This app will permit you to take multiple side shots from each point on a traverse.

The general steps for using the Traverse function are as follows:

1. Click on the **Traverse** button from the **Collect** screen.

2. In the **Traverse New Feature** screen, select an existing Point Feature as the **Reference Point Feature**.

3. In the **Name** box, enter or select the name of the Point Topic into which the new Point Feature will be stored. The ID will automatically be entered for you. Click **OK**.

4. Choose the method for defining the new point by tapping on **Side (mode)** or **Traverse (mode)** button below the ID field.

5. Optionally enter the descriptions for the newly defined Traverse Point Feature. Optionally assign a symbol for the new Point Feature to be stored.

6. Click the **Store** button to display the traverse data entry fields.

7. Enter the Slope Distance, Azimuth, and Slope for the point to be created with respect to the reference point. The reference point is shown with a **circle** around its symbol. The target point will be

displayed with the temporary symbol .

Click the **OK** button to record the new point.

8. If you are working in the **Traverse mode**, the newly stored Traverse Point will automatically become the next Reference Feature.

If you are working in the **Side mode**, the Reference Feature will stay the same.

To continue working in the same traverse or side-shot mode, repeat the above steps 5 through 7.

To switch to the other mode, first tap on **Side (mode)** or **Traverse (mode)** button below the ID field then repeat the above steps 5 through 7.

Please note: If you would like to store the new point to a different Feature Topic, tap the **New** button to call up the **Traverse New Feature** screen then enter or select the new Topic name. Click **OK** then continue with the above steps 5 through 7.

When GPS signal can be received again, you may return to normal GPS data collection mode by clicking the **GPS** button in the data collection screen.

When done with data collection, tap **Exit**.

The GPS Track

If you wish to record your GPS track in the background while performing other tasks in this app, turn on the GPS then select **GPS/Tracklog On**. A dialog will be displayed for you to set the desired **time interval**.

The recorded track will be stored in the **Tracklog Topic**.

To stop recording the track log, select **GPS/Tracklog Off** or turn off the GPS by using **GPS/GPS Off**.

You may record one or more tracks in this manner.

The Tracklog function is available only while GPS is turned on. Also, the logged track becomes a Feature that you can select or zoom (into or out of) only after the data logging has been completed by selecting **GPS/GPS Off** or **GPS/Tracklog Off**.

If you don't see the new Tracklog record in **Sheet View**, please turn the Sheet View off then on. Then the new Tracklog record will display.

Export Job Data

You may export all the Feature data in a Job in a number of formats.

Export Shapefiles

To export the Features in the active Job to Shapefiles, tap the **Main Menu** icon, select **Job** then select **Export Shapefiles**.

Select one or more Topic layers to export. Each Feature Topic will be exported as a separate set of Shapefiles.

Each set of Shapefiles consists of several files (e.g. the .shp, the shx, the .dbf, and the .prj files). The exported data files will reside in the **Documents folder** for the application. To access your exported Shapefiles outside this app, first connect to the iTunes® program then look in the Documents folder for Utility Data Collection in the File Sharing section.

If you need to use the Shapefiles data with another GIS application, please copy the .shp, the .shx, the .dbf, and the .prj file by the same job name to your desktop computer.

As there is a limit of 10 characters in the field name for the DBF file, if an Attrbrite name exceeds 10 characters, it will be truncated.

Export DXF

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 the working coordinate system. The distances and angles will be exported in the active distance and angle units.

Export to PDF

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

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

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

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

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.

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 this app.

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

Warning:

A deleted file cannot be recovered.

Transfer Files

Besides using **iTunes®** to copy files between Utility Data Collection and your computer, there are a couple other ways to transfer files between the two machines. You can also store your job files in iCloud® storage and retrieve them later.

Email Files

You may email Job files (*.pmp), Feature Lists (*.fbr), TXT files (*.txt), PDF files (*.pdf), DXF files (*.dxf) and Shapefiles (*.shp, *.shx, *.dbf, *.prj). To do so, first tap the **Main Menu** icon, select **Job**, then select **EMail Files**.

If the Files for your device are in iCloud® Storage, then mark the **On Cloud** checkbox.

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.

Store or Retrieve Files via iCloud® Service

This app supports iCloud® service for file storage. To make use of iCloud® Storage, make sure that Documents and Data is turned ON under the Cloud setting on your device.

Under **Menu/Setup/iCloud** of this app, there are checkboxes for a number of file types. When you enable iCloud for a file type, the app will move the selected type of files to your iCloud® storage location whenever you tap the **OK** button on the iCloud Setup screen. Afterwards the app will look for that type of files only from the iCloud storage until you unmark the iCloud check box for that file type.

For example, if you select iCloud® storage for the "**Job**" file type under **Menu/Setup/iCloud**, the folder for loading and saving the .pmp files and for importing the Shapefiles would be on the cloud. Therefore the app would attempt

to look for the files in iCloud. Unmarking the iCloud storage setting will permit the app to look for the .pmp files and the Shapefiles in the local Document folder for this app.

Helpful Tip: As there are two possible places for storing your files, when you are puzzled why you are unable find a certain file, be sure to inspect the iCloud Setup under **Menu/Setup/iCloud**.

To view the names of the files stored on cloud, tap the **Settings** icon on the Home page of your iOS device then select iCloud\Storage & Backup\Manage Storage\iGPSGIS II. The same cloud name "iGPSGIS II" is shared by our apps that support iCloud® storage.

The files stored at the iCloud® storage location can be accessed by another iPad® or iPhone® device. This makes it possible to share the *.pim background map files.

A word of caution regarding sharing the **.pmp job files** or the **.fbr Feature List files** using iCloud. As defined by Apple, if two apps use the same file on iCloud, these apps must synchronize the file automatically. Therefore, you must take care when using the same file in two different apps or on two different devices if you will be making changes to the file. For example, suppose you and a colleague share the same iCloud account and open the same .pmp job (stored on iCloud). You add a Point Feature, while your colleague adds a Line Feature. When you save the job, the job will be automatically updated on your colleague's device from the cloud. As a result, your colleague will gain a new Point Feature but lose the newly created Line Feature that he has not yet saved.

Get/Send Files via FTP

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

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

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

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

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

If the files for your device are in iCloud® Storage then mark the **on Cloud** checkbox.

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

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

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

2. Specify the FTP Path, i.e. the desired folder on the PC.

3. Click the "Start" button to start the FTP server.

4. In the iOS app enable the FTP function under Menu/Job then log in to the ftp site.

5. In the iOS app select the files to be sent, then tap the corresponding arrow button.

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Measure Distance

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

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

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

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

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

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

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

this screen and discard the temporary shape.

Measure Area

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

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

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

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

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

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

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

Locate a Point by Address

To look for a location on the displayed built-in Map by address or coordinates, tap on the pull-down arrow of the **Utilities Menu** icon (which may be showing the Meter Reading icon) then select **Locate a Point by Address**. This function will only work when **Map** is turned on.

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

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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Map Meter Routes

There are a few ways by which you could set up a meter route. Once a meter route has been set up, it can be used repeatedly for the monthly meter reading tasks.

You might undertake the initial setup of a meter route by manually placing the meters on a digital map, or by using GPS to log the GPS position of each meter.

Digitizing Meter Locations

To digitize the meters, you will need to first open an existing Job or create a new Job. Tap on the Main Menu icon then select the **Job** function. From the Job Menu, select **Open Job** then tap on the down arrow for File Name and select **"tree"**. For the Feature List, select **"r1r2"**. Tap on **OK** to open this Job.

Now on the Main Menu icon then select the **Job** function. From the Job Menu, select **Save As**. Change the displayed FileName to **"myroutes.pmp"**. This is the Job file you will be working with.

You will also need to create a Point Topic layer. For this example, we will add the Point Topic, called "**R1-**", from the **r1r2.fbr** Feature List. Let's also add the Point Topic named "**R2-**".

"R1-" (standing for Route 1) and "R2-" (standing for Route 2) already have a few Attributes set up for meter reading. Later, you can create a Feature List that is tailored to the needs of your meter reading department.

Now tap the Topic Menu icon then select New Topic. From the drop-down list for the Topic Name field, select "R1-".

With this Topic active, and the satellite map turned on, drag the map to the left somewhat to show the group of houses by McFarland Road. Use two fingers to pull out the map to zoom in so you can see the houses more clearly.

Select the **Add Point Manually** function from the Map Tools menu.

Tap on the Node tool , drag it by the purple portion to the first house then tap once in the center to drop a point to represent the first meter. In the same way, pin down the second meter location, and so on. Add the points in the order the meter reader will be visiting each house.

If you tapped on the wrong location, you may use the **Move Node** function on the Map Tools menu to adjust the position of the selected Feature. Or, you may us the

Delete Feature function on the Map Tools menu to delete the selected Feature then try again.

When you have digitized all the 66 houses, tap the **Back** button to return to the main screen. Your map might look like the following:
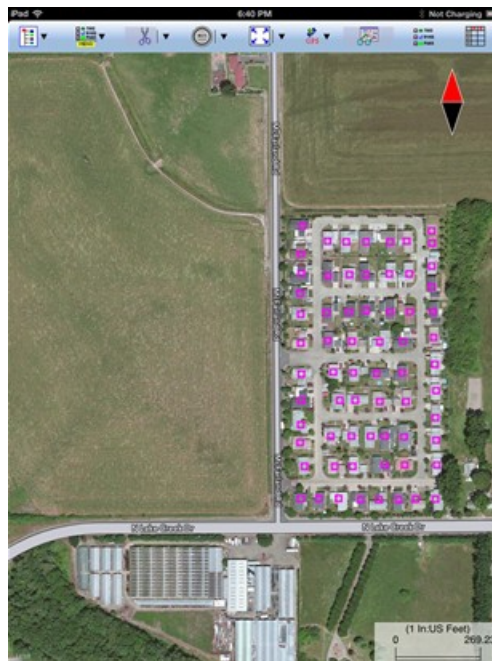
If you tap on a house, you will see its coordinates pop up briefly.

You can tap the Topic Menu icon then use the **Edit Topic** function to add the **Position_X** and **Position_Y** built-in Attributes to the "R1-" Topic. Then when you turn on Sheet View by tapping on , you will be able to see the coordinates of each house listed. You will be able to enter the meter number and address information for each meter.

Logging GPS Position for the Meters

If you are using a high-accuracy GPS receiver with your iPad, you could take this GPS system out to the meter route and log the position of each meter.

To do so, you will first create a new Job or open the relevant existing Job and

associate it with the appropriate Feature List.

Then you will tap on the GPS Menu icon and turn on the GPS receiver. Select **Collect** from the GPS Menu then tap the **New** button to call up the **Store Feature** screen.

If the Feature List associated with the Job is **r1r2.fbr**, then you could select "R1-" as the Feature Name. A Feature ID will automatically be assigned. After you tap on **OK**, you will be able assign a symbol to the Feature as well as tag it with Attrbiutes. Then you will tap on the **Store** button to start logging the GPS position. Stand still at that location until the end of the point data logging session.

After the first point has been logged, walk to the next House then tap on the **Store** button again to store the second point. When all points have been logged, tap the **Exit** button to end the data collection session.

You can tap the Topic Menu icon then use the **Edit Topic** function to add the **Position_X** and **Position_Y** built-in Attributes to the "R1-" Topic. Then when you turn on Sheet View by tapping on , you will be able to see the coordinates of each house listed. You will be able to enter the meter number and address information for each meter.

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Import Meter Information

If the GPS locations of the meters are already known, you could place them along with the meter number and address information in a text file and import all the data into a Topic in the Job. If such information can be exported from your PC software (such as PC-GIS X) in Shapefiles format, then you could import the Shapefiles into a Job. If such information is available in a DXF file, you could import the DXF file into a Job.

Importing Data from a Text File

You can import Attribute data for the Features on a Topic layer into a Job from a text file. The data fields in the text file must be separated by commas. The Values may be enclosed in double quotes (") or not. Please note that if any of the Values contain a comma, such as "Paul Bryne, Jr.", then you must enclose all Values within double quotes to permit the app to correctly interpret the data.

As an example, select the "**myroutes**" Job and select "**r1r2**" as the Feature List to be associated with this Job.

Tap on the Topic View icon then select the "**R2-**" Topic.

Now tap the Topic Menu icon then select **Import Text File**. Select "**R2**" as the File Name. R2.txt is an example text file that is provided with this app.

Tap the **Next Step** button and select "R2-" as the Topic Name.

Tap the **Next Step** button to see the Data Format of the information to be imported.

Accept the displayed coordinate system by tapping on the **Next Step** button.

Tap **OK** on the Preview screen to complete the data import.

You will see that the meters on the "R2-" meter route (Meadowlark Loop) have been automatically placed on the map.

With the "R2-" Topic selected, when you tap on , you will be able to see the meter information as well as the coordinates of each house listed.

The Import Text File function can also be used for importing just the meter number and address information for houses that have already been placed on the map. For example, you could prepare a text file containing the House ID, meter number and address fields, and let the import action replace the corresponding blank Attribute cells of the "R1-" Topic in myroutes.pmp. This will go a lot faster than entering the information into the Job by hand.

To try this process, select the "**myroutes**" Job and select "**r1r2**" as the Feature List to be associated with this Job. Tap on the Topic View icon then select the "**R1-**" Topic. Now tap the Topic Menu icon then select **Import Text File**. Select "**R1**" as the File Name. R1.txt is an example text file that is provided with this app.

Tap the **Next Step** button and select "R1-" as the Topic Name. As this Topic already exists in the Job and contains Features, you will be asked to select a **Relation Key** to correlate the incoming data with the existing database. Select

Feature_ID as the relation key and opt to **Overwrite** the existing data with the incoming data. Confirm to use the LLA coordinate system. On the Preview page, tap on **OK** to complete the data import process.

Now, both the "R1-" and "R2-" meter routes in the myroutes.pmp Job file have all the meter information and is ready for the meter reader to enter the meter readings.

If you have followed the above steps for digitizing meter locations and importing data from a text file, your **myroutes.pmp** Job file should look similar to the sample Job file named **r1r2.pmp**.

Importing Data from Shapefiles or a DXF file

If you have the meter information and meter locations available in Shapefiles format, you can import the Shapefiles into the active Job. Similarly, if you have the data in DXF format, you may import the DXF file into the active Job.

The **Import Shapefiles** and the **Import DXF** functions are on the **Job** menu. Select the file you wish to import. If you are prompted for the coordinate system, select the coordinate system that was active when the Shapefiiles or the DXF file was generated. When you import a DXF file into a Job, all the Topics and Features in the imported file will be added to the Job.

Remove Obsolete Meters

To manually delete obsolete meters from a meter route Topic in a Job, first tap on to turn on Sheet View. Then you can highlight an obsolete meter then tap the Recycle Bin icon.

This action will permanently remove the selected meter record.

Erase Old Meter Readings

Each month before new meter readings are taken, you will want to clear out the old readings. You may do so easily within this app.

First tap on the **Topic View** icon and select the meter route. Then tap the **Topic Menu** icon and select **Erase Values**.

Select the **Reading** attribute from the pull-down list then tap the **Go** button.

Be careful with using this function so you don't unintentionally erase the data for some other Attribute, such as the meter number and address information.

Meter Symbol and Color

In the **r1r2.fbr** sample Feature List, the **Reading** Attribute of the "**R1-**" and "**R2-**" Topics are set up such that when the Reading field is blank, the meter symbol has a **purple** color. After a reading has been entered, the symbol will assume a blue color. If the meter readings imported from Shapefiles, a text file or a DXF file are not blank (showing up as 0), the points will take on the default **blue** color. To initialize the imported meter route with blank meter reading Values, you can select the imported Topic in **Topic View** then use the **Erase Values** function on the **Topic Menu** to erase the Values of the Reading Attribute.

Sort Meter Records

You may reorder the meter records based on one or more Attributes that you specify. To do so, first make the meter route Topic active, then tap the Topic Menu icon and select **Sort Features**. Select, for example "Meter#" then tap the **Sort** button.

The **Feature ID** for each data record on a Topic layer provides a unique identification tag that could be used in sorting or searching the Feature/Attfibute/Values database for the Topic. Bear in mind, though, that as you add Features to a Topic, the newer Features will be placed on top of the older ones. Therefore, normally the Feature IDs for the digitized Features are arranged in descending order in Sheet View. To reverse this order, you can use the Sort Features function to sort the records after marking the checkboxes for "**Use**" and "**Descend**" for Feature_ID in the Sort Features screen.

Search for a Meter Record

This app provides a **Goto** function on the Topic Menu that you could use to quickly access a record based on certain criteria.

For example, for the "R1-" Topic In the myroutes.pmp job file, you could quickly locate a meter by using **Meter#** as the search criterion. To do so, in the Goto Record window, select Meter# then double-tap its Value field and enter the meter number. When you tap on the **Find from Top** button, the corresponding meter will be highlighted on the map. If Sheet View is turned on, the corresponding record will be highlighted in Sheet View.

Edit Meter Data

There are a few ways by which you can change the data for a meter record.

When you tap on to turn on the **Sheet View**, the meter records will be displayed. You can double-tap on a cell and change the meter information as appropriate.

When a meter is selected, you could tap the Feature Properties icon then tap the **Attribute** button to display the Attributes for the meter. You may change the

contents of any cell that is not a built-in Attribute or that is not locked from editing. Tap or double-tap on a cell to change its contents.

Another way to change the meter data is via the **Meter Reading** data input screen that you can access by tapping on the icon on the Utilities Menu. You could change the Meter Readings, update the coordinates and change the meter data input settings.

In fact, you could use the Meter Reading data input interface to work with any other Point Topic, not necessarily related to meter reading.

To prevent meter information from being accidentally changed by a meter reader, you can lock out the meter number and address fields. To do so, select the meter route as the active Topic, tap the Topic Menu icon then select **Edit Topic**. Tap the **Sheet Setup** tab then mark **Lock** checkbox for those Attributes that you want to make non-editable**.**

Export Meter Data to Text File

If you wish to export a data containing a name or address that includes a comma, such as "Paul Burns, Jr", you should mark the **Wrap data in double quotes (")** option so that the data fields can be correctly exported and the program importing the text file will be able to correctly interpret the data.

You may select which fields for a meter record to send out to a text file. Usually you will want to export the meter number, the meter readings and the field notes but not the existing meter address information. Please see **Export Text File** in the section titled **"Topic Menu"** for details about exporting data to a text file.

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Select Meter Route

Utility Data Collection provides a couple sample meter routes to help familiarize you with the meter reading functions. These routes contain fictitious meter numbers and address information but the meters do have actual geographic locations.

To open the sample Job to work with, first tap on the **Main Menu** icon at the upper-left corner, then select **Job**. From the Job Menu, select **Open Job**. For File Name, tap on the little down arrow then select **r1r2**. For **Feature List**, tap on the little down arrow then select **r1r2**.

You will see a bunch of symbols representing the meter locations.

It is helpful to have the built-in Map displayed in the background. If the satellite map is not shown, then tap on the **Main Menu** icon , select **Map** then select **Show Hybrid** to display the satellite map with road names.

If you see the **Meter Reading** icon at the top, tap on it to start the meter reading routine. If you don't see this icon but instead see **Measure Distance**, **Measure Area** or the **Loacate a point by address** icon, tap on the pull-down arrow by that icon then select **Meter Reading**.

You will be prompted to select a meter Route. Let's pick **R1-**, which corresponds to the upper group of meter locations. The first meter will be highlighted in orange color. If one of the meter locations was selected before you tapped the Meter Reading icon, then that meter will be highlighted in the Meter Reading screen.

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Read Meter & Enter Notes

After you have selected a meter route, a data entry panel will be presented for you to enter the readings and observations for the meters on that route. At the same time, the meter route will be displayed on a map for your reference.
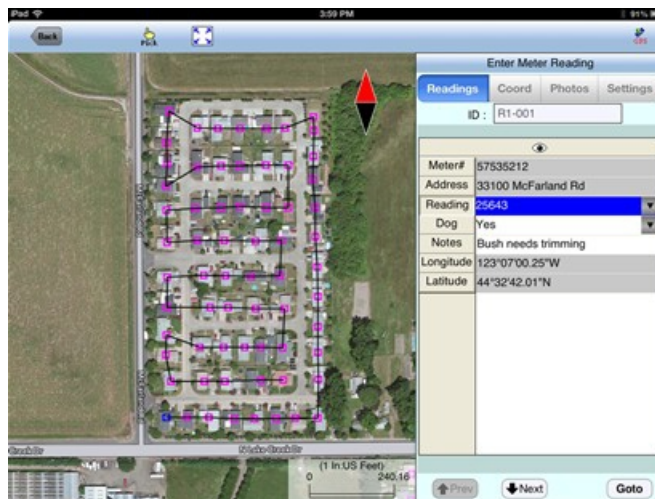
If you do not wish to see the path connecting the meters, you can tap on the **Settings** button then unmark the **Show Route** checkbox. You may choose a different line style or color, if you wish.

In this same window you can specify whether or not you would like to have the app automatically record the date and/or time data is entered into a specified data field. For example, you could mark the check box for "**Automatically log**" and also mark the two check boxes below it. The, you could select "**Reading**" as the field for which to log the date and time. Afterwards, every time a value is entered into the Reading field, or the existing value in this field is changed, the app will **automatically record or update the data entry date and time.**

Your manager may have locked such fields as the meter number and the address information to prevent them from being accidentally changed.

When a little "eye" icon is shown, the data entry panel is in the **View mode**. This means that you can tap once on any cell without invoking the keyboard. The keyboard will pop up for you to enter data only when you double-tap on a cell.

You can tap on 👁 to change it to a "pencil" icon ✏. This puts the data entry panel in **Edit mode**. In this mode, the keyboard will pop up whenever you tap on a cell.

After entering the meter reading, tap the **Next** button on the pop-up keyboard to move to the next data field.

When you see a little down arrow in the data cell, that means there are options from which you can make a selection. Tap on the down arrow then tap on the appropriate choice. For example, if the owner at the meter you are reading recently acquired a dog that is barking at you, you can make a note of that by selecting "Yes" for the **Dog** data field.

You may enter any other observations in the **Note** data field.

In the example that we have provided, the unread meters show a purple color. After you have entered a reading for a meter, its color will change to blue.

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Attach Photo

If you wish to attach one or more photos to the meter record, tap on the **Photos** tab. You may link photos from the Photo Library or the app's Documents Folder on your device.

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

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Review / Change Meter Data

On the **Meter Reading** data entry panel, there are buttons to help you easily review the data you have entered.

The **Prev** button will take you to the previous meter record, while the **Next** button will bring up the next meter record.

When you are just viewing the data and will not be entering anything, remember to tap on the ✏ icon to change it to the 👁 icon.

If you can identify the house on the map for which you wish to review the data, you can tap on the Pick icon to turn on the point selection mode then tap on that house to highlight it. The corresponding meter information will be displayed on the Enter Meter Reading panel.

If you are looking for the data for a particular meter, you can use the **Goto** button to help take you to that record. First tap on the checkbox for Feature ID to unmark it. Then select the Meter# Attribute. Enter the meter number then tap on Find from

Top.

If you are looking for clients who own dogs, then select the **Dog** Attribute. As there are probably more than one household with dogs, the app will first go to the first one, and you can tap the **Find Next** button to go to the next one, and so on.

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Save Data

It is important to save the data from time to time.

To do so, first tap the **Back** button to go back to the main map screen. Then tap the Main Menu icon and tap on **Job**. Now tap on **Save** to save the data.

To go back to the Meter Reading screen, tap on the **Meter Reading** icon at the top.

When all the meters on a route have been read, you may select another route to work with.

When you save a job, all the routes in the job will be saved to the job file.

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