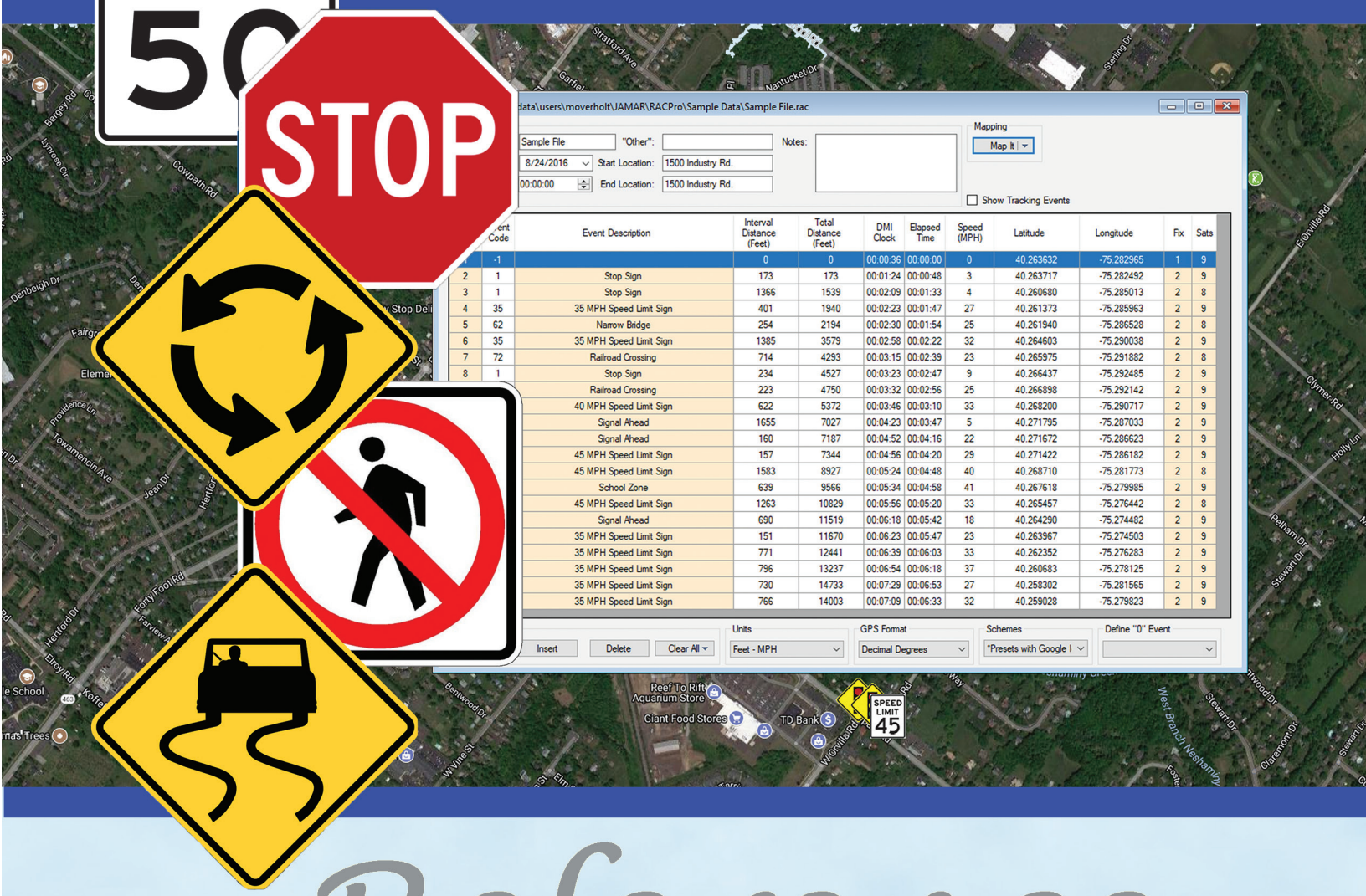
RACPro

Data Analysis Software for the RAC Geo II



Reference Manual

JAMAR Technologies, Inc.

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You may also contact us by e-mail at:

support@jamartech.com

For more information on our products, the latest news in product development, and to download software updates, visit our web site at:

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For information on all known issues with RACPro, go to:

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Address any correspondence to:

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Chapter 1

Introduction and Installation

Introduction & Installation

What is RACPro?

Welcome to RACPro, a JAMAR Technologies software program designed to interface with the RAC Geo II distance measuring instrument. This program will enable you to quickly and easily analyze your data and produce comprehensive reports.

Minimum Computer Requirements

• Windows 7, 8 or 10.
• 10 MB of free space on your hard disk.

Supported Data Collectors

RACPro supports the RAC Geo II and RAC Plus III distance measuring instruments.

Important

Software Updates & Support

Updated versions of JAMAR software are released periodically and are posted on the JAMAR web site. Licensed owners of RACPro may download updates to the program to make sure they always have the latest version of the software on their computer. To download the latest version of RACPro, go to **www.jamartech.com** and then select *Downloads* from the list of options.

If you encounter any problems while using the program, or have any questions on specific operations, refer first to this manual. For up to the minute information on all known issues with the program, refer to the RACPro support web page at: **www/jamartech.com/racprosupport.**

Installing RACPro

Begin the installation by plugging the RACPro USB Flash Drive into your computer. Locate the *RACPro Install* folder and double click the *setup.exe* file.

The Installation Options allow you to do a number of things in addition to installing the program. To begin installing the program, click on **Install RACPro**.

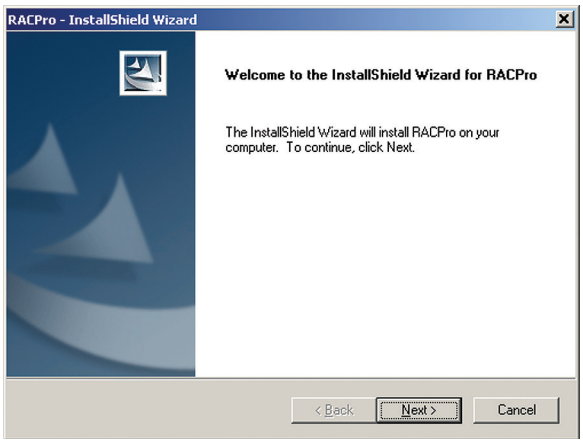


Figure 1-1: Welcome Screen

The Welcome screen lets you know that the installation for the program has begun. During the installation, files used by the program will be copied to your computer, including some Windows system files. If other programs are open and using some of the files that need to be installed, an error can occur. Make sure you close any programs that are running before you install this or any Windows-based software. Click Next and the License Agreement screen will appear.

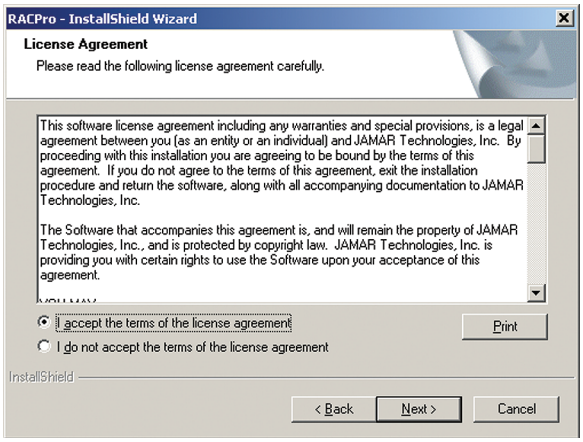


Figure 1-2: License Screen

The License Agreement screen allows you to review the software license for the program. RACPro is a 5-seat site licensed, which means you can install the program on up to five computers as long as they are at the same location. You must accept the agreement in order to proceed with the installation. If you do not accept the agreement, the program must be returned to JAMAR. If you agree to the license, click Next.

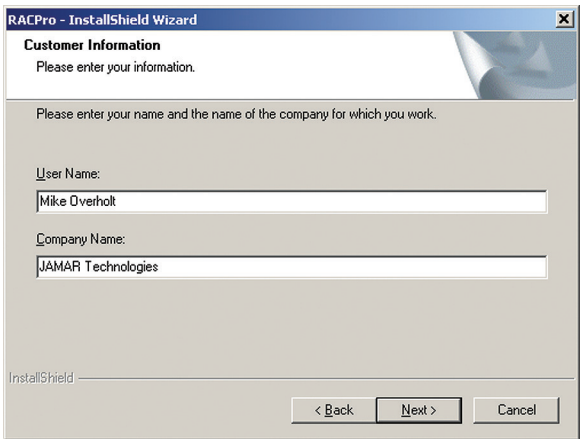


Figure 1-3: Information Screen

The Customer Information screen requires you to enter your name, as well as your company's name. Once the information has been entered, click the Next button to continue.

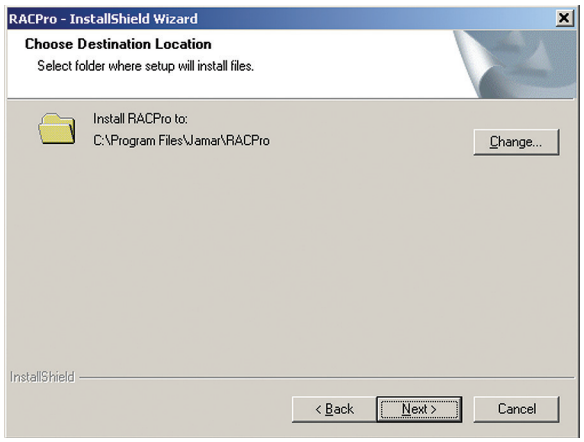


Figure 1-4: Destination Location Screen

The Choose Destination Location screen is used to select where the program will be installed. The default location is C:\Program Files\ JAMAR\RACPro. Once the directory has been set, click Next.

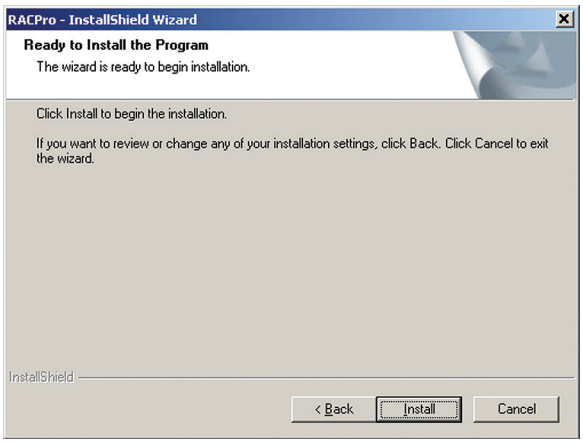


Figure 1-5: Ready to Install Screen

The Ready to Install the Program screen lets you know that the program is ready to begin the installation. Click Install to begin.

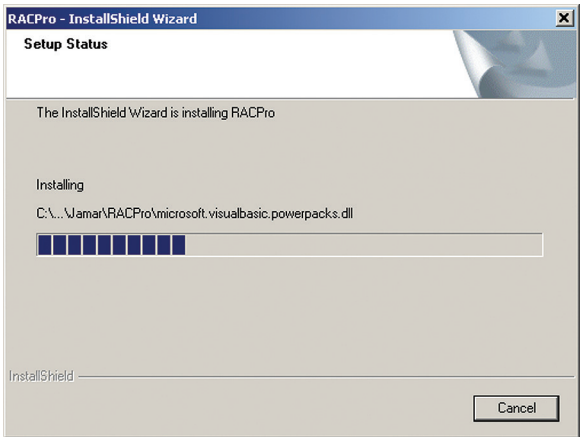


Figure 1-6: Setup Status Screen

The Setup Status screen shows you the progress of the installation as it installs the files needed for the program.

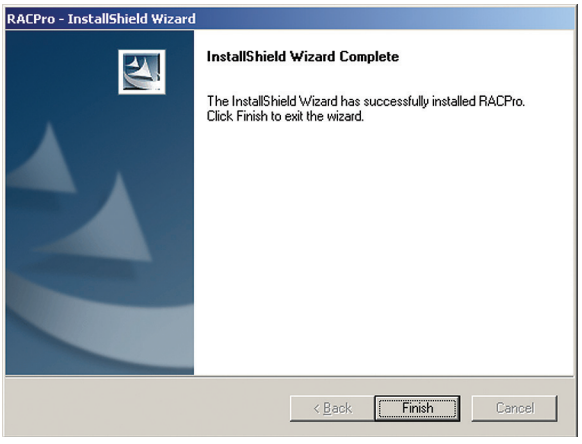


Figure 1-7: Installation Complete Screen

After the program files have been copied onto the computer, the InstallShield Wizard Complete screen will appear.

You may be prompted to Restart your computer at this point. If you are, be sure to restart before attempting to use RACPro.

Running RACPro

Like most Windows programs, there are several ways you can run the software. Here are three:

1– Open an Explorer window *(right click on My Computer and select Explore)* and find the RACPro. exe file, which is probably in the *C:\Program Files\Jamar\RACPro* folder. Double-click on the file **RACPro.exe** and the program will run.

2 – Double-click on the program shortcut that was created on the desktop during installation.

3 – Select **Start**, **Programs**, and then **JAMAR** from the list of installed programs. Choose **RACPro** from the list, then choose **RACPro** again to run the program.

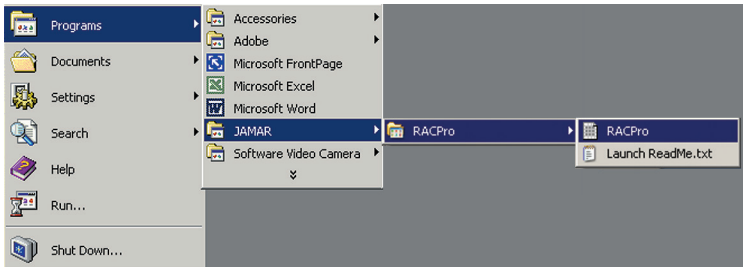


Figure 1-8: Start-up Selection

When you run RACPro for the first time, you will see a screen for entering your serial number for the program. Your serial number is a 20-digit number located on the back of the CD case. Once the serial number has been entered correctly, you should see the red light next to the entry field change to a green light. You can then click OK to enter the program.

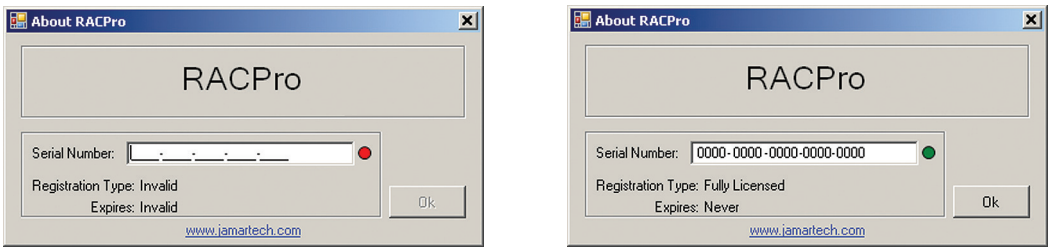
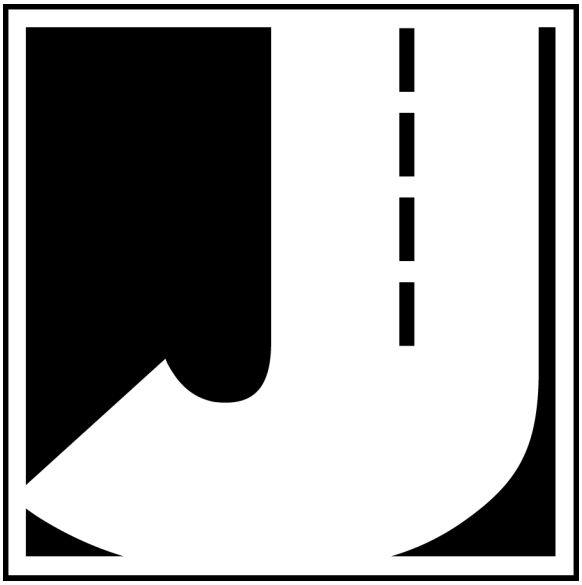


Figure 1-9: Serial Number Entry



Chapter 2

Learning the Basics of RACPro

Getting Started

Using RACPro

This chapter provides an introduction on how to use RACPro. This information is presented in a tutorial style so you can follow along on your computer as each aspect is covered. Once you have completed this chapter you should have a good working knowledge of the program.

To start the program, click the Windows *Start* button, select Programs, then JAMAR, then RACPro.

Quick Start Options

Each time you run RACPro, the **Quick Start Options** screen will appear first. The options on this screen correspond to the main features you can access in RACPro. These are: Download Survey, Merge Surveys, Edit Schemes, Collect in Real Time, Open a Recent File, Edit General Settings, Edit Survey Settings and Edit Report Titles.

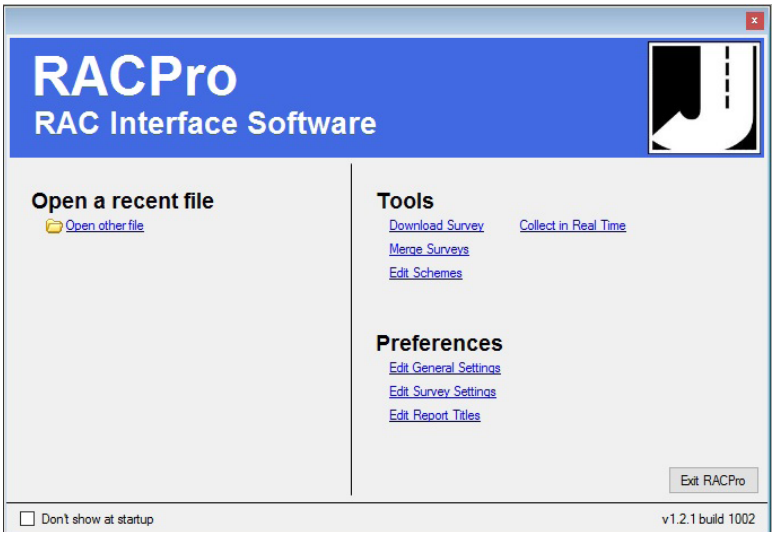


Figure 2-1: Quick Start Screen

The first item we want to look at now is under the **Preferences** heading, *Edit General Settings,* so click this link.

Editing Your Default Settings - General Settings

In the Preferences you can customize the main settings of RACPro. When you click the *Edit General Settings* link for the Quick Start Options you'll see the General Settings tab appear.

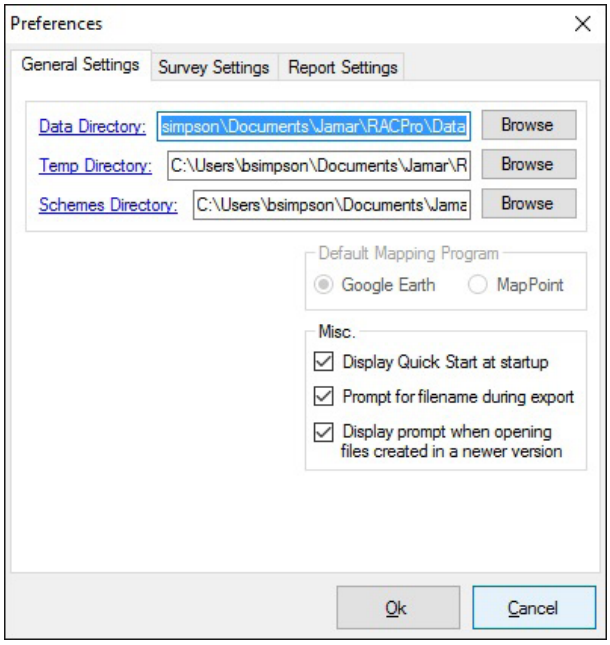


Figure 2-2: General Settings

The first three fields deal with the various paths that the program uses to access information. These are defaulted to be created in a folder labeled *JAMAR* in your 'My Documents' folder, but you can change then to any location that you like using the *Browse* buttons.

Data Directory – where the data files you create with the program will be stored.
Temp Directory – where temporary files will be stored when downloading data from a RAC.
Schemes Directory – where any custom Event Description schemes that you create will be stored.

The **Default Mapping Program** setting allows you to designate whether you want to use Google Earth or MapPoint as the default program when mapping GPS data.

The **Display Quick Start at Startup** check box allows you to turn off the main Quick Start screen if you'd rather just use the toolbar commands to access the various features of the program.

The **Prompt for filename during export** check box allows you choose whether to automatically export the file with its RACPro file name or prompt you for a file name before the export is complete.

The **Display prompt when opening files created in a newer version** check box allows you to be alerted if you are opening a file that was created in a newer version of RACPro. This lets you know that there may be some features of the file not supported in your version. It also lets you know that there may be an updated version available for you to install.

Editing Your Default Settings - Survey Settings

Next, click the *Survey Settings* tab and you'll see settings that are specific to surveys.

The **Hidden** and **Shown** fields at the top allow you to customize the data columns that are shown with your RACPro data files. The program is defaulted to show all available fields, so any item listed in the *Shown* field will appear with your RACPro file. If there is a field you do not want to see, use the arrows to move it to the *Hidden* field. You can also use the arrows to organize the order of the field that are being shown.

The **Default Scheme** drop-down box lets you choose from the list of text descriptions for the event codes used in a survey. If this is your first time through the program, *Default* will be the scheme name listed. The other scheme available for selection will be *Default with Icons*, which is the same as the Default scheme, but has more graphical icons for mapping purposes. The Edit button is a shortcut to the Edit Scheme screen which is also accessible from the main startup options. We'll cover this feature a little later in the tutorial.

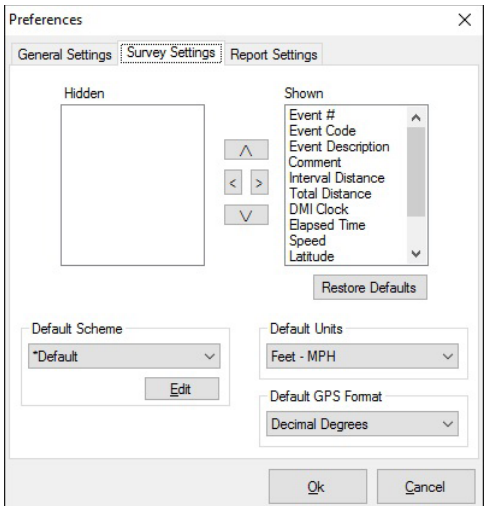


Figure 2-3: Survey Settings

The **Default Units** drop-down box determines the units of your survey data when you first upload it from the RAC. Choose the units you'll normally want to use. You'll be able to switch units later on a survey-by-survey basis if you desire.

The **Default GPS Format** setting allows you to select the format of how GPS data should be displayed in the program and shown on reports. There are three options:
• Decimal Degrees (40.215790º)
• Degrees, Decimal Minutes (40º 12.9474')
• Degrees, Minutes, Seconds (40º 12' 56.844")
In all cases, the value shown represents the same location, it is just shown in different formats. Select the one that best suits your needs.

Editing Your Default Settings - Report Settings

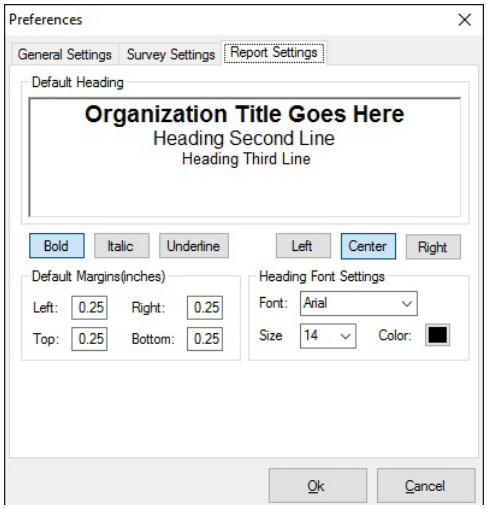


Figure 2-4: Report Settings

Click the **Report Settings** tab to bring this screen to the front. This screen is used to enter and edit the titles printed on the top of your reports.

You may type anything you wish in the Default Heading field. Some of the common headings used are organization name, phone number, web site and e-mail address

Once you have the headings set the way you want, click the **OK** button to save your changes and you will return to the Quick Start screen.

We'll now take a closer look at one of the options we just discussed, Schemes. Click on the *Edit Schemes* link to access this feature.

Working with Schemes

With RACPro, you can use different sets of Event Descriptions for different surveys. These sets of descriptions are called **Schemes**. To see a list of existing Scheme names, click the down arrow of the Scheme Name box.

The program comes with two default schemes, one named *Default* and the other named *Default with Icons*. To see how the Scheme Editor works, we'll create a new one.

To create our new scheme, click in the white area of the **Scheme Name** drop-down box and type in the name *Sample Scheme*, then in the Scheme Description box type in the description *Tutorial*.

We don't want to use the descriptions from the Default scheme, so click the **Clear All** button and all the existing events and descriptions will disappear. We'll now add a few back in, so click the **Add** button three times. In the fields that appear, type *1*, *2* and *3* in Event Code boxes. Next, type *Event 1*, *Event 2* and *Event 3* in the Event Description fields.

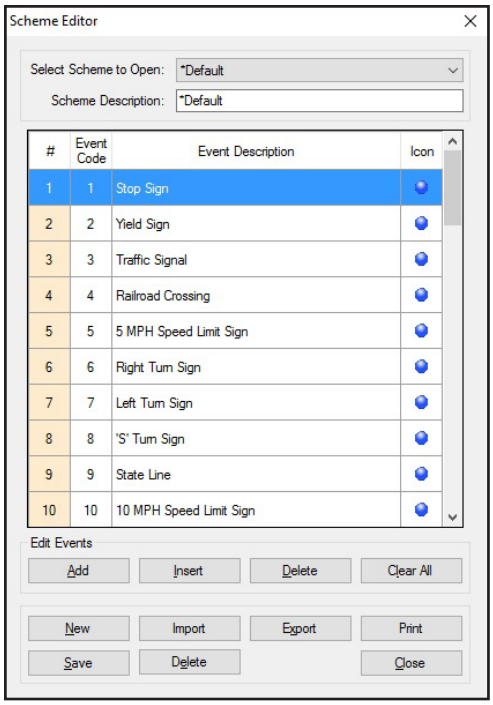


Figure 2-5: Scheme Editor

Now take note of the Icons shown next to each event description. These are used in the data mapping process (we'll learn about that a little later) to represent each event. The default is a blue dot, but these can be changed to just about any graphic you want.

To see how this is done, double click on the first blue dot and the *Open* file screen will appear, directing you to select a file.

Using the *Look in* field, navigate to C:\Program Files\JAMAR\RACPro\Default Icons and you'll see a list of icon images. Click on the first one, the image of a stop sign, then click Open and notice that the icon for the first event has now changed to the stop sign image.

Note that the images that can be used have to be either an ico or bmp format. Of these, bmp (or bit map) is more common and can be made with just about any graphics editing program, including the free Microsoft Paint program that comes with most computers.

Now that we've created our scheme, click the Save button and the Save As screen will appear with the file name already set to Sample Scheme. Click the **Save** button to preserve the changes we've made.

The **Print** button can be used to print a copy of the scheme if you want to take it to the field with you.

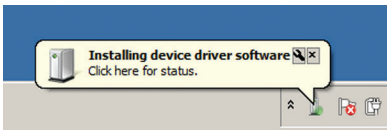
Every scheme that you create here will be available to apply to any open RACPro survey. We'll see how that works shortly. For now, click the **Close** button to return to the Quick Start screen.

Download Survey

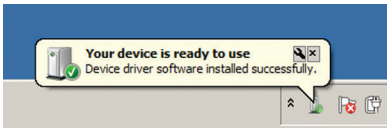
After you've collected data in the field with your RAC, you'll need to download that data into RACPro in order to analyze it and produce reports.

To transfer a stored survey from the RAC, begin by plugging the RAC USB cable into your computer.

Note that the first time you plug the cable into your computer it will need to load USB drivers. When you plug the cable in you should see a pop-up message along your Windows taskbar like the one shown to the right.



Windows will take a minute or two to find the proper driver and install it. This process is done when you see the message shown to the right.



If the driver does not install automatically, refer to the appendix for instructions on manually installing the driver.

Next, plug the smaller connector of the RAC USB cable into the lower side connector on your RAC labeled **PWR**. Just above the PWR connector is the **DATA** connector. Plug the larger connector of the RAC USB cable into this.

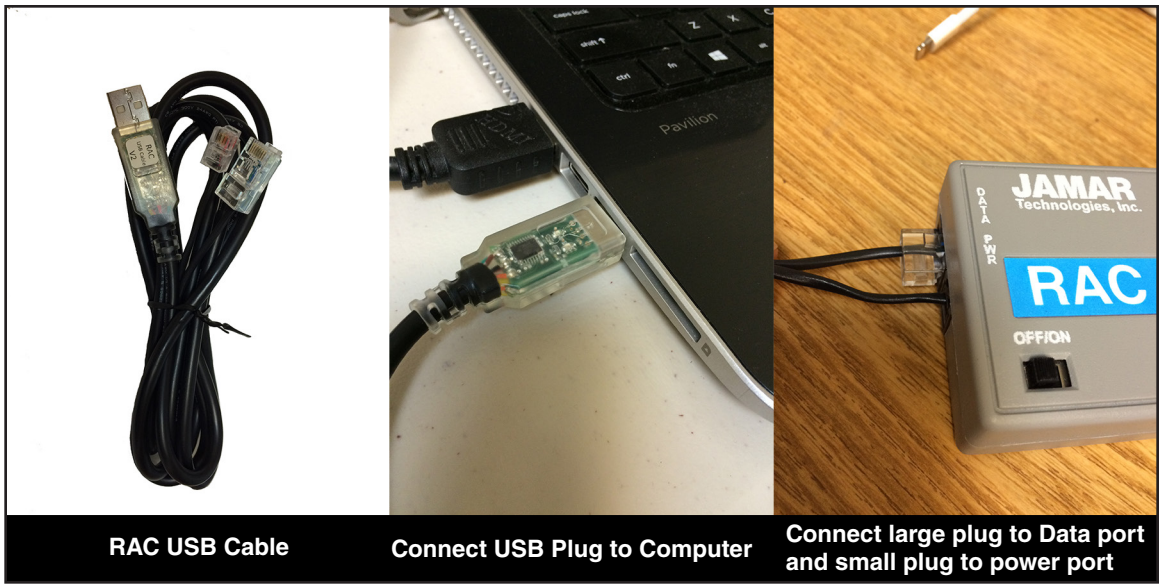
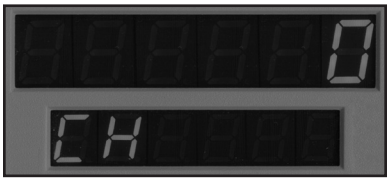


Figure 2-6: RAC USB Cable Connection

Turn the RAC's **OFF/ON** switch to the **ON** position.

Important

IMPORTANT - Note that if the RAC Geo is set to internal (GPS) sensor mode, when you first turn it on it will begin searching for GPS satellites. **The RAC Geo cannot download while in GPS search mode.** To bypass this screen, press the Geo's green *ENT* key. The display will then switch to show zero (0) in the upper display and count hold (CH) in the lower display. It is now ready to download data.



Now, click on the *Download Survey* link on the Quick Start screen and the Download screen will appear.

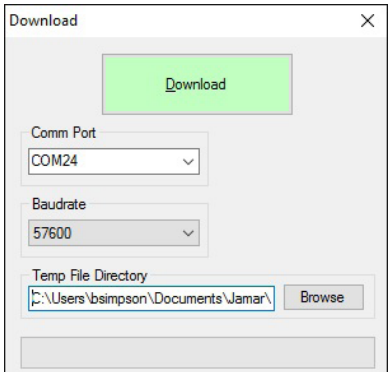


Figure 2-7: Download Screen

This screen gives you the chance to alter any of the settings that apply to your upcoming data transfer.

If everything looks correct, click the **Download** button and the data transfer will automatically take place. The lower display on your RAC Geo will show **SEnd** while it's transmitting survey data and once the transfer is complete, each survey stored in the RAC will appear as a separate Survey Data window on your computer. The RAC Geo will return to its normal mode, with the lower display showing **CH** once it's done sending its data.

Opening & Editing a Saved Survey

Next, we'll take a look at opening an existing survey, and ways it can be edited. Click the **Open other file** link under the *Open a Recent File* heading of the Quick Start screen to start this process.

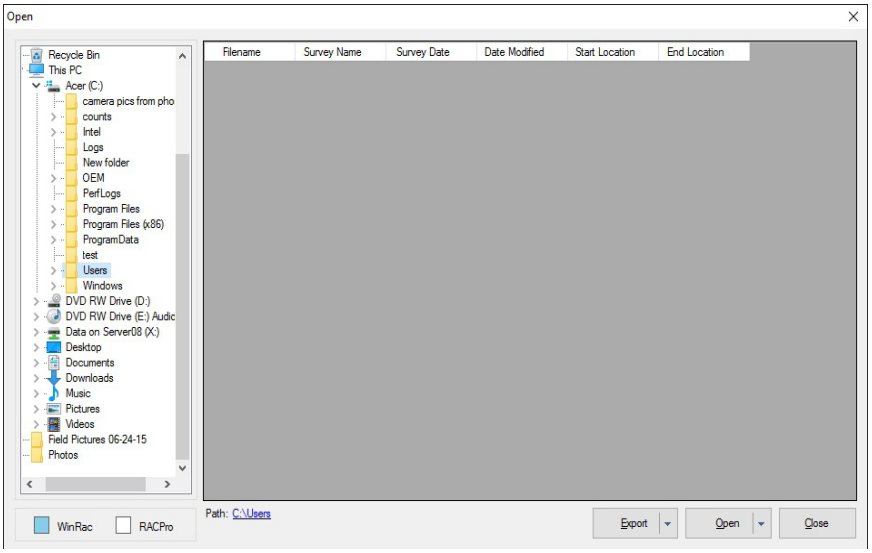


Figure 2-8: Open File Screen

The Open screen will then appear, but notice that there aren't any files for you to select. During installation, the program has created a Data folder for the program in the default path of My Documents\JAMAR\RACPro, but there aren't any files in this folder yet. As you use the program and download data from your RAC, this is typically where you'll find the saved data, but for the purposes of this tutorial will open a sample file stored in another location.

Using the menu tree to the left, go to the path C:\Program Files\JAMAR\RACPro\Sample Data and you should see a file named Sample File appear to the right.

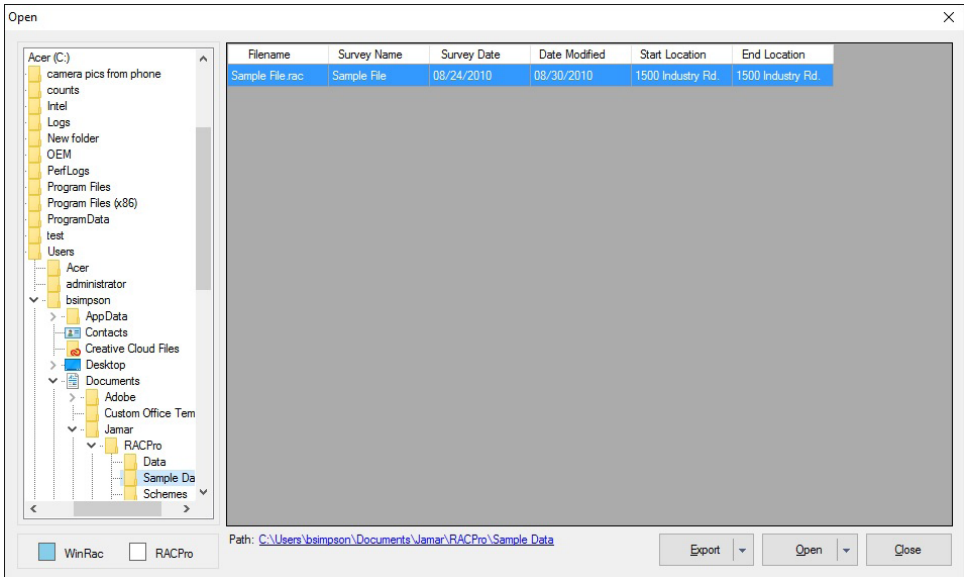
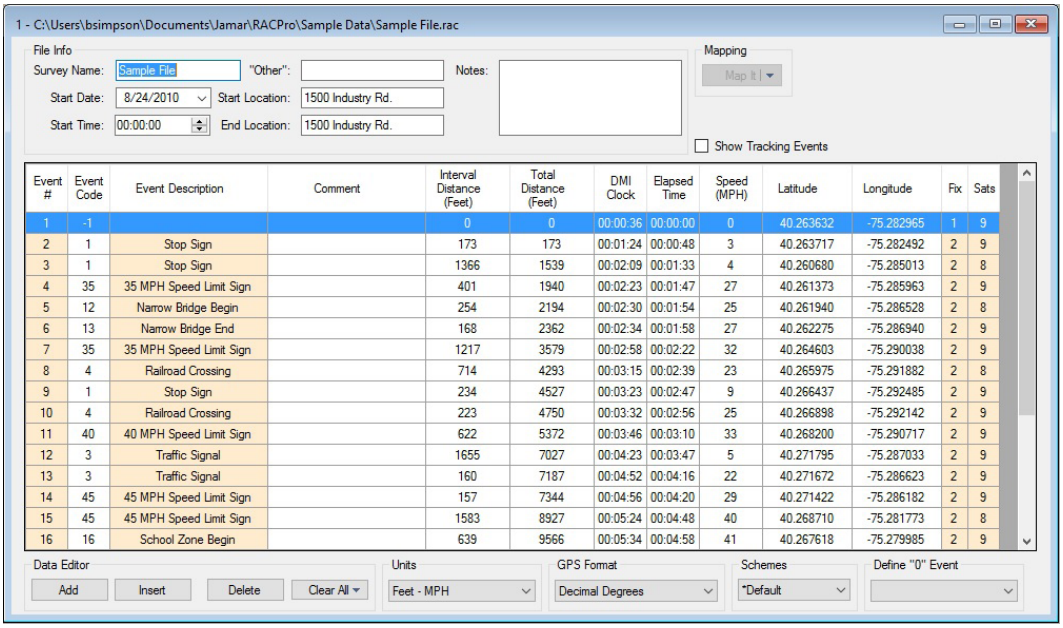


Figure 2-9: File Selected

Click the **Open** button to open the sample file in the program.

You will now see one Survey Data Window open on your screen. In the upper part of this window is a frame called **File Info**. The first box (top left), called **Survey Name,** is probably the most important. The name of this particular survey is Sample File. The **Survey Date** and **Start Time** boxes are assigned when the data is transferred from the DMI, but you can edit these fields at any time.



Event #	Event Code	Event Description	Comment	Interval Distance (Feet)	Total Distance (Feet)	DMI Clock	Elapsed Time	Speed (MPH)	Latitude	Longitude	Fix	Sats
1	-1			0	0	00:00:36	00:00:00	0	40.263632	-75.282965	1	9
2	1	Stop Sign		173	173	00:01:24	00:00:48	3	40.263717	-75.282492	2	9
3	1	Stop Sign		1366	1539	00:02:09	00:01:33	4	40.260680	-75.285013	2	8
4	35	35 MPH Speed Limit Sign		401	1940	00:02:23	00:01:47	27	40.261373	-75.285963	2	9
5	12	Narrow Bridge Begin		254	2194	00:02:30	00:01:54	25	40.261940	-75.286528	2	8
6	13	Narrow Bridge End		168	2362	00:02:34	00:01:58	27	40.262275	-75.286940	2	9
7	35	35 MPH Speed Limit Sign		1217	3579	00:02:58	00:02:22	32	40.264603	-75.290038	2	9
8	4	Railroad Crossing		714	4293	00:03:15	00:02:39	23	40.265975	-75.291882	2	8
9	1	Stop Sign		234	4527	00:03:23	00:02:47	9	40.266437	-75.292485	2	9
10	4	Railroad Crossing		223	4750	00:03:32	00:02:56	25	40.266898	-75.292142	2	9
11	40	40 MPH Speed Limit Sign		622	5372	00:03:46	00:03:10	33	40.268200	-75.290717	2	9
12	3	Traffic Signal		1655	7027	00:04:23	00:03:47	5	40.271795	-75.287033	2	9
13	3	Traffic Signal		160	7187	00:04:52	00:04:16	22	40.271672	-75.286623	2	9
14	45	45 MPH Speed Limit Sign		157	7344	00:04:56	00:04:20	29	40.271422	-75.286182	2	9
15	45	45 MPH Speed Limit Sign		1583	8927	00:05:24	00:04:48	40	40.268710	-75.281773	2	8
16	16	School Zone Begin		639	9566	00:05:34	00:04:58	41	40.267618	-75.279985	2	9

Figure 2-10: Data File Screen

The **Other**, **Start Location** and **End Location** fields enable you to add additional information about the survey. In the **Notes** box you have more space to add any other text which you want to be saved with your survey.

We'll see how the **Map It** button works shortly.

Most of the screen is filled with a grid which displays all of the events recorded in this survey. You can edit each cell in the white columns, while the values in the yellow columns are calculated automatically.

Below the grid are the Data Editor buttons, which allow you to **Add** events to the end of the file, **Insert** events above the currently selected event, **Delete** the currently selected event and **Clear All** of the events in the file.

To the right of the Data Editor is the **Units** drop-down box. Click the drop-down box and select *Miles-MPH*. Notice that the Interval Distance and Total Distance columns change to reflect the new units. Next, select *Kilometers-KPH* and notice that now also the Speed column has changed. Reset the units back to *Feet-MPH* when you are done.

To the right of the Units is the **Schemes** drop-down box. Click the down arrow and notice that the scheme we just created, *Sample Scheme*, is available on the list. Any scheme you create in the Scheme Editor can be applied to any survey you do.

Select the Sample Scheme and notice that the Event Descriptions for the survey change to match the new scheme. Any of the events codes that are not in our scheme come up blank in the event description. Set the scheme to *Default with Icons* and we'll soon see how the icons are used.

The **Define "0" Event** box can be used to change the definition for event code 0 in this survey. This can be useful if you have one common event used often in a survey. You can set the event a '0' while you collect data, then assign a default description to it. Click the down arrow and notice that the options listed are taken from the default scheme you have selected.

Now that we've seen how to work with our survey data, let's take a look at mapping the data.

Mapping Data

You have two options for mapping data - Microsoft Mappoint or Google Earth. Google Earth is free, but requires an Internet connection. Mappoint is not free, but can run without Internet access. Use the drop down arrow on the Map It button to select between the two programs. The information below is based on using Mappoint.

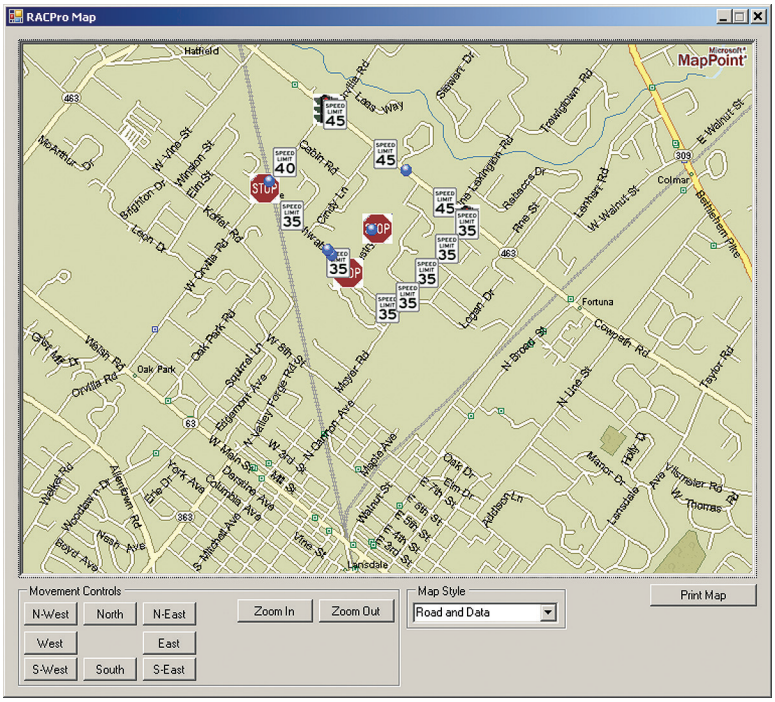


Figure 2-11: Mapped Data

Click the **Map It** button and a map will appear with your events mapped out on it.

Note that you must have a copy of Microsoft Mappoint installed on your computer for the map feature to work. You must also have GPS coordinates stored for your events.

Each event in our survey is mapped according to its GPS coordinates.

The Movement Control buttons at the bottom of the map can be used to move around or zoom in and out on the map. Alternatively, you can use your mouse for these functions. If you move your cursor to the edge of map, it will change to an arrow. Clicking the mouse button will then move you in that direction.

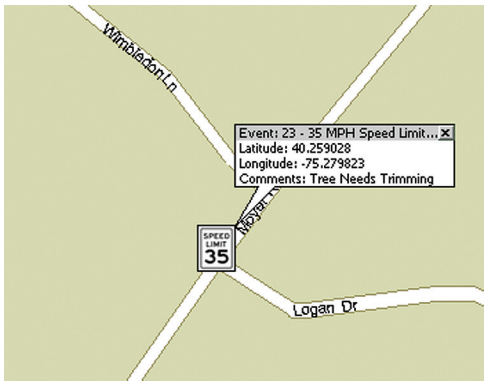


Figure 2-12: Event Information

To zoom in, hold down your mouse button while dragging across the screen and you'll see a box appear. Click anywhere inside the box to zoom in.

Now, zoom in on the 35 MPH sign icons near the bottom of the icons. Right-click your mouse on the one near the intersection of Logan Dr and you'll see a list of options appear. Click the first option, *Show Information*, and you'll see a box appear with information about this event.

This information is taken from the data in RACPro. The top box is the Event Code and Description, while the bottom box shows the GPS coordinates and any information from the Comments field.

At any point while your looking at the map information you can print what's visible on your screen by clicking the **Print Map** button. Once you are done looking that the map, close it by click the X in the upper right corner and you'll be returned to the main RACPro screen.

Producing Reports

Now we want to produce a report from our survey, so click the **Print** button in the toolbar.

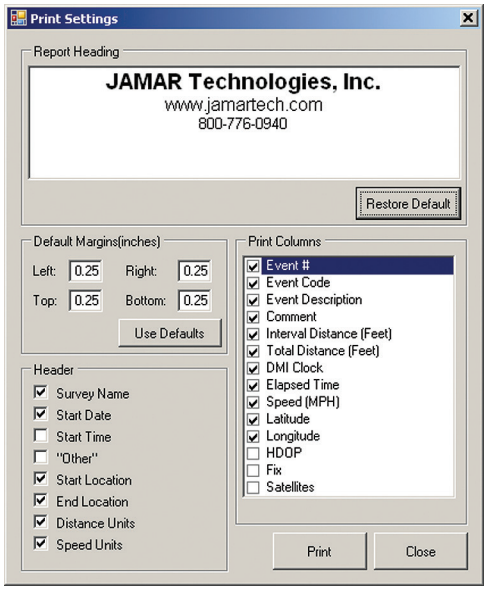


Figure 2-12: Print Settings

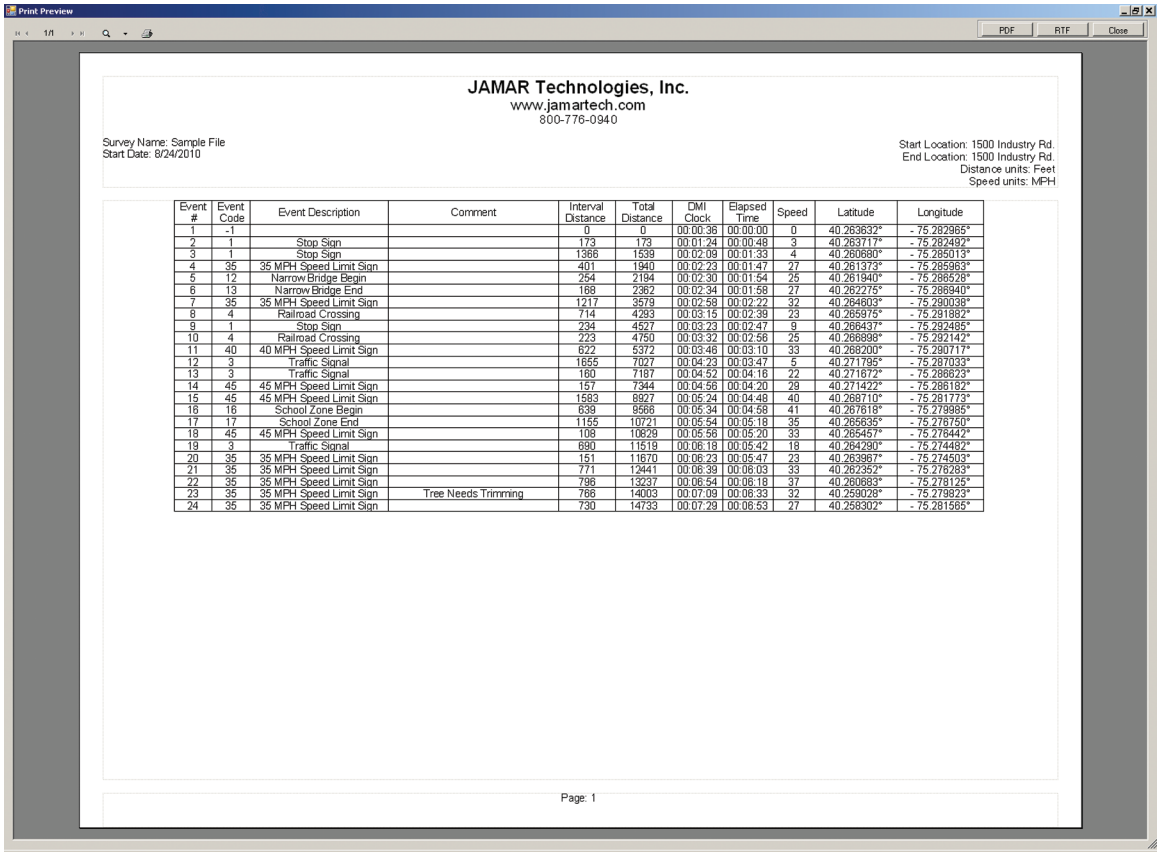
You are now shown the Print Settings screen.

This screen can be used to customize the information that you want to include with your report.

The *Report Headings* field at the top is read in from what you previously entered in the Preferences screen. You can choose to keep this information, or type in new headings.

The *Print Columns* field allows you to select the type of data columns you want on the report, while the *Header* field allows you to select what information should be printed at the top left and right header fields of the report.

For our report, we'll turn off the columns Fix and Satellites, so remove the checks from these boxes. For the header, turn on Survey Name, Start Date, Start Location, End Location, Distance Units and Speed Units. Once these are set, click Print to see a preview of the report.



Event #	Event Code	Event Description	Comment	Interval Distance	Total Distance	DMI Clock	Elapsed Time	Speed	Latitude	Longitude
1	-1			0	0	00:00:36	00:00:00	0	40.263632°	- 75.282965°
2	1	Stop Sign		173	173	00:01:24	00:00:48	3	40.263717°	- 75.282492°
3	1	Stop Sign		1366	1539	00:02:09	00:01:33	4	40.260680°	- 75.285013°
4	35	35 MPH Speed Limit Sign		401	1940	00:02:23	00:01:47	27	40.261373°	- 75.285963°
5	12	Narrow Bridge Begin		254	2194	00:02:30	00:01:54	25	40.261940°	- 75.286528°
6	13	Narrow Bridge End		168	2362	00:02:34	00:01:58	27	40.262276°	- 75.286940°
7	35	35 MPH Speed Limit Sign		1217	3579	00:02:58	00:02:22	32	40.264809°	- 75.290039°
8	4	Railroad Crossing		714	4293	00:03:15	00:02:39	23	40.265975°	- 75.291882°
9	1	Stop Sign		234	4527	00:03:23	00:02:47	9	40.266437°	- 75.292485°
10	4	Railroad Crossing		223	4750	00:03:32	00:02:56	25	40.266898°	- 75.292142°
11	40	40 MPH Speed Limit Sign		622	5372	00:03:46	00:03:10	33	40.268200°	- 75.290717°
12	3	Traffic Signal		1655	7027	00:04:23	00:03:47	5	40.271795°	- 75.287033°
13	3	Traffic Signal		160	7187	00:04:52	00:04:16	22	40.271672°	- 75.286823°
14	45	45 MPH Speed Limit Sign		157	7344	00:04:56	00:04:20	29	40.271472°	- 75.286182°
15	45	45 MPH Speed Limit Sign		1583	8927	00:05:24	00:04:48	40	40.268710°	- 75.281773°
16	16	School Zone Begin		639	9566	00:05:34	00:04:58	41	40.267618°	- 75.279985°
17	17	School Zone End		1155	10721	00:05:54	00:05:18	35	40.265635°	- 75.276750°
18	45	45 MPH Speed Limit Sign		108	10829	00:05:56	00:05:20	33	40.265457°	- 75.276442°
19	3	Traffic Signal		690	11519	00:06:18	00:05:42	18	40.264290°	- 75.274482°
20	35	35 MPH Speed Limit Sign		151	11670	00:06:23	00:05:47	23	40.263967°	- 75.274503°
21	35	35 MPH Speed Limit Sign		771	12441	00:06:39	00:06:03	33	40.262352°	- 75.276283°
22	35	35 MPH Speed Limit Sign		796	13237	00:06:54	00:06:18	37	40.260683°	- 75.278125°
23	35	35 MPH Speed Limit Sign	Tree Needs Trimming	766	14003	00:07:09	00:06:33	32	40.259028°	- 75.279923°
24	35	35 MPH Speed Limit Sign		730	14733	00:07:29	00:06:53	27	40.258302°	- 75.281565°

Figure 2-13: Print Preview

To print a copy of the report, click the **Printer** icon. If you would like to export your document into PDF format, click the **PDF** button. You can also export the document in Rich-Text format by clicking the RTF button.

Exporting Survey Data

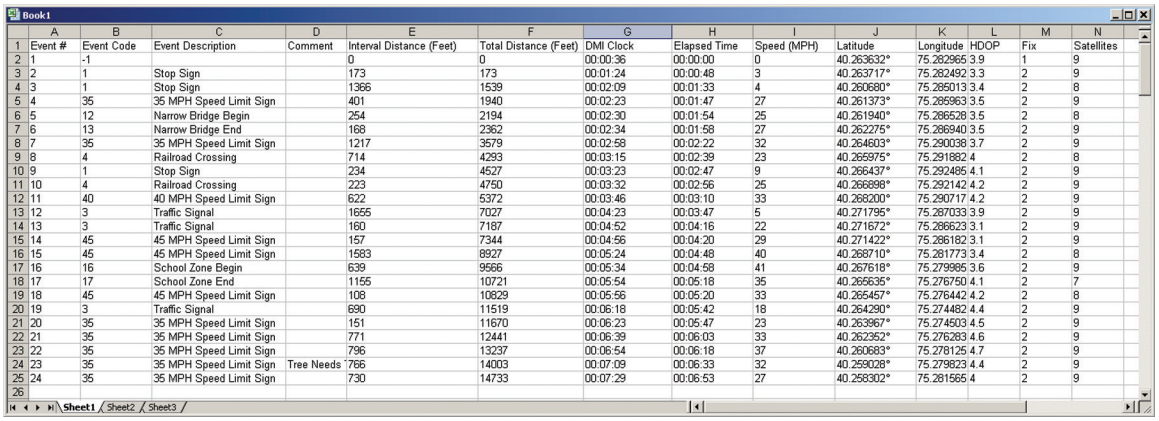
There may be times when you want to put your survey data into other programs for additional analysis. RACPro gives you two options for doing this. When you have a survey open, go the *File* menu and you can select to save the data as either a Microsoft Excel (.xls) file or a Microsoft Access (.mdb) file.

When you select either the Excel or Access option, the software will bring up a standard Windows save box and ask you to name your file and place it somewhere.

Once you have named and saved the file you then have the ability to open it in Excel, or if you saved as an .mdb to open the file in Access. Just browse to the location where you saved the data files and select your survey.

Once opened the two files will appear as follows:

The Excel File:



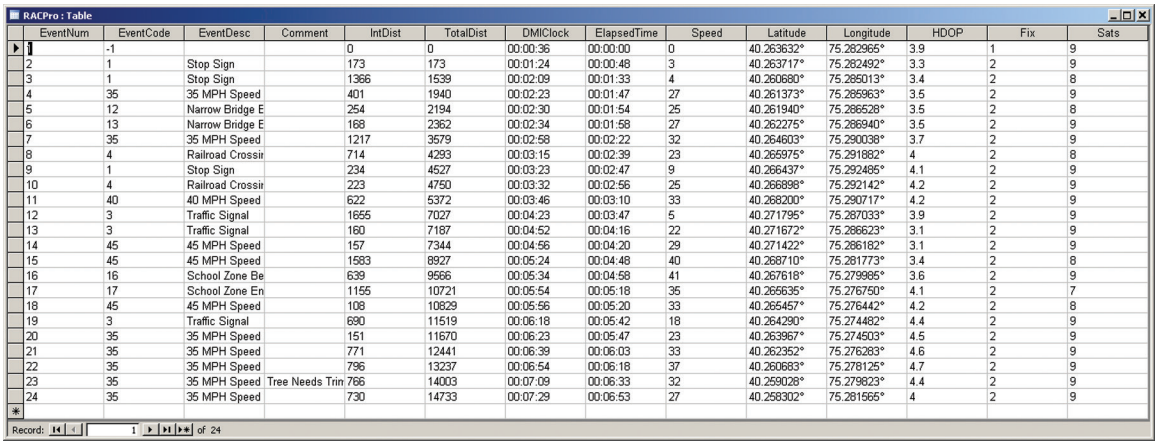
Book1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Event #	Event Code	Event Description	Comment	Interval Distance (Feet)	Total Distance (Feet)	DMI Clock	Elapsed Time	Speed (MPH)	Latitude	Longitude	HDOP	Fix	Satellites
2	1	-1			0	0	00:00:36	00:00:00	0	40.263632°	75.282965°	3.9	1	9
3	2	1	Stop Sign		173	173	00:01:24	00:00:48	3	40.263717°	75.282492°	3.3	2	9
4	3	1	Stop Sign		1366	1539	00:02:09	00:01:33	4	40.260680°	75.285013°	3.4	2	8
5	4	35	35 MPH Speed Limit Sign		401	1940	00:02:23	00:01:47	27	40.261373°	75.285963°	3.5	2	9
6	5	12	Narrow Bridge Begin		254	2194	00:02:30	00:01:54	25	40.261940°	75.286528°	3.5	2	8
7	6	13	Narrow Bridge End		168	2362	00:02:34	00:01:58	27	40.262275°	75.286940°	3.5	2	9
8	7	35	35 MPH Speed Limit Sign		1217	3579	00:02:58	00:02:22	32	40.264603°	75.290038°	3.7	2	9
9	8	4	Railroad Crossing		714	4293	00:03:15	00:02:39	23	40.265975°	75.291882°	4	2	8
10	9	1	Stop Sign		234	4527	00:03:23	00:02:47	9	40.266437°	75.292485°	4.1	2	9
11	10	4	Railroad Crossing		223	4750	00:03:32	00:02:56	25	40.266898°	75.292142°	4.2	2	9
12	11	40	40 MPH Speed Limit Sign		622	5372	00:03:46	00:03:10	33	40.268200°	75.290717°	4.2	2	9
13	12	3	Traffic Signal		1655	7027	00:04:23	00:03:47	5	40.271795°	75.287033°	3.9	2	9
14	13	3	Traffic Signal		160	7187	00:04:52	00:04:16	22	40.271672°	75.286623°	3.1	2	9
15	14	45	45 MPH Speed Limit Sign		157	7344	00:04:56	00:04:20	29	40.271422°	75.286182°	3.1	2	9
16	15	45	45 MPH Speed Limit Sign		1583	8927	00:05:24	00:04:48	40	40.268710°	75.281773°	3.4	2	8
17	16	16	School Zone Begin		639	9566	00:05:34	00:04:58	41	40.267618°	75.279985°	3.6	2	9
18	17	17	School Zone End		1155	10721	00:05:54	00:05:18	35	40.265635°	75.276750°	4.1	2	7
19	18	45	45 MPH Speed Limit Sign		108	10829	00:05:56	00:05:20	33	40.265457°	75.276442°	4.2	2	8
20	19	3	Traffic Signal		690	11519	00:06:18	00:05:42	18	40.264290°	75.274482°	4.4	2	9
21	20	35	35 MPH Speed Limit Sign		151	11670	00:06:23	00:05:47	23	40.263967°	75.274503°	4.5	2	9
22	21	35	35 MPH Speed Limit Sign		771	12441	00:06:39	00:06:03	33	40.262352°	75.276283°	4.6	2	9
23	22	35	35 MPH Speed Limit Sign		796	13237	00:06:54	00:06:18	37	40.260683°	75.278125°	4.7	2	9
24	23	35	35 MPH Speed Limit Sign	Tree Needs	766	14003	00:07:09	00:06:33	32	40.259028°	75.279823°	4.4	2	9
25	24	35	35 MPH Speed Limit Sign		730	14733	00:07:29	00:06:53	27	40.258302°	75.281565°	4	2	9
26														

Sheet1 / Sheet2 / Sheet3

Figure 2-14: Excel Export

The Access File:

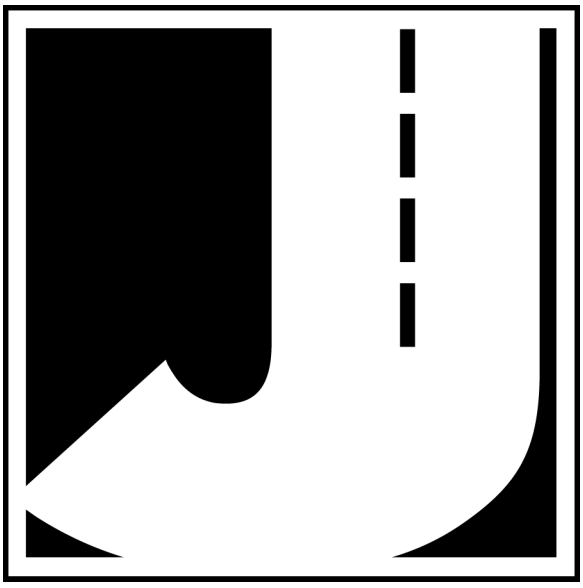


RACPro : Table

	EventNum	EventCode	EventDesc	Comment	IntDist	TotalDist	DMIClock	ElapsedTime	Speed	Latitude	Longitude	HDOP	Fix	Sats
▶	1	-1			0	0	00:00:36	00:00:00	0	40.263632°	75.282965°	3.9	1	9
	2	1	Stop Sign		173	173	00:01:24	00:00:48	3	40.263717°	75.282492°	3.3	2	9
	3	1	Stop Sign		1366	1539	00:02:09	00:01:33	4	40.260680°	75.285013°	3.4	2	8
	4	35	35 MPH Speed		401	1940	00:02:23	00:01:47	27	40.261373°	75.285963°	3.5	2	9
	5	12	Narrow Bridge E		254	2194	00:02:30	00:01:54	25	40.261940°	75.286528°	3.5	2	8
	6	13	Narrow Bridge E		168	2362	00:02:34	00:01:58	27	40.262275°	75.286940°	3.5	2	9
	7	35	35 MPH Speed		1217	3579	00:02:58	00:02:22	32	40.264603°	75.290038°	3.7	2	9
	8	4	Railroad Crossir		714	4293	00:03:15	00:02:39	23	40.265975°	75.291882°	4	2	8
	9	1	Stop Sign		234	4527	00:03:23	00:02:47	9	40.266437°	75.292485°	4.1	2	9
	10	4	Railroad Crossir		223	4750	00:03:32	00:02:56	25	40.266898°	75.292142°	4.2	2	9
	11	40	40 MPH Speed		622	5372	00:03:46	00:03:10	33	40.268200°	75.290717°	4.2	2	9
	12	3	Traffic Signal		1655	7027	00:04:23	00:03:47	5	40.271795°	75.287033°	3.9	2	9
	13	3	Traffic Signal		160	7187	00:04:52	00:04:16	22	40.271672°	75.286623°	3.1	2	9
	14	45	45 MPH Speed		157	7344	00:04:56	00:04:20	29	40.271422°	75.286182°	3.1	2	9
	15	45	45 MPH Speed		1583	8927	00:05:24	00:04:48	40	40.268710°	75.281773°	3.4	2	8
	16	16	School Zone Be		639	9566	00:05:34	00:04:58	41	40.267618°	75.279985°	3.6	2	9
	17	17	School Zone En		1155	10721	00:05:54	00:05:18	35	40.265635°	75.276750°	4.1	2	7
	18	45	45 MPH Speed		108	10829	00:05:56	00:05:20	33	40.265457°	75.276442°	4.2	2	8
	19	3	Traffic Signal		690	11519	00:06:18	00:05:42	18	40.264290°	75.274482°	4.4	2	9
	20	35	35 MPH Speed		151	11670	00:06:23	00:05:47	23	40.263967°	75.274503°	4.5	2	9
	21	35	35 MPH Speed		771	12441	00:06:39	00:06:03	33	40.262352°	75.276283°	4.6	2	9
	22	35	35 MPH Speed		796	13237	00:06:54	00:06:18	37	40.260683°	75.278125°	4.7	2	9
	23	35	35 MPH Speed	Tree Needs Trin	766	14003	00:07:09	00:06:33	32	40.259028°	75.279823°	4.4	2	9
	24	35	35 MPH Speed		730	14733	00:07:29	00:06:53	27	40.258302°	75.281565°	4	2	9
*														

Record: 1 of 24

Figure 2-15: Access Export



Chapter 3

Real Time Mode

Real Time Mode

One of the options available to you with the RACPro software is the ability to collect data from the RAC in real time. With this option you connect the RAC Geo II to a computer and enter data directly into the software while in the field.

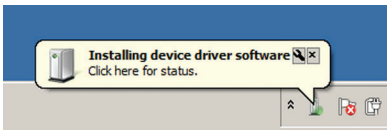
To do real time data collection you will need the following:

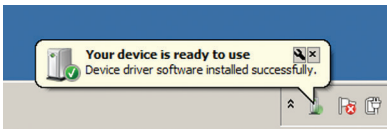
- A laptop or tablet computer with RACPro installed
- A RAC Geo II
- A RAC USB cable

Step 1 - Connect RAC Geo

Connect your RAC Geo II to your computer using the RAC USB cable.

Note that the first time you plug the cable into your computer it will need to load USB drivers. When you plug the cable in you should see a pop-up message along your Windows taskbar like the one shown to the right.





Windows will take a minute or two to find the proper driver and install it. This process is done when you see the message shown to the right.

If the driver does not install automatically, refer to the appendix for instructions on manually installing the driver.

Next, plug the smaller connector of the RAC USB cable into the lower side connector on your RAC labeled **PWR**. Just above the PWR connector is the **DATA** connector. Plug the larger connector of the RAC USB cable into this.

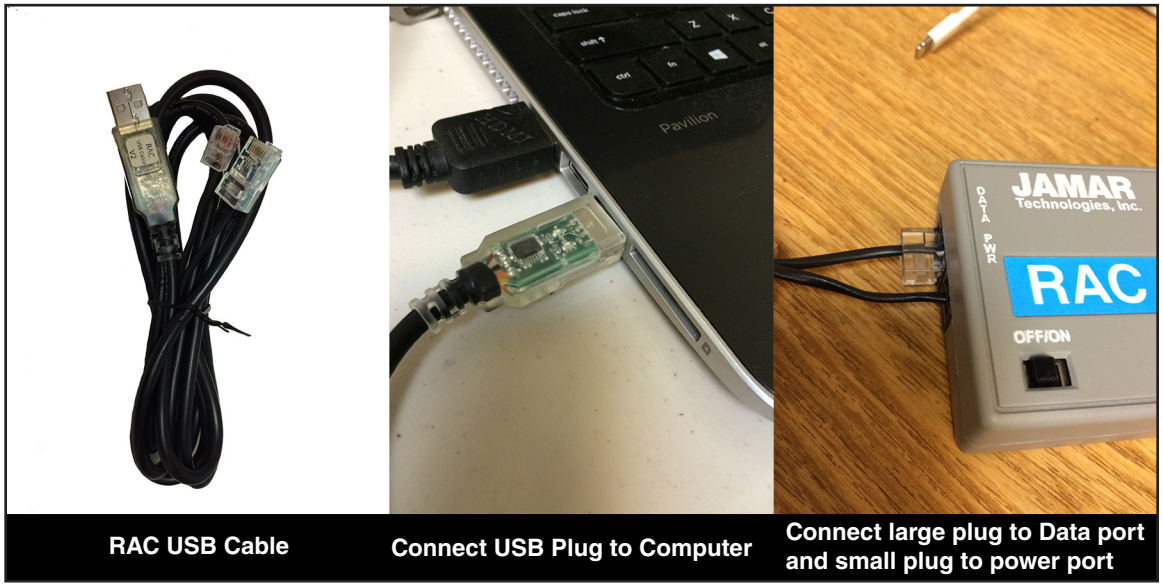


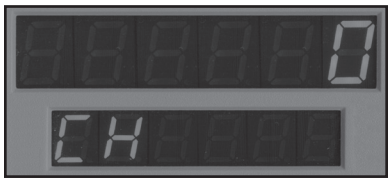
Figure 3-1: RAC USB Cable Connection

Step 2 - Power On

Turn the RAC's **OFF/ON** switch to the **ON** position.

Important

IMPORTANT - Note that if the RAC Geo is set to internal (GPS) sensor mode, when you first turn it on it will begin searching for GPS satellites. **The RAC Geo cannot connect to the computer while in GPS search mode.** To bypass this screen, press the Geo's green *ENT* key. The display will then switch to show zero (0) in the upper display and count hold (CH) in the lower display. It is now ready to communicate with the computer.



Step 3 - Prepare RACPro

From the RACPro Quick Start screen, click on *Collect in Real Time*.

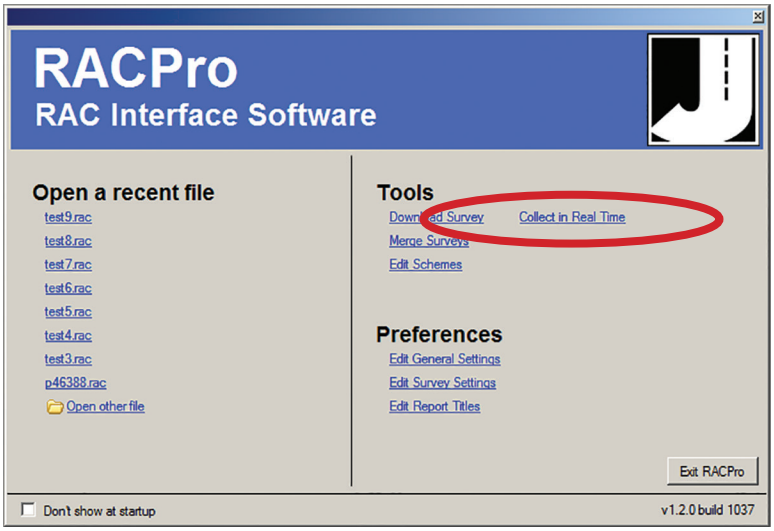


Figure 3-2: Select Collect Real Time

You'll be asked to assign a name to your file. Once that is done, the Real Time screen will appear**.**

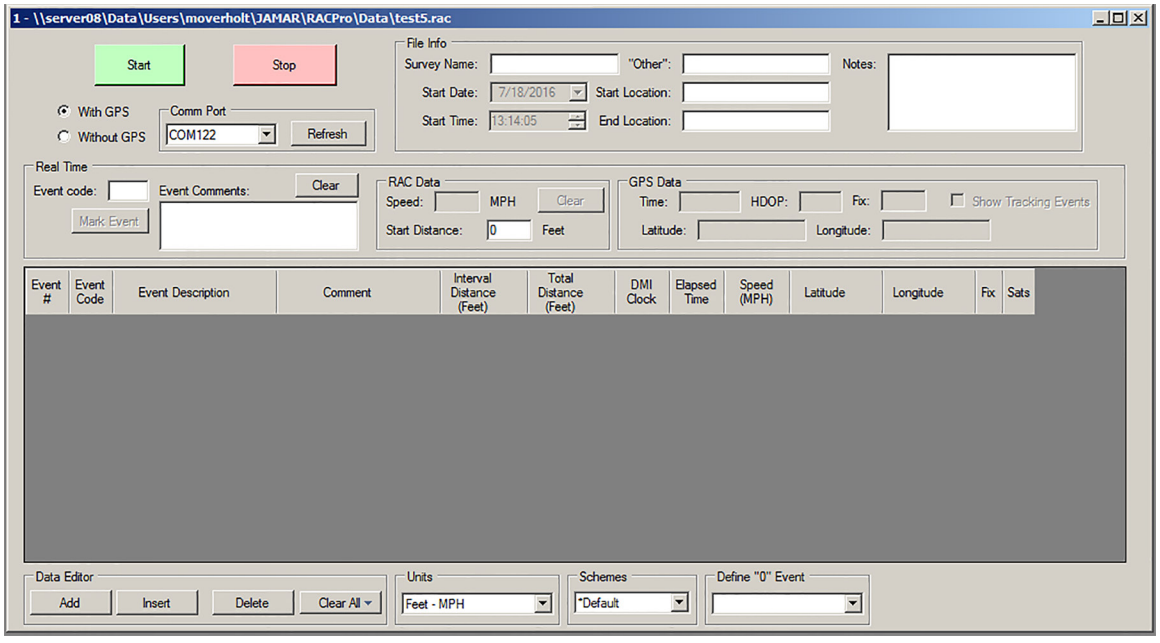
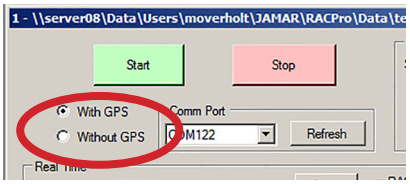


Figure 3-3: Real Time Screen

Step 4 - Select GPS Option

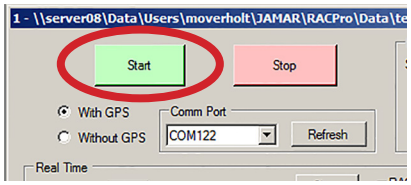
Select whether you want to collect the real time data *With GPS* or *Without GPS*. Note that this refers only to whether or not you want to store GPS info with your data. It does not refer to the type of sensor (internal or external) you are using.



Step 5 - Start Connection

Once you are ready to go, click the *Start* button. The display of the RAC Geo will then switch to show 'real' (as shown to the right) and the unit is ready to be controlled through the software.

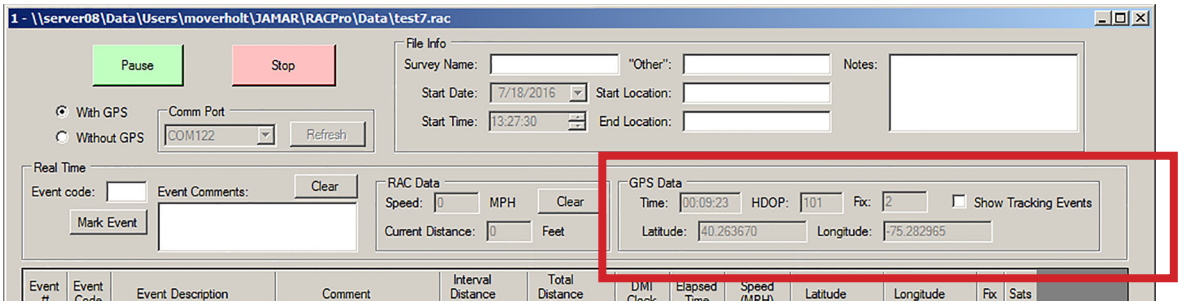
Figure 3-4: Start Real Time



Step 6 - Wait for GPS Signal

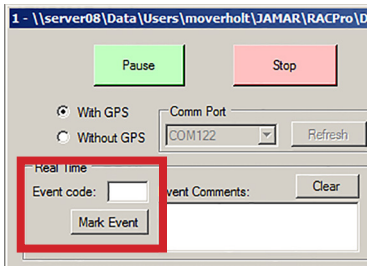
If you are collecting Real Time data with GPS, be sure to wait until the GPS Data fields populate before starting your data collection.

Figure 3-5: Real Time Screen with GPS



Step 7 - Begin Data Collection

Once you are ready to collect data, begin driving. Use the Event Code box to enter any events you want to mark. (Refer to chapter 2 for details on creating a scheme with events.)



Important

IMPORTANT - Note that for safety you should not attempt to enter events while driving. Either use a second person to enter the values on the computer or come to a complete stop out of the flow of traffic to record events yourself.

As you mark events, they will appear in the data spreadsheet.

Event #	Event Code	Event Description	Comment	Interval Distance (Feet)	Total Distance (Feet)	DMI Clock	Elapsed Time	Speed (MPH)	Latitude	Longitude	Fix	Sats
1	1	Stop Sign		0	0	00:02:49	01:01:47	0	40.263682	-75.282953	2	16
2	1	Stop Sign		0	0	00:04:02	03:03:00	0	40.263753	-75.282500	2	16
3	1	Stop Sign		0	0	00:04:46	03:03:44	0	40.260695	-75.285017	2	16
4	1	Stop Sign		0	0	00:06:19	05:05:17	0	40.266857	-75.285180	2	16
5	1	Stop Sign		0	0	00:07:18	06:06:16	0	40.265342	-75.286597	2	16
6	1	Stop Sign		0	0	00:07:52	06:06:50	0	40.263598	-75.288550	2	16

Step 8 - Stop Data Collection

When you are finished, click the *Stop* button and save your changes.

Chapter 4

Troubleshooting

Software Updates

If you are having any trouble using your copy of RACPro, the first thing we recommend you check is your version number. Updates to the program, which contain new features and bug fixes, are issued periodically and posted on our web site at **www.jamartech.com**. To check the version of your program, select About from the Help menu.

Error Messages

Any unexpected problems that occur in the program will usually generate an error message. Should you encounter one of these, make a note of the full error message then check the RACPro support web page at **www.jamartech.com/racprosupport.html** to see if the error is a known issue.

Frequently Asked Questions

My equipment won't download to the computer. What's wrong?
With most computers, downloading your data should be fairly easy. However, if you encounter a problem, check the following items.

1. Some devices that are plugged into a serial port will not allow you to download your data properly. These are devices that require a program (called a DEVICE DRIVER) to be running in the computer at all times. These device drivers are very self-centered, and think that all the data coming into the serial port is for them. Digital cameras, Palm Pilots, scanners, power backups, mice, digitizer boards, and light pens are all devices that require these device drivers to be running. If you have to unplug a device from the serial port to plug your download cable in, or if you are using a switch box, be sure that the device does not have a driver running in memory.

2. If you have a conflict on a serial port, or if your computer does not have a serial port, an alternative is to use a USB to Serial Adapter. These devices allow you to download data using a USB port as if it were a COM port. A wide variety of these devices are available, usually for less than $40. One can be ordered directly from JAMAR at www.jamartech.com/cables.html.

Appendix

Installing RAC USB Cable Drivers

The first time you connect the RAC USB Cable to a computer, you will need to install the drivers for the cable. There are two drivers that will be installed, one right after the other.

Figure A-1: Found New Hardware Wizard

The Windows 'Found New Hardware' message will pop up, then the *Found New Hardware Wizard* will appear.

One of the features of Windows is to use your Internet connection to search the Windows Update web site for any available drivers for USB devices you connect to your computer, like the USB adapter. If you have not used this feature before, you'll first see a screen like the one shown to the left when you first connect the adapter.

The drivers for the adapter are available through this feature, so if you'd like to allow the wizard to connect to the Internet, select one for the first two options and click Next.

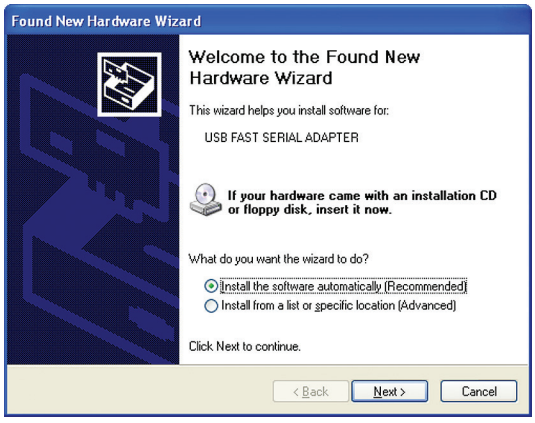


Figure A-2: Select Installation Method

After you click Next (or if you have previously instructed Windows to always check the Windows Update web site for drivers), you'll see the screen shown to the left.

This screen is used to tell Windows where to look for the drivers it needs. We recommend using the first selection, *Install the Software Automatically*.

Note that whenever possible we recommend you use the drivers available through the Windows Update web site as this is the easiest method for loading the drivers. However, if you are not able to use the Windows Update web site, the drivers are also available on the Downloads section of the JAMAR web site or the small CD that came with the RAC USB Cable.

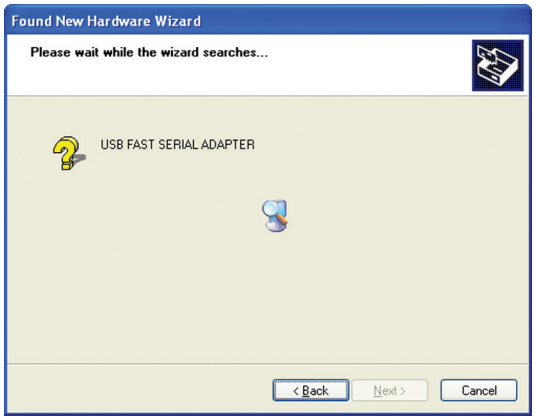


Figure A-3: Installing Driver

Once you are ready to proceed, click Next. The Wizard will then start searching for the best available drivers and you'll see a screen like the one shown to the left.

Once the wizard is finished searching, it will begin to load the driver it has found.

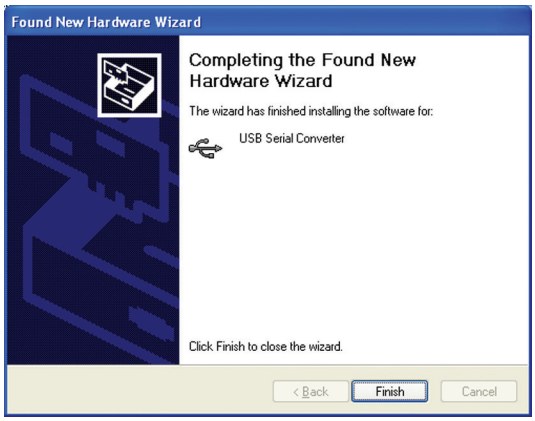
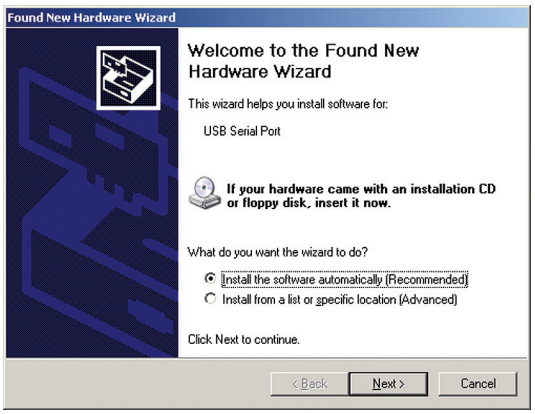


Figure A-4: First Driver Installed

When the driver is finished installing you'll see a screen like the one shown to the left.

Click Finish and you'll complete installing this driver, but there's still one more to go.



Once you click Finish, the Windows 'Found New Hardware' message will pop up again, referencing a USB Serial Port, and the *Found New Hardware Wizard* will reappear. Don't be alarmed, this is what's supposed to happen. There is a second driver that needs to be installed to create a virtual comm port.

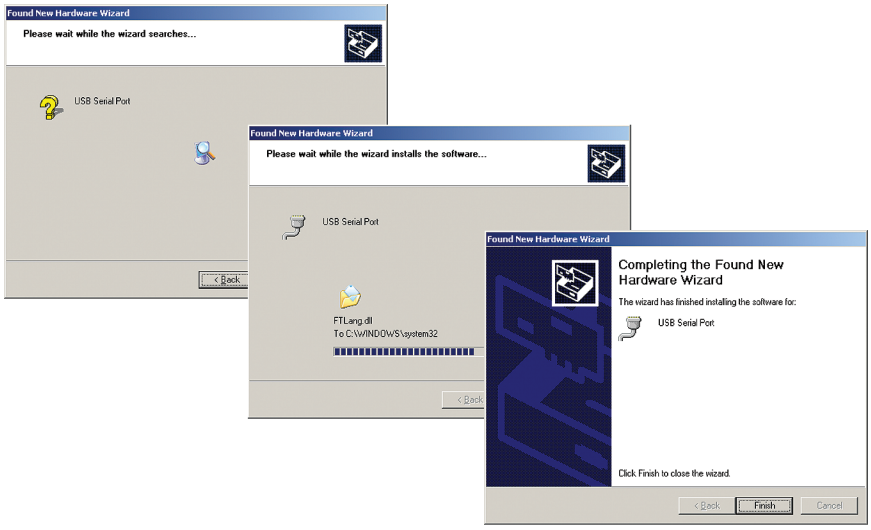


Figure A-5: Second Driver Installation

To install this second driver, follow the same steps as the first.

Once the second driver is installed, you may see a message prompting you to restart your computer. Restart your computer to complete the process of installing the drivers.

The process of installing the USB drivers has created a virtual comm port on your computer and assigned this port a number. You will need to select this comm port number in RACPro when you go to download your RAC. RACPro makes this easier to do by only listing the comm ports that are available in the connection screen. However, if you want to check to see what port number the virtual comm port has been assigned, you can do so through the computer's Device Manager list.

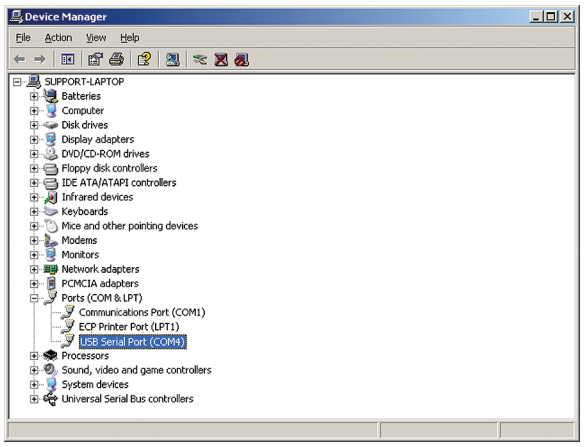


Figure A-6: Port Listings

To access this information, right-click on the My Computer icon then select Properties. In the System Properties window, click on the Hardware Tab, then click the Device Manager button. Click the plus sign (+) next to Ports and you should see a list similar to the one shown below, showing the port number that your computer has assigned.