R:Magellan X.5

Help Manual

R:Magellan X.5

Manual

by R:BASE Technologies, Inc.

Welcome to R:Magellan X.5!

R:Magellan is a R:BASE Plugin for integrating powerful mapping and analysis features into your R:BASE application. Using R:Magellan with several mapping solutions, including MapPoint and Maptitude software programs, as well as Google Maps, Bing Maps, and MapQuest online services, users can provide fast geographical travel instructions for multiple locations.

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Part I

1 Introduction

1.1 Introducing R:Magellan X.5

R:Magellan is a R:BASE Plugin for integrating powerful mapping and analysis features into your R:BASE application. Using R:Magellan with several mapping solutions, including MapPoint and Maptitude software programs, as well as Google Maps, Bing Maps, and MapQuest online services, users can provide fast geographical travel instructions for multiple locations.

Working with addresses or Latitude and Longitude coordinates, R:Magellan will map a specified route, from start to finish, and returns values for the trip including: total distance, trip duration, driving time, driving cost, longitude and latitude for each address, the distance traveled between the addresses, the elapsed distance and the number of addresses provided. The driving cost units and price are available to calculate a driving cost for a trip. In the event an address has multiple hits or is invalid, a "Find Address" dialog will be displayed to correct the existing address or specify a different address.

With the OPTIMIZATION parameter, R:Magellan can reorder the intermediate stops on your route so that your travel time between the start and end points is the most time-efficient.

Maps and directions can be sent to your printer with many additional options like a turn-by-turn map, driving directions only, a fax-able map, including the map legend, and more. After a route is calculated, a URL is returned based on the waypoints, which can be sent by email to a driver's mobile device (with Google maps) to take advantage of GPS assisted navigation.

When launching maps, you can edit the different destination points and how they are displayed on the map. Other parameters allow you to control whether toolbars are displays, map styles, and window state. Map files can also be saved and loaded with R:Magellan. Google and Bing map display include the options to for a "Trip Information" bar, which contains details for each waypoint, and a "Navigation" bar which contains details for each waypoint. The Navigation bar will only display if the Trip Information bar is displayed.

A Find Address utility is available to check if an address can be located. The search can be performed with an address or Latitude and Longitude coordinates. An address search may also be perform in "silent" mode to hide the "Find Address" dialog.

R:Magellan supports geocoding to find latitude and longitude coordinate geographic data from a provided street address. The plugin also provides reverse geocoding where an approximate address is returned with given latitude and longitude coordinates.

Your mapping solution software or online solution must be installed and/or configured accordingly before using the R:Magellan Plugin.

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First Edition

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- To help us expedite the process and provide high quality assistance, the licensee must provide proof of purchase when calling. Proof of purchase is defined as the following: registration number, purchase date, version and build number, and company or individual to which product is registered.
- To have operating system, workstations, and local network installed and functional. RBTI will NOT be responsible for resolving issues not pertaining to the Program.
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1.4 Complimentary Technical Support

30 DAY LIMITED COMPLIMENTARY TECHNICAL SUPPORT

A. LICENSEE RESPONSIBILITIES.

1. To help us expedite the process and provide high quality assistance, the licensee must provide proof of purchase. Proof of purchase is defined as the following: registration number, purchase date, version and build number, and company or individual to which product is registered.

2. To have operating system, workstations, and local network installed and functional. R:BASE Technologies will NOT be responsible for resolving issues not pertaining to the software product.

3. Our support staff deals with advanced issues, therefore the person contacting R:BASE Technologies for assistance should be the system administrator or have other R:BASE/SQL experience and be able to understand and implement the advice given.

4. To have the database, application, and command files being reviewed, safely backed-up before attempting assistance. R:BASE Technologies will NOT be held responsible for lost data or corruption as a result of advice given.

B. R:BASE TECHNOLOGIES, INC. RESPONSIBILITIES.

1. To provide quality assistance in a timely manner to aid in the installation of the product and elementary conversion of database, application, and command files within 30 days of the date of purchase.

2. To provide a reasonable solution for any solvable issue. Not all issues may be solved, and therefore we will acknowledge the existence of known issues, or bugs, which we are presently aware of, that have no reasonable work-around.

R:BASE Technologies reserves the right to limit the amount of support time allotted to a maximum of 2 HOURS during the 30-Day Complimentary Technical Support period. We also reserve the right to limit the quantity of calls from a particular licensee to 30 MINUTES in a single day. Issues are dealt with on a case-by-case basis, and are handled at the discretion of the support agent assigned to the case. Complimentary Support is limited to INSTALLATION and ELEMENTARY CONVERSION related issues ONLY. Our support hours are Monday through Friday, from 10:00 AM to 6:00 PM (EST).

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Part II

2 Installation

2.1 System Requirements

The following system specifications are recommended for the optimal use of R:BASE and R:BASE-related software.

Workstation Hardware

- 2-Core 2GHz+ CPU
- 2 GB of available RAM (4 GB recommended)
- 2 GB of available hard disk space
- 1024x768 or higher resolution video adapter and display
- Standard mouse or compatible pointing device
- Standard keyboard

Server Hardware

- 2-Core 2GHz+ CPU
- 6 GB of available RAM (8 GB recommended)

Operating System

- Microsoft Windows 11 (Professional)
- Microsoft Windows 10 (Professional)
- Microsoft Windows Server 2022
- Microsoft Windows Server 2019
- Microsoft Windows Server 2016
- Microsoft Windows Server 2012, 2012 R2

Network

- Ethernet infrastructure (Gigabyte recommended)
- Internet connection recommended, but not required, for license activation, software updates, and support
- Anti-virus programs should exclude the R:BASE program, and any add-on product, executable and database files

2.2 Things You Will Need

- License Key

  Before launching the installer, it is recommended that you have your 32-character License Key readily available. The License Key is provided in a document, with the email message, when the software was originally purchased. If you have lost or misplaced your License Key, please contact our Support Staff by email at support@rbase.com.

- Internet Access

  The computer where the software will be launched should have access to the Internet for activation. The Internet access is used to visit the R:BASE Technologies Web site to provide your required Activation Key.

  In instances where the software will be installed on a computer that is not connected to the Internet, you must then contact R:BASE Technologies to provide information displayed on the computer screen. Please contact our Product Activation Staff by email at activationkey@rbase.com. The Registration Number must be provided. The Registration Number is displayed on the invoice/order slip, and within the email, when the software was originally purchased.

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2.3 Software Installation

The installation of R:Magellan is fully automated, and does not require user intervention for the initial configuration.

Run the installer ".exe", provided by download, while physically sitting at the workstation to begin the installation process, and read the installer screens for licensing and other information as the program installs.

Installation Directory

C:\RBTI\RMagellanX5

Files Installed

RMagellanX5.rbm
libeay32.dll
ssleay32.dll
RMagellanX5.chm
RMagellanX5.pdf
License.rtf
ReadMe.txt

Requirements

1. The R:Magellan X.5 plugin file (RMagellanX5.rbm) and SSL DLLs (libeay32.dll, ssleay32.dll) must be placed in the R:BASE X.5 program folder or the compiled/runtime application folder.

R:BASE Version	Default Program Folder
X.5 (Version 10.5)	C:\RBTI\RBGX5
X.5 Enterprise (Version 10.5)	C:\RBTI\RBGX5E

2. To display maps with driving instructions, R:Magellan X.5 uses MS Edge as the embedded browser, where the WebView2 Runtime must be downloaded and installed. WebView2 Runtime is an Edge installation that is designed for embedding the engine in third party applications (R:BASE/R:Magellan). It recommended to download the Evergreen Standalone Installer (x86 installer). If you have Windows 11 (or higher), the WebView2 Runtime is likely already installed. https://developer.microsoft.com/en-us/microsoft-edge/webview2/

3. For R:BASE use, the WebView2Loader.dll must be located in the R:BASE program folder. For R:Compiler/Runtime for R:BASE use, the WebView2Loader.dll must be copied from the R:Compiler/Runtime for R:BASE program folder to the compiled/runtime application folder.

4. For R:BASE use, the RBEdgeBrowser.ocx file should already be loaded into the appropriate Windows system folder (System32 for 32-bit and SysWOW64 on 64-bit). For R:Compiler/Runtime for R:BASE use, the RBEdgeBrowser.ocx must be copied from the R:Compiler/Runtime for R:BASE program folder to the Windows system folder (System32 for 32-bit and SysWOW64 on 64-bit).

5. The RBEdgeBrowser.ocx file must be registered with an Administrator account. Open the operating system Command Prompt using "Run as administrator" and navigate to the SysWOW64 or System32 folder. Then, run "REGSVR32 RBEdgeBrowser.ocx" (without the quotes) at the command prompt. A successful registry should display the registration message as follows: DllRegisterServer in RBEdgeBrowser.ocx succeeded.

2.4 Plugin Activation

R:BASE Plugins can be used to enhance, or extend R:BASE operations. Current R:BASE Plugins use the .RBM file extension.

To begin using any plugin product, the plugin must be registered for use.

The license type for R:BASE and R:BASE plugin products must match. The license keys supplied with Single Seat and 5 Seat plugin products will only be accepted within Single Seat and 5 Seat versions of

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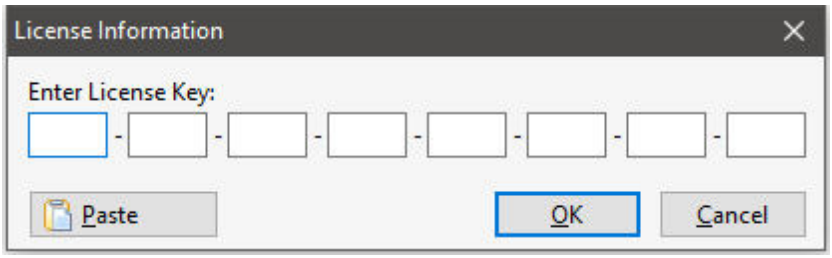
R:BASE, and are not accepted within R:Compiler for R:BASE or Runtime for R:BASE programs. The same license structure is also in place for Runtime License Keys for plugin products, where the key will not be accepted within Single Seat and 5 Seat Licenses R:BASE.

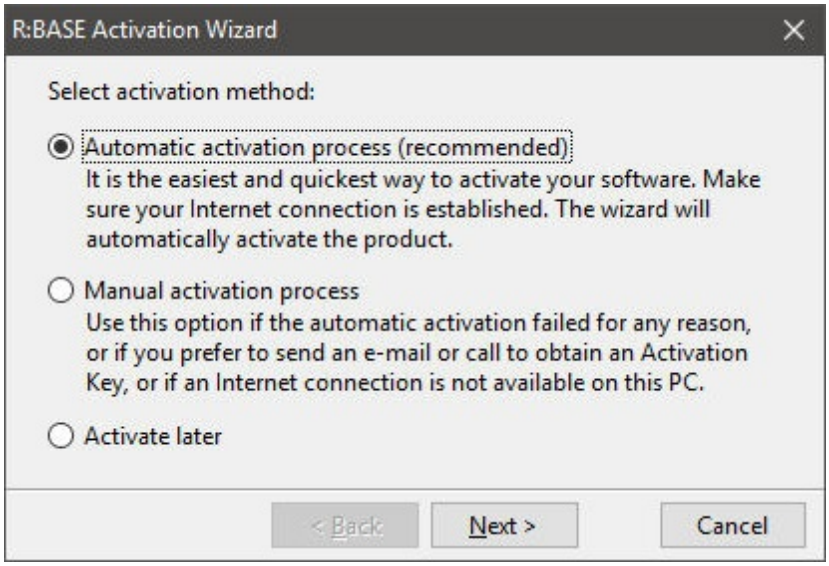
2.4.1 R:BASE

To begin using a plugin product, you must register the software within R:BASE by selecting "Help" > "Product Activation" from the main Menu Bar. In this window, select the "Add New" button where you can enter or copy and paste the License Key you received with your product.

Only "Per Seat" License Keys are valid for this entry screen. All "Runtime" License Keys must be registered within R:Compiler for R:BASE or within Runtime for R:BASE separately.



After entering the License Key, you will see a dialog to prompt for your activation method. The software can be activated automatically over the Internet, or manually by retrieving an Activation Key from R:BASE Technologies by email or over the phone. If you select "Later", you will be reminded each time R:BASE starts to activate your copy.



When activating the software manually, you select the e-mail link to launch your email client and send a pre-formatted message to R:BASE Technologies that will contain your License Key and the displayed Computer ID. You will need to provide your R:BASE Registration Number and Computer ID.

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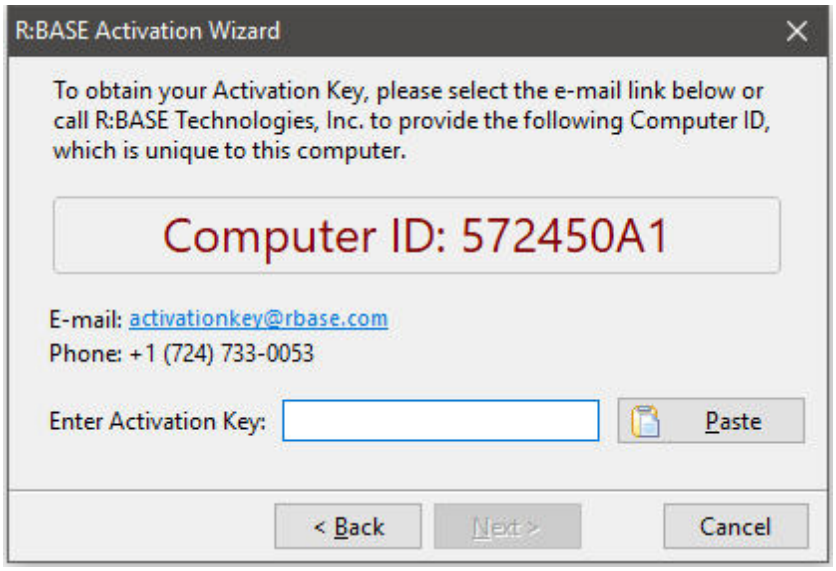
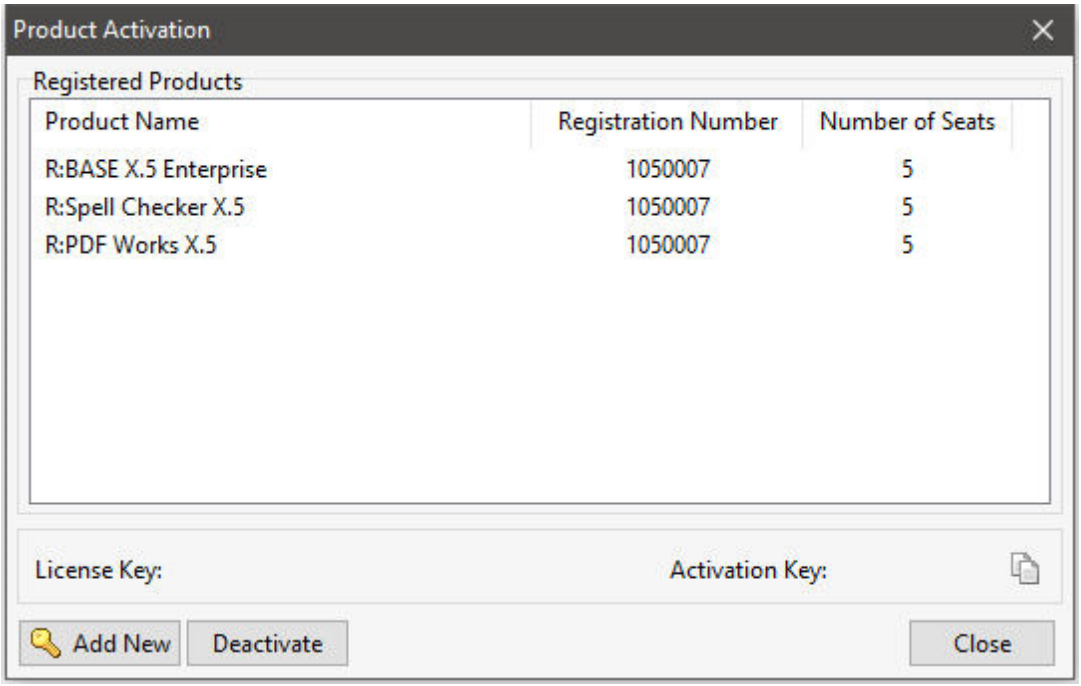


At any time, you can review your product information by starting R:BASE, and from the Menu Bar clicking on "Help" > "Product Activation". Your R:BASE Registration Number is displayed on the window. You can also enter additional License Keys for R:BASE add-on products.



Please be advised that if you are activating multiple workstations, it is highly recommended that you keep records of the computer name, Computer ID and Activation Key for future reference. Access to this information will prove convenient in the event of a hardware failure or license transfer when uninstalling R:BASE.

Please see: Uninstall/Reinstall

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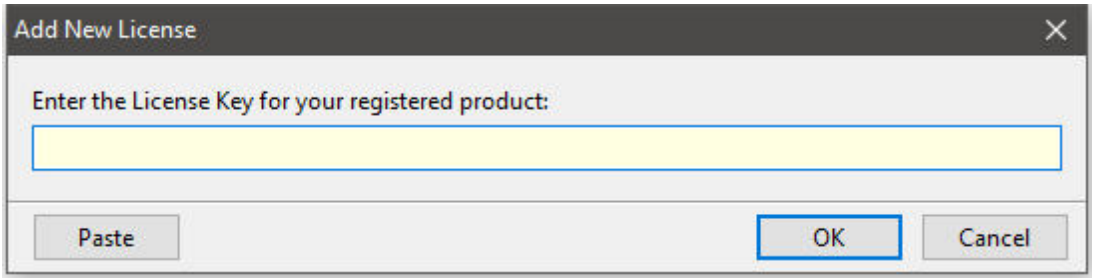
2.4.2 R:Compiler for R:BASE

Runtime License Key
Runtime license keys for an R:BASE Plugin must be stored within the compiled executable. A specific Runtime License Key would be provided after your purchase of the Runtime software product. Adding a Runtime License to your project can be done by selecting the "Add License" button, and pasting the appropriate Runtime License Key into the displayed dialog window.



After a Runtime License is added as a resource, it will be assigned a "Resource ID". This ID consists of the word "License" and an incrementing value for the number of licenses added to the executable.

Plugin File (.RBM)
R:BASE Plugin files can be added and stored within the compiled executable or included within the R:BASE application directory. The Runtime license key pertaining to the R:BASE Plugin must be stored in the compiled executable.

Adding a Plugin to the list of resources can be performed by selecting the "Add Plugin" button on the Tool Bar. You will be prompted to locate the appropriate Plugin file with the .RBM file extension. After a Plugin file is added as a resource, it will be assigned a "Resource ID". This ID consists of the Plugin file name.

2.4.3 Runtime for R:BASE

After R:BASE Plugins are acquired for Runtime for R:BASE applications, the Plugin file must be included in the Runtime application folder, to be loaded when the Runtime application launches.

To load the Plugin, the License Key must be included into the Runtime for R:BASE session by adding the following PROPERTY command within the application startup file:

```
PROPERTY ADD_LICENSE ####-####-####-####-####-####-####-#### ' '
```

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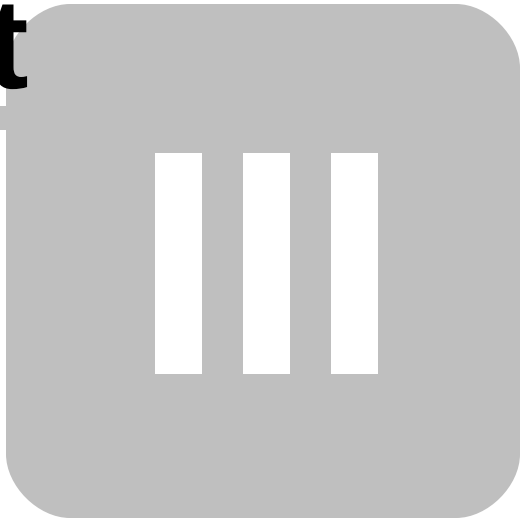
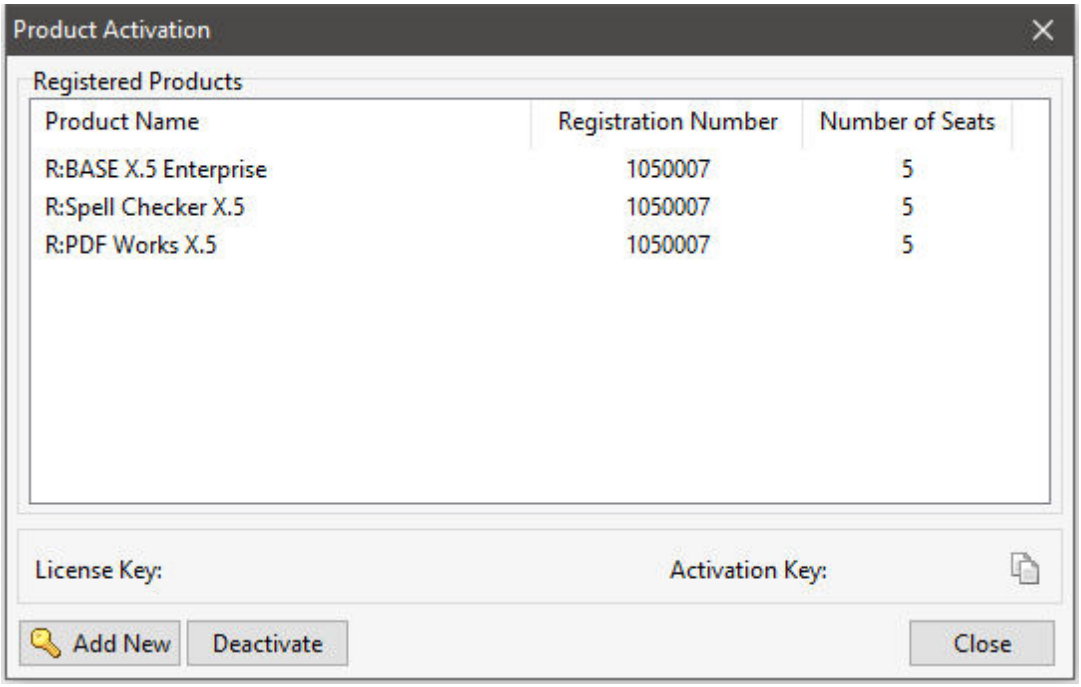
Part



3 Uninstall

If a computer is no longer using R:Magellan, through license transfer or hardware failure, the Activation Key that was used on that computer must be submitted to R:BASE Technologies so we can then remove the Activation Key from our log. We will disable the Key, which will then free up that used activation. Once a key is reported to us as no longer in use and deactivated, it can no longer be used on that computer.

Product deactivation can be performed automatically from within R:BASE. To review your product information select "Help" > "Product Activation" from the Menu Bar. Here, the License Key and Activation Key for a selected product is available for review.



If the License Key for your product is not readily available for the license transfer, select the "Copy License Key" button to send your License Key to the clipboard.

To deactivate a listed product, select it and press the "Deactivate" button. The below confirmation dialog will appear. After selecting "Yes", the product will be removed from the list.

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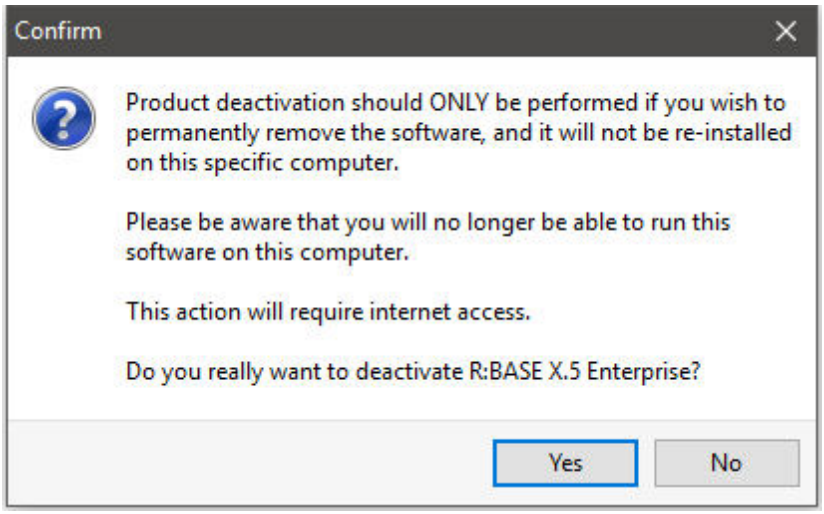

After completing the deactivation of the product, it can be successfully reinstalled and activated.

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Part IV

4 Map Engine Comparison

R:Magellan is a R:BASE Technologies Plugin product for integrating powerful mapping and analysis features into R:BASE applications. R:Magellan offers several map engine solutions, including MapPoint and Maptitude as software programs, as well as HERE Maps, Google Maps, Bing Maps, and MapQuest as online services. Each provides fast geographical travel instructions for multiple locations.

The following map engine comparison details the differences between each:

Feature	**MapPoint**	**Maptitude**	**Here Maps**	**Bing Maps**	**Google Maps**	**MapQuest**
Map Engine Type	Software	Software	Online	Online	Online	Online
License	Installation	Installation	Pay for Service	Pay for Premium Service	Pay for Premium Service	Pay for Premium Service
Query Limit	None	None	Plan Based	Plan Based	Plan Based	Plan Based
Waypoint (Address)	Yes	Yes	Yes	Yes	Yes	Yes
Coordinates	Yes	Yes	Yes	Yes	Yes	Yes
Route Calculation	Yes	Yes	Yes	Yes	Yes	Yes
Address Checking	Yes	No	No	Yes	Yes	No
Map Display	Yes	Yes	Yes	Yes	Yes	No
Driving Cost Units	Yes	No	No	No	No	No
Driving Cost	Yes	No	No	No	No	No
Optimization	Yes	Yes	Yes	Yes	Yes	Yes
Show Progress	Yes	Yes	Yes	Yes	Yes	Yes
Symbols	Yes	Yes (pin)	No	No	No	No
Map Styles	Yes	Yes	No	No	No	No
Save/Load Maps	Yes	Yes	No	No	No	No
Map Legend	Yes	Yes	No	No	No	No
Window State	Yes	Yes	Yes	Yes	Yes	Yes
Print Maps	Yes	Yes	No	No	No	No
Direction File	Yes	Yes	Yes	Yes	Yes	Yes
Miles/Kilometers Values	Yes	Yes	Yes	Yes	Yes	Yes
Coordinates for Stops	Yes	Yes	Yes	Yes	Yes	Yes
Total Trip Distance	Yes	Yes	Yes	Yes	Yes	Yes
Total Trip Duration	Yes	Yes	Yes	Yes	Yes	Yes
Number Stops in Route	Yes	Yes	Yes	Yes	Yes	Yes

Microsoft MapPoint and Bing Maps are registered trademarks of Microsoft Corporation.
Maptitude is a registered trademark of Caliper Corporation.
Here Maps is a registered trademark of HERE Global B.V.
Google Maps is a registered trademark of Google, Inc.
MapQuest is a registered trademark of MapQuest, Inc.

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Part V

5 Working With MapPoint

The following details the specific use of R:Magellan with Microsoft MapPoint.

Syntax:

```
PLUGIN RMagellan 'VarName|<Parameter Value>'
```

Where:

"**VarName**" is the resulting text variable which returns the status, such as 'OK' or the exact -ERROR- message.

"**Parameter**" is the available option recognized by the Plugin.

"**Value**" is the specific value used by the available parameter.

Notes:

- The R:Magellan parameters can be any number of values, but a starting location and ending location must be specified in order for a mapped route to be provided. Each address parameter must be separated with the pipe "**|**" character.
- MapPoint must be installed and configured accordingly on your workstation in order to use the program with R:Magellan.
- The R:Magellan Plugin returns variable values based upon the configuration settings within your MapPoint software. Be sure to review your route settings within MapPoint. Available options include:
  - Average driving day
  - Automatic rest stops
  - Driving speeds
  - Fuel consumption
  - Driving costs
  - Units (miles, kilometers)
- In the event an address has multiple hits or is invalid, the MapPoint "Find" dialog will be displayed to specify a different address, and then select the "Find" button.

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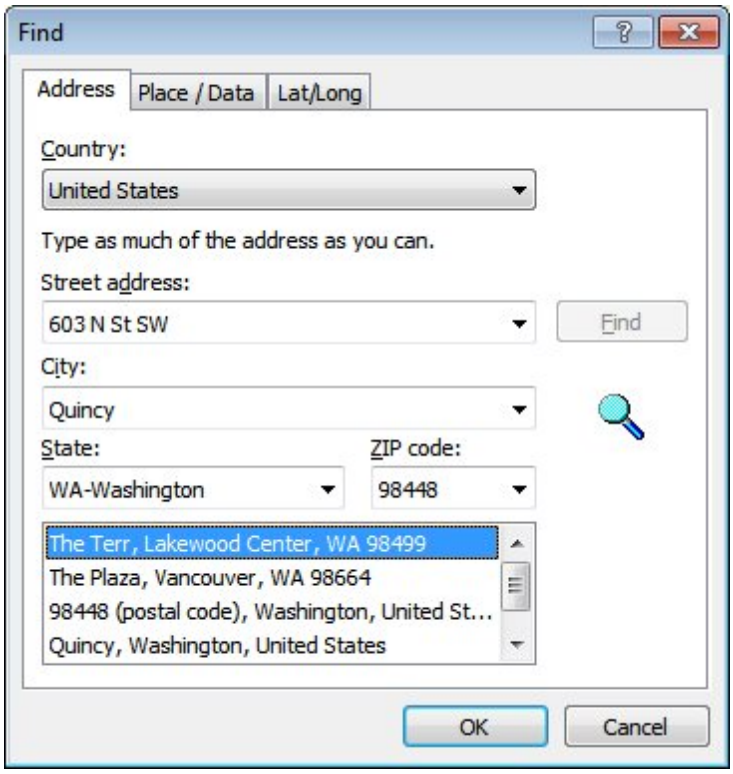

5.1 Map Calculation

The Map Calculation parameters control how a map route is calculated.

Parameters	**Values** (bold values are default)	**Description**
ROUTE_CALCULATION	**ON** OFF	Specifies whether the route is calculated
DRIVING_COST_UNITS	0 1 2 3	Returns or sets the method used to determine route costs. 0 = Cost based on fixed rate per GeoUnit (mile/kilometer) 1 = Cost based on price per liter of fuel 2 = Cost based on price per U.S. gallon of fuel 3 = Cost based on price per U.K. gallon of fuel
DRIVING_COST	Currency	Returns or sets the fuel price or fixed cost for determining route costs, depending on the method set in the DRIVING_COST_UNITS property.
DEGREES	**ON** OFF	Specifies if Latitude/Longitude return variables will be returned as a DOUBLE data type values (OFF).
OPTIMIZATION	ON **OFF**	Specifies whether optimization is used. With optimization set ON, you can reorder the intermediate stops on your route so that your travel time between the start and end points is the most time-efficient.
SHOW_PROGRESS	ON **OFF**	Specifies whether a progress window is displayed while calculations are processing.

Waypoint Address	Text	The waypoint address can be defined as a valid street address or by Latitude and Longitude coordinates.

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		When assigning a route, the waypoint addresses should be listed from start to finish in the order of arrival. The starting and ending points, would be listed first and last. Or, you could use the OPTIMIZATION parameter above. The street address value must contain a street number and name followed by a comma, then the city followed by another comma, and then the state and zip code. A correct address parameter example for R:BASE Technologies, Inc. is: 3935 Old William Penn Highway, Murrysville, PA 15668 The above street address format is specific to the United States. In other countries, the address format will vary. For example, the address format for a waypoint address in Sweden would begin with the street name and street number followed by a comma, then the zip code, followed by another comma, and then the city: Hästholmsvägen 32, 131 30, NACKA The waypoint address can also be defined as Latitude and Longitude coordinates. The coordinates must be defined in the decimal format, but as the TEXT data type. The accuracy of your location depends on the number of decimal values. Two different formats are supported to pass a location to R:Magellan. Two correct Latitude and Longitude coordinates parameter examples would be: COORDINATES 24.54410 ° NORTH~81.80530 ° WEST COORDINATES 24.54410~-81.80530 Additional options are available as to how your waypoint Address is displayed on the map allowing you to edit the address caption, symbol, and bubble itself. These additional option with the pound "#" character must be defined in the order below. #CAPTION value# - will alter the main caption of the bubble #SYMBOL value# - will change the symbol icon for the waypoint address. A list of 255 available symbols, by number are provided below. #DISPLAY value# - will define how the bubble is displayed. The three available options for DISPLAY are: • BALLOON • NAME • NONE These additional options are included with the waypoint address parameter and must be positioned within the pipe symbols in your command syntax. Additional options added the examples above are: #CAPTION RBTI##SYMBOL 81#3935 Old William Penn Highway, Murrysville, PA 15668 #CAPTION RBTI##DISPLAY NAME#COORDINATES 40.4284 ° NORTH~79.6958 ° WEST #CAPTION RBTI##DISPLAY NAME#COORDINATES 40.4284~-79.6958

Symbols
There are different sets of symbols available based upon the version of MapPoint that is used with R:Magellan.

Symbols in MapPoint 2010-2013:

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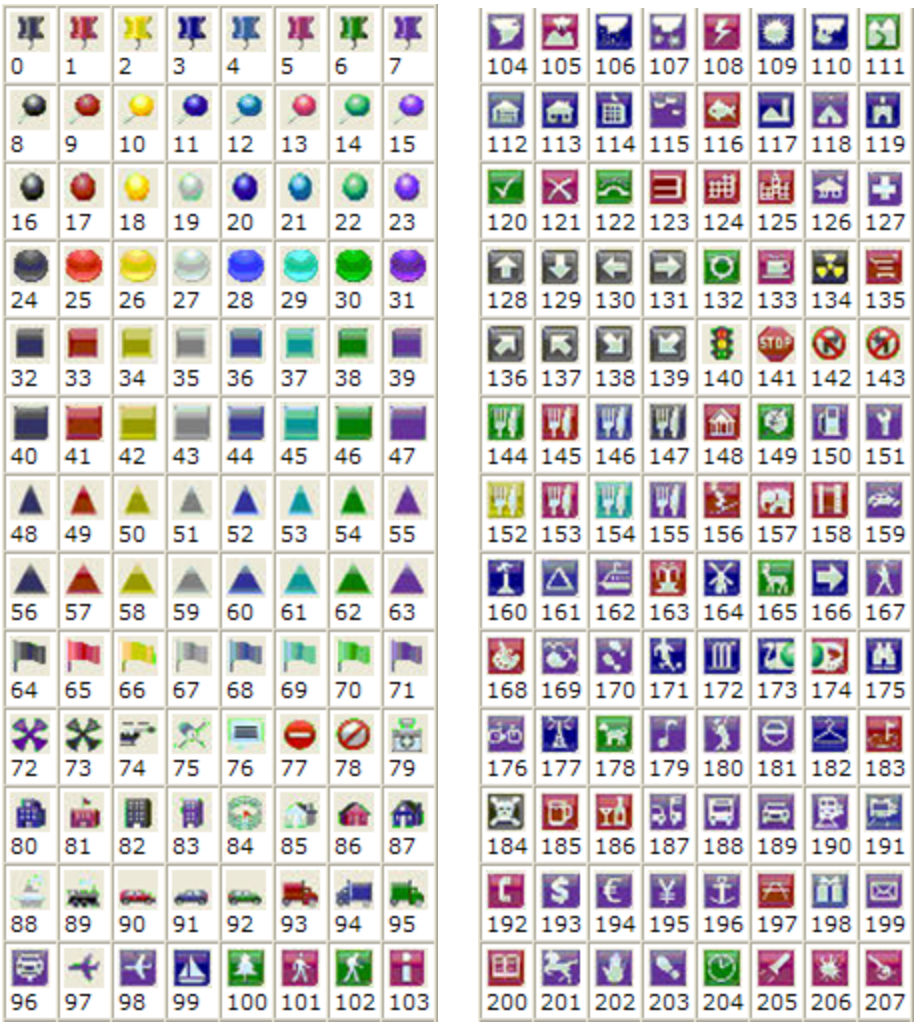

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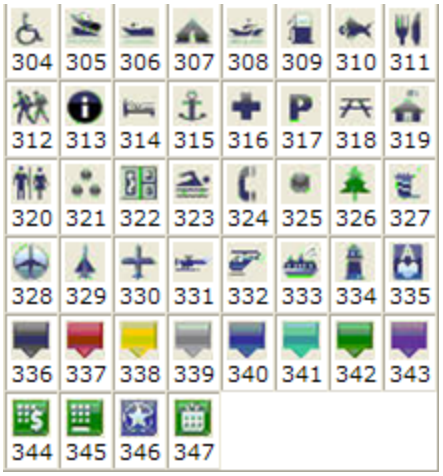

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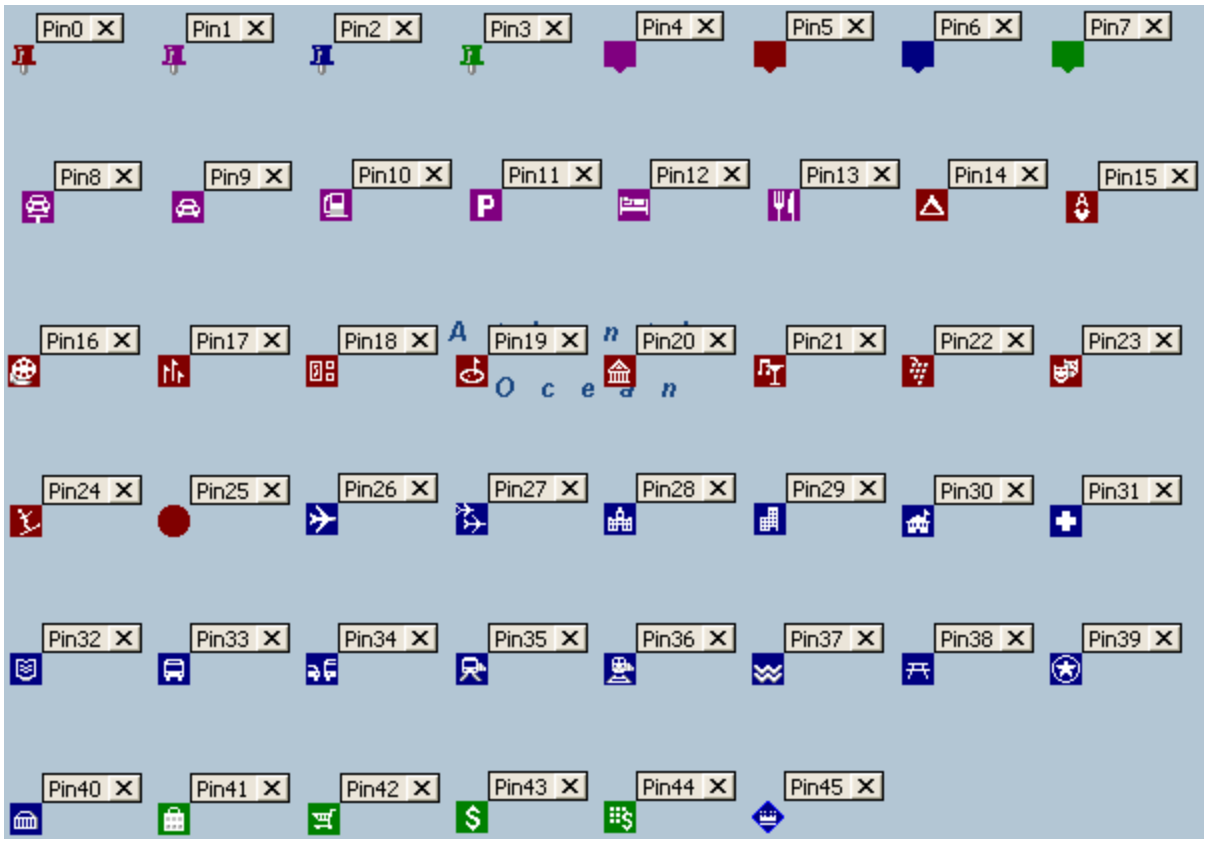
Symbols in MapPoint 2009:



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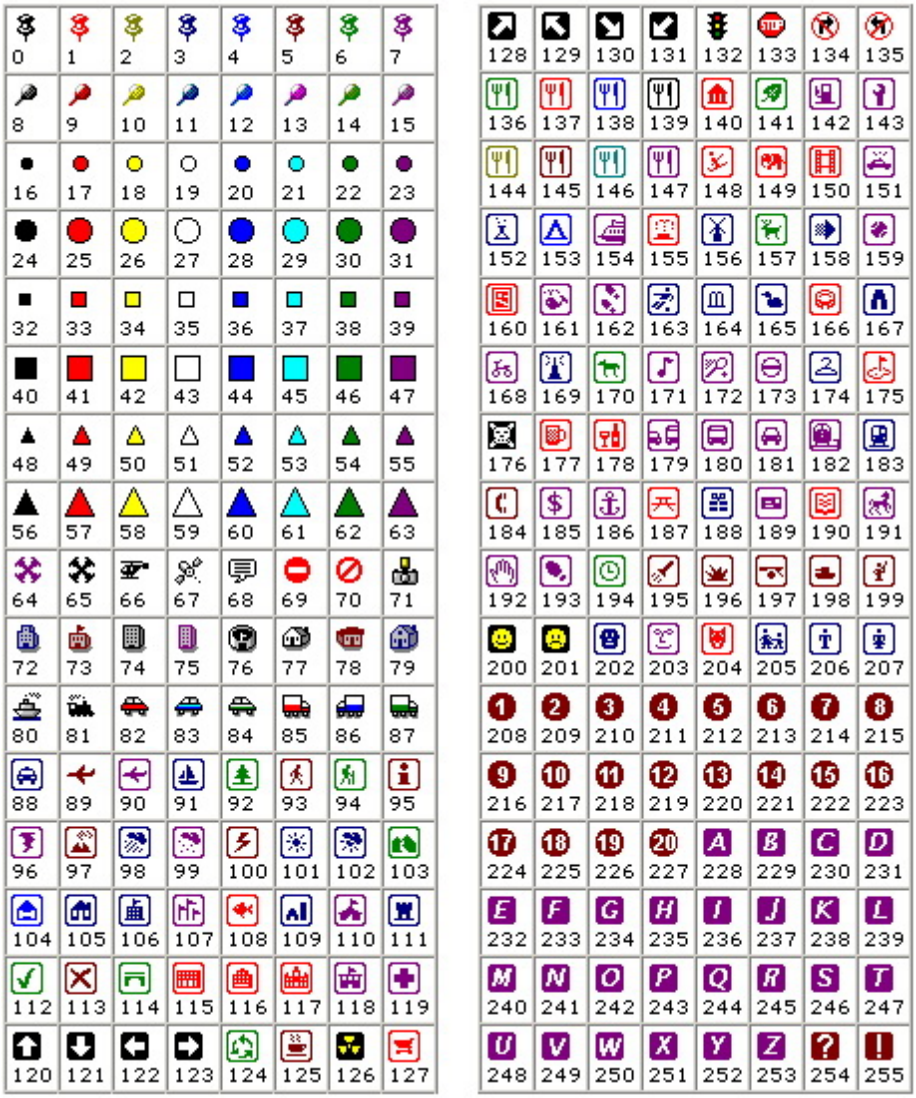
Symbols in MapPoint 2006 and below:



5.2 Map Display

The Map Display parameters control how a map route is displayed.

Parameters	**Values** (bold values are default)	**Description**
LOAD_MAP	filename	Loads a saved map from a file
SAVE_MAP	filename	Saves the current map, with waypoints, and all other objects to file
SHOW_MAP	**ON** OFF	Specifies whether the map will be displayed
MAP_STYLE	**DATA** POLITICAL ROAD ROAD_DATA	Specifies the map style

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	TERRAIN	
ITINERARY_VISIBLE	**ON** OFF	Specifies whether the route itinerary is visible
TOOLBARS	**ON** OFF	Specifies whether the MapPoint toolbars are displayed when a map is launched
PANE_STATE	LEGEND NEARBY_PLACES **ROUTE_PLANNER** NONE	Specifies the window pane displayed on the left side of the map and directions
WINDOW_STATE	MINIMIZED **MAXIMIZED** NORMAL	Specifies the R:Magellan window state when the map is displayed
FORM_CAPTION	value	Specifies text to appear in the form caption after "R:Magellan"

5.3 Printing Maps

The Printing Maps parameters control how a map route is printed. A map can be printed while you are viewing the map as well as through the command syntax parameters.

When you are viewing the map in the R:Magellan window, right-click anywhere in the directions panel, select "Edit" or "Open" and click on the "Print" icon to print different selected information. The following Print options are available:

- Select appropriate printer
- Print to file
- Print Current Map View
- Print Driving Directions Only
- Print Turn-by-Turn Maps
- Strip Maps
- Selected Map Area
- Highlighted Places Maps
  - Include Overview Map
- Number of Copies
- Title (Optional)
- Map Quality (Draft, Normal, Presentation)
  - Print Faxable Map
- More Options:
  - Print Route in as few pages as possible
  - Print high-detail strip maps using more pages
  - Print each stop on a separate page
  - Print each day on a separate page
  - Print a new page every [nnnn] miles
  - Print a new page every [nn] hours
  - Include Summary Statistics
  - Automatically Select Page Orientation

Print Parameters

Parameters	**Values** (bold values are default)	**Description**
PRINT_MAP	ON **OFF**	Specifies whether the map will be printed
PRINT_TITLE	text value	Specifies the text title
PRINT_COPIES	integer value	Specifies the number of copies
INCLUDE_OVERVIEW	ON **OFF**	Indicates whether the Overview Map is included in the printout.
INCLUDE_LEGEND	ON **OFF**	Indicates whether the map legend is included in the printout.

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PRINT_AREA	**MAP** DIRECTIONS TURN_BY_TURN STRIP_MAPS SELECTED_AREA HIGHLIGHTED_PLACES FULL_PAGE	**MAP** - prints the area of the map currently displayed on the screen **DIRECTIONS** - prints the driving directions as text in Portrait mode; no maps are printed **TURN_BY_TURN** - prints turn-by-turn maps in Portrait mode; miniature maps showing the intersections of every turn along the route **STRIP_MAPS** - prints strip maps in Landscape mode, one page per route segment, with a strip map displayed on the left side of each page and the corresponding driving directions on the right **SELECTED_AREA** - prints only the selected area of the map **HIGHLIGHTED_PLACES** - prints a street-level map for each highlighted place and Pushpin, along with any associated Pushpin text **FULL_PAGE** - prints extended maps to use a full page
PRINT_QUALITY	**NORMAL** DRAFT PRESENTATION	Specifies the resolution. DRAFT is low quality and PRESENTATION is high quality.
PRINT_ORIENTATION	**PORTRAIT** LANDSCAPE AUTO	Specifies whether a map prints vertically, horizontally, or automatically on a page
COLLATE	ON **OFF**	Specifies whether multiple copies will print in pre-sorted order
FAXABLE	ON **OFF**	Indicates whether to print a black and white map that is suitable for faxing. If ON, the printed map is faxable. Default value is OFF.

5.4 Return Variables

After the Plugin is launched, return variables are calculated for the total distance, trip duration, driving time, an estimated trip cost, longitude and latitude for each address, the distance traveled between the addresses, and the number of addresses provided. The first address listed is the origin. Each following address provided will be listed a destination on the map, incrementing by 1. A latitude and longitude variable is generated for each address given.

A distance variable is generated from the origin to the first destination. For each additional address provided, a distance variable is generated between those destinations. An elapsed distance is also provided from the origin to each destination on the route. The number of variables returned depend on the number of address parameters you insert into the PLUGIN command.

Variable Name	Data Type	Description
vDrivingDistance	DOUBLE	Total trip distance in miles
vTripDuration	INTEGER	Total trip duration in minutes (driving and not driving)
vDrivingTime	INTEGER	Total driving time in minutes
vTripCost	CURRENCY	Total estimated trip cost
vOriginLat	TEXT	Latitude coordinate for the origin
vOriginLong	TEXT	Longitude coordinate for origin
vOriginAddress	TEXT	Address for origin
vDest1Lat	TEXT	Latitude coordinate for first destination
vDest1Long	TEXT	Longitude coordinate for first destination
vDest1Addr	TEXT	Address for first destination
vDest2Lat	TEXT	Latitude coordinate for second destination
vDest2Long	TEXT	Longitude coordinate for second destination
vDest2Addr	TEXT	Address for second destination

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vDest1Dist	DOUBLE	Distance in miles from origin to first destination
vDest2Dist	DOUBLE	Distance in miles from first destination to second
vDest1Elapsed	DOUBLE	Distance in miles from origin to first destination
vDest2Elapsed	DOUBLE	Distance in miles from origin to second destination
vDestCount	INTEGER	Number of addresses in map route

5.5 Examples

5.5.1 Example 1

```
-- To launch a mapped route from the old Microrim headquarters to the
-- R:BASE Technologies, Inc. headquarters and save the map to a file

SET VAR vStartAddress TEXT = +
'#CAPTION MICRORIM##SYMBOL 74#15395 SE 30th Place, Bellevue, WA 98007'

SET VAR vEndAddress TEXT = +
'#CAPTION RBTI##SYMBOL 75#3935 Old William Penn Highway, Murrysville, PA
15668'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|SHOW_MAP ON +
|PANE_STATE NONE +
|TOOLBARS ON +
|WINDOW_STATE NORMAL +
|ROUTE_CALCULATION ON +
|ITINERARY_VISIBLE OFF +
|DRIVING_COST_UNITS 1 +
|DRIVING_COST $3.15 +
|MAP_STYLE ROAD|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
CLEAR VAR vPlugin, vStartAddress, vEndAddress
RETURN

--the following variables are returned
vDrivingDistance   = 2540.4                                  DOUBLE
vTripDuration      = 6220                                    INTEGER
vDrivingTime       = 2380                                    INTEGER
vTripCost          = $709.80                                 CURRENCY

vOriginLat         = 47.582494° North                        TEXT
vOriginLong        = 122.13518° West                         TEXT
vDest1Lat          = 40.428355° North                        TEXT
vDest1Long         = 79.695849° West                         TEXT

vDest1Elapsed      = 2540.4                                  DOUBLE
vDest1Dist         = 2540.4                                  DOUBLE
vDestCount         = 2                                       INTEGER
```

The following map is launched:

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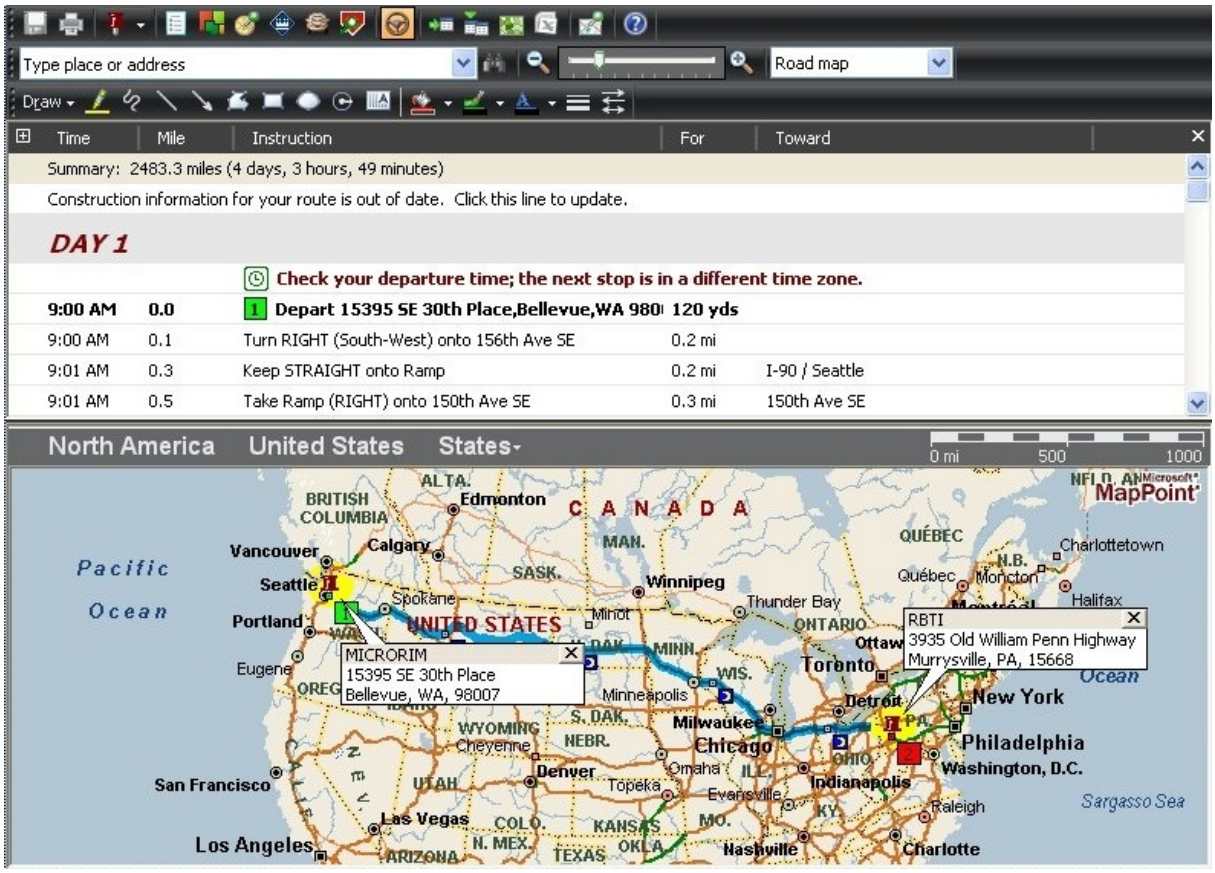

5.5.2 Example 2

```
-- To launch a mapped route from the western most point in the
-- United States (contiguous) to the Alamo in Texas, to the steps
-- of the U.S. Supreme Court, to the southern most point of the
-- United States (contiguous)

SET VAR vStartAddress TEXT = +
'#CAPTION Western Most Point##SYMBOL 92##DISPLAY NAME#COORDINATES 48.16350
° NORTH~124.7310 ° WEST'

SET VAR vSecondAddress TEXT = +
'#CAPTION The Alamo##SYMBOL 78##DISPLAY NAME#300 Alamo Plaza, San Antonio,
Texas 78205'

SET VAR vThirdAddress TEXT = +
'#CAPTION US Supreme Court##SYMBOL 117##DISPLAY NAME#131 1st Street,
Washington, DC 20002'

SET VAR vEndAddress TEXT = +
'#CAPTION Southern Most Point##SYMBOL 108##DISPLAY NAME#COORDINATES
24.5441~-81.8053'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|SHOW_MAP ON +
```

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```
|PANE_STATE NONE +
|TOOLBARS ON +
|WINDOW_STATE NORMAL +
|ROUTE_CALCULATION ON +
|ITINERARY_VISIBLE ON +
|DRIVING_COST_UNITS 1 +
|DRIVING_COST $3.15 +
|MAP_STYLE ROAD|' + +
.vStartAddress + '|' + .vSecondAddress + '|' + .vThirdAddress + '|' +
.vEndAddress)
&vPlugin
CLEAR VAR  vPlugin, vStartAddress, vSecondAddress, vThirdAddress,
vEndAddress
RETURN

--the following variables are returned
vDrivingDistance   = 5263.                                  DOUBLE
vTripDuration      = 14812                                  INTEGER
vDrivingTime       = 5194                                   INTEGER
vTripCost          = $1,492.31                              CURRENCY

vOriginLat         = 48.163509° North                       TEXT
vOriginLong        = 124.731008° West                       TEXT
vDest1Lat          = 29.425189° North                       TEXT
vDest1Long         = 98.486464° West                        TEXT
vDest2Lat          = 38.891344° North                       TEXT
vDest2Long         = 77.005844° West                        TEXT
vDest3Lat          = 24.544106° North                       TEXT
vDest3Long         = 81.805297° West                        TEXT

vDest1Elapsed      = 2431.                                  DOUBLE
vDest1Dist         = 2431.                                  DOUBLE
vDest2Elapsed      = 4036.2                                 DOUBLE
vDest2Dist         = 1605.2                                 DOUBLE
vDest3Elapsed      = 5263.                                  DOUBLE
vDest3Dist         = 1226.8                                 DOUBLE

vDestCount         = 4                                      INTEGER
```

The following map is launched:

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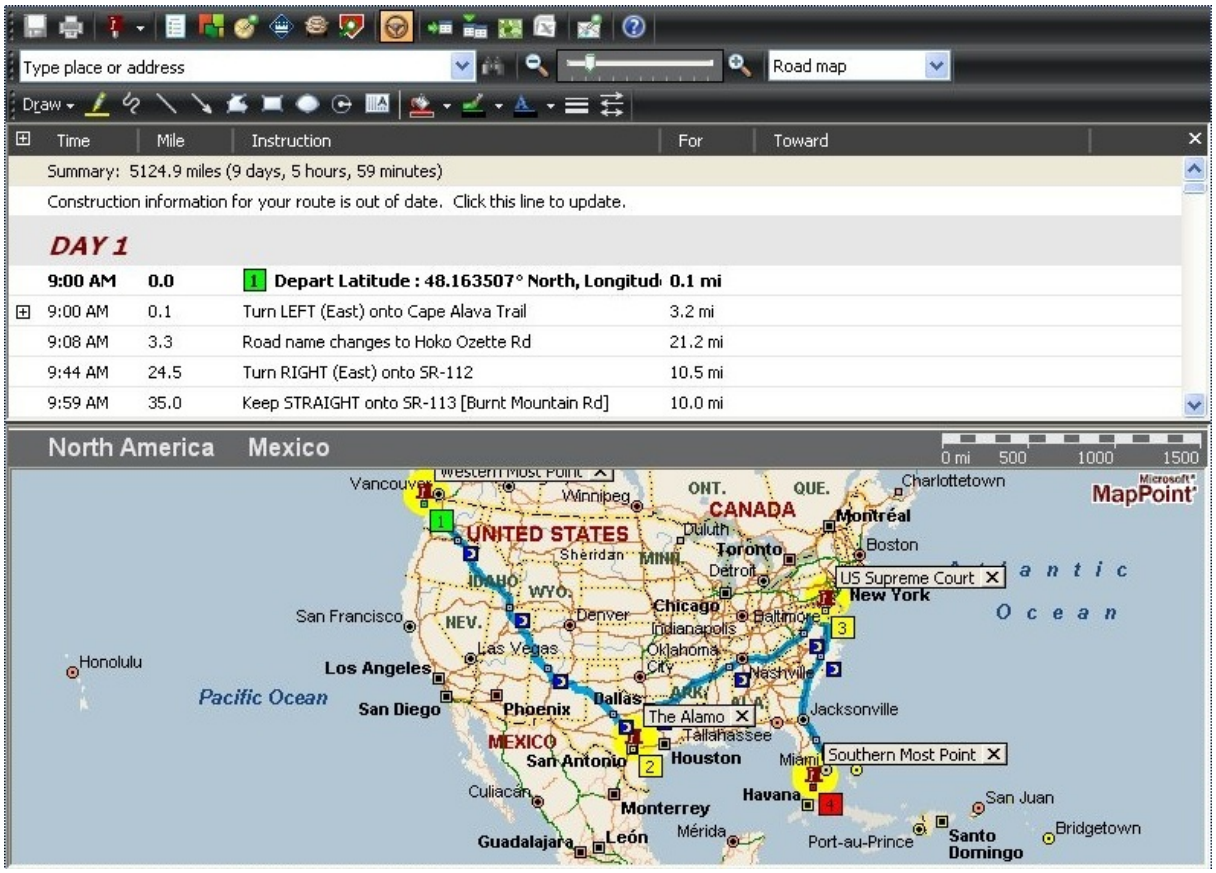

5.5.3 Example 3

-- To launch a mapped route from the Pittsburgh International Airport
-- to the Annual R:BASE Conference

```
SET VAR vStartAddress TEXT = +
'#CAPTION PGH Airport##SYMBOL 90##DISPLAY NAME#COORDINATES 40.49620~-
80.25425'

SET VAR vEndAddress TEXT = +
'#CAPTION R:BASE Conference##SYMBOL 200##DISPLAY NAME#3962 William Penn
Highway, Monroeville, PA 15146'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|SHOW_MAP ON +
|PANE_STATE NONE +
|TOOLBARS ON +
|WINDOW_STATE NORMAL +
|ROUTE_CALCULATION ON +
|ITINERARY_VISIBLE ON +
|DRIVING_COST_UNITS 1 +
|DRIVING_COST $3.15 +
|MAP_STYLE ROAD +
|INCLUDE_OVERVIEW ON +
```

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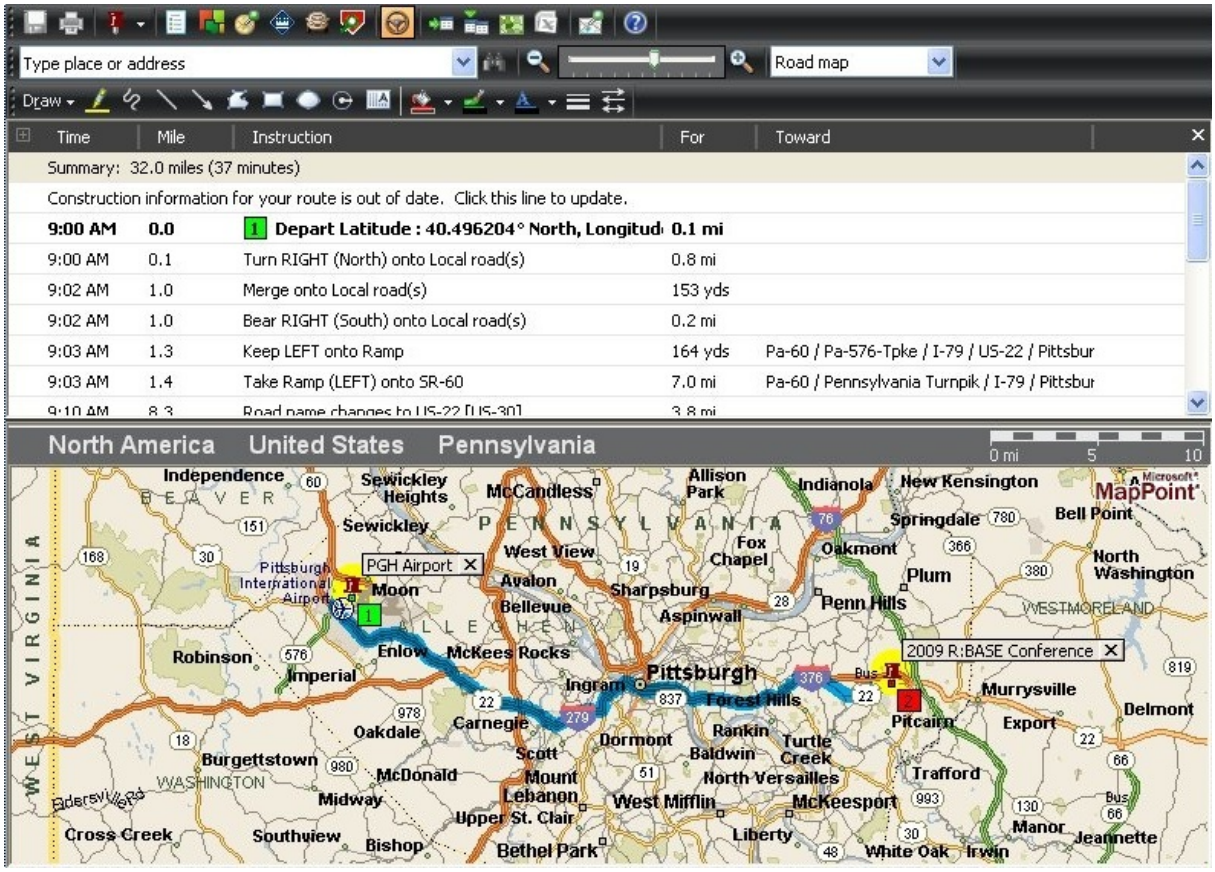
```
|INCLUDE_LEGEND ON +
|PRINT_AREA TURN_BY_TURN +
|PRINT_TITLE Printing MAP Using R:Magellan! +
|PRINT_ORIENTATION LANDSCAPE|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
RETURN

--the following variables are returned
vDrivingDistance    = 31.1                                  DOUBLE
vTripDuration       = 42                                    INTEGER
vDrivingTime        = 42                                    INTEGER
vTripCost           = $11.09                                CURRENCY

vOriginLat          = 40.496204° North                      TEXT
vOriginLong         = 80.254246° West                       TEXT
vDest1Lat           = 40.431077° North                      TEXT
vDest1Long          = 79.792183° West                       TEXT

vDest1Elapsed       = 31.1                                  DOUBLE
vDest1Dist          = 31.1                                  DOUBLE
vDestCount          = 2                                     INTEGER
```

The following map is launched:



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5.5.4 Example 4

```
-- To create a mapped route from the Pittsburgh International Airport
-- to the Annual R:BASE Conference, and then saved the route to a map file

SET VAR vStartAddress TEXT = +
'#CAPTION PGH Airport##SYMBOL 90##DISPLAY NAME#COORDINATES 40.49620~-
80.25425'

SET VAR vEndAddress TEXT = +
'#CAPTION R:BASE Conference##SYMBOL 200##DISPLAY NAME#3962 William Penn
Highway, Monroeville, PA 15146'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|ROUTE_CALCULATION ON +
|DRIVING_COST_UNITS 1 +
|DRIVING_COST $3.15 +
|MAP_STYLE ROAD +
|SHOW_MAP OFF +
|SAVE_MAP C:\RBTI\Conference.ptm|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
CLEAR VAR vPlugin, vStartAddress, vEndAddress
RETURN
```

5.5.5 Example 5

```
-- To load a map file

PLUGIN RMagellan vResult +
|LOAD_MAP C:\RBTI\RBTI.ptm +
|SHOW_MAP ON
```

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Part VI

6 Working With Bing Maps

The following details the specific use of R:Magellan with Bing Maps.

Syntax:

```
PLUGIN RMagellan 'VarName|<Parameter Value>'
```

Where:

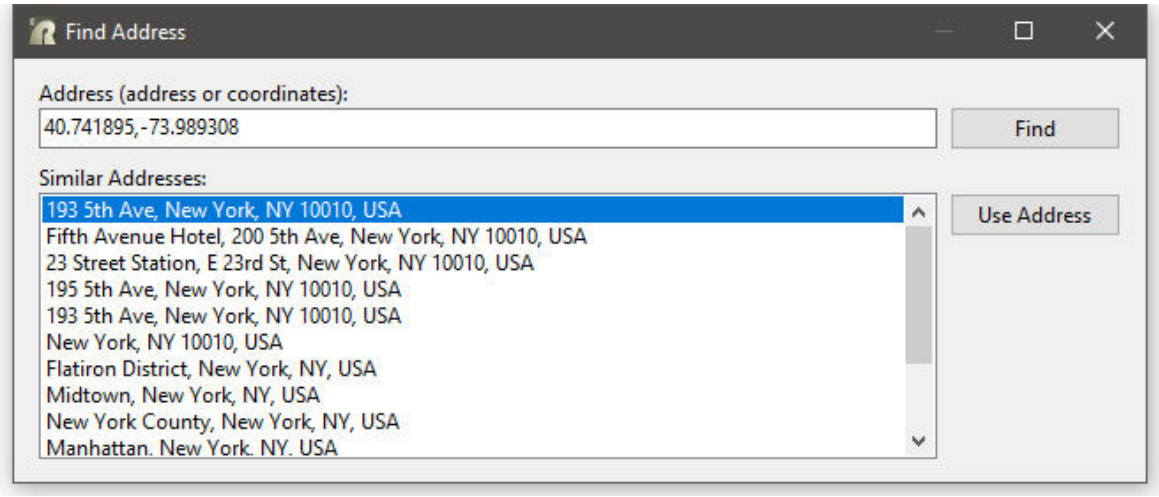
"**VarName**" is the resulting text variable which returns the status, such as 'OK' or the exact -ERROR- message.

"**Parameter**" is the available option recognized by the Plugin.

"**Value**" is the specific value used by the available parameter.

Notes:

- The R:Magellan parameters can be any number of values, but a starting location and ending location must be specified in order for a mapped route to be provided. Each address parameter must be separated with the pipe "**|**" character.
- A Bing Maps API key must be acquired and included with the PLUGIN syntax in order to use Bing's map and direction services with R:Magellan. See "Accessing Bing Maps Services" below.
- R:Magellan uses Microsoft Bing Maps Version 8 Control (V8).
- In the event an address or coordinates has multiple hits or is invalid, the "Find Address" dialog will be displayed to specify a different address. The "Address" field and "Find" button can be used to perform multiple searches for repeated search inquiries, where the user can enhance the address field contents to pinpoint the desired destination. Once a desired address is located and highlighted, the "Use Address" button is selected to use that destination.



Accessing Bing Maps Services

1. A Microsoft account must be created to access Bing Maps services. Please visit: https://msdn.microsoft.com/en-us/library/ff428642.aspx
2. After an account is created, visit the Bing Maps Dev Center to create a key. Please visit: https://www.bingmapsportal.com/Announcement
3. The key types are Trial, Basic, and Corporate. The Basic key has 125,000 free queries per year. There's also a limitation where a map query is denied (at random times). In case a query is denied RMagellan will retry for up to 10 times. Denial of queries don't happen in Corporate keys. The

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limitations of the Basic key also applies to the graphical maps. At random times, the graphical map may not show the correct trip and instead show a base map of the world.

4. Copy/paste the key into the R:BASE PLUGIN syntax for R:Magellan, specifically for the KEY parameter.

6.1 Map Calculation

The Map Calculation parameters control how a map route is calculated.

Parameters	**Values** (bold values are default)	**Description**
MAP_ENGINE	BING_MAPS	Specifies Bing Maps services will be used
KEY	key value	Specifies the API key
ROUTE_CALCULATION	ON OFF	Specifies whether the route is calculated
COORDINATES	value	Specifies latitude and longitude coordinates are used for a location, rather than an address
DIRECTIONS_FILE	file name	Specifies the file name to load the turn by turn navigation. The output can be in XML or CSV format depending on destination file extension.
DEGREES	**ON** OFF	Specifies if the latitude/longitude return variables are returned as degrees (ON) or a DOUBLE data type values (OFF).
OPTIMIZATION	ON OFF	Specifies whether optimization is used. With optimization set ON, you can reorder the intermediate stops on your route so that your travel time between the start and end points is the most time-efficient.
ROUTE_OPTIMIZATION_TYPE	DISTANCE TIME TIME_WITH_TRAFFIC	Specifies to optimize the route using the shortest distance, the shortest time, or shortest time with traffic
SHOW_PROGRESS	ON **OFF**	Specifies whether a progress window is displayed while calculations are processing.
SHOW_MAP	ON OFF	Specifies whether the map will be displayed (required for Google Maps)
WINDOW_STATE	MINIMIZED MAXIMIZED **NORMAL**	Specifies the R:Magellan window state when the map is displayed
FORM_CAPTION	value	Specifies text to appear in the form caption after "R:Magellan"
TRIPINFO_BAR	ON **OFF**	Specifies to display the "Trip Information" bar which contains details for each waypoint
NAVIGATION_BAR	ON **OFF**	Specifies to display the "Navigation" bar which contains details for each waypoint. The Navigation bar will only display if the TRIPINFO_BAR parameter is also ON.

Waypoint	value	The waypoint address can be defined as a valid street address or by Latitude and Longitude coordinates. When assigning a route, the waypoint addresses should be listed from start to finish in the order of arrival. The starting and ending points, would be listed first and last. Or, you could use the OPTIMIZATION parameter above. The street address value must contain a street number and name followed by a comma, then the city followed by another comma, and then the state and zip code. A correct address parameter example for R:BASE Technologies, Inc. is: 3935 Old William Penn Highway, Murrysville, PA 15668

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		The above street address format is specific to the United States. In other countries, the address format will vary. For example, the address format for a waypoint address in Sweden would begin with the street name and street number followed by a comma, then the zip code, followed by another comma, and then the city: Hästholmsvägen 32, 131 30, NACKA The waypoint address can also be defined as latitude and longitude coordinates. The coordinates must be defined in the decimal format, but as the TEXT data type. The accuracy of your location depends on the number of decimal values. COORDINATES 24.54410,-81.80530

6.2 Return Variables

After the Plugin is launched, return variables are calculated for the total distance, trip duration, driving time, an estimated trip cost, longitude and latitude for each address, the origin address and destination addresses, the distance traveled between the addresses, and the number of addresses provided. The first address listed is the origin. Each following address provided will be listed a destination on the map, incrementing by 1. A latitude and longitude variable is generated for each address given.

A distance variable is generated from the origin to the first destination. For each additional address provided, a distance variable is generated between those destinations. An elapsed distance is also provided from the origin to each destination on the route. The number of variables returned depend on the number of address parameters you insert into the PLUGIN command.

Variable Name	Data Type	Description
vDrivingDistance	DOUBLE	Total trip distance in miles
vTripDuration	INTEGER	Total trip duration in minutes
vOriginLat	TEXT	Latitude coordinate for the origin
vOriginLong	TEXT	Longitude coordinate for origin
vOriginAddress	TEXT	Address for origin
vDest1Lat	TEXT	Latitude coordinate for first destination
vDest1Long	TEXT	Longitude coordinate for first destination
vDest1Addr	TEXT	Address for first destination
vDest2Lat	TEXT	Latitude coordinate for second destination
vDest2Long	TEXT	Longitude coordinate for second destination
vDest2Addr	TEXT	Address for second destination
vDest1Dist	DOUBLE	Distance in miles from origin to first destination
vDest2Dist	DOUBLE	Distance in miles from first destination to second
vDest1Elapsed	DOUBLE	Distance in miles from origin to first destination
vDest2Elapsed	DOUBLE	Distance in miles from origin to second destination
vDestCount	INTEGER	Number of addresses in map route
vResolvedAddr	TEXT	If a calculated route contains invalid waypoints, where resolved addresses were selected with the "Use Address" button, the variable will contain a text string of the address variable names that were resolved, (e.g. 'vDest3Addr,vDest5Addr'). If vResolvedAddr is NULL, then no invalid and resolved address processes occurred.
vNavURL	TEXT	URL based on the waypoints, which can be sent by email to a driver's phone for navigation

Miles/Kilometers
The driving distance is provided in miles by default. If the kilometers unit is required, the global variable RMAGELLAN_DIST_UNIT can be used to modify the vDrivingDistance end result. If RMAGELLAN_DIST_UNIT is set to 'KM', then distances will be provided in kilometers. Any value other

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than 'KM' (including NULL or if the variable is undefined) will result to distances expressed in miles. Example:

```
SET VAR RMAGELLAN_DIST_UNIT TEXT = 'KM'
```

6.3 Examples

6.3.1 Example 1

```
-- To launch a mapped route from the old Microrim headquarters to the
-- R:BASE Technologies, Inc. headquarters and save the directions to a file

SET VAR vStartAddress TEXT = +
'15395 SE 30th Place, Bellevue, WA 98007'

SET VAR vEndAddress TEXT = +
'3935 Old William Penn Highway, Murrysville, PA 15668'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE BING_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|SHOW_MAP ON +
|TRIPINFO_BAR ON +
|NAVIGATION_BAR OFF +
|FORM_CAPTION From Microrim to R:BASE Technologies +
|DIRECTIONS_FILE C:\Directions\Trip_01.xml +
|ROUTE_CALCULATION ON|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
CLEAR VAR vPlugin, vStartAddress, vEndAddress
RETURN
```

The following variables are returned:

```
vNavURL            = http://bing.com/maps/default.a          TEXT
                     spx?mode=D&rtp=pos.47.582602_-
                     122.1353_15395+SE+30th+Pl%2C+B
                     ellevue%2C+WA+98007~pos.40.428
                     07_-79.69586_3935+Old+William+
                     Penn+Hwy%2C+Murrysville%2C+PA+
                     15668
vDrivingDistance   = 2480.1                               DOUBLE
vTripDuration      = 2147                                 INTEGER
vDrivingTime       = 2147                                 INTEGER
vTripCost          = $0.00                                CURRENCY
vOriginAddr        = 15395 SE 30th Pl, Bellevue,          TEXT
                     WA 98007
vDest1Addr         = 3935 Old William Penn Hwy,           TEXT
                     Murrysville, PA 15668
vResolvedAddr      =                                      TEXT
vOriginLat         = 47.582602                            DOUBLE
vDest1Lat          = 40.42807                             DOUBLE
vOriginLong        = -122.1353                            DOUBLE
vDest1Long         = -79.69586                            DOUBLE
vDest1Elapsed      = 2480.1                               DOUBLE
vDest1Dist         = 2480.1                               DOUBLE
```

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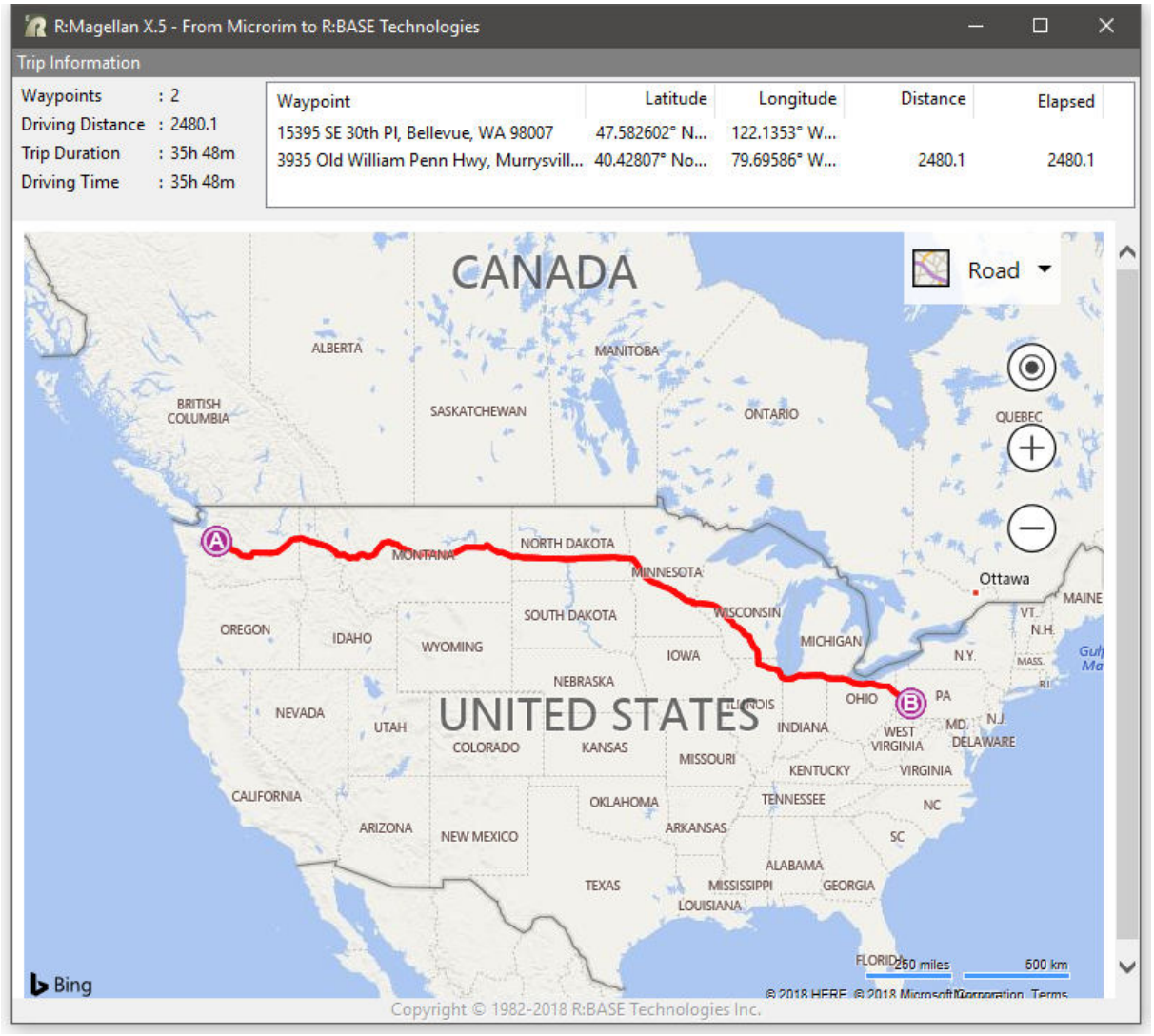
```
vDestCount          = 2                                    INTEGER
vResult             = OK                                   TEXT
```

The following map is launched:



6.3.2 Example 2

```
-- To launch a mapped route from the western most point in the
-- United States (contiguous) to the Alamo in Texas, to the steps
-- of the U.S. Supreme Court, to the southern most point of the
-- United States (contiguous)

SET VAR vStartAddress TEXT = +
'COORDINATES 48.16350,-124.7310'

SET VAR vSecondAddress TEXT = +
'300 Alamo Plaza, San Antonio, Texas 78205'

SET VAR vThirdAddress TEXT = +
```

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```
'131 1st Street, Washington, DC 20002'

SET VAR vEndAddress TEXT = +
'COORDINATES 24.5441,-81.8053'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE BING_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|FORM_CAPTION Travel USA +
|SHOW_MAP ON+
|TRIPINFO_BAR ON +
|NAVIGATION_BAR ON +
|ROUTE_CALCULATION ON +
|SHOW_PROGRESS OFF' + +
.vStartAddress + '|' + .vSecondAddress + '|' + .vThirdAddress + '|' +
.vEndAddress)
&vPlugin
CLEAR VAR  vPlugin, vStartAddress, vSecondAddress, vThirdAddress,
vEndAddress
RETURN
```

The following variables are returned:

```
vNavURL            = http://bing.com/maps/default.a          TEXT
                     spx?mode=D&rtp=pos.41.931896_-
                     79.306381_16350%2C+PA~pos.29.4
                     2577_-98.48578_300+Alamo+Plaza
                     %2C+San+Antonio%2C+TX+78205~po
                     s.38.891339_-77.005852_131+1st
                     +St+NE%2C+Washington%2C+DC+200
                     02~pos.43.300117_-77.67942_Mon
                     roe+County
vDrivingDistance   = 3598.7                              DOUBLE
vTripDuration      = 3130                                INTEGER
vDrivingTime       = 3130                                INTEGER
vTripCost          = $0.00                               CURRENCY
vOriginAddr        = 16350, PA                           TEXT
vDest1Addr         = 300 Alamo Plaza, San Antonio,       TEXT
                     TX 78205
vDest2Addr         = 131 1st St NE, Washington, DC       TEXT
                     20002
vDest3Addr         = Monroe County                       TEXT
vResolvedAddr      =                                     TEXT
vOriginLat         = 41.931896° North                    TEXT
vDest1Lat          = 29.42577° North                     TEXT
vDest2Lat          = 38.891339° North                    TEXT
vDest3Lat          = 43.300117° North                    TEXT
vOriginLong        = 79.306381° West                     TEXT
vDest1Long         = 98.48578° West                      TEXT
vDest2Long         = 77.005852° West                     TEXT
vDest3Long         = 77.67942° West                      TEXT
vDest1Elapsed      = 1600.2                              DOUBLE
vDest1Dist         = 1600.2                              DOUBLE
vDest2Elapsed      = 3207.8                              DOUBLE
vDest2Dist         = 1607.6                              DOUBLE
```

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```
vDest3Elapsed      = 3598.7                                    DOUBLE
vDest3Dist         = 390.9                                     DOUBLE
vDestCount         = 4                                         INTEGER
vResult            = OK                                        TEXT
```

6.3.3 Example 3

```
-- To launch a mapped route from the Pittsburgh International Airport
-- to the R:BASE Conference, with degrees turned off

SET VAR vStartAddress TEXT = +
'COORDINATES 40.49620,-80.25425'

SET VAR vEndAddress TEXT = +
'3962 William Penn Highway, Monroeville, PA 15146'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE BING_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|OPTIMIZATION ON +
|SHOW_MAP ON +
|TRIPINFO_BAR ON +
|NAVIGATION_BAR ON +
|FORM_CAPTION From Airport to the R:BASE Conference +
|DEGREES OFF|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
RETURN
```

The following variables are returned:

```
vNavURL            = http://bing.com/maps/default.a          TEXT
                     spx?mode=D&rtp=pos.40.496_-80.
                     25528_1000+Airport+Blvd%2C+Pit
                     tsburgh%2C+PA+15231~pos.40.437
                     44_-79.77317_3962+William+Penn
                     +Hwy%2C+Monroeville%2C+PA+1514
                     6
vDrivingDistance   = 33.1                                    DOUBLE
vTripDuration      = 37                                      INTEGER
vDrivingTime       = 37                                      INTEGER
vTripCost          = $0.00                                   CURRENCY
vOriginAddr        = 1000 Airport Blvd,                      TEXT
                     Pittsburgh, PA 15231
vDest1Addr         = 3962 William Penn Hwy,                  TEXT
                     Monroeville, PA 15146
vResolvedAddr      =                                         TEXT
vOriginLat         = 40.496                                  DOUBLE
vDest1Lat          = 40.43744                                DOUBLE
vOriginLong        = -80.25528                               DOUBLE
vDest1Long         = -79.77317                               DOUBLE
vDest1Elapsed      = 33.1                                    DOUBLE
vDest1Dist         = 33.1                                    DOUBLE
vDestCount         = 2                                       INTEGER
```

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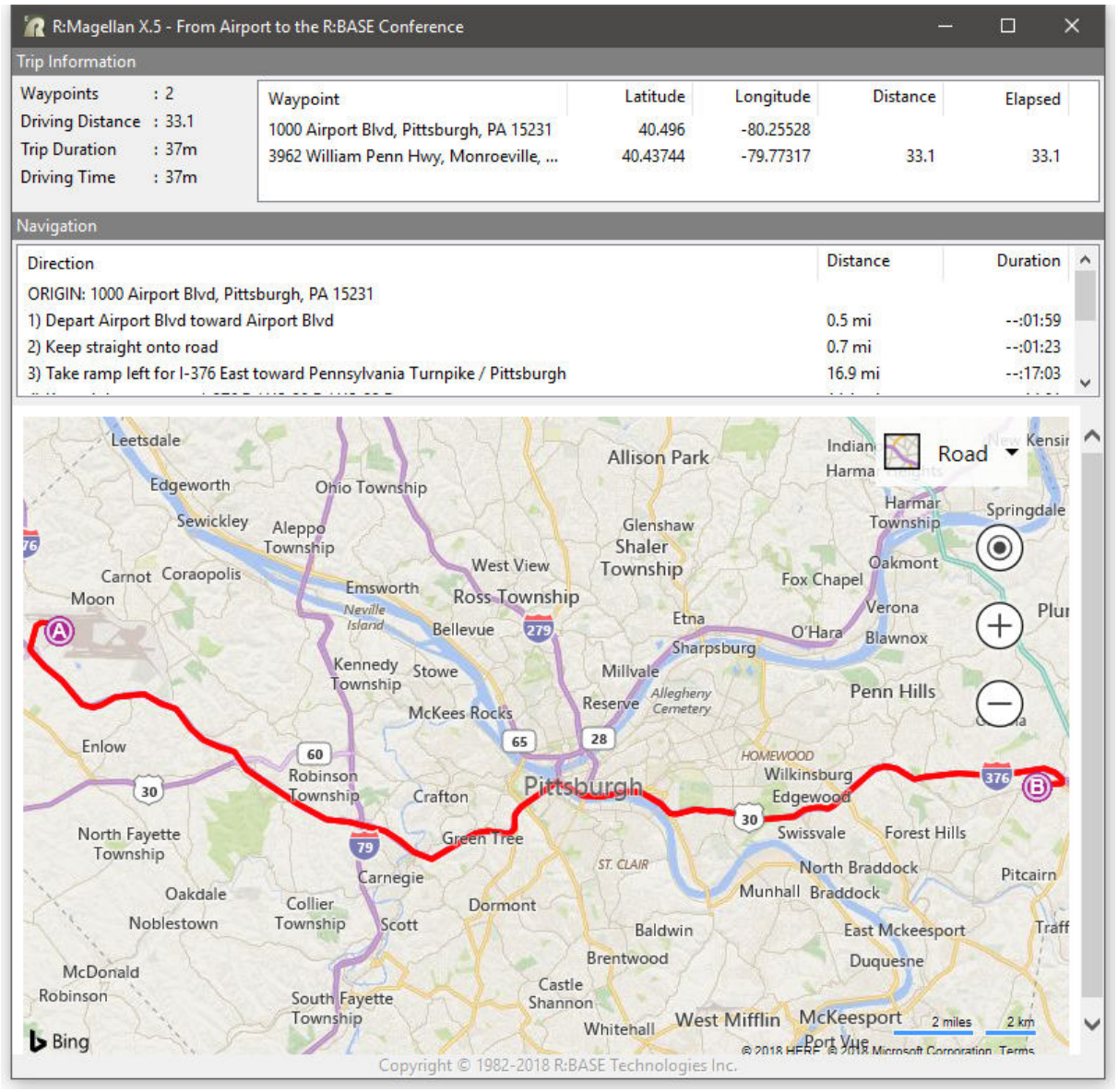
```
vResult          = OK                                    TEXT
```

The following map is launched:



6.3.4 Example 4

-- To launch a map displaying a single address

```
SET VAR vSingleAddress TEXT = +
'114 N Main St, Roswell, NM 88203'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE BING_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|SHOW_MAP ON +
```

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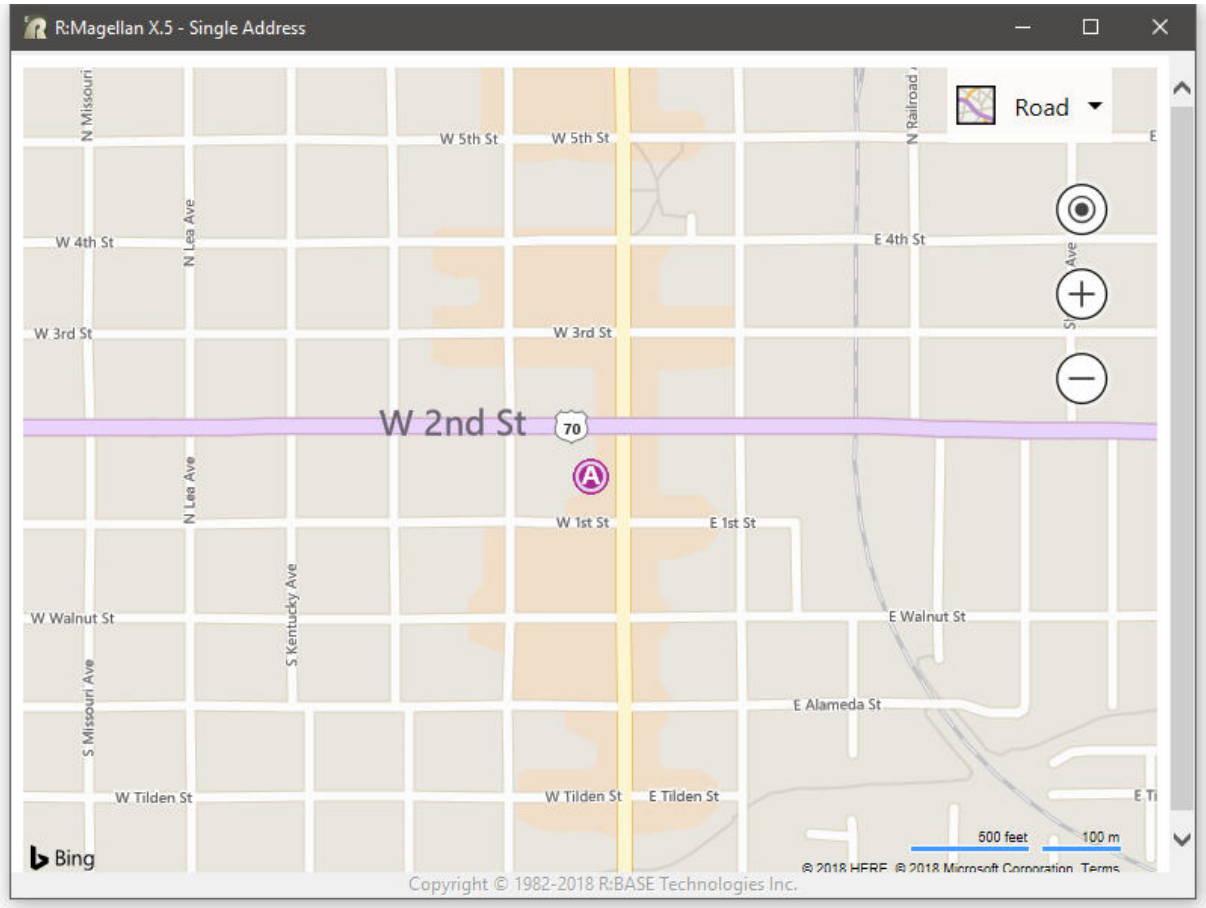
```
|TRIPINFO_BAR OFF +
|NAVIGATION_BAR OFF +
|FORM_CAPTION Single Address +
|' + .vSingleAddress)
&vPlugin
RETURN
```

The following variables are returned:

```
vNavURL            = http://bing.com/maps/default.a          TEXT
                     spx?mode=D&rtp=pos.33.39368_-1
                     04.52323_114+N+Main+St%2C+Rosw
                     ell%2C+NM+88203
vDrivingDistance   = 0.                                      DOUBLE
vTripDuration      = 0                                       INTEGER
vDrivingTime       = 0                                       INTEGER
vTripCost          = $0.00                                   CURRENCY
vOriginAddr        = 114 N Main St, Roswell, NM              TEXT
                     88203
vResolvedAddr      =                                         TEXT
vOriginLat         = 33.39368° North                         TEXT
vOriginLong        = 104.52323° West                         TEXT
vDestCount         = 1                                       INTEGER
vResult            = OK                                      TEXT
```

The following map is launched:



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Part VII

7 Working With Google Maps

The following details the specific use of R:Magellan with Google Maps.

Syntax:

```
PLUGIN RMagellan 'VarName|<Parameter Value>'
```

Where:

"**VarName**" is the resulting text variable which returns the status, such as 'OK' or the exact -ERROR- message.

"**Parameter**" is the available option recognized by the Plugin.

"**Value**" is the specific value used by the available parameter.

Notes:

- The R:Magellan parameters can be any number of values, but a starting location and ending location must be specified in order for a mapped route to be provided. Each address parameter must be separated with the pipe "**|**" character.
- A Google Maps "Directions API" key must be acquired and included with the PLUGIN syntax in order to use Google's map and direction services with R:Magellan. See "Accessing Google MAP Services" below.
- In order to utilize Google Maps, the OpenSSL Project files must installed on the computer as HTTPS is now a requirement of the map and geolocation APIs.

  OpenSSL:
  The OpenSSL Project is a collaborative effort to develop a robust, commercial-grade, full-featured, and Open Source toolkit implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) protocols.
  http://www.openssl.org/

  Win32 OpenSSL:
  Although the above site is Open Source, it is not user friendly as far as a Windows installation for general use. The Win32 OpenSSL Installation Project is dedicated to providing a simple installation of OpenSSL. It is easy to set up and easy to use through the simple, effective installer. Regardless of the Windows operating system, the Win32 installer must be used, not Win64.
  http://www.slproweb.com/products/Win32OpenSSL.html

  Once the OpenSSL libraries are installed, the required DLLs, libeay32.dll and ssleay32.dll, must be placed in the the R:BASE X.5 program directory or the runtime/compiled application directory. Although the DLLs may be placed into the operating system folder, it is advised to put the OpenSSL DLLs in the same folder as the applications that will use them. The reason is that different programs may have different SSL requirements.

- All PLUGIN commands MUST use the "SHOW_MAP ON" parameter, so a graphical map is displayed. This is Google's requirement. Using Directions data without displaying a map for which directions data was requested is prohibited. Additionally, calculation of directions generates copyrights and warnings which must be displayed to the user in some fashion. Additional information regarding the Directions API is available at the following URL:
  https://developers.google.com/maps/documentation/directions/intro/
- In the event an address or coordinates has multiple hits or is invalid, the "Find Address" dialog will be displayed to specify a different address. The "Address" field and "Find" button can be used to perform multiple searches for repeated search inquiries, where the user can enhance the address field contents to pinpoint the desired destination. Once a desired address is located and highlighted, the "Use Address" button is selected to use that destination.

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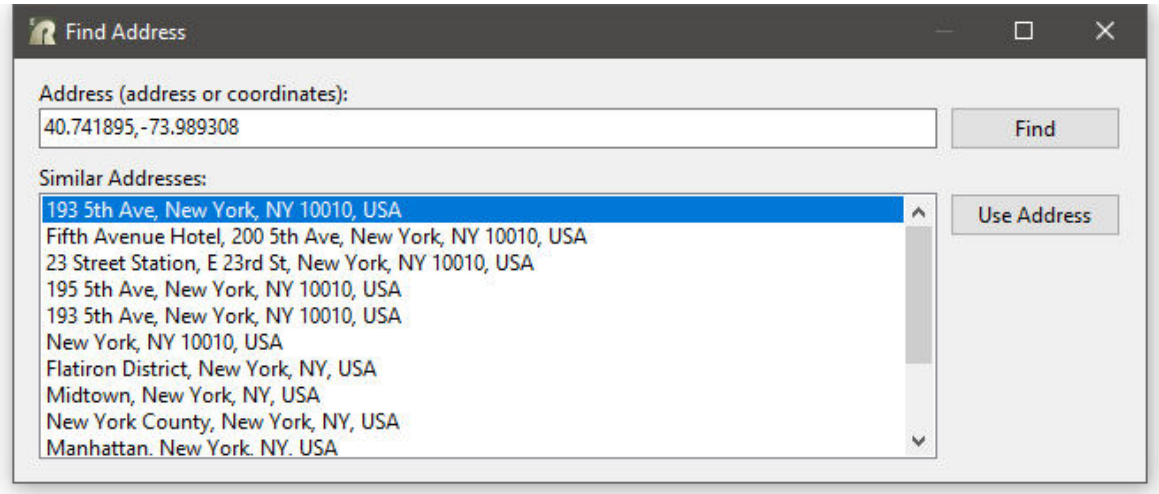

Accessing Google MAP Services

1. A Google account (GMail, etc.) must be created to access Google services and to use Google Maps. Please visit: https://accounts.google.com/
2. After an account is created, visit the Developers Console to create a project. Please visit: https://console.developers.google.com//flows/enableapi?apiid=directions_backend&keyType=SERVER_SIDE.
3. Only the Directions API is needed to use Google Maps with R:Magellan (Google Maps APIs > Directions API).
4. Enable the Directions API and create an access key.
5. Copy/paste the key into the R:BASE PLUGIN syntax for R:Magellan, specifically for the KEY parameter.

7.1 Map Calculation

The Map Calculation parameters control how a map route is calculated.

Parameters	**Values** (bold values are default)	**Description**
MAP_ENGINE	GOOGLE_MAPS	Specifies Google Maps services will be used
KEY	key value	Specifies the API key
ROUTE_CALCULATION	ON OFF	Specifies whether the route is calculated
COORDINATES	value	Specifies latitude and longitude coordinates are used for a location, rather than an address
DIRECTIONS_FILE	file name	Specifies the file name to load the turn by turn navigation. The output can be in XML or CSV format depending on destination file extension.
DEGREES	**ON** OFF	Specifies if the latitude/longitude return variables are returned as degrees (ON) or a DOUBLE data type values (OFF).
OPTIMIZATION	ON OFF	Specifies whether optimization is used. With optimization set ON, you can reorder the intermediate stops on your route so that your travel time between the start and end points is the most time-efficient.
SHOW_PROGRESS	ON **OFF**	Specifies whether a progress window is displayed while calculations are processing.
SHOW_MAP	ON OFF	Specifies whether the map will be displayed (required for Google Maps)

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WINDOW_STATE	MINIMIZED MAXIMIZED **NORMAL**	Specifies the R:Magellan window state when the map is displayed
FORM_CAPTION	value	Specifies text to appear in the form caption after "R:Magellan"
TRIPINFO_BAR	ON **OFF**	Specifies to display the "Trip Information" bar which contains details for each waypoint
NAVIGATION_BAR	ON **OFF**	Specifies to display the "Navigation" bar which contains details for each waypoint. The Navigation bar will only display if the TRIPINFO_BAR parameter is also ON.

Waypoint	value	The waypoint address can be defined as a valid street address or by Latitude and Longitude coordinates. When assigning a route, the waypoint addresses should be listed from start to finish in the order of arrival. The starting and ending points, would be listed first and last. Or, you could use the OPTIMIZATION parameter above. The street address value must contain a street number and name followed by a comma, then the city followed by another comma, and then the state and zip code. A correct address parameter example for R:BASE Technologies, Inc. is: 3935 Old William Penn Highway, Murrysville, PA 15668 The above street address format is specific to the United States. In other countries, the address format will vary. For example, the address format for a waypoint address in Sweden would begin with the street name and street number followed by a comma, then the zip code, followed by another comma, and then the city: Hästholmsvägen 32, 131 30, NACKA The waypoint address can also be defined as latitude and longitude coordinates. The coordinates must be defined in the decimal format, but as the TEXT data type. The accuracy of your location depends on the number of decimal values. COORDINATES 24.54410,-81.80530

7.2 Return Variables

After the Plugin is launched, return variables are calculated for the total distance, trip duration, driving time, an estimated trip cost, longitude and latitude for each address, the origin address and destination addresses, the distance traveled between the addresses, and the number of addresses provided. The first address listed is the origin. Each following address provided will be listed a destination on the map, incrementing by 1. A latitude and longitude variable is generated for each address given.

A distance variable is generated from the origin to the first destination. For each additional address provided, a distance variable is generated between those destinations. An elapsed distance is also provided from the origin to each destination on the route. The number of variables returned depend on the number of address parameters you insert into the PLUGIN command.

Variable Name	**Data Type**	**Description**
vDrivingDistance	DOUBLE	Total trip distance in miles
vTripDuration	INTEGER	Total trip duration in minutes
vOriginLat	TEXT	Latitude coordinate for the origin
vOriginLong	TEXT	Longitude coordinate for origin
vOriginAddress	TEXT	Address for origin
vDest1Lat	TEXT	Latitude coordinate for first destination
vDest1Long	TEXT	Longitude coordinate for first destination

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vDest1Addr	TEXT	Address for first destination
vDest2Lat	TEXT	Latitude coordinate for second destination
vDest2Long	TEXT	Longitude coordinate for second destination
vDest2Addr	TEXT	Address for second destination
vDest1Dist	DOUBLE	Distance in miles from origin to first destination
vDest2Dist	DOUBLE	Distance in miles from first destination to second
vDest1Elapsed	DOUBLE	Distance in miles from origin to first destination
vDest2Elapsed	DOUBLE	Distance in miles from origin to second destination
vDestCount	INTEGER	Number of addresses in map route
vResolvedAddr	TEXT	If a calculated route contains invalid waypoints, where resolved addresses were selected with the "Use Address" button, the variable will contain a text string of the address variable names that were resolved, (e.g. 'vDest3Addr,vDest5Addr'). If vResolvedAddr is NULL, then no invalid and resolved address processes occurred.
vNavURL	TEXT	URL based on the waypoints, which can be sent by email to a driver's phone for navigation

Miles/Kilometers
The driving distance is provided in miles by default. If the kilometers unit is required, the global variable RMAGELLAN_DIST_UNIT can be used to modify the vDrivingDistance end result. If RMAGELLAN_DIST_UNIT is set to 'KM', then distances will be provided in kilometers. Any value other than 'KM' (including NULL or if the variable is undefined) will result to distances expressed in miles. Example:

```
SET VAR RMAGELLAN_DIST_UNIT TEXT = 'KM'
```

7.3 Examples

7.3.1 Example 1

```
-- To launch a mapped route from the old Microrim headquarters to the
-- R:BASE Technologies, Inc. headquarters and save the directions to a file

SET VAR vStartAddress TEXT = +
'15395 SE 30th Place, Bellevue, WA 98007'

SET VAR vEndAddress TEXT = +
'3935 Old William Penn Highway, Murrysville, PA 15668'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE GOOGLE_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|SHOW_MAP ON +
|TRIPINFO_BAR ON +
|NAVIGATION_BAR OFF +
|FORM_CAPTION From Microrim to R:BASE Technologies +
|DIRECTIONS_FILE C:\Directions\Trip_01.csv +
|ROUTE_CALCULATION ON|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
CLEAR VAR vPlugin, vStartAddress, vEndAddress
RETURN
```

The following variables are returned:

```
vNavURL            = https://www.google.com/maps/di          TEXT
                     r/15395+SE+30th+Pl%2C+Bellevue
```

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```
                    %2C+WA+98007%2C+USA/3935+Old+W
                    illiam+Penn+Hwy%2C+Murrysville
                    %2C+PA+15668%2C+USA/am=t/
vDrivingDistance   = 2526.                                  DOUBLE
vTripDuration      = 2236                                   INTEGER
vDrivingTime       = 2236                                   INTEGER
vTripCost          = $0.00                                  CURRENCY
vOriginAddr        = 15395 SE 30th Pl, Bellevue,            TEXT
                     WA 98007, USA
vDest1Addr         = 3935 Old William Penn Hwy,             TEXT
                     Murrysville, PA 15668, USA
vResolvedAddr      =                                        TEXT
vOriginLat         = 47.582163° North                       TEXT
vDest1Lat          = 40.428307° North                       TEXT
vOriginLong        = 122.136611° West                       TEXT
vDest1Long         = 79.695816° West                        TEXT
vDest1Elapsed      = 2526.                                  DOUBLE
vDest1Dist         = 2526.                                  DOUBLE
vDestCount         = 2                                      INTEGER
vResult            = OK                                     TEXT
```

The following map is launched:

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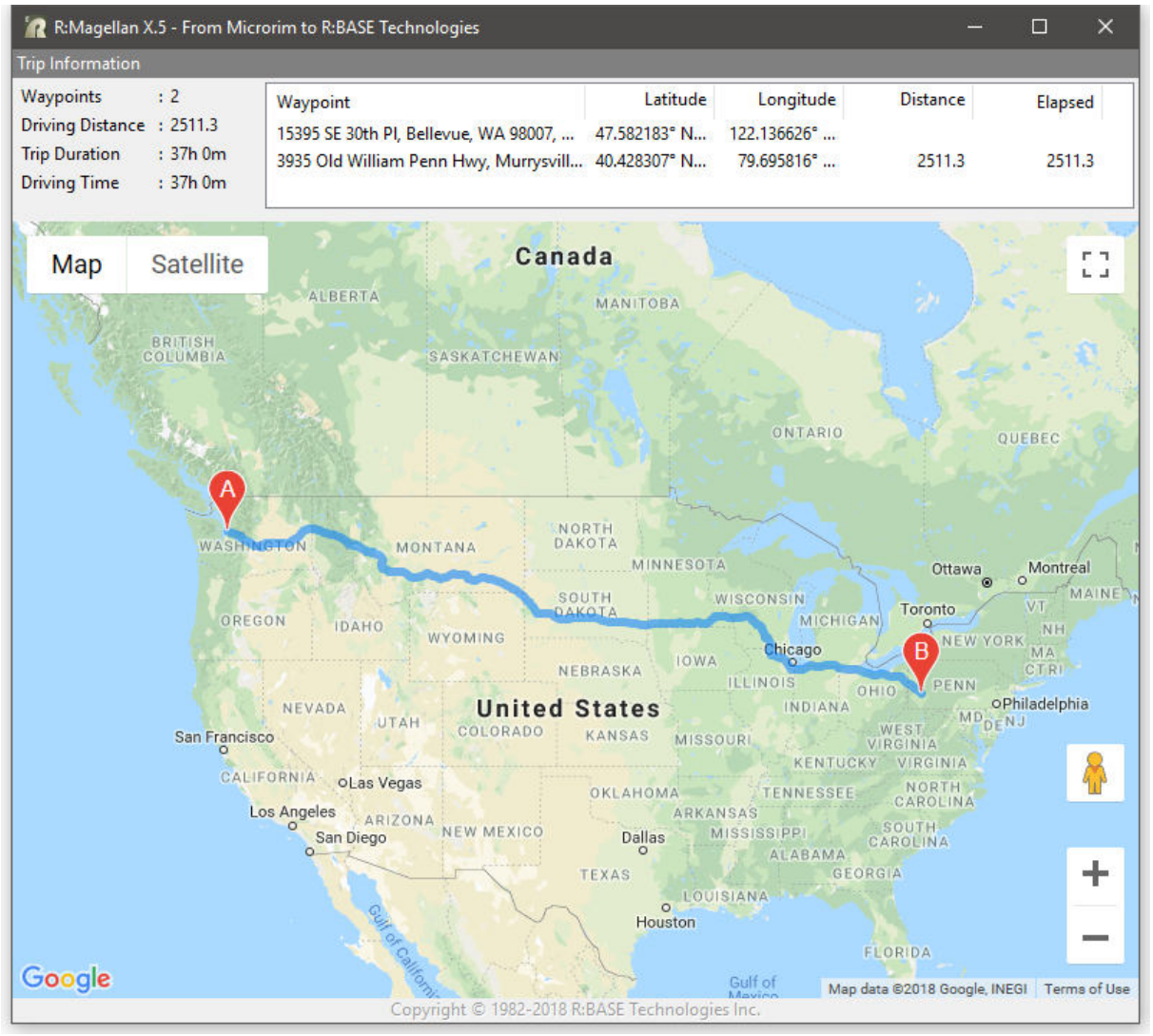

7.3.2 Example 2

```
-- To launch a mapped route from the western most point in the
-- United States (contiguous) to the Alamo in Texas, to the steps
-- of the U.S. Supreme Court, to the southern most point of the
-- United States (contiguous)

SET VAR vStartAddress TEXT = +
'COORDINATES 48.16350,-124.7310'

SET VAR vSecondAddress TEXT = +
'300 Alamo Plaza, San Antonio, Texas 78205'

SET VAR vThirdAddress TEXT = +
'131 1st Street, Washington, DC 20002'

SET VAR vEndAddress TEXT = +
'COORDINATES 24.5441,-81.8053'

SET VAR vPlugin TEXT = +
```

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```
('PLUGIN RMagellan vResult +
|MAP_ENGINE GOOGLE_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|SHOW_MAP ON +
|TRIPINFO_BAR ON +
|NAVIGATION_BAR ON +
|ROUTE_CALCULATION ON +
|SHOW_PROGRESS OFF' + +
.vStartAddress + '|' + .vSecondAddress + '|' + .vThirdAddress + '|' +
.vEndAddress)
&vPlugin
CLEAR VAR  vPlugin, vStartAddress, vSecondAddress, vThirdAddress,
vEndAddress
RETURN
```

The following variables are returned:

```
vNavURL            = https://www.google.com/maps/di          TEXT
                     r/Pacific+NW+Trail%2C+Clallam+
                     Bay%2C+WA+98326%2C+USA/300+Ala
                     mo+Plaza%2C+San+Antonio%2C+TX+
                     78205%2C+USA/131+First+St+NE%2
                     C+Washington%2C+DC+20543%2C+US
                     A/Covington+Ave%2C+Key+West%2C
                     +FL+33040%2C+USA/am=t/
vDrivingDistance   = 5144.3                                  DOUBLE
vTripDuration      = 4714                                    INTEGER
vDrivingTime       = 4714                                    INTEGER
vTripCost          = $0.00                                   CURRENCY
vOriginAddr        = Pacific NW Trail, Clallam               TEXT
                     Bay, WA 98326, USA
vDest1Addr         = 300 Alamo Plaza, San Antonio,           TEXT
                     TX 78205, USA
vDest2Addr         = 131 First St NE, Washington,            TEXT
                     DC 20543, USA
vDest3Addr         = Covington Ave, Key West, FL             TEXT
                     33040, USA
vResolvedAddr      =                                         TEXT
vOriginLat         = 48.147621° North                        TEXT
vDest1Lat          = 29.425837° North                        TEXT
vDest2Lat          = 38.891833° North                        TEXT
vDest3Lat          = 24.54715° North                         TEXT
vOriginLong        = 124.717724° West                        TEXT
vDest1Long         = 98.486912° West                         TEXT
vDest2Long         = 77.005927° West                         TEXT
vDest3Long         = 81.802437° West                         TEXT
vDest1Elapsed      = 2330.5                                  DOUBLE
vDest1Dist         = 2330.5                                  DOUBLE
vDest2Elapsed      = 3933.9                                  DOUBLE
vDest2Dist         = 1603.4                                  DOUBLE
vDest3Elapsed      = 5144.3                                  DOUBLE
vDest3Dist         = 1210.4                                  DOUBLE
vDestCount         = 4                                       INTEGER
vResult            = OK                                      TEXT
```

The following map is launched:

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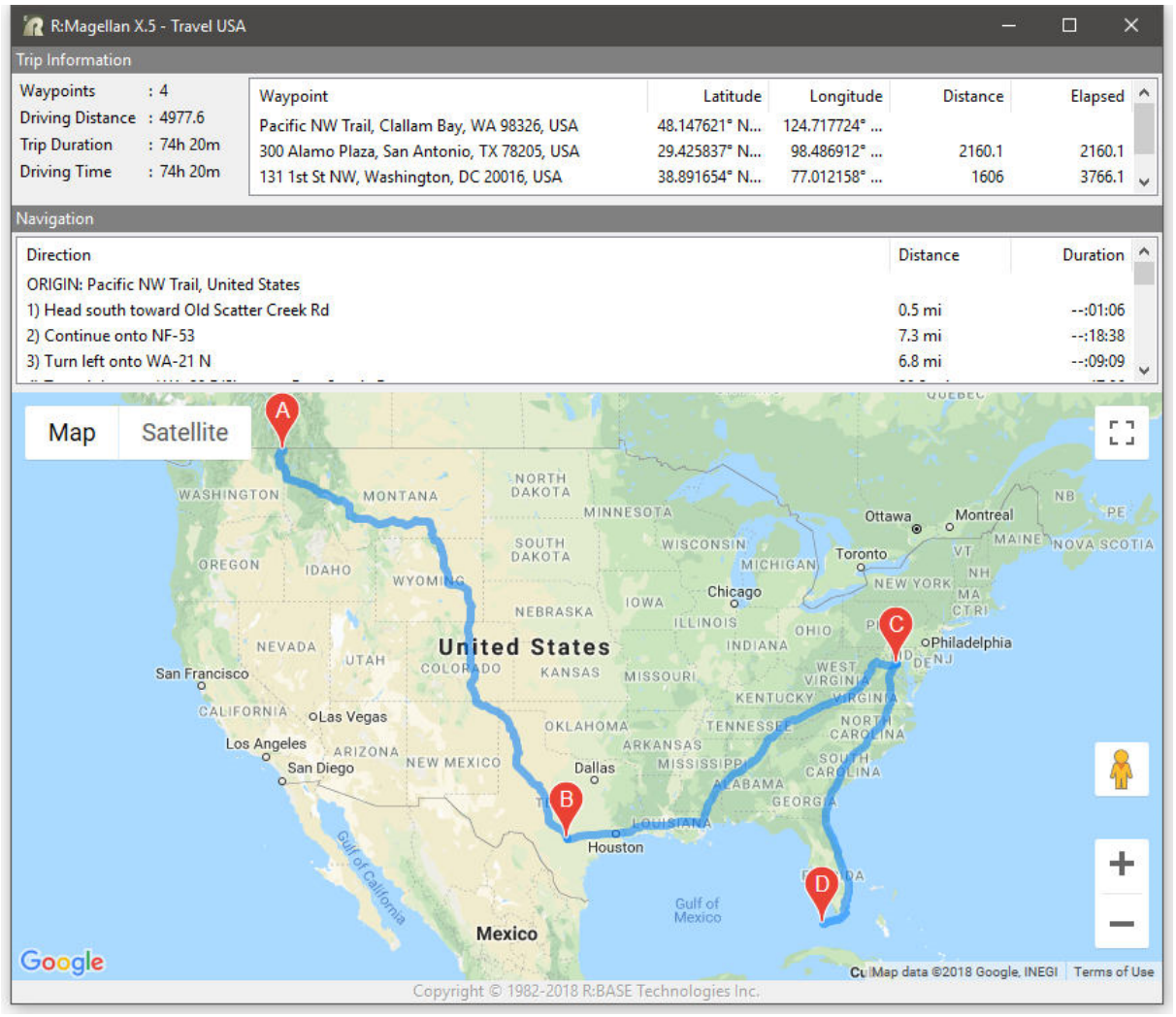

7.3.3 Example 3

```
-- To launch a mapped route from the Pittsburgh International Airport
-- to the R:BASE Conference, with degrees turned off

SET VAR vStartAddress TEXT = +
'COORDINATES 40.49620,-80.25425'

SET VAR vEndAddress TEXT = +
'3962 William Penn Highway, Monroeville, PA 15146'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE GOOGLE_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|SHOW_MAP ON +
|TRIPINFO_BAR ON +
|NAVIGATION_BAR ON +
|FORM_CAPTION From Airport to the R:BASE Conference +
```

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```
|DEGREES OFF|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
RETURN
```

The following variables are returned:

```
vNavURL            = https://www.google.com/maps/di          TEXT
                     r/Airport+Blvd%2C+Coraopolis%2
                     C+PA+15108%2C+USA/3962+William
                     +Penn+Hwy%2C+Monroeville%2C+PA
                     +15146%2C+USA/am=t/
vDrivingDistance   = 33.7                                    DOUBLE
vTripDuration      = 39                                      INTEGER
vDrivingTime       = 39                                      INTEGER
vTripCost          = $0.00                                   CURRENCY
vOriginAddr        = Airport Blvd, Coraopolis, PA            TEXT
                     15108, USA
vDest1Addr         = 3962 William Penn Hwy,                  TEXT
                     Monroeville, PA 15146, USA
vResolvedAddr      =                                         TEXT
vOriginLat         = 40.496615                               DOUBLE
vDest1Lat          = 40.438245                               DOUBLE
vOriginLong        = -80.255609                              DOUBLE
vDest1Long         = -79.773555                              DOUBLE
vDest1Elapsed      = 33.7                                    DOUBLE
vDest1Dist         = 33.7                                    DOUBLE
vDestCount         = 2                                       INTEGER
vResult            = OK                                      TEXT
```

The following map is launched:

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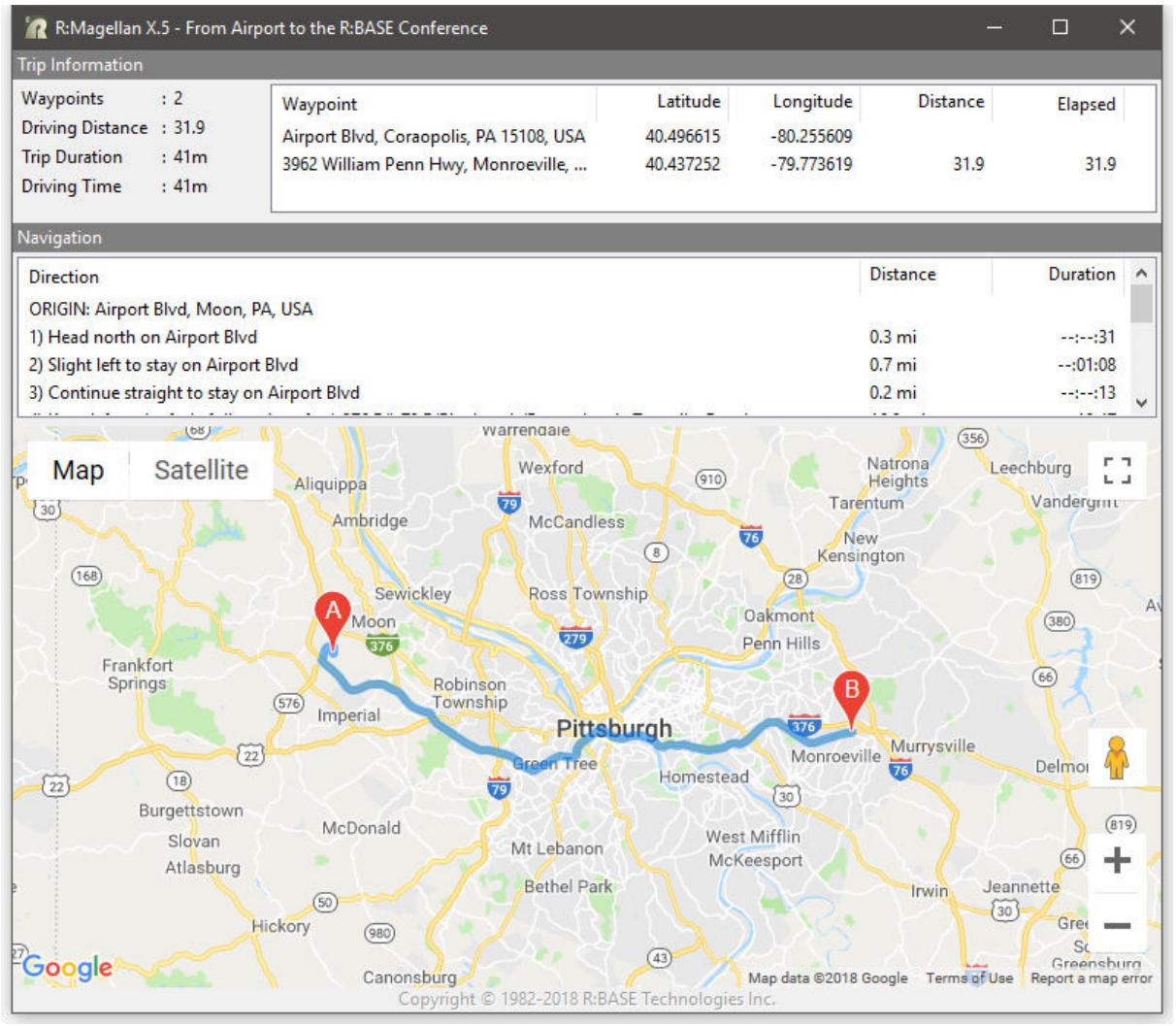

7.3.4 Example 4

-- To launch a map displaying a single address

```
SET VAR vSingleAddress TEXT = +
'114 N Main St, Roswell, NM 88203'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE GOOGLE_MAPS +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|SHOW_MAP ON +
|TRIPINFO_BAR OFF +
|NAVIGATION_BAR OFF +
|FORM_CAPTION Single Address +
|' + .vSingleAddress)
&vPlugin
RETURN
```

The following variables are returned:

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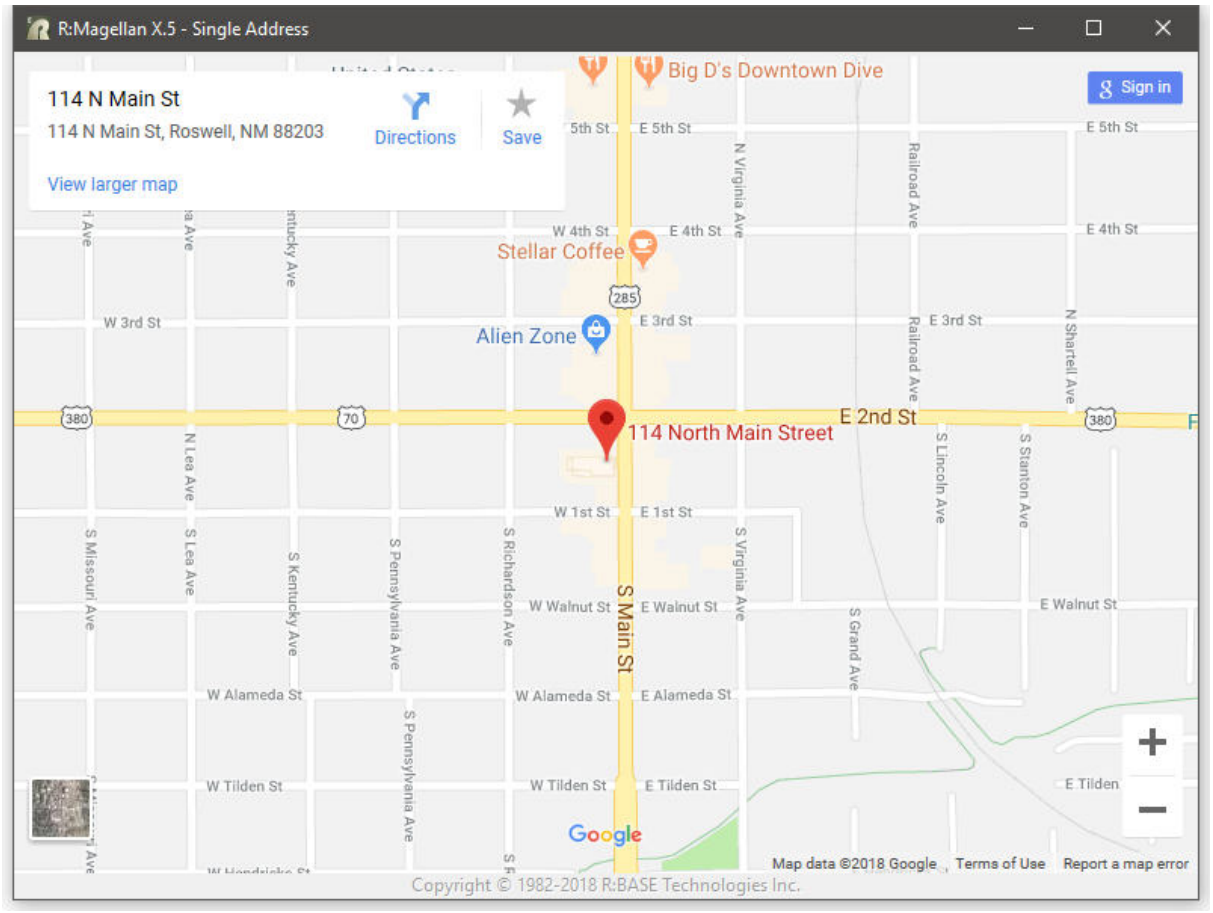
```
vNavURL             = https://www.google.com/maps/di          TEXT
                      r/114+N+Main+St%2C+Roswell%2C+
                      NM+88203%2C+USA/am=t/
vDrivingDistance    = 0.                                      DOUBLE
vTripDuration       = 0                                       INTEGER
vDrivingTime        = 0                                       INTEGER
vTripCost           = $0.00                                   CURRENCY
vOriginAddr         = 114 N Main St, Roswell, NM              TEXT
                      88203, USA
vResolvedAddr       =                                         TEXT
vOriginLat          = 33.39367° North                         TEXT
vOriginLong         = 104.523017° West                        TEXT
vDestCount          = 1                                       INTEGER
vResult             = OK                                      TEXT
```

The following map is launched:



Part VIII

8 Working With MapQuest

The following details the specific use of R:Magellan with MapQuest.

Syntax:

```
PLUGIN RMagellan 'VarName|<Parameter Value>'
```

Where:

"**VarName**" is the resulting text variable which returns the status, such as 'OK' or the exact -ERROR- message.

"**Parameter**" is the available option recognized by the Plugin.

"**Value**" is the specific value used by the available parameter.

Notes:

- The R:Magellan parameters can be any number of values, but a starting location and ending location must be specified in order for a mapped route to be provided. Each address parameter must be separated with the pipe "**|**" character.
- A MapQuest "Consumer Key" must be acquired and included with the PLUGIN syntax in order to use MapQuest's direction services with R:Magellan. See "Accessing MapQuest Services" below.
- The SHOW_MAP parameter is not supported in MapQuest, so a visual representation of the entered route will not be displayed.

Accessing MapQuest Services

1. An account must be created to access MapQuest services. Please visit: https://developer.mapquest.com/plan_purchase/steps/business_edition/business_edition_free
2. Fill in the required fields to create an account.
3. After the account setup is complete, go to "Keys & Reporting" and click "My Application" or any application. The "Consumer Key" is the key needed for R:Magellan.
4. Copy/paste the key into the R:BASE PLUGIN syntax for R:Magellan, specifically for the KEY parameter.

8.1 Map Calculation

The Map Calculation parameters control how a map route is calculated.

Parameters	**Values** (bold values are default)	**Description**
MAP_ENGINE	MAP_QUEST	Specifies MapQuest services will be used
KEY	key value	Specifies the consumer key
ROUTE_CALCULATION	ON OFF	Specifies whether the route is calculated
COORDINATES	value	Specifies latitude and longitude coordinates are used for a location, rather than an address
DIRECTIONS_FILE	file name	Specifies the file name to load the turn by turn navigation. The output can be in XML or CSV format depending on destination file extension.
DEGREES	**ON** OFF	Specifies if the latitude/longitude return variables are returned as degrees (ON) or a DOUBLE data type values (OFF).
OPTIMIZATION	ON OFF	Specifies whether optimization is used. With optimization set ON, you can reorder the intermediate stops on your

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		route so that your travel time between the start and end points is the most time-efficient.
ROUTE_OPTIMIZATION_TYPE	DISTANCE TIME	Specifies to optimize the route using the shortest distance or the shortest time
SHOW_PROGRESS	ON **OFF**	Specifies whether a progress window is displayed while calculations are processing.
WINDOW_STATE	MINIMIZED MAXIMIZED **NORMAL**	Specifies the R:Magellan window state when the map is displayed

Waypoint	value	The waypoint address can be defined as a valid street address or by Latitude and Longitude coordinates. When assigning a route, the waypoint addresses should be listed from start to finish in the order of arrival. The starting and ending points, would be listed first and last. Or, you could use the OPTIMIZATION parameter above. The street address value must contain a street number and name followed by a comma, then the city followed by another comma, and then the state and zip code. A correct address parameter example for R:BASE Technologies, Inc. is: 3935 Old William Penn Highway, Murrysville, PA 15668 The above street address format is specific to the United States. In other countries, the address format will vary. For example, the address format for a waypoint address in Sweden would begin with the street name and street number followed by a comma, then the zip code, followed by another comma, and then the city: Hästholmsvägen 32, 131 30, NACKA The waypoint address can also be defined as latitude and longitude coordinates. The coordinates must be defined in the decimal format, but as the TEXT data type. The accuracy of your location depends on the number of decimal values. COORDINATES 24.54410,-81.80530

8.2 Return Variables

After the Plugin is launched, return variables are calculated for the total distance, trip duration, driving time, an estimated trip cost, longitude and latitude for each address, the origin address and destination addresses, the distance traveled between the addresses, and the number of addresses provided. The first address listed is the origin. Each following address provided will be listed a destination on the map, incrementing by 1. A latitude and longitude variable is generated for each address given.

A distance variable is generated from the origin to the first destination. For each additional address provided, a distance variable is generated between those destinations. An elapsed distance is also provided from the origin to each destination on the route. The number of variables returned depend on the number of address parameters you insert into the PLUGIN command.

Variable Name	**Data Type**	**Description**
vDrivingDistance	DOUBLE	Total trip distance in miles
vTripDuration	INTEGER	Total trip duration in minutes
vOriginLat	TEXT	Latitude coordinate for the origin
vOriginLong	TEXT	Longitude coordinate for origin
vOriginAddress	TEXT	Address for origin
vDest1Lat	TEXT	Latitude coordinate for first destination
vDest1Long	TEXT	Longitude coordinate for first destination

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vDest1Addr	TEXT	Address for first destination
vDest2Lat	TEXT	Latitude coordinate for second destination
vDest2Long	TEXT	Longitude coordinate for second destination
vDest2Addr	TEXT	Address for second destination
vDest1Dist	DOUBLE	Distance in miles from origin to first destination
vDest2Dist	DOUBLE	Distance in miles from first destination to second
vDest1Elapsed	DOUBLE	Distance in miles from origin to first destination
vDest2Elapsed	DOUBLE	Distance in miles from origin to second destination
vDestCount	INTEGER	Number of addresses in map route

Miles/Kilometers
The driving distance is provided in miles by default. If the kilometers unit is required, the global variable RMAGELLAN_DIST_UNIT can be used to modify the vDrivingDistance end result. If RMAGELLAN_DIST_UNIT is set to 'KM', then distances will be provided in kilometers. Any value other than 'KM' (including NULL or if the variable is undefined) will result to distances expressed in miles. Example:

```
SET VAR RMAGELLAN_DIST_UNIT TEXT = 'KM'
```

8.3 Examples

8.3.1 Example 1

```
-- To launch a mapped route from the old Microrim headquarters to the
-- R:BASE Technologies, Inc. headquarters and save the directions to a file

SET VAR vStartAddress TEXT = +
'15395 SE 30th Place, Bellevue, WA 98007'

SET VAR vEndAddress TEXT = +
'3935 Old William Penn Highway, Murrysville, PA 15668'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE MAP_QUEST +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|OPTIMIZATION ON +
|ROUTE_OPTIMIZATION_TYPE TIME +
|DIRECTIONS_FILE C:\Directions\Trip_01.csv +
|ROUTE_CALCULATION ON|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
CLEAR VAR vPlugin, vStartAddress, vEndAddress
RETURN
```

The following variables are returned:

```
vDrivingDistance   = 2531.                                  DOUBLE
vTripDuration      = 2147                                   INTEGER
vDrivingTime       = 2147                                   INTEGER
vTripCost          = $0.00                                  CURRENCY
vOriginAddress     = 15395 SE 30th Pl, Bellevue,            TEXT
                     WA 98007, USA
vDest1Addr         = 3935 Old William Penn Hwy,             TEXT
                     Murrysville, PA 15668, USA
vOriginLat         = 47.582163° North                       TEXT
vDest1Lat          = 40.428302° North                       TEXT
vOriginLong        = 122.136611° West                       TEXT
```

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```
vDest1Long          = 79.695846° West                          TEXT
vDest1Elapsed       = 2531.                                    DOUBLE
vDest1Dist          = 2531.                                    DOUBLE
vDestCount          = 2                                        INTEGER
vResult             = OK                                       TEXT
```

8.3.2 Example 2

```
-- To launch a mapped route from the western most point in the
-- United States (contiguous) to the Alamo in Texas, to the steps
-- of the U.S. Supreme Court, to the southern most point of the
-- United States (contiguous)

SET VAR vStartAddress TEXT = +
'COORDINATES 48.16350,-124.7310'

SET VAR vSecondAddress TEXT = +
'300 Alamo Plaza, San Antonio, Texas 78205'

SET VAR vThirdAddress TEXT = +
'131 1st Street, Washington, DC 20002'

SET VAR vEndAddress TEXT = +
'COORDINATES 24.5441,-81.8053'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE MAP_QUEST +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|OPTIMIZATION ON
|ROUTE_OPTIMIZATION_TYPE DISTANCE +
|ROUTE_CALCULATION ON +
|SHOW_PROGRESS OFF' + +
.vStartAddress + '|' + .vSecondAddress + '|' + .vThirdAddress + '|' +
.vEndAddress)
&vPlugin
CLEAR VAR  vPlugin, vStartAddress, vSecondAddress, vThirdAddress,
vEndAddress
RETURN
```

The following variables are returned:

```
vDrivingDistance    = 4930.                                    DOUBLE
vTripDuration       = 4708                                     INTEGER
vDrivingTime        = 4708                                     INTEGER
vTripCost           = $0.00                                    CURRENCY
vOriginAddress      = Pacific NW Trail, Clallam                TEXT
                      Bay, WA 98326, USA
vDest1Addr          = 300 Alamo Plaza, San Antonio,            TEXT
                      TX 78205, USA
vDest2Addr          = 131 First St NE, Washington,             TEXT
                      DC 20543, USA
vDest3Addr          = Covington Ave, Key West, FL              TEXT
                      33040, USA
vOriginLat          = 48.147621° North                         TEXT
vDest1Lat           = 29.425672° North                         TEXT
```

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```
vDest2Lat          = 38.890605° North                    TEXT
vDest3Lat          = 24.570955° North                    TEXT
vOriginLong        = 124.717724° West                    TEXT
vDest1Long         = 98.486953° West                     TEXT
vDest2Long         = 77.005928° West                     TEXT
vDest3Long         = 81.741653° West                     TEXT
vDest1Elapsed      = 2159.6                              DOUBLE
vDest1Dist         = 2159.6                              DOUBLE
vDest2Elapsed      = 3730.4                              DOUBLE
vDest2Dist         = 1570.8                              DOUBLE
vDest3Elapsed      = 4930.                               DOUBLE
vDest3Dist         = 1199.6                              DOUBLE
vDestCount         = 4                                   INTEGER
vResult            = OK                                  TEXT
```

8.3.3 Example 3

-- To launch a mapped route from the Pittsburgh International Airport
-- to the R:BASE Conference, with degrees turned off

```
SET VAR vStartAddress TEXT = +
'COORDINATES 40.49620,-80.25425'

SET VAR vEndAddress TEXT = +
'3962 William Penn Highway, Monroeville, PA 15146'

SET VAR vPlugin TEXT = +
('PLUGIN RMagellan vResult +
|MAP_ENGINE MAP_QUEST +
|KEY xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx +
|DEGREES OFF|' + .vStartAddress + '|' + .vEndAddress)
&vPlugin
RETURN
```

The following variables are returned:

```
vDrivingDistance   = 29.1                                DOUBLE
vTripDuration      = 36                                  INTEGER
vDrivingTime       = 36                                  INTEGER
vTripCost          = $0.00                               CURRENCY
vOriginAddress     = Airport Blvd, Coraopolis, PA        TEXT
                     15108, USA
vDest1Addr         = 3962 William Penn Hwy,              TEXT
                     Monroeville, PA 15146, USA
vOriginLat         = 40.496615                           DOUBLE
vDest1Lat          = 40.438224                           DOUBLE
vOriginLong        = -80.255609                          DOUBLE
vDest1Long         = -79.773498                          DOUBLE
vDest1Elapsed      = 29.1                                DOUBLE
vDest1Dist         = 29.1                                DOUBLE
vDestCount         = 2                                   INTEGER
vResult            = OK                                  TEXT
```

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Part

9 Find Address Utility

A Find Address utility is available to check if an address can be located. The search can be performed with an address or Latitude and Longitude coordinates. An address search may also be perform in "silent" mode to hide the "Find Address" dialog.

It is a good idea to check if an address can be resolved before using R:Magellan to calculate trips, allowing you to update the address table data when necessary.

Syntax:

```
PLUGIN RMagellan VarName|FIND_ADDRESS|<Parameter Value>'
```

Where:

"**VarName**" is the resulting text variable which returns the status, such as 'OK' or the exact -ERROR- message.

"**Parameter**" is the available option recognized by the Plugin.

"**Value**" is the specific value used by the available parameter.

Parameters:

Parameter	Value	Description
MAP_ENGINE	GOOGLE_MAPS BING_MAPS	Specifies map service to be used
KEY	value	Specifies the API key
VALUE	value	specifies an address or coordinates
SILENT	ON OFF	specifies to show or hide the "Find Address" dialog

Return Variables:

Variable Name	Description
vFormattedAddress	returns the resolved address

Notes:

- The variable and parameter values must be separated by a "|" pipe symbol.
- If vFormattedAddress is NULL, the input address cannot be located.

9.1 Examples

Example 01:

```
--checks latitude and longitude coordinates for a valid destination
--after changing "63.989308" to "73.989308", the first value is selected

PLUGIN RMAGELLAN vResult +
|FIND_ADDRESS +
|MAP_ENGINE GOOGLE_MAPS +
|KEY XXXXXXXXXXXXXXXXX +
|VALUE 40.741895,-63.989308
```

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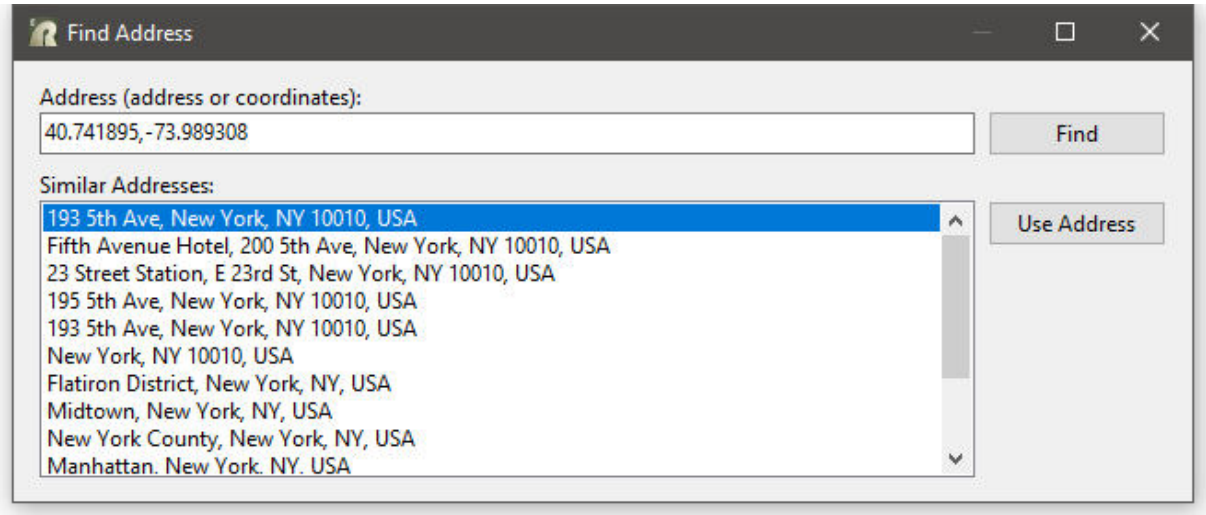


```
SHOW VAR
vFormattedAddress  = 193 5th Ave, New York, NY 10010, USA     TEXT
vResult            = OK                                       TEXT
```

Example 02:

```
--checks an address for a valid destination
--after changing the city and state from "Lodi, AR" to "Pittsburgh, PA", the first value is selected

SET VAR vInvalidEndAddress TEXT = '121 McKnight Road, Lodi, AR 16458'
SET VAR vCommand TEXT = +
('PLUGIN RMagellan vResult +
|FIND_ADDRESS +
|MAP_ENGINE BING_MAPS +
|KEY XXXXXXXXXXXXXXXXX +
|VALUE'&.vInvalidEndAddress)
&vCommand
RETURN

SHOW VAR
vFormattedAddress  = 16458 McKnight Rd, Pittsburgh, PA 15237, USA        TEXT
vResult            = OK                                                  TEXT
```

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Part X

10 Geocoding

The geocoding features of R:Magellan finds latitude and longitude coordinate geographic data from a provided street address. The plugin also provides reverse geocoding where an approximate address is returned with given latitude and longitude coordinates.

Syntax:

```
PLUGIN RMagellan vResult|GEOCODE|<parameters
```

Parameters:

Parameter	Value	Description
MAP_ENGINE	GOOGLE_MAPS BING_MAPS	Specifies map service to be used
KEY	value	Specifies the API key
DIRECTION	FORWARD (default) REVERSE	specifies the forward or reverse geocoding direction. With the **FORWARD** direction, an address is used to find latitude and longitude coordinates. With the **REVERSE** direction latitude and longitude coordinates are used to find an address.
VALUE	value	specifies an address or coordinates

Return Variables:

Direction	Variable Name	Description
Forward	vRGLat	returns the latitude
Forward	vRGLng	returns the longtitude
Forward/Reverse	vResult	returns the status, such as 'OK' or the exact -ERROR- message
Reverse	vRGAddress	returns the address

Notes:

- The variable and parameter values must be separated by a "|" pipe symbol.
- When using the FORWARD direction, the latitude and longitude are returned as DOUBLE data type values.
- When using the REVERSE direction, the latitude value must be listed first.
- When using the REVERSE direction, the latitude and longitude values must be separated with a comma.

10.1 Examples

Example 01:

--uses the FORWARD direction to acquire latitude and longitude coordinates

```
SET VAR vAddress TEXT = '3935 Old William Penn Highway, Murrysville, PA 15668 USA'
SET VAR vCommand TEXT = +
('PLUGIN RMagellan vResult +
|GEOCODE +
|MAP_ENGINE GOOGLE_MAPS +
|KEY XXXXXXXXXXXXXXXXX +
|VALUE'&.vAddress)
&vCommand
```

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```
RETURN

SHOW VAR
vRGLat       = 40.42807              DOUBLE
vRGLng       = -79.695855            DOUBLE
vResult      = OK                    TEXT
```

Example 02:

```
--uses the REVERSE direction to acquire an address

SET VAR vCoordinates TEXT = '39.631693,-105.117094'
SET VAR vCommand TEXT = +
('PLUGIN RMagellan vResult +
|GEOCODE +
|MAP_ENGINE BING_MAPS +
|KEY XXXXXXXXXXXXXXXX +
|DIRECTION REVERSE +
|VALUE'&.vCoordinates)
&vCommand
RETURN

SHOW VAR
vRGAddress    = 10601 West Marlowe Avenue, Littleton, CO 80127, USA          TEXT

vResult       = OK                                                           TEXT
```

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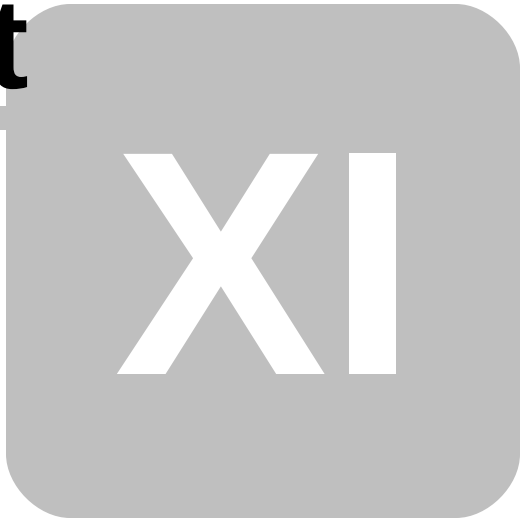
Part



11 Technical Support

Please read over the help documentation at least once before seeking support. We have worked very hard to make the help documentation clear and useful, but concise. It is suggested that you reread these instructions once you have become accustomed to using the software, as new uses will become apparent.

If you have further questions, and cannot find the answers in the documentation, you can obtain information from the below sources:

- Email our Technical Support Staff at: support@rbase.com
- Access the R:BASE Technologies Support home page online at https://www.rbase.com/support

You may be required to purchase a technical support plan. Several support plans are available to suit the needs of all users. Available Technical Support Plans

Please be prepared to provide the following:

- The product registration number, which is located on the invoice/order slip for the purchased product
- The type of operating system and hardware in use
- Details regarding your operating environment; such as available memory, disk space, your version of R:BASE, local area network, special drivers, related database structures, application files, and other files that are used or accessed by your application

All provide information will be used to better assist you.

R:BASE Technologies has a number of different services available for R:BASE products. As a registered user, you will receive information about new features for R:BASE and other R:BASE Technologies products. Please remember to register your software. https://www.rbase.com/register/

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Part XII

12 Useful Resources

. R:BASE Home Page:	https://www.rbase.com
. Up-to-Date R:BASE Updates:	https://www.rbaseupdates.com
. Current Product Details and Documentation:	https://www.rbase.com/rbgx5
. Support Home Page:	https://www.rbase.com/support
. Product Registration:	https://www.rbase.com/register
. Official R:BASE Facebook Page:	https://www.facebook.com/rbase
. Sample Applications:	https://www.razzak.com/sampleapplications
. Technical Documents (From the Edge):	https://www.razzak.com/fte
. Education and Training:	https://www.rbase.com/training
. Product News:	https://www.rbase.com/news
. Upcoming Events:	https://www.rbase.com/events
. R:BASE Online Help Manual:	https://www.rbase.com/support/rsyntax
. Form Properties Documentation:	https://www.rbase.com/support/FormProperties.pdf
. R:BASE Beginners Tutorial:	https://www.rbase.com/support/rtutorial
. R:BASE Solutions (Vertical Market Applications):	https://www.rbase.com/products/rbasesolutions

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Part XIII

13 Feedback

Suggestions and Enhancement Requests:

From time to time, everyone comes up with an idea for something they'd like a software product to do differently.

If you come across an idea that you think might make a nice enhancement, your input is always welcome.

Please submit your suggestion and/or enhancement request to the R:BASE Developers' Corner Crew (R:DCC) and describe what you think might make an ideal enhancement. In R:BASE, the R:DCC Client is fully integrated to communicate with the R:BASE development team. From the main menu bar, choose "Help" > "R:DCC Client". If you do not have a login profile, select "New User" to create one.

If you have a sample you wish to provide, have the files prepared within a zip archive prior to initiating the request. You will be prompted to upload any attachments during the submission process.

Unless additional information is needed, you will not receive a direct response. You can periodically check the status of your submitted enhancement request.

If you are experiencing any difficulties with the R:DCC Client, please send an e-mail to rdcc@rbase.com.

Reporting Bugs:

If you experience something you think might be a bug, please report it to the R:BASE Developers' Corner Crew. In R:BASE, the R:DCC Client is fully integrated to communicate with the R:BASE development team. From the main menu bar, choose "Help" > "R:DCC Client". If you do not have a login profile, select "New User" to create one.

You will need to describe:

- What you did, what happened, and what you expected to happen
- The product version and build
- Any error message displayed
- The operating system in use
- Anything else you think might be relevant

If you have a sample you wish to provide, have the files prepared within a zip archive prior to initiating the bug report. You will be prompted to upload any attachments during the submission process.

Unless additional information is needed, you will not receive a direct response. You can periodically check the status of your submitted bug.

If you are experiencing any difficulties with the R:DCC Client, please send an e-mail to rdcc@rbase.com.

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