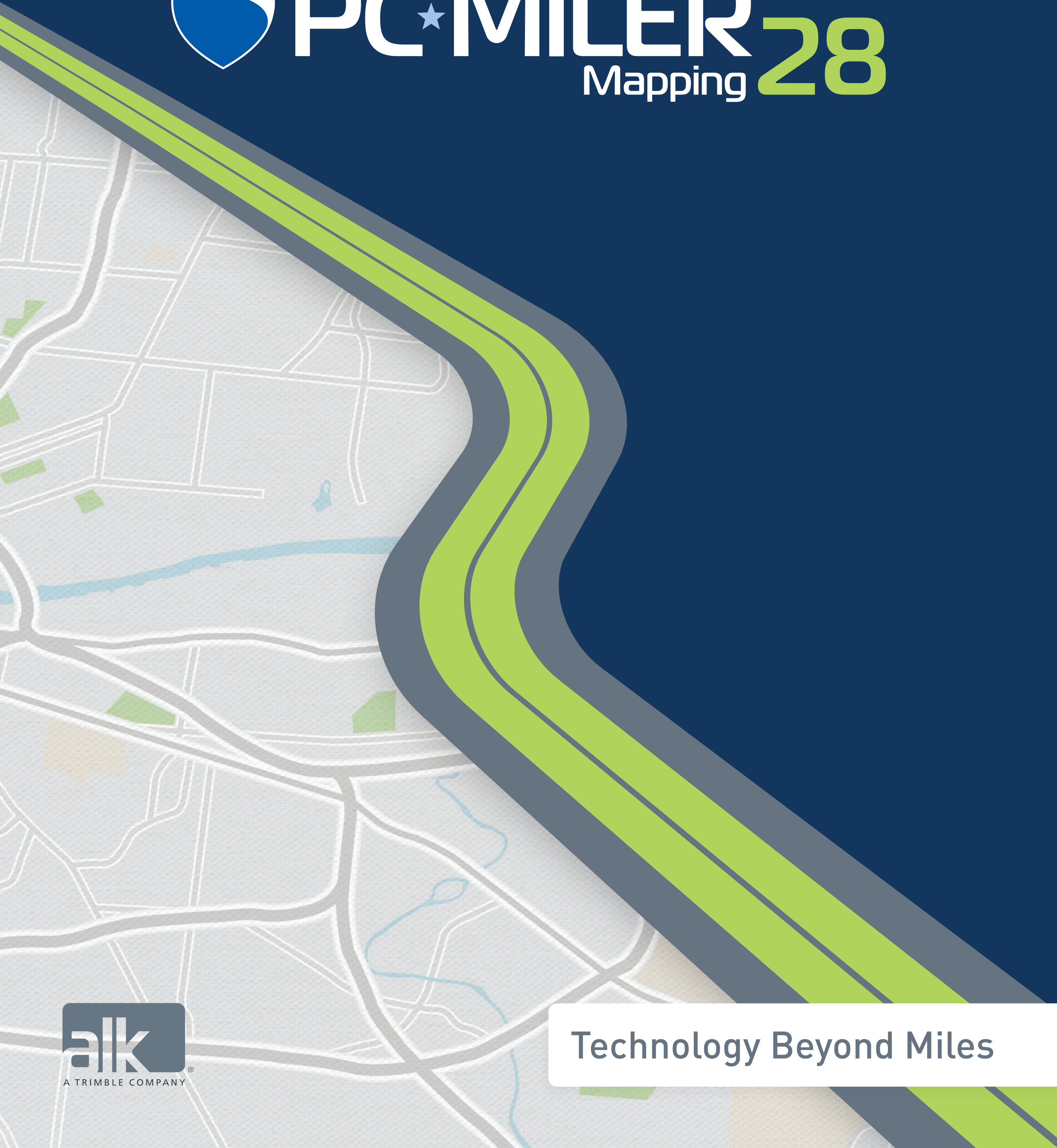
User's Guide

PC*MILER® Mapping 28



A TRIMBLE COMPANY

Technology Beyond Miles

PC*MILER® Product Line
END-USER LICENSE AGREEMENT

1. Grant of License: Subject to the terms, conditions, use limitations and payment of fees as set forth herein, ALK Technologies, Inc. (“ALK”) grants the end-user (“you”) a license to install and use the PC*MILER solution(s) (including traffic data subscriptions) you have purchased (“PC*MILER”) on a single personal computer. The PC*MILER software, data and documentation are provided for your personal, internal use only and not for resale. They are protected by copyright held by ALK and its licensors and are subject to the following terms and conditions which are agreed to by you, on the one hand, and ALK and its licensors (including their licensors and suppliers) on the other hand.

2. Title: You acknowledge that the PC*MILER computer programs, data, concepts, graphics, documentation, manuals and other material by, developed by or licensed to ALK, including but not limited to program output (together, “program materials”), are the exclusive property of ALK or its licensors. You do not secure title to any PC*MILER program materials by virtue of this license.

3. Copies: You may make one (1) copy of the PC*MILER program materials, provided you retain such copy in your possession and use it solely for backup purposes. You agree to reproduce the copyright and other proprietary rights notices of ALK and its licensors on such a copy. Otherwise, you agree not to copy, reverse engineer, interrogate or decode any PC*MILER program materials or attempt to defeat protection provided by ALK for preventing unauthorized copying or use of PC*MILER or to derive any source code or algorithms therefrom. You acknowledge that unauthorized use or reproduction of copies of any program materials or unauthorized transfer of any copy of the program materials is a serious crime and is grounds for suit for damages, injunctive relief and attorneys' fees.

4. Limitations on Transfer: This license is granted to you by ALK. You may not directly or indirectly lease, sublicense, sell or otherwise transfer PC*MILER or any PC*MILER program materials to third parties, or offer information services to third parties utilizing the PC*MILER program materials without ALK's prior written consent. To comply with this limitation, you must uninstall PC*MILER from your computer prior to selling or transferring that computer to a third party.

5. Limitations on Network Access: You may not allow end-users or software applications on other computers or devices to directly or indirectly access this copy of PC*MILER via any type of computer or communications network (including but not limited to local area networks, wide area networks, intranets, extranets, the internet, virtual private networks, Wi-Fi, Bluetooth, and cellular and satellite communications systems), using middleware (including but not limited to Citrix MetaFrame and Microsoft Terminal Server) or otherwise (including but not limited to access through PC*MILER connectivity products), or install or use PC*MILER on a network file server, without

first notifying ALK, executing a written supplemental license agreement, and paying the license fee that corresponds to the number and types of uses to which access is to be allowed.

6. Limitations on Data Extraction: You may extract data (including but not limited to program output such as distances, maps, and driving directions) from PC*MILER and use it in other applications on the same computer on which PC*MILER is legally licensed and installed. You may not transfer data extracted from PC*MILER onto any other computer or device unless you have licensed PC*MILER for that computer or device.

7. Limitations on Mobile Communications: Without limiting the generality of the foregoing, you may not transmit PC*MILER street-level driving directions through mobile communications systems such as Qualcomm, satellite, or cellular services or to mobile devices such as computers, handhelds, pagers, or telephones without first executing a written supplemental license agreement with ALK and paying the license fee that corresponds to the number and types of devices and systems to and through which transmission is to be permitted.

8. Limitations on Disclosure: You may disclose PC*MILER distances to trading partners for specific origin-destination moves for which you provide transportation services and use PC*MILER distances as a basis for payment. You may not make any other disclosure of PC*MILER programs and materials, including but not limited to program output, to anyone outside the legal entity that paid for and holds this license, without prior written permission of ALK. You acknowledge that the PC*MILER programs and materials by, developed by or licensed to ALK are very valuable to ALK and its licensors, and their use or disclosure to third parties except as permitted by this license or by a written supplemental license agreement with ALK is strictly prohibited.

9. Security: You agree to take reasonable and prudent steps to safeguard the security of the PC*MILER program materials and to notify ALK immediately if you become aware of the theft or unauthorized possession, use, transfer or sale of the PC*MILER program materials licensed to you by ALK.

10. Acceptance: You are deemed to have accepted the PC*MILER program materials upon receipt.

11. Warranties: ALK represents and warrants that:

    A. For ninety (90) days from date of purchase, PC*MILER, when delivered and properly installed, will function substantially according to its specifications on a computer purchased independently by you.

    B. For ninety (90) days from date of purchase, the software media on which ALK provides PC*MILER to you will function substantially free of errors and defects. ALK will replace defective media during the warranty period at no charge to you unless the defect is the result of accident, abuse, or misapplication of the product.

C. THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITING THE GENERALITY OF THE FOREGOING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. THE PC*MILER PROGRAM, DATAAND DOCUMENTATION IS SOLD "AS IS". IN NO EVENT SHALL ALK OR ITS LICENSORS BE LIABLE FOR ANY INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES SUCH AS, BUT NOT LIMITED TO, LOSS IN CONNECTION WITH OR ARISING OUT OF THE EXISTENCE OF THE FURNISHING, FUNCTIONING OR USE OF ANY ITEM OF SOFTWARE, DATA OR SERVICES PROVIDED FOR IN THIS AGREEMENT. IN THE EVENT THAT A COURT OF PROPER JURISDICTION DETERMINES THAT THE DAMAGE LIMITATIONS SET FORTH ABOVE ARE ILLEGAL OR UNENFORCEABLE THEN, IN NO EVENT SHALL DAMAGES EXCEED THE CONTRACT PRICE. THIS WARRANTY SHALL NOT ACCRUE TO THE BENEFIT OF THIRD PARTIES OR ASSIGNEES.

12. Disclaimer: The data may contain inaccurate, incomplete or untimely information due to the passage of time, changing circumstances, sources used and the nature of collecting comprehensive geographic data, any of which may lead to incorrect results. PC*MILER's suggested routings and traffic data are provided without a warranty of any kind. The user assumes full responsibility for any delay, expense, loss or damage that may occur as a result of their use. The user shall have no recourse against Canada, whether by way of any suit or action, for any loss, liability, damage or cost that may occur at any time, by reason of possession or use of Natural Resources Canada data.

13. Termination: This Agreement will terminate immediately upon any of the following events:

A. If you seek an order for relief under the bankruptcy laws of the United States or similar laws of any other jurisdiction, or a composition with or assignment for the benefit of creditors, or dissolution or liquidation, or if proceedings under any bankruptcy or insolvency law are commenced against you and are not discharged within thirty (30) calendar days.

B. If you materially breach any terms, conditions, use limitations, payment obligations, or any other terms of this Agreement.

C. Upon expiration of any written supplemental license agreement between you and ALK of which this license is a part.

14. Obligations on Termination: Termination or expiration of this Agreement shall not be construed to release you from any obligations that existed prior to the date of such termination or expiration.

15. Hold Harmless and Indemnity: To the maximum extent permitted by applicable law, you agreeto hold harmless and indemnify ALK and its subsidiaries, affiliates, officers, agents, licensors, co-branders or other partners, and employees from and against any

third party claim (other than a third party claim for Intellectual Property Rights) arising from or in any way related to your use of PC*MILER, including any liability or expense arising from all claims, losses, damages (actual and/or consequential), suits, judgments, litigation costs and attorneys' fees, of every kind and nature. ALK shall use good faith efforts to provide you with written notice of such claim, suit or action.

16. Disclosure for products containing Historical or Real-time Traffic data: traffic data, including historical traffic data, is licensed as a subscription service which must be renewed annually for continued use. ALK and its licensor(s) will use commercially reasonable efforts to make traffic data available at least 99.5% of the time each calendar month, excluding minor performance or technical issues as well as downtime attributable to necessary maintenance, and Force Majeure.

17. Limitations on Export: You hereby expressly agree not to export PC*MILER, in whole or in part, or any data derived therefrom, in violation of any export laws or regulations of the United States.

18. Miscellaneous: This Agreement shall be construed and applied in accordance with the laws of the State of New Jersey. The Courts of the State of New Jersey shall be the exclusive forum for all actions or interpretation pertaining to this Agreement. Any amendments or addenda to this Agreement shall be in writing executed by all parties hereto. This is the entire Agreement between the parties and supersedes any prior or contemporaneous agreements or understandings. Should any provision of this Agreement be found to be illegal or unenforceable, then only so much of this Agreement as shall be illegal or unenforceable shall be stricken and the balance of this Agreement shall remain in full force and effect.

Table of Contents

PC*MILER®Product Line END-USER LICENSE AGREEMENT i

Chapter 1: GETTING STARTED 1

1.1 Requirements 2
1.2 Installing PC*MILER|Mapping 2
1.3 Technical Support 3
1.4 Printing the User's Guide 3
1.5 Distributing Applications That Use PC*MILERMapping 3
1.6 Licensing 4
1.7 What's New in PC*MILER|Mapping? 4

Chapter 2: MAP LAYERS 5

2.1 The Concept of Layers 5
2.2 Layer Control 5
2.3 Overlapping Pins 6

Chapter 3: PROGRAMMING WITH THE DLL INTERFACE 8

3.1 Getting Started 8
3.2 Built-in Functionality 9
3.3 Using PC*MILER|Mapping DLL Functions 11
3.3.1 Opening and Closing Map Windows 12
3.4 Map Manipulation Functions 14
3.4.1 Map Style and Dimensions 14
3.4.2 Map Drawers 17
3.4.3 Scroll, Print, Copy and Redraw 18
3.4.4 Toggle Display Features 19
3.4.5 Toggle Legends 20
3.4.6 Adding or Removing Detail 22
3.4.7 Frame and Zoom Functions 22
3.4.8 Layer Control Functions 24
3.4.9 Callback Functions 25
3.4.10 Callback Ability 27
3.4.11 Displaying Pins, Trips, and Lines in the Map Window 34
3.4.12 Saving .GIF Images 36
3.5 Plot Functions 36
3.5.1 Pin and Label Functions 37
3.5.2 Assigning Alias Names To Colors 40
3.5.3 Assigning Alias Names To Bitmaps 40
3.5.4 Setting a Custom Font For Labels 40
3.5.5 Pin Label Positioning 41
3.5.6 Trip and Line Functions 41
3.5.7 Pinmap Functions 43
3.5.8 Map Region Functions 44

3.6 Geofence and Highlight Functions 45
3.6.1 Geofence Functions 45
3.6.2 State Highlight Functions 50
3.6.3 Street Highlight Functions 51
3.7 Management Functions 52
3.8 Multiple Map Windows (‘Ex’ Functions) 53

Chapter 4: USING PC*MILER|MAPPING WITH EXCEL 55
4.1 Enabling the Add-In Manually 55
4.2 Disabling the Add-In Manually 57
4.3 Enable/Disable Autoloading of PC*MILER|Mapping 57
4.4 Functions Available Through the Excel Interface 57
4.4.1 Plotting an Icon 58
4.4.2 PC*MILER|Mapping Icons 59
4.4.3 Plotting a Route Between Two Points 61
4.4.4 Plotting a Line Between Two Points 63
4.4.5 Deleting Icons 65
4.4.6 Deleting Lines 66
4.4.7 Deleting Trips 67
4.4.8 PCMG Functions Available in Excel 68

Chapter 5: USING THE PC*MILER|MAPPING COM SERVER 69
5.1 Summary of the Objects 69
5.2 PCMMapMgr PROPERTIES AND METHODS 73
5.3 PCMMap PROPERTIES AND METHODS 74
5.4 PCMMapSettings PROPERTIES 93

Chapter 6: TROUBLE-SHOOTING (HELPFUL HINTS) 95

APPENDIX A: LOCATION OF HEADER FILES & SAMPLE CODE 97

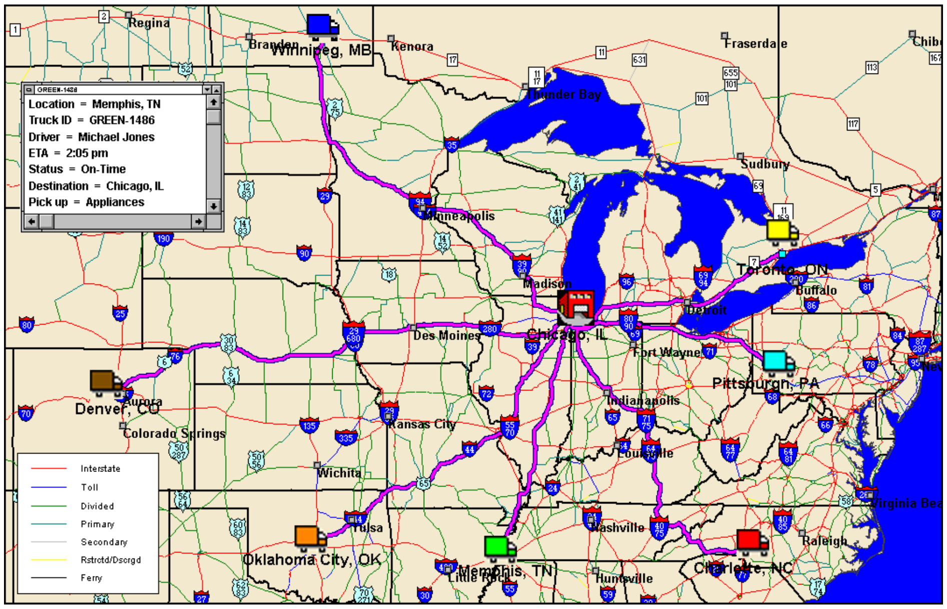
APPENDIX B: THE PCMSERVE.INI FILE 98

APPENDIX C: ERROR CODES 103

APPENDIX D: ALPHABETICAL FUNCTION INDEX 104

Chapter 1 Getting Started

PC*MILER|Mapping is an extended version of the PC*MILER map in DLL form. It has all the features of the PC*MILER map plus the ability to draw routes, icons ("pins"), and lines at precise geographic locations. PC*MILER|Mapping is intended to be used by software developers who want to integrate maps into their applications. It is ideal for vehicle tracking, route visualization, and viewing geographic data.


GREEN-1486

Location = Memphis, TN
Truck ID = GREEN-1486
Driver = Michael Jones
ETA = 2:05 pm
Status = On-Time
Destination = Chicago, IL
Pick up = Appliances

*Portion of a Map Created Using PC*MILER|Mapping*

ALK gives programmers a choice between several interfaces: dynamic DLL linking, use of Mapping COM objects, and Java.

All interfaces include the capability to control the map: zoom to a particular region, location, group of locations, or trip; scroll the map in a desired direction; zoom in and out; and control map detail level.

Plot functions make it possible to display custom locations on the map (as circles, squares or bitmaps), and trips. A set of functions is provided to interact with the map, primarily for mouse events.

For Windows applications, the client application will not be able to attach to the window handle and write on top of the map window owned by the mapping dll.

We suggest that you use our extensive set of API functions to plot on top of the map to ensure high quality graphics.

For web applications, PC*MILER|Mapping includes the capability to generate GIF images in the desired dimensions. Since the GIF image is sent to the client application as a buffer or file, the client application may overlay their own graphics on top of our map. As stated above for Windows applications, we suggest that you use our extensive set of API functions to plot on top of the map to ensure high quality graphics.

PC*MILER|Mapping is sold separately from PC*MILER. It supports mapping functions and interfaces to other programs. Support is provided for using PC*MILER|Mapping with 'C', 'C++', Visual Basic, Excel and Delphi.

PC*MILER|Mapping allows users to draw routes and plot geographic information on the PC*MILER map from other Windows applications. It is intended to be used in conjunction with other Windows programs such as Microsoft® Excel® and Microsoft® Access®, and by developers with their own applications.

1.1 Requirements

PC*MILER|Mapping requires a base installation of PC*MILER or PC*MILER|Streets. For a complete list of PC*MILER platforms and requirements, see the PC*MILER *User's Guide*. (To access the *User's Guide*, see *Printing the User's Guide* below.)

Additionally, the Mapping application requires:

- 3 MB extra free space on your hard disk
- A development system. Interface definitions for Borland C++ and Visual Basic are currently supported, but other development systems should have no trouble calling PC*MILER|Mapping.

1.2 Installing PC*MILER|Mapping

PC*MILER|Mapping is a PC*MILER add-on product that can be installed when you install PC*MILER or at a later time. To install Mapping along with PC*MILER, you simply make sure that "**PC*MILER|Mapping**" is checked on the list of PC*MILER components when you are prompted during the installation process.

If you are adding the PC*MILER|Mapping module at a later time, see the PDF *User's Guide* that was included with the PC*MILER installation (refer to *Adding New PC*MILER Products* in Chapter 2). To access the *User's Guide*, see *Printing the User's Guide* below.

1.3 Technical Support

ALK Technologies offers one year of free unlimited technical support to all registered users of PC*MILER. If you have any questions about PC*MILER|Mapping or problems with the software that cannot be resolved using this *User's Guide*, contact our staff:

Phone: 1.800.377.6453, ext. 2 or 1.609.683.0220, ext 2
Fax: 609.252.8196
Email:pcmsupport@alk.com
Web Site: www.pcmiler.com
Hours: 9:00am – 5:00pm EST, Mon-Fri

When calling, ask for "PC*MILER Technical Support". Please be sure to have your PC*MILER|Mapping Product Key Code, version number, Windows version number, and hardware configuration information (manufacturer, speed, and monitor type) available before your call. Please include this information in your message if you are contacting us by email.

1.4 Printing the User's Guide

To view or print additional copies or portions of the *User's Guide* for any PC*MILER product, click the Windows **Start** button>**All Programs** (or the equivalent in your version of Windows) **> PCMILER 28>User Guides**and select one of the .pdf files from the sub-menu.

You must have Adobe Acrobat Reader on your computer to open the *User's Guide*. If you do not have the program installed already, a free copy can be downloaded from www.adobe.com.

1.5 Distributing Applications That Use PC*MILERMapping

Purchasing PC*MILER|Mapping does not entitle you to redistribute any portions of this product. You may NOT redistribute ALK's highway database, source code, interface definitions, or the PC*MILER for Applications DLL.

Your clients can purchase additional versions of the PC*MILER engine and database directly from ALK. ALK Technologies' sales representatives can be reached at **1-800-377-MILE**.

1.6 Licensing

Unless you buy additional licenses, only one copy of PC*MILER| Mapping at a time can attach to the highway database. You can connect more client applications by purchasing additional database licenses from ALK (multi-user licenses). If you plan to connect many users to a network version of the PC*MILER database, ALK has attractive pricing for LAN versions.

1.7 What's New in PC*MILER|Mapping?

New in Version 28

- ***NEW!***Ten APIs for managing map styles, dimensions and features. See sections 3.4.1 and 3.4.2.
- ***NEW!*** Three APIs for adding and deleting street highlights. See section 3.6.3.
- ***NEW!***Two new callback functions. See section 3.4.9.
- **Deprecated in Version 28:** PCMGSetDebug, PCMGGetDebug, PCMGToggleShapePts, PCMGSetShapePts, PCMGGetShapePts, PCMGCreateLegendGif, PCMGSetCustomMode

New in Version 27

No new features were added to PC*MILER|Mapping Version 27.

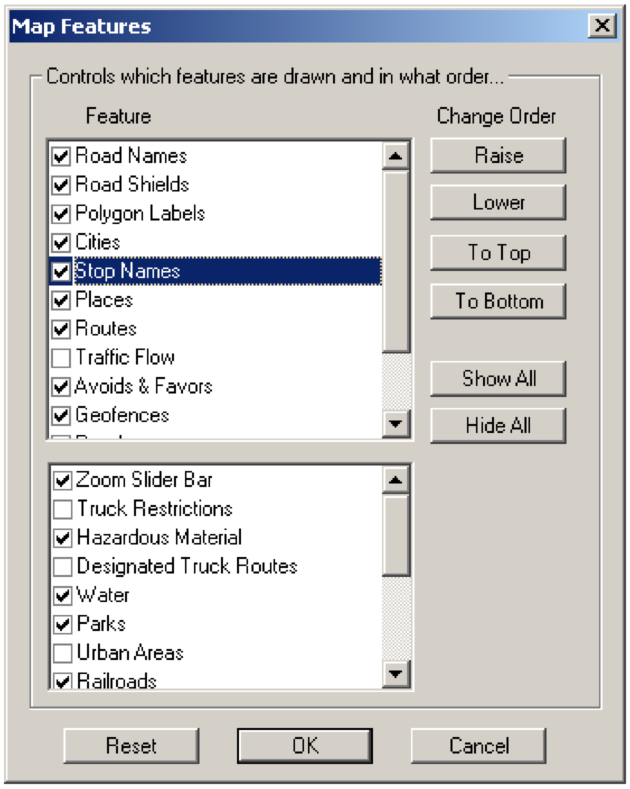
Chapter 2 Map Layers

2.1 The Concept of Layers

PC*MILER|Mapping uses the concept of layers to allow users to control certain types of map objects. All map objects are divided into layers such as Cities, Roads, Parks, Trips, etc. The user can control the visibility of each layer and the order in which they are displayed. For example, Road Shields normally should be drawn on the top of Roads.

2.2 Layer Control

You can control what features are displayed and in what order features are drawn on the map using the Map Features dialog box, a part of the regular Win32 DLL interface (this feature is not included in COM interface or Java). To open this dialog, first click on the map with the **right mouse button**, then choose *Features…*from the menu that pops up.



- [✓] Road Names
- [✓] Road Shields
- [✓] Polygon Labels
- [✓] Cities
- [✓] Stop Names
- [✓] Places
- [✓] Routes
- [ ] Traffic Flow
- [✓] Avoids & Favors
- [✓] Geofences

- [✓] Zoom Slider Bar
- [ ] Truck Restrictions
- [✓] Hazardous Material
- [ ] Designated Truck Routes
- [✓] Water
- [✓] Parks
- [ ] Urban Areas
- [✓] Railroads

Using the Map Features dialog box, you can hide or display the following map features: stop names; city names; cities; road labels; roads; U.S., Canadian and Mexican political boundaries; coastlines; oceans.

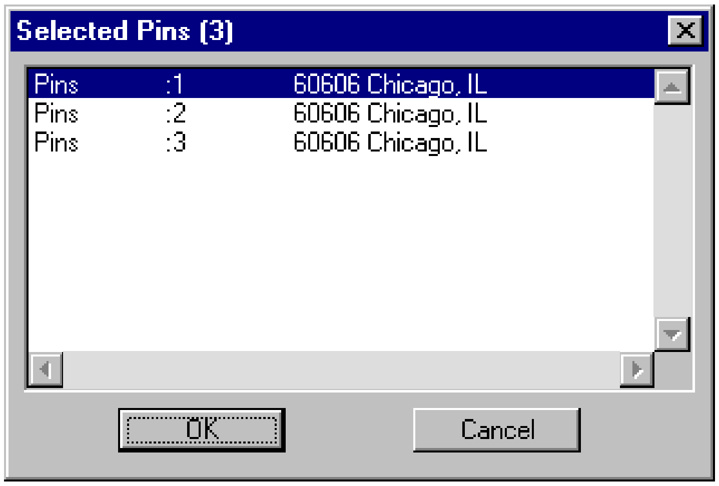
In the feature list of this dialog box, a checkmark means "display". Click on a feature on the list to highlight it, then click on the **Hide** button to remove the checkmark. Click again on the button (it will now say **Show**) to make the checkmark reappear. (You may also double-click on lines in the feature list to toggle **Show/Hide**.) Use the **Show All** and **Hide All** buttons to select or remove all the checkmarks. Click on the **Defaults** button to return to the default setting (all features are displayed).

The order (from bottom to top) in which the features appear in the dialog box determines the order in which they are drawn: items on the bottom of the list are drawn under the ones at the top. Use the **Raise**, **Lower**, **To Top**, and **To Bottom** buttons to manipulate the list. So, for example, if you highlight "City Names" and then click on the **To Top** button, "City Names" will move to the top of the list. When the map is redrawn the city names will be drawn last, on top of all other features. Clicking on **OK** closes the Map Features box and redraws the map.

2.3 Overlapping Pins

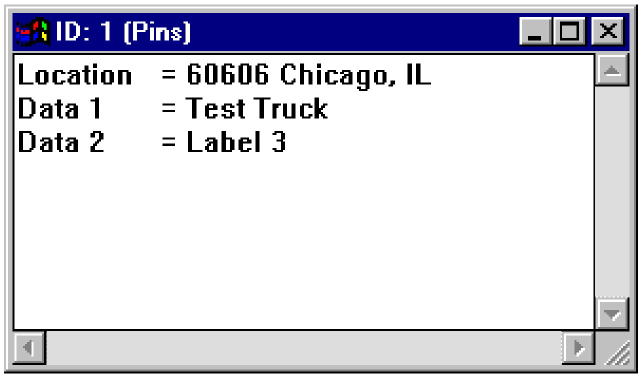
When you create a layer with multiple pins in the same location, PC*MILER|Mapping can create a special icon at that location that enables you to view a list of the cluster of pins and see detailed information about them. This feature is often used to reduce the number of pins on the map, and to simplify access to individual pins in close proximity to each other.

To see the list of pins represented by this icon, first click on the map with the right mouse button, then choose *Pick/Label>Pick Pins.* The cursor shape will change to a hand with a pointing finger. Now click on the target icon to bring up the Selected Pins dialog box. This dialog lists all the pins at the location you clicked. The number of pins listed is in parentheses in the title bar.



```
Pins    :1    60606 Chicago, IL
Pins    :2    60606 Chicago, IL
Pins    :3    60606 Chicago, IL
```

To see more detailed information about a pin as shown below, highlight it on the list and click **OK**, or double-click on the item you wish to select.



```
Location   = 60606 Chicago, IL
Data 1     = Test Truck
Data 2     = Label 3
```

Chapter 3 Programming With the DLL Interface

Programming with the regular DLL interface involves linking your Windows application to the PC*MILER|Mapping DLLs (statically or dynamically), then creating a map window (it can be a child of an existing window, or a completely new window), and then working with this window through DLL calls. All functions of this interface start with the prefix "PCMG". PC*MILER|Mapping also includes a set functions to create and work with **multiple map windows**(see section 3.8).

3.1 Getting Started

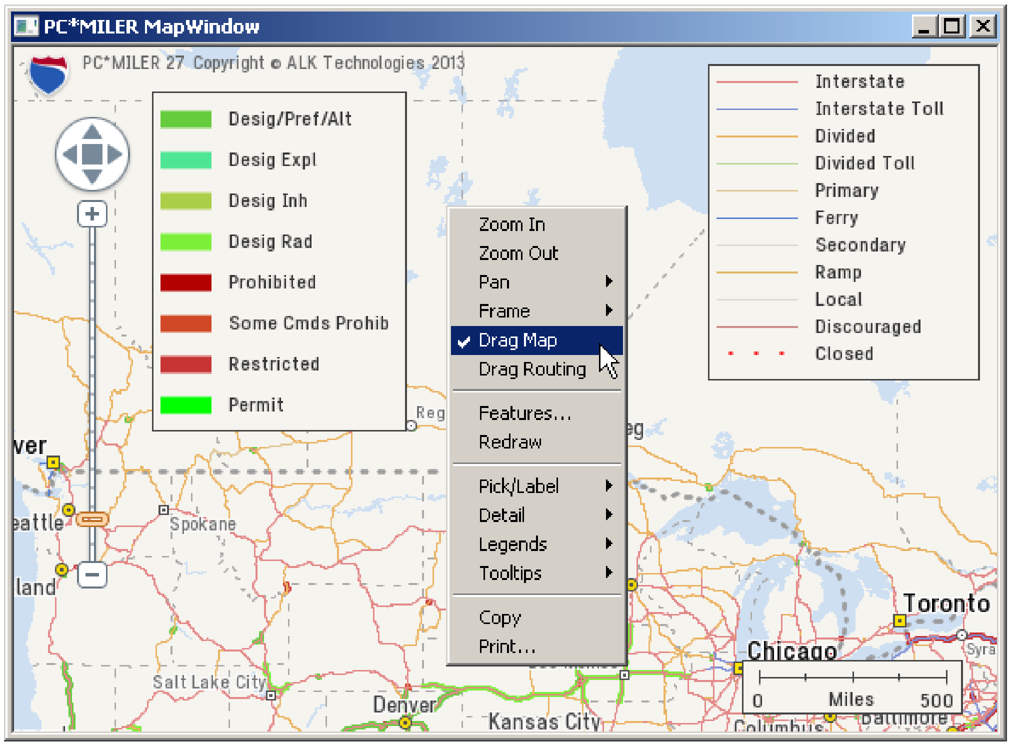
After completing the Full Installation you should have a Windows program group containing an icon for a test program to verify your installation. Starting this program will bring up the map window displaying the North American highway system and allow you to use the map's built-in functionality.

The PC*MILER|Mapping installation includes the following two main DLLs:

MapWindow DLL	**pcmgw32.dll** (PC*MILER and PC*MILER|Worldwide) **pmwsmap.dll** (PC*MILER|Streets) Provides functions to create and manipulate a map window that displays the PC*MILER network containing U.S., Canadian, and Mexican political boundaries, state boundaries, city names, highways, roads.
Mapping DLL	**pcmgmp32.dll** (PC*MILER and PCMILER|Worldwide) **pmwscomm.dll** (PC*MILER|Streets) This DLL provides functions to plot geographic information such as icons, routes, and lines in the map window.

3.2 Built-in Functionality

To allow you to get started more quickly, PC*MILER|Mapping has built-in zooming features and a menu invoked off the right mouse button which provides much of its functionality.



To zoom to an area, drag a rectangle around it (hold down the left mouse and drag) or double-click on a point within the area to center the map around it. The following features are provided in the right-mouse menu:

Zoom In	Zoom in by a factor of two; can be repeated for closer views; increases detail.
Zoom out	Zoom out by a factor of two; can be repeated; decreases detail.
Pan>	Shift the map view in any of eight directions: **North**, **South**, **East**, or**West**.
Frame >	Frame one of the geographic areas listed in the sub-menu.**Auto Frame Route** automatically frames all routes when they are generated. **All Routes** frames every generated route drawn on the map. To frame just one route, select it from the bottom of the menu.

Drag Map	In Drag Map mode, the user can drag the map in any direction to change the view. Click the left mouse button, hold, and drag.
Drag Routing	Enables the user to drag a route onto a different road, creating a new via point.
Features…	Invoke the Features dialog box to control which features are drawn on the map and the order in which they are drawn.
Redraw	Redraw the current display in the map window.
Pick/Label >	Choose one from the sub-menu: **Label Cities:** Enable user to label and deselect locations and road intersections with the mouse. **Label Roads:** Enable user to label and deselect roads with the mouse. **Pick Pins:** Enable user to click on the pins and display a window listing information about the icon. **Clear:** Delete all labels that have been added manually.
Detail >	Add to, reduce or return to the default number of roads, road names and place names drawn on the map. (Choose **More**, **Less**, or **Default** from the submenu).
Legends >	Show/Hide the **Scale of Miles**, **Road Legend**, **Route Legend**, **Restriction Legend**(with PC*MILER| HazMat installed)**,** and/or **Traffic Legend** (with Traffic features installed).
Tooltips >	Select **Route Distance** to have a tooltip appear when the cursor is placed over a route on the map. The tooltip will display the distance between the selected point and the route's origin, and between the selected point and the route's final destination.
Copy	Copythe map to the clipboard for retrieval in other Windows programs.
Print…	Print the map that is currently displayed in the map window.

3.3 Using PC*MILER|Mapping DLL Functions

This section explains how to create applications that use the PC*MILER|Mapping DLL's. While this section is geared to 'C' programmers, it should apply to any language that can call DLL's using the Pascal calling convention.

Function references for all the subroutines described in Chapter 3 can also be found in the header files in the PC*MILER|Mapping installation – see *Appendix A*. Please have a look at the sample code included with PC*MILER|Mapping for a detailed example of how to use the DLL. The location of these files is usually C:\ALK Technologies\PCMILER28\Mapping.

Building an application with the MapWindow DLL is similar to using other DLL's from C programs. You'll need to specify the directories that contain header and library files for the MapWindow `DLL`in your project. If you installed PC*MILER|Mapping in the default location C:\ALK Technologies\PCMILER28, the headers and the libraries will be in C:\ALK Technologies\ PCMILER28\Mapping. Sample code will also be in the Mapping directory.

All the function declarations of **pcmgw32.dll** (or **pmwsmap.dll** for PC*MILER|Streets)are included in **pcmgwin.h**. All the function declarations of **pcmgmp32.dll**(or **pmwscomm.dll** for PC*MILER|Streets)are included in **pcmgmap.h**.

Call LoadLibrary at runtime to load the DLL and then call `GetProcAddress` to retrieve the entry points for the functions exported from the DLL. Examples of this method using Visual C++ are included in the subdirectory `MAPPING\MSVCPP` of your PC*MILER installation.

You can also either link the application with the supplied import libraries (**pcmgw32.lib, pcmgmp32.lib)**, or include the `IMPORTS` section from the included def files (**pcmgw32.def, pcmgmp32.def**) in your project's module definition file.

NOTE: Beginning with Version 14, all PC*MILER DLL's are compiled with Visual C++. So the included lib files may not be compatible with compilers other than Visual C++. We strongly recommend that the LoadLibrary method should be used.

Differences in PC*MILER and PC*MILER|Streets DLL filenames and directories are summarized below:

PC*MILER and PC*MILER|Worldwide	**PC*MILER|Streets**
C:\...PCMILER28\MAPPING	C:\...PCMILER28\MAPPING
pcmgw32.dll	pmwsmap.dll
pcmgmp32.dll	pmwscomm.dll
pcmgw32.lib	pmwsmap.lib
pcmsmp32.lib	pmwscomm.dll
pcmgw32.def	pmwsmap.def
pcmsmp32.def	pmwscomm.def
PCMSERVE.INI	PCMSERVE.INI

3.3.1 Opening and Closing Map Windows

There are potentially four steps, using the functions described in this section, for opening and closing map windows:

1. Initialize the data for a new map window using `PCMGInitMap()`.
2. Create the new map window using either `PCMGCreateMapWindow()` or `PCMGCreateMapChild()`.
3. Close the new map window using `PCMGCloseMap()`, or completely close the application using `PCMGCleanupMap()`.
4. If `PCMGCloseMap()` was used to close a particular map window, you may reinitialize and reopen a new map window (steps 1 and 2 above), or reopen an existing map window using `PCMGResizeMapChild()`. If you called `PCMGCleanupMap()` and then wish to use PC*MILER|Mapping again, you must call `PCMGInitMap()` as in step 1 above.

```
BOOL _PCMGWFN PCMGInitMap(const char FAR *appName, const
char FAR *iniFile);
```

The function `PCMGInitMap`will initialize data for a new map window. Your application must call this function before calling any other MapWindow DLL functions.

The first argument is the name of the calling application.

The second argument is the name of the INI file. The DLL uses this to locate the PC*MILER database. Both arguments may be Null. The default ini file name is **pcmserve.ini**. The return value is TRUE if the initialization is successful, otherwise the return value is FALSE.

```
HWND _PCMGWFN PCMGCreateMapWindow(HWND parentHWnd, const
char FAR title, int width, int height);
```

`PCMGCreateMapWindow()`creates a new map window. It automatically displays the PC*MILER network containing U.S, Canadian and Mexican political boundaries, state boundaries, city names, highways and roads.

The first argument is the handle to the parent window. If the first argument is NULL, PC*MILER|Mapping creates the map window as a child of the desktop window – PC*MILER|Mapping creates a standalone overlapped map window as a child to this parent window and sets the title, width and the height for the map window. This map window always stays on top of the parent window and it has a title and border.

This function returns the valid handle to the map window if it creates the map window successfully. It returns NULL on error.

This is how your application should call these functions:

```
HWND mapWin;
if (PCMGInitMap("Test App", "pcmserve.ini"))
{
mapWin = PCMGCreateMapWindow(parentWindow,
"Test Map Window", 400, 300);
}
```

```
HWND _PCMGWFN PCMGCreateMapChild(HWND parentWin);
```

`PCMGCreateMapChild()` creates a new map window as a child of the parent window. In this case, the map window is not a standalone window. Instead it gets created in the client rectangle of the parent window. The new map window does not have a title or border.

The first argument, which is the handle to the parent window, must not be NULL.

This function returns the valid handle to the map window, if it creates the map window successfully. It returns NULL in case of error or if the parent window handle is NULL.

A Delphi canvas, Visual Basic Form or a Borland OWL TFrameWindow could all be parent windows.

In order to resize the map canvas, you should forward resize messages from the parent to the map window child using `PCMGResizeMapChild`.

```
BOOL _PCMGWFN PCMGResizeMapChild(short redraw);
```

This function returns FALSE if the parent window does not exist. Otherwise it resizes a map canvas to the parent's size. Calling this function will make the map child resize itself to fit exactly inside the parent window.

Use this function only if you have created the map window with `PCMGCreateMapChild`.

```
PCMGCloseMap (long mapid);
```

`PCMGCloseMap()` is used to close a particular map window if open. If closing the application completely, use the function `PCMGCleanupMap()`(see below).

```
BOOL _PCMGWFN PCMGCleanupMap();
```

`PCMGCleanupMap()`frees all map data and closes the PC*MILER|Mapping application. **This function should only be used to completely close the application.** To close a particular window, use `PCMGCloseMap()`. If you want to use PC*MILER|Mapping again after calling `PCMGCleanupMap()`, you first need to call `PCMGInitMap()` as in step 1 at the beginning of this section.

3.4 Map Manipulation Functions

NOTE: The PushMapView, PopMapView, GetMapView, and SetMapView functions have been discontinued.

The functions in this section allow you to manipulate the map window. All functions return a negative value in case of error. See *Appendix C*for a list of error codes.

3.4.1 Map Style and Dimensions

The functions below are for managing map styles and dimensions.

```
LRESULT _PCMGWFN PCMGGetMapStyleList(char* pList, long
lListSize);
```

The above function returns a list of valid style names the user can select from. The list of names will be delimited by the "|" character. The argument *pList* must be a pre-allocated memory buffer that gets populated with the list. *long lListSize* should indicate the available size of the buffer.

```
LRESULT _PCMGWFN PCMGGetActiveMapStyle(char* pSyleName,
longbufSize);
```

Gets the name of the currently active map style.

Parameters:

pStyleName	Empty buffer where the active style name is placed
bufSize	Size of the empty buffer

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGSetMapStyle(const char* pStyleName);
```

Using the above function, the user can specify what style to use for the map. The name given will be checked to ensure it is a valid style name. If it is, the map's style will be updated appropriately. If not, the map will remain unchanged and a -1 value will be returned. See the *PC*MILER User's Guide* or Help for more on available map styles.

```
LRESULT _PCMGWFN PCMGGetMapWindowDims(long *llLat, long
*llLon, long *urLat, long *urLon);
```

The above function returns the lower left and upper right corners of the map projection rectangle in lat/long coordinates as long values. The user must supply four (4) valid long pointers that will be populated with the relevant information. After the data is returned, each value can be divided by 1000000.0 to get the decimal version of the lat/long values if desired.

```
LRESULT _PCMGWFN PCMGSetProjectionRect(float latitude1,
float latitude2, float longitude2);
```

Allows the user to specify a desired projection rectangle for the PC*MILER map. The rectangle is defined by the lower left corner and the upper right corner of the desired viewing area using latitude/longitude coordinates in decimal format. PC*MILER will do its best to adjust the maps projection rectangle to match the user specified one. We cannot guarantee that it will match exactly though. Calling this function will generate a map resize event.

Parameters:

latitude1	Lower left hand corner latitude coordinate
longitude1	Lower left hand corner longitude coordinate
latitude2	Upper right hand corner latitude coordinate
longitude2	Upper right hand corner longitude coordinate

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGGetProjectionRect(float* latitude1,
float* latitude2, float* longitude2);
```

Returns the current projection rectangle of the PC*MILER map. The coordinates will be the lower left and upper right corners of the rectangle. They will be given as latitude/longitude coordinates in decimal format.

Parameters:

latitude1	Lower left hand corner latitude coordinate
longitude1	Lower left hand corner longitude coordinate
latitude2	Upper right hand corner latitude coordinate
longitude2	Upper right hand corner longitude coordinate

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGSetProjectionRadius(float latitude,
float latitude, long radius);
```

Allows the user to specify the projection rectangle of the map based on a center point and desired viewing radius. The center point is specified as a latitutde/longitude coordinate in decimal format and the radius is specified in whole miles. Calling this function will generate a map resize event.

Parameters:

latitude	Latitude of the desired center point
longitude	Longitude of the desired center point
radius	Desired radius (in miles) to encapsulate in the projection rectangle

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGSetProjectionCenter(float latitude,
float longitude);
```

Allows the user to re-center the projection rectangle of the map to the specified coordinate. The dimensions and zoom level of the map will remain the same, just readjusted to the new center. The center coordinate is specified as a latitude/longitude coordinate in decimal format. Calling this function will generate a map resize event.

Parameters:

latitude	Latitude of the desired center point
longitude	Longitude of the desired center point

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGPixelToLatLong(long x, long y, float
*latitude, float *longitude);
```

Will convert a window (x,y) coordinate into a latitude/longitude coordinate within the map's current projection rectangle. The lat/long coordinate will be given in decimal format.

Parameters:

x	x-coordinate to be converted
y	y-coordinate to be converted
latitude	Where the converted latitude coordinate is stored
longitude	Where the converted longitude coordinate is stored

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGLatLongToPixel(float latitude, float
longitude, long *x, long *y);
```

Will convert a latitude/longitude coordinate into a window (x,y) coordinate. The latitude/longitude coordinate is not required to be within the map's current projection rectangle for this to work. This function can return coordinates outside the bounds of the actual map window.

Parameters:

latitude	The latitude coordinate, in decimal format, to convert
longitude	The longitude coordinate, in decimal format, to convert
x	Where the converted x coordinate is stored
y	Where the converted y coordinate is stored

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

3.4.2 Map Drawers

```
LRESULT _PCMGWFN PCMGGetDrawerCount();
```

This function returns the number of drawers or features offered by the PC*MILER map. Examples of a drawer are Roads, Cities, Hazmat, Time Zones, etc.

Return Values:

<0	Internal error, operation failed
>=0	The number of drawers currently loaded by the PC*MILER map

```
LRESULT _PCMGWFN PCMGGetDrawerInfo(long index, char*
displayName, long bufSize, bool* visible);
```

This function retrieves basic information about a specific PC*MILER drawer based on an index value. It returns the drawer's display name as well as its current visibility state on the PC*MILER map.

Parameters:

index	Index of the drawer for which to get information
displayName	Buffer in which to store the drawer's display name
displaySize	Size of the display name buffer
visible	Boolean in which to store the drawer's visibility state

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

```
LRESULT _PCMGWFN PCMGSetDrawerVisible(const char*
displayName, bool visible);
```

Allows the user to set whether a specific drawer is visible on the map or not. The drawer's display name is used as the unique identifier for the specific drawer you want to set visibility for.

Parameters:

displayName	Display name of the drawer
visible	Visibility state to set the drawer to

Return Value:

<0	Internal error, operation failed
>=0	Operation successful

3.4.3 Scroll, Print, Copy and Redraw

```
LRESULT _PCMGWFN PCMGScrollMapView(int direction);
```

This function allows you to scroll the map window one 'page' in a given compass direction.

The argument 'direction' must be one of the values from the list below:

DIR_WEST	DIR_NORTHEAST
DIR_EAST	DIR_NORTHWEST
DIR_NORTH	DIR_SOUTHEAST
DIR_SOUTH	DIR_SOUTHWEST

```
LRESULT _PCMGWFN PCMGPrintMap(BOOL showDlg, const char FAR
*title);
```

Print the map. Pass FALSE for `showDlg` to bypass PRINT dialog. The second argument, `title`, is the name that appears on top of the printed map.

```
LRESULT _PCMGWFN PCMGPrintMapOnDC(HDC hDC, const char FAR
*title);
```

Print the map directly on a printer DC. Client app needs to prepare DC. The second argument, `title`, is the name that appears on top of the printed map.

```
LRESULT _PCMGWFN PCMGCopyMap();
```

Copy the map to the clipboard. Allows pasting into other Windows applications.

```
LRESULT _PCMGWFN PCMGRedraw();
```

Force a redraw of the entire map.

3.4.4 Toggle Display Features

```
LRESULT _PCMGWFN PCMGSetCityLabeling(BOOL onOff);
```

Turns city labeling on or off. When on, clicking a road intersection with the left mouse will label it with a city or intersection name. Clicking again will remove the label.

```
LRESULT _PCMGWFN PCMGGetCityLabeling();
```

Gets the current status of “City Labeling Mode”, whether on or off.

```
LRESULT _PCMGWFN PCMGToggleCityPicking();
```

Turns “City Labeling Mode” on and off. When on, clicking a road intersection with the left mouse will label it with a city or intersection name. Clicking again will remove the label.

```
LRESULT _PCMGWFN PCMGSetRoadLabeling(BOOL onOff);
```

(Deprecated in Version 28) Turns road labeling on or off. When on, clicking a road will place a shield on the road. Clicking again will remove the shield.

```
LRESULT _PCMGWFN PCMGGetRoadLabeling();
```

(Deprecated in Version 28) Gets the current status of “Road Labeling Mode” (on or off).

```
LRESULT _PCMGWFN PCMGToggleRoadPicking();
```

(Deprecated in Version 28) Turns “Road Labeling Mode” on and off. When on, clicking a road with the left mouse will place a shield on the road. Clicking again will remove the shield.

```
LRESULT _PCMGWFN PCMGSetPinPicking(BOOL onOff);
```

Turns pin picking on or off. When on, clicking a pushpin will display information about that pin.

```
LRESULT _PCMGWFN PCMGGetPinPicking();
```

Gets the current status of "Pin Picking Mode", whether on or off.

```
LRESULT DLLFUNC PCMGTogglePinPicking();
```

Turns "Pin Picking Mode" on and off. When on, clicking a pushpin displays information about that pin.

```
LRESULT _PCMGWFN PCMGClearLabels();
```

Clears all labels created by the user when in "City Labeling" mode.

NOTE: If you zoom out from an area that you have custom labelled as described above, the labels will disappear as the level of detail decreases. When you zoom back in again, your labels will reappear.

```
LRESULT _PCMGWFN PCMGToggleRouteDistTooltip();
```

Toggles the state of distance to destination tooltips on route lines.

```
LRESULT _PCMGWFN PCMGSetRouteDistTooltip(BOOL onOff);
```

Used to explicitly set the state of distance to destination tooltips on route lines on or off.

```
LRESULT _PCMGWFN PCMGGetRouteDistTooltip ();
```

Returns the current state of the distance to destination tooltip feature, on or off.

3.4.5 Toggle Legends

NOTE: Legends can be dragged around the map window.

```
LRESULT DLLFUNC PCMGSetRoadLegend(BOOL onOff);
```

Turns the Road Legend on and off. The road legend identifies the road types displayed in the map.

```
LRESULT _PCMGWFN PCMGToggleRoadLegend();
```

An alternate way to turn the Road Legend on/off.

```
LRESULT _PCMGWFN PCMGGetRoadLegend();
```

Gets the status of the “Road Legend” function, whether on or off.

```
LRESULT _PCMGWFN PCMGToggleRouteLegend();
```

Toggles the Route Legend on/off. The Route Legend identifies routes on the map by color and number and may be dragged around the map.

```
LRESULT _PCMGWFN PCMGSetRouteLegend(BOOL onOff);
```

Explicitly sets the visibility state of the Route Legend, on or off.

```
LRESULT _PCMGWFN PCMGGetRouteLegend();
```

Returns the visibility of the Route Legend, on or off.

```
LRESULT DLLFUNC PCMGToggleRestrictionsLegend;
```

Toggles the visibilityf the Restrictions Legend on the map. This legend identifies the PC*MILER|HazMat road types displayed on the map.

```
LRESULT DLLFUNC PCMGSetRestrictionsLegend(BOOL onOff);
```

Explicitly sets the visibility of the Restrictions Legend, on or off.

```
LRESULT DLLFUNC PCMGGetRestrictionsLegend;
```

Returns the visibility state of the Restrictions Legend, on or off.

```
LRESULT DLLFUNC PCMGToggleTrafficLegend;
```

Toggles the visibility of the Traffic Legend on the map. This legend identifies the colors that are used to show traffic conditions on the map.

```
LRESULT DLLFUNC PCMGSetTrafficLegend(BOOL onOff);
```

Explicitly sets the visibility of the Traffic Legend, on or off.

```
LRESULT DLLFUNC PCMGGetTrafficLegend;
```

Returns the visibility state of the Traffic Legend, on or off.

```
LRESULT DLLFUNC PCMGSetScale(BOOL onOff);
```

Turns the Scale of Miles on and off. When distances are measured in kilometers, displays a Scale of Kilometers.

```
LRESULT _PCMGWFN PCMGGetScale();
```

Returns the visibility of the Scale of Miles legend, whether on or off.

```
LRESULT _PCMGWFN PCMGToggleScale();
```

Toggles the Scale of Miles on and off.

3.4.6 Adding or Removing Detail

```
LRESULT _PCMGWFN PCMGAddDetail();
```

Increases the number of roads, road names and city names displayed. Each call to the function increases the level of detail by the same amount as zooming in a level. May be called multiple times to dramatically increase the level of detail.

```
LRESULT _PCMGWFN PCMGRemoveDetail();
```

Decreases the number of roads, road names and city names displayed. Each call to the function decreases the level of detail by the same amount as zooming out a level. The function may be called multiple times to dramatically decrease the level of detail.

```
LRESULT _PCMGWFN PCMGDefaultDetail();
```

Resets the number of roads, road names and city names displayed to the default.

```
LRESULT _PCMGWFN PCMGGetDetailAdjust();
```

Returns the detail level adjustment value; i.e. the amount the user has increased or decreased the detail level over the base value.

```
LRESULT _PCMGWFN PCMGGetDetailLevel();
```

Returns the current detail level of the map.

3.4.7 Frame and Zoom Functions

```
LRESULT _PCMGWFN PCMGSetUSWindow();
```

Frames the continental United States.

```
LRESULT _PCMGWFN PCMGSetNAWindow();
```

Frames North America.

```
LRESULT _PCMGWFN PCMGSetCanWindow();
```

Frames Canada.

```
LRESULT _PCMGWFN PCMGSetMexWindow();
```

Frames Mexico.

NOTE: The above functions will not be supported for 32-bit in future releases of PC*MILER|Mapping. Users should be using the new set of frame functions.

Use the following functions to frame different areas of the map.

```
LRESULT _PCMGWFN PCMGNumFrameAreas();
LRESULT _PCMGWFN PCMGGetFrameArea(int index, char FAR
*buffer, int bufSize);
LRESULT _PCMGWFN PCMGFrameArea(const char far *areaName);
```

`PCMGNumFrameAreas()`returns the number of frameable areas available.

Use `PCMGGetFrameArea()` to retrieve each frameable area name by index. This function will fill the area name in the buffer. This area name stored in the buffer should then be passed to `PCMGFrameArea()`to frame that particular area. The return value of this function is the number of characters copied into the buffer.

The following code creates a combo box that lists all the frameable area names:

```
int numAreas;
char buf[25];
int ret = 0;
numAreas = PCMGNumFrameAreas();
for (int i = 0; i < numAreas; i ++){
    ret = PCMGGetFrameArea(i, buf, 25);
    if (ret > 0)
         ComboBox->Items->Add(buf);
}
```

The following code frames the area that is selected in the edit region of the combo box:

```
PCMGFrameArea(ComboBox->Text.c_str());
```

Currently there are eight frameable areas available: US, NA, Bermuda, Hawaii, Greenland, Canada, Mexico, Puerto Rico.

```
LRESULT _PCMGWFN PCMGZoomIn();
```

Zooms in one level. Equivalent to double-clicking with the left mouse. Will cause more detail to appear on the map.

```
LRESULT _PCMGWFN PCMGZoomOut();
```

Zooms out one level. Will cause less detail to appear on the map.

Use the following function to zoom to a specified location on the map:

```
LRESULT _PCMGWFN PCMGZoomToPlace(const char FAR *place, int
radius);
```

`PCMGZoomToPlace()` returns -22 (UNKNOWN_LOCATION) if the specified location cannot be geocoded or is invalid. Returns 0 on success. `Place` can be any valid PC*MILER location (city-state, lat/long, etc.). `Radius` is the preferred radius for the viewing scale, specified in distance units multiplied by 10. For example, a value of "30" would be 3 miles or 3 kilometers, depending on currently used distance units. A negative value will use the current viewing scale – only the center of the map will change, the map scale stays the same. A value of 0 for the radius will cause Mapping to use the default radius specified in the PCMSERVE.INI, for example:

```
[Defaults]
FrameRadius=30
```

3.4.8 Layer Control Functions

```
LRESULT _PCMGWFN PCMGShowLayer(const char FAR *pLayerName);
LRESULT _PCMGWFN PCMGHideLayer(const char FAR *pLayerName);
```

Using these functions, you can show or hide a layer by name. Layers are groups of features in the map. Some layers, like roads and political boundaries, are provided with the map. Other layers, like groups of pins, routes and lines, are created by the user.

```
LRESULT _PCMGWFN  PCMGPlotLabel(const char FAR *layerID,
const char FAR *ID,const char FAR *importance, const char
FAR *style, const char FAR *locations,LPCSTR options);
```

Using this function, you can highlight a place on the map. This draws a stop label similar to PC*MILER stops.

```
LRESULT _PCMGWFN PCMGDeleteLabel(const char FAR *layerID,
const char FAR *ID);
```

Using this function, you can delete a highlighted label from the map.

```
LRESULT DLLFUNC PCMGSetUseOverlapIcon(const char FAR
*playerName, BOOL onOff);
```

This function enables or disables the display of the overlap icon by layer for multiple pins that overlap.

```
LRESULT DLLFUNC PCMGSetOverlapIconName(const char FAR
*playerName, const char FAR *pIconName);
```

Allows the user to specify the icon to be used by layer as an overlap icon.

3.4.9 Callback Functions

Callback functions are used to enable user interaction between the map and the rest of the application, in particular, notification of mouse events related to pin picking. This is provided so that users can override the default behavior that the PC*MILER|Mapping window exhibits when the user is performing pin picking. More information is available below in section 3.4.10, *Callback Ability*.

```
LRESULT DLLFUNC PCMGSetReceiver(HWND hWnd);
```

This function assigns the provided window handle to receive specific mouse event messages from the PC*MILER|Mapping window. The PC*MILER|Mapping window will send standard window messages to the specified window. This window must have a standard message handling callback function defined or else it will not receive any of these window messages. Read more on the types of messages that are sent in section 3.4.10, *Callback ability*.

```
LRESULT DLLFUNC PCMGSetCallBack(BOOL onOff);
```

This function sets the use of callbacks on or off. If callbacks are turned on then the PC*MILER|Mapping window will broadcast specific mouse event messages to the previously designated window handle. When turned off, the mouse event messages will not be broadcast and the PC*MILER|Mapping window will perform the default mouse actions.

```
LRESULT_PCMGWFN
PCMGSetMouseInterceptCallback(MouseInterceptCallback
callback);
```

This function registers a callback function that will be passed a specific set of mouse events as they happen on the map. This callback will be the first function to receive these events and will give the user the first chance to act on them before the PC*MILER map does. The specific mouse messages we will send to this callback are:

WM_LBUTTONDOWN (0x0201)
WM_LBUTTONUP (0x0202)

WM_LBUTTONDBLCLK (0x0203)
WM_RBUTTONDOWN (0x0204
WM_RBUTTONUP (0x0205)
WM_MOUSEMOVE (0x0200)
WM_MOUSELEAVE (0x02A3)

Parameters:

callback	A function pointer to the user defined callback function

Return Values:

<0	Internal error, operation failed
>=0	Operation successful

The callback function signature is defined as follows:
typedef cdecl bool (*MouseInterceptCallback) (unsigned long mapID, unsigned long mode, unsigned long msgID, long windowX, long windowY, unsigned long modKeys);

Parameters:

mapID	Unique ID of the map generating the mouse message
mode	Value indicating current mode of the mouse. This mode is PC*MILER-specific
msgID	One of the seven mouse event ID's listed above
windowX	x window coordinate where the mouse event occurred
windowY	y window coordinate where the mouse event occurred
modKeys	Value indicating what (if any) modifier keys were pressed during the mouse event

Return Values:

True	Indicates that the callback has handled the given mouse message. This will cause the PC*MILER map to bypass any further processing of this mouse message.
False	Indicates that the callback did not fully handle the message. The PC*MILER map will be allowed to process this message as normal.

```
LRESULT_PCMGWFN PCMGSetMapResizeCallback(MapResizeCallback
callback);
```

This function registers a callback function that will be called after every map resize event generated by the PC*MILER map. The callback is simply used to pass the user information about the map after an event occurs.

Parameters:

callback	A function pointer to the user-defined callback function.

Return Values:

<0	Internal error, operation failed

>=0	Operation successful

The callback function signature is defined as follows:
typedef cdecl void (*MapResizeCallback) (unsigned long mapID, long zoomLevel, float latitude1, float longitude1, float latitude2, float longitude2);

Parameters:

mapID	Unique ID of the map generating the resize event
zoomLevel	Current zoom level of the map
latitude1	Current lower left latitude of the map projection rectangle in decimal format
longitude1	Current lower left longitude of the map projection rectangle in decimal format
latitude2	Current upper right latitude of the map projection rectangle in decimal format
longitude2	Current upper right longitude of the map projection rectangle in decimal format

3.4.10 Callback Ability

CRITICAL NOTE For PREVIOUS MAPPING CALLBACK USERS: In Version 25, all mouse messages were updated to include the map ID value at the end of the data string in *lpData*. Customer code that parses this string may have to be updated to properly handle this new value at the end of the string.

PC*MILER|Mapping has the ability to broadcast specific mouse messages to the calling application based on user interaction. There are four different mouse actions that will cause a mouse event message to be broadcast:

1) Left mouse click of a pin
2) Right mouse click of a pin
3) General mouse movement
4) Mouse mode changed

If callbacks are turned on, a mouse event message will be generated and sent to the registered callback window. The contents of the message are packed into a COPYDATASTRUCT, which is defined below.

```
struct COPYDATASTRUCT
{
     Unsigned long dwData;
     Unsigned long cbData;
     Void* lpData;
}
```

The contents of each field of this structure are detailed below:

dwData: The PC*MILER|Mapping code puts two separate values inside of this unsigned long value, one value is in the lower 16 bits, the other in the upper 16 bits. The upper 16 bits contains a value indicating the message type being returned. The lower 16 bits contains a value indicating what the current mouse mode is.

The upper 16 bits are the most important as this value will tell you which mouse action occurred and dictates how the rest of the structure should be interpreted. There are 5 possible values that can be returned from the PC*MILER|Mapping mouse events:

1 = Mouse Move event.
2 = Mouse Mode Changed event.
9 = Left Mouse Click event on a selected pin.
10 = Left Mouse Click event on no pin.
11 = Right Mouse Click event on a pin or set of pins.

In C/C++ customers can use the macro `HIWORD()` to extract the upper 16 bits of this variable and `LOWORD()` to extract the lower 16 bits.

cbData: The value of this variable tells us how many bytes are pointed to by the *lpData* variable.

lpData: If this variable is not NULL, it will point to a C-style string containing more detailed information related to the mouse event being reported. In each case, if there are multiple individual pieces of data they will be separated by the | character. Below are the details of what each mouse mode puts into this string.

Mouse Move: “`location|mapID`”. The location could either be a lat/long pair, a city name, or a road name. It is dependent on what the mouse cursor is currently moving over.

Right Mouse Click on a pin:
“`pin_layer_name|pin_name|pin_location|x|y|mapID`”

Left Mouse Click: message type 9:
“`pin_layer_name|pin_name|pin_location|mapID`”
`message type 10: ”None|mapID`”

Mouse Mode Change: “`mapID`”

Sample code including lat/long coordinates is below:

```
/*************************************************
* This file contains two examples of how to use the
PCMGWIN DLL from 'C' and 'C++'. Code similar to this
structure can be used from Delphi, Visual Basic,
PowerBuilder, etc. This example contains code to handle
the callback feature.
* Note: this program requires you to link with BOTH the
libs for PCMGMAP.DLL and PCMGWIN.DLL. i.e. link with the
files PCMGMAP.LIB and PCMGWIN.LIB.
* Copyright 1999-2014, ALK Technologies, Inc. ALL RIGHTS
RESERVED.
*************************************************/
#include <windows.h>
#include <owl\dialog.h>
#include <stdio.h>
#include <string.h>
#include "pcmgmap.h"
#include "pcmgwin.h"
HWND OpenMapWindow(HWND parentWindow);
void PlotExamples();

char iniFileName[100] = "pcmserve.ini";

#ifdef __cplusplus
#include <owl/applicat.h>
#include <owl/framewin.h>
#include <owl/listbox.h>

#define BUFLEN          256
#define LISTID          100
#define LISTWIDTH  600
#define LISTHEIGHT 400
#define CM_SAVE    0x100
class TMsgList : public TListBox
{
  public:
    TMsgList();
};

TMsgList::TMsgList() : TListBox(0, LISTID, 0, 0,
LISTWIDTH, LISTHEIGHT)
{
    Attr.Style |=  LBS_DISABLENOSCROLL |
                   LBS_NOINTEGRALHEIGHT;
    Attr.Style &= ~LBS_SORT;
}

/************************************************/
```

```
class TEngineWindow : public TFrameWindow
{
  public:
    TEngineWindow(const char *title);
    int AddString(const char *str)
          { return(pListBox->AddString(str)); }
    LRESULT StringMessage(WPARAM, LPARAM);
    // Save menu command...
    void SetupWindow();
  private:
    TMsgList *pListBox;
  DECLARE_RESPONSE_TABLE(TEngineWindow);
};
DEFINE_RESPONSE_TABLE1(TEngineWindow, TFrameWindow)
    EV_WM_SYSCOMMAND,
    EV_MESSAGE(WM_COPYDATA, StringMessage),
END_RESPONSE_TABLE;

LRESULT TEngineWindow::StringMessage(WPARAM wParam,
LPARAM lParam)
{
    int ret;
    char *str = NULL;
    char buffer[BUFLEN];

    COPYDATASTRUCT *cds = (COPYDATASTRUCT *)lParam;
    if (!cds)
         return(-1);

    switch (HIWORD(cds->dwData))
    {
         case 1:
         // lpData contains the lat long coords
              wsprintf(buffer, "MSG_STRING: %s", (char
              *) cds->lpData);
              return 1;
              break;
         case 2:
         /* These are the label/pick modes that can be
         selected from the menu */
         // No Mode = 0
         // Label Roads = 1
         // Label Cities = 2
         // Pick Pins = 4
              wsprintf(buffer, "MSG_MODE: %ld",
                   (long) LOWORD(cds->dwData));
              break;
         case 9:
```

```
     /* when the user clicks with the left mouse button
     then the folowing information is returned: */
          // layerId, pinId, location
          // the information is separated with '|''s
                wsprintf(buffer, "MSG_PICK_SYMBOL:
                %ld", (long) cds->lpData);
                break;
          /* when the user clicks with the left mouse
          button on any empty location on the map, then
          the folowing information is returned (works
          only in pin-picking mode): */
          case 10:
          /* location (latitude/longitude) precision can
          be controlled by LatLongDigits parameter in
          Pcmserve.ini (see Appendix) */
                wsprintf(buffer, "MSG_PICK_LOCATION:
                %ld", (long) cds->lpData);
                break;
          case 11:
          /* Only if the PCMGSetCallBack has been called
          to enable callbacks i.e. onOff = 1, then the
          menu, when the right mouse is clicked, has been
          disabled, so that the application can bring up
          its own menu */
          /* The following pin information is also
          returned:
           layerId, pinId, location, xCoord, yCoord */
          /* the information is separated with '|''s */
                wsprintf(buffer, "MSG_RT_MOUSE_CLK: %ld",
                (long) cds->lpData);
                break;
     }

     str = buffer;
     if (pListBox && str)
     {
          ret = pListBox->AddString(str);
          // Do not delete the string: is managed by
          calling app.
          return(ret);
      }
      else
          return(-1);
}


TEngineWindow::TEngineWindow(const char *title) :
     TFrameWindow(0, title, new TMsgList(), TRUE)
```

```
{
    pListBox = dynamic_cast<TMsgList *>
    (GetClientWindow());
}
void TEngineWindow::SetupWindow()
{
    TFrameWindow::SetupWindow();
}


/*************************************************
COMMON FUNCTIONS:
*************************************************/

/* Open a new PC*MILER|MapWin window */
 HWND OpenMapWindow(HWND parentWindow, char *iniFile)
{
    HWND mapWin;

/* Load map data. Pass in calling application name and
INI file name */
    if (PCMGInitMap("Test App", iniFile))
    {
         /* Must have a valid parentWindow */
        if (!parentWindow)
                  parentWindow = ::GetDesktopWindow();
/* Create an OVERLAPPED window (not a child window) */
        mapWin = PCMGCreateMapWindow(parentWindow,
        "PC*MILER Test MapWindow", 400, 300);
    }
    return(mapWin);
}


/*************************************************
* CLASS LIBRARY EXAMPLE (BORLAND OWL SPECIFIC):
* WARNING: This will only compile under BORLAND 4.0 or
later! You must adapt this code for Visual C++ and MFC.
*************************************************/

class TestApp : public TApplication
{
    public:
        TestApp (char far *name) : TApplication(name)
             { }
        ~TestApp()
             { PCMGCleanupMap(); }
        void InitMainWindow();
```

```
         void InitInstance();
};
void TestApp::InitInstance()
{
         HWND mapWindow;
         TApplication::InitInstance();

         /* Initialize and create the map window */
         mapWindow = OpenMapWindow(MainWindow->HWindow,
         iniFileName);
         PCMGSetReceiver(MainWindow->HWindow);
         PCMGSetCallBack(1);
         if (!mapWindow)
             ::MessageBox(MainWindow->HWindow, "Could
             not create PCMGW32 DLL map", "Error",
             MB_OK);
}

void TestApp::InitMainWindow()
{
         TFrameWindow *pFrame;

         /* Create the application's main window */
         pFrame = new TEngineWindow("Test App [Main
              Window]");
         SetMainWindow(pFrame);
         pFrame->Attr.X = 100;
         pFrame->Attr.Y = 100;
         pFrame->Attr.W = 600;
         pFrame->Attr.H = 400;
}

int OwlMain(int argc, char **argv)

{
         if (1 < argc)
              strcpy (iniFileName, argv[1]);
         TestApp testApp("Test App");
         return(testApp.Run());
}

#endif /* #ifdef __cplusplus */
```

3.4.11 Displaying Pins, Trips, and Lines in the Map Window

There are several ways to display pins in the map window using the Mapping DLL, **pcmgmp32.dll** *(for PC*MILER|Streets,* **pmwscomm.dll***)*.

One way is to link both the MapWindow DLL and the Mapping DLL with your application. In this case, the Mapping DLL directly calls the MapWindow DLL functions.

Or you can have two separate applications linking each DLL individually. In this case, PC*MILER|Mapping sends Windows messages to the map window to display the icons. When the map window receives these messages, it processes these messages to display icons on the map.
Make sure that you have the map window open before calling any of the PC*MILER|Mapping functions because the communication fails otherwise.

By default, the PC*MILER|Mapping communicates with a window whose title has 'PC*MILER' as the first eight characters. However, you can create a map window with any title. Use the function`PCMGSetDisplayWindow`(provided in PC*MILER|Mapping) to connect the map window to PC*MILER|Mapping. `PCMGSetDisplayWindow`is used to give PC*MILER|Mapping a handle to the map window.

You need to call `SetDisplayWindow` before you call any other PC*MILER|Mapping functions.

If you are linking both the DLL's in your application, then your code should look like this:

```
HWND mapWin;

if (PCMGInitMap("Test App", iniFile))
{
/* Create an OVERLAPPED window */
mapWin = PCMGCreateMapWindow(parentWindow, "Test Map",
400, 300);

/* Now point PC*MILER|Mapping DLL at the new map window
and DLL */
    if (mapWin)
    {
PCMGSetDisplayWindow (mapWin);
PCMGPlotPin("Pins", "Truck1", "1", "Red Truck",
"Chicago, IL", "Test Truck");
    }
}
```

If you don’t link these two DLLs together, and if you are trying to display icons in the map window from other applications that are linked with the Mapping DLL, you need to do the following:

1. Find the map window’s window handle.

2. Call `PCMGSetDisplayWindow` with the handle found in Step 1.

The sample Borland C++ program to do this is below. The complete example program is in the file **mpwint32.cpp** located in the mapping directory of your PC*MILER installation.

```
int DemoRun()
{
    HWND mapwin = FindDisplayWindow();
    if (mapwin)
    {
PCMGSetDisplayWindow (mapwin);
PCMGPlotPin("Layer2", "A Pin", "1", "Red Truck 5",
"Pittsburgh,PA", "Label1|Label2|Label3");
    }
    return 0;
}

static HWND FindDisplayWindow()
{
    HWND win;

// Return value is 0 if found, 1 if not.
if (0 == EnumWindows(FindClientWin, (long) &win)) return
(win);
    else
         return (NULL);
}

//Title of the map window
#define MAP_WIN_TITLE   "Test Map"

static BOOL CALLBACK FindClientWin (HWND win, LPARAM
param)
{
    char buffer[256];
    HWND *pWin = (HWND *)param;
// If window has no title, go to the next one.
    if (0 == GetWindowText(win, buffer, 255))
         return(1);
if( 0 == strncmp(MAP_WIN_TITLE, buffer,
strlen(MAP_WIN_TITLE)))
    {
         *pWin = win;
         return(0);
    }
    return(1);
}
```

3.4.12 Saving .GIF Images

The following function enables you to save .GIF map images.

```
long PCMGCreateGifFile(long sx, long sy, char* fileName,
long option);
```

This function saves the .GIF image of the current map to a given file. X and y are the dimensions of the image. Returns 1 on success. The following constants represent the five possible options for positioning the legend:

0	NO_SCALE
1	TOP_LEFT_SCALE
2	TOP_RIGHT_SCALE
3	BOTTOM_LEFT_SCALE
4	BOTTOM_RIGHT_SCALE

BOTTOM_RIGHT_SCALE is the default position.

3.5 Plot Functions

The advanced interface to the PC*MILER|Mapping functions gives greater control over when and how pins, routes and lines are drawn, and allows data about a pin to be displayed in a dialog box when the pin is chosen.

All arguments are strings, and the separator between elements in stops, styles, options and labels is a vertical bar ('|'). For example, 'Princeton, NJ|Chicago, IL|90210' is a valid series of stops, and 'Red|5' is a valid style. The separator for an importance range is two periods (".."). For example, '1..4' is a valid importance range, as is simply '4' (the trip appears at levels 4 and higher).

The user can group pins into "layers", or "pinmaps." These layers can be turned on and off by the user through PC*MILER|Mapping function calls. The user of the map can also click on the pin symbols to invoke information about the pins.

Pins (that are represented as "Circles" and "Squares") and trip lines, and straight lines can be displayed with different colors.

These functions are available in the Excel VB script except where noted.

3.5.1 Pin and Label Functions

NOTE: See the following sections for descriptions of how to assign alias names to colors and bitmaps, and how to create custom settings for fonts in labels.

```
long PCMGPlotPin(LAYER layerID, OBJECT_ID ID, IMPORT
importance, MARKER symbol, LOCATION location, PIN_LABEL
labels);
```

Create or update a pin. The pin is uniquely identified by *layerID* and *ID*. If the given pin does not exist, it is created. If it does exist, all data for the pin is updated. The return code is negative if there is an error. If the layer identified by *layerID* does not exist, then a layer is created.

The field *ID* can be any text string.

The field *importance* determines a level of importance for the given pin. The importance of a pin determines at what level of detail the pin is drawn. Level of detail works as follows: as the user zooms in to tighter areas on the map, the level of detail increases. This means that less significant roads, places, and pins come into view as the user zooms in. There are six levels of detail.

For pins, importance can be a number between 1 and 6. Importance level 1 is the most important; pins with importance level 1 are always shown. Pins with importance level 6 are only shown when the user is zoomed in very tight.

If you do not care about importance, specify "1" for the importance argument. Pins with importance level 1 will always be shown.

Importance can be specified as a range, such as "1..3". If a pin's importance is specified as a range, then it will only be shown when the map's level of detail falls into that range. For example, suppose a pin is assigned the importance range "1..5". The pin will show up when the map's level of detail is between 1 and 5. Detail level 5 roughly corresponds to a zoom level of a single state. Therefore, the pin will not show up when the map is zoomed in tighter than a single state.

Ranges can be useful when trying to reduce clutter on the map. Using importance ranges, one could set up different views of the same data, each with different levels of detail. For example, suppose one is trying to plot 200 trucks in two neighboring states. When the map is zoomed to the entire United States, the 200 truck icons in those two states become very cluttered. To solve this problem, one could create two pins--one for each state--that are displayed at importance levels "1..3". Then, the 200 truck pins could be marked with importance levels "4..6".

This has the effect of showing two pins--one in each state--at the U.S. level. As the user "zooms down" to the state level, the two aggregate pins will disappear, and the 200 truck pins will appear.

The field *symbol* must specify a valid symbol. Symbols can either be the names of .BMP files, or they can be built-in PCMGS symbols. See section 4.4.2, *PC*MILER|Mapping Icons* for symbols provided with PC*MILER|Mapping.

The field *location* is a text string specifying one of the following:

Location Type	**Description**	**Examples**
Postal Code	A postal code. (See the PCMSERVE.INI *Appendix*on setting the U.S. vs. Mexican postal code format default.)	80903
City, State	A PC*MILER city name, followed by two-character state abbreviation.	Princeton, NJ
Canadian Postal Code	The six character postal code in the following format: **L#L #L#**. (Available as an add-on data module.)	K7L 4E7
SPLC Code	The six or nine digit SPLC. (Available as an add-on data module.)	221094000 221099240
Latitude, Longitude	Two coordinates are specified here. Each coordinate can have one of two formats. The first format is an 8 character string, described below. The second format is decimal degrees. In the 8 character string format, a coordinate is specified as follows: Digits 1-3 specify the hours portion of the measurement. Digits 4-5 specify the minutes portion of the measurement. Digits 6-7 specify the seconds portion of the measurement. Digit 8 is one of the following: 'N', 'n', 'W', 'w'. The last digit determines if the coordinate is a latitude or longitude. The last character is optional. If it is NOT present, then the first coordinate is assumed to be latitude and the second coordinate is assumed to be longitude. In the decimal degrees format, the two	0401750N,0742131W 0401750 / 0742131 0742131w 0401750n 040.2972N, 074.35861w

	coordinates are expressed as decimal degrees. Again, the last character is one of 'N', 'n', 'W', 'w'. This determines whether the given coordinates is latitude or longitude. If the last character is NOT present, then the first coordinate is assumed to be the latitude. The coordinates must be separated by at least one of the characters from the following set: space (' '), comma (','), forward slash ('/'), backward slash ('\'), semicolon (';'), and colon (':').	
Custom Place	A custom place name created in PC*MILER.	My House
Place Name with local Street Address	Available only with PC*MILER|Streets. A street address can be added to any of the above place names, must be separated from the place name by a semi-colon (;).	Kingston, NJ; 16 Laurel Avenue

The field *labels* is an optional list of up to 8 values for PC*MILER to store and display in an information dialog when the pin is clicked on. The values in the list are delimited by vertical bars.

For example, the following function call will display a red route 4 pixels wide from Princeton to San Diego via Chicago, generated using PC*MILER Shortest routing, and visible when zoomed in at least 3, but not more than 5, times:

```
retCode = PCMGPlotPin("MyLayer", "MyPin", "3..5", "Red
Truck","Chicago,  IL",  "On  time|Carrying  Oranges|Unit
35B");
```

```
long PCMGDeletePin(LAYER layerID, OBJECT_ID ID);
```

This function removes the pin identified by *ID* in the layer *layerID*.

```
long PCMGFramePin(LAYER layerID, OBJECT_ID ID);
```

This function zooms the map to center the pin specified by *layerID* and *ID*.

```
long PCMGPlotLabel(LAYER layerID, OBJECT_ID ID);
```

This function highlights a place on the map. It draws a stop label similar to PC*MILER stop labels.

```
long PCMGDeleteLabel(LAYER layerID, OBJECT_ID ID);
```

This function removes a stop label from the map.

3.5.2 Assigning Alias Names To Colors

To assign alias names to colors, use the **[Map\Colors]** section of the **map_opts.ini** file located in your PC*MILER installation folder in ALK Technologies\PCMILER28\App.

For example, the color RGB(255,0,255) can be given the name "Purple" by adding:

```
[Map\Colors]
Purple=(255,0,255)
```

3.5.3 Assigning Alias Names To Bitmaps

The bitmap image aliases used by the`PCMGPlotPin` function are stored in the **[Map\Bitmaps]** section of the **map_opts.ini** file located in your PC*MILER installation folder – usually in C:\ALK Technologies\PCMILER28\App. You can create your own alias names that point to the location of additional bitmaps by adding lines to this section of the .ini file. Here is an example of such a line:

```
[Map\Bitmaps]
Yellow Lpushpin=c:\ALK Technologies\PCMILER28\Bitmaps\ lpin_y.bmp
```

3.5.4 Setting a Custom Font For Labels

The default font for pins and labels created using the functions `PCMGPlotLabel` and `PCMGPlotPin` (see section 3.5.1) is 'System', size=16, bold. You can change this default setting in the **map_opts.ini** file, located in your PC*MILER installation folder in ALK Technologies\PCMILER28\App.

In this .ini file, font styles for specific layers are described in sections with the heading **[Map\Pinmaps\Labels\<Layer Name>]**. "Layer" is the first argument in the `PCMGPlotPin` and `PCMGPlotLabel` functions. So, for example, to set the font style for a layer named "Homes", a section like this would be added to the map_opts.ini:

```
[Map\Pinmaps\Labels\Homes]
FontHeight=12
FontName="Arial"
FontWeight="Bold" (could be also "Regular")
FontItalic=1
FontColor="Purple" (could also be an integer, see Assigning Alias Names to Colors below)
```

NOTE: This logic does not apply to trips. Stop labels always use the default (System, size 16) font. The Mapping DLL could be modified to apply the logic used for labels and pins for trips if necessary.

3.5.5 Pin Label Positioning

The position of a label can be specified by concatenating the " | " character plus one of (LEFT, RIGHT, BOTTOM, TOP) to the end of the bitmap parameter in the `PCMGPlotPin` function.

Examples:

```
PCMGPlotPin (“layer1”, “WhiteHouse”, “1..3”, “RED CIRCLE
5|LEFT”, “20500 Washington, CD; 1600 Pennsylvania Avenue”,
“White House”);
```

```
PCMGPlotPin (“layer1”, “WhiteHouse”, “1..3”,
“whitehouse.bmp|LEFT”, “20500 Washington, CD; 1600
Pennsylvania Avenue”, “White House”);
```

3.5.6 Trip and Line Functions

IMPORTANT NOTE: Drawing more than about 50 route lines on the map simultaneously is not recommended, individual routes cannot be seen clearly when there is alarge number of them on the map.

```
long PCMGPlotTrip(LAYER layerID, OBJECT_ID ID, IMPORT
importance, STYLE style, LOCATION locations, PIN_LABEL
options);
```

Draws a trip's route over the PC*MILER network where *layerID* is the feature layer to add the new trip to, *ID* is its unique identifier, *importance* is a range of numbers denoting which levels of detail it will appear at, *style* is what color and width to use, *locations* is the list of stops (PC*MILER place names only) that make up the trip, and *options* is a list of routing options PC*MILER will use to calculate the route.

All arguments are strings, and the separator between elements in stops, styles, and options is a vertical bar ('|'). For example, 'Princeton, NJ|Chicago, IL|90210' is a valid series of stops, and 'Red|5' is a valid style. The separator for an importance range is two periods (".."). For example, '1..4' is a valid importance range, as is simply '4' (the trip appears at levels 4 and higher).

Valid routing options are:

Routing types: 'PRAC', 'SHORT', 'NATL', 'TOLL', or '53FT'. Case is not important and the following will also work: 'Practical', 'Shortest', and 'National'. (See the *PC*MILER User's Guide* or Help for descriptions.)

Hub mode: Routes will display in Hub mode if you use ‘HUB’ as an option, and in regular mode with ‘NOHUB’.

Borders: Routes will stay within a country if you specify borders as ‘CLOSED’, or will cross borders if you specify ‘OPEN’.

Custom: Routes will display respecting the avoided and favored roads set in PC*MILER. You can specify the option as ‘CUSTOM’ or ‘NOCUSTOM’.

Use Highway Only: ‘USESTREETS’ to use local streets in route calculations, or ‘USEHIGHWAY’ to calculate the route using an air distance from the midpoint of the nearest highway segment to the postal code or city/state destination.

Vehicle Type: ‘HEAVY’ or ‘LIGHT’. Case is not important and the following will also work: ‘Heavy’ and ‘Light’.

Haz types: ‘GENERAL’, ‘EXPLOSIVE’, ‘INHALANT’, ‘RADIOACTIVE’, ‘CORROSIVE’, or ‘FLAMMABLE’. (See the *PC*MILER User’s Guide* or Help for descriptions.)

NOTE: You can set defaults for these and other routing and management options in the **pcmserve.ini** file (see *Appendix B* for a list of pcmserve.inisettings).

NOTE for PC*MILER|Streets Users:When stops are city names or postal codes, by default “Highway Only” routing is used. See the PC*MILER *User’s Guide* for a description of this option, and *Appendix B* in this guide to change the default.

For example, the following function call will display a red route 4 pixels wide from Princeton to San Diego via Chicago, generated using PC*MILER Shortest routing, and visible when zoomed in at least 3, but not more than 5, times:

retCode = PCMGPlotTrip(“MyLayer”, “MyRoute”, “3..5”, “Red|4”, “08540|Chicago, IL|San Diego, CA”, “Short|NOHUB”);

```
long PCMGDeleteTrip(LAYER layerID, OBJECT_ID ID);
```

This function removes the trip identified by *ID* in the layer *layerID.*

```
long PCMGFrameTrip(LAYER layerID, OBJECT_ID ID);
```

This function zooms the map to include a view of the entire trip identified by *ID* in the layer *layerID.*

```
long PCMGPlotLine(LAYER layerID, OBJECT_ID ID, IMPORT
importance, STYLE style, LOCATION locations);
```

where *layerID* is the feature layer to add the new line to, *ID* is its unique identifier, *importance* is a range of numbers denoting which levels of detail it will appear at, *style* is what color and width to use, and *locations* is the list of points (PC*MILER place names or LatLong coordinates) that make up the line.

All arguments are strings, and the separator between elements in points and styles is a vertical bar (‘|’). For example, ‘Princeton, NJ|Chicago, IL|90210’ is a valid series of points, and ‘Red|5’ is a valid style. The separator for an importance range is two periods (“..”). For example, ‘1..4’ is a valid importance range, as is simply ‘4’ (the trip appears at levels 4 and higher).

retCode = PCMGPlotLine(“MyLayer”, “MyRoute”, “3..5”, “Red|4”, “08540|Chicago, IL|San Diego, CA”, “Short|NOHUB”);

```
long PCMGDeleteLine(LAYER layerID, OBJECT_ID ID);
```

This function removes the line identified by *ID* in the layer *layerID*.

3.5.7 Pinmap Functions

The user can group pins into “layers”, or “pinmaps.” These layers can be turned on and off by the user through PC*MILER|Mapping function calls or interactively from within PC*MILER.

The user of the map can click on the pin symbols to invoke information about the pins. In PC*MILER, go into ‘picking’ mode by clicking on the ‘Pick Pin’ speed button in the tool bar. Once in ‘Pick Pin’ mode, clicking once on a pin in the map will invoke an information dialog containing the data sent across with PCMGPlotPin().

```
long PCMGSetInfoLabels(LAYER layerID, OBJECT_ID id,
IMPORTANCE importance, MARKER symbol, LOCATION loc,
PIN_LABEL labels);
```

Sets the “titles” of the given pinmap layer identified by *layerID*. The titles form the left-hand column in pop-up information windows which are invoked when the user clicks on a pin in the map. If the pinmap identified by *layerID* does not exist, then a pinmap with that name is created.

ID is the label for the id of the chosen pin.

Importance is a space filler and is not displayed.

Symbol is the label for the symbol of the chosen pin.

Loc is the label for the location of the chosen pin.

Labels contains up to eight titles for the eight data fields which may be passed from PCMGPlotPin. If they are not specified, the default labels are “Data1..Data8”.

For example:

```
retCode = PCMGSetInfoLabels (“MyLayer”, “ID:”,
“Importance”, “Symbol:”, “Location:”, “Store:|Time:
|Move:|Product”)
```

```
long PCMGDeletePinmap(LAYER layerID);
```

This function removes the layer identified by *layerID* from the map. All pins in the layer are deleted.

```
long PCMGShowPinmap(LAYER layerID, BOOL show);
```

This function changes the visibility of the layer specified by *layerID*. If the *show* parameter is non-zero, the layer is visible. If the *show* parameter is zero, the layer is hidden. It is NOT deleted. Layers can be shown or hidden as often as desired.

```
long PCMGFramePinmap(LAYER layerID);
```

This function zooms the map to include all of the pins in the pinmap layer *layerID*.

```
long PCMGDeleteTripLayer(LAYER layerID);
```

This function removes the layer identified by *layerID* from the map. All trips in the layer are deleted.

```
long PCMGFrameTrip(LAYER layerID);
```

This function zooms the map to include all of the pins in the pinmap layer *layerID*.

```
long PCMGFrameTripLayer(LAYER layerID);
```

This function zooms the map to include all trips in the trip layer *layerID*.

3.5.8 Map Region Functions

The following functions can be used in applications using PC*MILER|Worldwide or PC*MILER|DTOD mapping, when region selection is needed.

```
long PCMGNumRegions(int level);
long PCMGGetRegionName(int level);
long PCMGSwitchRegion(int level);
```

`PCMGNumRegions()` returns the number of map regions (“NA”, “Europe”, “Asia”, etc.).

As an example, if a web menu is being built, assume “N” number of regions is returned. `PCMGGetRegionName()` is then called (in a loop) to get each region’s name, passing indexes from 0 through N, and the region names are added to the menu. Example:

```
char region [100];
int num_regs;
num_regs = PCMGNumRegions();

for (int i = 0; i < num_regs; i++)
{
PCMSGetRegionName (i, region, 100);
}
```

When the user of the menu picks a region, the software calls `PCMGSwitchRegion()` to zoom in on this region.

```
LRESULT _PCMGWFN PCMGSetDefaultRegion(char FAR *regionId);

LRESULT _PCMGWFN PCMGGetDefaultRegion(char FAR *regionId,
int bufSize);
```

Use `PCMGSetDefaultRegion` to set a default region; *regionId* can be ‘NA’, ‘SA’, ‘Africa’, ‘Asia’, ‘Europe’, ‘ME’, or ‘Oceania’. `PCMGGetDefaultRegion` returns the existing default region.

3.6 Geofence and Highlight Functions

NOTE: Two settings in the PCMSERVE.INI file can be edited to control the autosaving of road preferences on shutdown. See Appendix B, *The PCMSERVE.INI File* and look under [MappingOptions] in the INI.

3.6.1 Geofence Functions

A “geofence” is a virtual perimeter assigned to a geographic area so that when the perimeter of that selected area is crossed, a notification is generated. It may be used in many different scenarios, for example:

- Drawing a zone around a warehouse to identify a delivery or billing zone.

- Alerting dispatchers when a vehicle leaves a designated area, for example, leaving New York City when they aren't authorized to do so.
- Receiving an alert if an asset has crossed into a high crime area.

New tools were added to PC*MILER Interactive and PC*MILER|Mapping in Version 25 to create geofences and assign different sizes, colors, and locations to them. Each geofence can be set to generate a route warning identifying when a route enters/exits its perimeter.

In PC*MILER Interactive users can perform the following tasks related to geofencing:

- Assign and modify the characteristics of a geofence:
  - Define its shape – set it to a circle, rectangle, or user-defined polygon
  - Define its coloring – define the border color, border width and fill color
  - Define its size – identify perimeter boundaries using the provided shapes or use the free form drawing tools
- Uniquely name an individual geofence
- Create, modify, delete and name sets of geofences that consists of one or more geofences
- Use the geofence's perimeter to generate route alerts/warnings in reports when the perimeter is crossed
- Use the geofence's perimeter to consider the roads in the geofenced area as avoided so that when a route is generated it will not consider those roads in route calculations
- Turn on/off a geofence displayed on the map as well as its status when generating routes

In PC*MILER|Mapping, the functions described below are used to plot and manage geofences, in sets or one by one, on the map.

```
LRESULT _PCMGWFN PCMGAddGeofence(const char FAR *pName,
char cShapeType, const char FAR *pPoints);
```

Creates a new geofence based on a collection of points.

- *pName* = name of the newly-created geofence
- *cShape* = the type of shape of the geofence
- *pPoints* = the collection of points that represents the new geofence

cShape can be either 0, 1, or 2. These values correspond to a specific geofence shape type. 0 = Rectangle, 1 = Circle, 2 = Free form polygon. This shape type will govern what *pPoints* must contain (described below).

pPoints should be a string containing a list of lat long coordinates that will be used to define the boundaries of the new geofence. The required format of this string is given below. If creating a rectangular geofence, there must be 2 lat/long coordinates (no more, no less) which define two opposing corners of the rectangle. A circular geofence must be defined in the same way. In this case the rectangle will define the bounding box for the desired circle.

If creating a free-form polygon geofence, there must be at least 3 distinct lat longs given to form a valid polygon. There is no upper limit on the number of points that can be given for a free-form polygon. The order that the points are given in will be the same order used to render the final polygon. It is not necessary to repeat the first vertex again at the end of the list.

pPoints valid string format: "lat1,long1|lat2,long2|lat3,long3|…"

```
LRESULT _PCMGWFN PCMGDeleteGeofence(unsigned long fenceID);
```

Deletes an existing geofence, using its ID.

```
LRESULT _PCMGWFN PCMGActivateGeofence(unsigned long
fenceID, int iActiveState);
```

Activates the specified geofence and sets its active state to one of two possible states. *iActiveState* can be either 0, 1, or 2:
0 = The geofence is turned off and will not be actively drawn on the screen or used for routing/reporting purposes.
1 = The geofence will be drawn on the map and will **only** generate report warnings when a route passes through it. If the use of custom roads is turned on, a geofence in this active state will **not** be avoided by routes.
2 = The geofence will be drawn on the map and will generate a report warning if a route passes through it. If the use of custom roads is turned on, a geofence in this state will be actively avoided for all routes.

```
LRESULT _PCMGWFN PCMGIsGeofenceActive(unsigned long
fenceID);
```

Retrieves the activation status of the specified geofence.

```
LRESULT _PCMGWFN PCMGModifyGeofenceColor(unsigned long
fenceID, unsigned char R, unsigned char G, unsigned char
B);
```

Modifies the color of the area inside the perimeter of a specified geofence by supplying R,G,B values for the color.

```
LRESULT _PCMGWFN PCMGModifyGeofenceBorderColor(unsigned
long fenceID, unsigned char R, unsigned char G, unsigned
char B);
```

Modifies the color of the perimeter of a specified geofence by supplying R,G,B values for the color.

```
LRESULT _PCMGWFN PCMGFindGeofenceID(const char FAR *pName);
```

Retrieves the ID of a specified geofence, using its assigned name.

```
LRESULT _PCMGWFN PCMGSetGeofenceName(unsigned long fenceID,
const char FAR *pName);
```

Renames an existing geofence, *pName* = the new name.

```
LRESULT _PCMGWFN PCMGGetGeofenceName(unsigned long fenceID,
char FAR *pName, int bufLen);
```

Retrieves the name of an existing geofence, identified by its ID.

```
LRESULT _PCMGWFN PCMGAddGeofenceSet(const char FAR *pName);
```

Creates a new geofence set based on the name provided by the user.

```
LRESULT _PCMGWFN PCMGAddGeofenceToSet(unsigned long
fenceID, unsigned long setID);
```

Adds an existing geofence to an existing set based on the geofence ID and set ID. If the geofence is already a member of another set then it will automatically be removed from the old set and put into the new set. If either the geofence or the set does not exist, an error will be returned.

```
LRESULT _PCMGWFN PCMGRemoveGeofenceFromSet(unsigned long
fenceID, unsigned long setID);
```

Removes a geofence from an existing geofence set based on the geofence ID and set ID.

```
LRESULT _PCMGWFN PCMGDeleteGeofenceSet(unsigned long
setID);
```

Deletes an existing geofence set.

```
LRESULT _PCMGWFN PCMGActivateGeofenceSet(unsigned long
setID, int iActiveState);
```

Activates a geofence set based on the set ID and assigns it to one of two possible states. *iActiveState* can be either 0, 1, or 2:

0 = The set is turned off and will not be actively drawn on the screen or used for routing/reporting purposes.

1 = The set will be drawn on the map and will **only** generate report warnings when a route passes through one of its geofences. If the use of custom roads is turned on, sets in this active state will **not** be avoided by routes.

2 = The set will be drawn on the map and will generate a report warning if a route passes through one of its geofences. If the use of custom roads is turned on, the set in this state will be actively avoided for all routes.

```
LRESULT _PCMGWFN PCMGIsGeofenceSetActive(unsigned long
setID);
```

Queries the activation status of a geofence set based on the set ID.

```
LRESULT _PCMGWFN PCMGFindGeofenceSetID(const char FAR
*pName);
```

Queries the ID of a geofence set based on its name.

```
LRESULT _PCMGWFN PCMGModifyGeofenceSetColor(unsigned long
setID, unsigned char R, unsigned char G, unsigned char B);
```

Modifies the color within the perimeter of the geofence set by the supplying R,G,B values of the desired color.

```
LRESULT _PCMGWFN PCMGModifyGeofenceSetBorderColor(unsigned
long setID, int width, unsigned char R, unsigned char G,
unsigned char B);
```

Modifies the width and color of the perimeter of the geofence set by the supplying R,G,B values of the desired color.

```
LRESULT _PCMGWFN PCMGGetGeofenceSetColor(unsigned long
setID, unsigned char* R, unsigned char* G, unsigned char*
B);
```

Retrieves the color within the perimeter of a geofence set, using R,G,B values.

```
LRESULT _PCMGWFN PCMGGetGeofenceSetBorderColor(unsigned
long setID, int*width, unsigned char* R, unsigned char* G,
unsigned char* B);
```

Retrieves the width and color of the perimeter of a set, using R,G,B values.

```
LRESULT _PCMGWFN PCMGSetGeofenceSetName(unsigned long
setID, const char FAR *pName);
```

Renames a geofence set using the geofence ID, *pName* = the new name.

```
LRESULT _PCMGWFN PCMGGetGeofenceSetName(unsigned long
setID, char FAR *pName, int bufLen);
```

Retrieves the name of a geofence set, identified by ID. *bufLen* = the length of the provided buffer.

```
LRESULT _PCMGWFN PCMGNumGeofenceSets();
```

Retrieves the number of existing geofence sets.

```
LRESULT _PCMGWFN PCMGGetGeofenceSet(unsigned long index,
char FAR *pName, unsigned long* pID);
```

Retrieves the name and set ID of an existing geofence set.

```
LRESULT _PCMGWFN PCMGNumGeofencesInSet(unsigned long
setID);
```

Retrieves the number of geofences in the specified set.

```
LRESULT _PCMGWFN PCMGGetGeofenceFromSet(unsigned long
setID, unsigned long fenceIndex, char FAR *pName, unsigned
long *pID);
```

Retrieves the specified geofence from a geofence set. *fenceIndex* = an index of the geofences with the set.

3.6.2 State Highlight Functions

The state highlight functions let users highlight a state as a zone on the map. There are Ex versions, for multiple map windows, of each of the functions below (see section 3.8).

```
LRESULT _PCMGWFN PCMGAddStateHighlight(const char*
pStateAbbrev, unsigned char R, unsigned char G, unsigned
char B);
```

This function makes the specified state into a highlighted zone. *pStateAbbrev* is a standard two-letter abbreviation as recognized by PC*MILER (if necessary, see the PC*MILER *User's Guide* or online Help for a complete list of abbreviations). The color of the highlight is set using numeric R,G,B values.

```
LRESULT _PCMGWFN PCMGDeleteStateHighlight(const char*
pStateAbbrev);
```

Deletes an existing state highlight.

```
LRESULT _PCMGWFN PCMGGetStateHighlightColor(const char*
pStateAbbrev, unsigned char *R, unsigned char *G, unsigned
char *B);
```

Queries the color of an existing state highlight.

3.6.3 Street Highlight Functions

```
LRESULT _PCMGWFN PCMGAddStreetHighlight(const char*
streetName);
```

This function searches the map's current projection rectangle for a specific street based on the given name information. Any results found by the geocoding engine will then be highlighted on the map. This highlight will be preserved until the user chooses to remove it explicitly.

Each call to this API will generate one internal highlight record that tracks all of the highlighted road segments found. Each record is indexed based on the input string. If the same input is given multiple times, only one record will be maintained. This feature will only work when licensed for PC*MILER|Streets data and when the map is zoomed in far enough to view street level data.

Parameters:

streetName	Name of the street to highlight. Text should not contain any city, state/ZIP/SPLC information, just the street name information

Return Values:

-4	Street data not visible on the map, operation failed
<0	Internal error, operation failed
0	operation successful

```
LRESULT _PCMGWFN PCMGDeleteStreetHighlight(const char*
streetName);
```

This function removes a specific street highlight from the map. The input to this function should match the input used when adding a street highlight to the map. If it does not, the desired highlight might not be properly removed from the map.

Params:

streetName	Name of the street to highlight

Return Values:

<0	Internal error, operation failed
0	operation successful

```
LRESULT _PCMGWFN PCMGDeleteAllStreetHighlights();
```

Removes all street highlights from the map.

Return Values:

<0	Internal error, operation failed
0	operation successful

3.7 Management Functions

```
HMODULE PCMGGetDisplayModule(void);
```

This function returns a handle to PC*MILER. It is provided for backward compatibility, and is not needed for 32-bit applications.
Note: This function is not part of the Excel interface.

```
HWND PCMGGetDisplayWindow(void);
```

This function returns a handle to PC*MILER for Window's main window.
Note: This function is not part of the Excel interface.

```
void PCMGSetDisplayModule(HMODULE mod);
```

This function is used to give PC*MILER|Mapping the module handle for PC*MILER. It is provided for backward compatibility, and is not needed for 32-bit applications.

Do not use this unless you are an expert. Normally, you will not have to call this function, as PC*MILER|Mapping searches for and finds PC*MILER when function calls are made. This function is provided for unusual circumstances.
Note: This function is not part of the Excel interface.

```
void DECLARE PCMGSetDisplayWindow(HWND win);
```

This function is used to give PC*MILER|Mapping a handle to the main window of PC*MILER. Do not use this unless you are an expert. Normally, you will not have to call this function, as PC*MILER|Mapping searches for and finds PC*MILER when PC*MILER|Mapping function calls are made. This function is provided for extraordinary circumstances.
Note: This function is not part of the Excel interface.

```
void PCMGSetRedraw(BOOL onOff);
```

This function controls redrawing of the map. It is used when many pins, trips or lines are being sent in a short period of time to prevent excessive redrawing of the map. The strategy is to turn the redraw off, send many draw objects, then turn redraw back on so that there will be a single redraw of the map.

In order for this function to work properly, you must first call `PCMGSetDisplayWindow()`and pass the window handle that `PCMGCreateChildMap()` returns. Code should be modified to do this:

```
HWND hwnd = PCMGCreateChildMap(parent)
PCMGSetDisplayWindow(hwnd)
```

Then `PCMGSetRedraw()` can be used as desired.

```
LRESULT _PCMGWFN PCMGTrafficStatus();
```

An API has been added to query the PC*MILER Traffic Features subscription status. May return the following: -1 = an unlimited subscription that is not set to expire; -2 = there is no subscription and Traffic Features are not accessible; or if a number greater than or equal to 0 is returned, it is the number of days left until the traffic subscription expires.

3.8 Multiple Map Windows ('Ex' Functions)

PC*MILER|Mapping now allows you to create multiple map windows. To create and use more than one map window, you use an "Ex" version of the Mapping DLL functions you are already familiar with.

To create an additional new map window, instead of using `PCMGCreateMapWindow` or `PCMGCreateMapChild` you use `PCMGCreateMapWindowEx`or `PCMGCreateMapChildEx`. The difference between the regular and the Ex version of these functions is that the regular function returns the map window's window handle, whereas the Ex version returns a unique identifier that is used in all other Ex functions to determine which map window should be manipulated.

Most PC*MILER|Mapping functions have an Ex version – (see the **pcmgwinex.h** file in the PC*MILER|Mapping installation folder for a complete list of Ex functions – the location is usually C:\ALK Technologies\PCMILER28\Mapping\C_CPP). All Ex functions take one extra argument which is a mapid.

In addition, one new Ex function – described below – has been added that enables you to close a particular map window. Use `PCMGCleanupMap()` if you want to close all open map windows while completely closing the Mapping application (see section 3.3.1 for important information on opening and closing map windows).

```
PCMGCloseMapEx (long mapid); .
```

Sample code for multiple map windows:

```
long mapid1 = PCMGCreateMapWindowEx(parentHWnd,
"MapWindow1", 500, 500);
long mapid2 = PCMGCreateMapWindowEx(parentHWnd,
"MapWindow2", 500, 500);
```

```
long result;

//To zoom MapWindow1
result = PCMGZoomInEx(mapid1);

//To zoom MapWindow2
result = PCMGZoomInEx(mapid2);

//To plot a pin on MapWindow1
result  =  PCMGPlotPinEx((mapid1,  "MyLayer",  "P1",  "1",
"Blue Truck", "Denver,CO", "OnTime");
```

Chapter 4 Using PC*MILER|Mappingwith Excel

If PC*MILER|Spreadsheets was purchased and installed, PC*MILER|Mapping will include an Add-In for Excel 97 or higher. To complete the installation you must enable the Add-In manually from within Excel, or configure Excel to automatically load the Add-In each time you open the program.

After enabling the Add-In, you must start the PC*MILER|Mapping program (double-click the PC*MILER|Mapping program icon). With the Mapping program and Excel running simultaneously, you may plot icons, routes and lines from Excel to the PC*MILER map. If you start the map window from your own program, the first eight characters in the map window title must be “PC*MILER” to connect to Excel.

NOTE: All the functions available through this Add-in are listed in the Excel User Defined function category under the `Insert|Function` menu command.

4.1 Enablingthe Add-In Manually

For Microsoft Office 2003 (or older):

1. Open Excel.
2. In the top tool bar menu, select **Tools**>**Add-Ins…**>**Browse**.
3. Navigate to the folder where PC*MILER is installed and go to the **Excel folder.** The default location of the Excel folder is …\ALK Technologies\PCMILER28\Excel.
4. In the …\Excel folder, click on the **Pcmgmp32.xla** file then click **OK**.
5. In the Add-Ins dialog box, "PC*MILER|Mapping" will appear in the list of products with a check next to it. This confirms that the Add-In is activated.
6. Click **OK** to continue. The setup is now complete.

The PC*MILER|Mapping functions are now ready to be used and will be available every time you start Excel.

For Microsoft Office 2007 and 2010:

1. Open Excel.
2. Click on the **Microsoft symbol** in the upper left-hand corner of the screen (Excel 2007), or click on the **File** menu (Excel 2010).
3. In the list that opens, click on the **Excel Options** button at the bottom (Excel 2007) or the **Options** menu option (Excel 2010).
4. In the dialog box that opens, in the left-hand column menu click on **Add-Ins**.
5. In the right-hand side of the dialog box, there's a drop down menu next to **Manage**. Select **Excel Add-Ins** if it is not already selected, then click the **Go** button to continue.
6. In the Add-Ins dialog box that opens, click **Browse** and navigate to the folder where PC*MILER is installed and go to the **Excel folder** (the default location is C:\ALK Technologies\PCMILER28\Excel).
7. In the …\Excel folder, click on the **Pcmgmp32.xla** file, then click **OK**.
8. In the Add-Ins dialog box, "PC*MILER|Mapping" will appear in the list of products with a check next to it. This confirms that the Add-In is activated.
9. Click **OK** to continue.

The remaining steps below are necessary only if you wish to turn off security warning messages for this spreadsheet.

10. Click on the **Microsoft symbol** in the upper left-hand corner of the screen..
11. In the list that opens, at the bottom click on the **Excel Options** button.
12. In the dialog box that opens, in the left-hand column menu listing click on **Trust Center**. Then click on the **Trust Center Settings** button on the right.
13. Click on **Trusted Locations** in the left-hand column menu.
14. Check if the location of the Excel folder from Step 6 is in the list of trusted locations; if not, click **Add New Location…** .
15. Click **Browse…** and navigate to the location of the Excel folder.
16. Select "**Subfolders of this location are also trusted**", then click **OK**.
17. In the Trust Center, check "**Allow Trusted Locations on my network**", then click **OK**. The setup is now complete.

The PC*MILER|Mapping functions are now ready to be used and will be available every time you start Excel.

4.2 Disabling the Add-In Manually

1. Start Excel.
2. **For Microsoft Office 2003:**

   Under the **Tools** menu, choose **Add-Ins**, then remove the check next to "**PC*MILER|Mapping**" and click **OK**.

   For Microsoft Office 2007:

   Click the Microsoft Office button , click **Excel Options**, and then click **Add-Ins**. In the **Manage** pick list at the bottom of the window that opens, select **Excel Add-Ins** if it is not already selected. Then click "**Go…**" and remove the check next to "**PC*MILER| Mapping**", and click **OK**.

   For Microsoft Office 2010:
   Click **File** then **Options** to open the Excel Options dialog. On the left, click **Add-Ins**. In the **Manage** pick list at the bottom of the window that opens, select **Excel Add-Ins** if it is not already selected. Then click "**Go…**" and remove the check next to "**PC*MILER| Mapping**", and click **OK**.

The PC*MILER|Mapping functions are now removed. They will not be available the next time you start Excel.

4.3 Enable/Disable Autoloading of PC*MILER|Mapping

To have PC*MILER|Mapping functions always available, copy the file **pcmgmp32.xla** to the Excel startup directory. This directory is called **xlstart** and is located in the directory where Excel is installed. For more information see Excel Help under the search item "Startup Directory".

To Disable Autoloading of PC*MILER|Mapping:

Remove the file **pcmgmp32.xla** from the Excel **xlstart** directory.

4.4 Functions Available Through the Excel Interface

The set of functions described in this section is available only through the PC*MILER|Mapping Microsoft® Excel interface. There are two ways to use PC*MILER|Mapping formulas in Excel: either type them directly into a cell or use the Formula Wizard (see the Excel Help search topic "Formulas, Entering"). The sections below list the Excel functions, and provide descriptions of their specific tasks.

NOTE: Any cells in Excel that contain postal codes must be formatted properly. In the Excel Format menu choose **Cells… > Number**, then under "**Category**" highlight "**Special > Zip Code**" and click **OK**. If the formatting is not correct, preceding zeros may be dropped – for example, the postal code "08540" would become "8540".

4.4.1 Plotting an Icon

You can either plot a set of pins without naming each one, using **PlotPin()**, or you can give each one an identifier which will allow you to modify its settings using **PlotPinID()**. The prototype of the function **PlotPin** is:

```
PlotPin (icon, location [, label])
```

PlotPindraws an icon on the map at the point specified by location. *Icon* may be one of the icons provided with PC*MILER|Mapping, or the filename of a .BMP file. *Location* is a PC*MILER place name, postal code, SPLC (add-on data module), Canadian Postal Code (add-on data module), lat/long coordinate, or a custom place name created in PC*MILER. If you are using PC*MILER|Streets, a street address may be added, separated from the place name by a semicolon; for example, "**kingston, nj; 16 laurel avenue**". *Label* is an optional string which appears under the icon.

Icons plotted with **PlotPin** are deleted using the function **DeletePins**. The prototype of the function **PlotPinID()** is:

```
PlotPinID (ID, icon, location [, label])
```

PlotPinIDdraws an icon, identified by *ID*, on the map at the point specified by *location*. *ID* can be any string or other unique identifier. *Icon* may be one of the icons provided with PC*MILER|Mapping, or the filename of a .BMP file. *Location* is a PC*MILER place name, postal code, SPLC (add-on data module), Canadian Postal Code (add-on data module), lat/long coordinate, or a custom place name created in PC*MILER. If you are using PC*MILER|Streets, a street address may be added, separated from the place name by a semicolon; for example, "**kingston, nj; 16 laurel avenue**". *Label* is a string which appears under the icon and is optional.

Icons plotted with **PlotPinID** are NOT deleted using the function **DeletePins**. You must delete them individually using **DeletePinID**.

4.4.2 PC*MILER|Mapping Icons

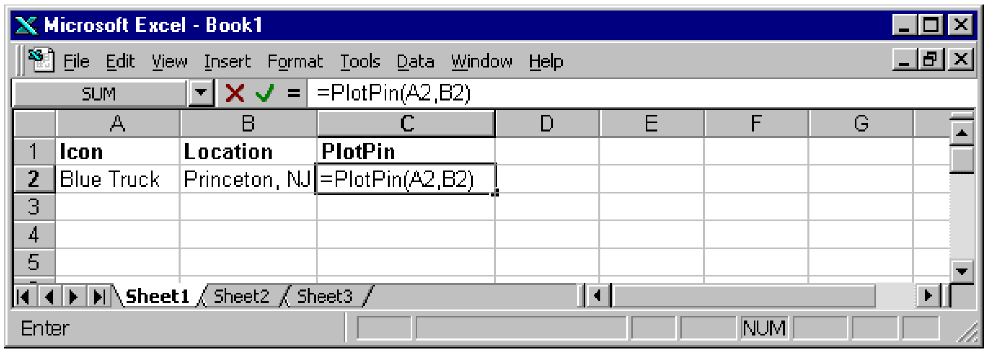
A PC*MILER|Mapping icon is a text string composed of two parts: type and color separated by a space. In addition to the icons pictured below are a **Box** and **Circle**. If you plot a **Box** or **Circle**, you can add a size argument (eg. 'Red Box 10') which sets the box's size in pixels.

You can also plot icons of your own design. To do so, pass the complete path to a **.BMP** (bitmap format) file to the **PlotPin** or **PlotPinID** functions.

For example, if you pass the path 'c:\ALK Technologies\PCMILER28\icon.bmp' (a sample icon included in your installation) to either function, you'll see a new bitmap with the word 'ICON' on it displayed on your map. You can generate your own bitmaps using the PaintBrush program included with Windows.

NOTE: Size the canvas first before beginning to paint your bitmap. Bitmaps must be in .BMP format to load.

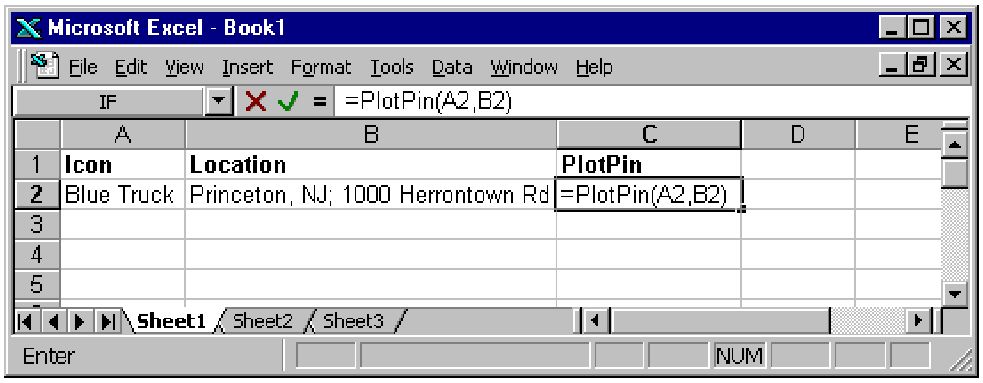
Example: To plot an icon without a label:



=PlotPin(A2,B2)

	A	B	C	D	E	F	G
1	Icon	Location	PlotPin				
2	Blue Truck	Princeton, NJ	=PlotPin(A2,B2)				
3							
4							
5							

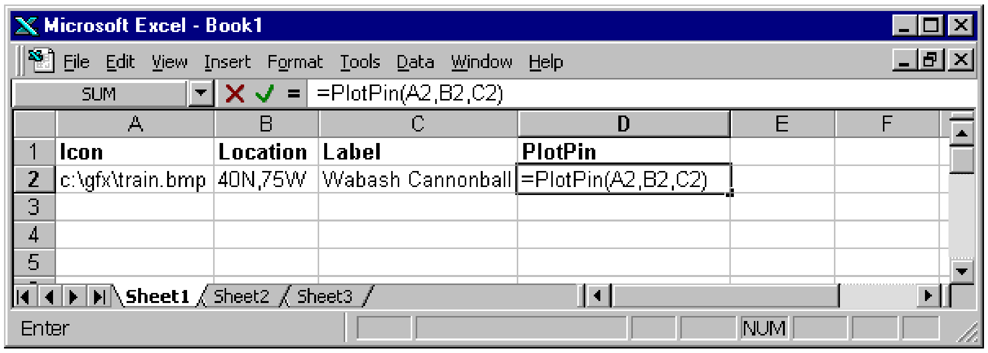
Example: To plot an icon without a label, using a street address *(only available with PC*MILER| Streets installed)*:



=PlotPin(A2,B2)

	A	B	C	D	E
1	Icon	Location	PlotPin		
2	Blue Truck	Princeton, NJ; 1000 Herrontown Rd	=PlotPin(A2,B2)		
3					
4					
5					

Example: To plot a user defined icon at a LatLong position, with a label:



=PlotPin(A2,B2,C2)

	A	B	C	D
1	Icon	Location	Label	PlotPin
2	c:\gfx\train.bmp	40N,75W	Wabash Cannonball	=PlotPin(A2,B2,C2)

Available Bitmaps:

Warehouse	Large Truck	Trailer
Tag	Large Pushpin	Large Package
Truck	Large Warehouse	Pushpin
Large Tag	Package	

Icon Colors:

ICON	COLORS	EXAMPLE
Warehouse	Red, Green, Blue, Yellow, Pink, Darkblue, DarkYellow	Green Warehouse
Tag	Yellow, Green, Pink	Green Tag
Trailer	Red, Yellow, Green, Blue	Green Trailer
Truck	Red, Yellow, Green, Blue	Green Truck
Pushpin	Yellow, Green, Blue, Purple	Green Pushpin
Package	DarkYellow	DarkYellow Package
LTruck	Red, Yellow, Green, Blue	Green LTruck
LPushpin	Yellow, Green, Blue, Purple	Green LPushpin
LPackage	DarkYellow	DarkYellow LPackage
LWarehouse	Red, Green, Blue, Yellow, Pink, DarkBlue, DarkYellow	DarkYellow LWarehouse
LTag	Yellow, Green, Pink	Yellow LTag
Box	Blue, DarkBlue, Green, DarkGreen, Yellow, DarkYellow, Gray, DarkGray, Red, White	DarkBlue Box Red Box 5
Circle	Blue, DarkBlue, Green, DarkGreen, Yellow, DarkYellow, Gray, DarkGray, Red, White	Red Circle Blue Circle 4

4.4.3 Plotting a Route Between Two Points

You can either plot a set of trips without naming each one, using **PlotTrip()**, or you can give each one an identifier which will allow you to modify its settings using **PlotTripID()**. The prototype for the function **PlotTrip** is:

```
PlotTrip (origin, destination [, style]);
```

PlotTripruns a route between *origin* and *destination* from the PC*MILER database and draws the route on the map. *Origin* and *destination* may be designated as PC*MILER place names, postal codes, six digit Canadian postal codes (available as an add-on data module), SPLC codes (available as an add-on data module), latitude/longitude coordinates, or custom place names created in PC*MILER. If you are using PC*MILER|Streets, a street address may be added, separated from the place name by a semicolon; for example, "**kingston, nj; 16 laurel avenue**".

NOTE for PC*MILER|Streets Users:When stops are city names or postal codes, by default "Highway Only" routing is used. See the PC*MILER *User's Guide* for a description of this option, and *Appendix B* in this guide to change the default.

Style is a text string and is composed of two parts: color and width (in pixels) separated by a space. It is optional. The colors available are the same as the ones listed for **Box** and **Circle** pins above. The default color is Green and the default width is 5.

Routes plotted with **PlotTrip** are deleted using the function **DeleteTrips**.

The prototype for the function **PlotTripID** is:

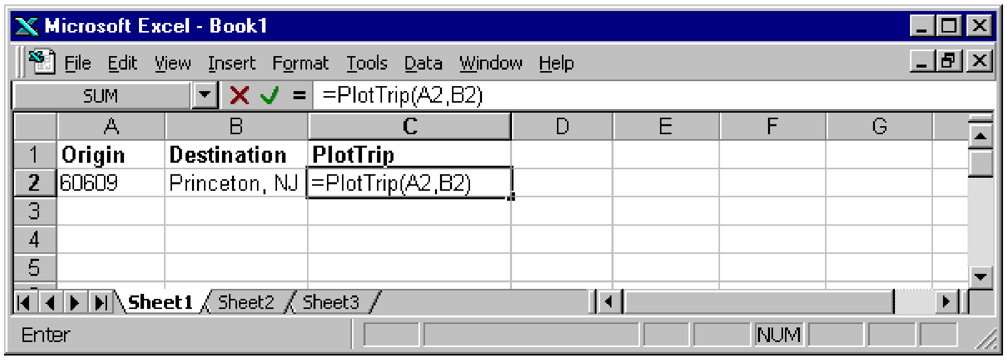
```
PlotTripID (ID, origin, destination [, style]);
```

PlotTripIDruns a route, identified by *ID*, between *origin* and *destination* from the PC*MILER database and draws the route on the map. *ID* can be any string or other unique identifier. *Origin* and *destination* may be designated as PC*MILER place names, postal codes, six digit Canadian Postal Codes (available as an add-on data module), SPLC codes (available as an add-on data module), latitude/longitude coordinates, or custom place names created in PC*MILER. If you are using PC*MILER|Streets, a street address may be added, separated from the place name by a semicolon; for example, "**kingston, nj; 16 laurel avenue**".

Style is a text string and is composed of two parts: color and width (in pixels) separated by a space. It is optional. The colors available are the same as the ones listed for **Box** and **Circle** pins above. The default color is Green and the default width is 5.

Trips plotted with **PlotTripID** are NOT deleted using the function **DeleteTrips**. You must delete them individually using **DeleteTripID**.

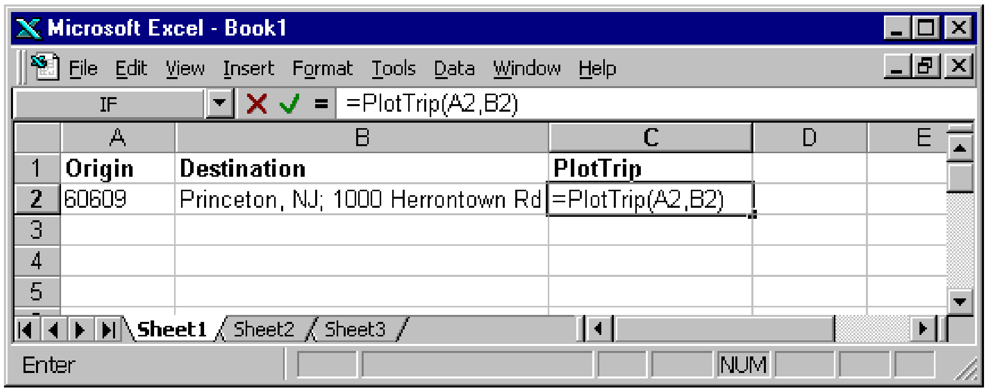
Example: To plot a simple trip:



=PlotTrip(A2,B2)

	A	B	C
1	Origin	Destination	PlotTrip
2	60609	Princeton, NJ	=PlotTrip(A2,B2)

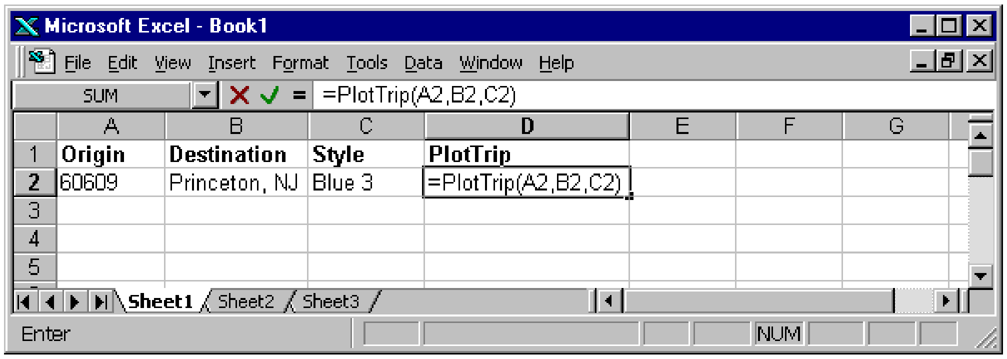
Example: To plot a simple trip with a street address *(PC*MILER|Streets only)*:



=PlotTrip(A2,B2)

	A	B	C
1	Origin	Destination	PlotTrip
2	60609	Princeton, NJ; 1000 Herrontown Rd	=PlotTrip(A2,B2)

Example: To plot a route with a custom line style:



=PlotTrip(A2,B2,C2)

	A	B	C	D
1	Origin	Destination	Style	PlotTrip
2	60609	Princeton, NJ	Blue 3	=PlotTrip(A2,B2,C2)

4.4.4 Plotting a Line Between Two Points

You can either plot a set of lines without naming each one, using **PlotLine()**, or you can give each one an identifier which will allow you to modify its settings using **PlotLineID()**.

The prototype for the function **PlotLine** is:

```
PlotLine (Origin, Destination [, style]);
```

PlotLinedraws a line between *origin* and *destination* on the map. *Origin* and *destination* may be designated as PC*MILER place names, postal codes, six digit Canadian Postal Codes (available as an add-on data module), SPLC codes (available as an add-on data module), latitude/longitude coordinates, or custom place names created in PC*MILER. If you are using PC*MILER|Streets, a street address may be added, separated from the place name by a semicolon; for example, "**kingston, nj; 16 laurel avenue**".

Style is a text string and is composed of two parts: color and width (in pixels) separated by a space. It is optional. The colors available are the same as the ones listed for **Box** and **Circle** pins above. The default color is Blue and the default width is 4.

Lines plotted with **PlotLine** are deleted using the function **DeleteLines**.
The prototype for the function **PlotLineID** is:

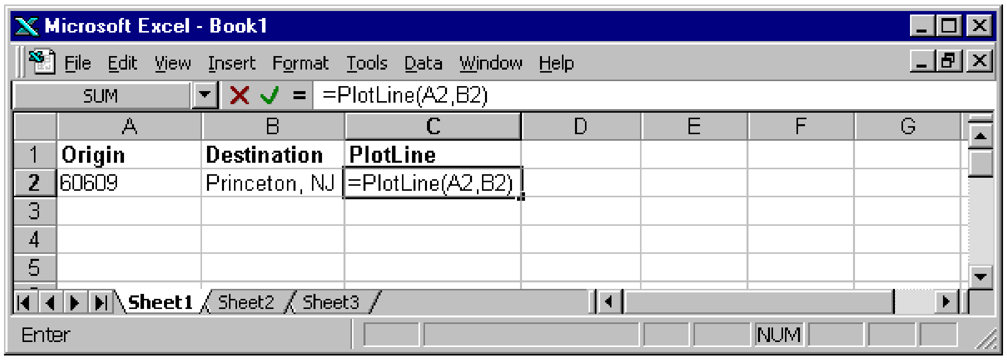
```
PlotLineID (ID, Origin, Destination [, style]);
```

PlotLineIDdraws a line, identified by *ID*, between *origin* and *destination* on the map. *ID* can be any string or other unique identifier. *Origin* and *destination* may be designated as PC*MILER place names, postal codes, six digit Canadian Postal Codes (available as an add-on data module), SPLC codes (available as an add-on data module), lat/long coordinates, or custom place names created in PC*MILER. If you are using PC*MILER|Streets, a street address may be added, separated from the place name by a semicolon; for example, "**kingston, nj; 16 laurel avenue**".

Style is a text string and is composed of two parts: color and width (in pixels) separated by a space. It is optional. The colors available are the same as the ones listed for **Box** and **Circle** pins above. The default color is Blue and the default width is 4.

Lines plotted with **PlotLineID** are NOT deleted using the function **DeleteLines**. You must delete them individually using **DeleteLineID**.

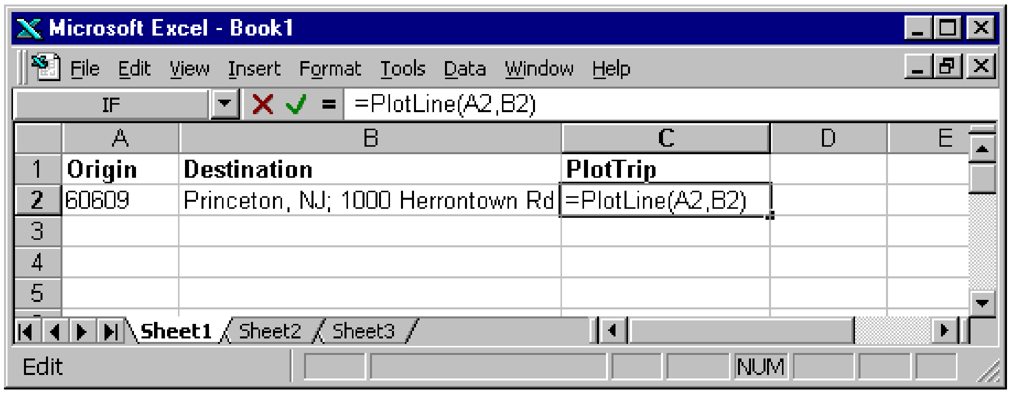
Example: To plot a simple line:



=PlotLine(A2,B2)

	A	B	C
1	**Origin**	**Destination**	**PlotLine**
2	60609	Princeton, NJ	=PlotLine(A2,B2)

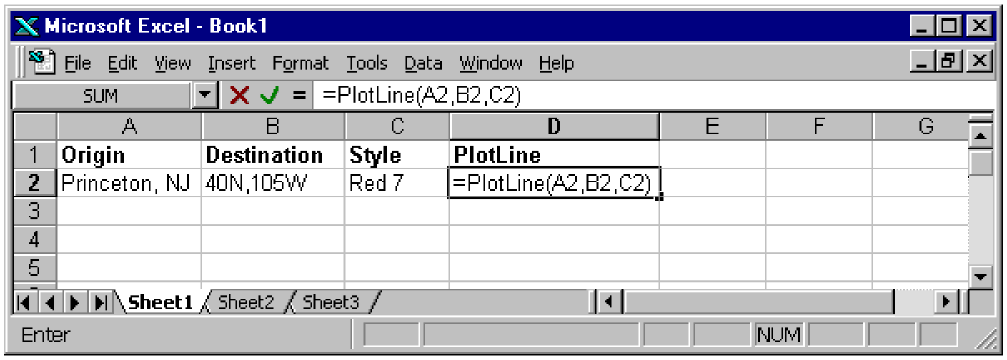
Example: To plot a simple line with a local street address *(available with PC*MILER|Streets only)*:



=PlotLine(A2,B2)

	A	B	C
1	**Origin**	**Destination**	**PlotTrip**
2	60609	Princeton, NJ; 1000 Herrontown Rd	=PlotLine(A2,B2)

Example: To plot a line with lat/long and specified style:



=PlotLine(A2,B2,C2)

	A	B	C	D
1	**Origin**	**Destination**	**Style**	**PlotLine**
2	Princeton, NJ	40N,105W	Red 7	=PlotLine(A2,B2,C2)

4.4.5 Deleting Icons

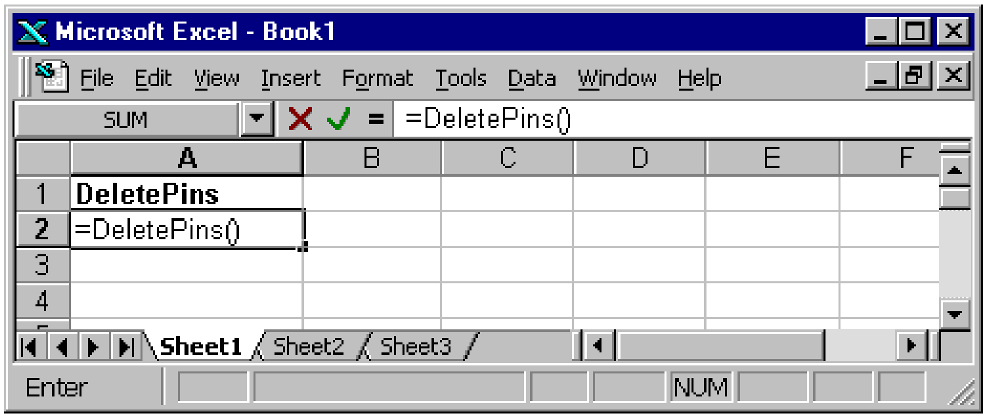
The function **DeletePins** deletes all pins on the map layer, the prototype is:

```
DeletePins();
```

Use the function **DeletePinID** to delete individual pins, the prototype is:

```
DeletePinID(PinID);
```

Example: To delete all the icons that were drawn using **PlotPinID**:



Formula bar: =DeletePins()

	A	B	C	D	E	F
1	**DeletePins**					
2	=DeletePins()					
3						
4						

4.4.6 Deleting Lines

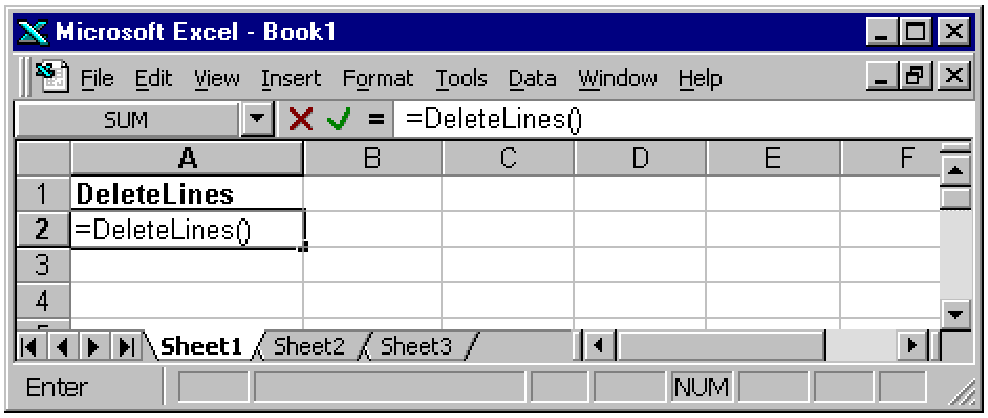
DeleteLines deletes all lines drawn on the map layer, the prototype is:

```
DeleteLines();
```

Use the function **DeleteLineID** to delete individual lines, the prototype is:

```
DeleteLineID(LineID);
```

Example: To delete all the lines that were drawn using **PlotLine**:



```
=DeleteLines()
```

	A	B	C	D	E	F
1	DeleteLines					
2	=DeleteLines()					
3						
4						

4.4.7 Deleting Trips

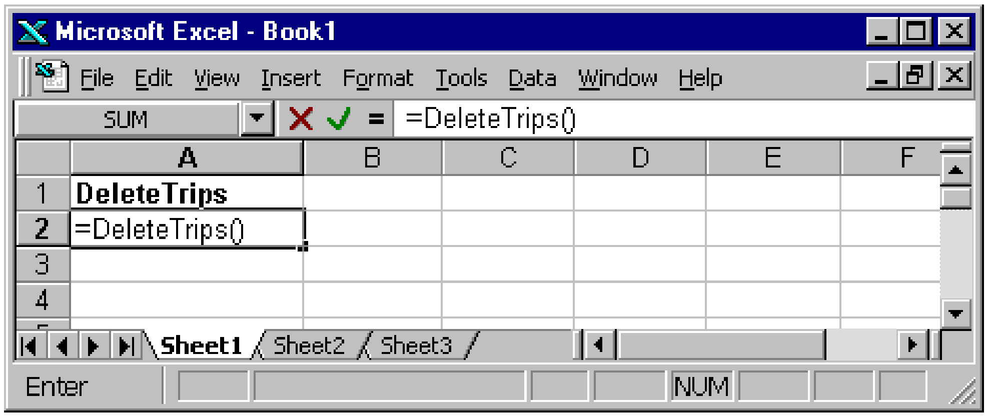
DeleteTrips deletes all trips drawn on the map layer, the prototype is:

```
DeleteTrips();
```

Use the function **DeleteTripID** to delete individual trips:

```
DeleteTripID(TripID);
```

Example: To delete all the lines that were drawn using **PlotTrip**:



=DeleteTrips()

	A	B	C	D	E	F
1	DeleteTrips					
2	=DeleteTrips()					
3						
4						

4.4.8 PCMG Functions Available in Excel

In addition to the functions described in sections 4.4.1 – 4.4.7, there are several other PC*MILER|Mapping functions that are now available for use in Excel. These functions start with the prefix “PCMG”, and include additional arguments for those users who would like to have expanded capability in Excel. You will see them listed under *User Defined* in the list of available functions in the Insert Function dialog. Please refer to Chapter 3 for detailed descriptions of these functions.

```
PCMGPlotLine
PCMGDeleteLine

PCMGPlotPin
PCMGFramePin
PCMGDeletePin

PCMGShowPinmap
PCMGFramePinmap
PCMGDeletePinmap

PCMGPlotTrip
PCMGDeleteTrip

PCMGSetRedraw

PCMGSetInfoLabels
```

Chapter 5 Using the PC*MILER|Mapping COM Server

The PC*MILER|Mapping COM Server can be called from Active Server Pages (ASP), Visual Basic, and all of the other OLE-compatible languages. Examples of calling from Active Server Pages (ASP) using VBScript is included in the installation.

The PC*MILER|Mapping COM Server must be registered before using. If you have not registered the component during the installation, register the DLL by calling **Regsvr32 pcmgole.dll.**

The PC*MILER|Mapping COM Server provides two main COM objects: the `PCMMapMgr` object and the `PCMMap`object.

5.1 Summary of the Objects

PCMMapMgr provides a connection to the PC*MILER|Mapping DLL, and allows you to create multiple map windows. You need to create an instance of the PCMMapMgr object first in order to use PC*MILER|Mapping COM Server. Once an instance of the `PCMMapMgr` object is created, you can create a `PCMMap` object.

Methods:

- Use the `IsOK` method to make sure there were no errors creating the `PCMMapMgr` object.
- Use the `CreateMap` method to create a `PCMMap` object.

Call the `CreateObject` function with the object's `ProgID`.

```
Dim mapMgrObj as Object
Dim ret
Set mapMgrObj =
CreateObject("Pcmgole.PCMMapMgr")
ret = mapMgrObj.IsOK
If (ret <= 0) Then
     //Error handling
```

The version-independent ProgID for the PC*MILER|Mapping OLE is "`Pcmgole.PCMMapMgr`".

The **PCMMap** is created each time a map is to be created and all map functionality is accessed through this object. The PCMMap object is not the same as the map window you create using the PC*MILER|Mapping function `PCMGCreateMapWindow`. In order to draw a PC*MILER map in any windows object's client area, you need to call the Paint method when responding to a WM_PAINT event. If you are using it on the web, you do not need to call the Paint method. Instead use the CreateGif method to create a .gif image of the map.

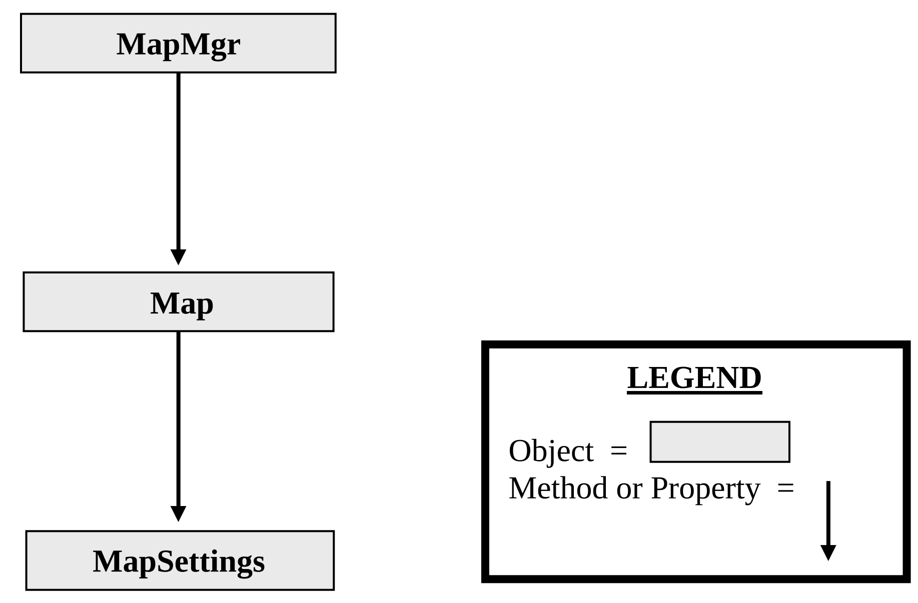
NOTE: It is the user's responsibility to delete all objects that have been created.

PCMMapSettings can be used to get the map settings. It returns the map's center, zoom level and the detail level. The syntax is:

```
mapSettingsObj = mapMgrObj.MapSettings
```

The PCMMapSettings object is useful to recreate the map if you are using it in a stateless web application. Before destroying the PCMMap object, call `MapSettings` to save the map's center, zoom level and the detail level. Then next time after creating a new PCMMap object, call `SetMapSettings` with the previously saved values to recreate the map that was destroyed. Any user-created layers such as trips, pins, lines and labels will not be recreated. Users need to call appropriate functions to create these layers again.

Figure 1: RELATIONSHIPS OF OBJECTS
— *How to get from one object to another*



Objects, properties and methods listed

PCMMapMgr OBJECT PROPERTIES AND METHODS

PROPERTIES:

`IsOK`	BOOL	(read)
`ErrorCode`	long	(read)

METHODS:

```
CreateMap
```

PCMMap OBJECT PROPERTIES AND METHODS

PROPERTIES:

`MapID`	long	(read)
`MapSettings`	long	(read)
`NumFrameAreas`	long	(read)

METHODS:

```
CreateGifFile
CreateGifBytes
CopyToClipboard
GetFrameArea
FrameArea
SetGifDirectory
ZoomIn
ZoomOut
ZoomTo
ZoomToPlace
GetGifLocationXY
MoreDetail
LessDetail
Pan
SetMapSettings
SetScaleUnits
ToggleRoadLegend
ToggleRouteLegend
ToggleScaleLegend
UpdateRoute
UpdateRoute2
FrameRoute
Paint
Print
PlotPin
SetUseOverlapIcon
SetOverlapIconName
```

```
FramePin
FramePinMap
DeletePin
PlotLabel
DeleteLabel
PlotLine
DeleteLine
PlotTrip
FrameTrip
DeleteTrip
DeletePinMap
ShowPinMap
ShowLayer
```

PCMMapSettings OBJECT PROPERTIES

PROPERTIES:

`x`	long	(read)
`y`	long	(read)
`xzoom`	long	(read)
`yzoom`	long	(read)
`detail`	long	(read)

5.2 PCMMapMgr PROPERTIES AND METHODS

IsOK property (read)

Description:

Checks that the `PCMMapMgr` object was created with no errors.

Visual Basic Syntax:

Ret = mapMgrObj.**isOK**

Remarks:

Returns S_OK if the object is in a valid state, S_FALSE if not.

ErrorCode property (read)

Description:

Returns the PCMMapMgr object error code.

Visual Basic Syntax:

mapMgrErrorCode = mapMgrObj.**ErrorCode**

Part	Type	Description
mapMgr*ErrorCode*	long	*mapMgrObj* error code

Remarks:

Returns **pcmgmp32.dll** or **pmwscomm.dll** specific error codes.

CreateMap method

Description:

Returns a `PCMMap` object.

Visual Basic Syntax:

mapObj = mapMgrObj.**CreateMap**

Com – Interface:

HRESULT **CreateMap**([out, retval] IPCMMap** mapObj);

Part	Type	Description
mapObj	object	`PCMMap` object

Remarks:

Returns the map object.

5.3 PCMMap PROPERTIES AND METHODS

MapID property (read)

Description:

Returns a unique id for each map created by the `CreateMap` method.

Visual Basic Syntax:

id = mapObj.**MapID**

Part	Type	Description
id	long	the unique id for this map

Remarks:

Returns -1 if errors occurred on creation.

MapSettings property (read)

Description:

Returns a `PCMMapSettings` object. This object can be used to get the map settings. It returns the map's center, zoom level and the detail level.

Visual Basic Syntax:

mapSettingsObj = mapMgrObj.**MapSettings**

Part	Type	Description
mapSettingsObj	object	map settings object

Remarks:

`PCMMapSettings` object is useful to recreate the map if you are using it in a stateless web application. Before destroying the PCMMap object, call `MapSettings` to save the map's center, zoom level and the detail level. Then next time after creating a new PCMMap object, call `SetMapSettings` with the previously saved values to recreate the map that was destroyed. Any user-created layers such as trips, pins, lines and labels will not be recreated. Users need to call appropriate functions to create these layers again.

NumFrameAreas property (read)

Description:

Returns the number of frameable areas available through this map.

Visual Basic Syntax:

num = *mapObj*.**NumFrameAreas**

Part	Type	Description
num	long	the number of frameable areas

Remarks:

PCMGNumFrameAreas

CopyToClipboard method

Description:

Places the current gif image on the system Clipboard.

Visual Basic Syntax:

mapObj. CopyToClipboard (hdc)

Com – Interface:

HRESULT **CopyToClipboard**([in] long hdc);

Part	Type	Description
hdc	long	Handle to the device context

CreateGifFile method

Description:

Creates a .gif file of the map on disk.

Visual Basic Syntax:

mapObj.**CreateGifFile(**width, height, gifId, option**)**

Com – Interface:

HRESULT **CreateGifFile**([in] long width, [in] long height, BSTR gifId, [in] long option);

Part	Type	Description
width	long	desired width of the .gif in pixels
height	long	desired height of the .gif in pixels
gifId	string	filename of the .gif (may have full path)
option	long	desired scale legend option

Remarks:

Returns 1 on success. The following constants respresent the five possible options for positioning the legend:

0	NO_SCALE
1	TOP_LEFT_SCALE
2	TOP_RIGHT_SCALE
3	BOTTOM_LEFT_SCALE
4	BOTTOM_RIGHT_SCALE

BOTTOM_RIGHT_SCALE is the default position.

CreateGifBytes method

Description:

Creates a gif image in memory.

Visual Basic Syntax:

mapObj.**CreateGifBytes(**width, height, option, buffer**)**

Com – Interface:

HRESULT **CreateGifBytes**([in] long width, [in] long height,[in] long option, VARIANT *buffer);

Part	Type	Description
width	long	desired width of the gif image in pixels
height	long	desired height of the gif image in pixels
option	long	desired scale legend option
buffer	VARIANT	buffer

Remarks:

Returns 1 on success. The following constants respresent the five possible options for positioning the legend:

0	NO_SCALE
1	TOP_LEFT_SCALE
2	TOP_RIGHT_SCALE
3	BOTTOM_LEFT_SCALE
4	BOTTOM_RIGHT_SCALE

BOTTOM_RIGHT_SCALE is the default position.

DeleteLabel method

Description:

Deletes the label identified by id in the layer layerid.

Visual Basic Syntax:

mapObj.**DeleteLabel(**layerid, id**)**

Com – Interface:

HRESULT **DeleteLabel**([in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	id of the layer containing the label to be deleted
id	string	unique identifier of the label

DeleteLine method

Description:

Deletes the line identified by id in the layer layerid.

Visual Basic Syntax:

mapObj.**DeleteLine(**layerid, id**)**

Com – Interface:

HRESULT **DeleteLine**([in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	id of the layer containing the line to be deleted
id	string	unique identifier of line

Remarks:

Refer to section 3.5of this manual or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

DeletePin method

Description:

Deletes the pin identified by id in the layer layerid.

Visual Basic Syntax:

mapObj.**DeletePin(**layerid, id**)**

Com – Interface:

HRESULT **DeletePin**([in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	layerid of the layer containing the pin to be deleted
id	string	id of the pin to be deleted

Remarks:

Refer to section 3.5.1, *Pin and Label Functions* or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

DeletePinMap method

Description:

Removes the Pin layer identified by layerid from the map.

Visual Basic Syntax:

mapObj.DeletePinMap(layerid)

Com – Interface:

HRESULT **DeletePinMap**([in] BSTR);

Part	Type	Description
layerid	string	id of the layer to be deleted

Remarks:

Use this function to remove an entire layer. All objects in the layer are deleted. This function can be used to remove Pin layers, Trip layers, Line layers and Label layers.

DeleteTrip method

Description:

Deletes the trip identified by id in the layer layerid.

Visual Basic Syntax:

mapObj.**DeleteTrip(**layerid, id**)**

Com – Interface:

HRESULT **DeleteTrip**([in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	id of the layer containing the trip to be removed
id	string	id of the trip to be removed

Remarks:

Refer to section 3.5.6, *Trip and Line Functions* or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

FrameArea method

Description:

Frames the area specified by the string parameter.

Visual Basic Syntax:

mapObj.FrameArea(area)

Com – Interface:

HRESULT **FrameArea**(BSTR areaName);

Part	Type	Description
area	string	the string name of the area

Remarks:

PCMGFrameArea

FramePin method

Description:

Zooms the map to center the pin specified by layerid and id.

Visual Basic Syntax:

mapObj.**FramePin(**layerid, id**)**

Com – Interface:

HRESULT **FramePin**(layerid, id);

Part	Type	Description
layerid	string	layerid of the layer containing the pin to be framed
id	string	id of the pin to be framed

Remarks:

Refer to section 3.5.1, *Pin and Label Functions* or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

FramePinMap method

Description:

Zooms the map to include all of the pins in the pinmap layer layerid.

Visual Basic Syntax:

mapObj.FramePinMap(layerid)

Com – Interface:

HRESULT **FramePinMap**([in] BSTR);

Part	Type	Description
layerid	string	id of the layer containing the pins to be framed

Remarks:

Refer to section 3.5.7, *Pinmap Functions* or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

FrameRoute method

Description:

Frames the trip represented by the trip ID.

Visual Basic Syntax:

mapObj.FrameRoute(tripID)

Com – Interface:

HRESULT **FrameRoute**([in] long tripID);

Part	Type	Description
tripID	long	trip id

Remarks:

The user must have the PC*MILER|Connect object to display trip information on the map.

FrameTrip method

Description:

Frames the route plotted by PlotTrip.

Visual Basic Syntax:

mapObj.**FrameTrip(**layered, id**)**

Com – Interface:

HRESULT **FrameTrip**([in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	should match layered parameter in PlotTrip call
id	string	should match id parameter in PlotTrip call

Remarks:

PlotTrip

GetFrameArea method

Description:

Gets the string name of the frameable area indexed by which. Which must be 0 to `NumFrameAreas`-1.

Visual Basic Syntax:

area = *mapObj*.**GetFrameArea(**which**)**

Com – Interface:

HRESULT **GetFrameArea**([in] long which, [out, retval] BSTR* area);

Part	Type	Description
area	string	the string name of the area
which	long	index of the frameable area

Remarks:

PCMGGetFrameArea

LessDetail method

Description:

Decreases the number of roads, road names and city names displayed. Each call to the function decreases the level of detail by the same amount as zooming out a level. The function may be called multiple times to dramatically decrease the level of detail.

Visual Basic Syntax:

mapObj.LessDetail

Com – Interface:

HRESULT **LessDetail**();

Remarks:

PCMGRemoveDetail

MoreDetail method

Description:

Increases the number of roads, road names and city names displayed. Each call to the function increases the level of detail by the same amount as zooming in a level. The function may be called multiple times to dramatically increase the level of detail.

Visual Basic Syntax:

mapObj.MoreDetail

Com – Interface:

HRESULT **MoreDetail**();

Remarks:

PCMGAddDetail

Paint method

Description:

Draws the map. This function should be used when responding to a WM_PAINT message, usually in your **OnPaint** message-handler member function.

Visual Basic Syntax:

mapObj.**Paint**(hdc, hwnd)

Com – Interface:

HRESULT **Paint**([in] long hdc, [in] long hwnd);

Part	Type	Description
Hdc	long	Handle to the device context to draw in.
Hwnd	long	Handle to the window to be painted.

Remarks:

Returns S_OK if the function was successful , S_FALSE if not.

Pan method

Description:

Moves the viewable area of the map in one of eight directions (N, S, E, W, NE, NW, SE, SW).

Visual Basic Syntax:

mapObj.**Pan(**dir, factor**)**

Com – Interface:

HRESULT **Pan**([in] long dir, [in] double factor);

Part	Type	Description
dir	long	direction to pan
factor	double	distance factor

Remarks:

The following constants represent the eight possible directions for panning:

NORTH	0
NORTHEAST	1
EAST	2
SOUTHEAST	3
SOUTH	4
SOUTHWEST	5
WEST	6
NORTHWEST	7

The distance factor determines how far on the map the viewable area moves and represents the map size in tenths. A factor of 0.0 does not move the viewable area and a factor of 1.0 moves the viewable area exactly one map size. That is, panning with a factor of 1.0 will completely move the area so no locations in the previous view are in the subsequent view. A factor of 0.5 will move the view ½ of the map's area in the direction specified.

PlotLabel method

Description:

Draws a label on the map.

Visual Basic Syntax:

mapObj.**PlotLabel(**layerid, id, importance, style, locations, label**)**

Com – Interface:

HRESULT **PlotLabel**([in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	id of the layer to which the new label will be added
id	string	unique identifier of new label
importance	string	level of importance (determines at what level of detail the label will be drawn);1 to 6, with 1 being most important
style	string	which color and line width to use
locations	string	location of label (PC*MILER place names only)
label	string	text of label

PlotLine method

Description:

Draws a line on the map.

Visual Basic Syntax:

mapObj.**PlotLine(**layerid, id, importance, style, locations**)**

Com – Interface:

HRESULT **PlotLine**([in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	id of the layer to which the new line will be added
id	string	unique identifier of new line
importance	string	level of importance (determines at what level of detail the line will be drawn);1 to 6, with 1 being most important
style	string	which color and line width to use
locations	string	list of stops that make up the line (PC*MILER place names only)

Remarks:

Refer to section 3.5.6, *Trip and Line Functions* or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

PlotPin method

Description:

Draws an icon on the map.

Visual Basic Syntax:

mapObj.**PlotPin(**layerid, id, importance, symbol, location, labels**)**

Com – Interface:

HRESULT **PlotPin**([in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	layer that contains the pin (will be created if none exists)
id	string	unique identifier for the pin (pin will be created if none exists)
importance	string	level of importance (determines at what level of detail pin will be drawn); 1 to 6, with 1 being most important

symbol	string	.bmp file name, or PCMGS symbol
location	string	ZIP or postal code, city/state, Canadian postal code, SPLC code, or lat/long
labels	string	(optional) list of up to eight values

Remarks:

Refer to section 3.5.1, *Pin and Label Functions* or *Plot Functions* in the Index or Contents of PC*MILER|Mapping Help.

SetUseOverlapIcon method

Description:

Sets overlapping mode for pin layer

Visual Basic Syntax:

mapObj.**SetUseOverlapIcon(**layerid, on_off**)**

Com – Interface:

HRESULT **SetUseOverlapIcon** ([in] BSTR, [in] BOOL);

Part	Type	Description
layerid	string	layer that contains the pin (will be created if none exists)
on_off	boolean	

Remarks:

Refer to section 3.4.8, *Layer Control Functions* or *Layer Control Functions* in the Index of PC*MILER|Mapping Help.

SetOverlapIconName method

Description:

Sets overlapping icon for pin layer

Visual Basic Syntax:

mapObj.SetOverlapIconName(layerid, icon)

Com – Interface:

HRESULT **SetOverlapIconName** ([in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	layer that contains the pin (will be created if none exists)
icon	string	.bmp file name, or PCMGS symbol

Remarks:

Refer to section 3.4.8, *Layer Control Functions* or *Layer Control Functions* in the Index of PC*MILER|Mapping Help.

PlotTrip method

Description:

Draws a route's trip over the PC*MILER network on the map.

Visual Basic Syntax:

mapObj.**PlotTrip(**layerid, id, importance, style, locations, options**)**

Com – Interface:

HRESULT **PlotTrip**([in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR, [in] BSTR);

Part	Type	Description
layerid	string	the feature layer to which the new trip will be added
id	string	unique identifier of the trip
importance	string	level of importance (determines at what level of detail the trip will be drawn); 1 to 6, with 1 being most important
style	string	which line color and width to use
locations	string	list of stops that make up the trip (PC*MILER place names only)
options	string	list of PC*MILER routing options to use when calculating the trip

Remarks:

Refer to section 3.5.6, *Trip and Line Functions* or *Plot Functions* in the Index or Contents of Mapping Help.

Print method

Description:

Prints the map to a printer device.

Visual Basic Syntax:

mapObj.**Print (**hdc, title)

Com – Interface:

HRESULT **Print** ([in] long hdc, [in] BSTR, title);

Part	Type	Description
hdc	long	handle to the printer device context.
title	string	title for the printed map.

Remarks:

Returns S_OK if the function was successful , S_FALSE if not.

SetGifDirectory **method**

Description:

Sets the default directory or folder to store .gif images created by `CreateGifFile`.

Visual Basic Syntax:

mapObj.SetGifDirectory(dir)

Com – Interface:

HRESULT **SetGifDirectory**([in] BSTR);

Part	Type	Description
dir	string	name of the directory or folder.

Remarks:

Ignore this if you are always using a full path in `CreateGifFile`.

SetMapSettings **method**

Description:

Set the mapping settings for this map.

Visual Basic Syntax:

mapMgrObj.**SetMapSettings(**x, y, xzoom, yzoom, detail**)**

Com – Interface:

HRESULT **SetMapSettings**([in] long x, [in] long y, [in] long xzoom, [in] long yzoom, [in] long detail);

Part	Type	Description
x	long	x coordinate of the map's center.
y	long	y coordinate of the map's center.
xzoom	long	xzoom level
yzoom	long	yzoom level
detail	long	detail level

SetScaleUnits method

Description:
Set scale units of the map to miles or kilometers.

Visual Basic Syntax:
mapObj.SetScaleUnits(units)
Com – Interface:
HRESULT **SetScaleUnits**([in] long units);

Part	Type	Description
units	long	miles or kilometers

Remarks:
Sets the maps units to either miles (0) or kilometers(1).

ToggleScaleLegend method

Description:
Sets the scale legend visibility.

Visual Basic Syntax:
mapObj.ToggleScaleLegend(on_off)
Com – Interface:
HRESULT **ToggleScaleLegend**([in] int value);

Part	Type	Description
Value	int	set to 0 to hide the legend, set to nonzero to show the legend

ToggleRoadLegend method

Description:
Sets the road legend visibility.

Visual Basic Syntax:
mapObj.ToggleRoadLegend(on_off)
Com – Interface:
HRESULT **ToggleRoadLegend**([in] int value);

Part	Type	Description
Value	int	set to 0 to hide the legend, set to nonzero to show the legend

ToggleRouteLegend method

Description:

Sets the route legend visibility.

Visual Basic Syntax:

mapObj.ToggleRouteLegend(on_off)

Com – Interface:

HRESULT **ToggleRouteLegend**([in] int value);

Part	Type	Description
Value	int	set to 0 to hide the legend, set to nonzero to show the legend

ShowLayer method

Description:

Use this function to show or hide the layer identified by layerid.

Visual Basic Syntax:

mapObj. **ShowLayer(**layerid, onoff**)**

Com – Interface:

HRESULT **ShowLayer**([in] BSTR, [in] BOOL);

Part	Type	Description
layerid	string	layer name
onoff	BOOL	show if true, or hide if false

Remarks:

This function can be used to show or hide Trip layers, Line layers, Label layers, and any PC*MILER layers. Use True to turn the layer on, use False to turn the layer off.

ShowPinMap method

Description:

Use this function to show or hide the Pin layer identified by layerid.

Visual Basic Syntax:

mapObj.**ShowPinMap(**layerid, onoff**)**

Com – Interface:

HRESULT **ShowPinMap**([in] BSTR, [in] BOOL);

Part	Type	Description
layerid	string	layer name
onoff	BOOL	true or false

Remarks:

This function can be used to show or hide only pin layers (layers will not be deleted). Use True to turn the layer on, False to turn the layer off. Refer to section 3.5.7, *Pinmap Functions* or *Pinmap Functions* (under *Plot Functions*) in the Index or Contents of Mapping Help.

UpdateRoute method

Description:

Updates the map with information in the trip represented by the trip ID.

Visual Basic Syntax:

mapObj.UpdateRoute(tripID)

Com – Interface:

HRESULT **UpdateRoute**([in] long tripID);

Part	Type	Description
tripID	long	trip id

Remarks:

The user must have the PC*MILER|Connect object to display trip information on the map.

UpdateRoute2 method

Description:

Updates the map with information in the trip represented by the trip ID and drawn with style represented by the Style.

Visual Basic Syntax:

mapObj.**UpdateRoute2(**tripID, Style**)**

Com – Interface:

HRESULT **UpdateRoute2**([in] tripID, [in] Style);

Part	Type	Description
tripID	long	trip id
Style	string	style (line width and color, separated by vertical bar, for example "red|5")

Remarks:

This function is the extension of UpdateRoute. See section 4.4.3, *Plotting a Route Between Two Points* for a description of style variable.

ZoomIn method

Description:

Zooms in one level. Equivalent to double-clicking with the left mouse. Will cause more detail to appear on the map.

Visual Basic Syntax:

mapObj.ZoomIn

Com – Interface:

HRESULT **ZoomIn**();

Remarks:

PCMGZoomIn

ZoomOut method

Description:

Zooms out one level. Will cause less detail to appear on the map.

Visual Basic Syntax:

mapObj.ZoomOut

Com – Interface:

HRESULT **ZoomOut**();

Remarks:

PCMGZoomOut

ZoomTo method

Description:

Zooms to a rectangle on the map.

Visual Basic Syntax:

mapObj.**ZoomTo(**left, top, right, bottom)

Com – Interface:

HRESULT **ZoomTo**([in] long left, [in] long top, [in] long right, [in] long bottom);

Part	Type	Description
left	long	left of the rectangle
top	long	top of the rectangle
right	long	right of the rectangle
bottom	long	bottom of the rectangle

ZoomToPlace method

Description:

Zooms to a place on the map.

Visual Basic Syntax:

mapObj.**ZoomToPlace(**placename**)**

Com – Interface:

HRESULT **ZoomToPlace**([in] BSTR);

Part	Type	Description
placename	string	name of the place

GetGifLocationXY method

Description:

This function does the opposite of the one above, it returns an (x,y) point in the GIF image corresponding to a given location (location can be any valid PCM location: Lat/Long, postal code, city/state, or POI).

Visual Basic Syntax:

mapObj.**GetGifLocationXY(**width, height, BSTR**)**

Com – Interface:

HRESULT **GetGifLocationXY** ([in] long width, [in] long height, [in] BSTR, [out] long *x, [out] long *y);

Part	Type	Description
width	long	width of GIF in pixels
height	long	height of GIF in pixels
BSTR	string	PC*MILER Lat/Long, postcode, city/state, POI
x	long	horizontal position
y	long	vertical position

Remarks:

PCMGGetGifLocationXY

5.4 PCMMapSettings PROPERTIES

X property (read)

Description:

Returns the x coordinate of the map settings object.

Visual Basic Syntax:

xcoord = MapSettingsObj**.x**

Part	Type	Description
xcoord	long	the x coordinate of this object

Y property (read)

Description:

Returns the y coordinate of the map settings object.

Visual Basic Syntax:

ycoord = MapSettingsObj**.y**

Part	Type	Description
ycoord	long	the y coordinate of this object

Xzoom property (read)

Description:

Returns the xzoom level of the map settings object.

Visual Basic Syntax:

xzoomlevel = MapSettingsObj**.xZoom**

Part	Type	Description
xzoomlevel	long	the xzoom level

Yzoom property (read)

Description:

Returns the yzoom level of the map settings object.

Visual Basic Syntax:

yzoomlevel = MapSettingsObj**.yZoom**

Part	Type	Description
yzoomlevel	long	the yzoom level

Detail property (read)

Description:

Returns the detail level of the map settings object.

Visual Basic Syntax:

detaillevel = MapSettingsObj**.Detail**

Part	Type	Description
detaillevel	long	the detail level

Chapter 6 Trouble-shooting (Helpful Hints)

Postal codes with leading zero's

If you enter a postal code with a leading zero (e.g. 08540) Excel may interpret it as a number and remove the leading zero. To correct this problem, either type an apostrophe in front of the postal code (e.g. '08540) or format the field as text.

'Cannot access PCMGMP32.XLA' error

When you open the Add-in dialog box, a dialog box appears that gives the above error. Microsoft has acknowledged this problem and is researching it. Please call Microsoft and refer to document number ***Q128186***for a status update if you are experiencing this problem.

To access **pcmgmp32.xla**, exit and restart Excel and manually enable the Add-In (see Chapter 4).

'Cannot find VBAEN.OLB' error

Excel will attempt to access this file when it tries to load the Add-In. First, make sure that the file **vbaen.olb** exists. It should be either in the Windows directory or the `SYSTEM` subdirectory inside the Windows directory. If the file does not exist, you must re-install Windows.

If the file exists, then the problem is in the Windows Registration File (**reg.dat**). The location of **vbaen.olb** is saved in the **reg.dat**. Make sure the path to this file in the **reg.dat** points to the correct location. You can run **REGEDIT /V** to view/edit the **reg.dat**. **Note:** We do not support making modifications to this file. Please make a backup copy before making any changes.

Look for the key "**TypeLib**". Look for the **Win17** selection. Under this section should be a complete path to the **vbaen.olb**. Ensure the full path is correct.

'Sub or function not defined' error

When making calls to PC*MILER|Mapping from a macro sheet, you may see this message. To fix the problem, from the **Tools** menu select **References** and make sure that **pcmgmp32.xla** is checked.

PC*MILER|Mapping won’t restart

Under certain circumstances when using Windows for Workgroups the pcmgmap.exe will not start after it has been opened and closed. To restart it you must exit Windows. To avoid this problem, always exit Excel before exiting the PC*MILER|Mapping program.

Bitmaps do not draw

On some machines with very little video memory (like laptops), bitmaps may not be drawn on the screen. To reduce the demand on video memory, change video drivers to reduce the number of colors being rendered or move to a lower resolution video mode.

You have problems using custom routing from PC*MILER

If you have problems using custom routing that you created in PC*MILER, set the value of the following item in the PCMSERVE.INI file to TRUE:

```
CustomRoute = TRUE
```

The PCMSERVE.INI file is located in your Windows or Winnt folder. See *Appendix B.*

Appendix A

Appendix A: Location of Header Files & Sample Code

The header files pcmgmap.h, pcmgwin.h, and pcmgwinex.hfor unmanaged win32 applications can be found in the C_CPP folder of the PC*MILER|Mapping installation (usually C:\ALK Technologies\PCMILER28\Mapping\C_CPP). Sample code is in the same location.

Pcmgmap.def and pcmgwin.def are found in the Mapping folder. Other subfolders in the Mapping folderinclude additional files containing sample code and additional documentation, along with descriptive ReadMe files.

Appendix B

Appendix B: The PCMSERVE.INI File

PC*MILER|Mapping and PC*MILER|Connect share the same INI file (**PCMSERVE.INI**).You can modify the INI file to set default trip options so that these options are active each time PC*MILER|Mappingstarts up. This file is located in your Windows or Windows NT folder, and can be opened using Notepad, Wordpad, or another text editor.

Note that trip options can also be set using the API functions or in PC*MILER interactive. **An option set with an API function takes precedence over both the INI setting and the setting in PC*MILER interactive.** The order of precedence is as follows:

1. Options that are set using PC*MILER|Mapping functions prevail over the default options set in PC*MILER and the INI file.
2. Options set in PCMSERVE.INI prevail over those set in PC*MILER.
3. Options set in PC*MILER as defaults take effect only in the absence of settings 1 and 2.

NOTE: Beginning in Version 26, customizations in the PCMSERVE.INI file from the previous version are retained when you install a new version of PC*MILER.

Settings in the INI that can be added or edited are listed below. If you open the INI file, you won't see all of these settings in it.If any key doesn't have a value or is not found in the INI file, it assumes the default value or the value set in PC*MILER interactive.

Key	Valid Values	Description
[Engine]		

`ShowEngine=`	`0`
	`1`
		Should Connect automaticallystart the engine (1) or not (0).
		Default = 0

[Logging]		

`Enable=`	`0`
	`1`
		Should log files be generated (1) or not (0).
		Default = 0

`File=`		Path/file name of log file.

`Append=`	`0`
	`1`
		Append to old file (1) or write over (0).
		Default = 0

`MaxStrLen=`	`Any integer up to 254`	Assign number of characters to truncate

		log messages to (optional).

`DisplayTime=`	`0`
	`1`
		When DisplayTime = 1, date and time are shown at the beginning of each line in specified log file.
		Default = 0

[Defaults]

`CalcType=`	`Practical`
	`Shortest`
	`National`
	`AvoidToll`
	`Air`
	`FiftyThree`
		The default routing type: most Practical, Shortest by distance, favor National Network highways, avoid tolls, air (straight line), or 53 foot trailer routing.
		Default = Practical
		Note: Toll-discouraged, national, and 53’ routing are based on Practical miles.
		Note Also: When 53' Trailer routing is selected, the National Network is automatically included – but not necessarily vice versa.

`Units=`	`Miles` `Kilometers`	What unit of measure should distance be shown in. Default = Miles
`ChangeDest=`	`TRUE` `FALSE`	When optimizing the route, should the trip’s destination be optimized also (T). Default = False
`Borders=`	`TRUE` `FALSE`	Should the engine try to keep routes within the United States (F), or can they cross and recross the borders at will (T). Default = True
`HubMode=`	`TRUE` `FALSE`	Calculate the routes from the origin to each stop (T), not through each stop (F). Default = False
`AlphaOrder=`	`TRUE` `FALSE`	List the states in the State Report in alphabetical order (T) or in the order driven (F). Default = True
`FerryMiles=`	`TRUE` `FALSE`	Use ferry distances in mileage and cost calculations (T), or don’t use (F). Default = True
`LightVehicle=`	`TRUE` `FALSE`	Should the DLL use Light Vehicle routing (only available if Streets data is

		installed with PC*MILER). Default=False
`MAPPING=`	`TRUE` `FALSE`	(AS/400 parameter) Default = False
`EXPMAP=`	`TRUE` `FALSE`	(AS/400 parameter) Default = False

[Options]

`CustomRoute=`	`TRUE` `FALSE`	Should PC*MILER|Connectuse Custom routing. Default = False

`HazRoute=`
*(with PC*MILER|Hazmat add-on only)*
	`None`
	`General`
	`Explosive`
	`Inhalant`
	`Radioactive`
	`Corrosive`
	`Flammable`
	`HarmfultoWater`
		Hazardous material routing types for **North America** are: none (hazmat routing disabled), general, explosive, inhalant, radioactive, corrosive, or flammable. For **Europe or Oceania**, hazmat route types are: none, general, explosive, flammable, or harmful to water.
		Default (all regions) = None

`PartialCityMatch=`	`TRUE` `FALSE`	Enables the return of a city match on a partial match of 28 characters. Default = False
`HistoricalRoadSpeeds=`	`TRUE` `FALSE`	Toggles activation of traffic data for use in time-based routing. Equivalent to the “Use Traffic Data” button in PC*MILER. Default = False
`TranslateAlias=`	`TRUE` `FALSE`	This setting pertains to geocoding in PC*MILER|FuelTax. It changes “*” and “()” in a custom place name to a “Zip-City-State; Address” format.
`UseUSPostCodes=`	`TRUE` `FALSE`	When set to TRUE, if a 5-digit postal code might be a U.S. or a Mexican code, the U.S. code will be used. Default = True *(see note below)*
`UseMexPostCodes=`	`TRUE` `FALSE`	When set to TRUE, if a 5-digit postal code might be a U.S. or a Mexican code, the Mexican code will be used. Default = False

		NOTE: If `UseUSPostCodes` and `UseMexPostCodes` are both FALSE, or are not in the INI, the default U.S. code will be used.
`UseStreets=` *(with PC*MILER|Streets data only)*	TRUE FALSE	Should street-level (T) or highway-only (F) routing be used when stops are city names or postal codes. Default = False
`LatLonFormatDecimal=`	TRUE FALSE	Pertains to the function `PCMSAddressToLatLong()`, causing the function to return lat/longs in decimal degrees (e.g. 40.348848N,74.662703W). When this line is not included in the .INI or is included but =FALSE, the function returns degrees, minutes, seconds (e.g. 0402056N,0743946W). Default = False (Note: when this line is not present, default = false)
`UseNLAbbrevInMX=`	TRUE FALSE	When set to TRUE, the "NL" abbreviation geocodes to Nuevo Leon in Mexico. Default=False
`UseOverlapIcon=`	TRUE FALSE	Should overlap icons be used when pins overlap. Default=True
`UseOverlapCount=`	TRUE FALSE	Place pin count in overlap icon (e.g. an icon representing three overlapping pins will have a "3" text label). Default=True
`CountryAbbrevType=`	FIPS ISO2 ISO3 GENC2 GENC3	For PC*MILER|Worldwide, this option sets the country code format that will be accepted when using city name/country abbreviations as locations in regions other than North America. Default = FIPS

[MappingOptions]

`AvoidFavorAutoSave =`	TRUE FALSE	(PC*MILER|Mapping) This option can be set to TRUE to autosave avoids/favors on shutdown. Default = False (Note: when this line is

		not present, default = false)
`GeofenceAutoSave=`	`TRUE` (default, underlined) `FALSE`	(PC*MILER|Mapping) With this option set to TRUE, PC*MILER|Mapping automatically saves geofence data on shutdown. Default = True (Note: when this line is not present, default = true)

[Defaults]

`Region=`	`NA`
	`SA`
	`Africa`
	`Asia`
	`Europe`
	`ME`
	`Oceania`
		Default region is NA (North America). Other regions available with PC*MILER|Worldwide.

`ClassicMap=` *(Optional, may be added)*	`FALSE` `TRUE`	Map will display in PC*MILER Version 18 style when set to TRUE.
`DragMode=` *(Optional, may be added)*	`FALSE` `TRUE`	When set to TRUE, user can drag the map in any direction to shift the view.
`ProductName=`	`PC*MILER`	
`Product Version=`	`28`	Current version of PC*MILER.
`DLLPath=`	`Usually C:\ALK Technologies\ PCMILER28\app`	Path to the current installation of PC*MILER.

Appendix C

Appendix C: Error Codes

General error	-10
Pin map does not exist	-20
Failed to create pin map	-21
Unknown location	-22
Bad bit map	-23
Bad bit map file	-24
Pin does not exist	-25
Bad importance value	-26
Map does not exist	-27
Failed to create route	-28
Not enough stops	-29
Invalid stop	-30
Trip not ready	-31
Route not run	-32
Invalid style	-33
Invalid route options	-34
Failed to create line	-35
Invalid point	-36
Not enough points	-37
Invalid arguments	-38
Route does not exist	-39
Line does not exist	-40

Appendix D

Appendix D: Alphabetical Function Index

/*COM function*/ CopyToClipboard (PCMMap method), 75
/*COM function*/ CreateGifBytes (PCMMap method), 76
/*COM function*/ CreateGifFile (PCMMap method), 75
/*COM function*/ CreateMap (PCMMapMgr method), 73
/*COM function*/ DeleteLabel (PCMMap method), 77
/*COM function*/ DeleteLine (PCMMap method), 77
/*COM function*/ DeletePin (PCMMap method), 77
/*COM function*/ DeletePinMap (PCMMap method), 78
/*COM function*/ DeleteTrip (PCMMap method), 78
/*COM function*/ Detail (PCMMap method), 94
/*COM function*/ ErrorCode (PCMMapMgr property), 73
/*COM function*/ FrameArea (PCMMap method), 79
/*COM function*/ FramePin (PCMMap method), 79
/*COM function*/ FramePinMap (PCMMap method), 79
/*COM function*/ FrameRoute (PCMMap method), 80
/*COM function*/ FrameTrip (PCMMap method), 80
/*COM function*/ GetFrameArea (PCMMap method), 81
/*COM function*/ GetGifLocationXY (PCMMap method), 92
/*COM function*/ IsOK (PCMMapMgr property), 73
/*COM function*/ LessDetail (PCMMap method), 81
/*COM function*/ MapID (PCMMap property), 74
/*COM function*/ MapSettings (PCMMap property), 74
/*COM function*/ MoreDetail (PCMMap method), 81
/*COM function*/ NumFrameAreas (PCMMap property), 75
/*COM function*/ Paint (PCMMap method), 82
/*COM function*/ Pan (PCMMap method), 82
/*COM function*/ PlotLabel (PCMMap method), 83
/*COM function*/ PlotLine (PCMMap method), 84
/*COM function*/ PlotPin (PCMMap method), 84
/*COM function*/ PlotTrip (PCMMap method), 86
/*COM function*/ Print (PCMMap method), 86
/*COM function*/ SetGifDirectory (PCMMap method), 87
/*COM function*/ SetMapSettings (PCMMap method), 87
/*COM function*/ SetOverlapIconName (PCMMap method), 85
/*COM function*/ SetScaleUnits (PCMMap method), 88
/*COM function*/ SetUseOverlapIcon (PCMMap method), 85
/*COM function*/ ShowLayer (PCMMap method), 89
/*COM function*/ ShowPinMap (PCMMap method), 89
/*COM function*/ ToggeRoadLegend (PCMMap method), 88
/*COM function*/ ToggleRouteLegend (PCMMap method), 89
/*COM function*/ ToggleScaleLegend (PCMMap method), 88
/*COM function*/ UpdateRoute (PCMMap method), 90
/*COM function*/ UpdateRoute2 (PCMMap method), 90

/*COM function*/ X (PCMMap property), 93
/*COM function*/ Xzoom (PCMMap property), 93
/*COM function*/ Y (PCMMap property), 93
/*COM function*/ Yzoom (PCMMap method), 94
/*COM function*/ ZoomIn (PCMMap method), 91
/*COM function*/ ZoomOut (PCMMap method), 91
/*COM function*/ ZoomTo (PCMMap method), 91
/*COM function*/ ZoomToPlace (PCMMap method), 92
/*COM object*/ PCMMap, 69, 70
/*COM object*/ PCMMapSettings, 70

/*Excel function*/ DeleteLineID, 66
/*Excel function*/ DeletePinID, 65
/*Excel function*/ DeletePins, 65
/*Excel function*/ DeleteTripID, 67
/*Excel function*/ DeleteTrips, 67
/*Excel function*/ DeletLines, 66
/*Excel function*/ PlotLine, 63
/*Excel function*/ PlotLineID, 63
/*Excel function*/ PlotPin, 58
/*Excel function*/ PlotPinID, 58
/*Excel function*/ PlotTrip, 61
/*Excel function*/ PlotTripID, 61

PCMGActivateGeofence, 47
PCMGActivateGeofenceSet, 48
PCMGAddDetail, 22
PCMGAddGeofence, 46
PCMGAddGeofenceSet, 48
PCMGAddGeofenceToSet, 48
PCMGAddStateHighlight, 50
PCMGAddStreetHighlight, 51
PCMGCleanupMap, 14, 29, 53
PCMGClearLabels, 20
PCMGCloseMap, 12, 14
PCMGCloseMapEx, 53
PCMGCopyMap, 19
PCMGCreateChildMap, 52
PCMGCreateGifFile, 36
PCMGCreateMapChild, 12, 13
PCMGCreateMapChildEx, 53
PCMGCreateMapWindow, 12, 13, 29, 34
PCMGCreateMapWindowEx, 53
PCMGDefaultDetail, 22
PCMGDeleteAllStreetHighlights, 51
PCMGDeleteGeofence, 47
PCMGDeleteGeofenceSet, 48
PCMGDeleteLabel, 25, 39

PCMGDeleteLine, 43, 68
PCMGDeletePin, 39, 68
PCMGDeletePinmap, 44, 68
PCMGDeleteStateHighlight, 50
PCMGDeleteStreetHighlight, 51
PCMGDeleteTrip, 68
PCMGDeleteTripLayer, 44
PCMGFindGeofenceID, 48
PCMGFindGeofenceSetID, 49
PCMGFrameArea, 23
PCMGFramePin, 39, 68
PCMGFramePinmap, 44, 68
PCMGFrameTrip, 44
PCMGFrameTripLayer, 44
PCMGGetActiveMapStyle, 14
PCMGGetCityLabeling, 19
PCMGGetDebug, 68
PCMGGetDefaultRegion, 45
PCMGGetDetailAdjust, 22
PCMGGetDetailLevel, 22
PCMGGetDisplayModule, 52
PCMGGetDisplayWindow, 52
PCMGGetDrawerCount, 17
PCMGGetDrawerInfo, 18
PCMGGetFrameArea, 23
PCMGGetGeofenceFromSet, 50
PCMGGetGeofenceName, 48
PCMGGetGeofenceSet, 50
PCMGGetGeofenceSetBorderColor, 49
PCMGGetGeofenceSetColor, 49
PCMGGetGeofenceSetName, 49
PCMGGetMapStyleList, 14
PCMGGetMapWindowDims, 15
PCMGGetPinPicking, 20
PCMGGetProjectionRect, 15
PCMGGetRegionName, 45
PCMGGetRestrictionsLegend, 21
PCMGGetRoadLabeling, 19
PCMGGetRoadLegend, 21
PCMGGetRouteDistTooltip, 20
PCMGGetRouteLegend, 21
PCMGGetScale, 22
PCMGGetStateHighlightColor, 50
PCMGGetTrafficLegend, 21
PCMGHideLayer, 24
PCMGInitMap, 12, 29, 34
PCMGIsGeofenceActive, 47
PCMGIsGeofenceSetActive, 49

PCMGLatLongToPixel, 17
PCMGModifyGeofenceBorderColor, 47
PCMGModifyGeofenceColor, 47
PCMGModifyGeofenceSetBorderColor, 49
PCMGModifyGeofenceSetColor, 49
PCMGNumFrameAreas, 23
PCMGNumGeofenceSets, 50
PCMGNumGeofencesInSet, 50
PCMGNumRegions, 45
PCMGPixelToLatLong, 17
PCMGPlotLabel, 24, 39, 40
PCMGPlotLine, 42, 68
PCMGPlotPin, 34, 35, 37, 39, 40, 41, 42, 43, 68
PCMGPlotTrip, 41, 68
PCMGPrintMap, 18
PCMGPrintMapOnDC, 19
PCMGRedraw, 19
PCMGRemoveDetail, 22
PCMGRemoveGeofenceFromSet, 48
PCMGResizeMapChild, 13
PCMGScrollMapView, 18
PCMGSetCallBack, 25, 29
PCMGSetCanWindow, 23
PCMGSetCityLabeling, 19
PCMGSetDebug, 68
PCMGSetDefaultRegion, 45
PCMGSetDisplayModule, 52
PCMGSetDisplayWindow, 34, 35, 52
PCMGSetDrawerVisible, 18
PCMGSetGeofenceName, 48
PCMGSetGeofenceSetName, 49
PCMGSetInfoLabels, 43, 68
PCMGSetMapResizeCallback, 26
PCMGSetMapStyle, 15
PCMGSetMexWindow, 23
PCMGSetMouseInterceptCallback, 25
PCMGSetNAWindow, 23
PCMGSetOverlapIconName, 25
PCMGSetPinPicking, 20
PCMGSetProjectionCenter, 16
PCMGSetProjectionRadius, 16
PCMGSetProjectionRect, 15
PCMGSetReceiver, 25, 29
PCMGSetRedraw, 52, 68
PCMGSetRestrictionsLegend, 21
PCMGSetRoadLabeling, 19
PCMGSetRoadLegend, 20
PCMGSetRouteDistTooltip, 20

PCMGSetRouteLegend, 21
PCMGSetScale, 22
PCMGSetTrafficLegend, 21
PCMGSetUseOverlapIcon, 25
PCMGSetUSWindow, 22
PCMGShowLayer, 24
PCMGShowPinmap, 44, 68
PCMGSwitchRegion, 45
PCMGToggleCityPicking, 19
PCMGTogglePinPicking, 20
PCMGToggleRestrictionsLegend, 21
PCMGToggleRoadLegend, 21
PCMGToggleRoadPicking, 19
PCMGToggleRouteDistTooltip, 20
PCMGToggleRouteLegend, 21
PCMGToggleScale, 22
PCMGToggleTrafficLegend, 21
PCMGTrafficStatus, 53
PCMGZoomIn, 24
PCMGZoomOut, 24
PCMGZoomToPlace, 24