PMGlobe for Windows

Mike Cowlishaw

IBM Fellow
IBM UK Laboratories

mfc@speleotrove.com

PMGlobe 3.31

Table of Contents

Right click to update Table of Contents (or Tools-Update-All).

PMGlobe User's Guide

Introduction

PMGlobe is a program which displays the Earth as a globe on a Windows 2000 or later Windows platform. It can be run as an application or as a screen saver.

You can choose to view the globe from any direction, or select one of a number of "standard" views; the image shown on the globe's surface can be a chosen from several built-in images, or can be loaded from external files.

In addition to simply displaying a picture of the world, PMGlobe will also let you light the globe as though by sunlight – so you can see at a glance those areas of the globe where the sun has risen, and where it is night; this is especially effective if you choose a full-screen view.

Further options add shading to the globe for a three-dimensional effect, alter the view of the twilight zone, let you measure and track distances between points on the globe, and let the globe be drawn without a frame or background.

With the command interface included with PMGlobe, you can add markers, labels, clocks, and graphics to the globe and have more control over its actions. If you wish, a series of commands can be put into a text file for execution, or you can use Rexx as a macro language for PMGlobe – all PMGlobe commands can be used in macros. Other features are described in detail below.

This document includes:

- an introduction to PMGlobe (this section)
- installation instructions
- a guide to using PMGlobe
- background and other details
- a guide to using PMGlobe commands and macros.

The algorithms, data, and code for PMGlobe were first developed for *PMGlobe for OS/2* and *Palm Globe*, globe applications for OS/2 and the PalmPilot™, respectively. The current releases of PMGlobe for Windows, PalmPilot, and OS/2 are available from
http://speleotrove.com/pmglobe/

Acknowledgements

Many people have made suggestions for PMGlobe features when it was first written (for OS/2). The major improvement in PMGlobe 3 – full-colour images of the globe – has been made possible by

NASA; the daylight image (the NASA *Visible Earth* image) was compiled from images captured by the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument on the Terra satellite. The night-time city lights were imaged from Defense Meteorological Satellite Program spacecraft. For details, see:

http://earthobservatory.nasa.gov/Newsroom/BlueMarble/

Installation

System requirements

PMGlobe 3 should run correctly on Windows 2000, Windows XP, or equivalent. It *may* run on earlier versions, such as Windows 98, but this has not been tested, and certain features (such as display as a circular window) may fail.

Your display settings should be for at least 16-bit colour (unless "classic" imagery is used).

PMGlobe requires less than one Megabyte of disk space. Depending on the imagery used and the chosen window size, PMGlobe typically uses between 6 and 20 Megabytes of RAM while running.

Installing PMGlobe

PMGlobe is distributed as a Microsoft Installer (MSI) package, `PMGlobe.msi`. Opening this file on Windows 2000 or Windows XP will start the installation process.

After installation, you should find a PMGlobe folder in the Start Programs list; click on the PMGlobe icon in that folder to start the application.

Installation of the package also enables the PMGlobe Screen Saver. To use this:

1. right click on the desktop and choose Properties (or click on Display in the Control Panel). This will open the Display Properties dialog.

2. click on the Screen Saver tab.

3. you should now find PMGlobe in the Screen saver drop-down list. Selecting it should show a picture of the globe on the small screen image.

4. configure the startup settings for the screen saver by clicking the Settings button. This will start PMGlobe in interactive mode to let you change the settings you wish (viewpoint, background colour, imagery, twilight settings, startup macro, *etc.*). Close PMGlobe to save the screen saver settings and complete configuration.

5. set the other screen saver settings as required. Click on Preview to see the globe full-size.

You can also install PMGlobe manually; this is described in Appendix A (see page 37).

Uninstalling PMGlobe

Open the Windows Control Panel then use "Add or remove programs" to uninstall PMGlobe.

Command-line options

The PMGlobe application may be started from a Command Prompt, script, shortcut, or batch file. In any of these cases, the PMGlobe command verb may be followed by one or more of these options:

CONSOLE   starts a Windows console (see page 11) when PMGlobe is started; this displays the results of QUERY commands, *etc.*

FULLSCREEN   starts PMGlobe with the globe filling the screen, as though the "Make full screen" option had been selected in the Options menu (see page 11)

`MACRO name`   runs the named macro (see page 20) when PMGlobe is started. Enclose the name in single or double quotes if it has embedded blanks. This option overrides any startup macro set from the Options menu.

For example:

```
start pmglobe fullscreen macro profile
```

or

```
start pmglobe fullscreen macro "C:\program files\pmglobe\sample"
```

Using PMGlobe

Starting to use PMGlobe

When you first start PMGlobe, you will be shown a view of the globe which will normally include your current time zone. Depending on the time of day, you should see a daylight image of the globe (on the side facing the sun), a night-time image ("city lights", on the dark side of the globe), or both.

As with most Windows applications, the primary means of controlling the PMGlobe program is by using the mouse pointer to select menu items, manipulate the globe image, and so on.

PMGlobe also has a command interface which allows it to be controlled by typing in text commands (which can also be invoked from programs). This command interface is described in a later section.

Using the mouse with PMGlobe

Use the mouse with PMGlobe to select menu items and so on, just as with other Windows applications.

When PMGlobe is visible and the mouse pointer is over the image of the globe a hover window showing the longitude and latitude of the pointer is shown (you can turn this off from the Options menu (see page 11)). At this point, the left mouse button can be used to select a geographical location on the globe, and the right mouse button can be used to pop up a menu of choices, one of which lets you set the centre point (focus) of the view to the position indicated by the pointer. In more detail:

Right mouse button: setting new viewpoint

To change the view of the globe, move the mouse pointer over a point on the globe (so that a cross-hair cursor appears) and click the right mouse button. The top item of the pop-up menu will be "Focus"; left-click on this and the globe will then be redrawn with the selected point at the centre of the view.

Unless using the circular view of the globe (no fram or background), you can optionally set the right mouse button from the Views menu (see page 12) so that it will re-centre (focus) the globe without using the pop-up menu.

Right mouse button: off-globe pop-up menu

If the mouse pointer is over the window background (off the globe), it will be shown as a standard arrow pointer instead of as a cross-hair cursor. In this case, clicking the right mouse button will show a pop-up menu of options in the usual manner. This pop-up menu exactly duplicates the menu bar choices; you can remove (or restore) the menu bar using the Options menu (see page 11).

Left mouse button: the position/distance calculator

Move the mouse pointer to any visible point on the globe, so that a cross-hair cursor appears, and click the left mouse button. This will cause the *PMGlobe Position/Distance Calculator* window to appear (if not already visible). You can move the calculator anywhere on the screen, just like any other window. Then:

1. The current position (Latitude and Longitude) of the mouse is displayed if the mouse is over the

globe.

2. A single click of the left mouse button records the current point on the distance calculator. Up to two points can be recorded: if two are shown then the distance between them is also displayed, in kilometres and miles. (The distance shown is the "Great Circle Distance", that is, the shortest distance between the points when moving over the surface of the globe.)

3. Once a point has been selected, it can be fixed (made into a *base* point) by checking the box marked "Fix" next to the point. This keeps that point visible on the calculator while you select a number of other points to measure a series of distances. Uncheck the box to reurn to normal operation.

4. If there is no fixed point, you can check the Track box. This clears any current points and starts tracking new ones: after the first new point the path (Great Circle route) to each new selection is shown on the globe, and the total length of the track is accumulated and displayed. Uncheck the box to return to normal operation.

You can clear all selected points, including any fixed point, by pressing the **Reset** button on the calculator. This also resets the total track distance to zero, erases any tracks displayed on the globe, and turns off tracking.

Clicking the **Cancel** button or pressing the Esc (Escape) key hides the calculator.

Menu bar choices

The PMGlobe menu choices can be selected from the menu bar (or the pop-up menu) in the usual way. They fall into four groups:

Options lets you change the window shape and appearance, run macros and commands, and select other options

Views is used to select a fixed viewpoint from which the globe is seen, change movement settings, or choose the latitude and longitude grid shown on the globe

Imagery is used to choose the image used for the daylight or night side of the globe, select sunlight or flat lighting and 3-D shading, alter the twilight setting, and select the background colour.

Help provides an "About PMGlobe" choice, and also brief summaries of the other menu selections.

Each of the first three groups (and each submenu in each group) has a summary *Help* panel as its first selection. The other selections are described in more detail in the following sections.

PMGlobe menus

The Options menu

The *Options* menu lets you change the main PMGlobe window shape, size, and appearance, run macros and commands, and select other options It lists the following choices:

Run macro...   displays a file dialog to let you select a macro that is to be run. (Macros are lists of commands, or programs written in Rexx. They have a file extension of `.pmg`, and let you do more complicated things than are possible using just menu selections – see below for more details.)

For example, if you installed all the files that came with PMGlobe, clicking on the file `sample.pmg` would run that macro and show various cities and clocks on the globe. You might like to use the Notepad editor to look at the macros supplied, to see how they work.

Halt macro   is enabled when a macro is running. If selected, any macro that is running is halted.

Set startup macro...   displays a file dialog to let you select a macro that is to be run when PMGlobe starts up (for example, `sample.pmg`). If no selection is made in the file dialog, no macro is run automatically at startup.

Command...   displays the Command dialog (see page 19), which may be used to enter PMGlobe commands directly. Pressing the Esc (Escape) key also brings up the Command dialog.

Use console   when checked, a Windows console is opened for displaying any output from commands or macros. This is not normally needed except when debugging or developing macros. Note that closing the console by using its close button will also close the PMGlobe main window; if you do not wish this, uncheck the menu item to remove the console.

Make window square   makes the window fit the globe on all edges, if possible (it may not be possible on some narrow or low windows).

Make full screen   removes the title and menu bars and maximizes the window to fill the screen entirely. You can still use Windows key combinations to move the window, *etc.* (for example: Alt-F4 will close PMGlobe). Right-click off the globe to pop-up the menus.

Use Restore from this menu (or Alt-Space, R) to return the window to its previous size and position.

Restore   restores the window (from full screen or Maximize), as from the System (Window) menu or by using Alt-Space, R. The title and menu bars are always displayed after a Restore.

Maximize   maximizes the window to fill the screen, as from the System (Window) menu or by using Alt-Space, X. The title and menu bars are always displayed after a Maximize. Use "Make full screen" for an image which fills the screen without title bar or menu bar. Use Restore from this menu or the System menu (or Alt-Space, R) to return the window to its previous size and position after a Maximize.

Minimize   mimimizes the window, as from the System (Window) menu or by using Alt-Space, N. Automatic refresh of the image is suspended while PMGlobe is minimized. This

option may be useful if you have elected not to use a title bar.

Circular window	when selected, the globe is shown as a circular window. This has no title bar, menu bar, or background. When the globe is shown as a circular window, the right mouse button will always display a pop-up menu when clicked over the globe so you have access to the options. F6 can also be used to switch PMGlobe between a rectangular and circular window.
Show position and distance calculator	when selected, this makes the position and distance calculator appear (it will also appear automatically if you click on the window with the left mouse button). See above for information on how to use the calculator.
Show hover window	when selected, PMGlobe displays a hover window showing the longitude and latitude of the pointer (if the pointer is over the image of the globe). Uncheck this option to hide the hover window.
Large cross-hair cursor	when selected, this requests that a larger-than-usual coloured cross-hair cursor be used when the mouse pointer is over the globe itself. If not selected, the standard cross-hair cursor is used.
Use title bar	requests that the PMGlobe title bar (with the system menu icon and other buttons) be shown. This is the default. The options menu, including Exit, Maximize, and Minimize options, is always available by clicking the left mouse button on the window background (off the globe), even if the menu bar and title bar are not shown.
Use menu bar	requests that the menu bar be shown below the PMGlobe title bar. This is the default. The options menu, including Exit and Minimize options, is always available by clicking the left mouse button on the window background (off the globe), even if the menu bar and title bar are not shown.
Set refresh time	this lets you choose how long PMGlobe will wait after completing a view of the globe before it redraws it. This takes effect whenever marks with clocks are defined or sunlighting is in effect (sunlighting is the default, and needs regular updating to give a correct picture). The refresh takes place immediately after the wall-clock time that is a multiple of the selected refresh interval (for example, if "One Hour" is selected, the refresh should take place on the hour). The default refresh time is one minute.
Save settings	this saves the settings you have selected; they will then be used automatically when PMGlobe is next started. The settings are also saved automatically when Windows is shut down or PMGlobe is closed.
Reset settings to defaults	resets all saved settings, except the position of windows and the names of image files, to the defaults used when PMGlobe was first run.
Exit	leaves PMGlobe. The settings, window positions, *etc.*, are saved automatically.

The Views menu

The *Views* menu lets you change the point from which the globe is viewed, by tilting or rotating the globe, selecting a standard viewpoint, or choosing a fixed latitude or longitude. You can also change the grid line settings, and control whether the view can be changed by a mouse click.

Tilt/rotate	displays a sub-menu with the following choices:
	Tilt view to tilts the globe by 15º towards the North (so that the North pole is

North	closer to the viewpoint)
Tilt view to South	tilts the globe by 15º towards the South
Rotate view to West	rotates the globe by 30º towards the West (so more Westerly longitudes are seen)
Rotate view to East	rotates the globe by 30º towards the East.
Standard views	displays a sub-menu with a choice of standard views:

Europe & Africa (0º)	Places the Intersection of the Equator and the Greenwich Meridian (0ºN, 0ºE) at the centre of view.
Americas (90ºW)	Places 0ºN, 90ºW at the centre of view.
India & Asia (90ºE)	Places 0ºN, 90ºE at the centre of view.
Pacific (180º)	Places the Pacific ocean (0ºN, 180ºE) at the centre of view.
North Pole	Places 90ºN, 0ºE at the centre of view.
South Pole	Places 90ºS, 0ºE at the centre of view.

Snap to equator	Centres the view at latitude 0ºN and leaves the longitude at the centre of view unchanged.
Snap to Greenwich	Centres the view at longitude 0ºE and leaves the latitude at the centre of view unchanged.
Grid line choices	displays a sub-menu which lets you choose which grid lines (lines of latitude or longitude) are superimposed on the globe, and what colour should be used to display them.
Spin with sun	if checked, this choice synchronizes the view with the sun. That is, the globe will rotate as time passes, keeping the apparent position of the sun (and hence the boundary between day and night) fixed.
Focus on right mouse button	if checked, this choice lets set the focus (centre point) of the globe view directly by clicking the right mouse button while the pointer is over the globe image (see above). If not checked (or if the globe is shown as a circular window) clicking the right mouse button on the globe will bring up the pop-up menu.

The Imagery menu

The *Imagery* menu lets you the choose the images used for daylight and night sides of the globe. These can be the "Classic" PMGlobe land and sea views, built-in full-colour images, or images loaded from files (or any mixture of these).

The menu also lets you control whether sunlighting is calculated and shown, and whether full 3-dimensional (3-D) shading is to be used. You can also change the twilight setting and the background colour.

Daylight image displays a sub-menu with the following options for controlling the image seen on the daylight side of the globe (or for the whole globe if sunlighting is switched off):

    Classic uses the "Classic" PMGlobe land and sea image (a solid colour for each)

    Default (full colour) uses the built-in full-colour NASA *Visible Earth*[1] daylight image

    Image from file uses an image from a selected file for the daylight side of the globe (see the next menu choice for details); this option is only available after a file has been selected

    Set daylight image file... chooses (using the Windows file selection dialog) an image which is then automatically selected for display instead of the Classic or Default images.

        The image selected should normally be a cylindrical projection of the Earth, twice as wide as high, with the intersection of the Greenwich Meridian (0º longitude) and the Equator (0º latitude) in the centre. It must have a file extension (type) of `.jpg`, `.gif`, or `.bmp`. For best results it should be at least 900 pixels high.

        If any other image or projection is used, it will be projected onto the surface of the globe as though it were a cylindrical projection.

        Whenever the image is used to refresh the globe, it will be reloaded if its timestamp has changed since the last use – any update to the image file will therefore, in due course, appear on the globe.

    Classic land colour displays a sub-menu which lets you select the colour of the land shown when using the Classic daylight image

    Classic water (lake and sea) colour displays a sub-menu which lets you select the colour of water features shown when using the Classic daylight image.

Night image displays a sub-menu with the following options for controlling the image seen on the night side of the globe (when sunlighting is selected):

    Classic (starlight) uses the "Classic" PMGlobe land and sea image to create a "starlight" effect (black sea, faint grey land)

    Default (city uses the built-in NASA *Visible Earth* night-time image

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1   The NASA Visible Earth image was compiled from images captured by the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument on the Terra satellite. Lights on the night side were imaged from Defense Meteorological Satellite Program spacecraft. For details, see:
http://earthobservatory.nasa.gov/Newsroom/BlueMarble/

lights)

Image from file	uses an image from a selected file (see below) for the night side of the globe; this option is only available after a file has been selected
Reduced daylight	the currently selected daylight image is used, somewhat darkened, for the night side of the globe
Dark daylight	the currently selected daylight image is used, much darkened, for the night side of the globe
None (pitch black)	no image is shown for the night side of the globe
Set night image file...	chooses (using the Windows file selection dialog) an image which is then automatically selected for night-time display instead of the Classic or Default images. The night-time image is selected and used in the same way as the daylight image from file (see above).

Sunlight   When checked, the globe is displayed as though lit by sunlight at the current time of day, with the daylight image being used for the side of the globe facing the sun and the night-time image for the obverse. The images are mixed in the twilight zone (see page 15).

This lets you see at a glance which parts of the world are in daylight, and which are in the dark. This lighting is (of course) time dependent, so your PC must have the correct time of day and time zone set in order to show the sunlight correctly (right-click on the clock on the Windows task bar to adjust these, or use the Date and Time option in the Control Panel).

If sunlight is not selected, the daylight image will be used for the whole globe.

When sunlight is being shown, the globe will normally be re-drawn (refreshed) at regular intervals, as selected from the *Refresh* option in the *Options* menu (see page 11). This shows how the sunlight moves across the earth. The section on accuracy (see page 17) gives more details.

3-D   This choice adds shading, to give the globe a "three-dimensional" (3-D) appearance. When using sunlight, the shading used indicates the lighting effect of the sun on the earth (and hence is brightest where the sun is overhead, and somewhat darker near the terminator).

If 3-D is selected without selecting sunlight, artificial lighting from the front and top left of the globe is supplied, as though the globe were being lit by overhead room lighting.

Twilight setting displays a sub-menu which lets you choose how the twilight band is shown on the globe, when sunlight is in effect.

The sun is not a point source of light, and the atmosphere scatters its light, too. Therefore, sunlight is seen on the dark side of the earth for some time before the sun rises and for some time after it sets. You can select to see all, part, or none of this twilight band on the globe.

The twilight band, when shown, is displayed as a graded mix of the daylight and night-time images. Beyond the selected band, the night-time image is used.

You may choose any one of the twilight settings:

Theoretical sunrise/set (0º) This setting lights the earth as though by a point source at the centre of the sun; the sunrise/set line is shown as though sunlight ceased when the centre of the sun crossed the horizon, and so no twilight can be seen; exactly half the globe is lit. The line between the dark and light sides of the globe is the terminator.

Ideal sunrise/set (0º50') This is a practical and generally accepted definition of sunrise and sunset (fifty minutes of angle after the theoretical sunrise/set) which allows for the diameter of the sun and common atmospheric effects. The line seen on the globe joins the points at which the disc of the sun will have just disappeared or be just about to appear, and encloses a very narrow band of twilight.

Civil twilight (6º) This setting marks the end of "civil twilight" – a convenient point used for legal purposes (for example, when it is too dark to carry out certain tasks). _Please note that PMGlobe's rendering of this line must not be used for any critical or legal decisions; errors and bugs are always possible, and the definition used by PMGlobe (six degrees after the theoretical sunrise/set) may not match the legal definition used in your country._

Naval twilight (12º) This setting indicates the points where it is dark for all practical purposes: the centre of the sun is twelve degrees below the horizon.

Astronomical twilight (18º) At this distance from the terminator no effects from sunlight can be detected, and the centre of the sun is eighteen degrees below the horizon.

Background colour displays a sub-menu which lets you select the colour of the background used for the globe (the area of the PMGlobe window outside the circle of the globe image).

Date and time limits and accuracy

The data used for presenting the globe are loaded in compressed form (from about 22kB for the Classic map, and 300kB total for the default images). The coastline and lake data for the Classic map were compiled from several different sources, with some manual editing to improve the representation in critical areas such as narrow straits and isthmuses. The accuracy of the coastline and other data is not guaranteed in any way, but is believed to be within 11km (7 miles) in the worst case (near the equator) and significantly better in the East-West direction in Northern and Southern latitudes.

When distance calculations are carried out, a mouse selection can only be determined to the nearest pixel (picture element) on the screen. The longitude and latitude are then reported as at the centre of that pixel. Distances are then calculated between the two coordinates selected and should be accurate to the nearest unit (km or mile), or 0.2%, whichever is greater. The 0.2% limit is a consequence of the assumption used in the calculation that the earth is spherical (which it is not).

Time and sun position calculations are only important when the sunlight option is selected. In this case, PMGlobe needs to know the current date and time-of-day (taken from your computer's clock and time zone settings – make sure these are set correctly). PMGlobe uses Windows' time zone mechanism to allow for daylight savings time changes and so on; these are normally automatic.

From the current time and time zone information, PMGlobe can determine the apparent solar time (which is as much as 16 minutes different from the Civil time used for clocks) and hence the sun's position. This is then used to display the globe as though lit by the sun: the light/dark dividing line thus shows where the sun is rising or setting.

The various calculations done should give an accuracy of sun position that leads to a sunset or sunrise indication that is correct to within twenty seconds of time. Actual sunset or sunrise times will be a little different because of atmospheric effects, which vary with the time of year, the weather, and latitude (in very Northern or Southern latitudes, especially, scattering effects can greatly prolong daylight in summertime). However, PMGlobe does give a useful indication of sunrise and sunset, and of course lets you see at a glance which parts of the globe are in night or daylight.

Celestial events such as equinoxes, and solstices especially, are very dependent on the earth's movements; equinoxes should be correct within some tens of minutes, solstices should be correct within about ten hours.

Please note that results will be incorrect if you set your computer's date to be earlier than 1 January 1990. Also, the formulae used to calculate the sun's position may prove to be inaccurate at some distant time in the future, because the earth's movement is not entirely predictable.

Performance considerations

PMGlobe is designed as a "32-bit" application, with all calculations being carried out using 32-bit integers (floating-point arithmetic is not used).

On slower processors, there may be a noticeable delay when the globe is drawn, especially if the window is large or fullscreen. The relatively long draw times are due to the number of calculations needed; for each pixel that is part of the globe, the program must determine the corresponding latitude and longitude, whether that point is land or water or is in daylight, twilight, or night, and how brightly it is lit (which depends on the angle of the surface of the globe at that point, relative to the sun's current position).

In general, therefore, the simpler the image presented the faster it is drawn. Selecting *Sunlight* or *3-D* both slow down the drawing. Similarly, non-equatorial (tilted) views take significantly longer to draw than equatorial views (hence the *Snap to equator* view option).

As a rough guide, the simplest (flat lighting, equatorial view, no sunlight) image with a diameter of 400 pixels would take about 4–6 seconds to draw on a 25MHz 386 PC or PS/2. On a modern 2GHz Pentium-based PC, this should reduce to about 60ms. The most complicated drawing (3-D shading, non-equatorial view, sunlight) might take about four times longer.

The time taken is inversely proportional to the speed of the processor and proportional to the square of the image diameter.

Image load time

If the default or external images are used to create the globe picture, there may be a noticeable pause before the globe is first seen while the images are first loaded and decompressed. For a faster initial display, set both daylight and night images to use the "Classic" imagery, which has a negligible load time.

Command and Macro Reference

Using commands and macros

PMGlobe can be controlled or programmed by means of *commands*, which are text strings typed in by hand or generated by programs. For example, the command:

```
set sunlight on
```

causes the globe image to be drawn with sunlighting (just as though "sunlight" had been selected from the Imagery menu). For every command, the first word is the command *verb* (set, in this case) and the following words are arguments to the command. Similarly,

```
set sunlight off
```

turns sunlighting off.

Using the Command dialog

To enter a command by hand, press the Esc (Escape) key when PMGlobe has the focus, or select "Command..." from the Options menu. This will display the PMGlobe Command dialog. The command dialog allows editing of the command in the usual way, using Insert, Delete, Backspace, Cursor Left/Right, Cut, Paste, and so on. It also has a simple "retrieve" (history) facility, controlled by the Cursor Up/Down keys.[2] To enter (execute) the command, press the Enter key, or click the OK button.

The command dialog can be hidden (closed) by clicking on the close box or the Cancel button, or by pressing the Esc (Escape) key.

There are two check boxes in the dialog:

Macros   This indicates whether a search for macros (see below) is carried out before treating the entered string as a command. When checked, macros with the same name as the command verb will be searched for and (if found) that macro will be called, even if there is a command with the same name. Unchecking the box disables the macro search.

Console   This check box indicates whether a Windows console is active for PMGlobe, and has the same effect as the Use console (see page 11) option in the Options menu. Changing the state of the check box will remove or start the console, as appropriate.

Note that closing the console using its titlebar options will also exit PMGlobe.

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2   For some reason, Windows generates a tone when these are used, but they should function correctly.

Using macros

A PMGlobe *macro* is a text file which contains either a simple list of commands (a *command-list macro*) or a program written in the Rexx[3] programming language (a *Rexx macro*) which can give more control over the creation and issuing of PMGlobe commands. In either case, the macro is a simple text file with a file extension of .pmg.

A macro is invoked either from the command dialog (by typing the name of the macro) or by using the "Run Macro..." selection in the Options menu. This latter selection will bring up a normal Windows file dialog which will let you choose the macro to run.

You can also have a macro run automatically when PMGlobe is started by specifying "macro filename" as a parameter to the PMGlobe call, for example:

```
start pmglobe macro triangle
```

Using command-list macros

A command-list macro is a text file (which you can edit with Notepad or any other plain text editor) which must have a file extension of .pmg. Each line of the file is either:

- a comment (its first non-blank character is "**;**")

- a blank (empty) line

- a command (just as could be entered from the command dialog).

The first line in a command-list macro *must* be a comment; this is used to distinguish command-list macros from Rexx macros.

Here is a simple command-list macro, called triangle.pmg (the numbers on the left identify the lines of the macro and do not appear in the macro file):

```
1.  ; triangle.pmg: draw a triangle on the Globe
2.
3.  set drawcolour red
4.  gmove  0  0
5.  gline  0 90
6.  gline 90  0
7.  gline  0  0
```

Line 1 is a comment which describes the macro. It, and the blank line 2, have no effect on PMGlobe.

Line 3 sets the colour for drawing on the globe to Red.

Line 4 (the graphics move command, gmove) moves the *current point* for graphics to latitude 0, longitude 0 (the coordinate system origin, a point off the coast of Africa).

Lines 5 through 7 are three graphics line commands (gline). Each of these draws a line, using the current drawing colour, from the current point to the point specified on the gline command, and then sets the current point to be the end of the new line.

Any of the commands described below, except *extract*, can be used in command-list macros.

---

3 See: http://en.wikipedia.org/wiki/REXX

Using Rexx macros

To use a Rexx macro, you must have a Rexx interpreter installed. PMGlobe has only been tested with IBM Object Rexx and Open Object Rexx – which is now available from `http://www.oorexx.org/` – but other Rexx implementations which use the standard Rexx interface should also work.

In addition to issuing commands, macros using the Rexx language can use the full power of the Rexx language to program PMGlobe. A description of the language is outside the scope of this document, but here is a simple example:

```
1. /* myzone.pmg - display timezone in the titlebar */
2.
3. -- get PMGlobe version and timezone name
4. 'extract version zonename'
5.
6. if zonename='???'
7.    then 'message Time zone is unknown'
8.    else 'set title PMGlobe' version', in' zonename
```

Here, lines 1 through 3 are commentary. Line 4 then uses the `extract` command to get the current values of the PMGlobe version number and time zone name. As long as this is valid, the text of the PMGlobe window's title bar is then set, perhaps to: **PMGlobe 3.10, in GMT Daylight Time**.

Rexx macros are run in the same way as command-list macros, but may have argument words passed to them from the rest of the command (these can be retrieved using `parse arg` or the `arg()` function in Rexx).

Command Reference

General rules

The following general rules apply to the semantics and syntax of the commands listed in the alphabetical list (see page 24).

1. Keywords in commands are shown in uppercase to indicate their constant nature; they may be entered in any (or mixed) case.

2. Square brackets indicate optional keywords or values; a vertical "or bar" ("|") indicates that a choice of one or more keywords should be made.

3. A value following a keyword (such as the file name on the MACRO command, *etc.*) may be specified as a *quoted token*, which allows it to contain embedded blanks.

   A quoted token is one which begins with a delimiter which is a single or double quote character. Such a token is then only ended by a matching quote or by the end of the command. A quote which matches the starting quote may be included inside a quoted operand by doubling up the quote; in this case it does not end the token.

   The content of the quoted token (after the delimiters have been removed and any doubled delimiter quotes have been reduced to a single instance) forms the value of the token which is then used as if it were a single word.

   For example: `macro "c:\program files\pmglobe\sample"`

4. Angles may be specified in degrees in decimal form, such as `-30` or `+45.5`, where for latitude and longitude negative implies south of the equator or west of Greenwich respectively. The more usual format is also allowed (for example: `52°30'10E`) – details are given below.

   In this document, the character "°" is the degree character, encoded in Windows as 176 (decimal) or `'B0'x` (hexadecimal). This character can usually be entered by holding down the Alt key while typing 176 on the numeric keypad.

   Angles returned by QUERY or EXTRACT will always be in decimal form.

5. Times are specified and returned in seconds (with an optional sign for relative times).

6. Colours may be entered in any case, and (with valid alternative spellings in parentheses) must be one of: White, Gray (Grey), Black, Red, Green, Blue, Pink (Magenta), Cyan (Turquoise), Yellow, DarkRed, DarkGreen, DarkBlue, Purple (DarkPink, DarkMagenta), DarkCyan (DarkTurquoise), or Brown. PaleGray (PaleGrey) is also allowed, for the globe background colour only.

   A QUERY or EXTRACT will return the first shown name for each colour, in uppercase.

7. The keyword CENTRE may also be spelled as CENTER, and COLOUR as (or within) a keyword may be spelled COLOR.

8. It is recommended that long-running macros (especially those that use the WAIT command) use the SET TITLE command to change the window title to indicate that the macro is running. The title should be restored to its previous value if halted. Good macros will also allow for asynchronous alteration of viewpoint, *etc.*, should the user interact with PMGlobe while the macro is running.

9. Graphics (drawn with the GLINE command) are shown above any grid lines, and underneath any markers, clocks, and marks. Any tracks (drawn using the Distance Calculator, or using the TRACK option on graphics commands) are drawn immediately above any graphics.

10. The return code from a command (accessible using the variable `rc` in a Rexx macro) is 0 for a successful completion, positive if some error in the command was found, or negative if the command failed (*e.g.*, insufficient memory).

Formats allowed for specifying degrees

A degree value may be specified in *degree-minutes-seconds* format, or in *degree.decimal* format.

If the degree value is specifying a latitude or longitude, then it may be followed by one of the characters N, S, E, W (in either case), as appropriate. The default is N (North) for latitude and E (East) for longitude. A leading minus sign is allowed in either format, and negates the direction implied by any N, E, S, or W. A leading plus sign is also allowed; it has no effect.

No blanks are allowed. The seconds, or seconds and minutes, may be omitted, as may insignificant leading zeros. The syntax is therefore one of:

```
[+|-][d]d[o[m]m['[s]s["]]][x]
[+|-][d]d[.[[d]d]d][x]
```

where the degree indicator in the first format may be either the letter O (either case) or the true degree character (º, ASCII 176 in Windows).

Examples (all specifying a negative angle of 12 degrees 30 minutes):

```
12º30'S        -12º30           12º30W          -12.5
12º30'0"S      -12º30'00N      -12.500E          12o30s
```

Alphabetic list of commands

The following PMGlobe commands are available in PMGlobe 3.

EXIT

End PMGlobe (as though Exit had been selected from the Options menu, or Close were selected in the system menu).

EXTRACT items

Used for obtaining the values of various PMGlobe settings for use with a Rexx macro.

items is a list of one or more keywords, as given in the QUERY and SET commands below. The values of the specified items are placed into Rexx variables of the same name. (See above for a simple example.)

FONT name [SIZE height] [COLOUR colour] [FACE facename]

Defines a font, with nickname *name* (up to 15 characters). SIZE sets the font size (total height in points), and FACE specifies the name of a font (*e.g.*, `Helvetica`, `Courier`, *etc.*). FACE, if used, must be the last keyword in the command, and the remainder of the command forms the face name.

Windows will choose a font as close as possible to the requested font. If no FACE is specified then a default system proportional font is used. The default size for fonts is 12 points.

The colour for a font is specified using the COLOUR keyword and one of the colours listed above. The default colour is Yellow.

Fonts may not be redefined. The default system proportional font is predefined with the nickname `default`.

GERASE [DRAW|TRACK]

Erases either all DRAW graphics or all TRACK graphics. DRAW is the default; TRACK is normally only used by PMGlobe, for drawing tracks.

GLINE lat lon [DRAW|TRACK]

Draws either a DRAW or a TRACK line from the current point to the point specified, and then makes the specified point the current point. DRAW is the default, and draws the line in the colour set by DRAWCOLOUR. TRACK is normally only used by PMGlobe, for drawing tracks, and draws the line in the colour set by TRACKCOLOUR.

If no current point has been set (by GMOVE) before this command is used, latitude 0 and longitude 0 are used.

GMOVE lat lon [DRAW|TRACK]

Sets the current point for either DRAW or TRACK graphics. DRAW is the default, and sets the current point for DRAW graphics. TRACK is normally only used by PMGlobe, and sets the current point for TRACK graphics.

MACRO file [argumentstring]

Invoke the specified command-list or Rexx macro. The macro should be in the working directory for the application, or have its path specified.

If the name or path contains blanks the *file* value must be a quoted token. For example: `macro "c:\program files\pmglobe\sample"`

If no filename extension is given, one of `.pmg` is added. The remainder of the command is passed as the argument to the macro (accessible in Rexx by the PARSE ARG instruction or ARG(1) built-in function).

Note that at the highest level, macros run as a single separate thread. Macros may invoke each other, using the MACRO command, up to a depth of ten (other than this, only one macro can be running at a time). All macros that are running will be halted by selecting Halt macro from the Options menu or the command dialog.

MARK lat lon [MARKER m] [X position] [Y position] [RIGHT] [CLOCK zone] [LABEL text]

Adds a mark to the displayed globe. Latitude and longitude (lat and lon) set the position of the mark and are always required.

The mark will be indicated according to the setting of of `SET MARKER` (default "+") at the time of the MARK command, unless overridden by the option MARKER. The value, m, of the marker can be any of ".", "+", "x", or "X" for various shapes of marker. "!" may be used for a tiny (single-pixel) marker. m can be OFF if no mark is to be shown.

The colour used for a mark is the current drawing colour, as set by `SET DRAWCOLOUR colour`, at the time of the MARK command. If none was set then `White` is used.

A mark may have some text associated with it, described by the CLOCK and LABEL options. This text is displayed with the start of the baseline at an offset from the mark as determined by the X and Y options; the offsets are given in pixels, up to 1000, and may be positive or negative, or CENTRE. The default X and Y offsets (X position and Y position) are +3. If the text would extend beyond the bounds of the square enclosing the globe, then its position is adjusted in order to stay within bounds (if possible). The RIGHT option may be specified to use the right-hand end of the baseline to position the text (and in this case the default X position is –3).

If CLOCK is specified, the text begins with a time-of-day clock. The *zone* may either be defined as an offset from GMT, in seconds, or it may be the name of a time zone. This time zone name may either be one of the default time zones (see page 30) or it may be one specified by a previous ZONE command. The time-of-day clock is shown in 24-hour or civil format, depending on the setting of CLOCKCIVIL, and is refreshed according to the REFRESH setting. Use the CLOCKDAY setting for an additional tomorrow/yesterday indication (+/–), which immediately follows the time-of-day clock.

If LABEL is specified, it must be the last option on the command: the remainder of the command, after the keyword LABEL and one blank, forms the label part of the text, which follows any clock and may be up to 100 characters.

For example:

```
  mark  37o45  -122o27  clock PST label San Francisco
```

The font used for the text is the current font, as set by `SET FONT nickname`, at the time of the MARK command. If none is set then the default system font is used.

Markers, clocks, and labels can be included or excluded as a group by using the MARKERS, CLOCKS, and LABELS settings respectively. No markers, clocks, or labels are shown if the window size is less than or equal to 64 pixels in either dimension.

MARKDELETE lat|ALL lon|ALL

Deletes one or more marks from the globe. Latitude and longitude (lat and lon) are always required but either or both may be specified as ALL. Any mark that matches the specified lat and lon is deleted (where ALL matches any latitude or longitude, as appropriate). If neither lat nor lon is ALL then at least one mark should exist with the given coordinates.

MESSAGE text

Display text in a message box. The message box can be moved, and does not inhibit interaction with the globe or distance calculator. The MESSAGE command waits until the OK pushbutton on the message box is selected or the message box is closed. Commands are currently limited to 200 characters, so the longest message possible is 192 characters.

REDRAW [ALL]

Initiates a redrawing of the Globe. Normally a REDRAW is automatic at the end of a macro or after a command is entered from the command dialog. The REDRAW command is provided for long-running macros. The command does not wait until redrawing is complete.

The ALL option requests that all features of the globe are redrawn, including any grid lines and marks (normally only those features that have changed since the last draw are drawn).

QUERY items

Queries the state of various PMGlobe settings. *items* is a list of one or more keywords. The result of the QUERY command is displayed on the PMGlobe console (which must be active before the command is executed); each item's name and value are shown, each starting on a new line.

Any item that can be set by the SET command (see below) may also be queried. The value of any item that may be set or queried may also be obtained by a Rexx macro, using the EXTRACT command.

Valid items are:

ACTIVE	ON if the globe window is the active window, else OFF
CLOCKMARKS	number of clocks set using the MARK command
DAYOFFSET	time offset due to daylight savings (ON, OFF, or UNKNOWN)
DAYSAVINGS	the daylight savings offset in effect (in seconds), if any, or UNKNOWN
DIAMETER	globe diameter in pixels (0 if unknown)
FONTS	number of fonts defined using the FONT command
GMTOFFSET	base time offset from GMT (in seconds), or UNKNOWN
ININAME	full path and file name of the .INI file used to save PMGlobe settings
MARKS	number of marks set using the MARK command

SUNLAT	latitude at which the sun is overhead (x.xxx), or UNKNOWN
SUNLON	longitude at which the sun is overhead (x.xxx), or UNKNOWN (multiply by -4 to get the time in minutes from solar noon)
VERSION	PMGlobe version number
VERSIONB	Version extended information
ZONENAME	current time zone full name, as supplied by Windows ("???" if unknown)

SET item newvalue

Changes the state of various PMGlobe settings to *newvalue*, which is the remainder of the command following the item name and one blank. *item* is one of the following names. The value of any item that can be SET can also be queried using the QUERY command, or obtained by a Rexx macro using the EXTRACT command (see above).

Flags (items that are either ON or OFF) can also be set to INVERT, which changes the state of the flag from ON to OFF or vice versa.

Valid items are:

BACKCOLOUR	set the colour of the background (names as given in the general rules above)
CIRCULAR	display the globe as a circular window (ON or OFF)
CLOCKCIVIL	use 12-hour clock format for any clocks (ON or OFF)
CLOCKDAY	add flag (+ for tomorrow, - for yesterday) to clocks (ON or OFF)
CLOCKS	display the clocks on marks (ON or OFF)
CONSOLE	display the windows console, to view Query output, Rexx tracing, *etc.* (ON or OFF)
CROSSHAIR	use the large cross-hair cursor when over globe (ON or OFF)
DAYIMAGE	set the image to be used for daylight or default view of the globe (CLASSIC, DEFAULT, or FILE)
DAYIMAGEFILE	set the file to be used when DAYIMAGE is set to FILE. The given file must be fully specified or be in the current directory, and it must have a file extension of `.jpg`, `.gif`, or `.bmp`. For best results the image should be at least 900 pixels high. Image files are reloaded when the globe image is refreshed if they are in use and their name or timestamp changes.
DRAWCOLOUR	set the colour for drawing markers and graphics (names as above)
ERRORBOX	display command errors in a message box (ON or OFF)
FONT	sets the current font, by nickname
GRIDCOLOUR	set the colour of grid lines (names as above)
GRIDLAT	set the grid latitude line frequency (0 for off, or one of 10, 15, 30, or 90)
GRIDLON	set the grid longitude line frequency (0 for off, or one of 10, 15, or 30)
GRIDPOLAR	show grid polar circles (ON or OFF)

GRIDTROPIC	show grid tropics of Cancer and Capricorn (ON or OFF)
HOVER	show the longitude and latitude of the pointer in a hover window (ON or OFF)
HOVERABOVE	show the hover window above the cursor (ON or OFF)
LABELS	display the labels on marks (ON or OFF)
LANDCOLOUR	set the colour used for land in the Classic daylight image (names as above)
MARGIN	percentage border to allow around globe (0 through 49.999)
MARKER	current default marker (".", "+", "x", "X", or OFF)
MARKERS	display the markers on marks (ON or OFF)
MENUBAR	display the menu bar above the globe (ON or OFF)
NIGHTIMAGE	set the image to be used for the night-time view of the globe (CLASSIC, DEFAULT, FILE, HALFDAY, DARKDAY, or BLACK)
NIGHTIMAGEFILE	set the file to be used when NIGHTIMAGE is set to FILE, following the same rules as for DAYIMAGEFILE, above.
REFRESH	set the refresh interval (in seconds, maximum 24 hours)
SHADING	set "3-D" shading (ON or OFF)
SHOWDRAW	show (update) picture of globe as it is calculated (ON or OFF)
SPIN	set "rotate with sun" (ON or OFF). If ON, the viewpoint changes with the time of day (the position of the sun is fixed, as set by SUNOFFSET).
STARTMACRO	set the macro file (with extension .pmg) which will be run when PMGlobe starts
SUNLIGHT	set "sun" lighting (ON or OFF)
SUNOFFSET	set the offset to be used for the sun, if SPIN is ON. This is a offset in seconds of up to +/– 12 hours, with the sun being overhead at offset 0 and to the right of the screen if offset +6 hours (+21600). SUNOFFSET is updated automatically when a fixed view position is set.
TITLE	set the window title (max 50 characters)
TITLEBAR	display the PMGlobe window title bar (ON or OFF)
TRACKCOLOUR	set the colour for drawing tracks (names as above)
TWILIGHT	set the degrees of twilight shown (0 through 18 degrees)
USEROFFSET	time to add to real time (seconds, maximum +/– one year)
VIEWLAT	latitude of centre of view (x.xxx)
VIEWLON	longitude of centre of view (x.xxx)
WATERCOLOUR	set the colour used for lakes and seas in the Classic daylight image (names as above)

The following settings are for development use only; the effect of each is not defined:

DIAG   display diagnostic messages on the console (ON or OFF)

DIAGMSG   display Windows client messages on the console (ON or OFF)

TEST   controls certain test functions (ON or OFF)

WAIT [REDRAW] [time] [+time]

Wait until a redraw is completed, or until a particular time-of-day, or for a certain length of time from now. Any times are given in hours, with optional minutes and seconds indicated by colons (for example, +0:20 would mean "wait for twenty minutes"). If a specific time of day is given and is earlier than the current time of day, then the next day is assumed. Multiple times (absolute, relative, or mixed) may be specified, and WAIT will return when the earliest is reached. The maximum wait time is 24 hours (+24).

If REDRAW is specified, then a REDRAW is started automatically, and WAIT will return when the redraw is complete or any time condition specified is met, whichever happens earlier.

Any WAIT called from a macro is also ended by selecting "Halt macro" from the Options menu or the command dialog.

ZONE name title

Defines a time zone, with nickname *name* (up to 15 characters and starting with an alphabetic character), which can then be used to define a clock in the MARK command (see page 25). The *title* must exactly match the full name of a Windows time zone as recorded in the Windows Registry.[4]

For example:

```
Zone PAC Pacific Standard Time
```

Note that PMGlobe sets up a number of default time zones (see page 30) so this command is only needed for new time zones.

---

4 In
  HKEY LOCAL MACHINE\Software\Microsoft\Windows NT\CurrentVersion\Time
  Zones

Default time zones

PMGlobe pre-defines names for a number of time zones which can be used to set clocks on the globe using the MARK command (see page).

These time zones are those included with Windows XP. Other (or later) Windows systems may have additional time zones, in which case you should use the ZONE command to define names for these if you need them. It is also possible that some of these timezones will be unavailable in some Windows systems.

Europe

Name	GMT Offset	Places and *Time zone title*
UK	+00:00	Cardiff, Dublin, Edinburgh, Lisbon, London, Warwick
		GMT Standard Time
WEST	+01:00	Amsterdam, Berlin, Bern, Oslo, Rome, Stockholm, Svalbard, Vienna
		W. Europe Standard Time
ROMAN	+01:00	Brussels, Copenhagen, Llanes, Madrid, Paris
		Romance Standard Time
CEST	+01:00	Belgrade, Bratislava, Budapest, Ljubljana, Prague
		Central Europe Standard Time
CEST2	+01:00	Sarajevo, Skopje, Warsaw, Zagreb
		Central European Standard Time
FLE	+02:00	Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius
		FLE Standard Time
GTB	+02:00	Athens, Istanbul, Minsk
		GTB Standard Time
EEST	+02:00	Bucharest
		E. Europe Standard Time
RUSS	+03:00	Moscow, St. Petersburg, Volgograd
		Russian Standard Time
CAUC	+04:00	Baku, Tbilisi, Yerevan
		Caucasus Standard Time

Africa

Name	GMT Offset	Places and *Time zone title*
GMT	+00:00	Casablanca, Monrovia, Tombouctou
		Greenwich Standard Time
WCA	+01:00	West Central Africa
		W. Central Africa Standard Time
SA	+02:00	Cape Town, Harare, Pretoria
		South Africa Standard Time
EGYPT	+02:00	Aswan, Cairo
		Egypt Standard Time
EAFR	+03:00	Nairobi
		E. Africa Standard Time

Middle East

Name	GMT Offset	Places and *Time zone title*
ISR	+02:00	Haifa, Jerusalem, Tel Aviv
		Israel Standard Time
IRAQ	+03:00	Baghdad, Basra
		Arabic Standard Time
ARAB	+03:00	Kuwait, Mecca, Riyadh
		Arab Standard Time
IRAN	+03:30	Tehran
		Iran Standard Time
ABUD	+04:00	Abu Dhabi, Muscat
		Arabian Standard Time

Central Asia

Name	GMT Offset	Places and *Time zone title*
AFGH	+04:30	Kabul, Kandahar
		Afghanistan Standard Time
EKAT	+05:00	Ekaterinburg (Sverdlovsk)
		Ekaterinburg Standard Time
WAST	+05:00	Islamabad, Karachi, Tashkent
		West Asia Standard Time
INDIA	+05:30	Chennai, Kolkata, Mumbai, New Delhi
		India Standard Time
NEPAL	+05:45	Kathmandu
		Nepal Standard Time
SRIL	+06:00	Sri Jayawardenepura
		Sri Lanka Standard Time
NCA	+06:00	Almaty, Novosibirsk
		N. Central Asia Standard Time
CASIA	+06:00	Astana, Dhaka
		Central Asia Standard Time
MYAN	+06:30	Rangoon
		Myanmar Standard Time
NAST	+07:00	Krasnoyarsk
		North Asia Standard Time

Atlantic

Name	GMT Offset	Places and *Time zone title*
MIDAT	-02:00	Mid-Atlantic
		Mid-Atlantic Standard Time
AZOR	-01:00	Azores, Ponta Delgada
		Azores Standard Time
CAPV	-01:00	Cape Verde Is., Praia
		Cape Verde Standard Time

East Asia

Name	GMT Offset	Places and *Time zone title*
SEAS	+07:00	Bangkok, Hanoi, Jakarta
		SE Asia Standard Time
NAEST	+08:00	Irkutsk, Ulaan Bataar
		North Asia East Standard Time
CHINA	+08:00	Beijing, Chongqing, Hong Kong, Urumqi
		China Standard Time
TAIP	+08:00	Taipei
		Taipei Standard Time
SING	+08:00	Kuala Lumpur, Singapore
		Singapore Standard Time
KOREA	+09:00	Seoul
		Korea Standard Time
JST	+09:00	Osaka, Sapporo, Tokyo
		Tokyo Standard Time
YAK	+09:00	Yakutsk
		Yakutsk Standard Time
VLAD	+10:00	Vladivostok
		Vladivostok Standard Time

Australasia

Name	GMT Offset	Places and *Time zone title*
AWST	+08:00	Kalgoorlie, Perth
		W. Australia Standard Time
ACST	+09:30	Darwin
		AUS Central Standard Time
ACT	+09:30	Adelaide, Alice Springs, Darwin
		Cen. Australia Standard Time
AEST	+10:00	Canberra, Melbourne, Sydney
		AUS Eastern Standard Time
EAST	+10:00	Brisbane
		E. Australia Standard Time
TASM	+10:00	Hobart
		Tasmania Standard Time
NZ	+12:00	Auckland, Christchurch, Wellington
		New Zealand Standard Time

Pacific

Name	GMT Offset	Places and *Time zone title*
WPST	+10:00	Guam, Port Moresby
		West Pacific Standard Time
CPAC	+11:00	Magadan, Solomon Is., New Caledonia
		Central Pacific Standard Time
FIJI	+12:00	Fiji, Kamchatka, Marshall Is.
		Fiji Standard Time
TONGA	+13:00	Nuku'alofa
		Tonga Standard Time
DATEL	-12:00	International Date Line West
		Dateline Standard Time
SAMOA	-11:00	Midway Island, Samoa
		Samoa Standard Time
HST	-10:00	Hawaii, Hilo, Honolulu
		Hawaiian Standard Time

North America (except USA)

Name	GMT Offset	Places and *Time zone title*
PST	-08:00	Tijuana, Vancouver
		Pacific Standard Time
MST	-07:00	Calgary, Edmonton
		Mountain Standard Time
CANC	-06:00	Saskatchewan, Winnipeg
		Canada Central Standard Time
EST	-05:00	Ottawa, Toronto
		Eastern Standard Time
AST	-04:00	Atlantic Time (Canada)
		Atlantic Standard Time
NEWF	-03:30	Newfoundland
		Newfoundland Standard Time
GREEN	-03:00	Greenland
		Greenland Standard Time

USA

Name	GMT Offset	Places and *Time zone title*
HST	-10:00	Hawaii, Hilo, Honolulu
		Hawaiian Standard Time
ALASK	-09:00	Anchorage, Fairbanks
		Alaskan Standard Time
PST	-08:00	Los Angeles, Portland, Sacramento, San Francisco, Seattle
		Pacific Standard Time
MST	-07:00	Denver, Salt Lake City
		Mountain Standard Time
MST-A	-07:00	Arizona
		US Mountain Standard Time
CST	-06:00	Chicago, Dallas, Omaha
		Central Standard Time
EST	-05:00	Boston, Miami, New York, Washington DC
		Eastern Standard Time
EST-I	-05:00	Indiana (East)
		US Eastern Standard Time

Central and South America

Name	GMT Offset	Places and *Time zone title*
MEX2	-07:00	Chihuahua, La Paz, Mazatlan
		Mexico Standard Time 2
MEX	-06:00	Guadalajara, Mexico City, Monterrey, Oaxaca
		Mexico Standard Time
CAM	-06:00	Central America
		Central America Standard Time
SAP	-05:00	Bogota, Lima, Quito
		SA Pacific Standard Time
PSA	-04:00	Santiago
		Pacific SA Standard Time
SAW	-04:00	Caracas, La Paz
		SA Western Standard Time
BRAS	-03:00	Brasilia
		E. South America Standard Time
SAE	-03:00	Buenos Aires, Georgetown
		SA Eastern Standard Time

Appendix A – Manual Installation

Installing the PMGlobe application

The easiest way to install PMGlobe is to use the Microsoft Installer (MSI) distribution described earlier (see page 7). However, you can also install it manually if you wish.

The manual installation PMGlobe package is distributed as a compressed `pmglobe3.zip` file which includes the software license (`license.txt`), the PMGlobe program (`pmglobe3.exe`), and its documentation (`pmglobe.pdf`). To install the program:

1. download the `pmglobe3.zip` file to your IBM PC-compatible computer

2. extract the files from the `pmglobe3.zip` file using a tool such as WinZip or UnZip

3. start (run) `pmglobe3.exe` by clicking on it in Windows Explorer or entering its name in a Command Prompt window, *etc.* If started from a command line or script, the same command line options can be used as when installed using the MSI distribution.

Installing PMGlobe as a Screen Saver

PMGlobe can be used as a screen saver as well as an application. To install it as a screen saver:

1. download the `pmglobe3.zip` file to your IBM PC-compatible computer

2. extract the files from the `pmglobe3.zip` file using a tool such as WinZip or UnZip

3. copy the `pmglobe3.exe` executable to your Windows system directory (usually `c:\windows\system32`)[5] and rename it to `pmglobe3.scr`. The extension must be `.scr` for Windows to recognize it as a screen saver.

4. right click on the desktop and choose Properties (or click on Display in the Control Panel). This will open the Display Properties dialog.

5. click on the Screen Saver tab.

6. you should now find PMGlobe in the Screen saver drop-down list. Selecting it should show a picture of the globe on the small screen image.

7. configure the startup settings for the screen saver by clicking the Settings button. This will start PMGlobe in interactive mode to let you change the settings you wish (viewpoint, background colour, imagery, twilight settings, startup macro, *etc.*). Close PMGlobe to save the screen saver settings and complete configuration.

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5   It may be called `c:\winnt\system32`. On Windows XP it can also be placed in the `c:\windows` directory.

8. set the other screen saver settings as required. Click on Preview to see the globe full-size.

Appendix B – Changes

This appendix lists changes since version 3.00 of this document.

Changes in Version 3.10 (4 September 2003)

- Values following keywords on commands may now be *quoted tokens*. This permits macro and other names to contain embedded blanks.

- Minor documentation corrections and clarifications have been made.

Changes in Version 3.21 (3 December 2003)

- PMGlobe may now be used both as a stand-alone application and also, independently, as a screen saver.

- The new "Set startup macro" option lets you select a macro which is to be run automatically when PMGlobe is started.

- The new "Spin with sun" view option requests that the viewpoint be changed over time to keep the apparent position of the sun fixed.

- The new SET command options (SPIN, STARTMACRO, and SUNOFFSET) allow control of the new settings from macros or the command dialog.

Changes in Version 3.24 (19 December 2003)

- PMGlobe can now be installed using the Microsoft Installer; this allows it to be uninstalled using "Add or Remove Programs". It also avoids duplicating the program for Screen Saver use.

- When a start macro is set the option is given to run it immediately.

- It is no longer an error to redefine a font, providing that its attributes do not change.

Changes in Version 3.25 (4 February 2004)

- Reflect the move to new website `http://www.cary.demon.co.uk/pmglobe/` in the Help, documentation, *etc*.

Changes in Version 3.30 (6 August 2004)

- A new hover window displays the pointer longitude and latitude. This may be switched on or off from the Options menu, or by using SET HOVER ON/OFF.

- The globe may now be shown as a circular window. The behaviour of MB2 has been altered to allow focus change using the pop-up menu (direct MB2 focus can still be selected from the Views menu for use when the globe is shown in a rectangular window). The circular window option may be switched on or off from the Options menu, or by using SET CIRCULAR ON/OFF.

- Screensaver window is now full-screen even if the Windows taskbar is not set for auto-hide.

- The distance calculator window may now be closed by pressing the Esc (Escape) key.

- Minor editoral changes have been made.

Changes in Version 3.31 (31 May 2005)

- A new set option, SET HOVERABOVE ON/OFF controls whether the hover window is shown above or below the cursor. The default is SET HOVERABOVE OFF.

The document is now formatted using OpenOffice (generated from GML), for improved PDF files with bookmarks, hot links, *etc*. There are no technical changes, although some web URLs have been updated.

Index

Right click to update Index (or Tools-Update-All).