# Getting Started with MapObjects 2.1 in PowerBuilder 7.0

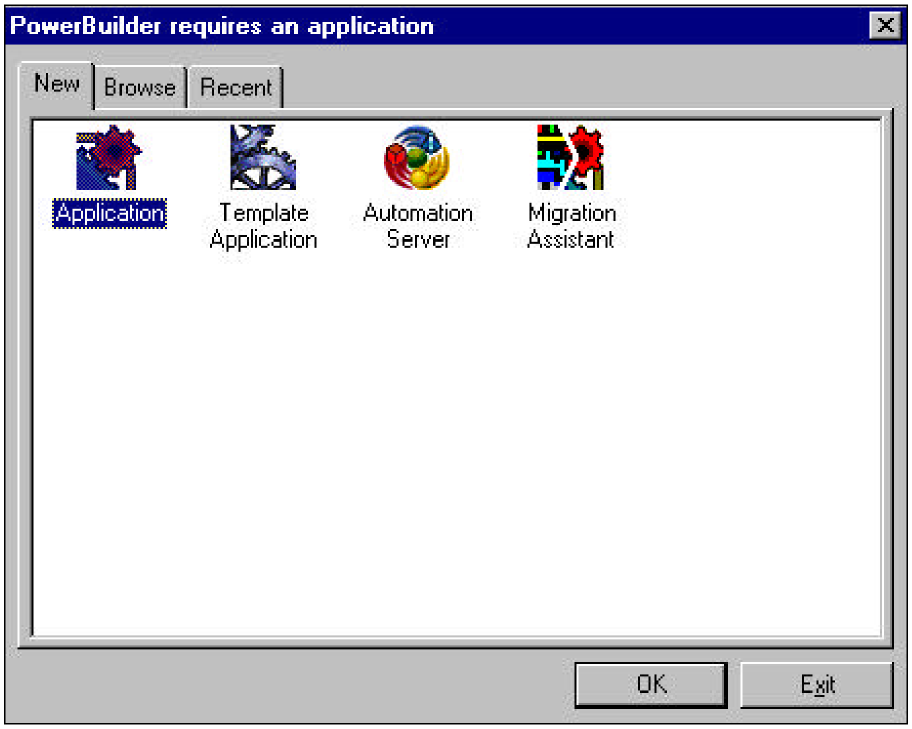
In this introductory document you'll use MapObjects 2.1 and PowerBuilder 7.0 to build an application that uses maps. This guide will show you how to…

- Display a map with multiple layers
- Control panning and zooming
- Add toolbar buttons
- Display map layers based on scale
- Perform spatial and logical queries
- Draw simple graphics on the map
- Display features with thematic renderers
- Dynamically display real-time data with an event tracking layer

## Create an application named "Map"

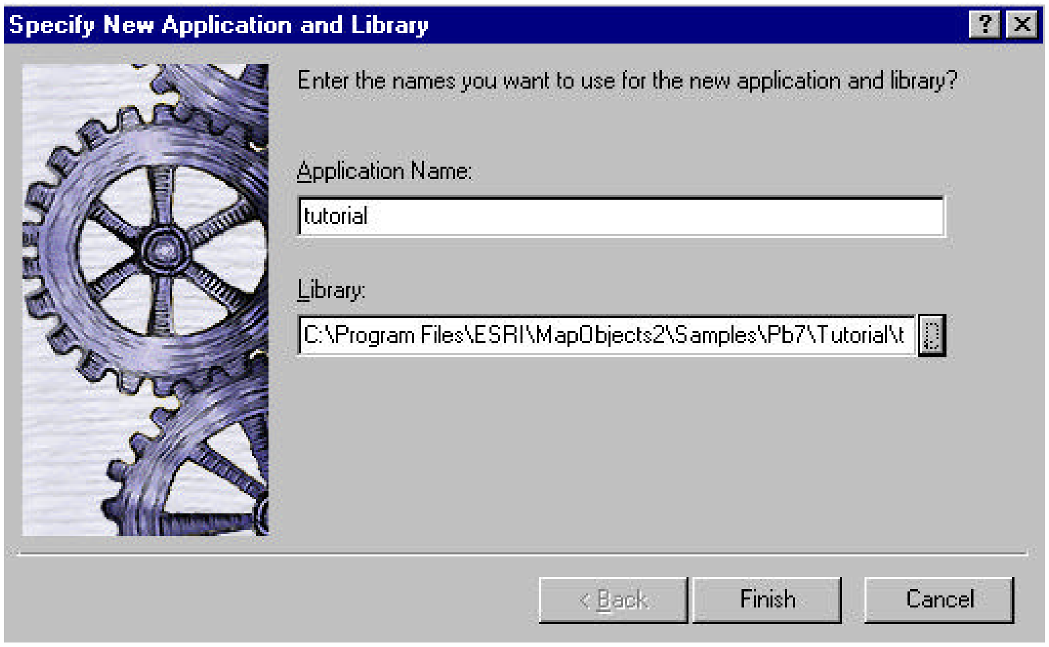
1. Launch PowerBuilder 7.0.

2. If previously opened applications are not available, PowerBuilder will display a dialog from which you will need to choose the **Application** icon and click **OK**.



If this dialog box does not appear, select **File** > **New** from your menu.

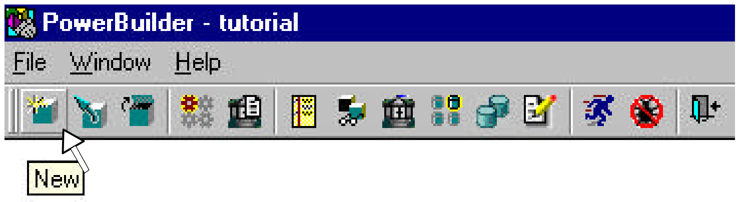
3. You will be prompted for details on what you want to call the new application and library. Type “**tutorial**” for your Application Name. For the Library, navigate to the location where you would like to store the *.pbl. Our tutorial is saved into the **MapObjects2\Samples\Pb7** directory.


Specify New Application and Library
Enter the names you want to use for the new application and library?
Application Name:
tutorial
Library:
C:\Program Files\ESRI\MapObjects2\Samples\Pb7\Tutorial\t
< Back
Finish
Cancel

6. Click the **Finish** button and you are at the PowerBuilder application window

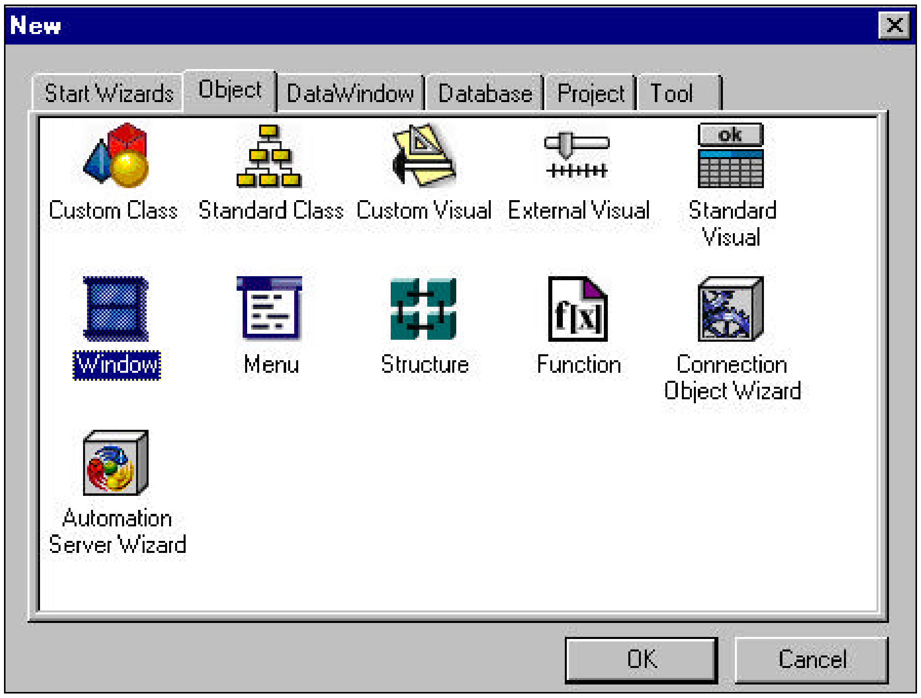
We need to create a window on which to display our map.

7. Select **File > New** from the menu bar, or choose the **New** tool on the Powerbar.



8. Select the **Object** tab in the **New** dialog that appears box and choose the **Window** icon. Once selected, click **OK**.

This will be the window on which you will place your map to display your data layers.

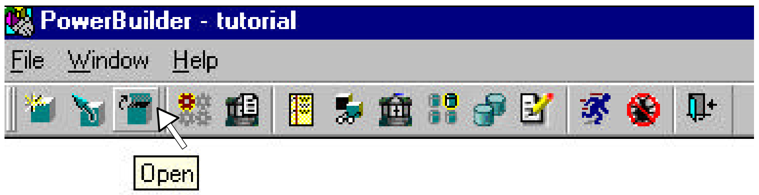


Your new window is untitled and unsaved.

9. Save the window as "w_map" and, in the Properties view, set the Title to " MapObjects Tutorial".

You will now modify the Open event script for the application in order to ensure the window with your map control is initialized when the application is first run.

10. Select **File** > **Open** from the menu bar, or choose the **Open** tool on the Powerbar.

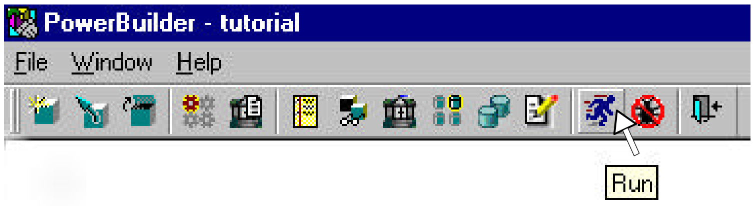


11. Select **Applications** in the ObjectType box and choose the **Tutorial**. Once selected, click **OK**.

12. Ensure the **Open** event is displayed in the Script view. Type "**open (w_map)**" in the script.

13. To compile this short script, right-click anywhere in the Script view area and select **Compile** from the popup menu that appears.

14. Close this window to return to the Layout view. Run the application as a test to ensure your window is sized and placed to your liking.

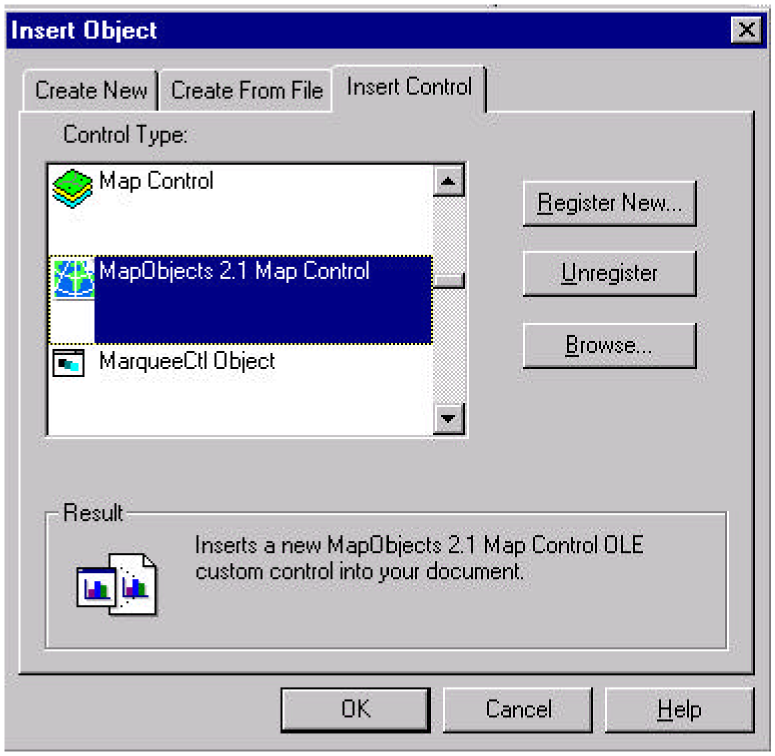


When you run your application at this stage, you should see an “empty” application window with a title of “ MapObjects Tutorial”.

## MapObjects Basics

### Add the MapObjects OCX control to the project

1. From the menu bar, select **Insert** > **Control** and scroll to the **OLE** option listed.
2. In the **Insert Object** dialog, click on the **Insert Control** tab.



Inserts a new MapObjects 2.1 Map Control OLE custom control into your document.

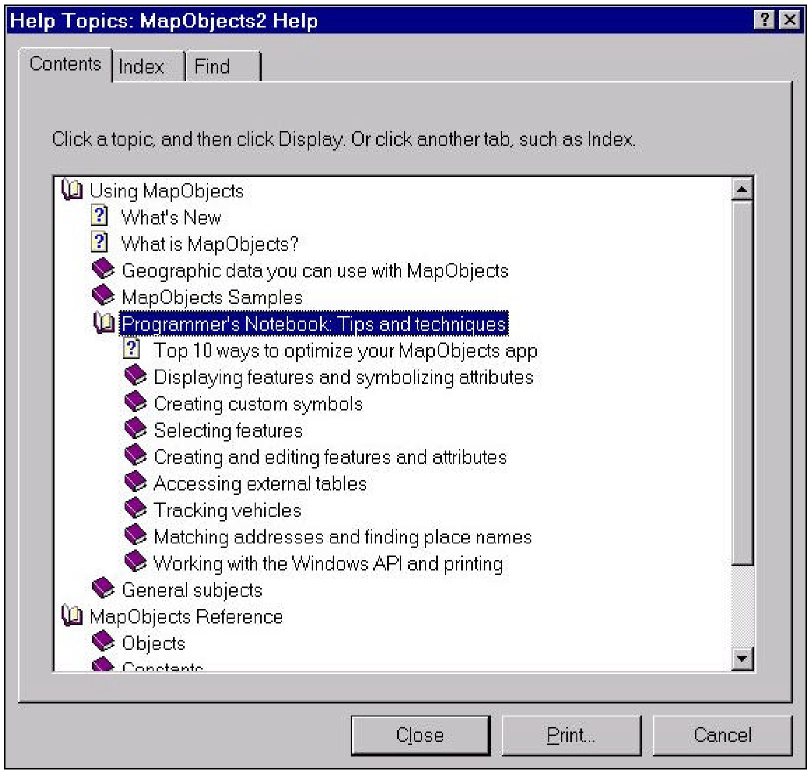
3. Scroll down to **MapObjects 2.1 Map Control** entry. Once selected, click **OK.**

Your cursor will turn into a crosshair icon.

4. Click on the w_map window surface. The Map Control will appear as an “empty” white box.
5. The Map control at first is quite small. Stretch it by grabbing the bottom right-hand corner, dragging it to a larger size. Leave some space (about half an inch) at the top.

## Getting MapObjects Help

The Map control is one of the 46 objects that make up MapObjects 2.1. To find out about the various objects, open the MapObjects2 Online Reference and select ‘Objects’ in the table of contents under the ‘MapObjects Reference’ heading. You can access the help from your Task Bar: Start > Programs > ESRI > MapObjects2. Additionally, the help file is named “MapObjects2.hlp”, and is located under “C:\Program Files\ESRI\MapObjects2\”, if you accept the default path during installation of MapObjects. The help system provides help for every object, property, method, event, and constant in the MapObjects software.



Click a topic, and then click Display. Or click another tab, such as Index.

- Using MapObjects
  - What's New
  - What is MapObjects?
  - Geographic data you can use with MapObjects
  - MapObjects Samples
  - Programmer's Notebook: Tips and techniques
    - Top 10 ways to optimize your MapObjects app
    - Displaying features and symbolizing attributes
    - Creating custom symbols
    - Selecting features
    - Creating and editing features and attributes
    - Accessing external tables
    - Tracking vehicles
    - Matching addresses and finding place names
    - Working with the Windows API and printing
  - General subjects
- MapObjects Reference
  - Objects
  - Constants

## Adding Data to the Map

Although MapObjects is a developer-based product, you can add data to the map interactively, by setting the properties in the **MapObjects Map Control Properties** window.

1. Open your w_map window and select the map control object

2. Make active your Properties view for the map control. If it is not visible, select the map control in your Layout view and choose **Properties** from the popup menu

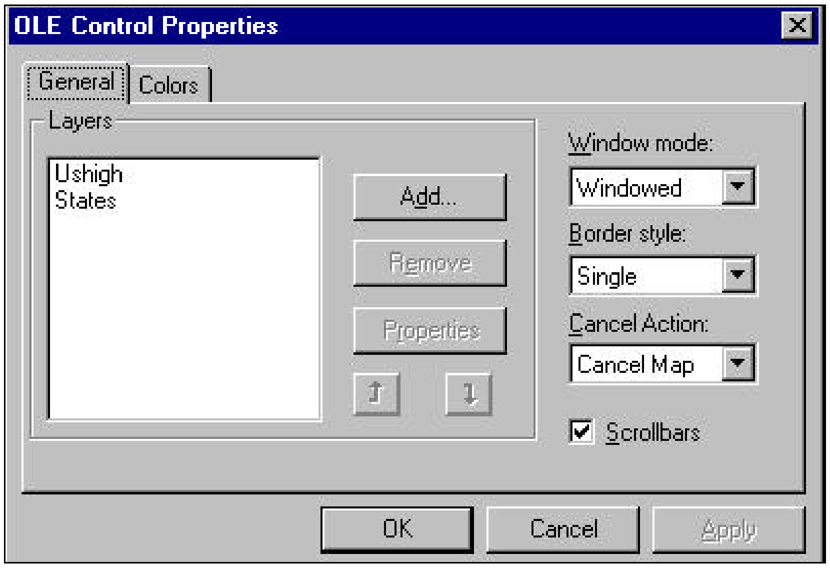
3. Change the map control’s name from **ole_1** to **ole_map**.

4. With the map control selected, right-click the mouse and select the **OLE Control Properties** option from the popup menu.

5. Click the **Add** button and navigate to the folder where the USA sample data is stored. All the shapefiles that we use in this application come with the MapObjects CD-ROM, installed in the default directory at . .\Program Files\ESRI\MapObjects2\Samples\Data.

6. Select the **States.shp** file and then click **Open**.

7. Add the file **USHigh.shp** in the same manner.



Layers: Ushigh, States
Window mode: Windowed
Border style: Single
Cancel Action: Cancel Map
[✓] Scrollbars

## Set properties for the layers

1. With the Ole Control Properties window still open, highlight the States layer in the Layers list (left pane), and then click the **Properties** button.
2. Click the **Color** button to select a color for the States layer.
3. Click **OK** to close the dialog.
4. Select a color for the USHigh layer in the same manner.
5. Click **OK** to close the Ole Control Properties window for the Map control.

## Test your application

1. Click the **Save** button in the PainterBar to save changes to w_map.
2. Choose the **Run** button in the PowerBar.

If you have successfully completed the above steps, when run, your application should display two vector layers showing the United States with the US Highway routes overlying the states.

# Pan and Zoom

At this point, your application can display the map at its full extent. In the following part of this tutorial, you will add simple pan and zoom functionality that will be activated in response to mouse clicks on the map. You will write code that executes in response to the MouseDown event on the map.

## Handle Map Resizing

In this step, you will add some code to the Resize event for the w_map window to ensure all objects on the window resize accordingly.

1. Open your Script view for the w_map window and select the **Resize** event. If the Script view is not displayed, select the gray background of the w_map window in your Layout view, and right-click to display the pop-up menu. Then select **Script.**

2. Add the following PowerScript:

```
ole_map.Width = this.WorkSpaceWidth()
ole_map.Height = this.WorkSpaceHeight() - 130 – 60
```

3. Compile the script.

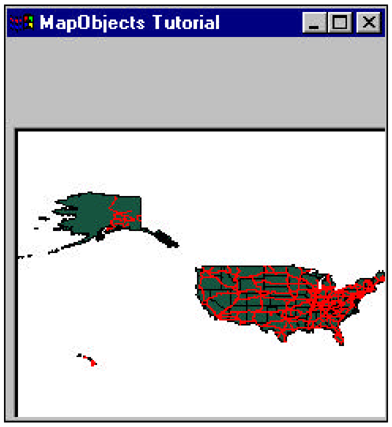
4. Similarly, select then **Open** event script for w_map, and add following four lines of Powerscript:

```
GetApplication().ToolBarUserControl = FALSE
ole_map.Width = this.WorkSpaceWidth()
ole_map.Height = this.WorkSpaceHeight() - 130 - 60
ole_map.Move(this.WorkSpaceX(), this.WorkSpaceY() + 130)
```

5. Compile your script and save the changes to your application.

6. Click the **Run** button in the PowerBar

You should see that the map control window is placed on the window at a particular location. Additionally, when you resize the window, the map control resizes accordingly. Don't worry about the gray space between the title bar and the map control; we'll be filling that area with a toolbar eventually.



7. Stop running your application and return to design mode.

## Adding Pan and Zoom capabilities

1. Click the map control, and right-click to display the popup menu. Select **Script.**
2. In the Script view, choose the **MouseDown** event script for ole_map.
3. Add the following Powerscript to the Script view:

```
If Shift = 0 Then
        If Button = 1 Then
                ole_map.Object.Extent = ole_map.Object.TrackRectangle
        Else
                ole_map.Object.Pan
        End If
Else
        If Button = 1 Then
                OleObject l_rect
                l_rect = ole_map.Object.Extent
                l_rect.ScaleRectangle(1.8)
                ole_map.Object.Extent = l_rect
        Else
                ole_map.Object.Extent = ole_map.Object.FullExtent
        End If
End If
```

4. Compile the Powerscript.

**TrackRectangle** is a method that applies to a Map control, returning a Rectangle object. When the user clicks on the map and drags, the TrackRectangle method rubberbands a rectangle. In this case, when the user releases the mouse, the map zooms to the specified area – that is, the rectangle that the user has tracked with the cursor.

5. Use the *left* mouse button to Zoom in, *right* mouse to Pan. Use *shift* + *left* button to Zoom out gradually, and *shift* + *right* button to set the map's extent to its full extent.

6. Stop the application, and you return to the Window painter workspace.

## Adding a toolbar

1. Click the **File** menu option and select **New**.
2. Select the **Menu** icon in the **New** dialog box that appears, in order to build a new toolbar.
3. Your new menu will be untitled, initially. Save it as **m_main** and begin adding. seven (7) items from the following table, using **Insert/Menu Item At End**. For each one of the entries, go to the **Toolbar** tab in the Properties view and set the **ToolBarItemOrder** property as shown in the table (below). Then go to the **ToolBarItemName** and add a picture of your choice to every button. The following are the values of the **ToolBarItemOrder** property for the new menu items:

| Menu Item | Order Value In Toolbar | Name |
|---|---|---|
| **Add Shape** | **0** | **m_addshape** |
| **Zoom In** | **1** | **m_zoomin** |
| **Zoom Out** | **2** | **m_zoomout** |
| **Pan** | **3** | **m_pan** |

| | | |
|---|---|---|
| **Query** | **4** | **m_query** |
| **Add Event** | **5** | **m_addevent** |
| **Full Extent** | **6** | **m_fullextent** |

4. We only want to see the toolbar buttons, as icons, so click on the General tab in the Properties View and turn off the **Visible** checkbox for each item.

5. Optionally, you can set Shortcut keys or, if you'd like to see pop-up tool tips, apply **ToolBarItemText** for all these buttons.

6. At this time, since we have not yet written code, these button won't do anything if you run the Application.

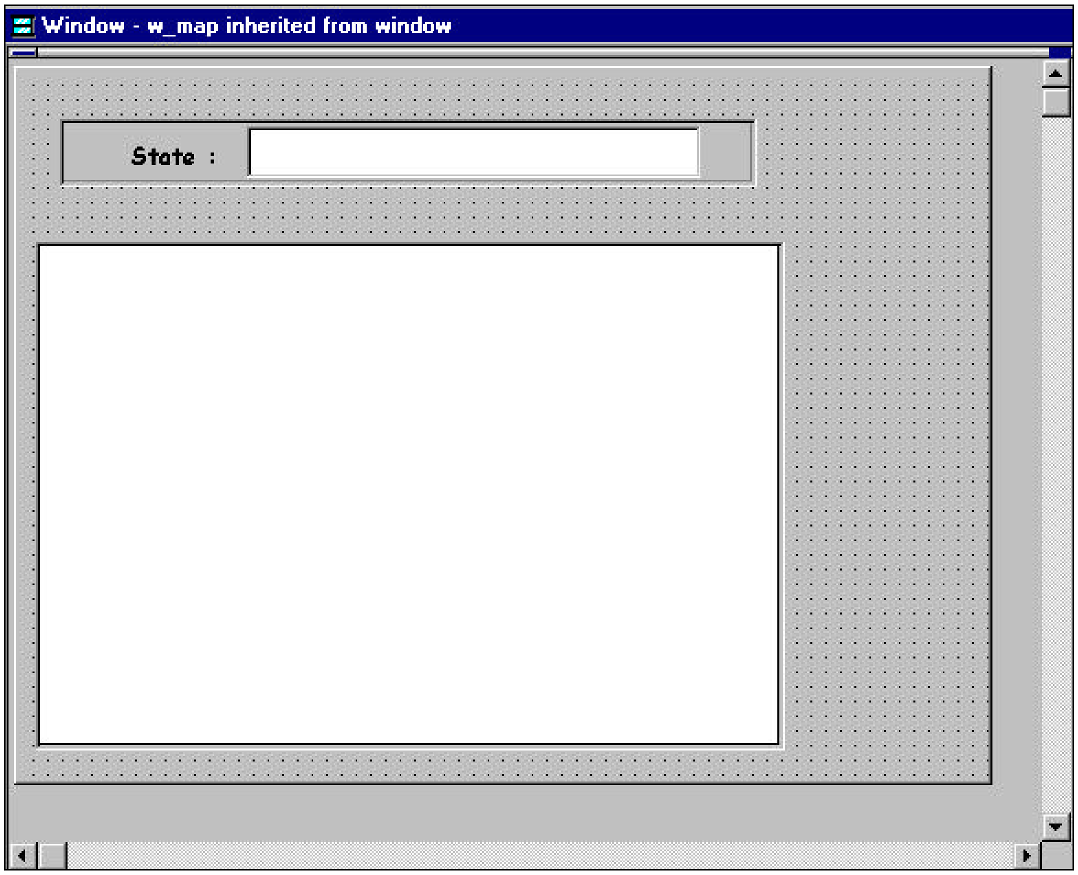
## Creating a find tool

1. When you are in the Window painter workspace, open the w_map window and select ***Insert ->Control -> OLE*** from the menu bar. Under the Insert Control tab where you found the MapObjects control, select **Threed Panel Control** and add it to the MDI form. Position the panel control along the top of the map control. For all three controls that we are adding here -- panel, static text, single line edit -- let's leave the control's height value as default to make things simple; only change the control's width value when you position and resize them.

2. Change the Panel control's name to **ole_panel** in the Property view.

3. Select ***Insert ->Control -> StaticText***, and add a static text control on top of the panel.

4. Select ***Insert ->Control -> SingleLineEdit***, and add a single line edit control next to the static text on the panel control.



5. Change then name of the static text control to st_text, change its text from "None" to "State:". Get into the **Font** sheet and change the control's **BackColor** to **ButtonFace**, if it's not set already.

6. Change the name of the single line edit control to sle_edit; get into the **Font** sheet and change the **BackColor** to **Custom** (white).

7. Since we want our panel controls to size proportionately as we resize the window, we need to add a few more lines of code. Go to the **Resize** event for w_map, and add the following line of PowerScript code at the end:

```
ole_panel.Width = this.WorkSpaceWidth()
```

8. Now add the following three lines to the **Open** event for w_map:

```
ole_panel.Height = 130
ole_panel.Width = this.WorkSpaceWidth()
ole_panel.Move(this.WorkSpaceX(), this.WorkSpaceY())
```

9. Run the application and test your changes. If the static text control, the single line edit control and the panel control are not aesthetically arranged when you run the application, return to design mode (Window painter workspace) and adjust their respective positions.

## Implementing the toolbar and Find tool

## Implement the Toolbar

For buttons 2 through 6 on the toolbar – that is, those buttons with ToolBarItemOrder values 1 to 5, representing *ZoomIn*, *ZoomOut, Pan, Query,* and *AddEvent* respectively – we need to ensure that only one button is active at a time. We must implement this behavior ourselves by keeping track of the active tool.

1. Delete all existing code in the **MouseDown** event for the ole_map control in w_map, or simply comment out the lines of code.

2. Add the following PowerScript to the **MouseDown** event for ole_map control:

```
OleObject l_pt
l_pt = ole_map.Object.ToMapPoint(ocx_x, ocx_y)

If m_main.m_ZoomIn.Checked Then
  ole_map.Object.Extent = ole_map.Object.TrackRectangle

ElseIf m_main.m_Zoomout.Checked Then
  Oleobject l_rect
  l_rect = ole_map.Object.Extent
  l_rect.ScaleRectangle(1.5)
  ole_map.Object.Extent = l_rect

ElseIf m_main.m_pan.Checked Then
  ole_map.Object.Pan

ElseIf m_main.m_query.Checked Then

   If IsValid(ole_map.Object.Layers.Item("States")) Then
     OleObject l_recset
     l_recset = ole_map.Object.Layers.Item("States").SearchShape(l_pt, 12,'')
     OleObject l_shp
     String ls_stname

     Do While Not recset.EOF
         l_shp = l_recset.Fields.Item("Shape").Value
         ls_stname = l_recset.Fields.Item("State_name").Value
         ole_map.Object.FlashShape(l_shp, 4)
         MessageBox("Find A State", "This is the State of " + ls_stname)
         l_recset.MoveNext
     Loop
   Else
     MessageBox("Query", "Add States layer first.")
End If

ElseIf m_main.m_addevent.Checked Then
     ole_map.Object.TrackingLayer.AddEvent(l_pt, 0)

End If
```

When the m_query button is clicked, the MapObjects **SearchShape** ( ) method is used on the MapLayer “States”, passing the user-clicked point (**pt**) as the first parameter, and the **moPointInPolygon** constant as the second parameter, setting the optional third argument to an empty string (‘’). If the feature contains the point where the user clicked, a polygon shape is returned and passed to the **FlashShape** method, to be flashed 4 times.

3. We want the Zoom In button to be checked when the application starts, so add the following line of PowerScript code to **Open** event for w_map:

   ```
   ////// Make sure button Zoomin is checked when app starts //////
   m_main.m_zoomin.Checked = True
   ```

4. To ensure only one button is checked at a time, we have to uncheck all other four buttons whenever a button is clicked (checked).

5. Open the Menu **-** m_main, select the menu item **ZoomIn**. Open the Script view and select the **Clicked** event for **m_zoomin**.

6. Add the following PowerScript code to the **Clicked** event for m_zoomin:

   ```
   m_main.m_zoomout.checked = false
   m_main.m_pan.checked = false
   m_main.m_query.checked = false
   m_main.m_addevent.checked = false
   this.checked = true
   ```

7. Similarly add code to the **Clicked** event for **m_zoomout**, **m_pan**, **m_query** and **m_addevent,** respectively.. Here is an example for m_addevent. Now complete similar code for the **Clicked** event for m_zoomout, m_pan, and m_query.

   ```
       m_main.m_zoomin.checked = false
       m_main.m_zoomout.checked = false
       m_main.m_pan.checked = false
       m_main.m_query.checked = false
       this.checked = true
   ```

8. To implement the FullExtent button on the toolbar, add the following code to the **Clicked** event for m_fullextent:

```
w_map.ole_map.object.extent = w_map.ole_map.object.fullextent
```

## Test your changes

1. Save the application.
2. Click the **Run** button in the PowerBar.
3. Click-drag your mouse on the map to zoom in. Notice that the ZoomIn button is already checked, as the default.
4. Select the Pan button in the toolbar, then click-drag your cursor on the map to see the map pan.
5. Select the ZoomOut button in the toolbar, then click on the map to zoom out.
6. Click the Query button in the toolbar, then select a U.S. state [feature] with your cursor. You will see the chosen state flash four times. A Message Box follows indicating which state it is you've selected.
7. Click the AddEvent button in the toolbar, then click somewhere on the map. You will see a new GeoEvent is created at the specified location on the map. If you would like to use another Symbol to draw the GeoEvent, you can easily do this by setting a Symbol object first.

   For example, you can change the last ElseIf statement in MouseDown event for ole_map from:

```
ElseIf m_main.m_addevent.Checked Then
    ole_map.Object.TrackingLayer.AddEvent(l_pt, 0)
```

to the following code:

```
ElseIf m_main.m_addevent.Checked Then
        OleObject l_tLayer
        l_tLayer = ole_map.Object.TrackingLayer
        l_tLayer.SymbolCount = 1
        l_tLayer.Symbol(0).Color = RGB(255, 0, 0) // Red
        l_tLayer.Symbol(0).Style = 4
        l_tLayer.Symbol(0).Font.Name = "Wingdings"
        l_tLayer.Symbol(0).Size = 18
        l_tLayer.Symbol(0).CharacterIndex = 81
        l_tLayer.AddEvent(pt, 0)
```

8. Now run your application again. You should see the GeoEvents displayed as red airplane symbols. The capability of displaying geographic entities on top of the map is often desirable, especially if those entities have a tendency to move. For example, a vehicle tracking system would want to display vehicles on the map at particular locations and update those locations over time, without redrawing all the layers of the map each time a vehicle changes location. If you would like to see a moving GeoEvent, simply use the Move( ) or MoveTo( ) method on the GeoEvent object. You can add a Timer control onto your map to trigger the movement of the events.

## Implement the Find tool

1. Go to the w_map Window painter Layout view.
2. Select ***Declare*** in the first dropdown listbox of the Script view.and ***Global Variables*** in the second dropdown listbox. Add two global variables:
   ```
   OleObject g_poly
   OleObject g_sym
   ```
3. Get into the **Open** event for w_map and the following PowerScript to initialize the global variable *g_sym*:
   ```
   ////// Initialize global variable g_sym //////
   g_sym = CREATE OleObject
   g_sym.ConnectToNewObject("MapObjects2.Symbol")
   g_sym.Color = RGB(255, 128, 0) // MoOrange
   g_sym.SymbolType = 2 // MoFillSymbol
   g_sym.Style = 10 // MoDarkGrayFill
   ```
4. Since we are allocating memory when the new OleObject ‘g_sym’ is created, we have to release the memory explicitly. We do this by adding the following script to the **Close** event for w_map. The **Close** event is triggered whenever you terminate the application.
   ```
   DESTROY g_sym
   ```

Now we will code the

5. Get into the Script view for the **sle_edit** object and select the **Modified** event. Add the following PowerScript:
   ```
   String ls_exp
   ```

```
OleObject l_recset, l_rect

//Extract the value from the edit box and construct a query.
If IsValid(ole_map.Object.Layers.Item("States")) Then
   ls_exp = "State_name = ~'" + this.Text + "~'"

//Pass the query to the SearchExpression method to return a recordset
   l_recset = ole_map.Object.Layers.Item("States").SearchExpression(ls_exp)

//Zoom to the extent of the first shape in the recordset
   If Not l_recset.EOF Then
     g_poly = l_recset.Fields.Item("Shape").Value
     l_rect = poly.Extent
     l_rect.ScaleRectangle(2)
     ole_map.Object.Extent = l_rect
   Else
     MessageBox("Query", this.text + " is not found.  Check your spelling and
                     try again.")
   End If
Else
     MessageBox("Query", "States layer is not found. Add this layer first.")
End If
```

6. Go to the Script view for ole_map and select the **AfterLayerDraw** event. Add the following PowerScript:

```
//Draw the resulting state using the symbol set up in the w_map Open event.
     If index = 0 then
          If IsValid(g_poly) Then
               If Not IsNull(g_poly) Then
                    ole_map.Object.DrawShape(g_poly, g_sym)
               End If
          End If
     End If
```

7. Run your application again, type **Florida** or **California** in the edit control and hit Enter.
   *NOTE: The state name you type is case-sensitive.*

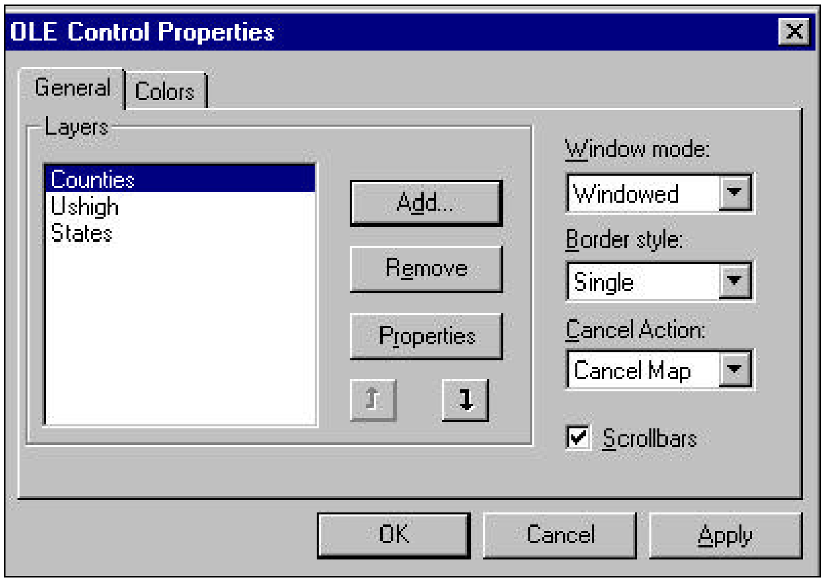
The above code first builds a simple SQL query expression using the value of sle_edit's Text property. The States layer is then searched using the SearchExpression method with the result being a Recordset object. If the value of the Recordset's EOF property is FALSE, the Recordset is positioned on the first record that satisfies the search expression. In that case, the value of the Shape field is obtained for the first record. The extent of the shape is scaled and then set to be the Extent of the map. The map is then implicitly redrawn when the Extent property is set. This will trigger a redraw of the map and, consequently, will initialize the map's AfterLayerDraw event, where we draw the shape using the Symbol that we defined earlier. Note that the DrawShape method can only be called in the BeforeLayerDraw, AfterLayerDraw, BeforeTrackingLayerDraw or AfterTrackingLayerDraw events on the map control.

## Displaying map layers based on scale

1. In the w_map painter view, select your ole_map and right-click to get the OLE Control Properties dialog.

2. Add a new layer, Counties.shp, to the map control and change the color for the layer. This shapefile will be found in the same directory where States.shp and Ushigh.shp are located.

3. Before closing the OLE Control Properties dialog, select the Counties layer that you just added and move the layer to the bottom of the list of layers, using the *Down* arrow button located beneath the **Properties** button on the dialog (see snapshot).



Since we've moved the Counties layer to the bottom of the list of layers, it will display first on the map control at run-time. MapObjects draws the layers in the Layers collection from the bottom up (in this case, Counties -> States -> USHigh). Therefore, the States layer will be displayed on top of, and covering, the Counties layer. In this step, we will be scripting such that the Counties and States layers will toggle their visibility, based on the current map extent

4. Add the following PowerScript to the **BeforeLayerDraw** event for ole_map. When you run the application and zoom in on the map, you will change the visibility of the Counties and States layers, depending on the current extent of the map. The value of the **Visible** property of each layer is based on the current extent of the map. If the width of the current extent is less than or equal to one-fourth of the full extent of the map, then the Counties layer will be visible and the States layer's visibility will be turned off.

```
If IsValid(this.Object.Layers.Item("Counties")) Then
    this.Object.Layers.Item("Counties").Visible = &
    this.Object.Extent.Width < ((this.Object.FullExtent.Width) / 4)
End If

If IsValid(this.Object.Layers.Item("States")) Then
    this.Object.Layers.Item("States").Visible = &
    this.Object.Extent.Width >= ((this.Object.FullExtent.Width) / 4)
End If
```

5. Run your application and zoom in on the map. As you change extents, the features of Counties layer will appear, as the States layer's visibility is set to False.

## Statistical Thematic Mapping

In this section, you will modify your application so that the Counties layer is drawn using the attribute information associated with the layer. We'll render on the values from the field "Pop1990" from the Counties attribute table, using the ClassBreaksRenderer object.

1. Select ***Declare*** **->** ***Global Variables…*** from the Script view and add one more global variable:

```
OleObject g_cbRend
```

2. Add the following to the end of the **Open** event for w_map:

```
////// Initialize global variable g_cbRend //////
g_cbRend = CREATE OleObject
g_cbRend.ConnectToNewobject("MapObjects2.ClassBreaksRenderer")
```

3. Go to the **BeforeLayerDraw** event for ole_map and add the following PowerScript at the end:

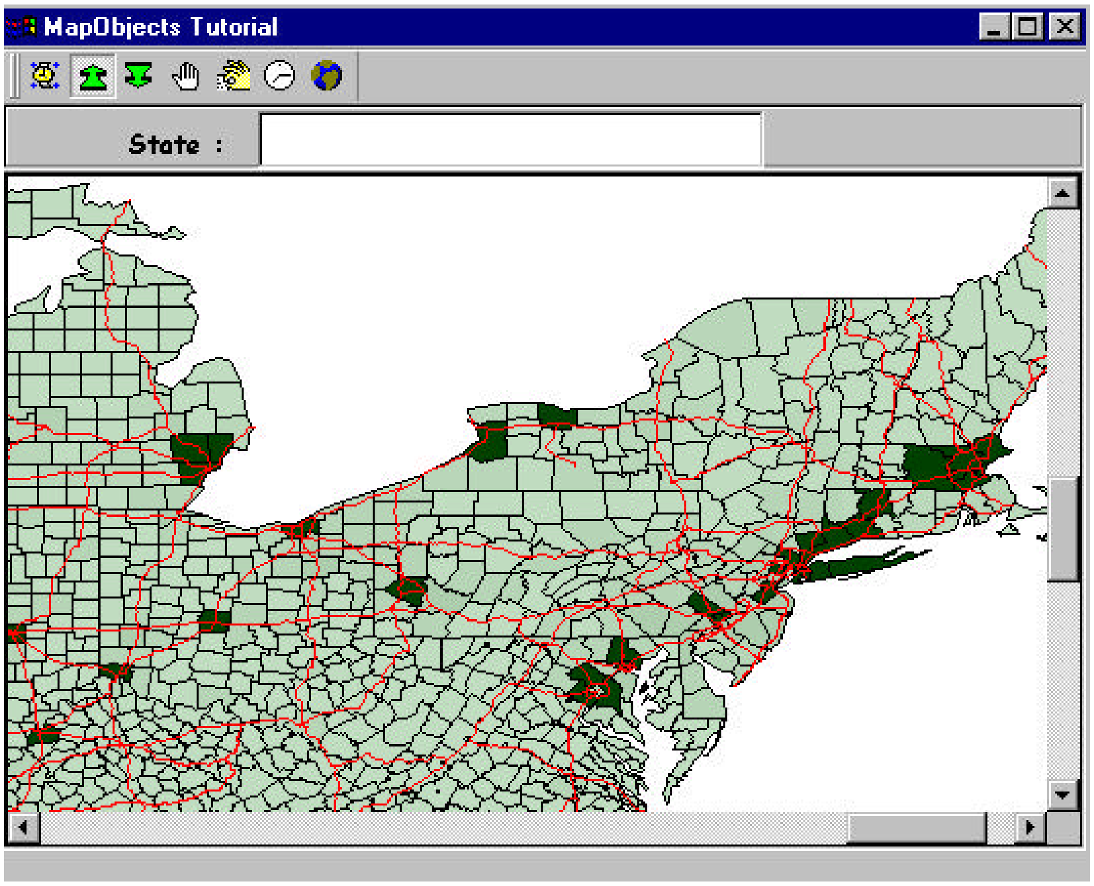
```
Double ld_breakVal
Int i
OleObject lo_stats

If IsValid(ole_map.Object.Layers.Item("Counties")) Then
  g_cbRend.Field = "Pop1990"
  lo_stats =
    ole_map.Object.Layers.Item("counties").Records.CalculateStatistics("Pop1990")
  ld_breakVal = lo_stats.Mean - (lo_stats.StdDev * 3)
      For i = 0 to 5
              If (ld_breakVal >= lo_stats.Min and ld_breakVal <= lo_stats.Max)
          Then
                      g_cbRend.BreakCount = g_cbRend.BreakCount + 1
                      g_cbRend.Break(g_cbRend.BreakCount - 1, ld_breakVal)
              End If
              ld_breakVal = ld_breakVal + lo_stats.StdDev
      Next
      ole_map.Object.Layers.Item("Counties").Renderer = g_cbRend
      g_cbRend.RampColors(12639424, 16384) // MoLimeGreen and MoDarkGreen
End If
```

4. Go to the **Close** event for w_map and add the following line to clean up the memory space we allocated above:

```
DESTROY g_cbRend
```

5. Run your application and zoom in such that the Counties layer becomes visible. Notice that the Counties features are now drawn in shades of green, depending on the attribute values of each county (Pop1990).



Each MapLayer object has a Renderer property. A Renderer object controls the symbology of the MapLayer features based upon a field value from the layer's attribute table. The ClassBreaksRenderer can be used to display continuous numeric data, in this case, the Population values by county in 1990.

# Working with DataConnection objects

In each of the previous sections you have worked with MapLayer objects that were specified interactively using the ole_map control's property sheet. In this section you will add code to your application, which creates and adds MapLayer objects programmatically using a DataConnection object.

### Remove the existing layers

1. Get into the OLE Control Properties dialog for your map control by right clicking on the mouse while the map control is selected and choosing **OLE Properties.**
2. Select the Ushigh layer then click **Remove** button to delete the layer.
3. Remove the States and Counties layers in the same manner. Click **OK** to exit the Control Properties dialog.
4. Go to the Script view and open the **BeforeLayerDraw** event for ole_map.
5. Comment the first part of code (two **If** statements) that handles the visibility of the Counties and States layers. Our next step will be to programmatically add the Counties layer.

```
/*
//////////// Comment out the following code //////////////
If IsValid(this.Object.Layers.Item("Counties")) Then
        this.Object.Layers.Item("Counties").Visible = &
        this.Object.Extent.Width < ((this.Object.FullExtent.Width) / 4)
End If

If IsValid(this.Object.Layers.Item("States")) Then
        this.Object.Layers.Item("States").Visible = &
        this.Object.Extent.Width >= ((this.Object.FullExtent.Width) / 4)
End If
//////////// The above code is commented now ///////////
*/
```

## Implement AddShape button on the toolbar

1. Open menu m_main and go to item AddShape.
2. Open the Script view and add the following code to the **Clicked** event for m_addshape:

```
//////////////////////////////////////////////////////////////////////////
// If the filename (fName) that you selected in the file dialog is this: //
// "C:\Program Files\Esri\MapObjects\Samples\Data\Usa\States.shp" //
// then: //
// dbName = "C:\ Program Files\Esri\MapObjects\Samples\Data\Usa" //
// shpName = "States.shp" //
// gdName = "States" //
//////////////////////////////////////////////////////////////////////////

String s_title, s_filter, s_ext, s_fName, s_gdName, s_dbName, s_shpName
Int i_value, i_pos

s_title = "Select a Shapefile"
s_filter = "ESRI Shape Files (*.shp), *.shp"
s_ext = "shp"
i_value = GetFileOpenName(s_title, s_fName, s_shpName, s_ext, s_filter)
If not i_value = 1 then Return
```

```
i_pos = Pos(Reverse(s_fName), "\")
s_dbName = Left(s_fName, Len(s_fName) – i_pos)
s_gdName = Left(s_shpName, Len(s_shpName) - 4)

OleObject lo_dc, lo_mLayer
lo_dc = CREATE OleObject
lo_dc.ConnectToNewObject("MapObjects2.DataConnection")
lo_mLayer = CREATE OleObject
lo_mLayer.ConnectToNewObject("MapObjects2.MapLayer")
lo_dc.Database = s_dbName

If Len(s_gdName) > 0 Then
lo_mLayer.GeoDataset = lo_dc.FindGeoDataset(s_gdName)
w_map.ole_map.Object.Layers.Add(lo_mLayer)
End If

w_map.ole_map.Object.Extent = w_map.ole_map.Object.FullExtent

DESTROY lo_dc
DESTROY lo_mLayer
```

3. Run the application and test the changes. Notice that this time there is no data in the map when the application is in run-time.

4. Click the AddShape button to navigate to a data location for your shapefiles. Once selected, Click **Open**. You can now dynamically add shapefiles to your application. This is an alternative to hard-coding the name and location of shapefiles that may not exist on target machines when your application is finally distributed.

Of course, you can add to the PowerScript in Step 2 such that you can programmatically load coverages, images, CAD data, etc. – displaying whatever vector or raster data you require that is also supported by MapObjects 2.1. A list of all supported data formats is provided in the online Help topic.

Congratulations! You have successfully completed the PowerBuilder 7.0 Tutorial using MapObjects 2.1. Let the games begin!