Creating a Nonrectangular Window

Janet Terra

Creating an irregular shaped window is achieved with WinAPI calls to user32.dll and gdi32.dll. The first step is to create a window without a caption. This can be achieved with the stylebits commands _WS_POPUP in the addbits parameter and _WS_CAPTION in the removebits paramater, or simply using the window_popup style. It is also advisable to keep the window in the forefront. Do this by using the stylebits command _WS_EX_TOPMOST in the extended bits parameter. Remember that any GUI window may be closed with Alt-F4.

For more detailed discussion of stylebits, see Stylebits - Windows.

Demo 1: Drawing a Nonrectangular Window

This first demo draws a circle, a rectangle, and some graphic text. The background is never added to the window. Only the actual drawings, including the graphic text, become part of the window. First, open a captionless window.

```
    Nomainwin

'Define the Window
    WindowWidth = 500
    WindowHeight = 500
    UpperLeftX = int((DisplayWidth-WindowWidth)/2)
    UpperLeftY = int((DisplayHeight-WindowHeight)/2)
    graphicbox #ShapeWindow.gb, 0, 0, 500, 500
    stylebits #ShapeWindow.gb, 0, _WS_BORDER, 0, 0

'Keep the Shaped Window in the Forefront
    stylebits #ShapeWindow, 0, 0, _WS_EX_TOPMOST, 0

    open "Shape Window" for window_popup as #ShapeWindow
    #ShapeWindow "trapclose [closeShapeWindow]"
```

Once the window is opened, handles and device controls to both the window and the graphicbox must be obtained.

```
'Obtain the Handles and Device Controls
    hBw = hWnd(#ShapeWindow)
    hBgb = hWnd(#ShapeWindow.gb)
    hDCw = GetDC(hBw)
    hDCgb = GetDC(hBgb)

'The Function
    Function GetDC(hW)
        Calldll #user32, "GetDC", _
            hW as ulong, _
            GetDC as ulong
    End Function
```

Now you're ready to draw an image. In this first demo, the image will be drawn using API calls. These are the steps in the [drawShape] gosub.

1: The Destination - Define a region to hold the finished window. Because this region will be built upon, start with all 0's for x, y, width and height.

```
'Original values for hRgn is meaningless
    hRgn = RectRegion(0, 0, 0, 0)

'The Function
    Function RectRegion(ulx, uly, width, height)
        CallDLL #gdi32, "CreateRectRgn", _
            ulx as long, _
            uly as long, _
            width as long, _
            height as long, _
            RectRegion as ulong
    End Function
```

2: The Circle - Define the x, y, width and height values for the circle. Select a red brush, paint the designated ellipse, delete the brush.

```
'hRgn1 = Elliptical Source Region
    hRgn1 = EllipticRegion(100, 50, 200, 250)
'Paint the Ellipse Red
    brushColor1 = 255 'Red Brush
    hBrush1 = createBrush(brushColor1)
    Call SelObject hDCw, hBrush1
    Call PaintRegion hDCw, hRgn1
    Call DelObject hBrush1

'The Functions and Subs
    Function RectRegion(ulx, uly, width, height)
```

```
        CallDLL #gdi32, "CreateRectRgn", _
            ulx as long, _
            uly as long, _
            width as long, _
            height as long, _
            RectRegion as ulong
    End Function

    Function EllipticRegion(ulx, uly, width, height)
        CallDLL #gdi32, "CreateEllipticRgn", _
            ulx as long, _
            uly as long, _
            width as long, _
            height as long, _
            EllipticRegion as ulong
    End Function
    Function createBrush(brushColor)
        Calldll #gdi32, "CreateSolidBrush", _
            brushColor as long, _
            createBrush as ulong
    End Function

    Sub PaintRegion hDC, hRgn
        Calldll #gdi32, "PaintRgn", _
            hDC as ulong, _
            hRgn as ulong, _
            null as long
    End Sub

    Sub DelObject hObject
        Calldll #gdi32, "DeleteObject",_
            hObject as ulong,_
            null as long
    End Sub

    Sub SelObject hDC, hBrush
        Calldll #gdi32, "SelectObject", _
            hDC as ulong, _
            hBrush as ulong, _
            null as long
    End Sub
```

Use CombineRgn to add this painted region, hRgn1, to the destination region, hRgn.

```
'Set hRgn to the Combination of itself and hRgn1
```

```
    newRgn = CombineRgn(hRgn, hRgn, hRgn1, _RGN_OR)
```

Now that region hRgn1 is a part of region hRgn, it is no longer needed. Delete that object to free memory.

```
'Delete hRgn1
    Call DelObject hRgn1
```

3: The Rectangle - Define the x, y, width and height values for the rectangle. Select a blue brush, paint the designated rectangle, delete the brush.

```
'hRgn2 = Rectangular Source Region
    hRgn2 = RectRegion(150, 75, 300, 200)
'Paint the rectangle blue
    brushColor2 = 255 * 256^2 'Blue Brush
    hBrush2 = createBrush(brushColor2)
    Call SelObject hDCw, hBrush2
    Call PaintRegion hDCw, hRgn2
    Call DelObject hBrush2
```

Once again, use the API Call CombineRgn to add the pixels of the rectangle hRgn2 to the final destination region hRgn.

```
'Set hRgn to the Combination of itself and hRgn2
    newRgn = CombineRgn(hRgn, hRgn, hRgn2, _RGN_OR)
```

The hRgn2 rectangle can now be safely deleted to free up space, as it's been added to the shaped window region hRgn.

```
'Delete hRgn2
    Call DelObject hRgn2
```

4: The newly built region made up of regions hRgn1 and hRgn2 can now be set as the window.

```
'Set hRgn as the Window
    Call SetWindowRgn hBw, hRgn, 1

'The Sub
    Sub SetWindowRgn hWnd, hRgn, redrawMode
        Calldll #user32, "SetWindowRgn",_
            hWnd as ulong,_
            hRgn as ulong,_
            redrawMode as long,_
            SetWindowRgn as long
    End Sub
```

The SetBkMode of #gdi32 can be called to achieve a transparent background for text. Text can then become part of the window.

```
'Set background to Transparent
    Call SetBkMode hDCgb, 1
```

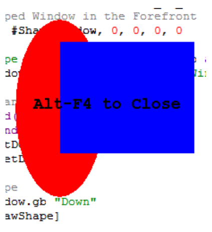
ReleaseDC is again called to release memory.

```
'Release memory
    Call ReleaseDC hBgb, hDCbg
```

Graphics text is accomplished with native Liberty BASIC code.

```
'Format Text
    #ShapeWindow.gb "font Courier_New 14 Bold"
    #ShapeWindow.gb "color Black; place 120 150"
    #ShapeWindow.gb "\Alt-F4 to Close"
    Wait
```

Run your program and a shaped window appears. Close the window with Alt-F4 or include a button for closure. The window will stay on top of other windows, but it is possible for the window to lose focus. If this happens, click on the window before pressing Alt-F4.



Click ShapedDemo1.bas for the entire program.

Demo 2: Creating a Nonrectangular Window from a Bitmap in Memory

The second demo creates a nonrectangular window from a bitmap in memory. This demo draws the image, but you could just as easily load the bitmap from file using Loadbmp. The stylebits _WS_BORDER is used to remove the graphicsbox border.

```
'Define the Window
    WindowWidth = 250
    WindowHeight = 250
    UpperLeftX = int((DisplayWidth-WindowWidth)/2)
    UpperLeftY = int((DisplayHeight-WindowHeight)/2)

    stylebits #ShapeWindow.gb, 0, _WS_BORDER, 0, 0
    graphicbox #ShapeWindow.gb, 0, 0, 250, 250
    stylebits #ShapeWindow, 0, 0, _WS_EX_TOPMOST, 0

    open "Shape Window" for window_Popup as #ShapeWindow
    #ShapeWindow "trapclose [closeShapeWindow]"

'Obtain the Handles and Device Controls
    hBw = hWnd(#ShapeWindow)
    hBgb = hWnd(#ShapeWindow.gb)
    hDCw = GetDC(hBw)
    hDCgb = GetDC(hBgb)

'Draw the Shape
    #ShapeWindow.gb, "Down; Fill Black"
    Gosub [drawShape]

    Wait
```

Once again, after the shapes are drawn, the background color is set to transparent before writing the graphic text. A region to hold the contents of the new window is defined.

```
'Set region to null
    hRgn = RectRegion(0, 0, 0, 0)
```

The shapes are drawn and text is written.

```
'Draw a Rectangle
    #ShapeWindow.gb "color darkblue; backcolor blue"
    #ShapeWindow.gb "place 50 200; boxfilled 225 225"

'Set background to Transparent
    Call SetBkMode hDCgb, 1
```

```
'Release memory
    Call ReleaseDC hBgb, hDCbg

'Format and write text
    #ShapeWindow.gb "font Courier_New 16 86 Bold"
    #ShapeWindow.gb "color darkgreen; place 5 210"
    #ShapeWindow.gb "\Alt-F4 to Close"
    #ShapeWindow.gb "flush"
```

Each pixel must be now be read. The background color is black, as defined by

```
    #ShapeWindow.gb, "down; fill black"
```

so only **NON-black pixels** will become part of the new region, hRgn. Using a nested loop, the pixels can be searched across and down.

```
'Read each pixel.  Add each pixel to hRgn only if
'color is NOT black (0)
    For x = 0 to 250
        For y = 0 to 250
            If pixelColor(hDCgb, x, y) <> 0 Then
                hTempRgn = RectRegion(x, y, x+1, y+1)
                newRgn = CombineRgn(hRgn, hRgn, hTempRgn, 3)
                Call DelObject hTempRgn
            End If
        Next y
    Next x
```

Each 2x2 block becomes a region. If the upper left corner pixel is not black, then that newly created tiny region (hTempRgn) becomes part of the final region (hRgn). If the upper left corner pixel is black, then it's not.

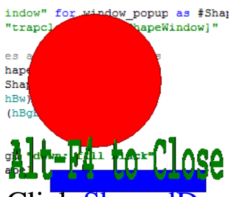
A word about searching by pixel. Reading pixel by pixel is a slow process. If you run the demo included in the files archive, be sure to allow 30 - 60 seconds before the background disappears. Larger bitmaps will take considerably longer.

Once the newly formed region, hRgn, is complete, that region is set as the window.

```
'Set the region as the Window
    Call SetWindowRgn hBw, hRgn, 1
```

As a reminder, API created objects remain in memory until deleted. When closing the window, be sure to release the memory with DelObject.

```
[closeShapeWindow]
    Call DelObject hBw
    Close #ShapeWindow
    End
```



```
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```

Click ShapedDemo2.bas for the entire program.

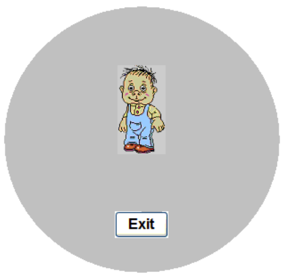
Demo 3: Shaped Windows Without Graphicboxes

Neither graphics nor graphicboxes are required for shaped windows. An advantage to not using drawn graphics is that there is no need to flush the drawings. Also, other GUI controls, such as buttons, listboxes, etc. can be included within the GUI. Controls cannot be reliably placed in a graphicbox. Images are loaded onto a regular window as statictext using the stylebits _SS_BITMAP and __SS_CENTERIMAGE. (See Stylebits - Statictext.)This method does require a defined shape, though, such as CreateRectRgn or CreateEllipticRgn. The window is then defined with SetWindowRgn. ShapedWindowDemo3.bas uses this technique. The demo requires the boy.bmp image, or any other image of your choice.

[boy.bmp](boy.bmp)

- Details
- Download
- 16 KB

Click ShapedDemo3.bas to view the entire program.



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