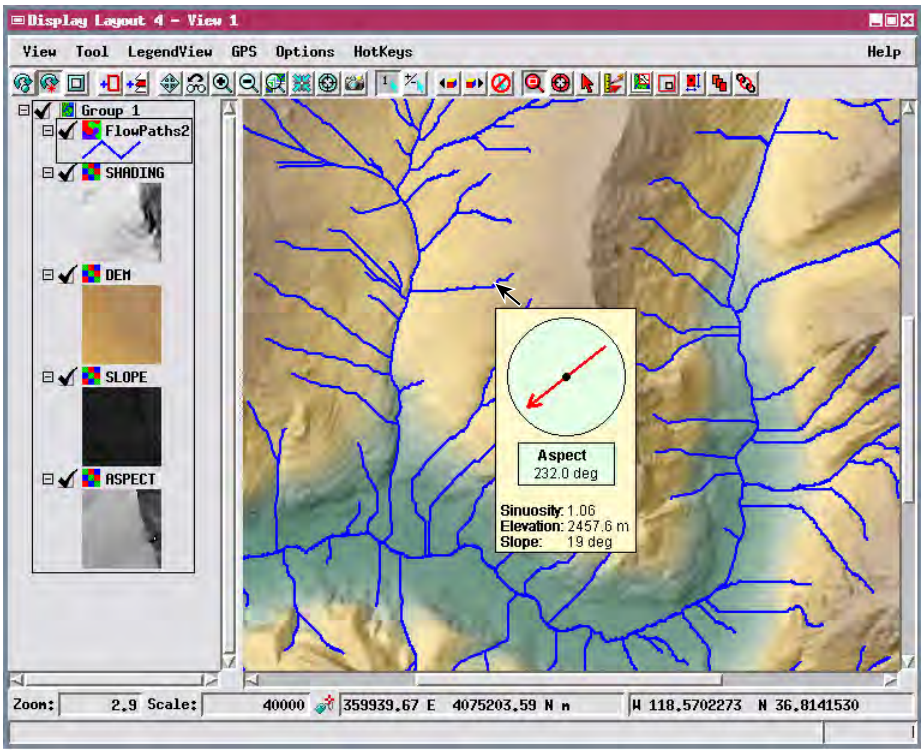
Sample Geospatial Script

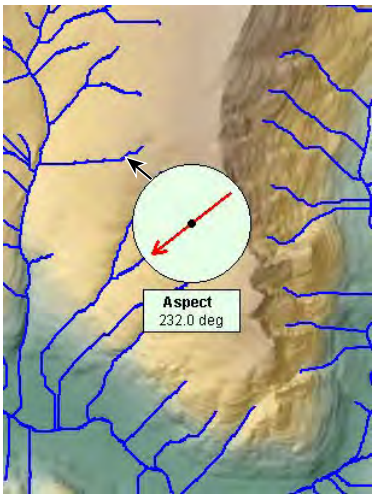
Using Graphics in Complex DataTips

Display control scripts allow you to add custom text and rich, context-sensitive graphical information to DataTips in groups, layouts, and atlases. A control script can read values from the raster cells and geometric elements at the cursor location, perform calculations if needed, and create charts, graphs, or other specialized graphics for presentation in the DataTip. You can configure the script to use the graphic alone (with transparent background) or embed the graphic in the default rectangular DataTip with background color and border. The script can also either allow or suppress the DataTip information that has been set outside the script for the various layers in the view.

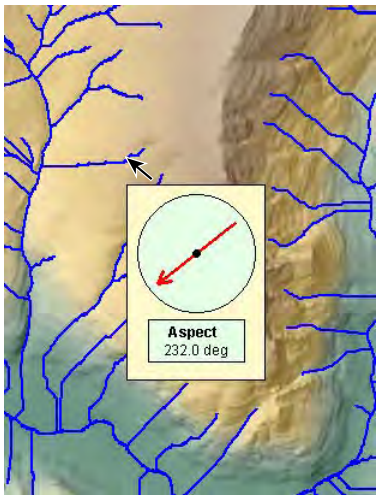
The illustrations on this page show these DataTip context options for a sample control script graphic. Each of the three sample control scripts reads the cell value under the mouse cursor from an ASPECT raster layer, creates a graphic with a pointer showing this aspect direction, and creates formatted text to report the numerical value. AspectTip1.sml shows only the aspect graphic with no DataTip background. AspectTip2.sml embeds the graphic in the normal colored DataTip background and border, but shows no information from other layers in the layout. AspectTip3.sml embeds the graphic in the normal DataTip background but also allows attribute information from other layers in the layout to appear (as designated by the settings on the DataTip panel of the Layer Controls window for each layer; see the Technical Guide entitled *Spatial Display: Designing Complex DataTips*).



AspectTip3.sml: Display layout with complex DataTip incorporating a graphic created by this Display Control Script. The graphic is created from the cell value read from the ASPECT raster object. The script adds this graphic to the DataTip information drawn from the SLOPE, DEM, and FlowPaths2 layers.



AspectTip1.sml: Display Control Script creates DataTip with aspect graphic only; no DataTip background or border.



AspectTip2.sml: Display Control Script creates DataTip with aspect graphic and default background color and border.

The bulk of the code for these three scripts is identical; only a few lines of code differ to produce these variations in DataTip context. The relevant excerpts of AspectTip1.sml are shown on the reverse side of this page, with the salient code section highlighted; the matching salient sections of the other two scripts are also shown for comparison, along with illustrations of the resulting DataTips.

Many sample scripts have been prepared to illustrate how you might use the features of the TNT products' scripting language for scripts and queries. These scripts can be downloaded from www.microimages.com/downloads/scripts.htm.

Excerpts and Variations for AspectTip Scripts

Red-boxed code sections below in AspectTip1, AspectTip2, and AspectTip3 determine the DataTip form.

Global Variables

```
class RVC_RASTER ASPECT;                    the aspect raster object
class GRE_LAYER aspectLayer;                the layer containing the aspect raster
class GRDEVICE_MEM_RGBA dev;                RGB Alpha (opacity) graphics rendering device in memory for drawing in DataTip
class COLOR transparent(0, 0, 0, 0);        transparent color to clear device
numeric height, width;                      height and width of graphics rendering device
```

procedure called when group or layout is initialized

```
proc OnInitialize () {
   width = 110;                             set width of rendering device in pixels
   height = width * 1.45;                   set height of rendering device in pixels
   dev.Create(height, width);               create graphics rendering device
   }
```

```
func OnViewDataTipShowRequest (             function called when DataTip request is made
  class GRE_VIEW view,
  class POINT2D point,
  class TOOLTIP datatip
  ) {
```

get transform from screen to layer coordinates and convert cursor position to layer coordinates

```
 trans = view.GetTransLayerToScreen(aspectLayer, 1);
  point = trans.ConvertPoint2DFwd(point);
  lin = floor(point.y);     col = floor(point.x);     line and column position of cell under cursor

  aspect = ASPECT[lin, col];                get cell value from ASPECT raster

  if (aspect <> ASPECT.$Info.NullValue)     if cursor is not over a null cell
     {
     dev.Clear(transparent);                clear the graphics rendering device
```

Draw static GraphTip elements

```
     gc = dev.CreateGC();                   create graphics context
```

draw background circle for aspect indicator and rectangle for aspect text

```
     center.x = width * 0.5;        center.y = center.x;
     radius = width * 0.45;         boxtop = center.x * 2;
     gc.SetColorRGB(240, 255, 240);
     gc.FillCircle(center.x, center.y, radius);
     gc.FillRect(15, boxtop, width-30, 35);
```

draw black circle outline and black rectangle outline

```
     gc.SetColorName("black");
     gc.DrawCircle(center.x, center.y, radius);     circle outline
     gc.DrawRect(15, boxtop, width-30, 35);         rectangle outline
```

set parameters for drawing Aspect text label in rectangle

```
     gc.DrawTextSetFont("ARIALBD.TTF");
     gc.DrawTextSetHeightPixels(12);
     color.Name = "black";
     gc.DrawTextSetColors(color);'
```

draw centered Aspect label in rectangle

```
     start = center.x - ( gc.TextGetWidth("Aspect:") * 0.5 );
     gc.DrawTextSimple("Aspect", start, boxtop + 15);
```

set aspect text and pointer parameters

```
     gc.DrawTextSetFont("ARIAL.TTF");           font for aspect value string

  if (aspect == -1) {                           flat area with aspect undefined; only write string
        aspect$ = "Undefined";
        start = center.x - ( gc.TextGetWidth(aspect$) * 0.5 );
        gc.DrawTextSimple(aspect$, start, boxtop + 30);
        }
```

draw aspect value and pointer

```
  else {
     aspect$ = sprintf("%.1f deg", aspect);     create and draw aspect label string

     start = center.x - ( gc.TextGetWidth(aspect$) * 0.5 );
     gc.DrawTextSimple(aspect$, start, boxtop + 30);

     aspectDrawAngle = (aspect - 90);           drawing angle for aspect pointer
     arrowLength = 40;
     gc.SetLineWidth(3);                        set line width to 3 pixels for pointer
```

find and store coordinates of end of pointer line

```
     arrowEnd.x = center.x + arrowLength * cosd(aspectDrawAngle);
     arrowEnd.y = center.y + arrowLength * sind(aspectDrawAngle);
```

move to start of pointer line and draw to end

```
     gc.MoveTo( center.x - arrowLength *
        cosd(aspectDrawAngle), center.y - arrowLength *
        sind(aspectDrawAngle) );
     gc.SetColorName("red");
     gc.DrawTo(arrowEnd.x, arrowEnd.y);
```

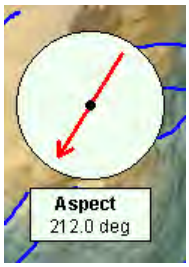
draw arrowhead and small black circle at center of rotation of pointer

```
     gc.DrawArrow(arrowEnd.x, arrowEnd.y, aspectDrawAngle, 9, 30, "Open");
     gc.SetColorName("black");
     gc.FillCircle(center.x, center.y, 3);
```

AspectTip1.sml

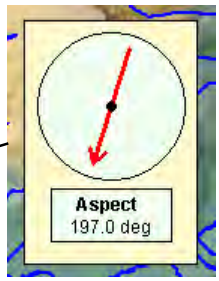
```
     set graphics device as an image in the DataTip
     datatip.SetImageTip(dev);
     use only the image, suppress the DataTip frame
     return -1;
     }
  }                                             end if not over null cell

else return -1;                                 if outside ASPECT raster or on null cell, don't show any DataTip
}                                               end OnViewDataTipShowRequest
```



Substituted in AspectTip2.sml

```
append the graphics device to the DataTip
datatip.AppendImage(dev);
datatip.AppendText("\n");
render image in normal DataTip frame, suppress entries from other layers
return 1;
```



Substituted in AspectTip3.sml

```
append the graphics device to the DataTip
datatip.AppendImage(dev);
set font for following entries
datatip.AppendText("{~FARIAL.TTF}\n");
render image in normal DataTip frame, allow entries from other layers
return 0;
```