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Vector Editor Module

Vector graphics are the best choice for the integration of graphics in a document because they are resolutionindependent. Vector graphics can be magnified or shrunk without affecting the quality of the image. It does not matter if you output at 300 dpi on a dot matrix printer or on an imagesetter at 2540 dpi - the result, relative to the precision of the output device - is free of distortion.

The Vector Editor module contains many powerful tools for creating vector graphics or editing existing ones. These tools allow you to set and move points, change path direction, close and smooth paths, and fill polygons. The Vector Editor module also includes tools to cut and paste paths, exchange lines and Bézier curves, and show tangents. You can select color and fill patterns for raster areas and borders. There is a command group to choose line style, line ends, line weight and line color. The Vector Editor module can also convert the contents of text, line or raster area frames into a vector graphic.

The Vector Editor module is loaded when Calamus is launched. If it is not loaded, click Modules in the Options menu and load VECTOR.CXM in the Modules dialog box. If you wish the module to load automatically, click Save System Setup in the Options menu. To access the Vector Editor module, click its icon in the Module Row. As with all modules, the Vector Editor module can be deleted when not in use.

The Vector Editor module does not work at the frame level. To create or edit objects in a vector graphic frame, select a vector graphic frame and then click the Open Vector Editor icon. Objects are edited inside the Vector Editor. The edited object can then be exported to the selected vector graphic frame. As with all frame types, the vector graphic frame can be resized, rotated or moved.

Vector Graphics - Overview
Vector Editor Module Command Groups

Vector Graphics - Overview

A vector graphic frame usually contains several vector objects, each of which consists of one or more paths. A path is made up of lines and Bézier curves joined together. All elements of the path have the same line type, and surround the same fill pattern. Each object has a fill color and pattern and a line type, color and style. Vector graphic objects are similar to raster area shapes in the Raster Area module.

Many features in the Raster Area module are available in the Vector Editor module. Simple raster area shapes, identical to those in the Raster Area module, are available as vector objects. The Color Settings and Border command group functions are also available in this module. By using the Vector Editor module, you can edit objects as you wish, or merge them with an existing vector object.

Vector Paths

Vector Paths

A path consists of multiple points which are connected by using straight lines or Bézier curves. You may be familiar with straight lines, but Bézier curves require definition. Besides the start and end points, Bézier curves are defined by two more points, called control points. Control points influence the appearance of the curve. The Bézier curve adjusts itself relative to a line connecting an end point and a control point. The distance between a control point and an end point defines a curve's degree of rounding.

A path can consist of several joined lines and/or Bézier curves. The resulting path is open or closed.

The start point of each path is indicated by a triangle; all other points are indicated by an empty box. Bézier curve control points appear as small crosses. If an object consists of more than one path, you can count the number of triangles to determine how many paths make up the object.

An object contains a fill color and pattern, and a border with a line style, line weight and line color. The same color, pattern and line attributes apply to the entire object.

It is not possible to create vector objects with holes in them, because objects can only have one fill pattern. To create an object with a hole, two paths are required; a path which is filled with white and a path containing the other fill pattern. The white path is then placed on top of the path with the fill pattern.

The part of an object that is contained within two paths running in opposite directions is not filled. Imagine a filled O. The outer path and inner path are running in the same direction; therefore the object is completely filled. By reversing the direction of the inner path, a white hole is created.

Vector Editor Module Command Groups

Working in the Vector Editor module is much like working in the Text or Text Style module. After selecting a vector graphic frame, you can create, modify or delete objects in that frame. The Object Mode, Color Settings and Border command groups let you to work at the object level. The Path Mode command group lets you to work with the paths which make up the objects. Each command group can be accessed by selecting its icon.

Object Mode Command Group
Objects Command Group
Path Mode Command Group
Color Command Group
Border Command Group

Object Mode Command Group

Functions:
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[Group Objects](#)
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[Shrink Frame to Objects](#)
[Join Objects](#)
[Miscellaneous Settings](#)
[Transform Object](#)
[Rotate Object](#)
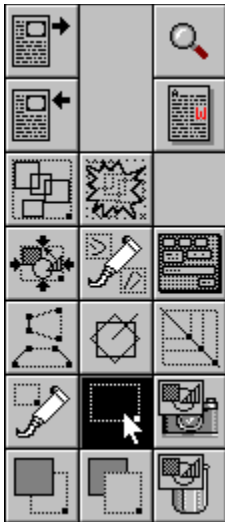[Size Object Proportionally](#)
[Create Object](#)
[Select Object](#)
[Copy Object](#)
[Place Object in Background](#)
[Place Object in Foreground](#)
[Delete Object](#)

Open Vector Editor

Whether creating a vector graphic or modifying an existing one, you must select a vector graphic frame before clicking the Open Vector Editor icon. The contents of the selected vector graphic frame will be imported into the Vector Editor. Once the Vector Editor is open, you can use any of the tools in its command groups to create or modify vector objects. The work area is defined by the size of the vector graphic frame being edited.

The Open Vector Editor function is also used to convert text, raster area and line frames to vector objects. (Raster graphics cannot be converted to vector objects.) These vector objects can then be modified. Once a frame type has been converted to a vector object, it cannot be returned to its original state.

Raster graphic frames can be used as background images in the Vector Editor. Both the raster graphic frame and the vector graphic frame must be selected prior to opening the Vector Editor. The contents of the raster graphic frame will be displayed in the background of the Vector Editor; the contents of the vector graphic frame will be in the foreground. You can only alter the vector objects in the foreground but you can trace the background raster graphics. Tracing is used to create vector objects for use in the Mask module.

Close Vector Editor

Clicking this icon will close the Vector Editor and return you to the layout window. The contents of the Vector Editor will be exported to the selected vector graphic frame.

Magnify View

The magnifying glass icon in the Vector Editor works like the one found in the Toolbar. Clicking the icon will change the pointer to a magnifying glass and let you magnify an area inside the Vector Editor.
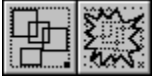
Full Size View

Clicking this icon will return the Vector Editor window to its original size, thereby making all vector objects visible.

Group/Ungroup Objects

These functions are identical to those in the Frame module. Select two or more objects and click the Group Objects icon to join them. Click Ungroup Objects to separate joined objects.

Shrink Frame to Objects

Clicking this icon will shrink the vector graphic frame to its smallest possible size without affecting the contents. This function is handy if you have deleted objects from a vector graphic and there is unwanted space in the frame.

Join Objects

This function combines selected objects into a single vector object. Select all the objects you wish to join and click the Join Objects icon. The group object can be resized, rotated or manipulated like a single object.

Miscellaneous Settings

This function lets you change several settings for working in the Vector Editor module. When you click the icon, this dialog box will appear:
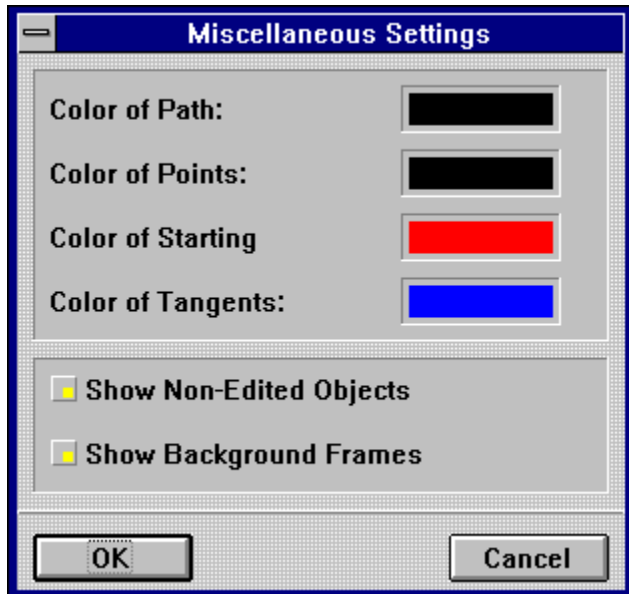
The dialog box lets you adjust the colors of the path components.

Show NonEdited Objects will display all objects when working in Path mode. To show only the object being edited, deselect this option. This method is useful when editing the paths of overlapping objects.

If you have a raster graphic frame as a background frame, it can be shown or hidden by using Show Background Frames. Deselect this option to hide a raster graphic frame until you want to see it.

Transform Object

You can transform one or more selected objects by using this function. Click the Transform Object icon to display its dialog box. Objects can be transformed, presented three-dimensionally or projected. It is possible to use complicated mathematical formulas to create some fascinating transformations. The possibilities are too numerous to list here although Bronstein is an excellent resource. Experimentation is recommended but work on a copy of a vector object; change one value at a time to explore the effects. Transformations are irreversible.

Rotate Object

Vector graphics can be rotated without loss of quality because their paths are recalculated after each rotation. Select one or more objects and click the Rotate Object icon. If you have selected more than one vector object they will be temporarily grouped. The Rotate Object dialog box will appear:
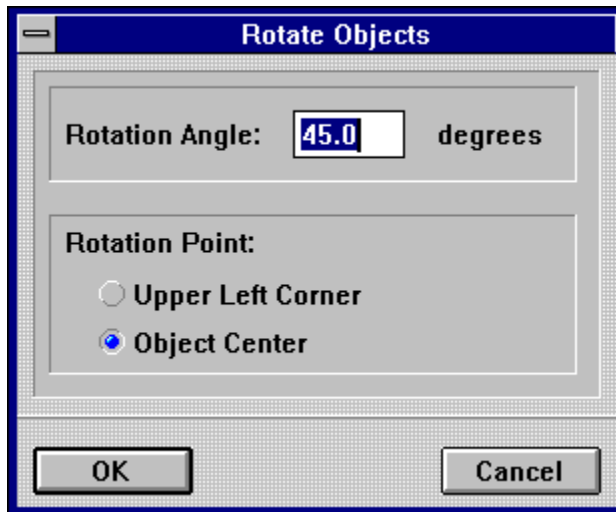
Within this dialog box you can specify the rotation angle and rotation point: either the upper left corner or the center of the object (or group of objects).

Size Object Proportionally

If this icon is selected, objects will be resized proportionally: a circle cannot be turned into an ellipse; a square cannot be turned into a rectangle. The frame handles will appear only in the four corners. Click and drag a corner handle to resize an object proportionally.

Create Object

After you have entered the Vector Editor, you can create a new vector object. An object consists of one or more paths which have a fill color, fill pattern and line type. When this icon is selected and you click inside the Vector Editor window, the pointer changes to the cross hair cursor. Click once to begin drawing; click again to finish. The shape selected in the Objects command group will appear inside the object frame you have just drawn. You can now modify its color, fill pattern, shape, size and position. You can also use the transformation or rotation function, see above.

Select Object

The Select Object function lets you select vector objects. Vector objects can be selected by clicking them. It is possible to select more than one object at a time by pressing [Shift] while clicking each object. Multiple objects can also be selected by drawing a rubber band frame around them. Only objects completely within the rubber band will be selected. You can cycle through overlapping objects by clicking repeatedly until the desired object frame is selected.

Click the right mouse button to switch between Select Object and Create Object mode.

Copy Object

To copy one or more vector objects, select them and click the Copy Object icon. A copy of each selected frame will be made below and to the right of the original object(s). The copies will be physical; virtual copies are not available in the Vector Editor module.

Place Object in Background/Foreground
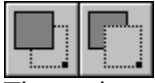
The order of overlapping vector objects can be changed using either of these functions. To move a selected object to the foreground, click the Place Object in Foreground icon. To move a selected object to the background, click the Place Object in Background icon.
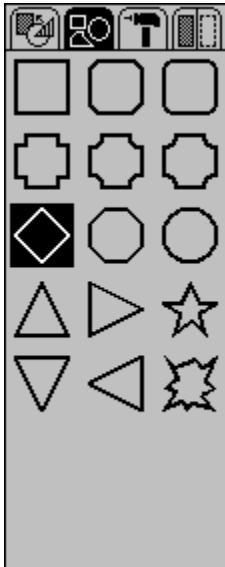
Delete Object

Clicking this icon will delete the selected vector object(s). An alert will ask you to confirm deletion.

Objects Command Group

This command group lets you select the shape of vector objects you create. The selected shape will be drawn when you create an object in the Vector Editor. When you create a vector object, its fill color and border color are black. The color may be changed by using the functions in the Color Settings and Border command groups. You can alter any predefined shape by using the tools available in the Path Mode command group.

Unlike the Raster Area module, there is no Shadow command group in the Vector Editor module. Shadows must be created manually by creating a second, darker object and placing it behind the first object.

Path Mode Command Group

Functions:
[Add Line](#)
[Add Bézier Curve](#)
[Magnify View/Full Size View](#)
[Select/Move Point](#)
[Delete Point](#)
[Add Point](#)
[Reverse Path Direction](#)
[Close and Round Path](#)
[Convert Line <-> Bézier Curve](#)
[Join Paths](#)
[Separate Paths](#)
[Show Tangents](#)
[Cut Path from Object](#)
[Copy Path](#)
[Delete Path](#)

The commands in this group let you edit vector paths which are used to create vector objects.

Add Line

This function and the next one determine whether a straight line or a Bézier curve will be drawn when a point is added to a path. If this icon is selected, a straight line will be added.

Add Bézier Curve

When this icon is selected, any point added to a path will be connected by a Bézier curve rather than a straight line. Two control points lie near the middle of a Bézier curve. When created, a Bézier curve is straight. The control points may be manipulated to change the shape of the curve. These control points are components of the Bézier curve; they are not part of the vector path.

Magnify View/Full Size View

While working in Path mode, these two icons can be used to switch between a userdefined magnification and full size view. These icons are explained above in the Object Mode command group.

Select/Move Point

To move path or control points, this icon has to be selected. A single click with the left mouse button on a point will select it. If you want to select more than one point, press [Shift] while you click each point. Multiple points can also be selected by drawing a rubber band frame around them.

If you press [Control] and click a point, all points in that path, including tangent points, will be selected.

Pressing the right mouse button will toggle between Select/Move Point mode and Add Point mode. The right mouse button will also deselect the selected path points.

Delete Point

This icon is used to delete individual path points. Clicking it will change the pointer to a pliers shape. Click the pliers on any point to remove it. If a control point is removed, the associated Bézier curve will be deleted.

Add Point

This function lets you create a new path or add points to an existing path. When you select this icon, the pointer will change to a hammer shape. Each time you click in the editor window, a point is created and connected to the previous point by a straight line or Bézier curve, depending on the icon selected (Add Line or Add Bézier Curve, see above).

To add points to an existing path, click the end point of the path, then click the Add Point icon; each successive click will add a new point, connected to the previous point by a straight line or Bézier curve.

Note that Bézier curves appear as straight lines with control points until you use the Close and Round Path function, see below, to curve the lines.

Pressing the right mouse button will toggle between Add Point mode and Select/Move Point mode.

Reverse Path Direction

This function lets you reverse the direction of a path. Clicking its icon makes the pointer resemble the icon. Clicking any point on a path will reverse that path's direction, so that the end point becomes the start point and vice versa. As mentioned in the introduction of this section, changing a path's direction will affect the fill pattern of the object if paths overlap. The start point of a path appears as a triangle. The end point and points along the path appear as hollow squares.

Close and Round Path

This command has two functions: it closes a path and it rounds curves. A closed path is a path where both the start and end points are in the same location. Clicking this icon will make the pointer resemble the function's icon. Click any point on a path and the end point will be moved on top of the start point; the two points will be joined, effectively closing the path. If there are Bézier curves in the path, they will be rounded. The icon remains selected so you can close and round other paths. Pressing the right mouse button switches to Select/Move Point mode.

Convert Line <-> Bézier Curve

When modifying a path, you may want to have a straight line where there is a Bézier curve or vice versa. First, click this icon, then click the point where the particular line or curve ends. When you convert lines to Bézier curves, new curves will not be rounded until you use the Close and Round Path function. This icon will remain selected so you can convert other points.

Join Paths

This function lets you join two separate paths. Select the end point of one path and drag it on top of the start point of another path. Select the Join Path icon and, with the glue bottle pointer, click these points to join them. You can also join two end points or two start points; the direction of one of the paths will be changed.
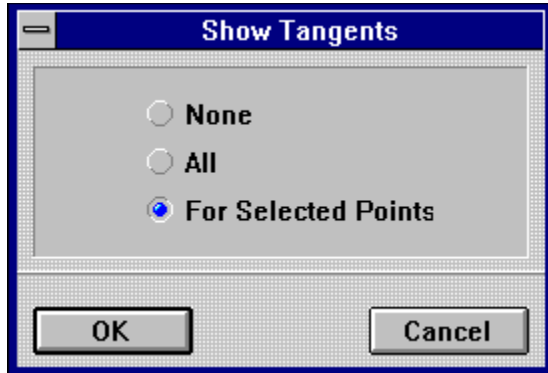
Separate Paths

This function is the opposite of the previous one. If this icon is selected, every time you click a point in a path, the path will be divided in two at that point. This function cannot be used on the start or end points of a path. When selected, the pointer will appear as a pair of scissors.

Show Tangents

You can show the tangents between path points and control points to better see a path's construction. Click this icon to show tangents; click again to hide tangents.

Click this icon to [DELETE]: show tangents; click again to hide tangents.] call the Show Tangents dialog box. Click None to hide all tangents; click All to show all tangents. Click For Selecyed Points to show tangents for points which are selected.

Cut Path from Object

This function lets you remove a path from an object. The path will become a separate, independent object. This function is the opposite of the Join Objects function in the Object Mode command group. To cut a path, select this icon; then select any point on the path you wish to cut. The icon remains selected so you can cut other paths from the object. Pressing the right mouse button switches you to Select/Move Point mode.

Copy Path

This command lets you copy a path. First, select one or more paths; then click this icon. A copy of the path(s) appears. Only physical copies are possible.

Delete Path

This function lets you delete one or more path points, or entire paths. Select the path points. Click the trashcan icon to delete the path.

Color Command Group

This command group lets you set the color and fill pattern of an object. Select an object and click the desired settings for fill color; the selected color will be applied to the object. Color Settings is a standard element used in many Calamus modules. See Color Settings Module, chapter 4, for more information.
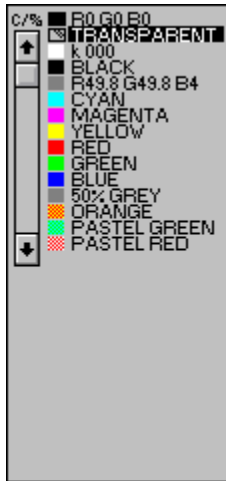
Border Command Group

The border that surrounds each vector object consists of a line that has three attributes: line style, line weight and line color. Select an object and click the attributes you want to change; they will be applied to the border of the selected vector object. Border functions in the Vector Editor module are identical to those described in the Raster Area module, earlier in this chapter.