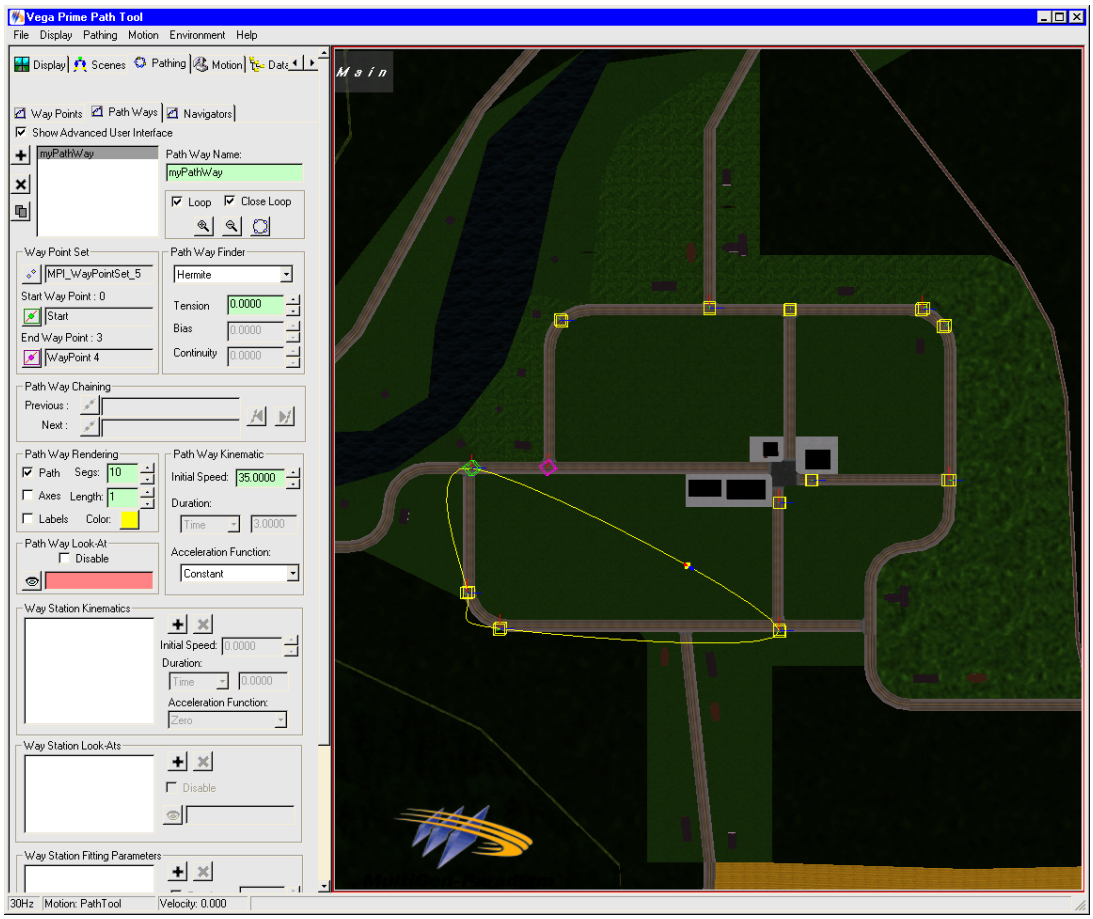
Pathing Tab

Using the Vega Prime Path Tool, located in the Pathing tab, you can design and fine tune a motion model to use in your Vega Prime application.

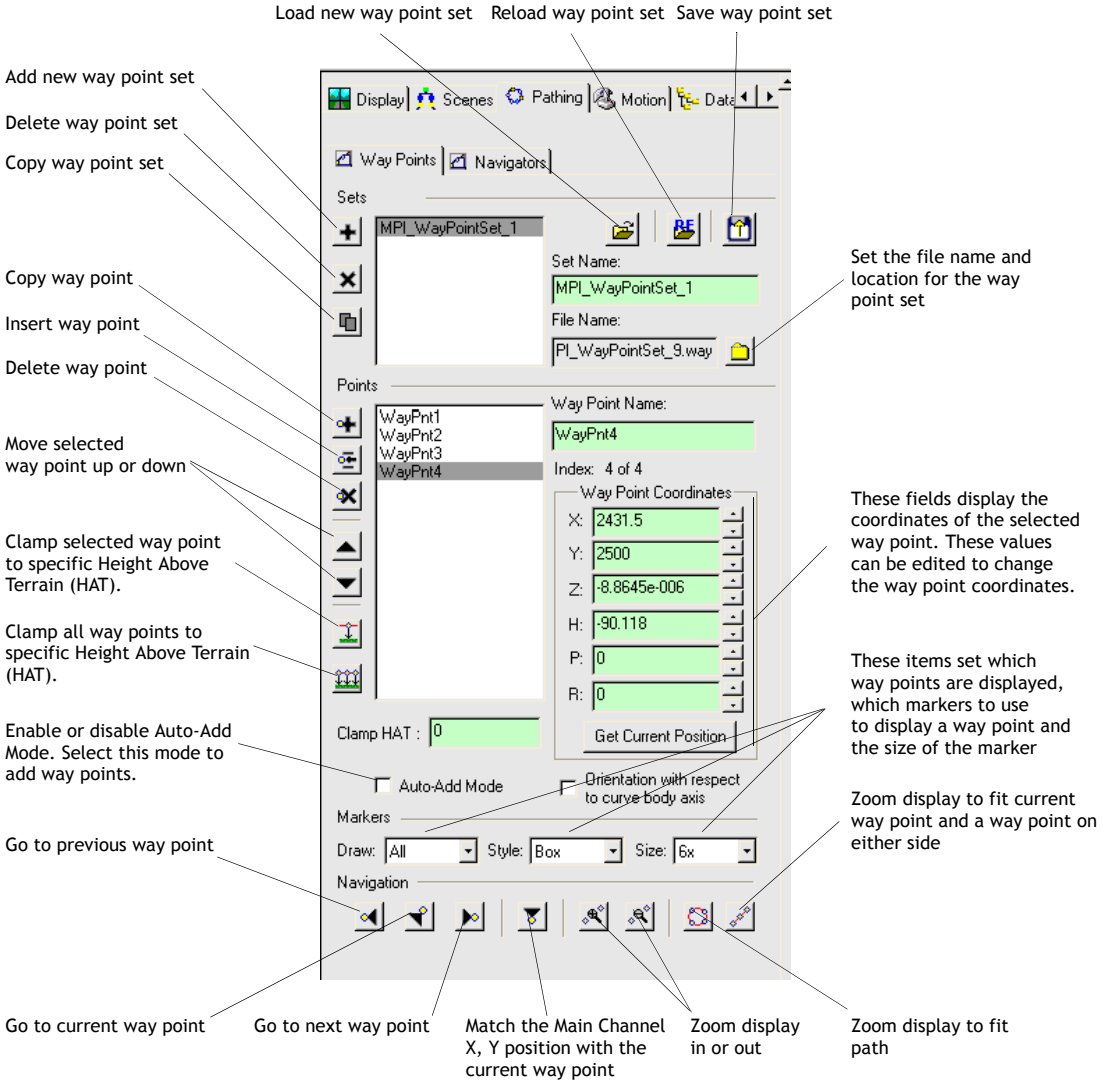
The Vega Prime Path Tool lets you define a set of points (way point set), a pathway traversing those points (pathway) and a description for how those points will be travelled (navigator). For example the speed at various points, is there an object that should be looked at on arriving at the point, or should the navigator stop at a certain point. Once these are created, these can be used as a motion strategy in your Vega Prime application.



The Vega Prime Path Tool contains three tabs: Way Points, Path Ways and Navigator. These tabs enable you to create the component parts of your new motion strategy.

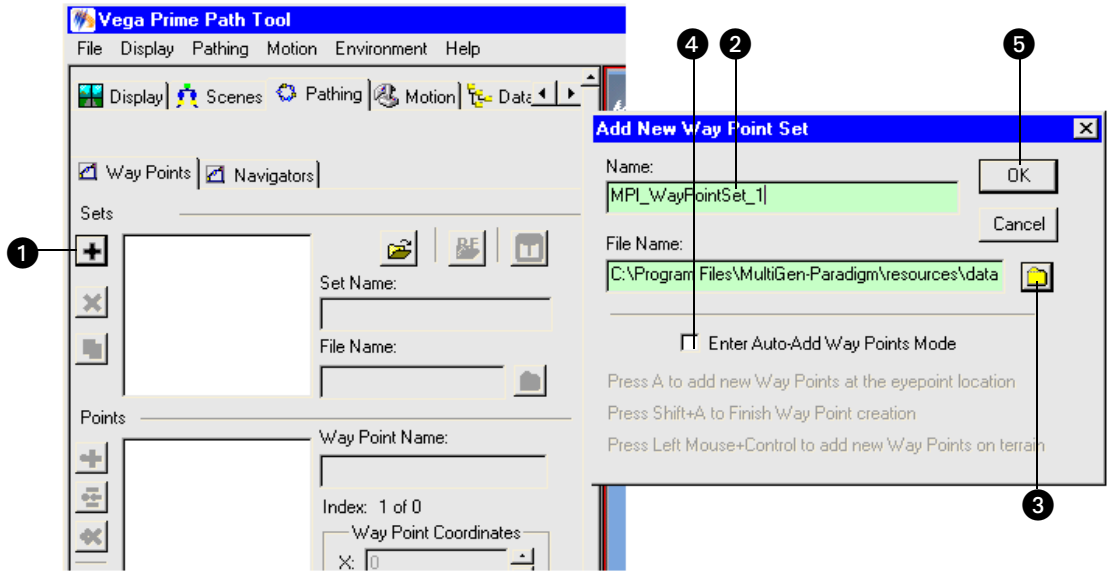
Way Points Tab

In the Way Points tab, you create and edit your way point set. The way point set contains the individual coordinates that describes your path way for your motion model. These are just the points themselves in space. Your Way Points tab should look like the following figure.



Creating a Way Point Set

The following procedure describes how to create a Path Tool Way Point set.

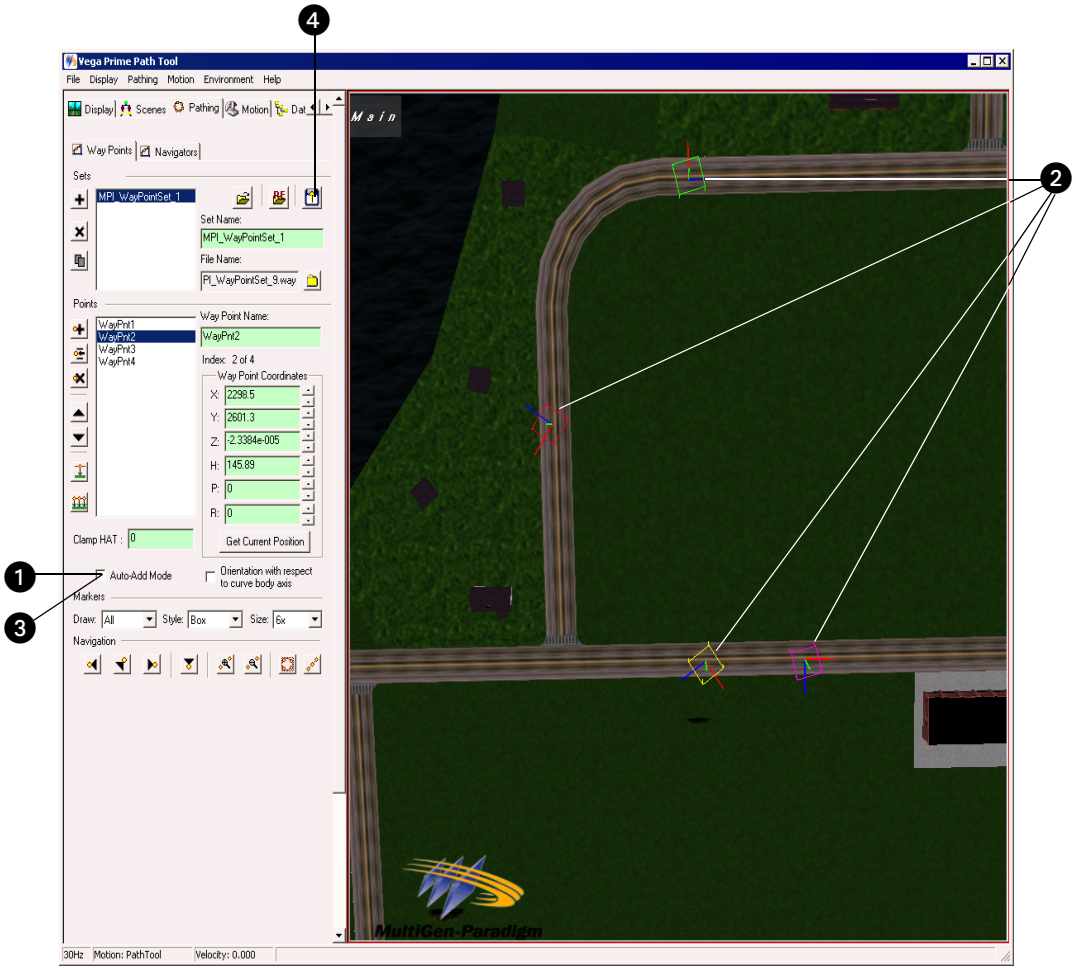


1. Click the **Add New Way Point Set** button. The **Add New Way Point Set** dialog opens
2. To name your way point set, type a name in the **Name:** field.
3. Click the folder button to navigate to the directory where you want to save your way point set and type the file name of your new way point set in the **File Name:** field.
4. Check the **Enter Auto-Add Way Points Mode** if you want to start adding way points as soon as this dialog closes.
5. Click the **OK** button. The dialog closes. If you selected **Enter Auto-Add Way Points Mode**, you are now in way point auto-add mdoe.

Entering Way Points in Auto-Add Mode

There are several ways to get way points into your way point set. You can start adding way points immediately into your way point set when you go into auto-add mode. To add way points to your current way point set, perform the following steps:

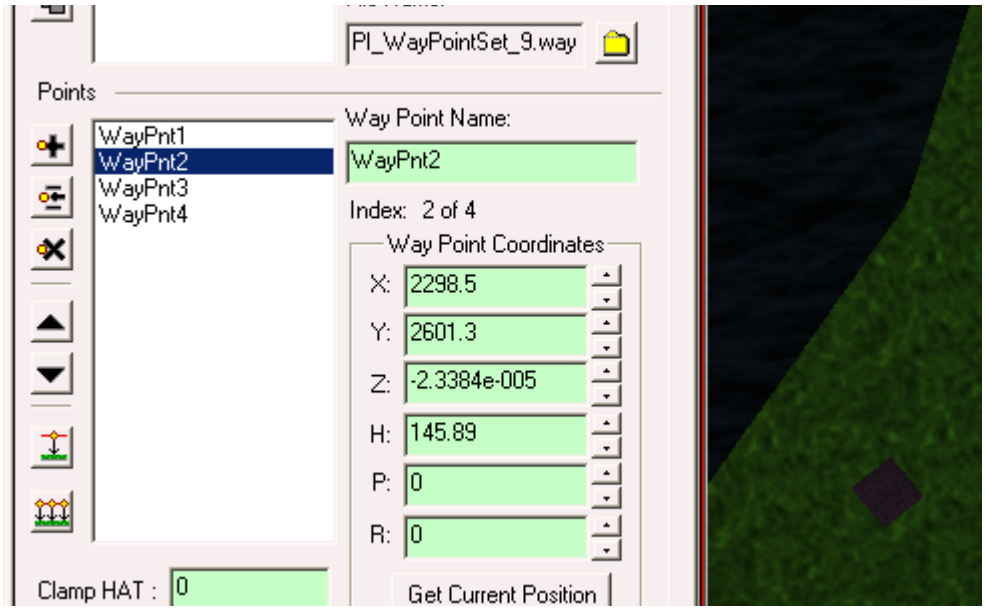
Note: You may want to position your viewing area before you add your new points. This can make it faster adding points in certain areas.



1. Check the Auto-Add Mode box to enter the Auto-Add Mode, if not already in this mode.
2. Ctrl-click the left mouse button to place a way point at the current location. Continue to add more points to your way point set in this manner.
3. When you are finished entering points, uncheck the Auto-Add Mode box to leave the Auto-Add Mode.
4. Click the Way Point Set Save button to save your points. Your points are displayed. The first point created is displayed as a green point. The last point

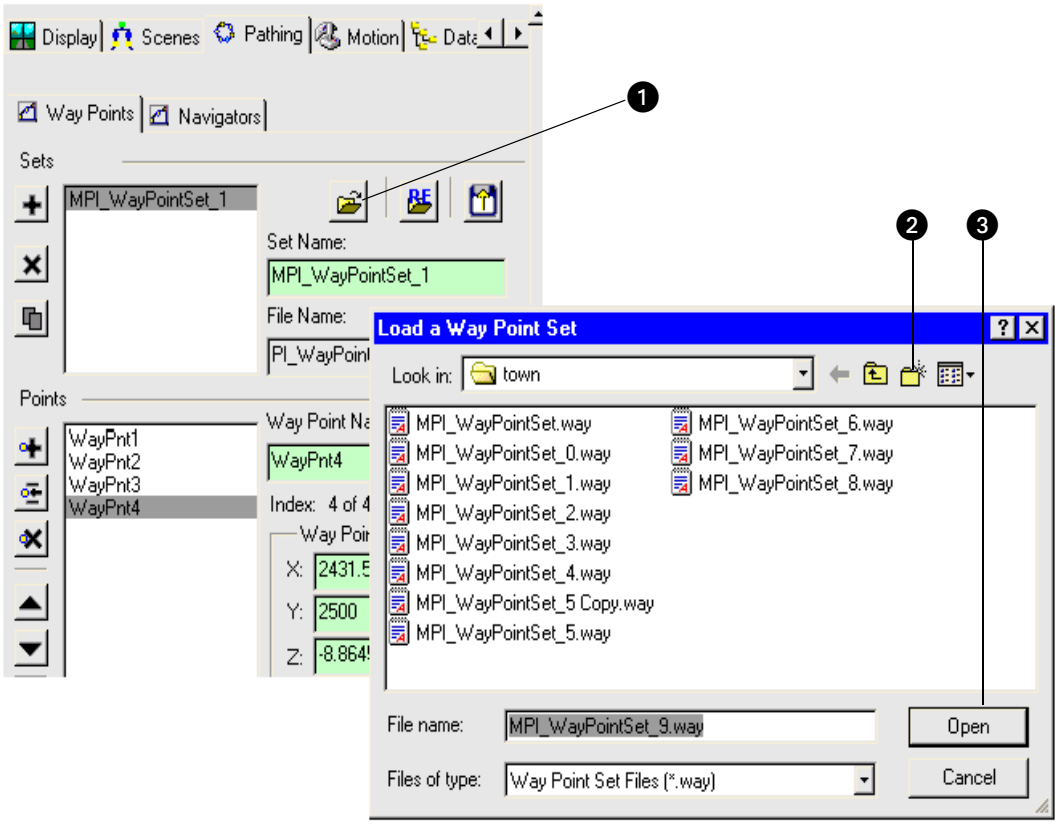
is displayed as a magenta point. The current point selected is displayed as a red point.

Each point that was entered in this set is listed in the Way Point List window similar to the figure below. As more points are added within the current way point set they are displayed in this window.



Adding a Way Point Set

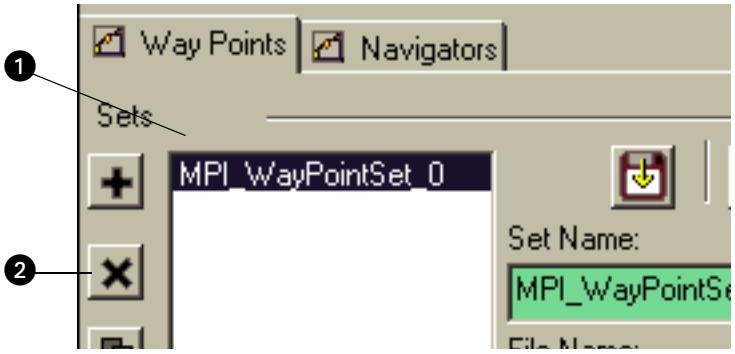
Multiple way point sets can be loaded and accessed during the current session using PathTool. The following procedure describes how to add additional way point sets to the current session.



1. Click the Load Way Point Set button. The **Load a Way Point Set** dialog opens .
2. Click the folder button to navigate to the directory where your way point set is located and type the file name of way point set in the **File Name:** field.
3. Click the Open button. The dialog closes and your way point set is added. The name of this new way point set shows up in the Way Point Set List.

Deleting a Way Point Set

Any way point set can be removed from the currently loaded Way Point Set list. The following procedure describes how to remove a way point set.



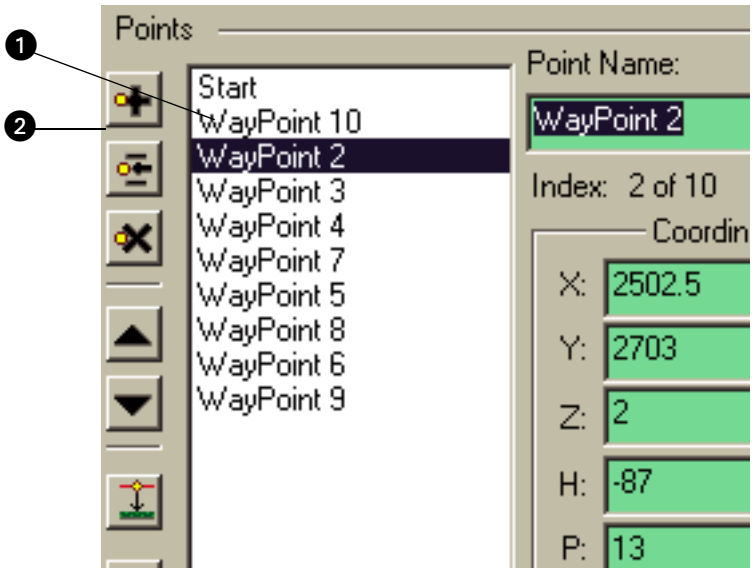
1. In the Way Point Set list box, click the way point set to delete.
2. Click the Remove Way Point set button. The way point set is deleted from the way point sets list box.

Editing Way Points

The Pathtool provides tools to edit individual way points in your way point set. Using these tools you can add new points (using the Auto Add mode), insert new points, delete existing points, or edit the values for current points.

Inserting a new way point

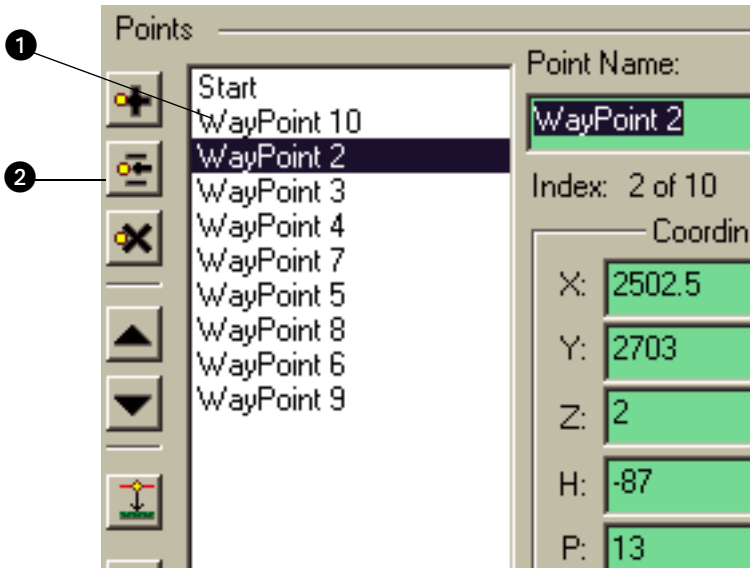
When you add a new way point, you may want to add a way point at a specific location in the way point list. This procedure shows how to add a way point at a specific location.



1. In the way points list, select a way point. Your new way point will inserted above the selected way point.
2. Click the **Insert a New Way Point** button. A new way point, corresponding to your current location, is inserted above the selected way point. This new way point is the latest way point in the set and is numbered accordingly, regardless of location in the way point list.

Deleting a way point.

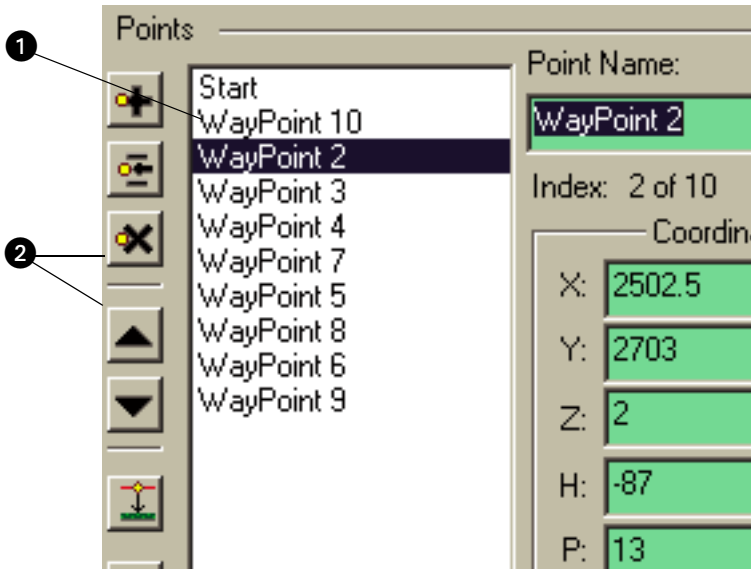
As you manage your way points you may want to delete a way point in your set. The following procedure shows how to delete a way point for the current way point set.



1. In the way point list, select the way point you want to delete.
2. Click the Delete the Current Way Point button. The way point is deleted from the way point list.

Changing a way points order

In your way points list, the order that the points are listed controls the order that the points are traversed. You can change this order for any way point in the set. The following procedure shows how to change the order of a specific way point.

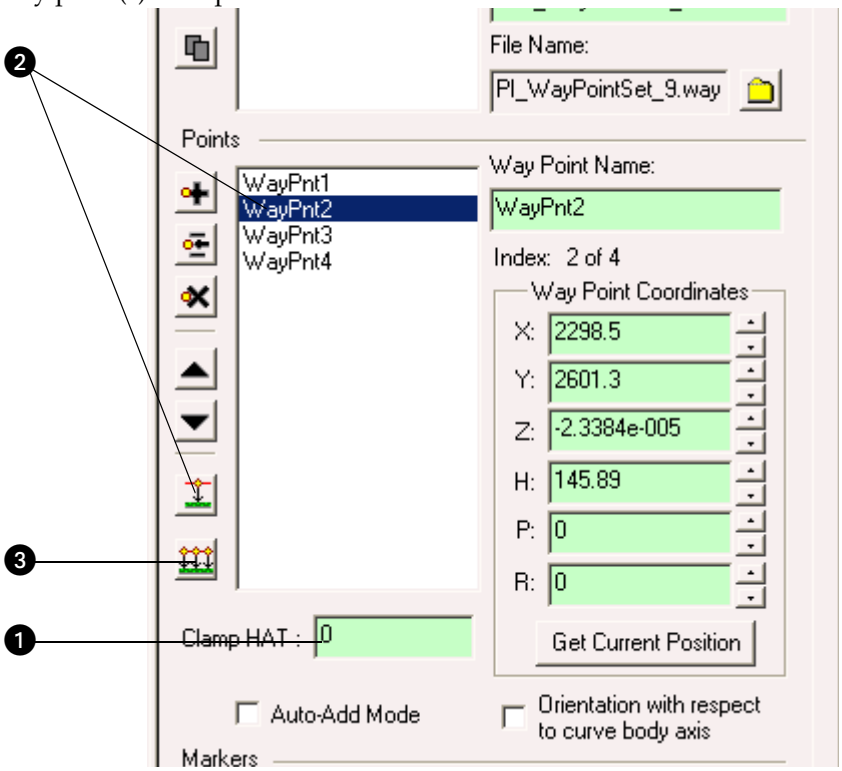


Note: This procedure only changes the order of the selected way point when it is traversed. This does not change the coordinates of the way point.

1. In the way point list, select the way point you want to move.
2. Click either the **Move the Way Point Up** button or the **Move the Way Point Down** button until the way point is located in the new position.

Clamping Way Points

You can change the height above terrain (HAT) for a specific way point or for the entire way point set. You may want to do this if the initial Z-coordinate for a way point or way point set is incorrect. The following procedure shows how to clamp way point(s) to a specified HAT.



1. In the **Clamp HAT** field, enter the value for the height above the terrain.

Note: This value represents the height above terrain, not above 0. An intersection test is done at the way point position. The Z-coordinate of this intersection is added to the HAT value to calculate the new Z-coordinate for the current way point.

2. If you want to clamp a single way point, in the way point list, select the way point and click the **Clamp the Current Way Point to the Clamp HAT** button. The Z-coordinate is updated to the new Clamp HAT value.
3. If you want to clamp all of the way points in the current set, click the **Clamp All Way Points to the Clamp HAT** button. The Z-coordinate for all the way points in the set is updated to the new Clamp HAT value.

Note: Depending on the number of way points in the current set, this operation may take some time because the intersection test is done for each way point.

Changing Coordinates of a Way Point

After you have your way point set, you may want to change some of the coordinates of those way points. Pathtool provides several methods for changing those coordinates. The following procedure shows how to edit way point coordinate values.

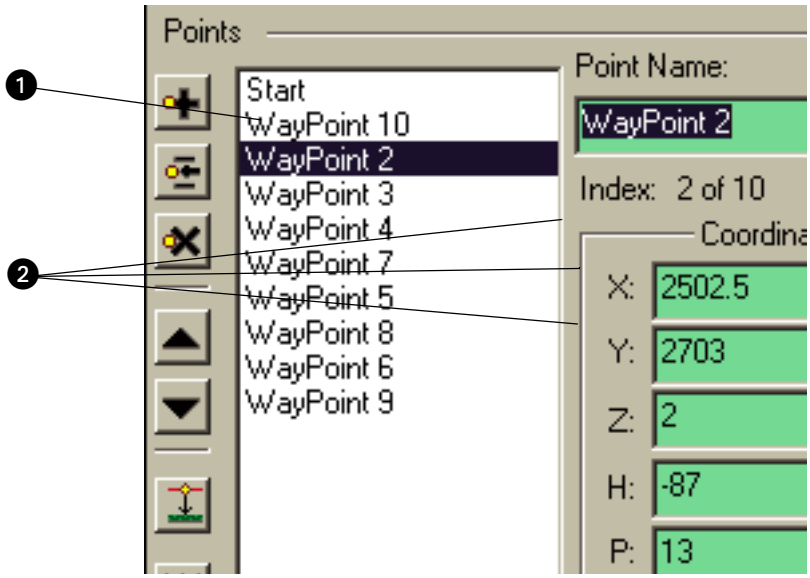
Selecting New Way Point Coordinates Using the Mouse

You can change the coordinates of an existing way point based on the current cursor location. This procedure uses the Path Tool motion model to change the point coordinates.

1. From the Motion pull-down menu select Path Tool if it is not already selected.
2. Position the cursor over the point you want to change and click to select or, in the way points list, click the specific name of the point to change. The selected point is displayed in red.
3. Press the left mouse button and drag the current point to the new location. The coordinates for this point are also updated to their new location.

Changing Individual Way Point Coordinates.

If you need finer control of the location of specific way points, using Pathtool, you can enter specific coordinates for a selected way point. The following procedure shows how to change individual way point coordinates.



1. Position the cursor over the point you want to change and click to select or, in the way points list, click the specific name of the point to change. The selected point is displayed in red.
2. Enter the new X, Y, Z coordinates for the selected way point. The point is displayed in the new location. The coordinates for this point are also updated to their new location.

Setting a Way Point to the Current Position

As you move thru your flight file, you may want to assign your current location to a specific way point. The following procedure shows how to assign your current location to a way point.

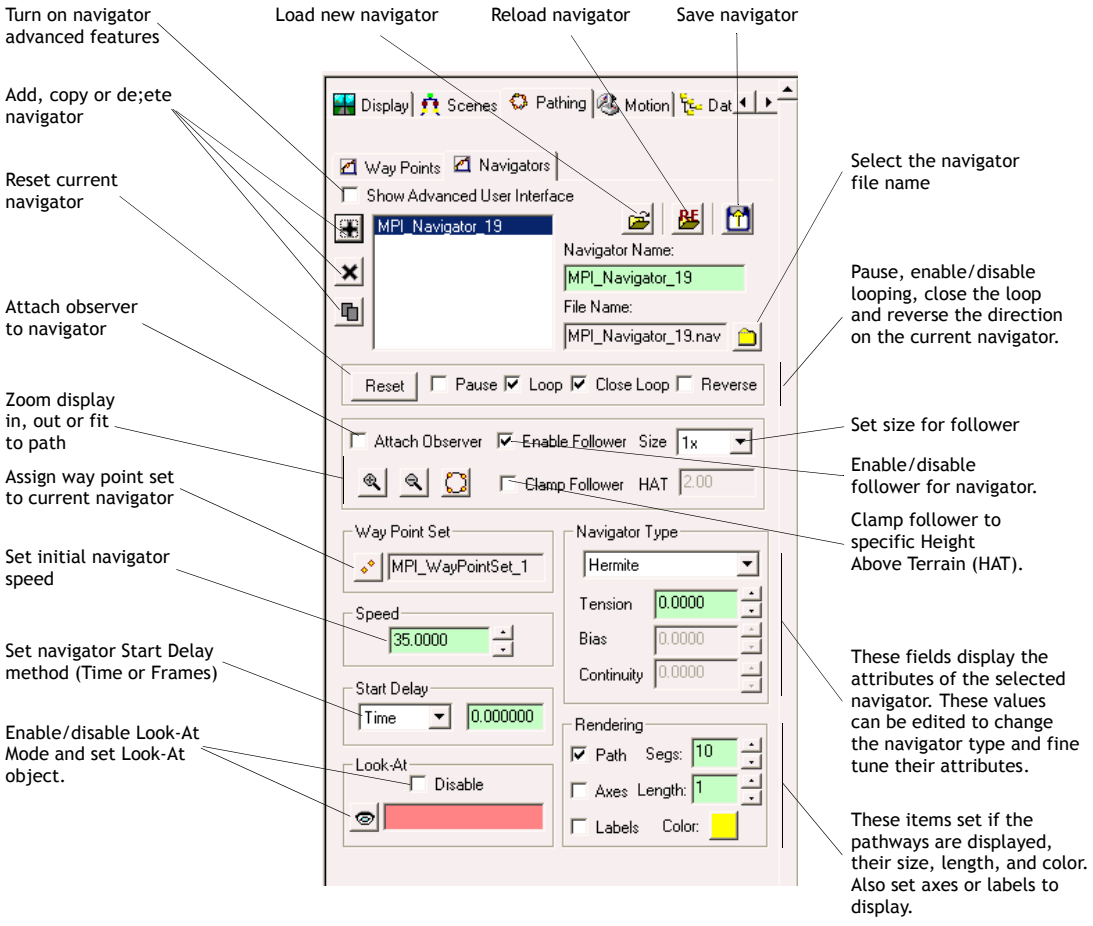
1. Position your main channel view to your specific location.
2. Position the cursor over the point you want to change and click to select or, in the way points list, click the specific name of the point to change. The selected point is displayed in red.

3. To the right of the way points list, click the Get Current Position button.

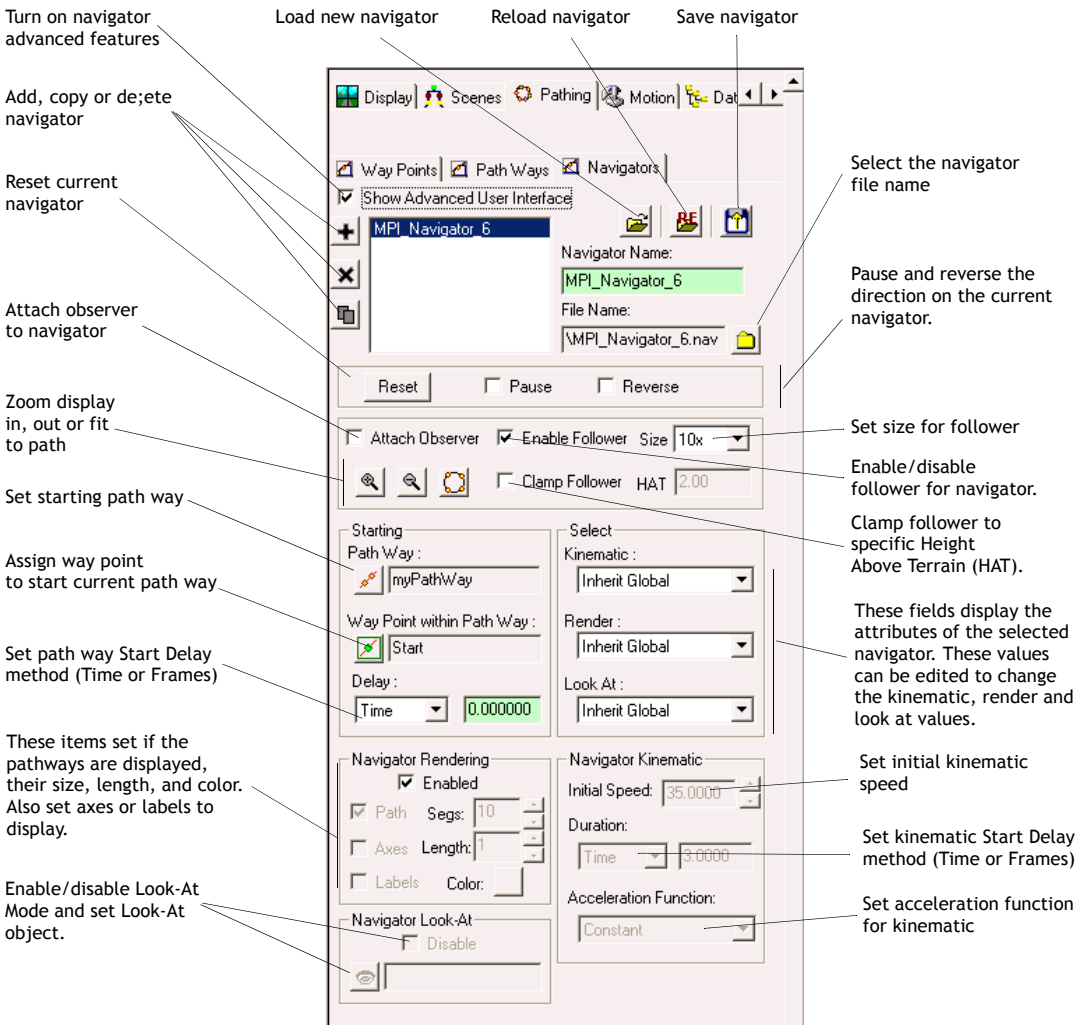
   The point is displayed in the new location. The coordinates for this point are also updated to their new location.

Navigator Tab

There are two navigator tabs available when using the Path Tool: standard and advanced. The standard menu looks like the following figure.

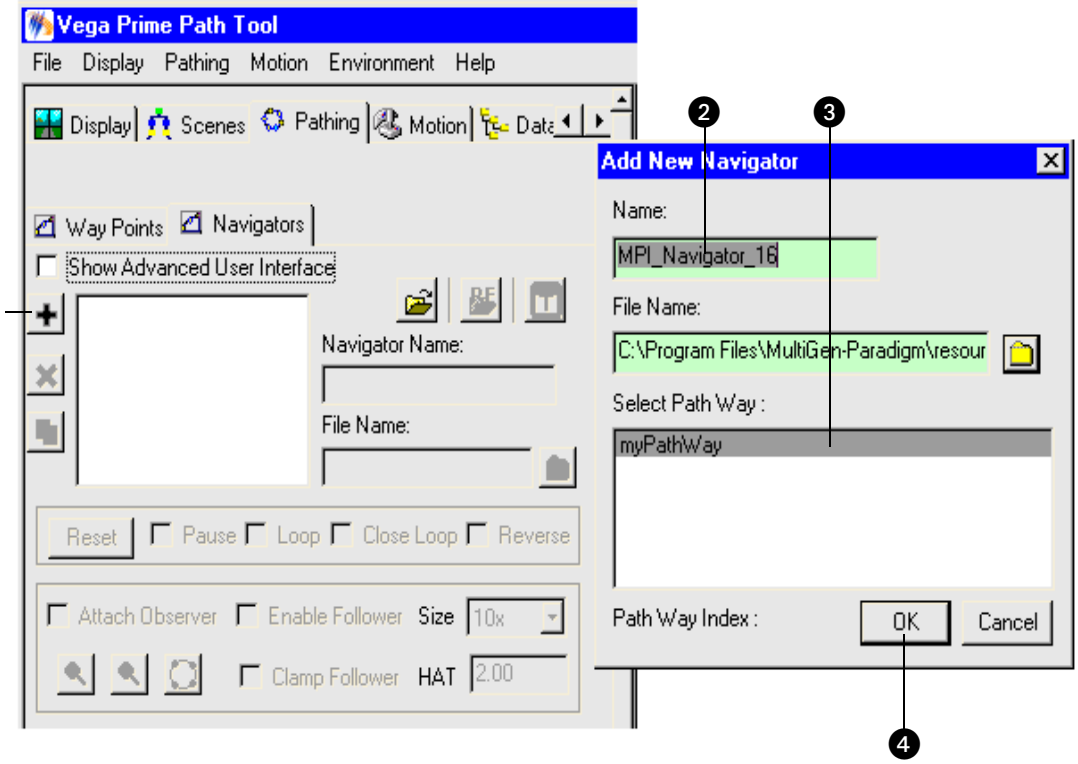


The advanced navigator tab looks like the following figure.



Creating a New Navigator

After you have a set of way points, you need to have a navigator. While the way points define the actual locations, it is the navigator that controls the actual motion and other events that occur at each way point. The following procedure shows how to create a new navigator the current way point set.



1. Click the New Navigator button. The Add New Navigator dialog box appears.
2. Enter the name of your navigator.
3. Select the Path Way you want your navigator to use.
4. Click the OK button.

Your navigator is now associated with the selected pathway and by default, you should see your pathway displayed, or rendered, and a little space ship, or navigator, is flying around your pathway.

Pathway Tab

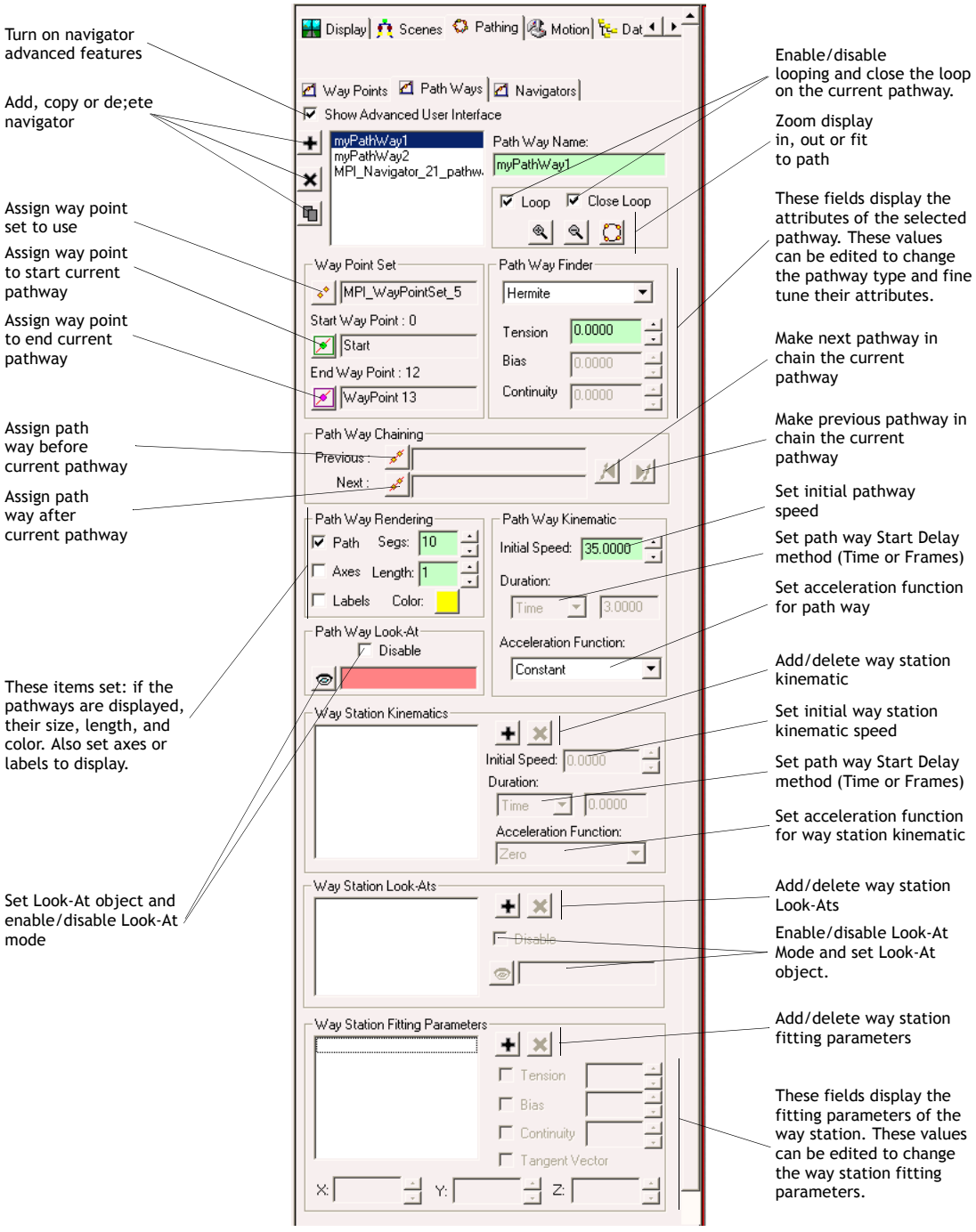
A pathway is a set of points that are traveled. If you want to use the analogy of way points being intersections on a street, a pathway would be the road that connects a given set of intersections. There is a starting point and an ending point. The Vega Prime Path Tool enables you to configure your pathway at the path level and at individual points. At the pathway and at each of the points, you can:

- Set the speed for the pathway, or at a given point.
- Set an object to be looked at, while traveling the pathway, or when a specific point is reached.
- Set how well your path fits to the current point.

A pathway can be constructed through all the points of your way point set, or through a subset of your way point set. If your pathway is a subset of a way point set, additional pathways can be created and these pathways chained together.

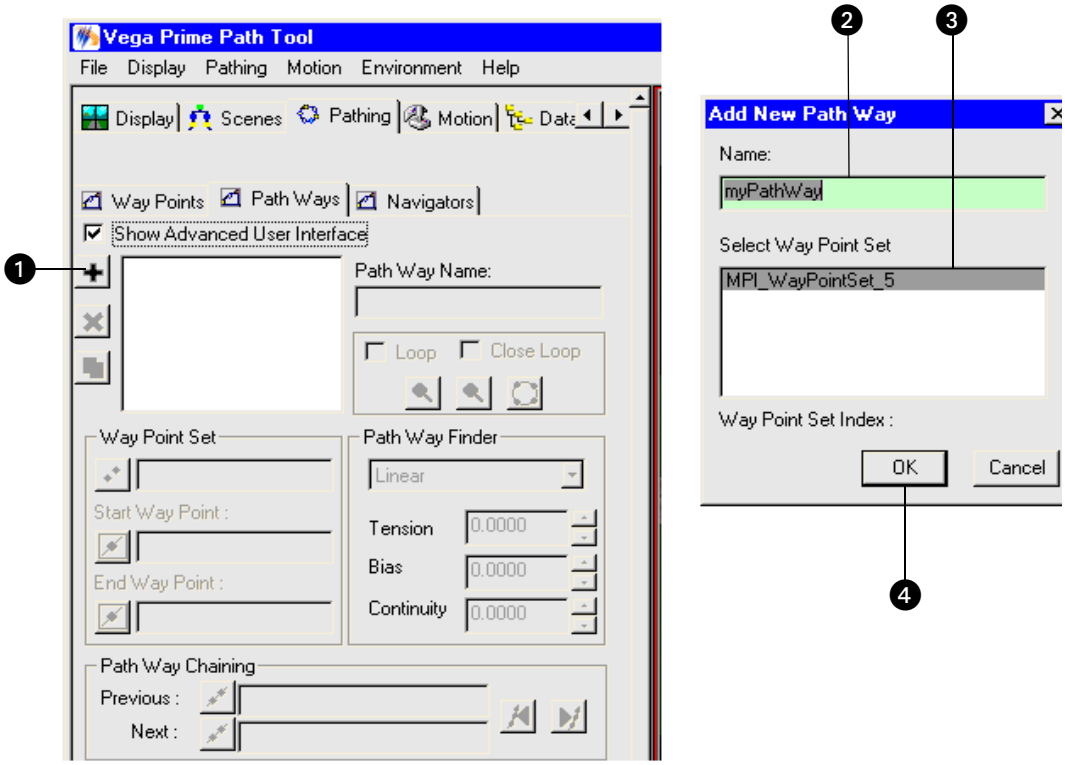
The Pathway tab should look similar to the following figure:

Note: The Pathway tab only appears if you have checked **Show Advanced User Interface** in the Navigator tab. When this is unchecked, the Vega Prime Path Tool assumes all of the points in your way point set will make up your pathway.


Turn on navigator advanced features
Add, copy or de;ete navigator
Assign way point set to use
Assign way point to start current pathway
Assign way point to end current pathway
Assign path way before current pathway
Assign path way after current pathway
These items set: if the pathways are displayed, their size, length, and color. Also set axes or labels to display.
Set Look-At object and enable/disable Look-At mode
Enable/disable looping and close the loop on the current pathway.
Zoom display in, out or fit to path
These fields display the attributes of the selected pathway. These values can be edited to change the pathway type and fine tune their attributes.
Make next pathway in chain the current pathway
Make previous pathway in chain the current pathway
Set initial pathway speed
Set path way Start Delay method (Time or Frames)
Set acceleration function for path way
Add/delete way station kinematic
Set initial way station kinematic speed
Set path way Start Delay method (Time or Frames)
Set acceleration function for way station kinematic
Add/delete way station Look-Ats
Enable/disable Look-At Mode and set Look-At object.
Add/delete way station fitting parameters
These fields display the fitting parameters of the way station. These values can be edited to change the way station fitting parameters.
Display
Scenes
Pathing
Motion
Dat
Way Points
Path Ways
Navigators
Show Advanced User Interface
myPathWay1
myPathWay2
MPI_Navigator_21_pathw.
Path Way Name:
myPathWay1
Loop
Close Loop
Way Point Set
MPI_WayPointSet_5
Start Way Point : 0
Start
End Way Point : 12
WayPoint 13
Path Way Finder
Hermite
Tension
0.0000
Bias
0.0000
Continuity
0.0000
Path Way Chaining
Previous :
Next :
Path Way Rendering
Path
Segs:
10
Axes
Length:
1
Labels
Color:
Path Way Kinematic
Initial Speed:
35.0000
Duration:
Time
3.0000
Acceleration Function:
Constant
Path Way Look-At
Disable
Way Station Kinematics
Initial Speed:
0.0000
Duration:
Time
0.0000
Acceleration Function:
Zero
Way Station Look-Ats
Disable
Way Station Fitting Parameters
Tension
Bias
Continuity
Tangent Vector
X:
Y:
Z:

Creating a Pathway

To create a pathway, perform the following steps:

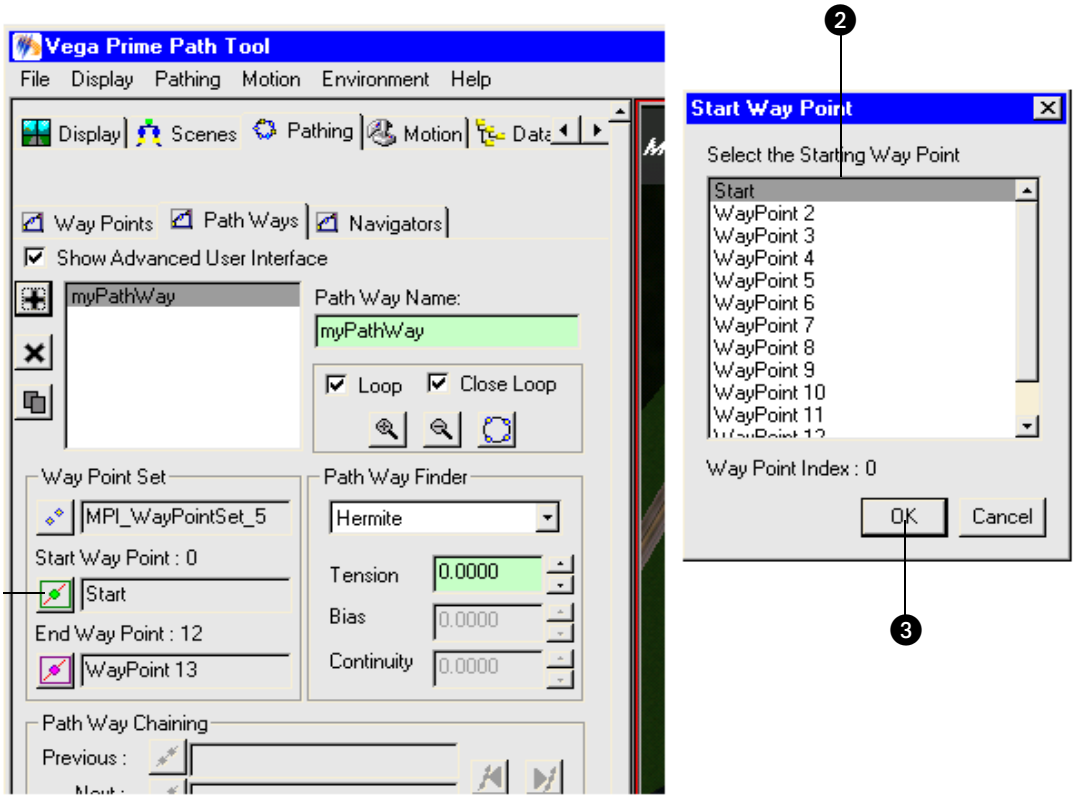


1. Click the New Pathway button. The Add New Path Way dialog box appears.
2. Enter the name of your pathway.
3. Select the WayPoint set containg the points you want to use in your Pathway.
4. Click the OK button.

Setting the Start Point

Determine which points of your way point set you want to use in your new pathway. Your pathway will be defined as a starting point, from your way point set, and all the subsequent points until your specified ending point. In the figures, the pathway will contain the first four points of the way point set, but your pathway may contain more points or fewer points.

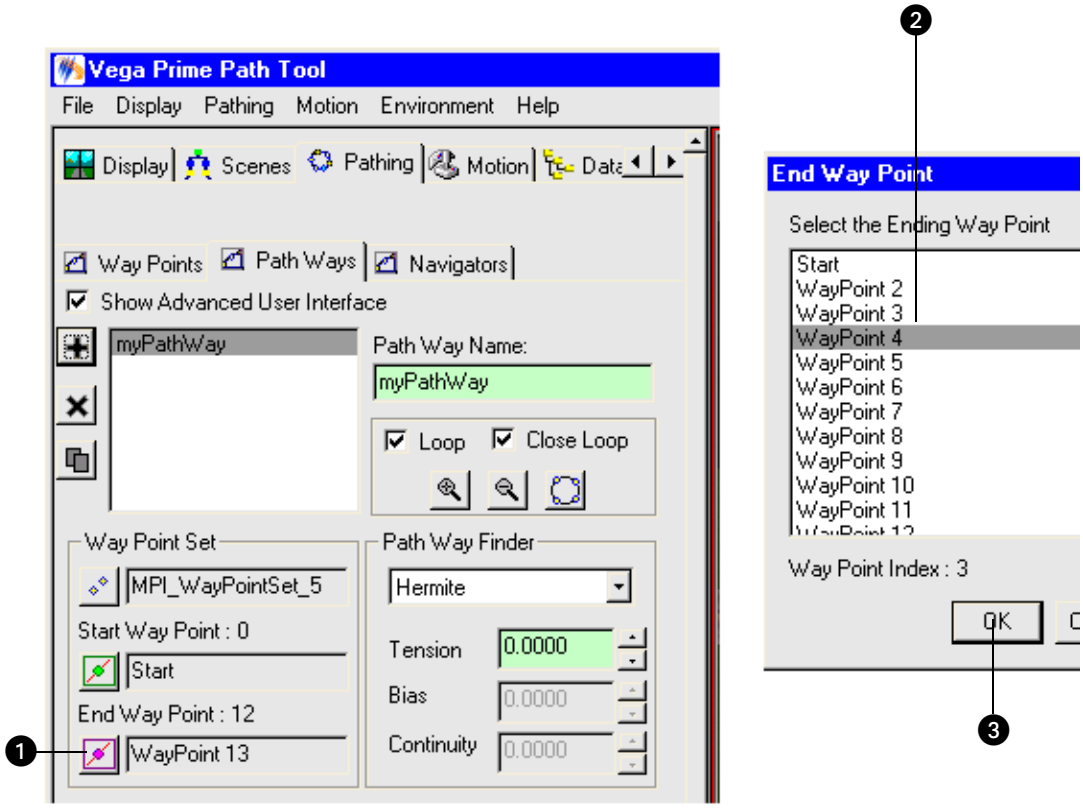
Note: By default, Pathtool assumes that your pathway starts with the first point in your way point set, and finishes with the last point in your way point set.



1. Click the Start Way Point button. The Start Way Point dialog box is displayed.
2. Select the point you want to be the starting point for your Pathway. In this example, the first point or Start is selected.
3. Click the OK button.

Setting the End Point

Now we will establish an endpoint for our pathway. In this example, our pathway will contain only four points, so we will be selecting Waypoint4 from our way point set.

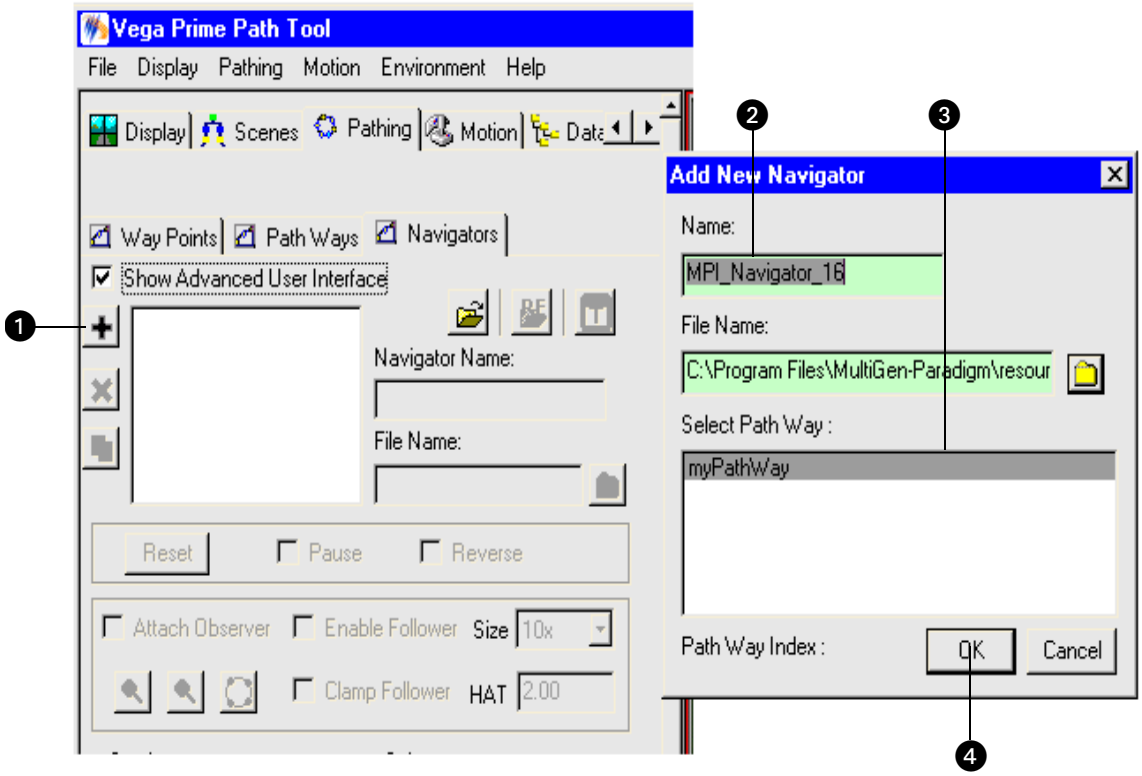


1. Click the End Way Point button. The EndWay Point dialog box is displayed.
2. Select the point you want to be the ending point for your Pathway. In this example, Waypoint 4 is selected.
3. Click the OK button.

Creating a Navigator for your Pathway

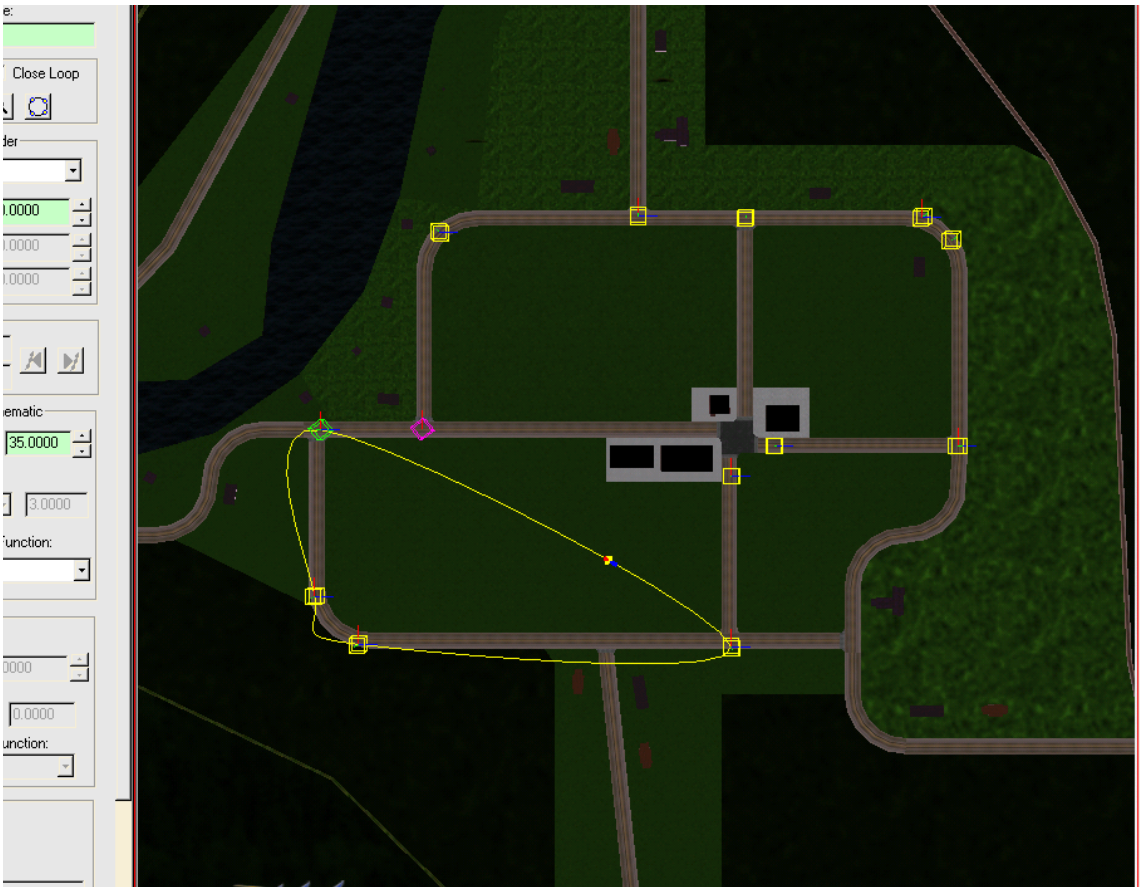
After you have created your pathway, you need to associate a navigator with this pathway. To continue our analogy, if the pathway is the streets or roads that you travel through the selected intersections, a navigator control how your car is traveling on that road.

To create a navigator for your pathway, perform the following steps:



1. Click the New Navigator button. The Add New Navigator dialog box appears.
2. Enter the name of your navigator.
3. Select the Path Way you want your navigator to use.
4. Click the OK button.

Your navigator is now associated with the selected pathway and by default, you should see your pathway displayed, or rendered, and a little space ship, or navigator, is flying around your pathway. For our example, we selected four points for our pathway, so our display looks like the following figure.



Converting Vega Path & Navigator Files

Path and navigator files created in Vega can be converted and used in Vega Prime Pathtool. Vega Prime provides a utility called pathconvert that converts the Vega path files (.pth) and the Vega navigator files (.nav) and converts them to Vega Prime way point files (.way) and Vega Prime navigator files (.nav). The following procedure shows how to convert an existing set of Vega path and navigator files to Vega Prime Pathtool compatible formats.

Note: The pathconvert utility is a command line utility and must be executed from your current operating systems command line.

1. In your current operating system, open a command line window.

2. In your command line window, to convert your existing Vega path and navigator files to the new Vega Prime path and navigator file formats, enter the following command:

   ```
   pathconvert -w waypoint set name -p oldfile.pth newfile.way -n oldfile.nav
   newfile.nav
   ```

   where *waypoint set name*, *oldfile*, *newfile*, *oldfile*, and *newfile* represent the Vega Prime way point set name, filenames of your Vega Classic path and navigator files and Vega Prime path and navigator files, respectively.