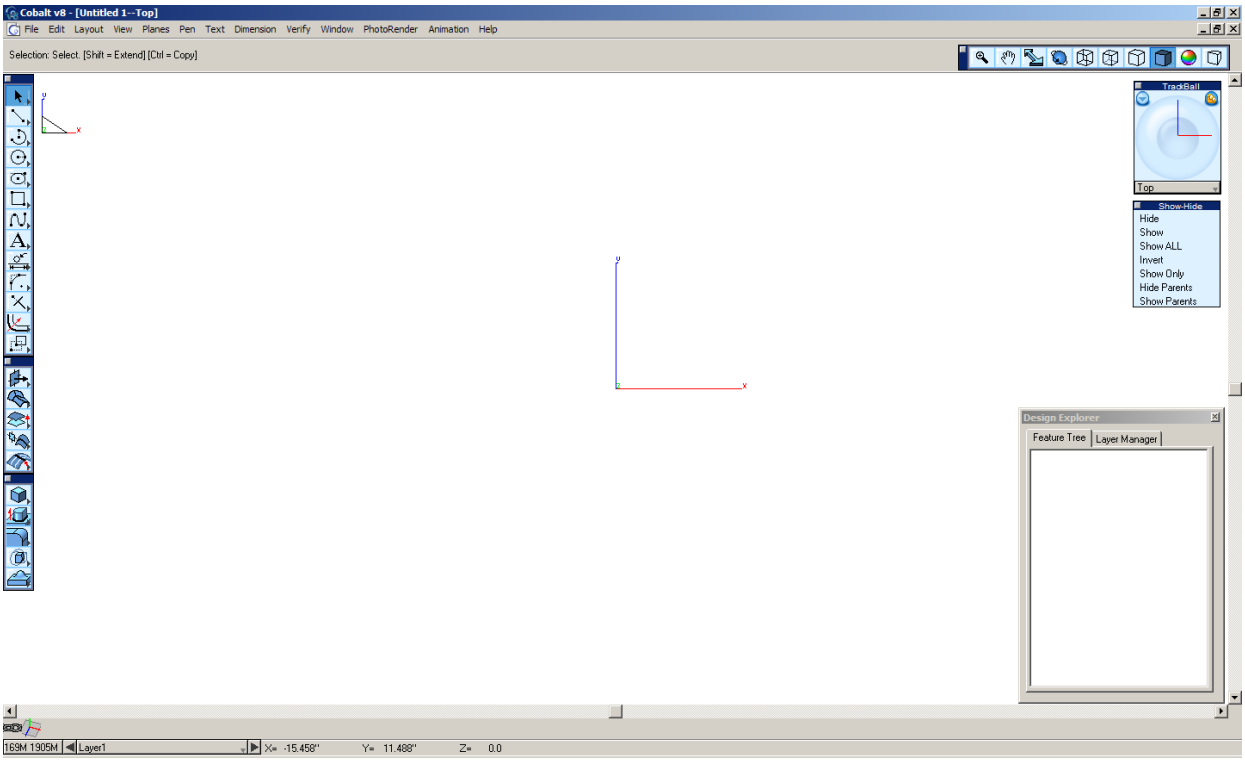
Introduction to the Ashlar-Vellum Modeling Interface and Key Features Tutorial

Using Cobalt™, Xenon™, Argon™

INTERINTRO0902

Introduction to the Ashlar-Vellum Modeling Interface and Key Features

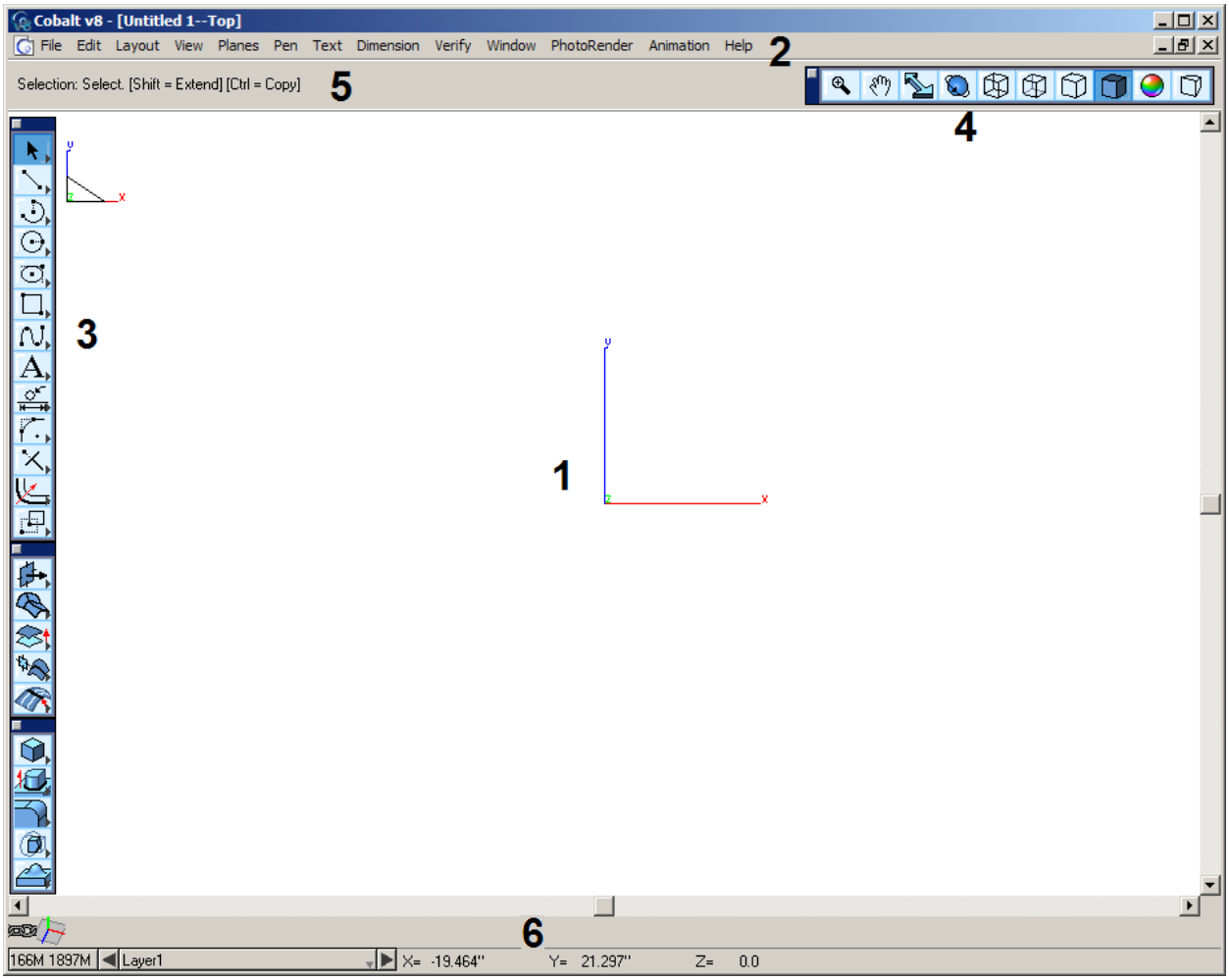
This brief overview of Ashlar-Vellum's modeling interface is intended to give a quick look at how its interface looks and also give some quick tips on the features that the Ashlar-Vellum interface provides to make the design process faster and easier by using the Trackball, Show-Hide window, and the Design Explorer.



Presented above are a variety of tools that are commonly used in the creation process. By the end of this tutorial you will hopefully gain an understanding of everything seen here. To begin, let's get a basic idea of what is on the screen and what these things do.

To make things a little simpler, let's close a couple of the windows, including the Design Explorer, the Trackball, and the Show-Hide palette. These are the windows on the right side of the screen. Close them by clicking on the small box in the upper corner of each of the respective windows. We will get back to them later, but for now we'll concentrate on the basic interface of the screen.

The interface, as it now looks, is composed of six basic areas.



1. The Drawing Area

The Drawing Area is the most obvious and the most important part of the Ashlar-Vellum workspace. This is the area where the project is created.

2. The Menu Bar

This area contains all the menus and commands that Ashlar-Vellum's modeling products offer. Access these menus by clicking on them with the mouse.

3. The Tool Palettes

This area contains creation and editing tools that are used to create the model. When the program is first open, three tool palettes already open. Access other palettes from the Window menu on the menu bar.

4. View Palette

This is a tool palette used to navigate the display of the model in the drawing area. It zooms, pans, and rotates the view. It toggles between view modes such as wireframe mode or shaded mode. It enables surface analysis and turns on/off perspective for display.

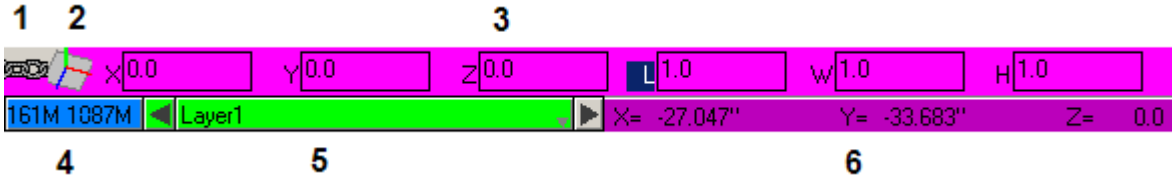
5. Message Line

This is the portion of the interface that prompts you for the next step when using a tool. For instance, when the line tool is selected from the tools palette, the Message Line says: *Single Line: Pick beginning point*. The program tells you what it needs to perform the task. This area also displays options available with the tool.

6. Status Area

This area displays a variety of data about the current state of the model.

There is a lot going on here. We'll take it one area at a time and keep it simple. The status area is made up of six different parts.



1. The Regen Status Indicator

A regen (regeneration) is needed when the relationship/constraint between a parent/child object pair has not been fully resolved. This may happen intentionally depending on which tools are being used. Most of the time regens are automatically executed after a change, but if it is unable to do so, the Regen Status indicator will turn red. In such a case, all that is necessary is to click in the indicator and the program will resolve links.

For instance, if a rectangle is created and extruded so that it became a cube, the cube is linked to that rectangle. If that cube is moved without moving the rectangle used to create it, the links between the two may become unresolved.

2. Coordinate System Axis Icon

This graphic shows the current coordinate system. Choose between the default global coordinate system or a user-defined coordinate system. Basically, it displays the type of work plane currently being used and defines work planes on which geometry gets created. For simple models, this tool is rarely used, but for advanced modeling this tool is handy for creating complex geometry.

3. The Status Line

The status line as shown above is filled with data entry fields. This is what it looks like when the **Single Line** tool is selected. If the **Selection** tool is clicked, the Status Line is empty. The information in this area changes with respect to the tool selected. This area inputs data for the geometry. The keyboard can be used, if desired. By using the mouse and clicking in the drawing area the information is automatically filled into the appropriate field.

4. Memory Indicator

This area displays two numbers. The larger number is the available RAM on the system and the smaller number in the amount of virtual memory available (RAM plus swap). As technical as that all sounds, it amounts to this: if the number on the left hand side begins to get extremely low, it is probably a good idea to save the work and restart the program. That number is showing what is left on your machine to run your operating system and other programs may have open. If you run out of RAM, your computer may crash. Certain functions of 3D modeling can be very RAM intensive and this is the exact reason that the indicator is there: so you don't run out RAM before you get a chance to save your work. Having to save the file and restart the program is much less frustrating than losing work and having to restart the computer.

5. Work Layer Indicator

This bar displays the active work layer. All new geometry that is created is placed on this layer. Toggle between layers by clicking on the arrows on both sides of the indicator.

6. Location Indicator

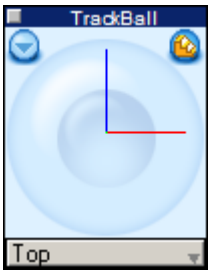
This shows the X, Y, and Z coordinates of the pointer while it is in the drawing area.

USING THE TRACKBALL

The Trackball is a display tool that rotates the view of the model in the drawing area, showing the model from different angles. It displays the parts of the model that may be blocked by other parts.

To explore the features that Trackball provides, use the pointer in the Menu Bar at the top of the screen to click on Window, dropping down a list. Click on Trackball and it will open on the screen. Use this same method to open and close all of the windows shown in that list.

Now that the Trackball is open let's take a look at it.

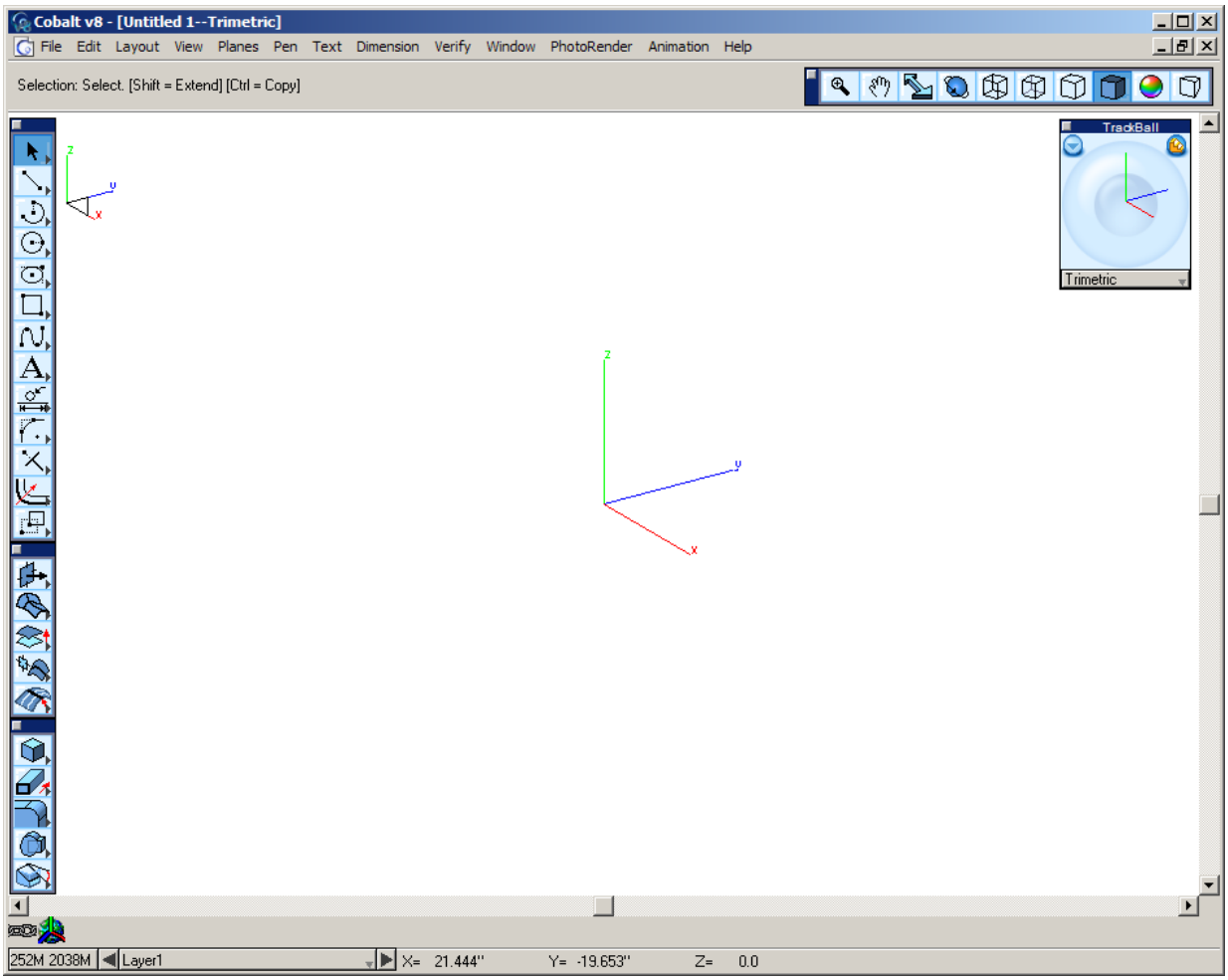


At the bottom of the Trackball window there is an area that currently displays the word Top. This shows that you are currently looking at the top view of the model in the drawing area. To change this view, click on the area that is showing the word Top. A list of other views drops down. Select any of them to become the current view. Click on the view called Trimetric. Notice how the lines in the blue circular area change with it. These lines represent the X, Y, and Z axes of the drawing area. Using this drop down list allows you to quickly look at the model from different views.

The main thing that you see is the Trackball itself. This round blue object rotates the view by simply clicking on it and dragging it around until the view is set the way you want. When clicking and draging within the ball itself, the lines that represent the axes move with the mouse as it is draged. Arriving at the desired view, let go of the mouse button and the view is set. In the Trackball view list there is the view DynView. This is the Dynamic View, which is basically any view that is not a preset view by the program or saved by the user.

How the Trackball works is easier to understand watching an actual object changing in the work area, so let's do that. From the drop-down list at the bottom of the Trackball window select Trimetric.

The window should look like this:



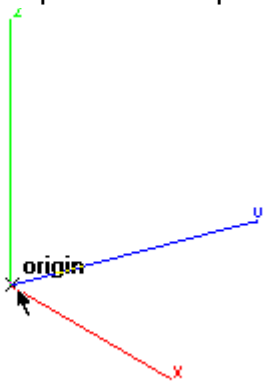
Notice how the axes in the middle of the drawing area look. Create a block in the drawing area to better see how the Trackball works.

From the Solids Palette on the left hand side of the screen, select the **Block Primitive** tool.

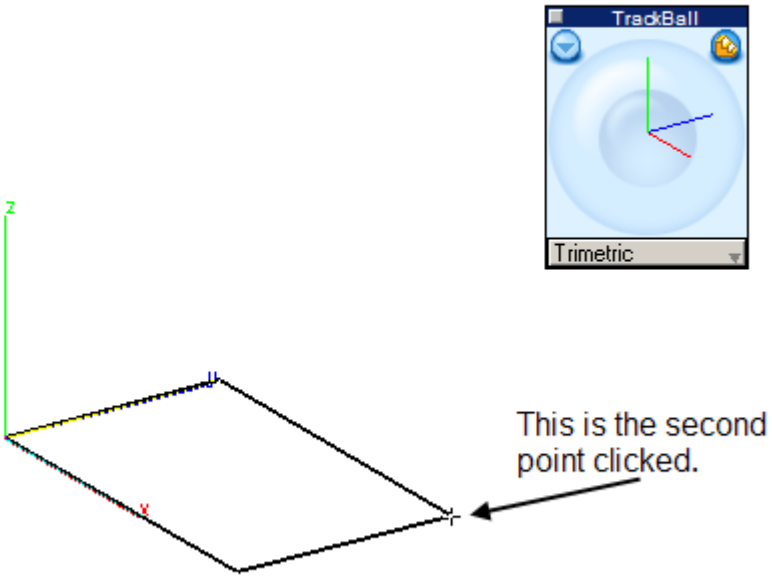
At the top of the screen in the Message Line it says: *Block Primitive: Enter start diagonal point (Shift=Square)*.

The first part of the statement is the tool being used, the second prompts you how to create the block. (The last part is an advanced option that we don't need to worry about right now.)

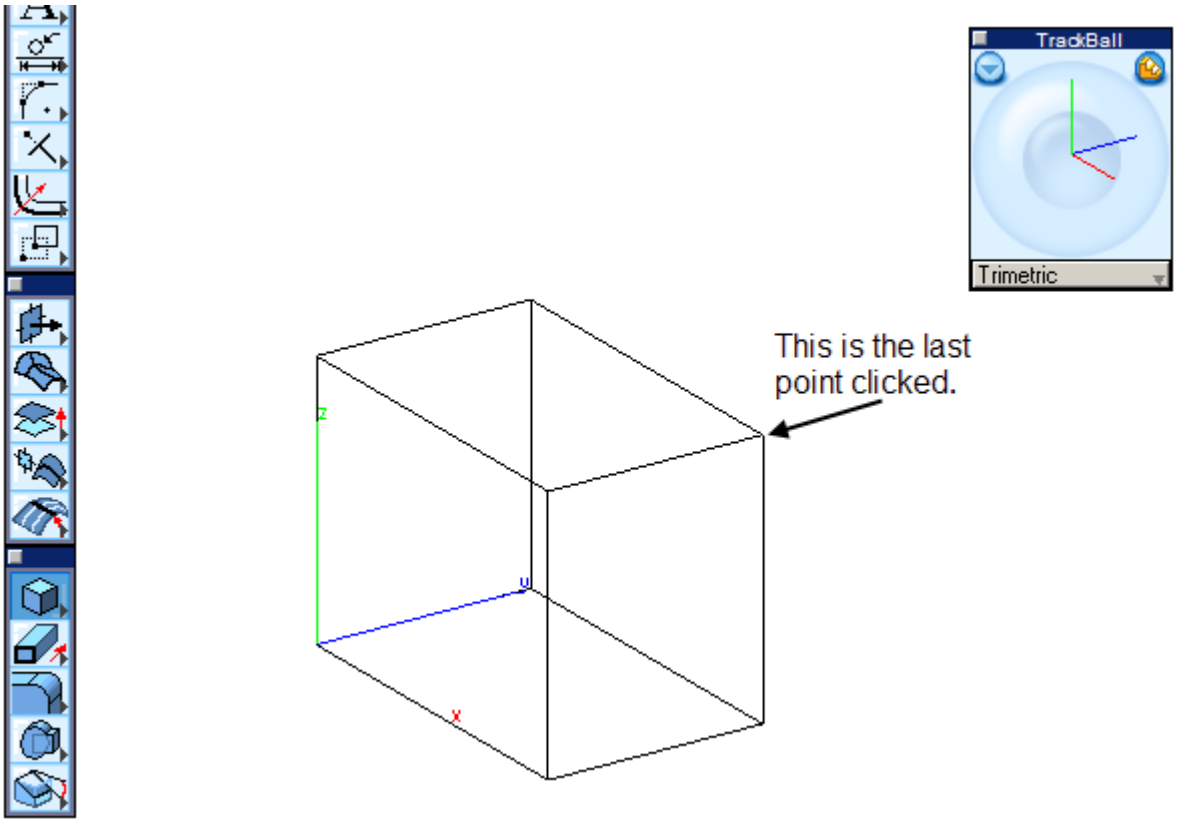
The prompt says to enter the starting point. Take the pointer into the drawing area and move it to the origin of the Drawing Area. The origin is where all three of the X, Y, and Z axes meet; (0,0,0), in other words. When getting close to that point, the word *origin* pops-up on the screen, near the pointer. This is done by another feature of the program called the Drafting Assistant. For now, just know that as long as that word *origin* is displayed, if the mouse is clicked, the point will be placed at the origin. So let's do that.



Now that the request of the Message line is fulfilled, another message comes up: *Enter end diagonal point*. For this exercise it isn't critical where this point is.



The Message Line now states to *Define Height*. To do this, just bring the mouse up a little bit to be able to see how the block will look. When it is the necessary height, just click the mouse and the block will be complete.



Now, having something to look at in the drawing area, use the Trackball to rotate the view to look at it from different angles.

Click inside the Trackball and drag the cursor around. The block rotates as the cursor is moved. To set the view back to the Trimetric view, select Trimetric from the drop down list at the bottom of the Trackball window.

NOTE: The Trackball does NOT actually rotate the block, it only rotates the VIEW of the block. The block is still in the place it was created.

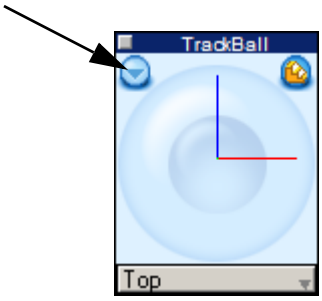
ADVANCED TRACKBALL FEATURES

Next, we'll look at some of the advanced features of the Trackball which customizes the viewing of the model as necessary.

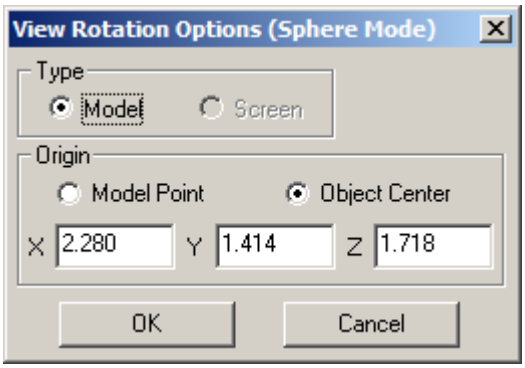
Features of the Trackball define where and how the Trackball rotates. Using the Trackball to rotate the view of the model, it uses a center point to rotate around. Use of the advanced features define this point. Take a look at how to do this.

Using the block made earlier, use the Trackball to rotate the view. Notice that the view rotates around the center of the block. We are going to change this so that it rotates around the origin of the drawing (0,0,0).

Before we start, set the view back to Trimetric from the drop down list at the bottom of the Trackball. Then click on the small circle with the arrow located in it, at the upper left hand corner of the Trackball window (shown below).



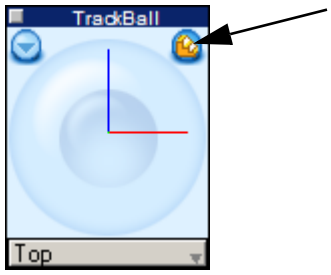
This will open up the View Rotation Options screen.



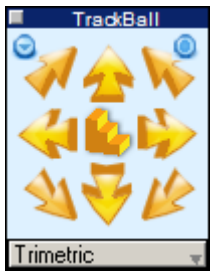
The view is set to Sphere Mode. This mode uses the blue Trackball to rotate. The type is set to Model, which defines the axes that the view rotates about. What's really important in this screen is the Origin. Currently it is set to Object Center. This means that when rotating the view, it rotates around the center of the object in the drawing area, in this case the block. At the bottom of this window it shows three coordinates. This is the center of the block. Depending on how large or small the block is, the coordinates may differ.

To rotate the view around the origin, change the Origin setting to Model Point. This defines a point in the model around which the view rotates. To change it to rotate around the origin, either type 0 into each of the X, Y, and Z fields, or click on the origin on the screen and the program will automatically fill in these coordinates. Set the point, using whichever method suits you best, and select OK. Now use the Trackball to rotate the view. Notice that now the view is rotating about the origin instead of the center of the block.

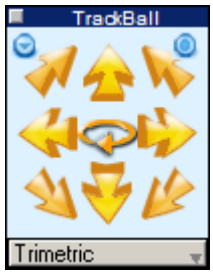
There is another icon in the upper right hand corner of the Trackball window. This icon toggles the Trackball from sphere mode to step mode. This mode shows the model in a step-by-step rotation or a continuous rotation.



Click on it, the Trackball window changes to look like this:



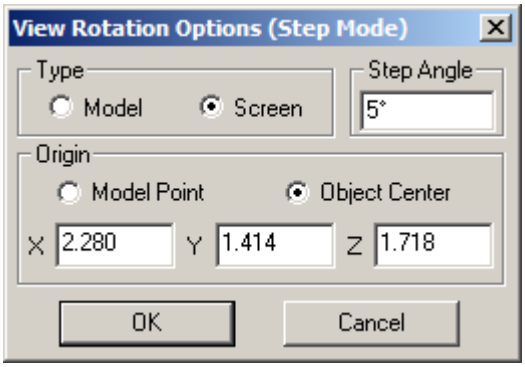
This is the step mode of the Trackball. Clicking on any of the arrows in the window displays the model in increments as it rotates around its point of rotation. The icon in the middle (resembling a staircase) indicates that clicking on the arrow moves step by step. Click on the stair icon to change to an arrow.



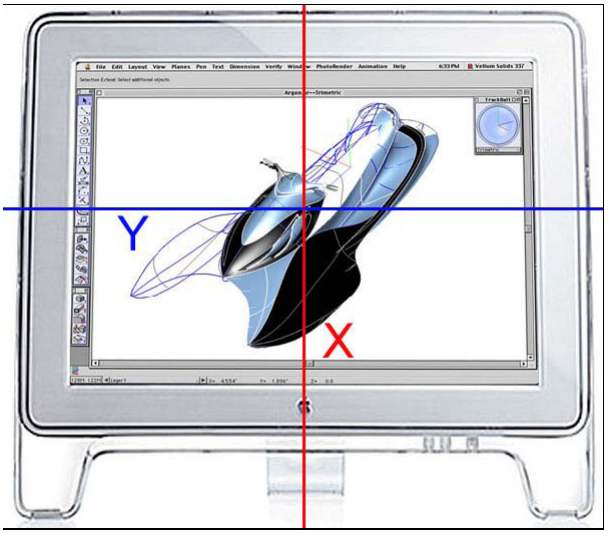
Click on one of the arrows to rotate the view continuously in the selected direction. It will look like it's spinning. To make it stop spinning, click in the drawing area of the screen.

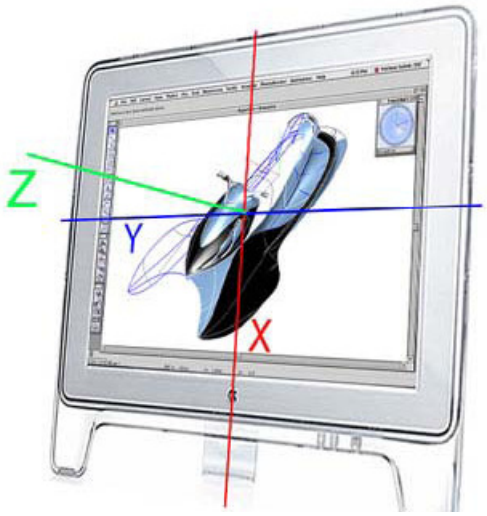
This mode of the Trackball offers features similar to the sphere mode of the Trackball. To access these options, click on the circle with the arrow in it at the upper left hand area of the Trackball window.

This will again open the View Rotation Options screen.



The type is set to Screen. Previously, in sphere mode, this was not an available option, nor was the Step Angle option. The step angle defines how many degrees the view will rotate when one of the arrows is clicked. In the continuous rotation mode, the higher the step angle, the smoother the view will rotate. The Type option defines the axes by which the model rotates. When it is set to Screen, it uses the axes of the screen around which to rotate the model. See the image below for a visual explanation:





When selecting the right and left arrows in the Trackball window, the geometry rotates around the X axis (the red line in the image), the up and down arrows rotate the view around the Y axis (the blue line), and the four corner arrows rotate the view about the Z axis (the green line).

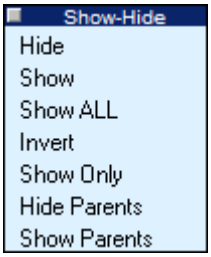
By changing the mode to Model, the Trackball uses the axes of the model to determine which direction to move when the arrows are selected.

The Origin option works just like it did in sphere mode.

The best way to learn how to set the Trackball is to play with the settings and see how they affect the rotation on the screen.

Using the Show-Hide Window

The Show-Hide window is a simple but very useful tool that helps to visually clean up the drawing area when it becomes cluttered.



This window contains some easy-to-use, almost obvious features, that show or hide objects on the screen.

When creating a complex model and when the screen often gets cluttered with all the geometry created. Select everything that you don't need to see at the moment using the select tool while holding the SHIFT key. Then select Hide from the Show-Hide window, and it disappears. It isn't gone, it's just been temporarily hidden while it is not necessary to see. To bring it back, select Show from the window and it will display all of the hidden objects previously ghosted.

From this select the items to see again. To show everything that has been hidden, select Show ALL. The Invert selection displays everything that is hidden and hides everything that is showing. To look at one or a few objects on the screen, select those items with the Select tool and click Show Only. This hides everything in the drawing area, except for the items selected.

Parent-Child Relationships in Xenon and Cobalt Only

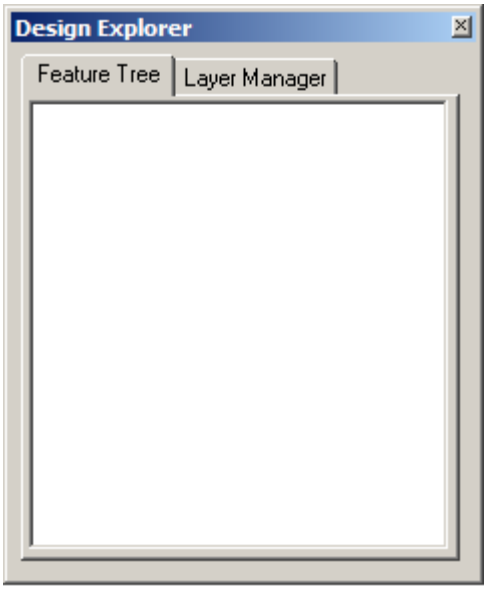
In the Show-Hide window of Xenon and Cobalt there are two more features. Due to the fact that these two products offer associativity between an object and the geometry used to create the object, they are considered to have a parent-child relationship. The parent is the defining geometry that creates the child. In other words, if a square is drawn and extruded into a cube, the square would be the parent and the cube would be the child. Changing the size of the square would in turn change the size of the cube. Xenon and Cobalt hide and show the parent geometry of an object.

For instance, using this cube that has been created from the square; by selecting the cube and selecting Hide Parents, the square would hide. Clicking Show Parents would display the square.

Using the Design Explorer

The Design Explorer window is a valuable tool for editing and viewing the objects selected in the Drawing Area. It takes full advantage of the associativity in Xenon and Cobalt. In Argon, the Design Explorer acts as a window to see which objects are selected, change names of objects, and edit primitive solids. Since Argon does not have associative geometry like Xenon or Cobalt, the functions of the Design Explorer are limited. To fully explore all of the features that the Design Explorer has to offer, the associativity of Xenon and Cobalt is required.

Let's start by seeing how the Design Explorer is used in all three Design Elements products including Argon, Xenon and Cobalt. Further on we'll discuss features found only in Xenon and Cobalt.



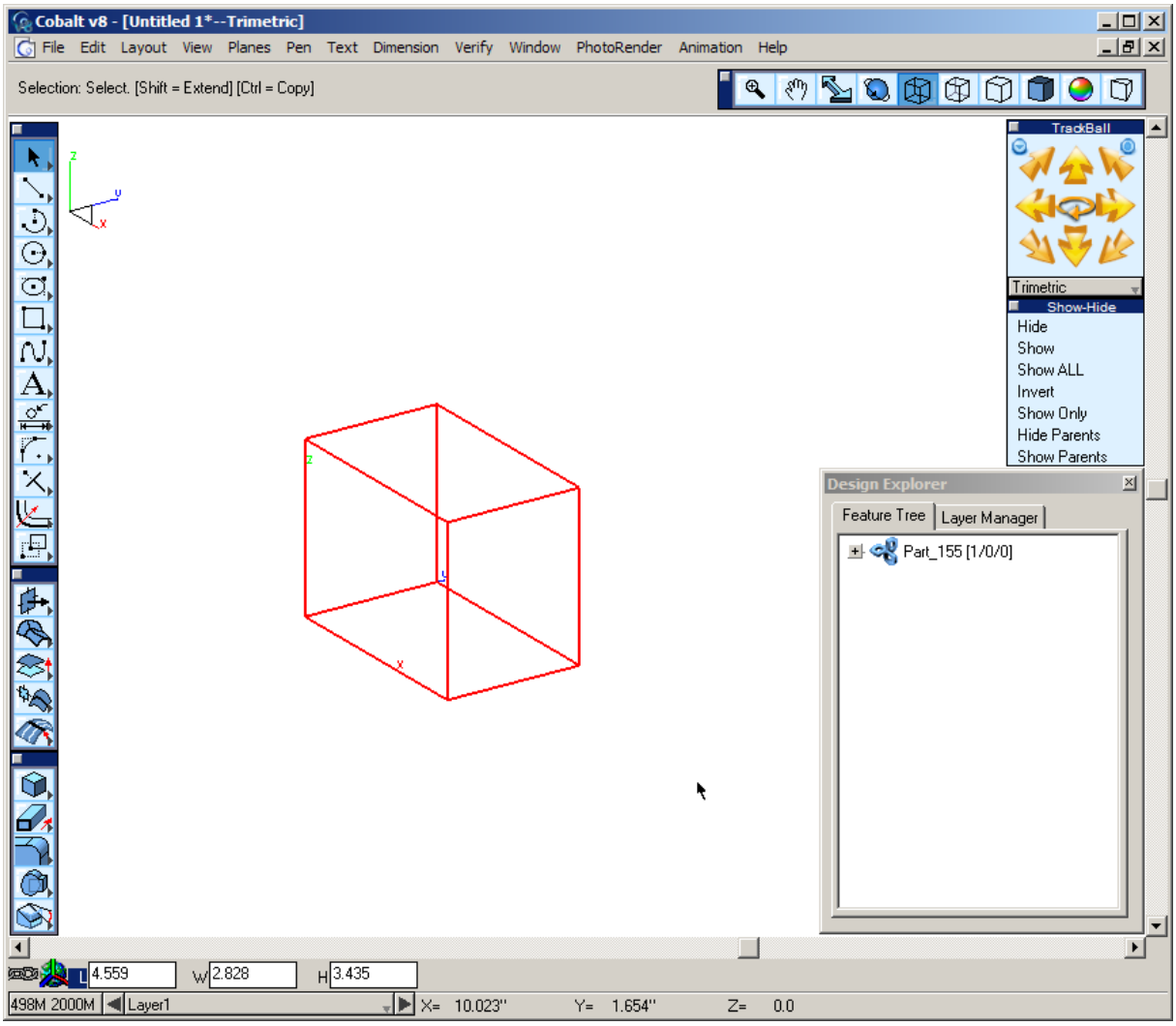
Here is the Design Explorer. It looks like a waste of screen real estate, doesn't it? In the beginning of the model creation it may seem so, but as the model grows in complexity, the Design Explorer becomes an essential tool for managing and editing the model.

To show the basic features of the Design Explorer, create something.

Take the pointer up to the Menu Bar and click File. When the drop down menu shows up, select New.

Move the pointer over to the Trackball and select the Trimetric view from the drop down list.

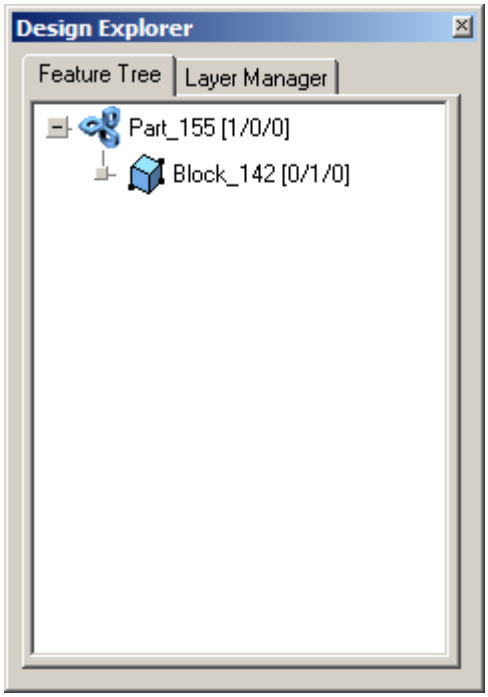
Create a block as you did previously in Using the Trackball.



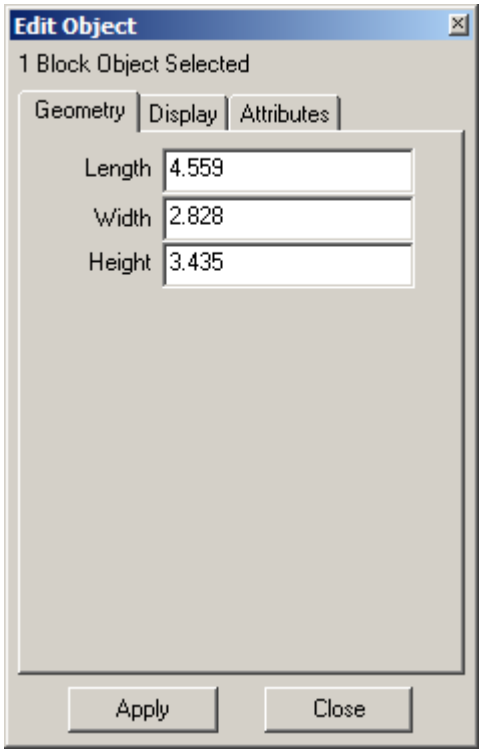
After creating the block in Argon, the Design Explorer gives it the name Block_35 (or something to that effect). In Xenon and Cobalt it will give it a name that begins with the word Part instead of Block.

Either way, click on the plus sign in the Design Explorer next to the name of the block, it will expand to show its structure. In this case it is made of a block. It may seem redundant, but by adding features to the part, the area just expanded can get very lengthy.

For now, lets look at the word Block that just appeared when the plus sign was clicked.



Double click on the subordinate word Block, the Edit Objects dialog box comes up. In this window, change the dimensions of the block as needed. This dialogue also changes the name of the object, work layer it is on, and a variety of other options. To change the size of the block, change the numbers in the Length, Width, and Height fields and select Apply. When finished, select Close.



This Next Section Applies Only to Xenon and Cobalt

Having associative geometry in Xenon and Cobalt makes the Design Explorer to be a much more powerful tool for editing and managing the model.

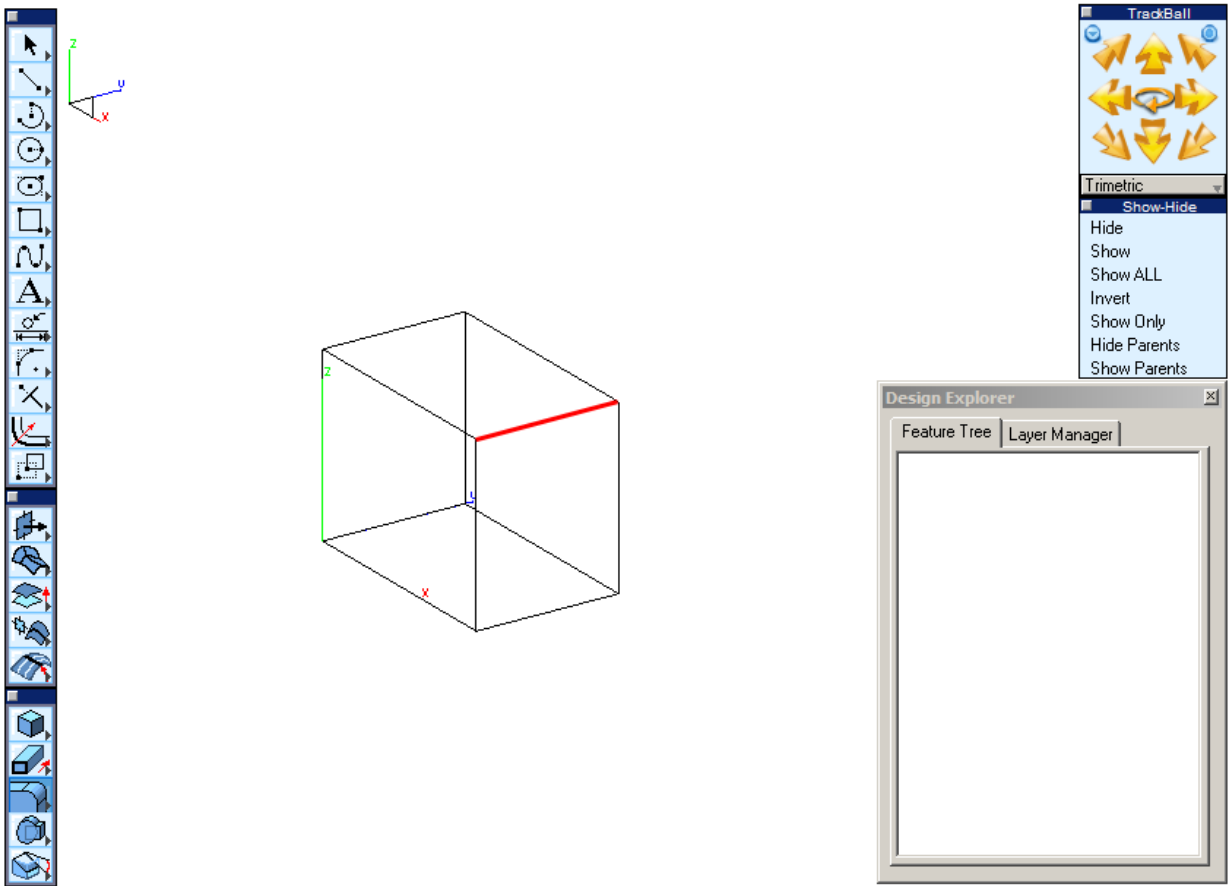
Let's look at some of the extended features of the Design Explorer that are provided in these two programs. With the block just created, round over some of the edges and use the Design Explorer to edit the amount of blending that takes place.

Move the mouse to the Solids Palette and select the **Blend** tool.

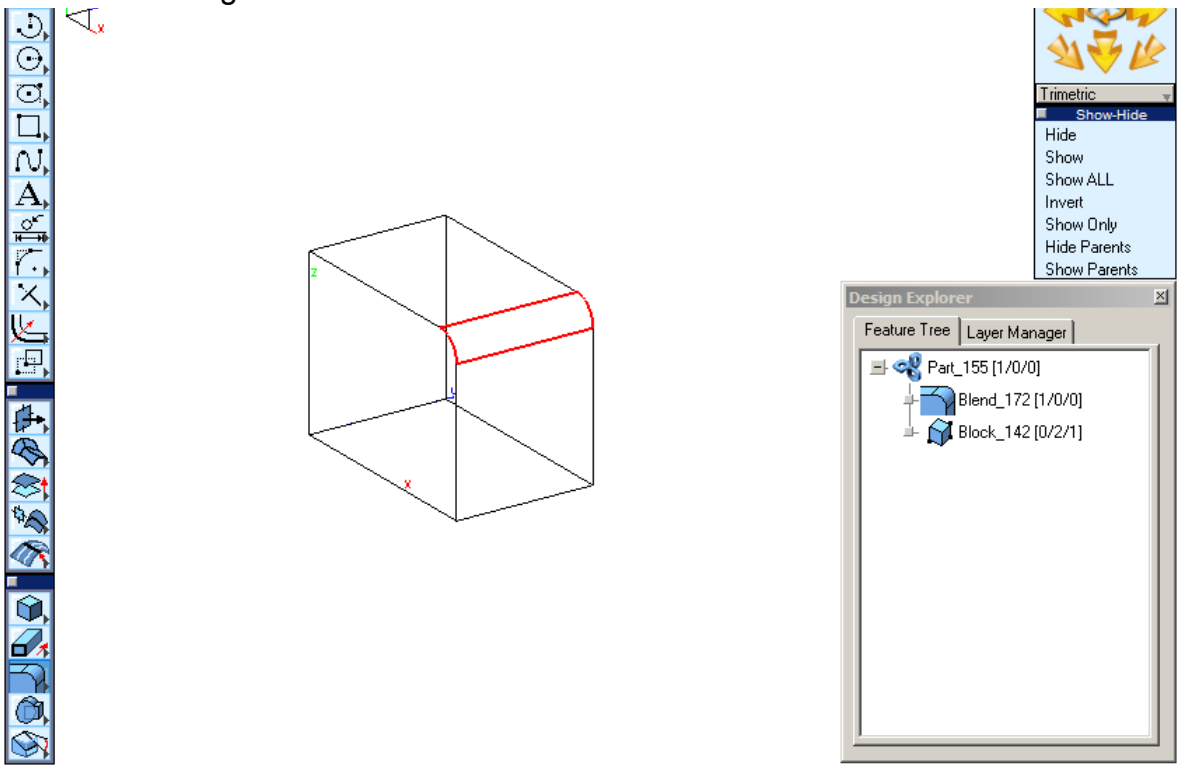
The Message Line changes:

In the status line, there are two data fields to enter the radius of the blend and the setback. For now the default settings will be fine.

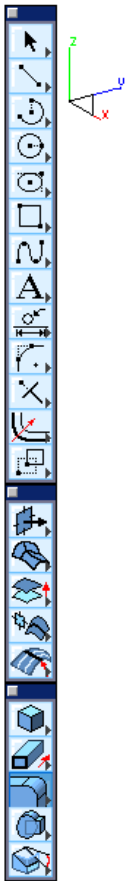
In the Drawing Area, click the edge shown below in bold red.

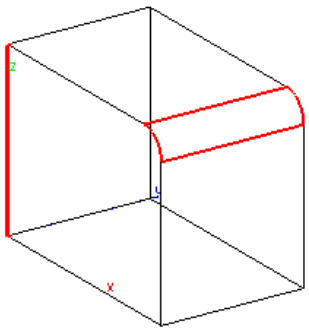


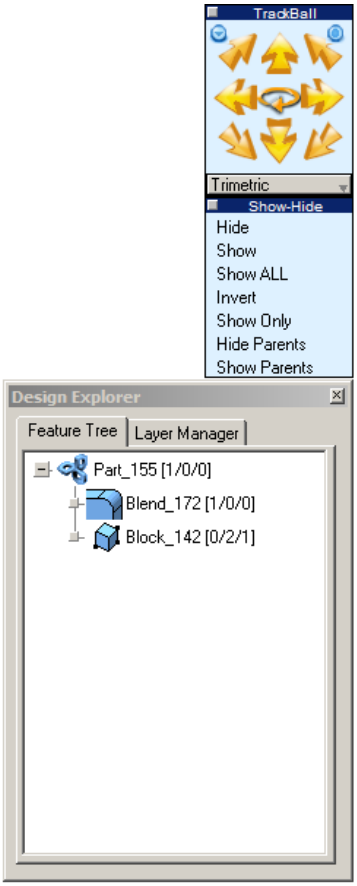
The selected edge has been rounded over.



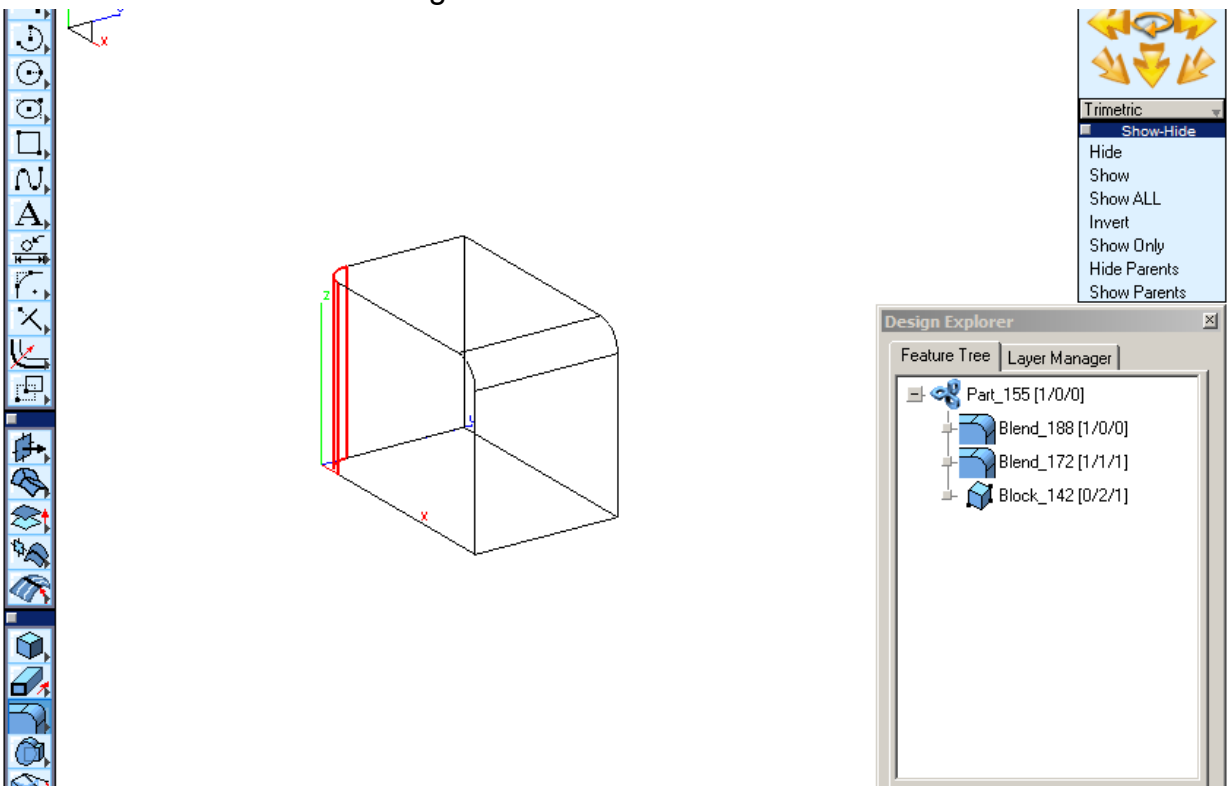
Select another edge to round it.



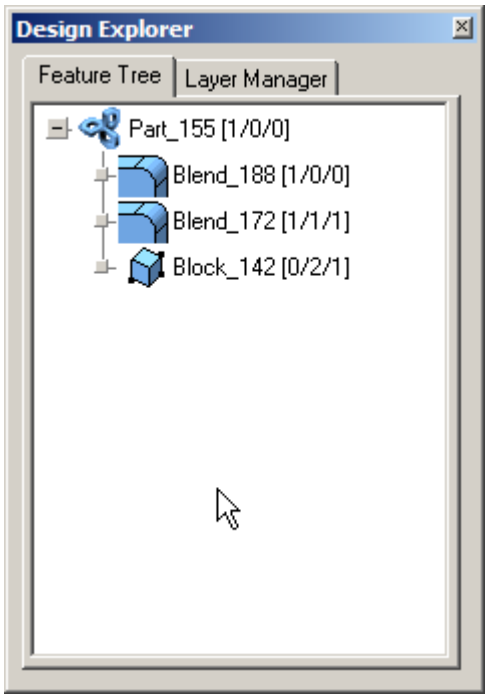




Now the model looks something like this.



Now move to the Design Explorer and click on the plus sign next to the name of the part.



The two blends are now in the list with the original block. Double clicking on them opens the Edit Objects dialogue again to change the value of the radius. That's where the associativity comes in handy. It is always possible to go back and change it.

Moreover, the blend can be removed. This is a big time saver to remove a feature, such as a blend, later down the line. In other programs that do not have associative geometry, it is necessary to recreate the shape.

To remove any feature, right click on the feature to remove and select Remove Feature from the drop-down list.

When right clicking on one of the blends, a pop-up menu appears.

To remove the feature (the blend), select Remove Feature. The blend has been removed from the block.

The right click menu also offers more options, such as opening the Edit Objects dialogue, or changing the name of an object. Also use this menu to resolve any links among geometry that may exist.

Using the Design Explorer can be an invaluable tool that can save time in redesign, editing, and controlling the model, and save your company money in revision costs.