

## Object Info Dialog Box

Double-click on the Object in a View window, or on its name in the Script List to access the Info dialog for numeric information and input for an object. Also, Double-click on an object in the script list or on a key frame marker to access the base information, and apply attributes. Some general information regarding Info dialog boxes is not covered here; see the Tool Palette chapter.

### Base Information

The Base Information for an object will be either Geometry or Surface, depending upon which radio button is “on.”

#### Geometry

##### Offset

x, y, z coordinates; these are delta values representing a change from the original position

##### Center

x, y, z coordinates mark the position of the object center. To precisely locate the object center, enter x, y, z values.

##### Scale

x, y, z dimension (%); enter values in the data fields to precisely resize the object.

##### Rotation

x, y, z axis (degrees); enter values in the data fields to precisely set the object rotation.

##### Linear Velocity

x, y, z (feet per second); enter values in the data fields to precisely set the object in motion in the desired direction.

##### Angular Velocity

x, y, z (degrees per second); enter values in the data fields to precisely set the object spinning on the desired axis.

##### Mass

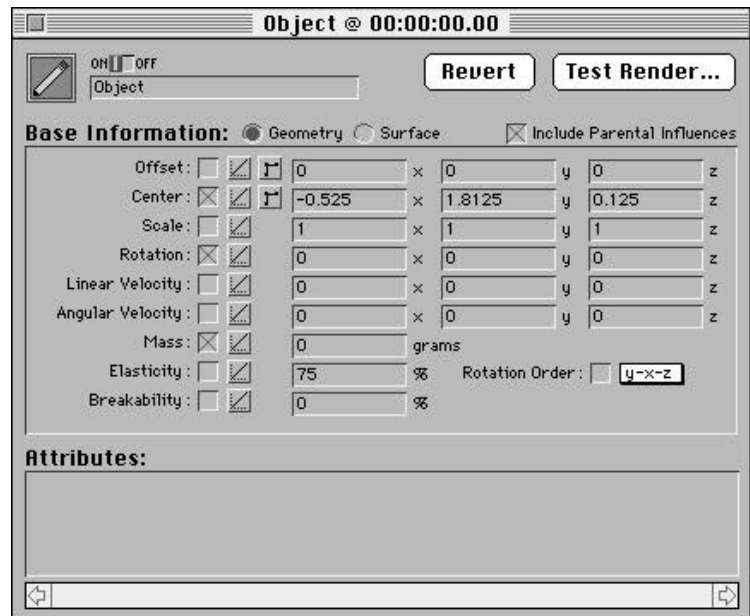
grams; enter a value in the data field to give the object a mass.

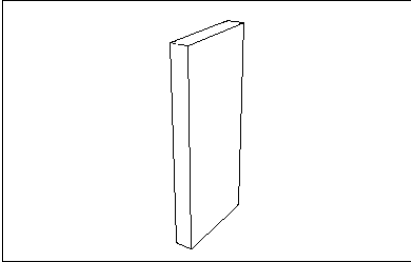
##### Elasticity

percent; enter a value in the data field to set the amount of rebound (bounce) the object will exhibit when it strikes a surface (Collision Animator applied). A value of 0 will make the object “stick” to the surface; a value of 100 will make the object bounce indefinitely without diminishing in amplitude (superball).

##### Breakability

percent; enter a value in the data field to set the sensitivity to impact (Collision Animator applied). A value of 100 will cause the object to break off upon any impact; a value of 0 will make the object impervious to impact (never break off).



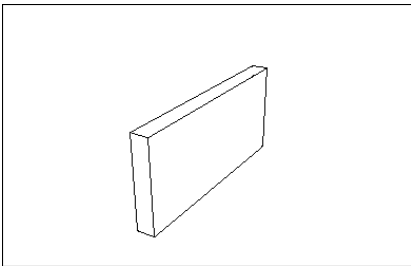


Original object orientation

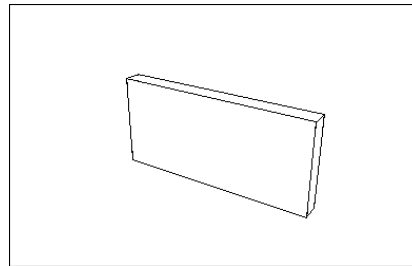
### Rotation Order

This menu lists the six possible orders of rotation on the three axis: x-y-z, y-z-x, z-x-y, y-x-z, x-z-y, and z-y-x. The selection in this menu will determine what order the rotation on multiple axes will occur. Select a rotation order other than y-x-z (default, set in the Environment Settings dialog box (Edit Menu)), and the check box will automatically activate to override the default. Unchecking the box will automatically return the rotation order to the default.

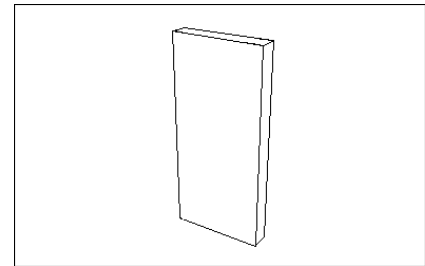
The Rotation Order is important in that the final orientation of an object which is subjected to rotation on multiple axes is not necessarily the same for all rotation sequences. Examine the following examples to see how different rotation orders can result in greatly different final object orientation.



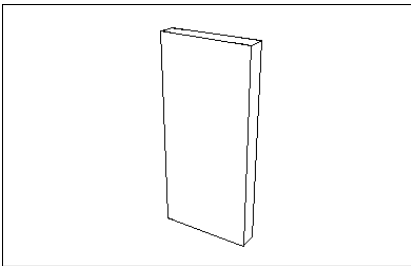
x rotation - x-y-z rotation order



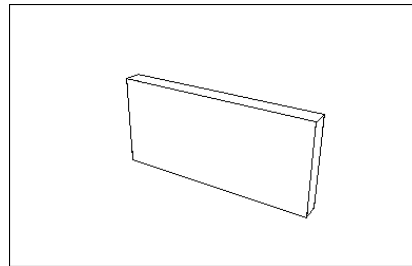
y rotation - x-y-z rotation order



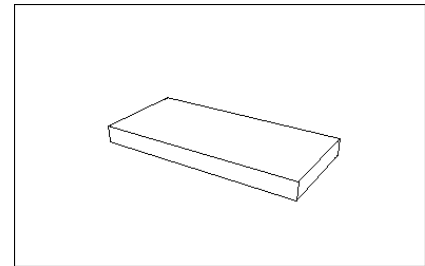
z rotation - x-y-z rotation order



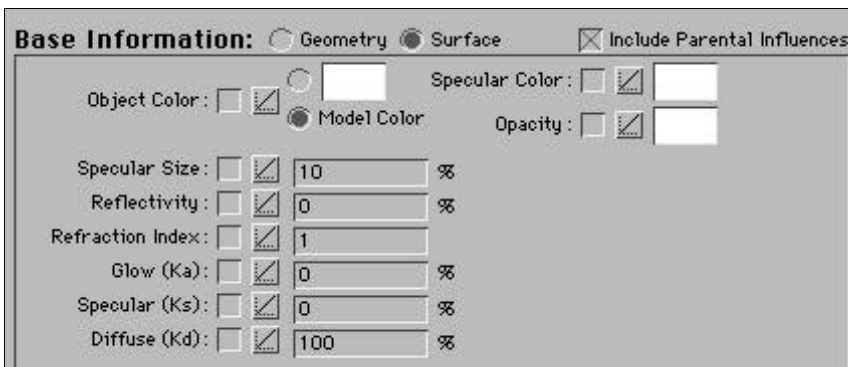
y rotation - y-z-x rotation order



z rotation - y-z-x rotation order



x rotation - y-z-x rotation order



### Surface

**Object color**  
color dialog box

**Specular color**  
color dialog box

**Opacity**  
color dialog box

**Specular size**  
percent

**Reflectivity**  
percent

**Refraction Index**  
whole number 0-100

**Glow ( $K_a$ )**  
percent

**Specular ( $K_s$ )**  
percent

**Diffuse ( $K_d$ )**  
percent

### Color dialog boxes

Click in any of the color boxes (Object Color, or Specular Color, or Opacity) to expose the standard color edit dialog for that feature. Refer to the Environment Settings section of the Presenter Menus chapter for more information about how to use the color edit dialog box.

Clicking in the color box for Object Color automatically sets the radio button “on” for the new color you are selecting. The default Object Color is that which was set in ModelPro; this is referred to as Model Color.

### Opacity

The Opacity color box has a function separate from changing some specific color. In the general case, you will want to set your Object opacity using the following guidelines:

Note: Opacity color – white = totally opaque  
black = totally transparent

#### To intuitively set the Object opacity

- 1) Click on the Opacity color box to expose the standard color edit dialog.
- 2) Adjust Brightness only, using the scroll bar at the right, or by making a numeric entry (0-65535).

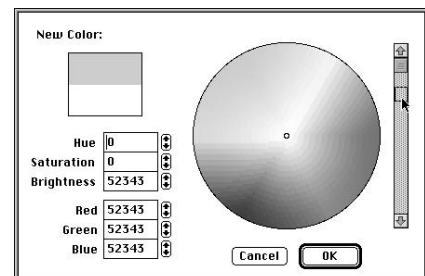
Setting opacity for particular colors is far more complex, and requires quite a bit of trial and error to achieve any degree of success. If you wish to tackle this type of opacity, start by understanding the following:

Note: for our purposes, “white” is a combination of Red, Green, Blue (RGB) with numeric values at the maximum (65535); Hue & Saturation set to minimum numeric value (0); Brightness set to maximum. “Black” is a combination of RGB & HSB all set to minimum.

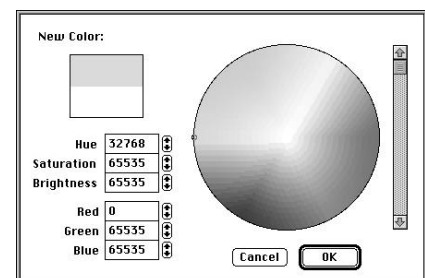
#### To make the Object transparent to “Red” light

- 1) Access the Opacity color dialog, and set the color to white (the default setting is white).
- 2) Enter a value of 0 for Red.

Note: the color indicated by the marker on the color wheel (shown in the upper portion of the color preview box) is the color of light to which the object will be opaque; in this case, Cyan.



Setting the brightness.



Making the object transparent to Red.

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By manipulating the following properties, it is possible to create a variety of surface effects like glass, metal and plastic. Except for the Refraction Index, these properties are defined by a numeric entry (0-100). An entry of 0 will have no effect; an entry of 100 will have the maximum effect. Only raytrace rendering will show Reflectivity and Refraction Index effects.

### **Specular ( $K_s$ )**

Specular intensity controls the color of the highlight (hot spot) created by a light source. Lower values make the color of the highlight closer to that of the object. Higher values make the highlight color closer to that of the light source.

### **Specular Size**

Specular size controls how “tight” the highlight is on the object. Lower values produce a loose (diffuse) highlight. Higher values create a tight (well-defined edges) highlight.

### **Specular Color**

If the check box is “on” for Specular Color, the Specular ( $K_s$ ) intensity is overridden. The color of the highlight takes that shown as Specular Color.

This parameter does not have a real-world counterpart. It is included to give you flexibility in creating special effects.

### **Reflectivity**

Reflectivity is a measure of how mirror-like a surface is. A lower value produces a less mirror-like surface. A higher value creates a more mirror-like surface.

### **Refraction Index**

This index corresponds to the amount of light, and manner in which light passes through a transparent object (i.e. glass and water). Refraction Indices range between 0 and 2. The distortion of an image viewed through the transparent object is an indicator of the Refraction Index value. Lower values indicate less distortion. Higher values indicate more distortion.

**Tip:** a highly reflective surface will have a high Specular intensity value.

**Tip:** a highly reflective surface will have a high Specular Size value.

**Tip:** a shiny, chrome bumper is highly reflective; the bark of a pine tree is non-reflective.

**Tip:** a pane of window glass has only slight refraction properties, depending on the thickness. A magnifying lens has more extreme refractive qualities.

## Object Geometry and Surface Attributes

### Glow ( $K_g$ )

This parameter determines to what degree an object will retain its own color. A lower value makes the object color tend toward the color of the light source, as the light source increases in intensity. A higher value makes the object tend to hold its own color, regardless of external lighting.

**Tip:** a Chinese paper lantern (which is lit from inside) would require a higher glow value, so as to be unaffected by other light sources, and have little or no shading.

### Diffuse ( $K_d$ )

This parameter determines how the light spreads across the object surface (gradation of object color). A lower value makes for less gradation. A higher value makes for more gradation. A proper mix of Diffuse ( $K_d$ ) and Specular ( $K_s$ ) intensity is imperative to create photorealistic surface effects.

**Tip:** a matte plastic surface would be highly diffuse.

The following table is to give you some starting points for setting the surface parameters. Some trial and error will be required to achieve the best results for your project.

	Dull Surface	Shiny Surface	Metal	Silver	Chrome	Glass	Water	Gold	Ice	
Specular Size	10	1.6	3	4	9	3	6	20	30	
Reflectivity	0	10	40	35	90	70	70	70	10	
Refraction Index	1	1	1	1	1	1.4	1.222	1	1.33	
Glow ( $K_g$ )	0	0	0	0	0	0	0	10	15	
Specular ( $K_s$ )	0	40	70	70	60	70	40	90	40	
Diffuse ( $K_d$ )	90	70	20	50	20	5	0	30	80	
Model Color	Hue	–	–	42000	36991	42655	0	29865	5619	28545
	Saturation	–	–	27943	4991	57291	0	4771	65535	9982
	Brightness	–	–	65535	65535	65535	65535	65535	65535	65535
Specular Color	Hue	–	–	0	35322	0	33289	34423	10449	0
	Saturation	–	–	0	13511	0	13124	16592	65535	0
	Brightness	–	–	65535	65535	65535	65535	65535	65535	65535