

ImpactPlus Companion

Contents

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1



Welcome

Welcome

Ready to add a new dimension to your Web graphics projects, digital movies, presentations, or desktop publishing? ImpactPlus will take you there! And no special skills are required—whether you use Wizards to create and customize instant scenes, or construct your own from scratch. ImpactPlus puts all the tools and resources you'll need within easy reach. You just pick and choose, mix and match—embellish and tweak to your heart's content. The professional-quality results will amaze you!

About the Companion

This Companion is your guide to getting started and getting results with ImpactPlus—from initial installation through advanced tips and examples.

- 1 **Welcome.** Read on for a feature summary—a checklist of the fun that's in store for you.
- 2 **Getting Started.** How to get up and running, and create instant 3D designs and animations.
- 3 **Setting the Scene.** A sequence of guided tours to introduce you to all the basic elements of the ImpactPlus interface.
- 4 **Making It Move.** How to add movement to your static scenes for eye-catching animations and movie clips.
- 5 **Waxing Creative.** Beyond the basics... more theory and practice to improve your use of text, bevel, color, texture, and deformation. Plus the secrets of anaglyph (stereo) imaging!
- 6 **Building New 3D Objects.** A comprehensive look around the 3D Workshop, where you'll be building your own sophisticated models in no time at all.
- 7 **Working with Other Software.** How to incorporate your ImpactPlus creations in a video, publication, presentation, or desktop publishing program.



“Vertex Fog” background effect

What You'll Find in ImpactPlus...

Whether you're a novice, a digital dabbler, or an old hand with 3D modeling, here's a quick summary of what's in store for you. Check the Welcome topic in online Help for direct links to detailed coverage.

- ◆ **Welcome to the Microworld!**

ImpactPlus gives you a limitless stage where you can create your own production—combining 3D text, geometric models, backgrounds, lighting effects, multiple cameras, and much more! It's easy to create a static scene and add optional animation. Browse ready-made models, from basic shapes to complex technology. Or use QuickShapes for your own adjustable instant objects... assemble into groups... reshape any model like plastic! Scene planes let you carve out a multi-dimensional virtual space.

- ◆ **Lights...**

Every new scene includes a built-in light source at your viewpoint... switch it on or off as needed, while setting up your custom lighting scheme. Choose and customize a scheme from the wide range of presets on the Studio's Lights tab... or add your own lights one by one. Use advanced lighting controls and effects, even cast shadows—with multiple color components to set the “quality” of each light's output, each object's reflectance.

- ◆ **Camera...**

Choose from six preset viewpoint angles, or simply drag for freeform viewpoints and object rotations. Achieve tilts and swivels in all three dimensions with intuitive orbit adjustments. Even move the viewpoint around without disturbing its custom angle. If one view won't do, you can open secondary scene windows for more vantage points and easier object manipulation.

- ◆ **Action!**

Make any static 3D scene come alive! The Studio's Animation tab even comes pre-loaded with dozens of exciting animated effects that you can click to apply to text and objects. Or you can place your own key frames for object properties you want to vary—let ImpactPlus generate the in-between motion as objects move, rotate, change size or color, and much more. The result: an animated GIF or AVI movie clip!

- ◆ **Not Real Enough? Grab Your 3D Specs!**

Leapin' lizards! Lest we forget... ImpactPlus can convert any scene to anaglyph stereo for viewing onscreen or on paper, using the supplied red-cyan glasses. For extra fun, try anaglyph animation!

◆ **Text You Can (Almost) Touch**

Add unique dimension and motion to your message! Use WYSIWYG text entry to preview fonts and formatting, then edit each character as a 3D element... change color, position, tilt, and other properties... retype text at any time. Great for animation—create spinning letters, exploding words, radical color shifts!

◆ **Texture You Can (Almost) Feel**

Decorate anything in the scene with a bitmap image for surface realism... grab texture presets from the Studio or define your own... include transparency for unique effects. Apply multiple texture components for added detail, environmental reflections, or hill-and-dale contouring. Easily rotate, resize, and move bitmap textures on any object. Switch planes and objects from solid to wireframe rendering, and apply flat or shaded colors and textures. Use vertex or table fog to add depth and drama. Animate textures... even use movie clips as textures, for a TV scene-within-a-scene!

◆ **Create Your Own 3D Models**

Go beyond mere scene-building... step into the 3D Workshop and easily construct your own 3D objects using QuickShapes, simple drawing tools, or even imported clip art. The Workshop instantly converts your 2D figures to extruded or lathed 3D shapes!

◆ **Versatile Import and Export**

Choose the correct settings *before* export with the built-in Export preview window. ImpactPlus supports industry-standard formats—for animations and movies, you can export to .GIF or .AVI... even as a series of still frames! Choose .PNG to preserve 32-bit transparent backgrounds. Output grayscale depth maps for advanced 3D effects in Serif PhotoPlus 8. Import standard metafiles, and for easy exchange, you can both import and export models in the DirectX™ (.X) format.

◆ **Serif Quality and Ease-of-Use**

ImpactPlus combines its own sophisticated 3D model format with built-in DirectX 8.1 support for rapid 3D rendering. MDI lets you open multiple 3D scenes at once. And of course, every detail of the UI is designed to support efficient, creative productivity. View and select lights, planes, and objects in the Navigator... check and control object and viewpoint coordinates in the Status panel... store your own custom models, lighting schemes, materials, backgrounds, and bevels in the Studio galleries. It's all there at your fingertips!



2



Getting Started

Registration, Upgrades, and Support

If you see the Registration Wizard when you launch ImpactPlus, please take a moment to complete the registration process. Just call Serif toll-free and provide the installation number and code shown. We'll give you a personalized registration number in return. Remember, if you need technical support please contact us. We aim to provide fast, friendly service and knowledgeable help.

Installation

What you need to run ImpactPlus

First of all, you'll need a system that runs a recent version of Windows with adequate speed. If you need help installing Windows or setting up your printer, refer to Windows documentation and help (see below).

- ◆ IBM compatible Pentium-class PC with CD-ROM drive and mouse (or other Microsoft compatible pointing device)
- ◆ Microsoft Windows® 98, 98SE, Me, 2000, or XP operating system
- ◆ 32MB RAM (64MB for Windows 2000/XP)
- ◆ 50MB minimum free hard disk space
- ◆ DirectX 6.1 (or higher) compatible 3D-accelerated SVGA graphics card (at 16-bit or higher color depth)
- ◆ DirectX 8.1 supplied with ImpactPlus

Additional disk resources and memory are required when editing large or complex documents.

What you need to know

Don't worry if you've never worked with 3D graphics software. ImpactPlus requires no special knowledge. Follow along on the Companion's guided tours and you'll be up to speed in no time.

If you're new to Windows computing, you will find it much easier if, before installing and using ImpactPlus, you spend a little time becoming familiar with the operating environment.

- From the Windows desktop, click the **Start** button at the lower left and choose **Help**.

First-time install

To install Serif ImpactPlus, simply insert the CD-ROM into your CD-ROM drive. The AutoRun feature automatically starts the Setup process. (If it doesn't, follow the manual install procedure described below.)

Just answer the on-screen questions to install the program. You will be given the choice between a Recommended install (which optimizes performance by loading speed-critical files to your hard drive for best performance) or a Custom install (which lets you specify the files you want copied to your hard drive).

ImpactPlus Resource CD-ROM

If you've purchased the Resource CD-ROM, we suggest you install it as soon as you've finished installing from the Program CD-ROM. Again, the AutoRun feature will automatically start the Setup when you insert the Resource CD-ROM into your drive.

Manual install/re-install

To re-install the software or to change any part of the installation at a later date, select **Settings/Control Panel** from the Windows Start menu and then click on the **Add/Remove Programs** icon. Make sure the correct CD-ROM is inserted into your CD-ROM drive and then simply follow the on-screen instructions. To install just one particular component to your hard drive, choose the Custom option and check only that component.

Starting ImpactPlus

Once ImpactPlus has been installed, you'll be ready to start. Setup adds a **Serif ImpactPlus** icon to the **Programs** submenu of the Windows Start menu.

- ❑ Use the Windows **Start** menu to start ImpactPlus, or if ImpactPlus is already running choose **New** from the File menu.



ImpactPlus launches and displays the Startup Wizard, with these options:

- ◆ **Use a Design Wizard** lets you preview and select from a variety of instant effects, ready for you to customize or use “as is.”
- ◆ **Start from Scratch** opens a blank scene window.
- ◆ **Open a Saved Scene** lets you browse and open your own files.
- ◆ **View Samples** displays a gallery of impressive ImpactPlus creations.

If you're just getting started with ImpactPlus, here's a quick summary of learning paths you can follow:

- 1 From the Startup Wizard, choose the **Use a Design Wizard** option. Then follow along with the Guided Tour below, “Instant Results.”
- 2 For information about ImpactPlus tools and menus, just move the mouse pointer around the screen. Watch the **HintLine** at the bottom of the screen for capsule descriptions of each feature.
- 3 Of course, read through the following Companion chapters for self-paced, hands-on tours of ImpactPlus tools and functions.

- 4 While there's a lot of valuable info in the Companion, online help has it all! Choose **ImpactPlus Help** from the Help menu to see what's available. The opening screen lets you browse the extensive Visual Reference, search the Index, or peruse the sequence of How To topics. Click **Help on Help** for some tips on how to proceed.
- 5 If you've purchased the Resource CD-ROM, take a look at the wide range of Tutorials covering basic to advanced topics.

Guided Tour: Instant Results

Creating amazing 3D effects that you can be proud of is easy with ImpactPlus! The ImpactPlus window works like a miniature world, with its own objects that you can construct, manipulate, illuminate, and photograph from any angle. Take a single snapshot, and you've got a still image you can use in an illustration or on a Web page. Take a series of snaps, as the scene changes, and you can play them back to produce animations and video clips. Either way, it's an intuitive and exciting way to get visual results!

You can get started right away by selecting a built-in Design Wizard...

- Run the Startup Wizard (**File/New**).

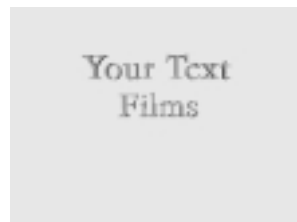
If the Startup Wizard fails to appear, check **Use Startup Wizard** on the **File/Preferences...** screen, then try again.



- From the Startup Wizard, click **Use a Design Wizard**.

You'll see the Wizard categories displayed on the left, with preview thumbnails on the right. You might take a few moments to explore the range of choices. (The actual number of Wizards depends on whether you've installed the Resource CD.) For this trial example, we'll customize an instant 3D movie intro!

- Open the **Intros** category and select the thumbnail for the **Style** Wizard, then click **OK**.



The selected design appears as a new scene in the ImpactPlus window. Since this is an animated scene, we're actually looking at the first frame of a series—that's why the word "Presents" isn't visible yet. But we can make significant changes to the scene right here on the first frame. Follow along carefully as we enhance several elements...




- ❑ Click the **Backgrounds** tab that's part of the ImpactPlus **Studio**, at the far right side of the window. Scroll down in the list of categories and select **Cosmic**. Then click the very first thumbnail ("Cosmic 01") in the gallery to add an instant sunset background to the scene. 
- ❑  Over on the **Tools toolbar** at the left side of the window, the **Move/Size** tool should already be selected. Using its pointer cursor, double-click on "Your Text Films."
- ❑ In the dialog, replace "Your Text" with your own name (or some other word)... pick a different font if you like... and click **OK**.
- ❑ Now drag the updated text block to the left of the sun. If it seems too big or small, you can resize it by dragging any node of the bounding box.




Next, we'll see how easy it is to add a 3D object to the scene!

- ❑ Click the Studio's **Models** tab and scroll down to the **Sci-fi** category. Click one of the futuristic flying machines; we've used "Space Jet," first thumbnail in the fifth row. The new object appears at the center of the scene. (You can also drag model thumbnails into the scene to position them precisely.) 
- ❑  Drag the jet object to the right of the sun, near the horizon. You may want to enlarge it a bit, and try using the **Rotate** tool (just below Move/Size) to give it a more dramatic angle. If you make a mistake, simply press **Ctrl-Z** to undo.

The jet looks a bit dark, so let's give it some extra illumination.

-  On the **Lights toolbar** at the lower left, click the **Add Point Light** button. This puts a new omnidirectional light source at the center of the scene and brightens the jet model considerably.



-  If the jet now looks too bright, click the **Intensity** button with the Point Light selected and drag the slider to adjust the light.

Now let's try one method of adding some color.


- With the Point Light still selected, click the Studio's **Attributes** tab. In the **Color/Transparency** panel, the white swatch will be highlighted (since the light is initially white). Click any other swatch to change the hue and you'll see the jet model respond accordingly. Keep trying colors until you find one you prefer.
- Finally, in order to preview the scene unobstructed, right-click somewhere other than on an object (for example, in the sky) and uncheck **Light Models**. The model representing the Point Light will vanish, but its light will still shine.

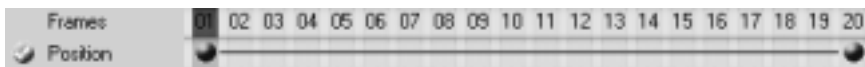
Now let's see how the revised scene looks when it's animated.

- ❑ Locate the **Animation toolbar**, which should be onscreen in a small, separate window. (If it's not visible, right-click and check **Animation**.) Then click the **Play** button.




The animation plays once and stops on the last frame. This particular sequence consists of 20 frames, with one text object (“Presents”) changing its position over time.

- ❑ To peek at what makes the animation happen, select the word “Presents” and then click the Animation toolbar’s  **Maximize** button to expand it. The two purple dots define the starting and ending position of the text object—that’s all there is to it!



In Chapter 4, you’ll learn how easy it is to create your own animated effects. No doubt you’d like to make that jet zoom across the sky, too... but let’s not jump the gun. First, spend some time learning about scenes and objects in the next chapter, and soon enough you’ll be able to return to this example and confidently animate the fly-by. For now, just make sure your customized file is saved before moving on.

- ❑  Click the **Save** button (or choose **Save** from the File menu). Provide a name, and the scene will be saved in the ImpactPlus .IPP format.
- ❑ If you’d care to view your results as an animated GIF or AVI movie, choose **Export** from the File menu, then select **Animation** and finally **Image** from the submenus. Select export options as desired (see Chapter 7 for details).

Video Setup Tips

If you'll be using ImpactPlus to create **video clips**—animated sequences to be inserted into existing video footage—then a bit of advance planning will go a long way. Because ImpactPlus clips must be tailored to suit your existing footage, it's helpful to learn as much as you can on the video production side before you get started creating the clips. Consult the documentation accompanying your video editing software for clarification of any terms and procedures that may be unfamiliar.

Here are some key points to consider:

- ◆ Does your video editor support **transparent overlays**—and if so, what kind? ImpactPlus can export images with transparent backgrounds, using either a single color (as in “bluescreening”) or full 32-bit variable transparency.
- ◆ Determine the **frame size** of the master video (for example 320x240 pixels) beforehand, and use these same dimensions for your ImpactPlus scenes. **File/Scene Setup...** offers several standard video sizes, or you can set custom dimensions. Note that many video editors prefer frame measurements divisible by 8 or 16.
- ◆ Video **frame rate** is another consideration. While full-quality video may use 24 or 30 frames per second, rates of 12 to 18 fps are usually acceptable for computer viewing. But again, for seamless integration, the main thing is to match the frame rate you're using in ImpactPlus to that of your master video.
- ◆ When you export, you can choose whether or not to use one of the compression algorithms or **codecs** available on your computer. Our best general advice is to export your ImpactPlus AVIs using **no compression** (with **Use Codec** unchecked). Since most codecs are “lossy” and will degrade the quality slightly with each save, a rule of thumb is to avoid compressing video segments more than once. Ideally, given enough disk storage space, you can keep your master video footage in uncompressed “raw” format through the entire editing process, then compress only at the final stage. When that time comes, plenty of information about the relative advantages of different codecs is available online.



3

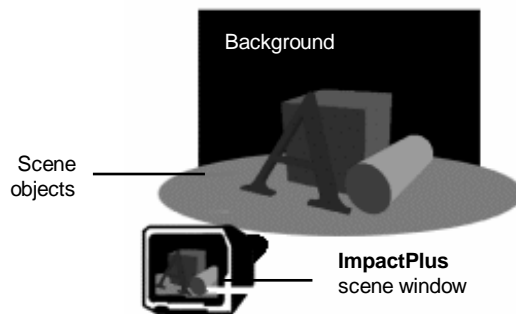


Setting the Scene

It's a 3D World...

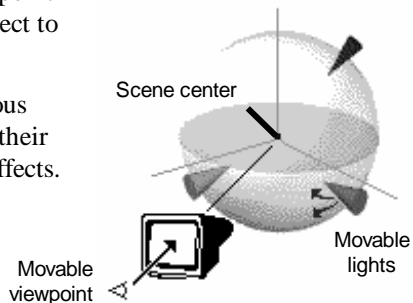
The best part of using ImpactPlus is that you can create terrific effects without having to master all sorts of spatial concepts and computer jargon. If you can grasp height, width, and depth, you're halfway home! But learning any new program does involve a bit of trial and error. Here's some background to help minimize the "error" part.

The main ImpactPlus window consists of a **frame** (with titlebar, menus, etc.) enclosing at least one **scene window**. Imagine you're behind a video camera, looking at a "set" with one or more **objects** positioned against a **background**. The ImpactPlus scene window is what you'd see through the camera's viewfinder. As you'd expect, there are tools to let you rearrange the objects, substitute a different background image, or change the studio lighting for different effects. But that's not all. With ImpactPlus, you can instantly change an object's colors and dimensions, rotate it in space, apply cool surface textures, create your own mini-universes of text and shapes, create animation... and more!



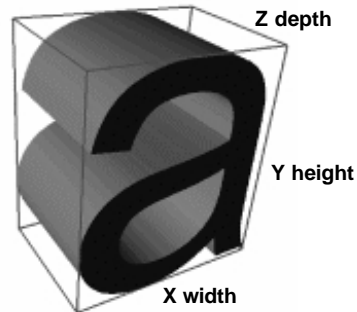
New objects appear at the **scene center**. From your **viewpoint**, looking through the scene window, you see the objects in perspective. You can reposition objects to be nearer or farther away (their sizes change accordingly), and freely move or point the "camera" anywhere with respect to the scene.

You can also place **lights** of various types around the scene, and vary their color and intensity for different effects.



Each three-dimensional object takes up space in three directions, defined in 3D parlance as the **X**, **Y**, and **Z axes**.

Think of the **X** axis as defining the object's **width** or left-to-right dimension, and the **Y** axis as defining its **height** or top-to-bottom dimension. For example, the **X** and **Y** axes define the black character "a" in this text object.

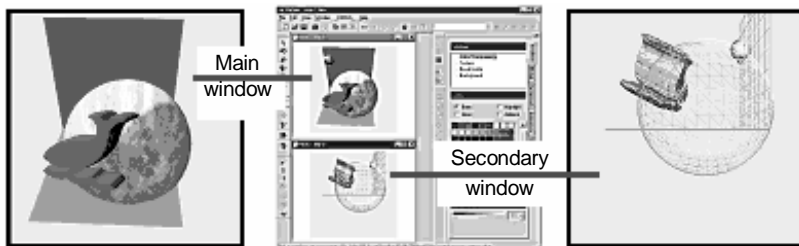


The **Z** axis defines the object's **depth** or front-to-back dimension. It's this extra dimension that gives us "3D."

Setting the view

To set the width and height of the scene, choose **Scene Setup...** from the File menu, or right-click on an empty part of the scene window and choose **Scene Setup....** Select a unit of measurement and enter the width and height.

You can supplement the initial **main window** with optional **secondary windows** as needed. The main window can view the scene from any position or angle, shows fully shaded objects, and defines the final scene that will be printed or exported. Secondary windows, useful for checking and correcting object positions, are limited to a fixed viewpoint (such as Top or Right) looking straight into the scene center, and objects appear in wireframe mode. Both kinds of window initially provide a single light source for working illumination.



For convenience, you can choose **Layout** from the View menu and select one of four basic window configurations. **Main** fits a single (main) window into the workspace; the other choices display a main window plus one, two, or three secondary windows. Or you can start with the one main window and open secondaries as needed—simply

choose **New Window** from the Window menu, then select the desired starting view (**Left**, **Right**, **Top**, **Bottom**, **Front**, or **Back**) from the submenu. It's possible to open any number of secondary windows, and drag or resize windows (or use the **Tile** command on the Window menu) to arrange the open windows. Note that you can't open more than one main window.

At **normal view** level (1:1 or 100%), the size of the scene window you see equals the size you've specified in Scene Setup. ImpactPlus gives you several ways of adjusting your working view without affecting the actual scene size:



To zoom in or out, choose the **Zoom** tool on the Tools toolbar, then left-click on the scene window to zoom in, or right-click to zoom out.



To adjust the scene window's size to fit within the main window area, click the **Zoom to Fit** button on the Standard toolbar, or choose **Zoom** from the View menu (or the scene's right-click menu) and select **To Fit**.



To restore the scene window to its actual size, click the **Normal View (1:1)** button on the Standard toolbar, or choose **Zoom** from the View menu (or the scene's right-click menu) and select **Normal View (1:1)**.

Zoom to Fit and **Normal View** are also available on a handy menu if you right-click any neutral part of the scene.

With this brief orientation, you're ready to begin creating and manipulating objects in your own 3D scenes! So follow along as the rest of the chapter continues to explore the ImpactPlus interface.

Guided Tour: 3D Scenes

ImpactPlus is so easy to use, with such compelling effects, that you're sure to want to experiment on your own. The following guided tour will help you get up to speed, and very soon you'll be pushing the limits of your creativity! We'll use checkbox bullets to mark the ongoing tutorial thread—steps we'd like you to complete as you follow along with the text. Save your work occasionally as you go along.

The main purpose of this tour is to introduce you to the various ImpactPlus tools—not to make you an expert! For additional details on each tool and procedure, be sure to consult online help's **Visual Reference** and **How To** sections.

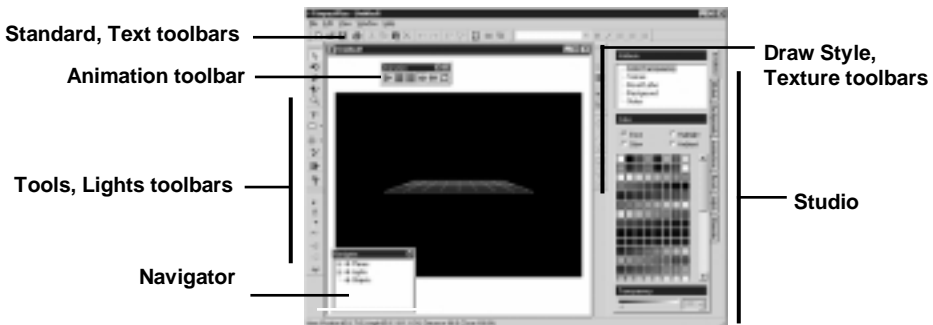
NOTE: If you have the ImpactPlus Resource CD-ROM, you can take the same tour by following the **Learning Lab** tutorial sequence... with the advantage of full-color illustrations and an onscreen format.

Making a scene


We'll begin by creating a new, blank scene window.

- Start ImpactPlus or, if it's already running, choose **New** from the File menu, and select the "Start from Scratch" Wizard option.
- Take a moment to identify the basic elements of the ImpactPlus interface: various **toolbars**, the **Navigator**, and the seven **Studio tabs** on the right.

Your screen will look something like the illustration below. You may wish to resize the main window to bring the tools a bit closer to the scene window, and also click the **Zoom to Fit** button to maximize the working area.




We won't be needing the Animation toolbar for some time, so we can hide it to free up some screen space.

- ❑ Hide the Animation toolbar by clicking its  **Close** button.

The lattice of blue lines in the center is the **Bottom plane**, one of six planes you can display as layout guides or scene elements. The Bottom plane slices through the scene center at the zero point of the scene's Y (vertical) axis. Initially the main window's viewpoint is elevated seven units above this plane, affording a perspective view.

The **Navigator** window provides a hierarchical tree listing of all the planes, lights, and objects in a scene. You can easily reposition this central panel, and use it to select, rename, and manipulate any listed element. Let's use it to hide the Bottom plane so the scene window is blank.

- ❑ In the Navigator, click  to expand the **Planes** category. Click to uncheck the box next to the **Bottom** entry, and the plane disappears, leaving an empty window. You can collapse the **Planes** category before proceeding.

The object of the exercise

Adding 3D models, also called "objects," to the scene is a snap!

- ❑ Click the Studio's **Models** tab to reveal the Basic Shapes category. Click the "Pyramid" shape (third row down in the middle).

ImpactPlus imports the model and creates a new pyramid object at the scene center. (For future reference, you can also drag models from the Models tab and drop them at a specific position.)

- ❑ In passing, note that the Navigator's **Objects** category now contains a new entry, a "Pyramid - 3DW Object." This default label simply means that this object was created in the ImpactPlus 3D Workshop (as detailed in Chapter 6).


If you want to relabel any Navigator item for more convenient identification, simply retype the label—here's a simple demonstration:

- ❑ In the Navigator, click the pyramid's label twice to select the text, then delete the words after "Pyramid".



The pyramid, like all the basic shapes, has a white color by default, and no special texture or other attributes. Initially, what you see is an edge-on view, which is why the object now looks like a flat quadrilateral. Let's prove that it really has three dimensions.

The right tool for the job

- ❑  With the pyramid object selected, click the button for the **Rotate tool** on the Tools toolbar at the left.

Immediately, a spherical bounding box appears, with three orbital lines and nodes where the orbits intersect. Dragging a node makes the object rotate around one of its three **internal axes**.



- ❑ Move the mouse pointer over the front node (watch for the special cursor), then drag it slightly to the left, then to the right, and you'll see the object revolve. Release the mouse button, then click again on the front node and this time drag up and down. As the object revolves, its sides reflect the frontal lighting in different directions and begin to appear distinct from each other. Leave the object tilted in a different direction from where it started.

When you drag a node, you can see the object revolve as if around a “spindle”. Each orbital line defines a rotational plane in relation to an internal axis, like the Earth’s equator in relation to its polar axis. Each object has three such internal axes: X, Y, and Z. These don’t change in relation to the object—in effect, no matter how each object twists and tumbles in space, it “remembers” its own top and bottom, front and back, right and left.

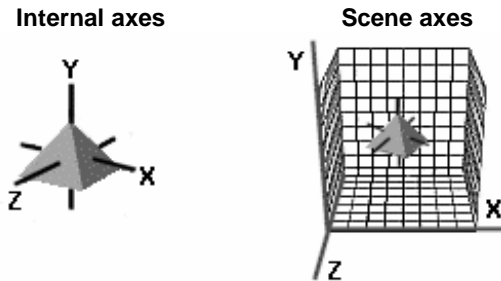


Now consider the computer screen through which you’re viewing the scene: it too has its own axes defining top, bottom, and so on. We call these the **scene axes**. They’re fixed and unchanging, and quite independent of the objects in the scene itself.

- ❑ With the pyramid still selected, hold down the **Y** key on the keyboard and you’ll see the object twist sideways. To reverse directions, press **Y** with the **Shift** key held down. Can you see how the object is rotating differently now?

Using the **X**, **Y**, and **Z** keys with the Rotation tool (rather than dragging nodes) makes the object rotate around the scene axes. The pyramid’s internal Y axis passes through its apex, but it’s not revolving around that axis now! With the **Y** key held down, it revolves in a horizontal plane, around the scene’s vertical Y axis.

- ❑ Try rotating the pyramid, contrasting the drag and keyboard methods, until you can clearly visualize the difference between internal and scene axes.




Finally, let's try some freeform rotation...

- ❑ Click anywhere on the pyramid (but avoiding the nodes), and drag slightly. You'll see the object respond as you "steer" it into a new position. Try using small circular motions to change orientation. Counter-clockwise motions will reverse clockwise changes, and vice versa.

By the way, ImpactPlus features multiple levels of undo (which you can set in **File/Preferences...**)—so if you seem to have rotated your pyramid hopelessly out of alignment, you can always backtrack... But with a bit of practice, you'll be able to use any of the three Rotation techniques to point objects unerringly in any direction!


Let's continue to explore the offerings on the Tools toolbar, using the pyramid as a sort of geometric guinea pig. The **HintLine** at the bottom of the ImpactPlus window provides Position, Size, and Angle information about each selected object, using an X, Y, Z format. Keep an eye on it as you proceed through the following steps.

- ❑  Click to select the **Move/Size tool**.

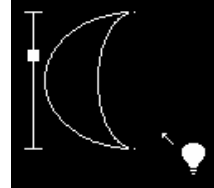
As its name implies, this tool handles two functions. If you click directly on an object, you can drag it around along the scene's X or Y axes. (Its distance from the viewpoint, or Z-distance, doesn't change.) Alternatively, you can click one of the object's nodes—the dots at the corners of the bounding box—and drag to resize it. (In this case, the object responds by growing or shrinking in three dimensions, although its center doesn't move.)

- ❑ Try moving and resizing the pyramid. Again, watch for the special cursor that appears when you're over a node.

Before proceeding, let's make life a bit more interesting by adding a second object to the scene—this time, a QuickShape.

- ❑  Click the little down arrow on the **Insert QuickShape tool**, near the middle of the Tools toolbar. (The actual button icon varies, depending on which shape you've selected most recently.) From the flyout menu that appears, choose the "Moon" shape. The cursor changes to a light bulb icon.

- ❑ Click in the scene window and drag sideways with the light bulb cursor until a crescent shape appears and is roughly as big as the pyramid object. When you release the mouse button, you'll see a slider.




You can adjust the outline of any QuickShape by dragging its slider(s). In this case, the single slider varies the "phase" of the moon object.

Experiment with the slider, leaving the moon as a typical thin crescent shape. Then double-click the shape to create the object. (Pressing **Esc** would cancel.)

As with the pyramid earlier, the moon object initially appears in front view, and the Navigator includes a new entry ("QuickShape") for it.



- ❑ Use the Rotate tool to swivel the moon to a more interesting angle.
- ❑ In the Navigator, relabel the QuickShape as "Moon."

 The next item on the Tools toolbar is the **Stretch tool**, which lets you adjust a single object's size along one dimension at a time—for example, to make it thicker or thinner without changing its height or width.

- ❑ Select the Stretch tool and click on the moon object.

Again, you'll see a bounding box; but this time it represents the internal axes of the object itself, as it's currently positioned in space. Dragging the nodes to adjust width, height, and depth is intuitive.

- ❑ Experiment with the tool until you get accustomed to the changes along each axis. Then return the moon to its original shape, more or less.

- ❑ Choose the Move/Size tool and drag the moon down until it intersects the pyramid. Both objects are still centered the same distance from the viewpoint, so where they take up the same space, they overlap with intriguing results!




The **Distance tool** lets you move an object's center along the scene's Z axis—in other words move it closer to (or further from) the viewpoint. This complements the Move tool and lets you place one object in front of another in your scenes.

- ❑ Choose the Distance tool and click on the moon object to select it. Now drag the object slightly down. Doing so decreases the Z-distance and brings the object closer; dragging up pushes the object away. Although the object appears to grow or shrink, bear in mind that it hasn't actually changed size—only position.


TIP: In working with objects, you'll often find yourself switching between the first four tools on the Tools toolbar. Use the shortcuts shown at right to jump quickly from one tool to another.

<u>To choose:</u>	<u>Press:</u>
Move/Size tool	Ctrl+1
Rotate tool	Ctrl+2
Stretch tool	Ctrl+3
Distance tool	Ctrl+4

You can select multiple objects by holding down the **Shift** key when selecting each object, or by dragging out a marquee around a group of objects. **Grouping** takes this one step further by combining separate objects into one composite object. You can move, resize, rotate, stretch, and perform other operations on a multiple selection or a group as if on a single object. Groups are handy because you can still select the individual component objects to make local adjustments as needed, and ungroup them if necessary.


- ❑  Try selecting both objects, then click the **Group** button on the Standard toolbar to combine them. Use the Move/Size tool to drag the combined object slightly.

Take a glance at the Navigator and you'll see that it now lists one "Group" object where it previously showed the two separate objects.

- ❑  Now click just the moon, and it acquires a red bounding box of its own. Drag the moon slightly and note that the pyramid doesn't budge. Click on a blank part of the scene to deselect all

objects, then click either object—notice that they’re still grouped! Finally, click the **Ungroup** button to revert to two separate objects.

Again, notice that the Navigator is keeping up with the changes.

- ❑  Moving right along, click the **Text tool**. Immediately, a text edit window pops up. Type a couple of words and pick a font from the drop-down list (we applied Stylistic SF to the words “Nile Style”). Click **OK**.

The text you typed appears in the scene as a new text object (front view, of course.) The Navigator now includes a new “Text” object.

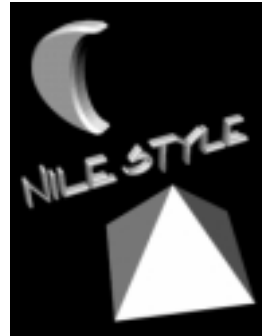
- ❑ Use the four basic tools (Move/Size, Rotate, etc.) to adjust the text and place it in relation to the other objects.

You can edit any text object by selecting it, then using the controls on the Standard toolbar to change font, alignment, and so on. To bring up the text edit window again, simply double-click the word object—then you can retype the text as needed.

- ❑ In the Navigator, click the “+” sign next to the Text object to expand the item. You’ll see that each letter is also listed as a separate object.

As the Navigator is showing us, text objects are groups consisting of separate letter-objects. That means you can edit single characters, too! The first time you click on a text object, the whole word or phrase is selected. Each subsequent click selects only the character under the tool. (To reselect the whole word, first click somewhere else to deselect it, then click the word again.) By selecting individual letters, you can adjust their position, color, or other attributes, which opens up a whole range of design options. For example, at right we’ve slightly enlarged and rotated the letter “N.” For details on working with text, see Chapter 5.

- ❑ If you haven’t yet saved your work-in-progress, do so now using **File/Save** or the toolbar button.




Different viewpoints

So far, we've covered tools that affect selected objects in the scene. The Tools toolbar also includes tools that let you alter the viewpoint, thus changing the appearance of the scene as a whole. Let's take a quick look.

- ❑ Click on a blank part of the scene to deselect all objects. Notice that the HintLine readout below the scene now shows values for the View.

The current Position value is given as “0.0, 7.0”, meaning 7 units above the Bottom plane. This is the default starting viewpoint for new scenes, and we haven't changed it since beginning the tour.

- ❑  Click the small down arrow on the **Viewpoint** button. A flyout menu appears, with seven choices. Move the cursor over the choices and you'll see six of them are fixed viewpoint positions: **Left, Right, Front, Back, Top, Bottom**.
- ❑ Click each of the preset buttons in turn and watch as the scene changes. As you do so, keep an eye on the HintLine readout.



The HintLine values describe how far the viewpoint deviates from the straight-on Front view (which is “0,0” on the Bottom plane). If the viewpoint moves horizontally from this Front view, the first value changes; vertically, and the second value changes. (For more, consult the online help topic on the Viewpoint tool.)

Don't think you're limited to just the six preset vantage points! In the main window, you can achieve unlimited “free orbit” viewpoint motion simply by dragging with the Viewpoint tool. (This option isn't available in secondary windows, which only show fixed viewpoints.)

- ❑ After clicking any of the fixed-position buttons, move the mouse pointer over the scene window, then click and drag—up, down, left, right. You'll see the view change continuously.
- ❑ Experiment with various dragging motions until you begin to get a feel for manipulating the viewpoint.



Conveniently, the **Free** button on the flyout “remembers” your last freeform setting. Let's try it.

- ❑  Click any of the fixed-position buttons on the flyout to restore a preset view. Then click the **Free** button on the flyout—and the scene snaps back to your previous freeform viewpoint.
- ❑  Continuing down the toolbar, next choose the **View Distance tool** and drag up or down in the scene window. Again, the whole scene changes.

Adjusting perspective with the View Distance tool can be useful for trimming (or adding) extra space around the edges of a scene. Note that unlike zooming in or out, this tool actually affects the final scene by altering how big objects appear in relation to the scene window.

Note that the Distance value on the HintLine readout changes as you use the tool. This number is actually the Z-coordinate of the viewpoint position with respect to the scene center. (Imagine a “camera” at the viewpoint position, as in the illustration below.) To confirm this, let’s look at another way of setting object and viewpoint properties.

- ❑ Click the Studio’s **Attributes** tab and then select the **Status** panel. Under **View**, locate the set of controls for **Position**.
- ❑ Try the View Distance tool again and you’ll see the Z value for view position changing, in accordance with the HintLine’s Distance value. Now click the arrows for the Z control—and the viewpoint changes just as if you were using the View Distance tool.

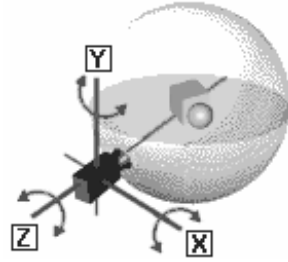


The Status panel serves as a sort of interactive HintLine, allowing you to fine-tune object and view properties using the same X, Y, and Z values. Most of the controls duplicate the tools we’ve already explored—but one adjustment is unique.

- ❑ Click the “up” arrow next to the first (**X**) control for the **View/Angle** adjustment. You’ll see the scene objects appear to move upward. Click the “down” arrow to reverse the change.

The **View Angle** control works like the Rotate tool—only here, it affects the tilt of our imaginary camera, as in the illustration. Changing the X, Y, or Z values pivots the camera around the respective axis.

- ❑ Try adjusting the Y and Z controls to get a feel for how changing the viewpoint angle changes the view. It's important to realize that the scene objects aren't moving—only your viewpoint is changing!



TIP: After changing the view angle, you can still move the viewpoint freely while maintaining the custom angle. Click the **Viewpoint** button, then hold down the **Shift** key while dragging in the scene window.

Note that in normal use, the Viewpoint tool affects the view angle as well as the view position, because the “camera” must keep twisting to stay pointed at scene center.

- ❑ If you want to restore the starting camera angle, enter “5.0, 0.0, 0.0” as the values.

In the material world

Up to this point, we've been content to leave all the objects in the scene in their original, rather pallid condition. And in fact, we've got a nice grayscale composition going. But before concluding the tour, let's liven things up a bit.

- ❑ Select the Studio's **Attributes** tab and display its **Color/Transparency** panel.

In ImpactPlus, as in the real world, a number of factors determine how an object appears. Besides **color**, an object's **material** (surface) properties include **texture**, **transparency**, and **shine**. Lighting makes a big difference, too—what looks like a blue moon may actually be a white moon illuminated by a blue light (or something else entirely)!

The four buttons at the top of the Color/Transparency panel let you control the interaction of light and



surface color components. This interaction can get fairly complicated, and we'll postpone detailed coverage until Chapter 5. For now, we'll stick with the currently selected **Base** setting. This is the major component in any event—basically it's what we mean when we loosely refer to the “color” of an object or light source. More technically, an object's Base color setting determines how the object reflects the Base component of any light that hits it.

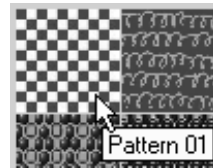
- ❑ Using any of the basic tools, select the moon object. Over in the Studio's color table, you'll notice that the white swatch is selected, indicating the moon's Base color is white.
- ❑ Now click any other color swatch, and then click several others to see what happens.

As you might expect, with each click the moon changes color.

- ❑ Drag the **Transparency** slider at the bottom of the Studio to see the moon fade to nothingness. Slide it back to leave the object fully visible when you're done.
- ❑ Now click the pyramid object to select it, and change its color to green. Then display the Studio's **Materials** tab.

Like the Models tab (and all the Studio tabs apart from Attributes), the Materials tab stores a wide variety of presets you can apply to your 3D creations. As mentioned above, each material preset combines information about color, texture, transparency, and shine.

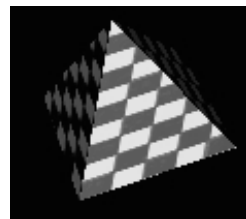
- ❑ Scroll down in the list of categories and expand the **Patterns** section. Click the first entry (the red-checked "Pattern01").



The green color on the pyramid gives way to the red-and-white pattern because the preset's material attributes superseded those previously defined for the object. If you've applied a preset and then want to adjust an individual attribute, just use the Attributes tab.

- ❑ As a very brief detour, right-click in the Studio gallery and notice the item **Add from Selection**—a command that lets you store your own custom materials here. The same menu affords other choices, like loading a DirectX (.X) file, or creating/editing gallery categories. It's sure to come in handy later on!
- ❑ Display the Attributes tab's **Color/Transparency** panel, and again click the green color swatch.

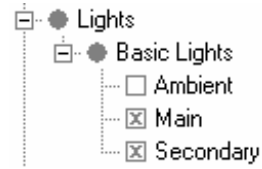
The checked texture remains, but now you've changed the object's Base color, creating a new material. Using this approach, it's easy to start with a Studio preset and custom-design your own effects... and then (as just noted) store them in the Studio for later use.




Shedding light on the situation

Taken together, all the lights used in a scene are known as the scene's **lighting scheme**.

- In the Navigator, expand the **Lights** category and then the **Basic Lights** subcategory.



Each new scene begins with a single **Main light** switched on in the main window, and a **Secondary light** in each secondary window. These window lights are fixed at the viewpoint in each window, providing working light so the scene isn't dark to start with.

- Uncheck the **Main Light** item. The scene goes dark since it has lost its only source of illumination. Check the item again.
-  Now click the **Back** button on the Viewpoint flyout. Notice that the scene is still evenly illuminated, since the Main light is now shining from the back. Return to the original viewpoint.

If all you want is straight-on, flat lighting in your scene, the Main light may suffice—but for adding depth, shadows, and subtlety, you have plenty of other lighting options. ImpactPlus provides four different types of light sources (**Ambient**, **Distant**, **Point**, and **Spot**) that you can mix and match in any number or combination. The Ambient light is included in each new scene, but switched off to start with; the others you can add one by one as needed.



Although each type of light has its own special properties—detailed in online help—one thing they have in common is the ability to take on a particular color. You can use multiple lights of different colors, in different positions, to create nuanced interactions with the base colors of scene objects. And you can even produce animations where lights move or change color between frames.

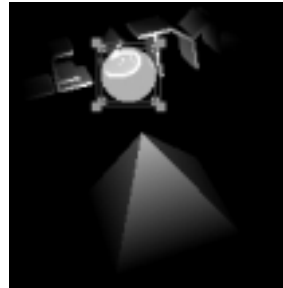
To get a feel for how the lights work, let's take a closer look.

- Select the Main light by clicking its entry in the Navigator.
- Display the Attributes tab's **Color/Transparency** panel. Notice that white is selected as the light's Base component (with the Glow and Ambient components grayed out). Click the **yellow** color swatch.

The scene objects change color completely as they're bathed in a vivid yellow hue. The actual changes you see will depend on the Base colors of individual objects.

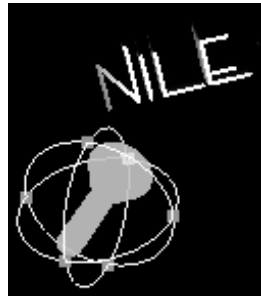
To review: Light sources produce light, and objects reflect light. What we've done is alter the Base component of the Main light from white to yellow. Each scene object's Base component determines how it reflects the yellow wavelengths. If you previously set your moon to a blue Base color, for example, it should now appear quite dark because it can't reflect the yellow: blue and yellow are complementary. With just one light source, the interaction of lighting and object colors won't get much simpler than this! (We'll return to the various other components in Chapter 5.)

- ❑  Locate the **Lights toolbar** on the left side of the screen. Click the **Intensity** button and then drag the slider to the left. You'll see the scene fade as the Main light's output dims. (If nothing happens, you need to reselect the light in the Navigator.)
- ❑ Now switch off the Main light completely by unchecking it in the Navigator. The scene goes dark for the time being.
- ❑  Just above the Intensity button, click the **Add Spotlight** button. You'll see a new object, a **model** representing a spotlight, appear between your viewpoint and the scene center. In the Navigator, a new item ("Spotlight") appears.





The non-basic lights (spotlights, point lights, and distant lights) all appear as models in the scene. You can click on the models directly or use the Navigator to select them, and the basic tools to reposition them.

- ❑ Use the Move/Size tool to drag the spotlight model around. Seen in profile, the model actually resembles a flashlight or torch—and the effect is exactly like shining one around in the dark. As it moves, it remains pointed forward, casting a pool of light ahead.
- ❑ Use the Rotate tool to swivel the light around so it points in different directions. Leave it pointing more or less straight ahead.



Now let's look at a couple of ways of varying the spotlight beam.

- ❑  Move the spotlight to the center of the frame, then choose the **Distance** tool and drag downward on the model. (As with any selected object, you can track the model's Z-position on the HintLine or the Status panel.) As the spotlight moves toward you, its beam widens to illuminate all three objects. Drag up, and the spotlight gets closer to the objects, with a tighter beam. Leave it about where it started ($Z = -20$).
- ❑  Now click the **Falloff** button on the Lights toolbar and experiment with the slider. This lets you adjust the beam's width without altering the light's position in space.

As with the Main light, you can use the Intensity slider to change the beam's brightness, and the Studio to alter the color components of the light source.

- ❑ To change the Base color of the spotlight beam, click a different color swatch on the Color/Transparency panel. Note that using a lighter or darker shade of a color is another way of altering the light's brightness.

Now that you're an expert on manipulating spotlights, you might try switching the Main light back on and varying its intensity in relation to the position and intensity of the spotlight.

Also on the Lights toolbar, you'll find buttons for adding **point lights** and **distant lights**. Each of these has its own special properties, which you can investigate at your leisure. We suggest you continue the same approach: turn off everything but the one light and then just experiment. (For details on each light type, search for "lights" in the online help index.)



In the meantime, don't overlook the Studio's **Lights tab**—well stocked with preset lighting schemes arranged into convenient categories. Another great way to experiment with lighting is simply to apply a preset, inspect the Navigator to see which lights have been included, and then customize the settings for best effect. As with materials, right-clicking in a Lights gallery gives you the option (**Add from Scene**) of saving the current scheme for later use.

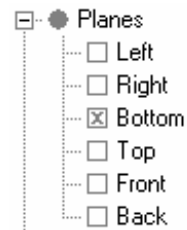
TIP: If you find that the light models in a scene are getting in the way of working on objects, uncheck **Light Models** on the View menu. This doesn't switch the lights off—it only hides their models—so you'll still be able to select and adjust light properties via the Navigator.

- ❑ Before we move on, save your scene as an .IPP file—perhaps using a different file name if you've made major changes since the last save.

The plane truth

To end this guided tour, let's return to planes—the last of the three main sections of the Navigator—which we've only briefly mentioned so far. To simplify things, we'll start with a blank scene. If you've already got an open scene, you can close it (although ImpactPlus does let you work with more than one open document).

- ❑ Choose **New** from the File menu and select the **Start From Scratch** option.
- ❑ In the Navigator, expand the Planes group.



The six planes listed are surfaces that function like the walls of a “virtual room” within the scene. You can use these planes simply as visualization aids, or include them as part of the final scene.

Let's see how to use the Studio and toolbars to apply colors, textures, and shadows to planes.

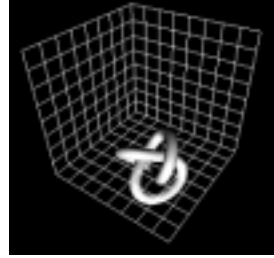
As before, the new scene has a visible **Bottom plane** slicing through the scene center.

- ❑ In the Navigator, switch on the Back and Left planes by checking them in the list.

Now the scene shows three planes that meet at a corner. (For a slightly wider view, you can use the Distance tool to zoom back.)

- ❑ On the Studio's **Models** tab, open the Basic Shapes category and click the “Torus Knot” thumbnail to bring a new object into the scene.
- ❑ Check the object's position on the HintLine or Status panel, and make sure it's at “0, 0, 0.”


- ❑ Choose the **Viewpoint** tool and drag randomly in Free Orbit mode to get a better sense of how the planes define a space within the scene, and where the scene center is located. Don't forget, you can hold down the **Shift** key to change view position without changing view angle. In the illustration, we've shifted the viewpoint to the right of center, and angled up.




ImpactPlus uses consistent X, Y, and Z units to describe position, size, and distance. For example, the Main viewpoint is initially 80 units in front of the scene center (0, 0, -80). New lights appear 20 units in front of center. And by default, each plane is initially a square of 40 units per side, with smaller 5x5 grid squares.

TIP: Using the **File/Preferences...** dialog, you can change the size of the scene planes (and the default setting, if desired) by changing the “Extent” setting. To make the grid squares larger or smaller, adjust the “Grid Size” setting.

Planes are square slabs fixed in space, but they behave in many respects like regular objects—for example, the way they respond to scene lighting.

- ❑  Click on the Back plane or select it in the Navigator. Locate the Draw Style toolbar and click the **Solid** button. The plane changes from a wireframe grid to a solid surface. Repeat these steps for the Bottom and Left planes.



- ❑ Drag the torus up so it's floating in the space enclosed by the three planes, and zoom in on it.
- ❑  With the torus selected, click the **Flat** button on the Draw Style toolbar.

The rounded contours of the torus take on a banded appearance (see illustration), with the “bands” apparently made up of trapezoidal shapes. In fact, they're subdivided even further!

- ❑  Click the **Wireframe** button.




Solid - Shaded

Solid - Flat

Wireframe

In Wireframe draw style, you can see that the “exoskeleton” of the torus is actually made up of of triangular **facets**—the building blocks of all ImpactPlus objects. To make an object appear solid, its facets are filled in one of two ways. In Shaded fill mode, each facet receives a complex gradient fill calculated from all three corners of the triangle, yielding a smooth, continuous surface. In Flat mode each facet takes a solid fill, an average of the three corner values. Flat-filled surfaces (like the torus in the middle) appear discontinuous, clearly composed of lots of separate surfaces. The difference between the two fill modes will be more apparent on some objects than others, and also depends on the properties of the light hitting the surface.


Like objects, planes can take either fill mode.

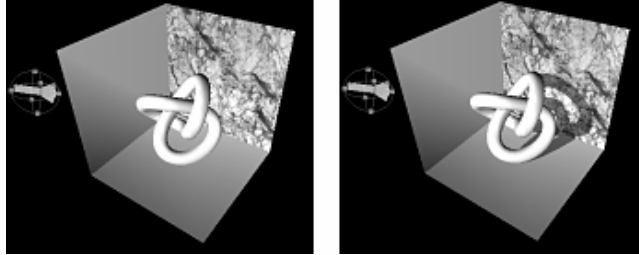
- Try switching one or more of the planes to Flat fill mode. Since planes are technically objects with just two facets, you may see a Flat plane appear as two distinct solid triangles!
-  Switch all three planes and the torus back to **Solid** draw style and **Shaded** fill mode before proceeding.


Besides changing its fill mode, you can change a plane’s material properties (color, texture, etc.) as easily as you can those of a regular object.

- With the Back plane selected, click the Studio’s **Materials** tab, open the “Marble” category, and click any texture thumbnail.

Shadows are one aspect of lighting we haven’t touched on, and they’re easy to demonstrate with this setup. By default, lights don’t cast shadows—but you can switch the property on for any light to produce a desired effect.

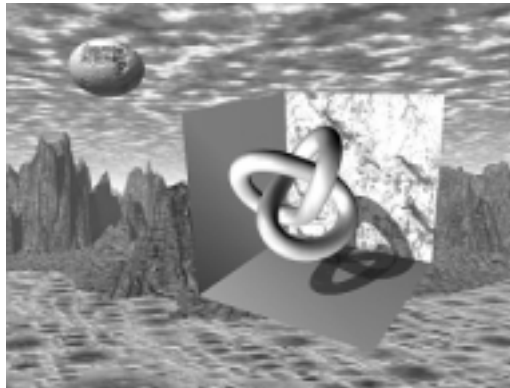
-  On the Lights toolbar, click the **Add Spotlight** button. Drag the new spotlight to the left side of the scene, above the midline. To accentuate its effect, tilt it toward the torus with the Rotate tool, and widen its beam by dragging the Falloff slider to the right. With proper positioning, you should be able to illuminate the torus and Bottom plane fully.



-  With the spotlight selected, click the **Shadows On/Off** button (on the Lights toolbar) so it's down.

Now the torus object casts a pretzel-shaped shadow.

- With the Move/Size tool, drag the object up and around for more dramatic results. You might also try adding one or more new lights to the scene to experiment with shadow effects.
- To add a finishing touch to this rather surrealistic scene, display the Studio's Backgrounds tab and expand the "Cosmic" category. Click any thumbnail... and use your imagination!



That completes this survey of the ImpactPlus scene window and its basic tool set. Everything we've touched upon is covered in greater depth in online help—but you already know more than enough to continue experimenting on your own. We'll pick up with more advanced concepts, tools, and techniques in Chapter 6. But if transforming static scenes into motion sequences and video clips is your goal... just continue straight on as we explore the powerful **Animation toolbar**.



4



Making It Move

Animation Basics

Producing animation with ImpactPlus is like having your own multi-camera movie studio in a shoebox. As the director, you have complete control over this world. And if you've been following along in the Companion so far, you know enough already to begin making movies... with just a bit more theory and hands-on training.


ImpactPlus animations are fundamentally static scenes, with the animation added as an “overlay”—in the form of variations stored as **frames**. (We'll explain more about these in a moment.) If you've previewed the ImpactPlus Samples and Design Wizards, you've probably noticed that some are animated, and some aren't. In Chapter 2's “Instant Results” tour, we took an animated Wizard scene and customized several of its static elements without affecting the animated playback.

The Studio's Animations tab provides yet another demonstration that animation works like an “overlay.” It stores lots of preset animation sequences that you can simply click to apply to any selected object or light model. To play back the results, you'll need the **Animation toolbar**. We introduced this in Chapter 2, and now it's time to take a closer look.

To display the Animation toolbar if it's not already visible, check **Animation** on the View menu. This toolbar has two states. In its compact form, it consists of a basic **Control Panel** for playing back animations (shown at right).



The first set of three buttons in the Control Panel are **Play**, **Stop**, and **Pause**. Use these to preview the animation directly in the scene window. The second set of buttons set the playback mode. Click **Single Run** to play the sequence once, stopping on the last frame. The next button, **Ping Pong**, plays the sequence indefinitely—first forward, then backward. Finally, the **Loop** button also sets up an endless repeat condition, this time repeating from the first frame each time.

To expand the toolbar, click its  **Maximize** button. This displays an **Edit Panel** that lets you edit existing animations or create new ones.

Note that you can drag the toolbar outside the ImpactPlus window to increase the available workspace. The toolbar automatically docks in certain positions; to keep it floating anywhere onscreen, hold down the **Ctrl** key when you drag the bar.

In order to use create animations or video clips for your Web pages, presentations, or movies, you'll need to export it to a standard format known as **animated GIF** or to the Windows **.AVI** movie format. Options that you set using the Animation toolbar, such as playback mode and speed, are incorporated into the animation when it's converted to a GIF or AVI.

To understand how animation works in ImpactPlus, consider a basic 3D scene with several objects. Instead of pointing a still camera at the scene, imagine we're using a movie camera that lets us expose one frame at a time. Between each exposure, we can adjust one or more of the scene objects (which may include objects, text, or lights) in various ways. We might change an object's position over time, so that it appeared to move from one side of the scene to the other. Or we might change its rotation angle, so that a sphere appeared to spin on its axis. Once we've shot a series of frames, we can play them back rapidly and see the motion unfold.

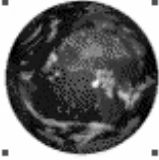

Creating animation in ImpactPlus is a fast and flexible process. In general, you first decide how many frames you want in the sequence. Then you issue instructions to the scene objects, telling them how to behave during the sequence. Naturally, each object that will change needs its own set of instructions. For each such object, you'll specify which properties need to vary, and define several **key frames** that show the object exactly as you want it to appear at that point in the sequence. ImpactPlus takes care of the rest: it examines the key frames and automatically generates "in-between" frames that take care of the transformations. The result is a seamless animation.

For each object, you can set key frames for **Position, Size, Rotation, Texture, Color, Transparency, Shine, and Deformation**. For the scene as a whole, you can set key frames for the background property **Fog**. Take a moment to think about the movements that could result from varying each property: zooms and pans, pinwheels, flying planes, planetary orbits, appearing and disappearing shapes, leaping lizards emerging from the mist, shifting lights and shadows, exploding text! To get started, try the following mini-lesson.

Guided Tour: 3D Animation

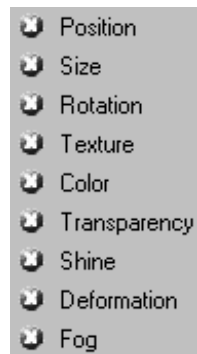
Follow along with this step-by-step example and create a rotating globe!

Around the world in 20 frames




- ❑ Choose **New** from the File menu (choose the “Start from Scratch” Wizard option) to start with a new, blank scene. If the any planes are visible, hide them using the Navigator.
- ❑ Click the Studio’s **Models** tab and select the “Planets” category. Click the “Earth” model’s thumbnail and a globe object will appear in the center of the scene, complete with seas and continents. The African continent takes up most of the right half of the globe. 
- ❑ Show the Animation toolbar (using **View/Toolbars**) if it’s not already visible. Click the  **Maximize** button if necessary to reveal the extended Edit Panel.

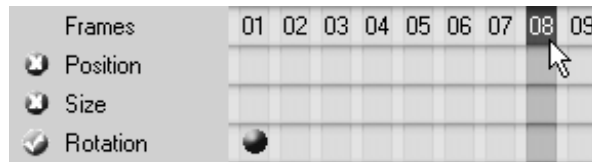
The controls along the bottom of the Edit Panel, and the property matrix above, provide feedback on the current animation. Note that the **Length** box is showing there are 20 frames in the sequence (the default value), and that the cells for frames 01 through 20 are accordingly shaded green in the matrix; beyond that, they’re gray. The **Current** box shows we’re looking at frame 1, and “01” column is highlighted. To the left of the property matrix, you can see various properties listed, each with its own button. These will all be much less mysterious in a moment.

- ❑ With the Move/Size tool, deselect the Earth by clicking in an empty part of the scene window, and now in the properties list you’ll see that only the last property (**Fog**) is enabled. That’s because it applies to the scene as a whole, regardless of what’s selected.
- ❑ Now select the Earth object again, and all the other object-specific properties become available, as at right.

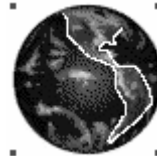


Let's create some key frames that will tell the Earth how to rotate. In order to generate a convincing full-cycle rotation, ImpactPlus needs us to provide several snapshots of what the Earth should look like at key positions in the cycle. So let's proceed to define our key frames: a starting and ending view, and a couple of intermediate views.

- ❑ The only property we need to include in the animation is rotation, so click the  button next to **Rotation** and it changes to , showing this property is now included.
- ❑ Click in the cell adjacent to **Rotation** in the frame "01" column. A  key frame marker immediately appears in the cell. This records the object's starting (frame 1) rotational value.
- ❑ Next we want to jump about a third of the way along the 20-frame sequence, so click the number "08" at the top of the matrix, or right-click in frame 8's column and choose **View Frame**. You'll see the Current box update to show we're on frame 8. We'll create a key frame for the first intermediate view here.



- ❑ Choose the **Rotate** tool. Click on the central node and drag it right (along the equator) to rotate the Earth until the east coast of South America is just disappearing over the horizon (on the HintLine "object angle" readout, a Y value of about -75°). You may need to drag twice. When you release the button after dragging, ImpactPlus inserts an automatic key frame marker at frame 8 for the Rotation property.

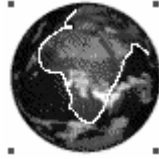




Note that ImpactPlus intelligently defines a new key frame each time you adjust one of the object properties you've checked to include in the animation. You can also use the Status panel of the Studio's Attributes tab to enter object coordinates directly.

- ❑ Now select frame 15. To create the second intermediate view, drag right on the central node until Australia is centered in the view (Y value of about 45° on the HintLine). Again, a key frame marker appears.



- ❑ For the end frame of the sequence, the Earth should be rotated nearly all the way around, just short of its starting position. Jump to frame 20. The scene will still look as it did in frame 15.
- ❑ Drag right on the central node to continue the Earth's rotation. Watch the HintLine and stop rotating when the Y value is about 20°. A fourth key frame marker appears in the frame 20 column.



- ❑ Now click the  **Play** button and you'll see the Earth rotate!
- To make it rotate continuously, click the  **Loop** button.

Congratulations! You've just made the Earth move. And now for a shortcut. Completing the above sequence will give you a valuable first-hand feel for animating an object from scratch... but in this case there's an easier way to get an object to rotate.

- ❑ Start with a new globe object, then simply look on the Studio's Animations tab, locate the Spins gallery, and apply the "Y Axis Rotated Counter-Clockwise" effect!

NOTE: To take your spinning globe another few steps further and convert it into a video clip intro, spin up your ImpactPlus Resource CD-ROM and check out the tutorial titled "Out of This World"!

Editing Animations

If you've just completed the mini-lesson above, want to customize a Design Wizard, or have even created an animation of your own, the Edit Panel on the Animation toolbar will show the key frames defined for each object in the scene. If there's more than one object, you'll need to click each one individually to see its key frames. Note that animations will often include static objects that don't move at all during the sequence.

It's easy to edit animations by adding new objects to the scene (with or without movement), replacing Wizard text with your own, and so on. Here are some additional pointers on working with the Animation toolbar:

- ◆ The easiest way to remove animation from an object is simply to select the object, then uncheck all the "included" properties on the Animation toolbar. Of course, if you've just applied the effect as a preset, you can simply use Undo.

- ◆ You can click on any frame number, or right-click in its column and choose **View Frame**, to jump to that frame.
- ◆ For a rapid preview, drag back and forth across the row of frame numbers or use the **Current** box spin arrows.
- ◆ If a particular object transformation appears jerky, first determine which property and key frame seem to be the source of the problem. Then go to that key frame and either:
 - Adjust the object property itself or
 - Move the key frame marker slightly (e.g. drag it left or right a frame at a time).Moving two key frames closer together has the effect of speeding up the transformation between them; moving them apart slows things down.
- ◆ To change the overall playback speed, type a new value into the **Speed** box and press **Enter**. The playback rate in ImpactPlus may not match the frame-per-second rate shown in the box. That value will only be applied when the animation is exported. To determine an optimal rate setting, always preview the exported file in a browser or suitable editing program.
- ◆ To change the number of frames in the sequence, simply type a new value into the **Length** box and press **Enter** (but see the following paragraph). Frames are added or subtracted at the end of the sequence. In general, the exported file will be more compact if it has fewer frames. There's nothing sacred about the default length of 20 frames. Many convincing animations can be accomplished in 10 frames or less.
- ◆ Be careful if adding or subtracting frames after you've defined key frames. Obviously, the resulting sequence won't have the same number of frames—and there's no undo for this action—so decide beforehand what you want ImpactPlus to do with the existing key frames.
 - To preserve the current relative distribution of key frames between the first and last frames, keep the **Adjust Key Frame Spread** box checked. For example, if you had a 12-frame sequence with key frames on 1, 6, and 12, and increased the Length to 20 with the adjustment option checked, the resulting key frames would be placed at 1, 10, and 20.
 - Uncheck the box to leave existing key frames exactly where they are. Using the same example, lengthening the sequence from 12 to 20 frames would leave the key frames at 1, 6, and 12. This would be useful if you planned to add add more motion to the end of the existing sequence. But note that if you shortened the same

sequence to 10 frames without adjusting the spread, you'd delete the key frame at frame 12.

- ◆ If you import a GIF, MPG, or AVI movie as a texture component (as described in Chapter 5), note that ImpactPlus fits the movie to the duration of the scene's animation (i.e. its Length times Speed). For example, a 25-frame animation at 10 frames per second has a duration of 2.5 seconds. If you import a 3-second movie as a texture, ImpactPlus will lop off its last half second. If the movie is too short, on the other hand, ImpactPlus loops it as needed. If you need to sync the two, adjust the animation's Length and/or Speed values prior to importing the movie. Also, note that movie texture playback is independent of property matrix or key frame settings. Finally, if an imported movie uses variable frame rate settings, ImpactPlus uses only the initial frame rate to determine the duration.

Producing Video Clips

So far in this chapter, we've covered the basic animation techniques with which you can produce standalone animated GIFs or AVIs for presentations, Web sites, personal messages and the like. You can use these same techniques, then simply export to the .AVI format, to create video clips to be integrated with existing video material for home or business presentations. For some great ideas to get you started, take a look at the ImpactPlus Design Wizards!

ImpactPlus lets you improve upon the relatively limited special effects available in standard video editing programs. What you can achieve technically will still depend in part on the versatility of your video editor—but the key creative question will always be: Where could your master video stand improvement? In particular, think about how you might keep your audience more engaged by using 3D text and graphics for video elements such as...

Intros. What they say about “first impressions” certainly holds true in video! For home audiences, simply *having* an intro will hook your viewers... while for more demanding audiences or clients it's a chance to put professionalism up front. Perhaps an animated logo, a simple movie title with nice lighting effects, or an atmosphere-building cinematic sequence... whatever your choice, try to set the tone for the overall presentation.



Credits. Keep your audience captivated through the final frame by livening things up at the end! Scrolling credits are just as easy to create as a spinning logo... consider running them over outtake or “bloopers” footage. Enhance your home movie by introducing the cameraperson and director, the subject, even the stars.



Titles and transitions. A picture may be worth a thousand words, but as digital video and Web media converge, text is more important than ever! Whether you cut to separate “title cards” as in the silent-movie era, employ blends or overlays (with or without animation), or simulate TV adverts... high-quality onscreen text can enhance any production.



Pre-production planning

The most useful planning you can do will be *creative thinking*. Animation has its own language—based on motion and change—and employing it fluently will guarantee greater impact in your video presentations. You can use surprise, humor, font psychology, character actions, color change, all manner of lighting and spatial transitions.

Reality intrudes, however. When you’re producing clips to supplement existing digital video footage, you’ll need to work backwards from that master video to determine what settings to use in ImpactPlus. So your creativity needs to be informed by knowledge of the particular video editing program (“editor”) you’re using. Its capabilities will largely determine how ambitious you can get—but remember, creativity will help you find a way around built-in limitations!

The type of video editor you’re using will make a difference. Most video editors provide a **storyboard-style** or **time line** interface where each video clip is represented by an image, and you can use drag-and-drop to assemble and rearrange the clips. If you’re just starting out, begin with a few small-scale experiments involving just several video clips. Make sure you’re familiar with the mechanics of the process before tackling a larger production.

Other programs are **frame-based** and deal with AVI video content as a series of separate graphic images. In this kind of environment you can edit individual frames, insert new single frames, and sometimes import a range of frames either as an insert or an overlay on existing frames. ImpactPlus provides the **Export>Animation Stills** option to accommodate this method of video editing.

If your editor supports **transitions** or **blends** between clips, consider whether you'll want to use these with your ImpactPlus sequences. If so, you'll need to pad the ImpactPlus footage with leading and/or trailing frames where "nothing happens"—allowing time for the blend to occur without detracting from more important action. Since adding even one second of animation (at, say, 30 frames per second) comes at the cost of longer export time, it's a good idea to leave adding the filler frames until the final export, after you're satisfied with the creative portion.

A whole new range of possibilities opens up if your video editor supports **multi-track** or **overlay** effects. Multi-tracking or mixing means that two (or more) video clips can be laid down concurrently and combined in creative ways. Some editors allow multi-tracking but only display the uppermost or overlay track. You may have the option of removing a single solid color from an overlay track, creating a composite for titling or background effects similar to the "blue-screening" used in movie and TV studios.

Frame-based editors may be able to accomplish overlay by importing frames that are already transparent. ImpactPlus can export animation stills with transparent backgrounds to suit this approach. The .GIF format supports one level of transparency (the single background color you designate will drop out), while the 32-bit .PNG format uses an alpha channel to preserve variable or in-between levels of transparency.

When planning your production, bear in mind that ImpactPlus outputs video clips without audio. Assuming your master video includes sound, find out how your video editor will allow you to deal with the resulting dropouts. For example, you may be able to insert the new video over an existing audio track, mix in new audio creatively over the ImpactPlus sections, or even stretch an existing audio track over the silent footage.

Production checklist

If you're just setting out to produce ImpactPlus video clips, here's a quick recap of the steps involved:

- 1 Find out as much as you can about the capabilities of your video editor (see the preceding section). Plan how you'll integrate ImpactPlus clips with existing master video, and collect basic information about relevant technical details like frame size, frame rate, and format. (Review the "Video Setup Tips" in Chapter 2.) Run some tests before you tackle a major production!

No matter how simple your concept, sketch a storyboard on paper for each ImpactPlus sequence you plan to produce. If you're preparing more than one clip, decide in advance on design elements that will lend consistency to the production.

- 2 Set up each ImpactPlus scene using suitable dimensions and background.
- 3 Add models and text objects, then set up scene lighting. Refine details like texture and bevel until the static scene looks right. Save custom elements as presets so you can reuse them in other scenes.
- 4 Calculate the clip's duration and frame rate based on the demands of your master video, and add animation frames as needed. Then go to work defining key frames for each element that will change over time.
- 5 Export periodically (uncompressed .AVI format recommended) and test video clip playback, making adjustments in ImpactPlus as needed. Try importing a clip into your video editor to confirm technical details.
- 6 Once you've found the right formula and approach, stick with it as you produce the rest of the clips you'll need!

Creative Tips

There's no disguising the fact that Serif's creative team have had a field day with ImpactPlus! The Samples supplied with the basic program and the Resource CD-ROM (choose **View Samples** from the Startup Wizard) provide ample evidence. We've sprinkled the artists' insights as tips throughout the Companion, and below you'll find several more relating especially to animation. As a bonus offering, see the descriptions in the special Production Notes Gallery (click **Production Notes** from online help).

- ◆ Scene planes can serve as walls, floors, or ceilings, or you can switch them off for unlimited vistas. Consider yet another option... you can achieve some intriguing animation effects by placing objects, lights, and viewpoint **inside a large object!** For example, you might use the 3D Workshop to lathe an L-shaped object, creating a hollow, open-bottomed cylinder. In ImpactPlus, use the View Distance tool to position the viewpoint inside the cylinder... create some objects inside... and you now have a new virtual space whose dimensions are under your control! If you apply a texture to the cylinder, it wraps around the interior walls and becomes a fake "background" that you can move, rotate, and scale. Try this as part of an animation sequence to simulate camera movement!
- ◆ Consider using a light source that casts **shadows** and also jitters slightly during an animation, to create the impression of flickering. You can also use shortening or lengthening shadows (made by light sources moving up or down in a scene) to mimic a sunrise or sunset in a scene that perhaps only uses the bottom plane.
- ◆ Distending objects with the **Deform tool's** simple "push-pull" technique (see the next chapter) is a great way of forming shapes that you cannot otherwise create with ImpactPlus. And as we've noted, Deformation is also a property that can be animated using key frames. Not only can you morph from one shape to another—you can make a tail wag, a tree bend in the wind, and much more. Try using a Reflective Environment texture for the eye-catching effect of a reflection that shifts as an object deforms.
- ◆ **Texture animation** affords lots of possibilities. Besides shifting a standard texture on an object during animation (by moving, rotating, or scaling), you can apply textures that bring their own animation with them! Simply import an animated GIF or AVI movie as a texture. The standard technique lets you mimic camera motion, or simulate falling rain or snow or a flickering flame.

With the second method you can include a TV in your scene that actually plays a movie during an animation.

- ◆ Manipulating **transparency** in adjacent frames of an animation lets you do cuts, fades and dissolves where one or more objects suddenly (or gradually) appear or disappear. This is an essential trick in creating movie titles and works well in complex scenes, too. First of all, create the objects you'll need, and keep them all visible until you've decided exactly when (like actors onstage) they'll each need to be onscreen. Then set Transparency key frames for each object, and finally use the Transparency slider to set the values. Using adjacent key frames, you can have an object switch completely on or off from one frame to another.
- ◆ Finally, here's a mundane reminder that will serve you well in many situations: Don't overlook the Status panel of the Studio's Attributes tab. Not only will this let you move and rotate objects and set the viewpoint with great precision, it will help you overcome optical illusions based on depth perception. In ImpactPlus as in the real world, sometimes it's hard to tell if an object is small, or merely far away! At least in ImpactPlus, you can resolve confusion by checking the Position and Size values on the Status panel.



5



Waxing Creative

Editing 3D Text

Text takes on a whole new significance when it leaps out at you in 3D. Flat typography turns into sculpture with the addition of a depth plane. Even single characters begin to resemble intricate carvings or profound monoliths. Add to that the possibilities of animating color, shape, and positional changes, and there are virtually no limits to where you can take text in ImpactPlus!



Wingdings characters

T+ If you've followed Chapter 3's guided tour, you already know how to enter text using the **Insert Text tool**, found both on the main window's Tools toolbar and in the 3D Workshop (see Chapter 6). You know that selecting the tool pops up a text edit window where you can enter your text, and that you can double-click a text object in the scene to edit it some more. And you can always enter text by pasting it via the Windows Clipboard. This section will cover a few additional things you should know about text objects, particularly if you intend to produce or edit animated text using the techniques discussed in Chapter 4.

The key point is that text objects are groups, which means you can edit either the whole object (one or more words) or any component character. For clarity, we'll refer to these as **strings** and **characters**. The distinction applies even if the string consists of only one character—the Navigator always lists the letter(s) separately. The first click on a text object selects the string, while subsequent clicks select individual characters for editing. To reselect the string, first click elsewhere to deselect all characters; then click the text object to start the cycle again.

- ◆ For either string or character objects, you can alter properties like position, size, stretch, and rotation using the standard tools on the Tools toolbar.
- ◆ To change the object's edge contours, apply a bevel preset (see the next section) from the Studio's Bevels tab, or customize the edge using the Bevels panel of the Attributes tab.
- ◆ Chapter 3 introduced the concept of a **material definition** (consisting of an object's base color, texture, transparency, and shine attributes). For either string or character objects, you can use

the Studio's Materials tab to apply these material attributes independently to the front, back, and/or sides of the object. We'll return to materials in a moment.

Character formatting repeats if you add new characters to the string. That is, the first new character takes the formatting of the first old character, the second follows the second, and so on. As an experiment, we started with the three-character string "ABC" (1), and adjusted the position and rotation of each character separately as in (2). Then we used the Text window to add the letters "DEF" with the result shown in (3). You can see how the formatting repeats in the added letters.



This rule of "repetitive formatting" applies to any individual character attributes you alter, including color, bevel, etc.

As for other objects, you can save a text object's material attributes to the Studio's Materials tab as a preset for future use. With the object selected, open any gallery (or create a new one), then right-click any thumbnail and choose **Add From Selection**. Repetitive formatting pertains here, too. When you save a string object's material, you're actually saving the sequence of material attributes used in that particular sequence of characters. The definition thus incorporates a repeating pattern based on the number of characters in the word. Note that position information does *not* get saved as part of a material definition.

In the example below, we started with a two-letter text object and set the first letter light gray, the second one dark gray. Then we selected the whole string and saved its material. The same material was then applied to the longer text object: you can see how the light/dark pattern has repeated itself.



Bevel

You may have noticed that when you create a new QuickShape—say, a rectangular solid—its edges seem a bit rounded rather than completely sharp. And if you apply a color to only the front or back face of the object (using the right-click **Apply to Front** or **Apply to Back** commands), the color seems to extend partway along the sides.



As the examples suggest, the front and back edges of QuickShapes are more complex than you might think. The same goes for other objects you can create in ImpactPlus—text and 3DW (3D Workshop) objects—as well as imported metafiles. All these can have what's known as a **bevel region**, a kind of extra bulge that adds definition to the edge. More technically, a bevel is a contour or profile defined by two curves, either of which can be **round** (convex), **flat**, or **chiseled** (concave).



Round

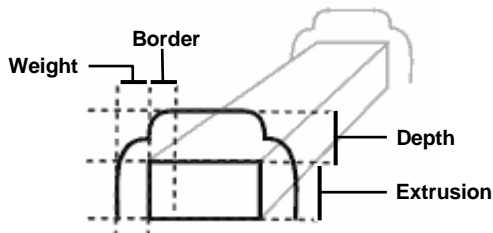


Flat



Chiseled

The Studio's Bevels tab includes a slew of preset bevels that you can apply to any suitable object. And the Attributes tab includes a Bevel/Lathe panel where you can fine-tune the bevel effect by adjusting its separate parameters, as shown in this diagram:



Extrusion is the object's thickness (Z-axis measurement) without its bevel; and **Depth** is the extent of the bevel "bulge." Adjustments with the Stretch tool, by the way, affect both properties. The two other settings, **Weight** and **Border**, refer to the width of the lower and upper curves, respectively. You can also specify a bevel of None, which removes the bulge and leaves a perfectly sharp edge if that's what you want.

Bevel properties go hand in hand with independent front, back, and side material definitions. In other words, objects that lack bevel properties—such as imported DirectX models and presets from the Basic Shapes group—don't lend themselves to front/back/side customization as do native ImpactPlus objects. We'll have more to say about materials over the next couple of sections.

Light and Color Components

Chapter 3 explained how to set the Base color component of objects, planes, and lights using the Color/Transparency panel of the Studio's Attributes tab. Before considering the other components, we'll need to step back and consider what light and color actually mean—and how they're handled in ImpactPlus.

When we discuss color in layman's terms, we may speak of a "green" street light, a "red" ball, or the sun reflecting "bright orange" off the water. In reality, of course, something much more complicated is going on: a mixture of different wavelengths of light, differently absorbed or reflected by various surfaces, is being detected by our eyes and brain. The mathematical ImpactPlus world steers a middle course between the simple and complex.

In ImpactPlus, the various types of lights all *produce* light in the scene. Objects and planes, in general, only *reflect* light from their surfaces. We can set the properties of lights and surfaces independently, and the interaction determines the surface color. For example, in Chapter 3 we saw how to change the Base color of a light and/or a surface for different resulting colors.

As you've probably guessed, there's more than just one such interaction—actually up to four—because ImpactPlus treats "light" itself as consisting of four color components called **Base**, **Highlight**, **Ambient**, and **Glow**. Each component describes a particular "quality" of light, as described below. We can adjust the color of each component produced by a light, and also how a particular object or shaded plane reflects each component. It's the sum of these interactions that determines the color of the surface.

Base should already be familiar: it refers to the main value of the color produced by a light source, or reflected by a surface. In layman's terms, it's what we mean when we speak of a green street light or a red ball.

Highlight relates to what we perceive as shininess: light glinting off an object or plane. For fine control over these "specular" reflections, you can set the Highlight value (for a light or surface) separately from the Base component. For objects and planes, you can also adjust the **Shine** setting which works like a coefficient or multiplier to determine the intensity of the reflection. Typically, an object or plane's Highlight color is set to some grayscale value, so its highlights will be the same color as the light source(s) hitting it.

Ambient only pertains to the single light source called **Ambient**, which can be switched on to let you vary the amount of "background" light that is "everywhere" in the scene. This Ambient Light has *only* an Ambient component. For an object or plane, the setting determines how much of the scene's Ambient light gets reflected if the source is switched on.

Glow applies only to objects and planes, not to lights. Normally its value is black (zero), but you can increase this for any object you want to represent a light source in the scene, for example a car headlight. (This is the exception to the rule that objects can only reflect light.) Planes are given a slightly gray Glow setting by default, just so they won't disappear if all the lights go out.

For light sources, the intensity or brightness of the light corresponds to the lightness setting (i.e. grayscale value) of its color components. In other words, you can dim a white light either by reducing its **Intensity** setting (on the Lights toolbar) or by making its Base component color grayer (on the Color/Transparency panel). And you can switch a component off by setting it to black.

We tried the preceding adjustments in Chapter 3, but here's a bit of further information. When you use the Intensity slider, the result affects the light's Base and Highlight component equally. When you use the Color/Transparency panel, you can set colors separately for each available component.

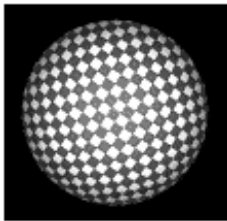
Experiment with the four color components, as well as the Shine and Transparency sliders. The more objects in your scene, the more possibilities for unique light/object interactions! Fine-tuning the settings can make objects vary from metallic to waxy, from shiny to matte. Check out the creative usage of color settings in the ImpactPlus Samples—for example, in “Still Life,” the dark Glow which lends an organic look to the fruit on display.

Texture Components

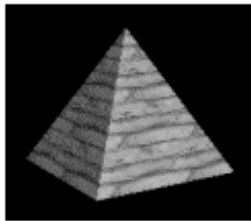
In Chapter 3, we introduced the concept of **material** properties that contribute to the surface appearance of each object, and experimented with applying preset materials from the Studio’s Materials tab. Texture is a key ingredient of a material definition—and like color, turns out to be a bit more complex than it might appear at first glance.

The Texture panel of the Studio’s Attributes tab lets you design a custom texture using your choice of texture components. You can apply **Base** and/or **Environment** texture components, with two alternative choices (**Surface** or **Reflective**) in the Environment category.

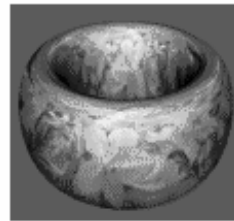
- ◆ Base refers to a basic texture component. A Surface Environment component is essentially a secondary Base texture.
- ◆ A Reflective Environment component looks like an external scene mirrored by the object’s surface. The reflective texture appears to be separate from the object, which may not be immediately obvious until you animate the object—but then, it can be truly impressive!
- ◆ If your computer’s graphics card supports hardware bump mapping, you also have the option of modifying the Environment texture using a **Bump** component. A Bump texture adds the impression of surface peaks and valleys. Grayscale variations in the applied bitmap translate into elevation data (black = high, white = low).



Base



Surface



Reflective

Applying a texture is simply a matter of making selections in the Texture panel. For example, check **Base** to apply a basic texture component. Click the thumbnail, then use the dialog to choose a specific image file. If you want to specify a single color that will become fully transparent in the scene, check **Transparent** in the dialog, then click the color button and use the dropper cursor to select a single color in the preview image.

Any texture components you apply become part of the object's material definition (along with color, transparency, and shine), and will be saved for each object when the scene itself is saved. An object without texture shows only continuous color.

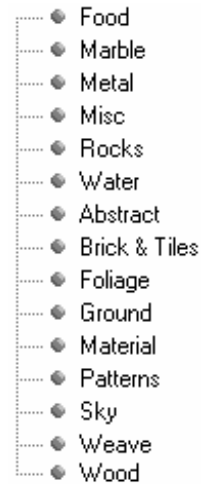
Once you've applied a texture, you can then use the **Texture toolbar** to fine-tune the placement of its components independently. Click the **Move**



Texture, **Scale Texture**, or **Rotate Texture** button and drag on the object to adjust. Three other toolbar buttons let you select any or all of the three possible texture components, so you can further refine your changes.

The **Materials tab** lets you apply a preset texture independently to the front, back, or sides of text, QuickShapes, 3DW objects, or imported metafiles. But if you edit or define the texture of one of these objects via the Attributes tab, the result affects all faces of the object at the same time. Fortunately, you can use simple workarounds to define different custom textures for different faces:

- ◆ A standard method is to use a sample object and use the Attributes tab to build up a texture definition on that object, and then save it as a custom preset in the Materials tab. This gives you a texture you can apply to any face of an object, as needed.
- ◆ In another situation, you might apply a texture first to the object's front, and scale it down to half size. If you then applied a texture to the sides and scaled down by half again, the front texture would be one-quarter of its original size and the side texture one-half.



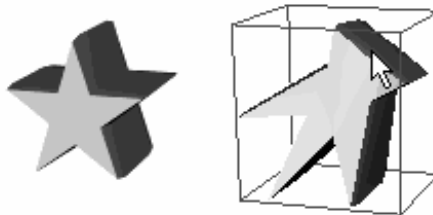
Separate front, back, and side attributes can add complexity (and creative possibilities) to the material definition! It's possible to have a master transparency setting for the whole object, and then separate Base, Glow, and Highlight (with its Shine setting) components for each of the front/back/side faces—not to mention up to three texture components for each face, and (for text objects) formatting variations over a range of characters!

With textures, complexity isn't the only avenue to creativity—a little bit of imagination can go a long way. For example, by carefully positioning a texture with transparency (try creating your own simple two-color bitmaps in a photo editor!) you can create “holes” in objects, define unique shapes, or simulate twinkling highlights. Add animation, and you can produce kinetic effects like rainfall. You can even import a GIF, MPG, or AVI movie, which then becomes an animated texture—for example, playing on the “screen” of a “TV set”!

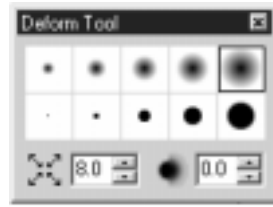
The Reflective Environment component works especially well with an extremely wide-angle photo as a source. Try to find one that fits in with the contents of your scene: for example, a landscape, skyline, or room interior. Create your own source images with a digital camera, a paint program, or even with ImpactPlus! For example, in the “City View” Sample, the attractive reflection in the glass dome near the center was created expressly for this scene: a simple picture of some tower blocks with illuminated windows, using basic shapes and contrasting colors. Then the image was brought in as a Reflective Environment texture... not much effort for a striking result.

Deformation and Morphing

The **Deform tool**, located on the Tools toolbar, lets you achieve incredible, elastic warping effects by pulling and pushing the nodes (vertices) where the faces defining a 3D object come together. For example, you can extend selected points of a star, turn a sphere into an egg, or make text appear to melt. To create dynamic, animated morphing effects, try varying the **Deformation** property between frames!



The tool works like a magnetic brush, with variable settings that determine its effect. As soon as you choose the tool, a special palette appears. Select a preset brush and then customize it as needed using the **Diameter** and/or **Focus** adjustments. The wider the Diameter, the larger the tool's coverage area. Higher Focus means a more sharply defined boundary between affected and unaffected nodes; less Focus means more gradual falloff toward the brush edge.



Simply drag on the object's edges to move its nodes and deform its shape.


For an actual view of object nodes, you may find it useful to zoom in and switch to Wireframe view using the Draw Style toolbar, or open a secondary window. The more nodes in the original object, the more effective the Deform tool will be. For example, a sphere will deform much more dramatically than a cube. When operating on group objects (including text objects and 3DW objects), the Deform tool affects component objects, not the whole group.

In general, apply deformation only after you've finished editing objects in other ways. Operations like changing bevel, revising text, or re-editing an object in the 3D Workshop will remove any deformation you've previously applied.

Anaglyph (Stereo) Images

Although ImpactPlus stores information about all three dimensions of a scene, a standard "3D" image (as viewed on screen or printout) is of course only two-dimensional—no less convincing when viewed with one eye closed. But try pouring an actual glass of milk with that same eye closed, and you may need to clean up afterwards! Depth perception in the real world is highly dependent on binocular (two-eyed) vision. Stereo photography, popular since the 19th century, takes advantage of the brain's rather amazing ability to extract depth information from two different pictures (originally taken several inches apart), when they are presented to each eye separately. Over the years, a wide variety of systems have been developed for storing and displaying stereo images as both still and motion pictures. The popular **anaglyph** method is one of the simplest yet most effective of these techniques.

You'll be glad to know that creating anaglyph stereo images with ImpactPlus requires no extra knowledge at all! Achieving great (as opposed to merely good) results takes a bit more preparation—but that can wait until later in the section! You can experiment with this cool feature using any standard 3D scene. Ready? Here goes:

- ❑ Prepare a 3D scene, using regular ImpactPlus tools and techniques.
- ❑  To preview the scene as an anaglyph image at any time, simply click the **Fullscreen Preview** button, then right-click and choose **Anaglyph View**. Put on your special red-cyan 3D glasses for an instant stereo image!
- ❑ To change the preview size, right-click and select **Fit to Screen**, **Half Size**, **Full Size**, or **Double Size**. To return to the scene window, press **Esc** or right-click and choose **Close**.
- ❑ To print the scene as an anaglyph image, choose **Print** from the File menu (or click the **Print** button) and select the **Anaglyph** option.
- ❑ To export as an anaglyph, choose **Export** from the File menu, then select **Scene**, **Animation**, or **Animation Stills** from the submenu, and finally the **Anaglyph** submenu option.

Now that you've seen the “good” results, how about achieving greatness? First, a bit of background theory is in order...

The anaglyph method relies on the fact that a color filter lets through only certain wavelengths, causing objects of that color to appear relatively brighter. Through a red lens, for example, a red line looks just as bright as its white background—and so the line “disappears,” while anything in a complementary color turns quite dark. Anaglyphs use two different colors to store two images on a single page, and special glasses with two color filters let each eye see a different image:



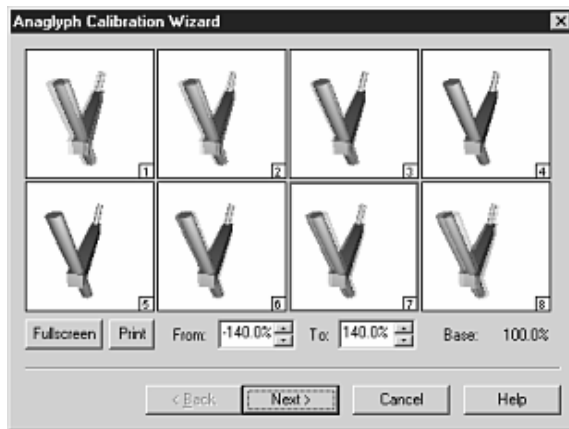
Left eye view (cyan)

Right eye view (red)

Anaglyph

ImpactPlus can render any 3D scene as an anaglyph image, and then export or print the result. Internally, it generates two separate pictures of the scene: one as if from the left eye's viewpoint, the other from the right, with the two viewpoints separated by an adjustable offset called the **base**. Then it creates an anaglyph by overlapping the two views, using cyan hues for the left-eye view and red for the right. When you gaze at this double image through your red-cyan glasses, each eye sees a different image and your brain does the rest—using the difference information, known as parallax, to construct an illusion of depth. (Try viewing an anaglyph through one eye at a time.) You can export animations, too... ImpactPlus simply repeats the same process for each frame in the sequence!

As you've seen, it's easy to create anaglyphs, but some are more successful than others, and you can take a number of steps to improve your results. For a start, familiarize yourself with the **Anaglyph Calibration Wizard**, which helps you to fine-tune each image for maximum impact, whether onscreen or for the printed page. We suggest you run the Wizard (**File/Anaglyph Calibration...**) each time you create an anaglyph using a new scene size or color scheme.



The Wizard consists of two steps, each based on picking the best result from an array of images that use different settings. At each step, you can either preview the array onscreen (click **Fullscreen**) or print it out (click **Print**). Use the method that corresponds to your intended output, as screen and printed color reproduction can differ significantly. If none of the choices seems acceptable, you can return to the Wizard screen and extend the range of values at either the low or high end (simply enter a new **From** or **To** value as needed), and then repeat the preview phase. When you've decided on the best preview image, click the corresponding numbered thumbnail on the Wizard screen.

In step one, as shown above, you determine the optimal **base** setting from a preview array where each image uses a different left-right viewpoint offset. Here, you're looking for the image with the most dramatic 3D effect but without excessive "ghosting." Keep in mind that if you expect to scale the image down at some point (i.e. the preview is significantly larger than the final size will be), you can choose an exaggerated base value now, as the offset will of course shrink when the image is downsized. For best results, do your scaling-down in ImpactPlus and calibrate using an image of final size.

In step two, all the samples use the same offset (the base value you've just selected), but they differ in the **saturation** level applied to the image. Saturation produces ghosting in contrasty or colorful scenes, so the ideal setting may vary considerably from one scene to another.

You'll see the result of updated settings the next time you choose Fullscreen Preview. ImpactPlus will store the settings and apply them to future previewed, printed, or exported images until you run through the Wizard sequence again.

Anaglyph tips

While there is no magic formula for producing perfect anaglyphs, if you manage colors correctly in designing the anaglyph scene, you'll be able to keep the saturation level high and still achieve a strong stereo effect. One relatively foolproof method is to use only grayscale values as in a "black and white" photo. In this case, the two anaglyph images will be shades of pure red and cyan, with no spurious hues in between. Through the 3D glasses, each eye will receive only a single image and the other one will be filtered out. Even in this case, you should avoid using very dark or light regions, as these may exceed the filtering range of the glasses and result in ghosting.

Chances are you'll want to add color to your scenes, however, and so the situation becomes more complex. For example, since all left-eye information comes from the color red, a bright red sphere will present no right-eye information and hence no stereo effect. Similarly, blue objects will lack left-eye information. The worst case would be a scene drenched in red or blue colors... as you can imagine, these would completely interfere with the red-cyan anaglyph separation. To avoid such depth dropouts, avoid using saturated reds, blues, and greens. Summing up, then, middle shades—especially of brown, yellow, and gray—will produce more satisfactory anaglyphs.



6



Building New 3D Objects

Welcome to the Workshop

If you've explored the Studio's Models tab, you've seen the tremendous variety of objects of all descriptions stored there. Just about all were created in ImpactPlus using the **3D Workshop!**



The Workshop provides an easy-to-use environment where you can create your own simple or complex 3D models from scratch. You can save the objects as separate **3DW files** (using the .3DW extension), quickly transfer them into any scene, and store them conveniently in the Studio to reuse later.

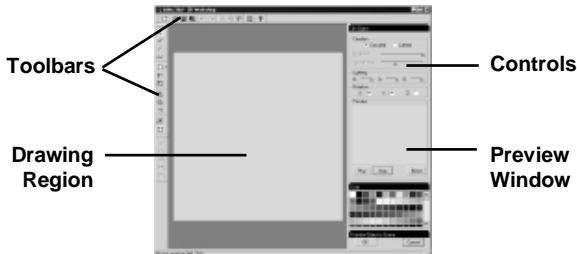
And you don't have to be a master craftsman to use the Workshop—a few basic concepts will carry you a long way. In this chapter we'll take a leisurely stroll through the facility and explain the various tools as we proceed. Come on in—no safety goggles required!

Guided Tour: The 3D Workshop

The 3D Workshop is a special-purpose window within ImpactPlus that, when launched, takes over from the main scene window. There are two basic ways to launch the Workshop. If you've already brought a Workshop-created object from the Models tab into the scene window, you can simply double-click the object to edit it. Or, to start from scratch, take this direct approach:

- ❑  Click the **3D Workshop** button on the Tools toolbar.


The window changes into the 3D Workshop, with its own toolbars, drawing region, Preview window, and controls.

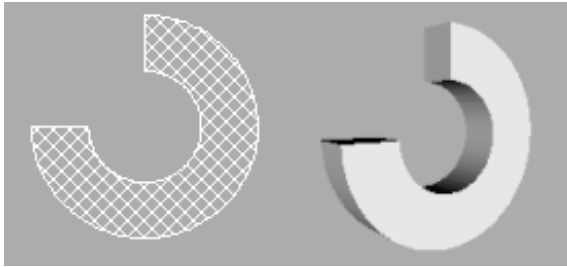


In a nutshell, the creation process works like this. First, you outline a two-dimensional (2D) figure, using any of the available drawing tools. Once you've closed the outline on itself, the Workshop projects the closed shape into 3D space and displays an animated preview. You can edit the original figure, change its colors, and adjust various attributes until you're happy with the 3D object, at which point you transfer it into the ImpactPlus scene window and exit the Workshop.

Let's take things one step at a time, and have some fun.

From 2D to 3D

- ❑  On the left toolbar, click the **Insert QuickShape** button. (QuickShapes are also supported in the main window, and were covered in Chapter 3.) Choose the "Donut" shape (top row, right) and drag out a shape in the drawing region. Hold the **Shift** key down when dragging to obtain a circular shape.



The QuickShape is already a closed 2D figure, of course, so as soon as it appears, its 3D projection starts animating at the right. Let's make a few quick observations.

- ❑ Check the **X** box in the Rotation panel, just above the Preview window. With both X and Y checked, the shape rotates around two axes rather than just one. Try checking the **Z** box also, and then uncheck one of them. Rather compelling, isn't it?
- ❑ Now click the **Stop** button, and then the **Reset** button. Right away the shape snaps back to its original orientation, matching the 2D figure. Click **Play** again to resume the preview motion.

Now it's the QuickShape's turn for some attention.

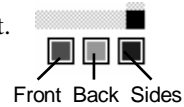
- ❑ Click the top button on the left toolbar to select the **Edit Tool**, then click the QuickShape to select it. Drag any of its adjustment handles to see both the 2D and 3D shapes respond. Can you turn the donut into a tiny sliver?

A key advantage of creating QuickShapes in the Workshop, rather

than in the main window, is that here they remain editable indefinitely—you can switch to other tools or change settings, and still return to the shape to make more adjustments.

With the QuickShape still selected, you may be wondering about the three little boxes at its lower right.

These **color handles** afford a direct way of applying color to (respectively) the front, back, and sides of a Workshop model.



- ❑ In the Color gallery below the preview window, click the red swatch and *drag it* over to the object's first (i.e. left) color handle. Now repeat this with the adjacent green swatch, but this time drop the color on the second color handle. The rotating preview will reveal that front and back are now differently colored.
- ❑ Here's another way to apply color. Right-click the blue swatch (next in line after the green one) and choose **Apply to Sides**. Note that the other options are on the menu, too, including **Apply to All**, which could save you some steps if you want the whole surface the same color.

While the object is still multi-colored (red, green, and blue), let's test-drive another set of Workshop controls and get a simple demonstration of RGB color mixing.

- ❑ In Lighting panel at the right, drag the **R** (Red) slider all the way to the left, to turn off the red component. The front face of the object, which was red a moment ago, is now black—because there's no red light to be reflected.
- ❑ Now drag the **G** (Green) slider to the left. With both red and green components gone, both front and back of the object appear black.
- ❑ Right-click the white color swatch and choose **Apply to All**. Now that the object's base color is back to a pure white, it appears solid blue under the single remaining (blue) light source.
- ❑ Slowly fade up the **R** and **G** sliders and watch the object reflect various mixtures of the three primaries. With all three sliders back up to maximum, the shape appears white once again... a nice way of showing that red, green, and blue add up to white light.

The main window's Lighting controls are independent of those in the Workshop. As we've just seen, in the Workshop you can use the color swatches, lighting controls, or both, to achieve a particular coloration.

When you transfer the object to the scene, however, any color applied in the Workshop merges into the object's Base color component. (The other components are assigned automatically: Ambient takes on the Base value, Highlight is set to light gray and Glow to black or zero.) The scene's own lighting scheme will be superimposed on the object components to create a final effect.

Any time you want to transfer a Workshop object to the scene, simply click the **OK** button at the lower right. (You can resume editing the object later by double-clicking it in the scene to launch the Workshop.) Clicking **Cancel** returns to the main window without transferring the object; you'll lose any unsaved changes in the Workshop. To save the Workshop contents at any point, click the **Save** or **Save As** button. You can load previously saved objects using the **Open** button.

Each Workshop-created object you transfer into the scene appears in the Navigator as a "Group 3DW Object"—even if it has only one component object. In this respect, 3DW objects behave like text objects.

Turn, turn, turn

Impressed with the 3D Workshop so far? Hold on, here comes the best part!

- By now, your "donut" QuickShape may have morphed considerably from its original form, so it's probably best to start over with a new shape. You can either delete the old one (simply select it and press **Delete**), or click the **New** button to clear the drawing region. Then drag out a new donut as before.
- Select the new QuickShape with the Edit tool and adjust its right handle to rotate the shape so it's oriented like the letter "C." The shape should be roughly centered in the drawing region. Finally, in the Rotation panel, check only the **Y** box, leaving **X** and **Z** unchecked.
- Now select **Lathed** in the Creation panel at the right.

In the Preview window, the 3D projection turns into a flat shape that looks like a pulley of some kind. What's going on? A single trial adjustment will reveal all.

- ❑ In the Creation panel, drag the **Degrees** slider to the left about halfway. Now the Preview window shows only half of the pulley—and you can clearly see it has a C-shaped cross-section that matches the 2D figure.



Just as a real-world lathe turns a workpiece around a long axis so it can be carved or shaped, **Lathed mode** takes the 2D drawn shape and revolves it around an axis line to produce a 3D projection. The Degrees slider lets you achieve a partial turn, anywhere from a full 360° down to a mere sliver. Previously, we were working in **Extruded mode**, where the flat 2D figure was simply extended a bit along the Z axis to give it some depth.

- ❑ Drag the 2D shape toward the dashed red axis line at the left side of the drawing region. Notice that the hole in the middle of the “pulley” gets smaller as the space between the shape and the axis decreases.
- ❑ Check the **X** box to add X-axis rotation. Wait until the 3D shape comes round to a position where you’ve got a clear view of its various profiles, and then click **Stop** to freeze it. (You may have to click **Play** and **Stop** a few times to achieve the best angle.)
- ❑ Now for some experimentation. Try adjusting one or more of the QuickShape’s handles in small increments, and notice how the 3D shape changes. (If you wish, restore the **Degrees** slider to its full-turn position.) See what happens if you drag the figure beyond the axis line: anything to the left of the line will be ignored.
- ❑ Drag the **Smoothness** slider all the way to the left. The result: a three-sided shape, but still with the 2D figure as its cross-section. Jog the slider little by little to the right, and you can add one side at a time. Interesting possibilities here!



Note that the Bevel/Lathe panel of the Studio’s Attributes tab includes its own Degrees and Smoothness sliders, so you can continue to fine-tune your “turned” 3DW objects after you’ve transferred them back into the main window.

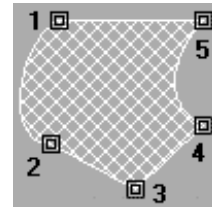
- ❑ Just for fun, switch back to Extruded mode, which now looks tame by comparison (but no less useful).

Who would have guessed that a humble donut could shape-shift into such varied forms? But there's more beyond QuickShapes... you won't even approach the Workshop's limits until you've tried its drawing tools. For an introduction, step right along to the next section.




Drawing shapes

- ❑  Click the **New** button to clear the drawing region, and select **Extruded** mode for a simpler 3D preview.
- ❑  Click the **Freehand Tool** button. In the drawing region, click for a starting node, then drag with the tool to draw something approximating a circle. End the line where you began it—on the starting node—to close the shape. The extruded projection appears instantly in the preview window.
- ❑ Press **Ctrl+Z** to undo the drawing, and try again. This time, trace something with a wavy outline, such as a head in profile or an imaginary island.
- ❑ Clear the screen again and draw an *incomplete* curve (not a closed figure), then click (without dragging) somewhere else. Click a third time and drag out a short segment, then end by clicking the starting node. The numbers in the illustration show one possible sequence.

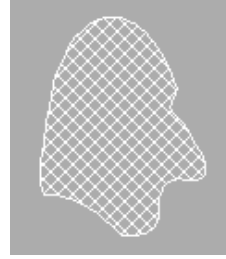


With the Freehand tool, clicking to place a new node automatically connects it to the previous node. Dragging from an existing node (including one you've just placed) attaches a curve in any shape you draw.

- ❑  Select the **Edit tool** and notice the distribution of **nodes** around the outline. (It doesn't matter if your figure differs somewhat from the illustration above.)

- Now for a small challenge. Using only the Edit tool, see if you can transform your shape into something like this...

Need a hint? Dragging a line segment is the easiest way to change the figure's shape. You can drag nodes, too, to change their position. Watch the tool cursor to see whether you're over a node or a segment.

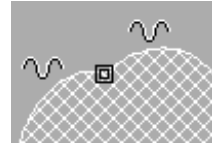


The last key point about freehand drawing and editing concerns nodes, which are slightly more complicated than they first appear.

- Drag each node of your figure in turn, moving it slightly away from the center. Don't worry about the resulting shape; just separate the nodes from each other.

You'll notice that certain nodes—at the junctions where you initially clicked a separate point and ImpactPlus drew a connecting line—are actually pairs of nodes that you can drag apart. These extra nodes in a drawn figure are normal, resulting from the Workshop's attempt to match the shape you drew.

- Look for any node that joins two curved-line segments (the tool cursor on each side should show a wavy line). Click the node to select it.



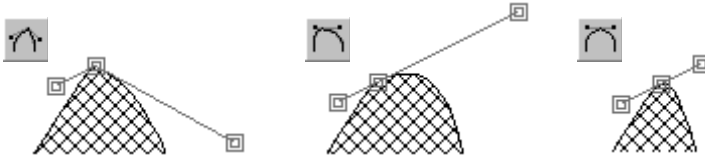
You'll see two green lines heading off in separate directions from the node. These are called **attractor handles** and they let you fine-tune the shape of a segment where it adjoins a node. You can precisely adjust the **slope** or angle at which a segment leaves a node, and also the segment's **depth**, i.e. how much it bulges in or out.



- Try dragging one handle, then the other, to see how the segments respond. Now try dragging some nodes elsewhere along the figure. You'll notice that nodes joining a curve to a straight-line segment have only one attractor handle, which makes sense because the straight line has a fixed slope and depth.


In any figure you draw from scratch, the nodes initially will be of the **sharp** variety—that is, the segments on either side of the node are completely independent of one another. For more rounded contours, you can use the buttons on the **Node Edit toolbar** at the lower left to convert a node to either **smooth** or **symmetric**. Smooth nodes force the

adjoining segments to assume the same slope, although they can have different depths. Symmetric nodes produce perfect rounding, where the segments have the same slope and depth.




- To convert a node, select it and then click a node type button. Take a moment to try converting one or more nodes to smooth or symmetric, then drag the segments on either side to see how the figure responds.

Note that the Node Edit toolbar also includes a **Straighten Line** button, which straightens out the segment on the trailing side of a node, and a **Delete Node** button, which helps to simplify a shape.


-  Click the **Line Tool** button and create a new shape by clicking to place each corner point of the figure. The connecting lines are drawn automatically, and this time you only get single nodes at each junction.

You've probably noticed—but it's worth emphasizing—that the drawing region can handle any number of separate objects, which appear in the Preview window (and when transferred to the scene) as a single, composite object. It's a valuable technique for adding extra protrusions and contours, or if you're creating complex models like those in the ImpactPlus Studio, for example.


-  To complete your survey of the drawing tools, click the **Curve Tool** button. This tool works like the Line tool—you click to place a series of points, which are automatically connected—but in this case the connecting lines are curved. You can drag after each click to adjust the new node's attractor handles and roughly shape the preceding segment. Now that you know about nodes and segments, you should find the tool straightforward to use.



Text and more


Before winding up this tour, let's briefly survey some of the other tools and functions that add convenience and power to the 3D Workshop.


 The Workshop has a **Text tool** that works very much like the standard Text tool in the main window. In the Workshop, only individual characters—not whole strings as in the main window—are selectable. Generally speaking, type single characters into the text creation window. The tool is most useful for creating single “dingbat” characters, or supplying letter shapes as a starting point for creative distortions.





 Another creation option is the **Insert Metafile** button, which lets you import a .WMF or .EMF file created in an outside program. Imported metafiles are converted to multiple complex polygons, typically with more nodes than you'll want to edit—but they are easily scaled, and this is still a convenient method of bringing external content into an ImpactPlus scene.

  Click the **Zoom In** and **Zoom Out** buttons to adjust the working view.

 The **Zoom to Fit** button resets the view to its initial state.

 To turn on a point grid as a drawing aid, click the **Snapping** button. With the grid turned on, nodes you draw “snap” to the nearest grid point—especially useful when drawing straight-edged figures.

 Click the **Show/Hide Nodes** button if necessary to reveal the nodes for editing, or conceal them for a clearer view of the figure.

 Use the **Preferences** button on the top toolbar to adjust the grid color and spacing, or to set the background color of the drawing region.



7



Working with Other Software

Aside from printing a scene out directly, there are two basic ways of incorporating an ImpactPlus image in a video, publication, or other graphic context: exporting and OLE.

Exporting

Exporting means converting an ImpactPlus scene to an external file format, as opposed to saving it in the native .IPP format. You can also export one or more selected objects as a DirectX (.X) file. Once you've exported your ImpactPlus creation to a suitable format, you can bring it into your favorite video editor, Web page editor, DTP, word-processor or any other application you choose.

Besides exporting the scene exactly as it appears on the screen, you can output in two other modes:

- ◆ As an **anaglyph** (stereo 3D) version of the scene, designed to be viewed with red/cyan glasses. For details on making and previewing anaglyph images, see Chapter 5.
- ◆ As a **depth map**—a grayscale representation that uses lightness values to encode depth information in the scene, with 256 possible levels for each underlying image pixel. Lighter areas represent peaks and darker areas represent valleys. You can use depth maps in conjunction with programs like Serif PhotoPlus which can import them to add 3D realism to standard “flat” images.

Whichever of these options you choose, the entire main window gets converted to an anti-aliased bitmap graphic (or a series of them, in the case of animations). You can fine-tune single graphics in a paint editing program like Serif PhotoPlus, so for example you don't have to worry if there's extra background showing around the scene objects—final cropping can come later. With animations or video clips, you'll have much less flexibility after export, so take care to follow the advice given in Chapter 4. In all cases, make sure you're satisfied with the composition, lighting, and colors in the scene before you export—it can be quite difficult to change those later.

Mechanics of exporting

To export a **static scene**, choose **Export** from the File menu and **Scene** from the submenu. Then select **Image**, **Anaglyph**, or **Depth Map**. In the dialog, use the **Save as Type** pull-down menu to specify the export file format. Provide a file name and folder location, and click **Save**. In the Export dialog, specify scaling and set options available for the particular format (see below), then click **OK**.

The basic steps are similar when exporting an **animation**. Choose **Export** from the File menu but select **Animation** from the submenu. Choose the export type and specify the format (.GIF or .AVI) and file name. Again you can set options in the Export dialog.

You can also export animations as sequences of **separate still-image files**—useful if you need to use a format other than .GIF or .AVI, and plan to continue editing the animation in a program that can import a series of stills. With this method, for example, you could use the .PNG format (see below) to retain variable background transparency in the animation. To export as a sequence of stills, choose **Animation Stills...** from the **File/Export** submenu. ImpactPlus automatically generates the numbering sequence, from 1 up to the number of frames.

Finally, you can export an individual object as an industry-standard **DirectX (.X)** file, for use as a model in another 3D package. In technical terms, ImpactPlus exports DirectX mesh data (with vertex normals, vertex UV texture coordinates and vertex colors), materials, texture references, and hierarchy. First, select the object to be exported. (If you select multiple objects, they will be exported individually.) Choose **DirectX Mesh** from the **File/Export** submenu.

Export settings

In the Export dialog, set any options available for the particular image and file format. The dialog includes an Image Preview window, which provides an accurate rendering of how your scene will look using the current combination of settings. You can zoom in and out, drag the scene to center it in the window, and experiment with different export options until the results are satisfactory.

- ◆ **Size:** Normally, the scene will be exported at its actual size, as specified in the **File/Scene Setup** dialog. To scale the exported image, you can change either the **Width** or **Height** value; click **100%** to restore the original size. The other value changes proportionally to maintain the same aspect ratio. Note that for anaglyph images (see Chapter 5), scaling the image will affect the offset of the red and cyan components—a smaller image obviously means less separation—and this may detract from the effectiveness of the stereo image. If you plan to scale the image when exporting, take this into account beforehand when you run the Anaglyph Calibration Wizard.

- ◆ **Bit Depth:** Bit depth relates to the number of colors in the exported image. For example, a bit depth of 4 bits per pixel can store 16 values; 8 bits per pixel, 256, and so on. 16-bit images have roughly “thousands” of values to describe each pixel’s color, and 24-bit images have “millions.” Of course, images with higher bit depth take up more disk space. Choose the bit depth that corresponds to the number of colors in the exported image. For 256-color images, you have the option of applying either an **Optimized** or a **Web-safe** palette..
- ◆ **Palette:** A color palette is a table of color values that gets stored with any image having 8 bits (256 colors) or less. If you’re exporting at 8 bits (256 colors) or less:
 - The default **Optimized** setting lets the ImpactPlus export filter determine the best colors to apply. This generally results in smooth color gradations and quite acceptable appearance when viewed on a High Color (16-bit) or better color display.
 - Choose **Web-safe** to reduce the colors to only those found in the 216-color palette used by Web browsers on limited-color systems. This will ensure that an image you place on a Web page won’t change its appearance when viewed on such systems.
- ◆ **Dithering:** Dithering comes into play with images being reduced to 8 bits (256 colors) or less. It’s a method of approximating colors outside the actual image palette—for example, by alternating pixels of red and blue from within the palette to produce the visual impression of a purple color that’s not in the palette. While dithering can degrade solid-color areas, with 3D images it’s usually more important to preserve subtle gradations of color.
 - To preserve gradations of color and/or an image background, dithering is clearly the best choice. You can choose either Ordered or Error Diffusion dithering. The former produces a discernably patterned effect, while the latter tends to average away the patterns for a more natural result.
 - To minimize file size, or if you happen to have an image with few colors, you can opt for no dithering—and the export filter will pick “nearest-match” color values from the palette being applied. You may see some color shifting, but the solid color areas will be preserved.

- ◆ **Transparency:** If your scene uses a solid color background and you're exporting to a suitable format like .GIF or .PNG, selecting the **Use Transparency** option will turn the background transparent. GIF files support single-level (on/off) transparency—one reason they're commonly used over backgrounds on Web pages. The .PNG format supports multiple levels of transparency for “alpha blending” effects (see below).

Note that the Transparency export setting is unrelated to the Transparency slider or the option of applying bitmap textures that use a single transparent color. Those controls affect whether you can see through objects within the scene itself, whereas the export setting affects only the scene background in the exported image.

- ◆ **Anti-Aliasing:** ImpactPlus routinely applies anti-aliasing to exported images, and it's recommended. To ensure blending at the edges when exporting as a GIF, match your scene's background color to the color of the Web page background where you expect to be using the GIF. For a sharper-edged (but less pretty) graphic that can be placed over any background—or if it's a sharp-edged effect you want—you can turn anti-aliasing off.
- ◆ **Compression:** Compression schemes, which apply different algorithms to encode the image information with fewer total bits and bytes, are used in many formats. Depending on the format, ImpactPlus may include a choice of compression scheme. In general, use the default setting unless you know for a fact that some other scheme is called for.

With the .JPG format, recommended for photographic backgrounds, you can set the level of quality desired using a slider. As you might expect, the highest-quality setting uses least compression, with no loss of image quality but the largest file size. The lowest-quality setting applies maximum compression for smallest size, but yields rather poor quality.

The .PNG format

For Web graphics, the increasingly popular .PNG (Portable Network Graphics, pronounced “ping”) format has a number of advantages over .GIF—the main ones, from an artist's perspective, being “lossless” 24-bit images and support for variable transparency. Whereas .GIF supports simple binary (“on-off”) transparency, .PNG allows up to 254 levels of partial transparency for normal images. The image file includes an “alpha channel” that directs pixels in the foreground image to merge with those in a background image. Most commonly used with 24-bit images, anti-aliasing creates the illusion of smooth

curves by varying pixel colors—for rounded images that look good against any background, not just against a white background. It’s especially useful for the small graphics commonly used on Web pages, such as bullets and fancy text.

Animation and video formats

The **.GIF** format is what makes Web animation possible, for a couple of reasons. First, it’s universally supported by Web browsers. Second, it’s a multi-part format, capable of encoding not just one image but multiple images in the same file. A GIF animation player or Web browser can display these images in sequence, in accordance with certain settings (looping, frame delay, etc.) included in the file. The result—it moves!

The **.AVI** (Audio-Video Interleaved) format is commonly used on the Windows platform to encode image sequences in sync with a mono or stereo sound track. ImpactPlus can export to the uncompressed **.AVI** format using 24-bit color, or to various compressed formats, depending on which **codecs** (compression/decompression schemes) are present on your machine. Our best general advice is to export your ImpactPlus AVIs using no compression (**Use Codec** unchecked); see Chapter 2’s “Video Setup Tips.” If you do use a codec, note that ImpactPlus doesn’t ship with specific codecs; however, several are shipped with Windows itself, and you can easily obtain others on the Web. Check the codec’s documentation for correct bit depth settings; 8-bit is the standard. Note that **.AVIs** don’t support certain playback properties of the animated **.GIF** format, such as “Loop” and “Ping Pong.”

OLE (Object Linking and Embedding)

Exporting ImpactPlus files as bitmap graphics is appropriate when you’re working with an application that requires images in a specific format (such as **.JPG** or **.GIF** for a Web page editor), or if you need to edit the graphic using a paint program. The drawback of exporting is that you lose the ability to edit the scene itself in ImpactPlus.

Many applications—for example, Serif’s desktop publishing program PagePlus—allow you to insert an ImpactPlus scene as an OLE object. This means you can still use ImpactPlus to modify the scene later, if necessary. For example, you can change the text in a text object or alter the color scheme without having to start from scratch.

In some situations, exporting (as described earlier) may be your only choice. For example, if your graphic requires a transparent background, you'll need to export to the .GIF format. Also, you may find that OLE can be slow and cumbersome due to the amount of bitmap data required for displaying and printing ImpactPlus objects at suitable quality.

Following are general guidelines for working with ImpactPlus OLE objects in a client application. (Bear in mind that actual procedures may differ depending on the application and operating system version.)

Choose the application's **Insert Object...** command, usually found on its Edit menu, and select "Serif ImpactPlus Scene" from the list of object types. Then, to insert a saved ImpactPlus (.IPP) file, choose the **Create from File** option and locate the file name. Check the **Link** box to link the object or leave the box unchecked to embed the object (so it's independent of the original file). Or, to create a new ImpactPlus object, choose the **Create New** option. ImpactPlus opens with the Startup Wizard (or a blank scene window if the Wizard is turned off). When you've created the scene, choose **Update** from the File menu to insert the scene as an object (or update the image already there) without closing ImpactPlus.

To edit an ImpactPlus object in any application, double-click the ImpactPlus OLE object within the application, or select the object and choose the application's **Edit Object** command. In Serif PagePlus, either action will launch ImpactPlus, displaying the scene ready for editing.

When you use OLE to create an ImpactPlus object in a client application such as Serif PagePlus or Microsoft Word, the object's **resolution**—its quality when viewed or printed from the client application—depends on the ratio of its dimensions in ImpactPlus to its dimensions in the application. For example, suppose you have set the dimensions of an ImpactPlus object to 300x300 pixels using the Scene Setup dialog. If the object occupies a 2-inch (5cm) square on the client application's page, its resolution will be 150 pixels to the inch (300 divided by 2). If you resize the object to a 1-inch square in the client application, its resolution will increase to 300 pixels to the inch. Conversely, if you increase the object's size, its resolution will decrease.

For additional details on using OLE, see the How To topic "Linking and embedding" in online help.