Adaptive Media

Envision3D
User Training

Student Guide

Course Introduction

End User Course Introduction

Objectives

Course Objectives

At the end of today, you will be able to:

1. Describe how an end-user benefits from Envision3D.
2. Describe the role of Envision Desktop.
3. Use basic DeskTop navigation controls.
4. Navigate with DeskTop viewpoints and paths.
5. Select objects on the DeskTop.
6. Install the Desktop plug-in.
7. Use DeskTop features and options such as editing a viewpoint and changing point of view with Top View and Front View.
8. Access, create, sort, and validate annotations.
9. Attach URLs to annotations.
10. Use annotations to facilitate workgroup collaboration.

At the end of Day 2, you will be able to:

1. Create a new path.
2. Add, delete, and change points on a path.
3. Save a path in two ways.
4. Measure and display angles and distance on the surface of an object.
5. Save a dimension in an annotation.
6. Create a viewpoint.
7. Load a viewpoint.
8. View attributes associated with an object.
9. Search for attributes associated with an object.
10. View the results of an attribute search (query).

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Who should attend?

The Envision3D User course is designed for content experts who have some understanding of 3D applications designed to manipulate and interrogate drawings—such applications as Pro Engineer, Daratech, Catia, Auto Desk, or Bentley Microstation. In addition, attendees should have an understanding of Microsoft Windows.

Why should I attend?

The purpose of this course is to prepare you to use Envision3D on a desktop computer in your workplace to review, manipulate, and interrogate 3D models. Specific skills that you will learn are listed under *Objectives*, above.

How will the course be presented?

The course is organized into five lessons, each with an associated hands-on exercise. Course duration is two days. The lessons are:

1. Overview of Envision3D
2. The Envision3D DeskTop
3. Annotation and Collaboration
4. Adding Value
5. Attributes and the Object Manager

Will there be a test?

There is no test associated with this course. During the hands-on exercises you will be filling out self-assessments and will be able to ask for assistance in meeting the course objectives.

Adaptive Media

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Lesson 1: Overview

Lesson 1: Overview of Envision3D

Lesson Topics

Overview of Envision3D

- How Envision3D Works
- Benefits to End-Users
- The Envision3D DeskTop
- Navigating Your DeskTop
- Viewpoints
- Paths
- Viewing Objects

Overview: How Envision3D Works

In a Nutshell

The Envision3D suite is a line of products that allow you to convert 3D models from other formats, such as

- DWG/REBIS
- DGN
- Pro/E
- STL
- VRML

into Envision3D format. Once the models are in Envision3D format, you can choose to automatically publish them to their appropriate locations on the Envision3D server and view and use them with a standard Web browser.

What This Product Can Do

Envision3D enables the distribution of highly complex 3D model designs across your enterprise. It can be used in all departments and with external partners or customers. Envision3D's client/server architecture delivers large 3D models from plant designs to complex mechanical assemblies over the company's Intranet and over the Internet.

Users can access, annotate, and check dimensions of 3D models in real-time from a desktop or laptop computer.

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Overview: How Envision3D Works, Continued

How it Works

Based on open industry standards, Envision3D uses a revolutionary approach to delivering large model rendering using technologies such as:

- continuous level-of-detail
- occlusion culling

Such technologies keep to the bare minimum geometric information affecting what the user actually sees. The result is 3D model information immediately accessible at an appropriate level-of-detail. The network delivery and patent-pending technology contained within Envision 3D can scale to deliver models that are essentially unlimited in size and complexity.

- over 100 MB
- 3M+ triangles
- 50K+ objects

In addition, Envision3D leverages OpenGL APIs to take advantage of hardware acceleration features.

Streaming

- Old Technology: First download the model, then view it.
- Revolutionary Technology:
  - Envision3D Dialog (Dynamic Interface Access LOGic)
  - Dialog allows the server and your workstation to communicate with each other while you navigate 3D models. Based on that communication, the server dynamically delivers only those portions of the 3D model relevant to your current viewpoint in the 3D model.

DeskTop

The DeskTop is the end-user interface which allows you to:

- View 3D models streamed from MediaManager
- Create and share custom views, paths, shortcuts and annotations to collaborate effectively on projects with other users

Overview: Benefits of Envision3D

Why Use It

Faster model load time—10 to 20 times faster than traditional approaches.
Faster navigation times—5 to 10 times faster.
Shorter product design review cycle, less review-time-to-market.
Early inputs from all reviewers improves reduces design time.
Use of product engineering data is available throughout the enterprise.
Design and project information can be shared across multiple sites separated by time and distance.
Saves travel and meeting time costs.

Collaborative Benefit

Envsion3D enables real-time collaboration, allowing the user to participate in group viewing sessions. Each participant can share ideas on an electronic whiteboard, annotate the model and open up a chat window to comment online which adds to an effective design review process.

Professionals working together—the biggest benefit of all.

Overview: The Envision3D DeskTop

Viewing, Controlling, Navigating via DeskTop

The DeskTop user interface has two parts:

- The Viewing Area (or Viewport)
- Customizable Toolbars

Components and Menu

The Pop-Up Menu is another interface component.

DeskTop Features

The toolbars are dockable items and can be controlled via the gripper bar.

- You can click and drag to dock/undock a toolbar.
- You can double click to undock a toolbar.
- Right click to hide or customize a toolbar.
- Tool tips give a description of each icon.

Overview: Navigating Your Desktop

Basic Navigation

Using the Movement toolbar. Click on icons to move in direction of arrows.

- Slider Bar: change speed of movement
- Middle Section: pan left, right, up and down
- Right Section: move forward and back

Using the Rotation toolbar. Click on icons to move in direction of arrows.

- Left Section: straighten the camera view
- Slider Bar: change speed of rotation
- Middle Section: turn left, pitch up, pitch down, turn right
- Right Section: roll left, roll right

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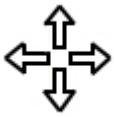
Expert Navigation Mouse and Keyboard Commands

Expert Navigation

Use key combinations and mouse movements to navigate.

- Hold down left mouse button and move cursor in viewing area.
- Arrow keys can be used instead of the mouse.
- Use Shift and Ctrl keys for changing pitch and for panning.

To move	Mouse/Keyboard Commands	Cursor
Turn: • left and right • forward and backward	Click and move cursor (left, right, up, down)	
Pan: • left and right, • up and down	Hold down Ctrl key, click, and move cursor (left, right, up, down)	
Rotate: • Pitch up and down • Turn left and right	Hold down Shift key, click and move cursor (up/down to pitch, left/right to turn, combination to change pitch while turning)	

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Overview: Navigating Your Desktop, Continued

Navigation Methods

Already covered:

- Navigation Toolbars
- Navigating using the mouse

Other navigation methods

- auxiliary views
- viewpoints
- paths

Overview: Viewpoints

Definition of a Viewpoint

Viewpoints are vantage points that have been previously saved. You can jump to them quickly and easily.

Navigating with Viewpoints

Click the Home button to return to the original viewpoint.

Click on the Jump to a Viewpoint icon and choose a viewpoint from the pop-up list.

Click the Last View icon to return to the previous viewpoint.

Continued on next page

Viewpoint Manager

Click on the Viewpoint Manager icon to view information on each saved viewpoint.

More about Viewpoints later.

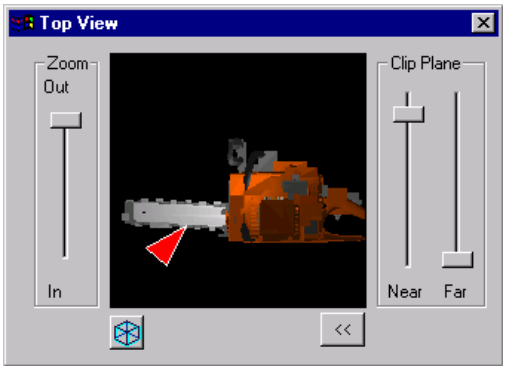
Auxiliary Views

Click on:

 Top View, or  Front View icon from the Viewpoints toolbar to access an auxiliary view.

(Click on  to view entire dialog.)

- In viewing area move model by using right-click.
- Move the position indicator (large red arrow) by using left click to update viewing area.
- Use clip planes and zoom sliders to narrow field of view. (Click on double arrow to expand the view and see these options)



Overview: Paths

Definition of a Path

Paths, like viewpoints, are predefined, but paths involve motion. They allow navigation through a 3D model and can be loaded by a user for quick and easy use.

Paths can be saved directly in a 3D model so that all users automatically have access to them when they open the model.

You can "play" a path, loop it, or stop it part way through and resume navigation with the mouse.

Why use paths?

- They allow you to save a fly-through of the model.
- They are a great tool for design reviews.

Accessing Paths

Click on the Play a path icon and select a path from the pop-up list. The viewpoint will begin moving along the selected path.

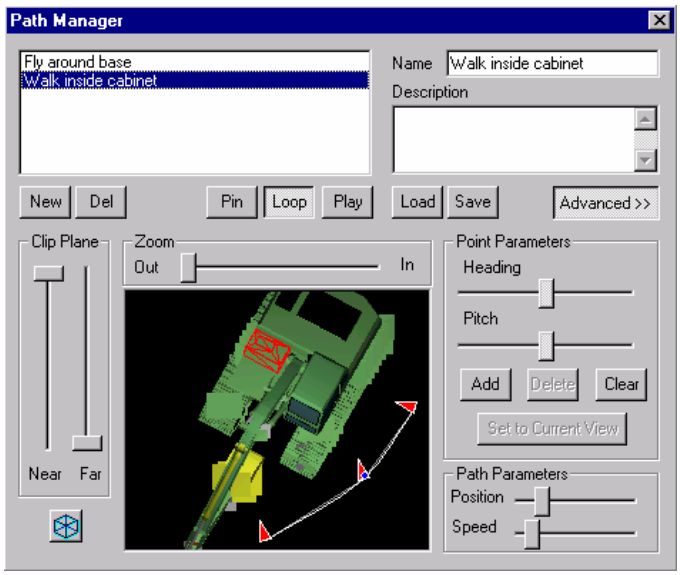
Navigating with Paths

Once a path is selected the viewpoint will automatically start to move along the path. You can click the Play/Stop Path button to alternate between pausing and resuming your movement along the path.

Click on the Path Manager icon to view information on each saved path.

Click on the advanced button to see the entire view of the Path Manager.

More about Paths later.



Overview: Objects

Selecting Objects

- Click an object in the viewport to select it
- Press Ctrl or Shift while clicking additional objects to select multiple objects
- To deselect an object, press Ctrl or Shift while clicking on it
- Press Ctrl and Shift to select using a bounding box
- Place your cursor over an object, then press Alt then click and drag to define the radius of a sphere. By default every object that touches the sphere will be selected.

Overview: Review Notes

Topics:

- How Envision3D works
- Benefits to the user
- Basic controls and features

Lab Exercise 1

Resources

Before beginning Lab 1, you will need access to the following at your workstation:

- Envision3D Manual
- Application Models (available on your server)

General Directions

Your instructor will inform you about what needs to be installed for this class. It may include installing our training environment on your machine. The "Adaptive" directory will have already been installed on the primary server that will be used for class. Your instructor will provide the correct path to this directory.

Copy files as directed and then review the directories and files in the "Adaptive" directory. The "install" directory contains all of the client software we will use. The "source" directory includes sample CAD files (the source files) that you will work with during your exercises. The web server directory includes an MIIS installation in the event that you do not have this readily available. The "tools" directory includes special utilities or scripts that you will find helpful in managing your application. These tools are not included in the standard installation provided by Adaptive Media. They are specially created for our students.

Install the Envision3D "Client" plug-in software on your machine (open the "install directory" and choose the Envision3D DeskTop folder. This is what all users need to have on their machines to work with Envision3D models. Click on Setup.exe. As you move forward in the installation, you will have the opportunity to select the actual components to install. You will find two of these are already checked (Optimizer and DeskTop). Uncheck Optimizer, leaving only the DeskTop checked.) Proceed with install.

You now have all the pieces you need to function as a "client" to the main "server" program. Be sure to use all of the available resources, including the online help, to complete the steps below.

When you're finished, complete the self-assessment for Lesson 1.

Opening the Training Model

A special Web page has been created for the class, to provide access to your first model. This is a fishing reel that has been converted to an Envision3D model. It has many features associated with it that will be helpful in learning how to work with the Envision3D DeskTop. Your instructor will provide the location of this page. Start your browser and access the model using the URL provided. Enter it here:

_____.

For this first exercise you will have a chance to work with a model that has been converted to the Envision3D format. We will use this first model to demonstrate several things:

- Basic Navigation
- Getting Lost and Finding Yourself Again
- Getting Started with Viewpoints, Paths and Objects

Task 1 Click on the fishing reel model and it will load into your Envision3D DeskTop application. Notice the tips and be sure to review these as you become familiar with the product.

Task 2 Take a few moments to review the layout of the Envision3D DeskTop. Notice the model in the viewport and the toolbars around the edges. These toolbars can be free floating and arranged to be most convenient for you.

Notice that when you click on an object in the viewer, the status bar at the bottom displays the object's name. Also, when you pass your cursor over an object the corresponding name will appear next to the cursor. Each object in the model has a name that is stored in an Envision3D object database. Values for objects are provided by the application that created the original model. If they exist, the transcoding process will capture these values and load them into an Envision3D database. Such values might include the vendor's name, the cost of a part, or particular part specifications. When you click on an object, you will see it turn to wireframe and the name of that object will display in the status bar. Later, we will explore how to use these values to move through the model and to obtain information about component parts. For now, just practice with selecting different objects in the model and noticing the display update. You will also see informational messages in the status bar. Try moving your mouse over a few options in the toolbars, and notice the Status Bar display.

Click your right mouse button and choose View. Note that the Status Bar view is checked. Uncheck it and notice that the Status Bar disappears. The other checked names under the View menu relate to the names of each of the toolbars. Uncheck some of them and then turn them all back on.

Double-click on the gripper bar  associated with one of the toolbars and notice that it undocks. Grab the title bar of the undocked window and move it back over the toolbar area and release the mouse. Right-click one of the gripper bars and select Hide to remove the toolbar. Now right-click on one of the other toolbars and notice that the toolbar you have just hidden is now unchecked. Re-check the toolbar name and see that it appears on the desktop.

Right-click on the gripper bar once more and select the Customize Toolbars option. The Envision3D client toolbars are already grouped in an intuitive

way, however this option allows the user to re-evaluate what is to be displayed within the interface. Uncheck and re-check some of the boxes next to the toolbar names and notice that they instantaneously disappear and reappear on the desktop. You can uncheck the Show Tooltips option if you do not wish to see the tooltips appear on the desktop. Uncheck the 'Cool Look' box and notice that the desktop icons change their appearance. Re-check the box if you prefer the default look. Click on the New button and enter a name for the new toolbar, then click OK. Notice that a new, undocked icon appears on the desktop. Now click on the second tab and select the rotation category. Click and drag one of the buttons that is associated with the rotation toolbar and release the mouse over the toolbar you have just created. In the same way that you can add buttons to toolbars you can also remove them as well. Click and drag one of the arrows from the rotation toolbar on the desktop and release it anywhere outside of the toolbar. The button disappears from the toolbar. Select the first tab again in the Customize Toolbars dialog box and make sure that the rotation category is selected. Click on the Reset button and notice that the destop toolbar returns to its default settings. Select the toolbar that you created and then click the Delete button. Click OK to exit from the dialog box.

The idea is that you can customize your working environment but depending on how you configure your Envision3D DeskTop, there may be some options or information hidden from your view.

Task 3

A few viewpoints have been set up for your use. A *viewpoint* presents a specific view that has been named. Use the Jump to a viewpoint icon to select views. You will notice that we have included three in this model. The "starting point" is the one currently displayed. When you look at the list of views you will see we have isolated specific parts of this reel (the handle and the spool) to show how viewpoints can help to target key areas in a larger model.

Begin by selecting the 'handle' viewpoint. After models are transcoded to the Envision3D format, such viewpoints are generally added by the application administrator to provide the valuable targets in each model. Select the 'spool' and notice how the view changes. Click on the Last View icon and see the viewpoint jump back to the 'handle' viewpoint. One of the most valuable viewpoints is a great general view of the model. Select the "starting point" viewpoint and consider how helpful it is – particularly for more casual users – to have this type of easy starting place for each model. If you get lost in the picture, you can quickly return to a familiar point.

Task 4

Now let's review features in the navigation toolbars.

Movement toolbar

Rotation toolbar

As you drag your mouse over each icon, you will learn about the functionality provided. Hold the mouse button down on the navigation arrow of choice, and the viewpoint will move in the direction shown.

Let's take a closer look at the model:

Move forward and back by clicking on the Move Forward or Move Backward icons.

Move to the left and right of the model by clicking on the left and right pan icons.

Rotate your view by clicking on each of the rotate icons in the rotation toolbars.

If you get lost, use your handy viewpoints to return to the "starting point." Also notice that the "Home" icon has been set to correspond to our "starting point" viewpoint and that you can click on it directly to move to the starting point. This is an important setting to ensure "being found" is just one click away.

The navigation icons provide clear visual choices on how to move around. You can also move around the model just by using your mouse. In the same way that you can navigate by clicking the directional arrow, you can also do this directly with your mouse and a combination of the Shift and Ctrl keys. You can perform limited navigation using the keyboard by pressing the Ctrl key with arrow keys to move in the chosen direction.

Place the mouse in the center of the viewport, and hold down the left mouse button as you move the mouse forward just a bit. Notice the cursor changes to reflect the direction of movement. Press the Ctrl key and do the same thing. Notice that now the cursor represents the panning icons and you can move left, right, up and down. Finally, try the Shift key and notice you have full rotational control. Practice for a few minutes moving left and

right and up and down in this 'Expert mode'. If you want to speed up – or slow down – use the slider bars in the navigation toolbars or press the plus (+) or minus (-) keys as you move. Practice definitely makes perfect when it comes to moving around in models quickly and efficiently!

Task 5 You can also use view features to quickly move your focus to another view of the model. Click your right mouse button and choose top view under Auxiliary Views. Notice that another window opens and that you can zoom in and out to see the model from a new vantage point.

Click anywhere in the 'top view' window and notice that a large red triangle shows your viewpoint. Note that as you move the triangle in the top view, the model is reacting in the main viewport to 'follow your directions'. Hold the Ctrl key down to change your heading angle. Practice with these views for a few minutes and then close this window.

Task 6 In the same way that viewpoints provide additional value, you can create paths to allow other users to move through the model with animation. Creating a path or tour, will be covered later in the course. For now, select the one we've already created called "basic tour." Notice that you can toggle between play and stop to pause movement along the path.

Lab 1: Self-Assessment Checklist

Action	Comments or Questions for Instructor
___ **Gained familiarity with Envision3D DeskTop components and features** • Installed the Envision3D DeskTop. • Opened the training model. • Moved DeskTop components in and out of view. • Selected objects in the model	
___ **Worked with viewpoints.** ___ • Used different viewpoints. • Returned to the original viewpoint set as "home."	
___ **Navigated with a variety of navigation features.** • Used the Navigation icons to change the point of view in the model. • Used mouse-driven navigation to view areas of the model. • Used keyboard-driven navigation with arrow keys to view. • Used the navigation icons to change the navigation speed. • Used shift and ctrl keys to change behaviors in navigation modes.	
___ **Used navigation paths.** • Played and stopped the "basic tour" path.	

✓ means *completed*

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Lesson 2: The Envision3D DeskTop

Lesson 2: The Envision3D DeskTop

Lesson Topics

The Envision3D DeskTop

- How application components work together
- Toolbar features and options
- Envision3D DeskTop managers
- Working with object controls
- Changing appearances
- Setting personal preferences
- Standard DeskTop services

The Desktop: Part of a System

Product Suite

The product suite includes:

- Envision3D Optimizer
- Envision3D MediaManager
- Envision3D DeskTop (client)

Part 1: Optimizer

Envision3D Optimizer

This is the first product used in the creation and delivery process. It allows the user to convert 3D model files into Envision 3D format model files.

The Optimizer also sends attribute data to the MediaManager. A database is then created containing the attribute/annotation information associated with the converted 3D model.

The 3D model files are converted into the Envision3D format, based on a number of options that the user chooses.

Part 2: Media Manager

Envision MediaManager

MediaManager streams Envision3D model files to client systems so users can navigate them using Envision3D DeskTop.

Envision MediaManager runs as a Windows NT service on the Envision Media Server. You maintain and manage MediaManager using the MediaManager Administrator. Although MediaManager has no interface, users can check how media streams are requested and delivered by MediaManager using the Windows NT Event Viewer.

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Media Manager (cont.)

The MediaManager also runs a database server component consisting of a Microsoft Access database containing attribute and annotation data. MediaManager provides the link between the databases and client systems. The data server component sends information from associated Access databases (.MDB) to Envision3D DeskTop, and vice versa. With this, users can create annotations, check object attributes, and do searches based on annotations and attributes.

MediaManager also communicates with Envision Optimizer when the Optimizer converts a model. It then automatically creates and populates the associated attribute/annotation database on the MediaManager server.

The Web Server is also a system component but is not part of the Envision3D package.

Part 3: DeskTop

Envision3D DeskTop

We have already met the final product in the process. Envision3D DeskTop works as a browser plugin. It allows the usr to navigate Envision3D models that are streamed over the network.

We have already touched on such DeskTop features as:

- navigation
- viewpoints
- paths

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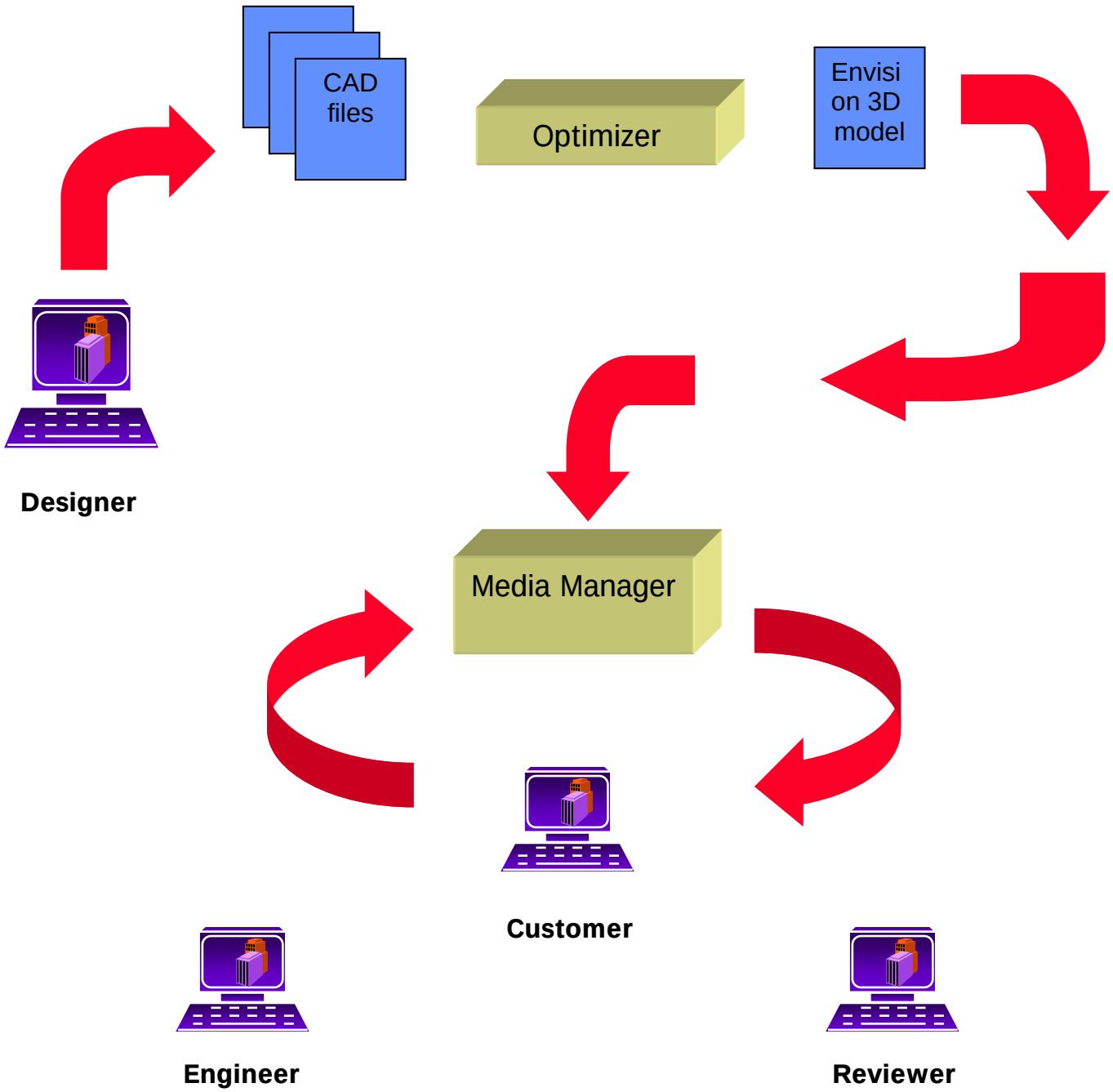
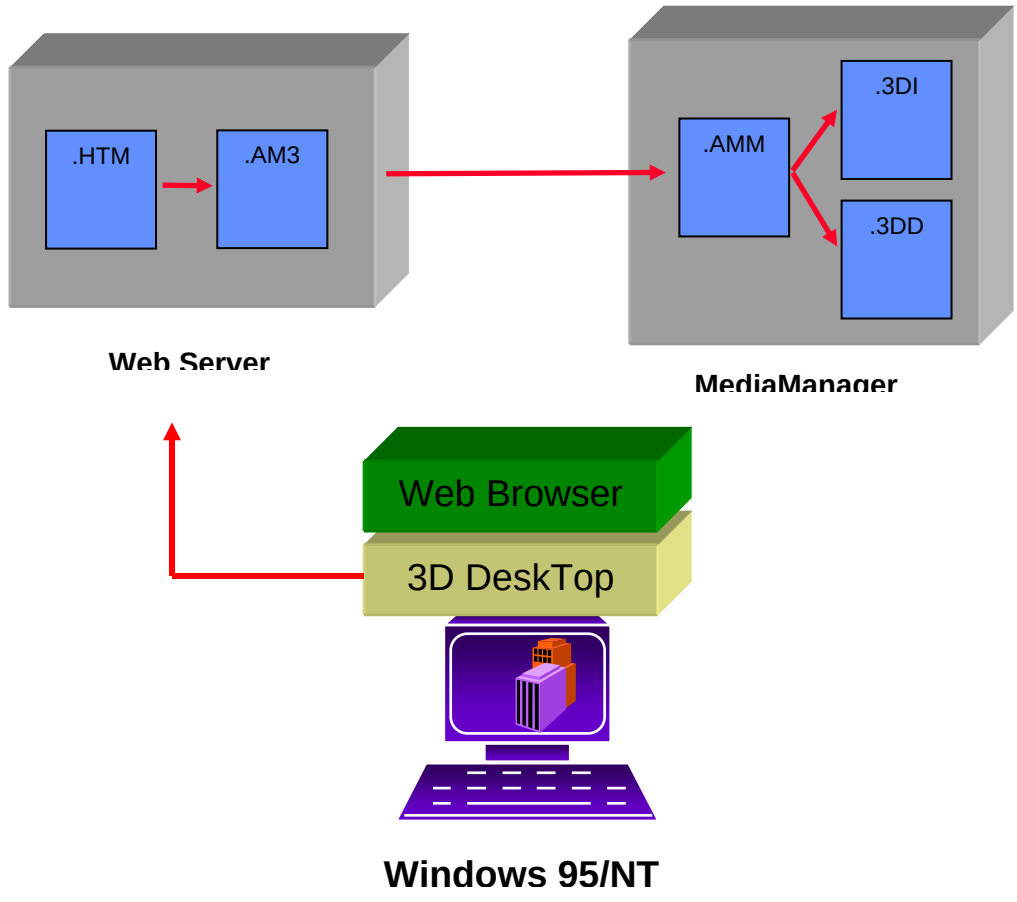
The Desktop: Part of a System, Continued

Workflow Follow the workflow from designer to reviewer.



Data Access: A client workstation, showing from where the data is accessed



DeskTop Specs

- Software components
  - Web browser
  - Netscape or IE
  - Netscape plug-in
  - Activex control
- System Requirements
  - Windows 95/NT 4.0
  - Pentium 133MHz
  - 32MB RAM
  - Optional: OpenGL accelerated graphics board

Opening a Model

Opening

- Open your web browser and browse to the URL
- Open .AM3 or .3DI file inside the browser
  - .am3 - reference file to actual model (resides on web server)
  - .3di - the actual model (resides on MediaManager server)

Closing

- To close your web browser press the Back button or navigate to new URL to close model

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DeskTop Features and Options: Managers Toolbar

Exploring the Managers and Views Options

This section organizes access to key DeskTop “managers” and “views” that assist you when working with Envision3D. You can collapse these options by clicking on the Managers/Views tab and reopen again with another click.

This section includes:

- Object Manager
- Object Manager (Parts)
- Dimensioning Manager
- Attribute Manager
- Annotation Manager

Accessing the Object Manager

The Object Manager is covered in detail in Lesson 6. At this point you only need to understand its basic role and how to use it to quickly navigate parts of the model. The Object Manager is essentially divided into two parts, the first of which allows you to create views containing collections of objects. This feature makes it easy to concentrate on smaller parts of the model rather than having to look at the entire model. The views are formed through isolating objects or by building a query. The second component is the Object Manager (Parts). This allows you to view the various collections of data as they were in the original files before conversion to the Envision3D format. You can select a part and view the associated attributes and also use it as a tool for isolating.

The Dimensioning Manager

The Dimensioning Manager is covered in detail in Lesson 4 – Adding Value. It allows you to capture dimensions on the model and specify line, arrow and text colors so others can easily recognize dimension notation.

The Attribute Manager

The Attribute Manager is covered in detail in Lesson 5 – Attributes. Keep in mind that Envision3D is an application designed to enable content to be shared from models originally created in other programs. Depending upon the origin program's functionality, there may be extensive information about the models and the component pieces in them. If this information exists, the Optimizer will capture it and send it to an Envision3D attribute database. This database is a Microsoft Access database. Enormous value can come from the use of this information. This feature is so popular that some organizations desire to create it, even when the original model did not include the information. In Section 5 – Attributes, we will introduce you to a simple tool created by Adaptive Media's Technical Support Group that will help you manage attributes for your model.

The Annotation Manager

The Annotation Manager is covered in detail in Lesson 3 – Annotation and Collaboration. Annotations are notes that reviewers have left relating to the model. For example, you might circle a part and leave a note that it must be ¼" larger. These annotations are captured in a database for each model. The Annotation Manager allows you to add your own annotations or respond to those created by others.

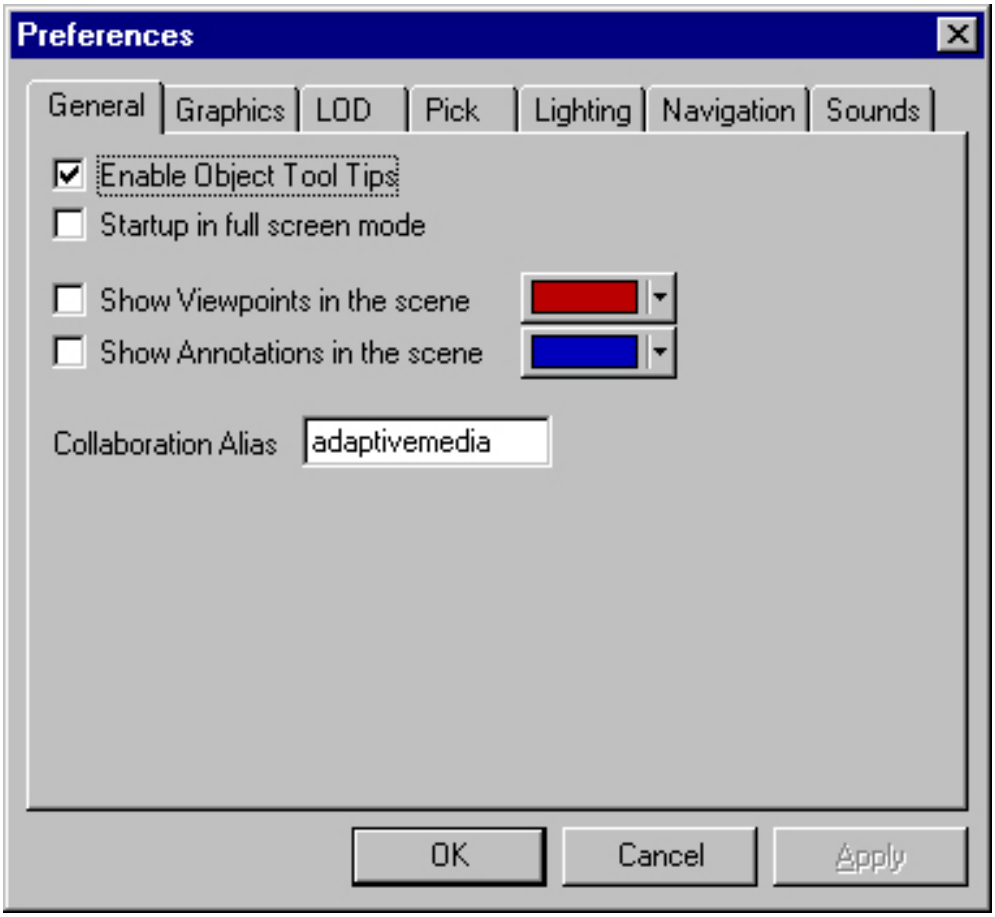
DeskTop Features and Options: Standard Toolbar

Print Print the current view. For resolution, choose Low if you want to print the annotation with your screen's resolution, choose Medium if you want to print the annotation with approximately 1/3 of your printer's resolution, and choose High if you want to print the annotation with your printer's maximum resolution. Note that the amount of memory you have available might impact the final printer output if you choose the Medium or High option.

Save Save the current view. The view is saved as a 24-bit bitmap (.BMP) file with the name you specify.

Copy Copy the current view to the Clipboard. The view is saved to the Clipboard as a 24-bit bitmap (.BMP) file.

Preferences



General Tab

Enable Object Tool Tips — Use this to turn on/off the tool tips when the mouse is over an object in the viewport.

Startup in full screen mode — Start Envision3D DeskTop in Full Screen mode when you open a 3D model. Press ESC to get out of Full Screen mode.

Show Viewpoints in the scene — Check this option on to view tabs in the 3D scene denoting where each of the set viewpoints are located. Choose the color you wish the label to be by picking from the popup color menu.

Show Annotations in the scene — Check this option to view annotations that are associated with the model. Choose the color you wish the annotation label to be, by picking from the popup color menu.

Collaboration Alias — Enter the name that you wish to be known by to other users. By default it is your user name.

Graphics Tab

Near Clip slider — Use this slider to set the minimum distance relative to your viewpoint at which objects in the model will be displayed, i.e. objects that are closer to your eyepoint than the minimum set, will not be drawn. The distances are given in terms of the model's standard unit of measure. If you set this value too low, particularly lower than 1.0, objects in the model may flicker, object resolution and differentiation may suffer, and performance may lag. You should try to set this value so you aren't viewing objects that are too close.

Far Clip slider — Use this slider to set the maximum distance relative to your viewpoint at which objects in the model will be displayed, i.e. objects that are further from your eyepoint than the maximum set, will not be drawn. The distances are given in terms of the model's standard unit of measure.If you set this value too high, objects in the model may flicker, object resolution and differentiation may suffer, and performance may lag. You should try to set this value so you aren't viewing objects that are too far away.

Specify far clip in absolute units. — Select this option to set the ranges on the Far Clip slider bar in terms of the actual dimensions of the scene depicted in the model. For example, if you are viewing a model of a house that is 200 units by 200 units square, a range of "1/100" to "10 times" on the slider bar is equivalent to 2 units to 2000 units. If you deselect this option, the ranges on the Far Clip slider bar are given in absolute terms of the model's standard unit of measure.

Max Frame — Set this option to normalize your navigation speed through the model. Use

Rate the slider to set a maximum frame rate that won't be exceeded when you navigate. If you set this option too high, you might navigate portions of the model with few objects and little detail much faster than other portions of the model. This can lead to difficulties navigating to the exact spot you choose.

Show Axis of Rotation Use this option to switch on/off the X, Y, Z axis of rotation indicator in the lower left corer of the viewport.

Show Statistics Use this option to switch on/off statistics pertaining to the model that is loaded.

Background Color Use to change the background color of the model. Click the color bar to display a standard Windows Color dialog box. Choose a color in the dialog box, and click OK. Note that the numbers displayed in the Windows Color dialog box are the RGB values of the background color selected.

LOD Tab (Level of Detail)

Blockiness slider Controls how large an object must be on the screen before it is displayed in detail rather than as a simple cube. The farther you move the slider to the right, or High end, the larger objects must be on the screen before they are displayed in detail. Note that if you change the Blockiness setting by moving the slider bar to the right, the setting you choose will override any quality settings you choose using the Scene Fidelity slider. The distance you must be from an object before it is no longer blocky is reduced according to how far you move the slider bar to the right.

LOD Clamp slider Controls the maximum level of detail used to display the objects in the model. Note that if you change the LOD Clamp setting by moving the slider bar to the left, the setting you choose will override any quality settings you choose using the Scene Fidelity slider. The maximum amount of detail added to any object is restricted by how far you move the slider bar to the left.

LOD Range Scale slider Each object in a 3D model has a scale that determines how fast it's detail degrades as you move away from it and how fast it's detail improves as you move toward it. Move this slider towards the left to move the range at which the detail of objects improves back and the range at which the detail of objects degrades back, as well. Move the slider towards the right to move the range at which the detail of objects improves in and the range at which the detail of objects degrades in, as well. In general, move the slider to the left to increase the detail level of objects and to the right to increase performance.

Scene Fidelity slider — Controls how much processing power and bandwidth is dedicated to adding detail to model objects versus how much is dedicated to navigation speed. The farther you move the slider to the right, the more resources are dedicated to navigation speed instead of adding detail to model objects. Detail is downgraded both in terms of object resolution and blockiness Note that detail is added to the objects in your field of view intelligently: given how you are navigating, detail is added to objects you are more likely to be viewing before objects that you are less likely to be viewing.

Improve Level of Detail While Stationary — If you select this option, no matter what detail level you choose on the Scene Fidelity slider bar, detail is added to objects up to the maximum amount possible whenever you stop navigating through the model. As soon as you start navigating again, the detail level you choose on the Scene Fidelity slider bar comes back into effect.

Save Memory vs. Decrease Loading Time slider — Controls how much system memory the DeskTop uses versus how fast objects are loaded. Move the slider to the left to save system memory and to the right to use more system memory but decrease the time it takes DeskTop to load objects. Note that the decreased loading time is not always in effect, but will in general affect how fast objects are loaded as you navigate through a model as well as how fast definition is added to objects as they remain in your view.

Pick Tab

Highlight Mode — Set the way selected objects are highlighted. Choose Wireframe to display selected objects in wireframe. Choose WireframeOverSolid to display selected objects in wireframe over their solid versions.

Highlight Color (popup menu to right of Highlight Mode) — Controls what color is used for the wireframe when you select an object.Click the color bar to display a standard Windows Color dialog box. Choose a color in the dialog box, and click OK. Note that the numbers displayed in the Windows Color dialog box are the RGB values of the background color selected.

Pick Action — Controls what happens when you select an object. Choose None to simply highlight an object when you pick it. Choose Fit to fit objects when you select them. Choose Hide to hide objects when you select them. Choose Show URL to automatically launch URLs attached to selected objects in a Web browser.

Enable Transparency — By default this option is turned on. When using the radial pick, the sphere that is drawn over the area to be included in the pick is transparent, making it easy for the user to see what is going to be picked. If transparency is not supported by the hardware this option should be turned off.

Pick only objects that are fully contained within sphere — This option works in conjunction with selecting objects using a sphere. When you press the Alt key and then click and drag with the mouse, the radius of a sphere is defined. Every object that touches the sphere is selected. Select this option if you wish only the objects that are fully contained within the defined sphere to be selected.

Use the picked point instead of the object's center — When the radial pick is used, the center of the sphere is taken as the center of the object that the cursor was over when the mouse was clicked. If you wish the center of the sphere to be the actual point you click, then this option should be checked.

Snap to Radius incremerts — If this option is checked, the radial pick will snap to the specified increment as the radius is defined by the cursor.

Lighting Tab

Ambience slider — Use this slider to change the amount of light shed on everything in your field of view.

Intensity slider — Use this slider to change the amount of light shed on what lies directly ahead of your viewpoint in the model.

Enable Specular Lighting — If you select this option, the surface of an object can reflect light. The amount of light an object surface reflects is determined by the object's reflective properties as specified in the input file (VRML, DGN, etc.) used to create the 3D model.

Navigation Tab

Automatically isolate when examining objects — Select this option to automatically isolate objects when you are in examine mode, hiding all the other objects and creating a new view hierarchy in the Object Manger. Deselect this option to simply fit the selected object or objects to be examined while keeping the rest of the model in view.

Unpick objects while examining — Select this object to unpick objects when examining them. The advantage of enabling this option is objects won't be displayed in wireframe or wireframe over opaque while you are examining them.

Animate camera when fitting an object — Select this option to fly to a new view of an object when fitting it rather than jumping to the new viewpoint.

Use joy stick mode when — When you fly through the model, you pitch up if you move your cursor

flying upwards and pitch down if you move your cursor downwards. Select this option to have the cursor movement match the airplane control stick metaphor: cursor down to pitch up, cursor up to pitch down.

Animate the camera while straightening up Select this option to 'fly' to your new view after selecting the Straighten Up Camera icon. Deselect this option to jump directly to the new viewpoint.

Reuse existing views Normally, when you isolate the same object multiple times, a new view is created in the Object Manager each time you isolate it. This can lead to many view entries in the Object Manager for a single object. Select this option to reuse an existing view of an object instead of creating new ones when you isolate the object multiple times.

Animate the camera while jumping to viewpoints Select this option to fly from your current viewpoint to a new position selected from the Jump to a Viewpoint menu

Sounds

Check the box associated with a sound you wish to hear while participating in a collaboration session with the Envision 3D client. A sound can be played each time a user:

- Logs in
- Logs out
- Receives a chat message
- Passes the mouse over an object that has a tool tip
- Adds an annotation
- Deleted an annotation

By default all boxes except for Tool Tips is checked.

Full Screen

Click this icon to fit the entire desktop to the full size of the screen. Press the escape key to return to the browser.

Help

Launches the Envision3D Online Help system.

Desktop Features and Options: Collaboration Toolbar

Using Collaboration	Collaboration is covered in detail in Lesson 7. Envision 3D incorporates Shared Vision, enabling real-time collaboration between users. Design reviews can be conducted on-line between designers, contractors, customers, etc. using annotations, chat and electronic whiteboard to share ideas or problems.
Become driver	Click this icon to take control of a collaborative session. This icon is only highlighted if there are two or more people connected to the same model. After clicking the icon the other user(s) will receive a message to accept or decline the invitation to start a collaborative session.
Transfer control	This icon will be highlighted if you have control of a collaborative session. If you wish to relinquish control to another user you simply click once to see a list of available user names and then click again to choose which user will take over the session
Disconnect from session	Click on this icon to disconnect from the collaborative seesion you are currently engaged in.
Join a session	Click on this icon to join a session currently in progress.
Privacy	The privacy icon allows you to hide your physical presence within the model. Other users will know that you are still with the session and will be able to chat to you, but your position within the model will not be known.
Toggle avatars	Click this icon to see the position of other users within the model.
Collaboration manager	This icon will activate the Collaboration Manager, which appears along the base of the viewport. From here you can view the events of the session and use the chat feature.

DeskTop Features and Options: Viewpoints Toolbar

(By default this toolbar is place vertically on the interface)

Navigating with Saved Views

Transcoding a model to the Envision3D format allows you to work with the model, but adding value in Home, Viewpoints and Paths allows every user to work easily with your model.

These are three areas that are generally handled by the administrator, or the person who is actually transcoding the model for your use. Once they complete the initial work, they identify some common views and paths that can be recalled by name from the user's DeskTop. Users then add to the ones created by the Administrator.

Home

The administrator generally establishes the viewpoint linked to the home icon. The heading can be the name of a viewpoint or path or coordinates. The text is entered in the.am3 file: "threed.initial.viewname"="name", where "name" is the name of the viewpoint that has been saved.

Last View

Click this icon to return to your previous viewpoint. Subsequent clicks will cycle through all the positions you have visited in the session.

Jump to a Viewpoint

Viewpoints that have been previously setup can be accessed via this icon. Click on this button and then select a viewpoint from the popup menu

Viewpoint Manager

Use the Viewpoint Manager to create viewpoints. Click the New button to save the current eyepoint. You can also select existing viewpoints, and modify labels and descriptions (if they belong to you) or delete viewpoints. You can choose to save your own viewpoints or load viewpoints from a .view file.

- Standard viewpoint saving
  - Viewpoints can be saved in a .view file.
  - A viewpoint file can be sent to other users via network or e-mail.

- Saving for default use:
  - Viewpoints can be saved directly in the model (.3di file).
  - These viewpoints will be accessible to all users.

  Usually done by the administrator or whoever optimizes the model.

Auxiliary Views

This is a bit of a refresher in this lesson. Remember that you can quickly click on the Top or Front View icon to change your viewing area. A special navigation tool will open with the position indicator updating the contents of the viewing area. You can also use the right-click in the viewing area to launch a popup that will allow you to choose your view.

To narrow the view, use the zoom and clip plane sliders.
To limit the depth of what's displayed in a View window, click the Advanced button to expand the window. Drag the Near slider down to move the closest extent of what is shown back.

Manipulating Models with Top/Front Views

Task	Action
Zoom in or out.	Drag the zoom slider down (for in) or up (for down).
Change the location of your point of view.	Click a different spot in the window. The red arrow moves to the location.
Change the direction of your point of view.	With Ctrl key down, drag the point of the red arrow to a different heading.
Move the portion of the model shown in the view.	Right-click the model display in the view window. Drag it to move the display.

DeskTop Features and Options: Paths Toolbar

(By default this toolbar is place vertically on the interface)

Navigating with Saved Paths	This toolbar enables the user to create pre-defined paths throughout the model. For example, you could create paths that show the evacuation routes within a chemical plant.
Play/Stop Path	Click this icon to play or stop a selected path.
Play Path	Click on this icon and then select a path to be played from the popup menu. Your eyepoint will automatically begin to move along the selected path.
Path Manager	The Path Manager has a number of features to create and edit a path and is covered in Lesson 4 – Adding Value. Please refer to that section if you have an immediate question. Otherwise, as you move through the course you will have the opportunity to create and edit paths.
Record a Path	Use this feature to create a fly-through path. Click on the icon and beginning moving about the model, click the icon again to stop recording a path.

DeskTop Features and Options: Appearance Toolbar

Wireframe Wireframe shows objects in outline rather than a solid form. Use this option cautiously as it can degrade performance if your graphics card is not very powerful or if the model is very complex. It is a nice feature to allow you to see "through" objects.

High Quality Lighting Choose this option to add light to a scene as if it was emanating spherically from your current viewpoint. This option is on by default if your system has accelerated Open GL.

Back Face Culling This feature is on by default. It means that the faces on an object that are pointing away from your current view are not rendered. You can turn it off in wireframe to see all of the objects. Be sure to turn it back on when you return to the solid view as it does degrade performance.

Antialiasing This option renders the edges of objects as accurately and smoothly as possible. Again, it will degrade performance if left on, but provides great alternatives for you when clarity of depiction is very important.

Maximum Level of Detail This feature is only available when isolating objects or looking at a view hierarchy (covered in Lesson 6: Object Manager). It builds the detail of objects to the maximum level and again, should be used with caution as it affects performance.

DeskTop Features and Options: Object Toolbar

(By default this toolbar is place vertically on the interface)

Object Controls

The icons in this toolbar are designed to help you manipulate objects in the viewing area.

Hide/Show Objects

You can hide or show objects in a model so they are not blocking your view of other objects. The keyboard shortcuts for these are H – hide and S –show.

If you have hidden objects, you can quickly see them again by clicking on the Show All Hidden Objects icon or with keyboard shortcut A – show all.

Isolate and Unisolate Objects

Isolate removes all objects from the view except those that you have selected.

1. Select the object(s) of interest
2. Click on the isolate icon or use the keyboard shortcut: I

The Unisolate icon will return you to normal view. The keyboard shortcut for unisolate is U.

Examine Objects

Examine is similar to isolate, but it creates additional value by changing the navigation controls as they relate to the selected object. By selecting this option you can rotate around concentrating solely on the selected objects rather than navigating through 3D space. If you click the "Reset Examine Center" it allows you to change your focus in relation to your current position.

1. Select the object(s) of interest
2. Click on the Examine icon or use the keyboard shortcut: E

To return to a normal view, click this icon again, or press E – it toggles between Examine on and Examine off.

The purpose of examining an object is to take a closer look at a particular object. It allows you to easily move the object so you can see it from all angles.

Examine Objects (continued)

- Keep in mind that:
  - When you examine an object, it is automatically isolated by default (preference setting); all other objects disappear. The object is centered in the display area

and is shown in wire frame.

- You can move the object toward you or away from you, rotate the object, or spin the object around.

Fit Objects

Fit instantly repositions the object, or multiple objects, you've selected into the center of the view.

1. Select the object(s) of interest
2. Click on the Fit icon or use the keyboard shortcut: F

Clear Selection

De-selects all objects that are currently selected.

DeskTop: Review Notes

Topics:

- How the Application Works: Components & Workflow
- Toolbar Features and Options
- Working with Objects
- Setting Preferences

Lab Exercise 2

Resources

Before beginning Lab 2, have access to the following at your workstation:

- Storage disk (floppy) for saving files
- Envision3D Manual

You will also need access to the application model, which is available on your server.

General Directions

Using the information in this workbook, complete the steps below. Consult your instructor, as needed.

- Throughout this lab exercise, explore the features that have been introduced. Especially practice using the tools that alter the appearance of selected objects.
- When you're finished, complete the self-assessment for Lab 2.

Task 1

- Open the designated model.
- Navigate to another website to close the model.
- Reopen the model.

Task 2

- Select a viewpoint.
- Change its description.
- Save the viewpoint to floppy disk.
- Email a viewpoint file to yourself (if this option is available at your training site)

Task 3

- View the model from the top without using the Top View icon.
- Change the location and direction of your point of view.
- Select an object and move to the center of the view window.
- Zoom in.
- View the model from the front.
- Change the location and direction again.
- Practice with the navigation features, using Expert Mode with Shift and Ctrl.

Continued on next page

Task 4

- View the model as it appeared at loading.
- Select an object in expert mode.
- View the object with different lighting.
- View the object from the top.
- Observe the effect of changing the near and far clip planes.
- Hide the object.
- Show the object.
- View the object with normal lighting.
- Reposition this object to the center of the viewing area.
- Deselect the object.
- Select multiple objects.
- Hide them.
- Show them (all at once).

Task 5

- Select one object
- Use Cntl/Shift to pick many objects with a rectangle mode.

Task 6

- Select an object with Object Manager (Parts).
- Number (sequence) the objects in the Object Manager's view object list.
- List the objects without numbers.
- Search for objects with a single alphanumeric character of your choice.
- Search for objects with a criterion (string) that is meaningful to that list.

Task 7

- Select an object.
- Remove all other objects from view.
- Return to normal view, keeping the object selected.
- Without interfering with the rest of the model parts, manipulate this object.
  - ♦ Rotate it.
  - ♦ Move it.
- Return to normal view.

Task 8

- Using the information in this section, quickly review each of the icons and options. This will help you determine your level of comfort with the various options and to make notes about which ones need more work. Use "Review Notes" on the next page to identify areas of particular interest or areas to study more about. Be sure to try out the different Preferences settings as well.

Lab 2: Self-Assessment Checklist

Action	Comments or Questions for Instructor
___ **Reviewed system components and workflow.** Gained a basic understanding of the products in the Envision3D suite. • Explored the general setup of server & client • Learned a bit about the role the Administrator plays in building a quality Envision3D model.	
___ **Worked with Toolbar Features & Options** • Edited a viewpoint. • Reviewed how "home" viewpoints are setup. • Saved a viewpoint with the model. • Saved a viewpoint on a floppy disk. • Practiced with DeskTop Managers and Views • Changed a point of view with Front View. • Used Object Manager to move within the model. • Worked with objects – hiding, showing, move, turning, raising, lowering, rotating. • Isolated and unisolated objects. • Examined objects in wireframe mode. • Learned to fit objects in the viewer • Practiced with Keyboard Shortcuts.	
___ **Worked with Mouse Modes** • Changed modes • Practiced with Expert Mode • Learned about Pick Rectangle Mode ___ **Changed Appearances** • Practiced with wireframe and lighting • Turned on back face culling ___ **Tried Preferences Variations**	

✓ means *completed*

Adaptive Media

User Training

Student Guide

Lesson 3: Annotation

Lesson 3: Annotation

Lesson Topics

Annotation and Collaboration

- Creating Annotations
- Responding to Annotations
- Focus on Collaboration

Annotations: Creating an Annotation

Annotations

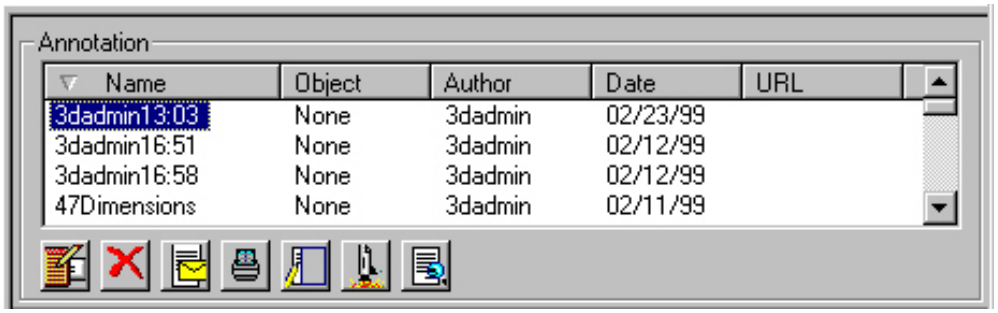
The point of annotations is to let you make comments and markups in a 3D model. Individual annotations can then be viewed and responded to by others in your workgroup. Annotations are perfect for collaborative efforts since they are available to all that view and use a particular model.

A snapshot of the current viewpoint is taken when an annotation is to be added in order to allow the user to 'draw' on the model. Effectively, the viewport becomes a 2D viewer and navigation is no longer possible until the user exits from the Annotation Manager.

Annotation Manager

Click on the Annotation Manager icon in the Managers toolbar. A list of all annotations for the current model is shown.

Viewing an Annotation



- Click on the name of the annotation.

  Annotation information will be shown in the viewport.
  Each annotation shows the name, object, author, date and any corresponding URL.

Continued on next page

Annotations: Creating an Annotation, Continued

Create an Annotation

The steps:

1. Navigate to a location in the model you want to annotate.

2. Click the Annotation Manager button.
   Optional: select an object to annotate.

3. Click the Add button in the Annotation Manager.

4. Use the Annotation toolbar to create and edit your annotation.

Annotating an Object

If you want the annotation associated with a particular object, select the object before pressing the Add Annotation button.

Continued on next page

Annotation Toolbar

Create a mark-up in freehand, e.g. circle a part that needs to be modified by an engineer. Hold down the left mouse button to draw.

Draw using a straight line. Click and drag with the left mouse button.

Draw an arrow. Click and drag with the left mouse button.

Draw a rectangle. Click and drag with the left mouse button to define the top left and lower right extremities of a rectangle.

Click in the viewport and a popup text dialog will appear to insert text. Click OK to insert the text.

Click in the viewport at the position you want to insert a note and a popup text dialog will appear. Click OK to insert the note and a circle with a number will appear in the viewport. To read the note, double-click on the circled number.

Click on a mark-up, text or note to highlight it. Click and drag to move it to another location.

Click on the font icon to see the font dialog box. Change the font parameters for future text annotations.

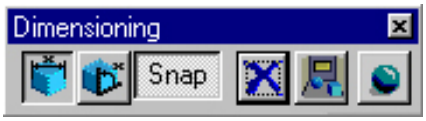
Click on the line width icon to see the line width dialog box. Move the slider to change the width of your lines.

Click on the color icon to see the color dialog box. Choose different colors, for example, to denote the priority for modifications to the model.

Delete all mark-ups, text and notes.

Erase the last mark-up, text or note. Subsequent clicks on this icon will erase each markup in the order they were created.

Calculate dimensions between objects. Click on this icon and the Dimension toolbar will appear.



Dimension distance. Click and drag from one point to another to measure the distance.

Dimension angle. The dimension angle is defined by inputting three points. Click and drag to enter the first two points. Now place your cusor over the square vertex that represents the second point, then click and drag to define the angle.

Snap to vertex. If this is selected, the cursor will snap to a vertex when determining dimensions. When this option is turned off the cursor will pick points on the object.

Delete dimension will delete the last dimension created. Subsequent clicks will delete each dimension in the order it was created. Dimension preferences sets the size, color, text color and precision for both the lines and arrows that denote the distances and angles.

Refine will revert back to the model and continue streaming geometry. Click OK to return to Dimensioning.

Show/hide annotation details dialog. The dialog contains entries for the annotation name, associated URL, description and the ability to attach the annotation to a view hierarchy (the attach button is greyed out if there are no isolated views or queries). Clicking the Attach button gives you a way of storing the view hierarchy, which is not stored when a user exits the database. If a user was to load a model and click on an annotation that has been attached, he/she will be prompted to restore the view hierarchy.

Cancel the annotation and return to normal viewing.

Finish and store the annotation.

Responding to an Annotation

Existing annotations cannot be edited, but you can:

Delete an annotation (as long as you are the author).

Respond to someone else's annotation.

Print Annotation

Print the annotation. This produces a print out of the annotation window (the browser and Envision 3D interface is not included).

Hide Annotation

Hide Annotation lets you return to navigating the model.

Accessing Annotation Details

Launch URL will launch the URL that is associated with the selected annotation.

Show annotation text will display any text that has been entered via the annotations dialog box.

Sorting Annotations

You can sort annotations in the Annotation Manager. You can sort by several categories.

- Click on the heading by which you want to sort (Name/Object/etc.).
- When sort is complete, an arrow appears next to the heading name.

Annotations: Collaboration

Value of Annotations

The real value of annotations is the ability to collaborate with others on how models should be used, enhanced, or modified. Adding descriptive information in annotations provides a shared dialog throughout the workgroup.

From design plan through manufacturing and maintenance, annotations make the incredible difference by capturing knowledge – or questions – along the way.

Annotations can be very useful in group sessions and this is covered in more detail in Chapter 7 – Collaboration.

Annotation: Review Notes

Topics:

- Creating annotations
- Annotation states
- Collaboration

Lab Exercise 3

Resources

Before beginning Lab 3, have access to the following at your workstation:

- Storage disk
- Envision3D Manual

You will also need access to the application model, which is available on your server.

General Directions

Review available resources to complete the steps below. Consult your instructor, as needed.

- Throughout this lab exercise, explore the features that have been introduced.
- When you are finished, complete the self-assessment for Lab 3.

Task 1

- View the information in the Annotation Manager.
- Sort the list of annotations by
  - Object
  - Author
  - Date

Task 2

- Create annotations that are associated with a particular object of your choice. Include:
  - A note
  - A line

Task 3

- Create an annotation that says: "Check with Me." Modify the font so it appears in red.
- Move the text.
- Delete the annotation.

Task 4

- Create and document a variety of annotations that use each of the features on the annotation toolbar.

Task 5

- Switch between annotation display and navigation mode.

Continued on next page

Task 5

- Attach a URL by means of an annotation.
- If possible, use the link to navigate to the website.
- Return to the model.

Task 6

- Create an annotation with another student/colleague in mind.
- If networked, respond to the annotation of a student/colleague.

Task 7

- Sort the list of annotations by your “author” name.

Lab 3: Self-Assessment Checklist

Action	Comments or Questions for Instructor
___ **Used and saved annotations.** • Accessed an annotation. • Attached an annotation to an object. • Created a text annotation. • Created an annotation arrow. • Created a freehand annotation. • Modified line characteristics in an annotation. • Created a note to an annotation. • Deleted an annotation. • Switched between annotation display and navigation mode. • Modified the font and line color in an annotation. • Identified three types of edits. • Sorted annotations by author. • Sorted annotations by date. • Saved an annotation with the model. • Saved an annotation to disk. • Optional: attached an annotation to a view hierarchy.	
___ **Identified where to link an annotation to a URL.**	
___ **Cited ways a workgroup benefits from the use of annotations.**	

✓ means *completed*