IRISVIEW User's Guide

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Document Number 007-5001-020

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Contents

Figures

Chapter 1

Welcome

By installing IRISVISION™ in your personal computer you've created a graphics workstation with the power and features of systems costing thousands of dollars more.

To introduce you to the power of IRISVISION, Silicon Graphics® has developed an exciting new software program: IRISVIEW™.

IRISVIEW allows you to render and manipulate 3D images, in real time, from drawings created in AutoCAD® or other CAD programs. With IRISVIEW's special scripting feature, you can even record your work for later playback.

IRISVIEW features include:

- Display of 3D images with smooth (Gouraud) shading, flat shading, or in wireframe.
- Eight individual light sources.
- An ambient light source.
- Intensity controls for both the ambient and individual light sources.
- Orthographic and perspective views of your drawing.
- Drawing controls allowing you to pan, zoom, rotate, tilt, and walk through your drawing.
- Recording and playback of anything occurring within the display area of IRISVIEW.
- Output files in both PostScript® and HP-GL® file formats.

A drawing must be in the *DXF* format in order to be used with IRISVIEW. If the drawing is in any other format, you must first use your CAD software to resave it as a *DXF* file.

For example, if you're using AutoCAD, open your drawing within *AutoCAD* and resave it as *DXF* with the ***DXFOUT*** command. It may then be used with IRISVIEW.

Note: Do not save the drawing as "ENTITIES-only" (E) when using AutoCAD's ***DXFOUT*** command, or IRISVIEW will not be able to display the drawing properly.

For additional information on preparing drawings for use with IRISVIEW, please consult the Appendix to this guide.

Chapter 2

Installing the Software

Be sure that you've properly installed the IRISVISION boardset and software before proceeding with the IRISVIEW installation.

In addition to the application software, the IRISVIEW disk(s) contain sample *DXF* files for you to experiment with. If you wish to create additional drawings to use with IRISVIEW, you'll also need a CAD program, such as AutoCAD, that can create *DXF* files.

To install IRISVIEW:

1. Insert the disk labeled *IRISVIEW* into drive A.

   If your copy of IRISVIEW comes on two disks, insert the disk labeled *Disk 1*.

2. Type:

   `a:install`

   and press **<Enter>**.

After a moment the first in a series of menus appears on screen. Use the up and down arrow keys to highlight the desired menu option, and press **<Enter>** to make the selection.

3. Select the drive where you'd like the software to be installed.
4. Type the name of the directory where you'd like the software to be installed, or simply press **<Enter>** to accept the default directory, *SGI*.
5. Select "Install IRISVIEW."

6. If your copy of IRISVIEW comes on two disks, remove *Disk 1* and insert *Disk 2* when prompted. Press any key (except the <Esc> key) to continue.

When the installation process is completed, the menu from step 5 appears again. At this point you may select "Quit" to exit the installation program, or select "Install DXF Files" to install the sample files that run with IRISVIEW.

Select "Quit" from the menu when you're finished.

Input Devices

IRISVIEW requires a mouse, tablet or stylus, along with a Microsoft®-compatible mouse driver.

It is highly recommended that the mouse driver be installed as a device driver in your *config.sys* file in order to guarantee flawless performance. Loading the driver as a command file such as *mouse.com* may cause problems with the software. This is true of many types of software, including AutoCAD.

One way of installing the driver is to enter **device=mouse.sys** in your *config.sys file.*

The software that came with your mouse should have included both types of mouse drivers. For further information, please consult the manual that came with your input device.

Mouse Buttons

If your mouse has more than one button, all buttons perform the same function in IRISVIEW with one exception: the Walk function uses a second mouse button for greater precision and control.

Loading IRISVIEW

Within the directory where you installed IRISVIEW, type:

```
irisview
```

and press **<Enter>**.

After a moment IRISVIEW appears on the screen.

Chapter 3

Using IRISVIEW

After you've loaded IRISVIEW into your computer, the main screen appears with a display area, a row of buttons along the top, and a column of buttons along the right side of the screen.

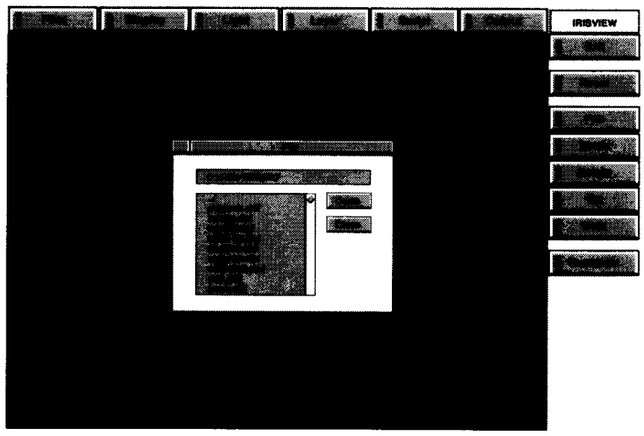

Figure 3-1 IRISVIEW main screen.

Clicking one of the buttons along the top of the screen displays a command palette. These palettes are used to:

- bring drawings on screen
- determine how the drawings are displayed
- create recordings of your work
- create both PostScript and HP-GL files for printing

The buttons along the right side of the screen are used to move and manipulate an on-screen drawing. There is also an ***Exit*** button in this column that allows you to quit IRISVIEW.

A small indicator light appears on the left side of each button on the main screen, except the ***Exit*** button. When a button is clicked, the indicator light "turns on" to indicate that the button is selected.

Figure 3-2 Button indicator light.

This type of button also appears in many of the IRISVIEW command palettes.

While IRISVIEW is Processing...

IRISVIEW displays a "wait cursor" in the shape of an hourglass while processing information. You'll need to wait a moment until this cursor disappears before making another selection.

The Command Palettes

A command palette appears when you click one of the buttons along the top of the screen. The button indicator light remains on while the palette is displayed, and only one palette may be on screen at any time.

The palettes all have two important control features as illustrated in Figure 3-3.

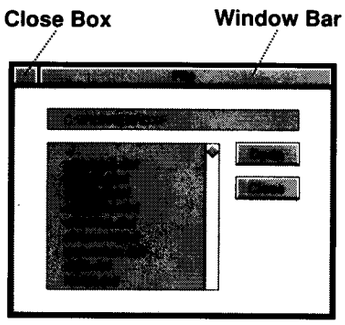

Figure 3-3 Palette control features.

Window Bar

Pressing and dragging on the window bar allows you to move the palette around on the screen.

Close Box

Clicking the close box closes the palette window, removing it from the screen. In order to display a new palette, you must first close the one you're currently using. You must also close any on-screen palette before using one of the buttons along the right side of the screen.

Loading a Drawing: The File Palette

IRISVIEW displays both 2D and 3D *DXF* files; of course your view of the file is limited to the dimensional information it contains. You can't see a 2D file in three dimensions.

Files are loaded into IRISVIEW using the File palette. The palette appears when you click the ***File*** button in the upper-left corner of the main screen.

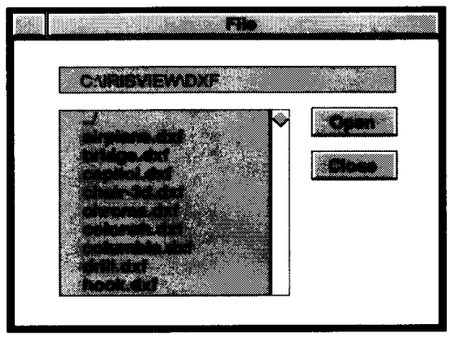

Figure 3-4 File palette.

IRISVIEW displays one file at a time. Loading a new drawing automatically closes the one currently open.

You may use the File palette to change directories, as well as to open and close drawing files.

To load a file:

1. Click the ***File*** button to display the file palette.

   Note: The File palette will already be on the screen when IRISVIEW first appears.

2. Click to select a *DXF* file from the list on the palette.
3. Click ***Open***.

After a moment the selected file appears in the display area, and the File palette automatically closes.

To change directories:

Directory names are followed by a \. To open a directory, click the directory name and then click ***Open***. The File palette then lists the files contained in that directory.

To go back a directory click "..\" at the top of the list and then click ***Open***.

To close a file:

1. Click the ***File*** button to display the File palette.

   The name of the file currently loaded appears highlighted in the file list.

2. Click ***Close***.

You are now free to open another file.

Manipulating a Drawing

Drawings are manipulated using the control buttons located along the right side of the screen, just below the ***Exit*** button. You'll need to close any palette that might be on the screen before using any of the control buttons.

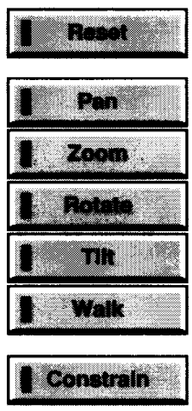

Figure 3-5 Control buttons.

Reset

Clicking ***Reset*** resets your drawing to the state it was in when you first opened the drawing in IRISVIEW. This is very useful if your drawing disappears from IRISVIEW's display area while you're using the control buttons.

Pan

The ***Pan*** control allows you to move the drawing across the screen.

Drag the pointer in the direction of the desired movement within the display area as illustrated in Figures 3-6 and 3-7.

Note: To "drag the pointer," hold down the mouse button while moving the mouse to reposition the on-screen pointer. A crosshair appears on screen whenever you press the mouse button while the pointer is in IRISVIEW's display area.

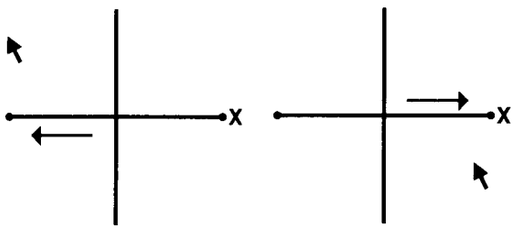

Figure 3-6 Pan left and right.

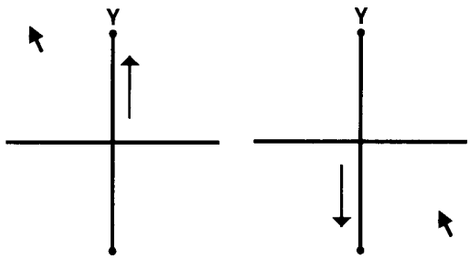

Figure 3-7 Pan up and down.

Zoom

The ***Zoom*** control allows you to move your point-of-view closer to the object (zoom in) or farther from the object (zoom out).

Drag the pointer upward to zoom in, downward to zoom out.

Note: The concept of zooming has no meaning in an orthographic view, so the ***Zoom*** control scales the object.

Rotate

The ***Rotate*** control allows you to rotate your drawing horizontally (around the Y axis) and vertically (around the X axis).

Drag the pointer in the direction of the desired rotation as illustrated in Figures 3-8 and 3-9.

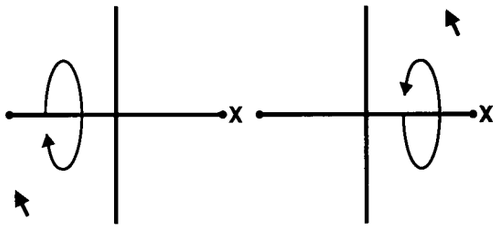

Figure 3-8 Rotate vertically.

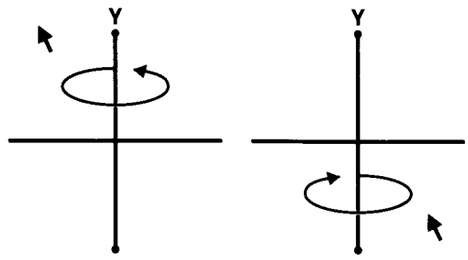

Figure 3-9 Rotate horizontally.

Tilt

The ***Tilt*** control allows you to turn your drawing around the X and Z axes. Tilting around the Z axis "pinwheels" the drawing.

Drag the pointer up and down to turn your drawing around the X axis.

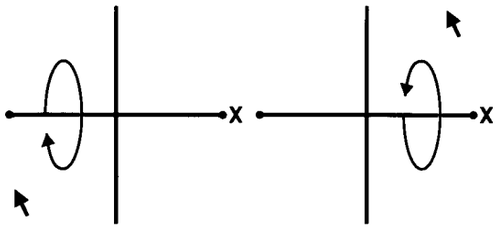

Figure 3-10 Tilt around the X axis.

Drag the pointer left and right to turn your drawing around the Z axis.

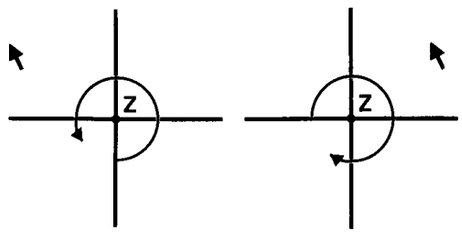

Figure 3-11 Tilt around the Z axis.

Walk

The ***Walk*** control allows you to walk around and through your drawing. In order to achieve this flexibility, ***Walk*** works somewhat differently than the other controls.

Walk uses a second mouse button, if your mouse has one. The second mouse button referred to here can be any button but the left one. If you press a second mouse button at the same time as the left mouse button, the action initiated by the second button takes precedence. If you're using a one button mouse, you'll need to use IRISVIEW's other controls to achieve the same functionality as the second mouse button.

Walk displays a view of your drawing as seen through an imaginary camera. The "camera view" is controlled by positioning the screen pointer. This powerful feature allows you to approach a building on your drawing, and then tilt the camera view upward to *look up* at the building.

Some aspects of ***Walk*** may take some getting used to. For example, when you move the camera view to the right, the drawing seems to move to the left because the camera is *walking by the drawing.*

Although dragging the pointer is the best way to move through your drawing, the ***Walk*** control is sensitive to the pointer's position within IRISVIEW's display area any time you're pressing the mouse button – whether or not you're dragging the pointer. The crosshair can be used

as a reference for positioning the pointer, as it visually divides the display area into four quadrants.

With only the left mouse button pressed down, position the pointer:

- in the upper half of the screen to zoom in
- in the lower half of the screen to zoom out
- in the right half of the screen to move the camera to the right
- in the left half of the screen to move the camera to the left

With the second mouse button pressed down, position the pointer:

- in the upper half of the screen to tilt the camera up
- in the lower half of the screen to tilt the camera down
- in the right half of the screen to move the camera to the right
- in the left half of the screen to move the camera to the left

Constrain

The ***Constrain*** button that appears below the five control buttons allows you to restrict the effect of a control button to either the left/right or the up/down pointer movement. Clicking ***Constrain*** toggles the button on and off.

For example, with ***Rotate*** selected, click the ***Constrain*** button to toggle it on. Now drag the pointer in the direction of the desired rotation, and the ***Constrain*** feature restricts the movement to that axis.

With ***Tilt*** selected and ***Constrain*** turned on, dragging the pointer to the right restricts the tilt to a turn around the Z axis; dragging up or down restricts the tilt to a turn around the X axis.

The ***Constrain*** feature remains in effect until you click the button again to toggle it off.

Constrain does not work with ***Zoom***, and the button does not appear if ***Zoom*** is selected.

Display Options: The Display Palette

IRISVIEW gives you the following options for displaying a 3D drawing:

- Orthographic or perspective view.
- Wireframe, flat shaded, or smooth (Gouraud) shaded objects.

The Display palette is used to control these settings. This palette is also used to:

- Change the background color of the display area.
- Adjust your mouse sensitivity.

The Display palette appears when you click the ***Display*** button at the top of the main screen.

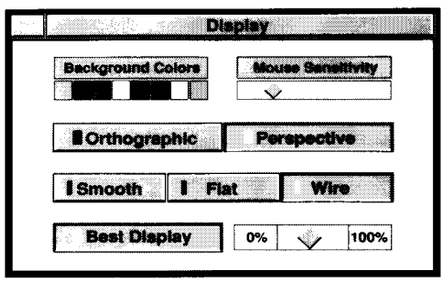

Figure 3-12 Display palette.

Background Colors

You may select a background color for the display area by clicking the desired color in this panel.

Mouse Sensitivity

You may adjust the sensitivity of your mouse by dragging the Mouse Sensitivity slide bar. The sensitivity of the mouse determines the distance traveled by the pointer on screen in relation to the distance traveled by the mouse on the tabletop.

Dragging the slide bar to the left makes the mouse less sensitive, and the pointer seems to move slowly on screen. Dragging to the right makes it more sensitive, and the pointer seems to move rapidly across the screen.

View

Click either ***Orthographic*** or ***Perspective*** to determine your view of the drawing.

3D Model

Click on the appropriate button to determine how your 3D drawing is displayed.

Smooth displays your drawing with Gouraud shading.

Flat displays your drawing with flat shading.

Wireframe displays your drawing in wireframe.

Note: Only entities created as 3D Polygon Meshes are displayed with Gouraud shading. IRISVIEW needs the information contained in these entities in order to properly render them as Gouraud shaded models. AutoCAD® users should consult the section on 3D Polygon Meshes within their AutoCAD manual for further information on this topic.

Best Display

The ***Best Display*** button toggles on and off when you click it. When the ***Best Display*** feature is turned on, shaded drawings are automatically displayed in wireframe while the drawing is being moved or manipulated. This allows IRISVIEW to display movement as smoothly as possible. The drawing automatically reverts to the selected shading when the movement ceases.

Best Display Slide Bar

The slider appearing alongside the ***Best Display*** button allows you to adjust the number of wireframe vectors that are drawn when ***Best Display*** is operating. The fewer the vectors that are displayed when the drawing is being manipulated, the faster and smoother the action.

The "0%" and "100%" marking opposite ends of the slider bar represent 0% to 100% of the total vectors in the drawing. When the slider bar first appears, its relative position reflects the display of 500 wireframe vectors during ***Best Display*** operation.

Lighting a Drawing: The Light Palette

IRISVIEW provides both an ambient light and eight individual light sources to illuminate your 3D drawing. There are controls to adjust their intensity, and the individual lights may be positioned anywhere in 3D space.

The Light palette is used to control these features. The palette appears when you click the ***Light*** button at the top of the main screen.

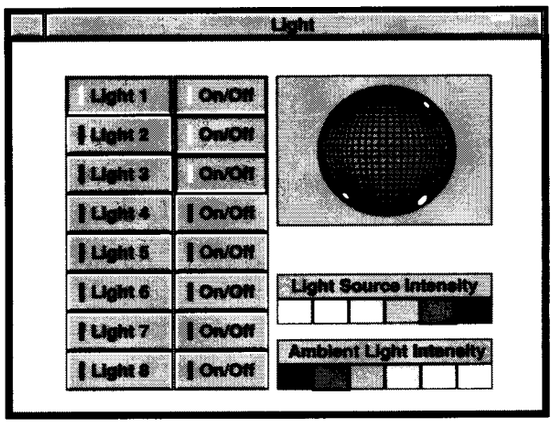

Figure 3-13 Light palette.

Individual Light Sources

The eight individual light sources appear in a column of buttons along the left side of the palette. An *On/Off* button appears to the right of each light source.

The globe in upper right of the Light palette represents three dimensional space and is used to position the eight light sources.

When the Light palette is first brought on the screen, the eight lights are positioned at equal intervals around the globe. The first three lights are turned on; the other five lights are turned off. Lights that are turned on appear as white dots on the globe. Lights that are turned off do not appear.

One of the lights sources is also selected. The LED button for the selected light is lit, and the selected light appears larger than any other light on the globe.

A Light Source Intensity control appears in the lower right of the palette.

Turning Lights On and Off

To turn individual lights on and off, click the ***On/Off*** button located to the right of the appropriate light source.

Positioning Lights

Think of your drawing as being in the center of the lighting globe and then position the lights around it.

1. Click the light source button to select it.
2. Position the screen pointer on the globe.
3. Press and hold down the mouse button while you drag the pointer across the globe.

When you drag the pointer, it acts like a joystick control, causing the selected light to follow along as you change directions. The light orbits all the way around the globe, as well as across the face of the globe, depending on how you drag the pointer. You may speed up the movement of the lights by dragging the pointer off the face of the globe.

Modifying Light Intensity

To modify the intensity of the individual light sources:

1. Click the light source button to select it.
2. Click the desired intensity from the Light Source Intensity control.

Ambient Light Source

IRISVIEW supplies an ambient light source so that areas of your drawing not lit by individual light sources will have some background illumination.

Modifying Ambient Light Intensity

To modify the intensity of the ambient light source, select the desired intensity from the Ambient Light Intensity panel.

Note: If your drawing appears "washed out," try reducing the ambient light intensity.

Drawing Layers: The Layer Palette

IRISVIEW recognizes the layers you defined for your drawing within AutoCAD, and gives you two ways to control them:

- Layers may be turned on and off.
- A color or "material" may be applied to a layer.

The Layer palette is used to control the drawing layers. The palette appears when you click the ***Layer*** button at the top of the main screen.

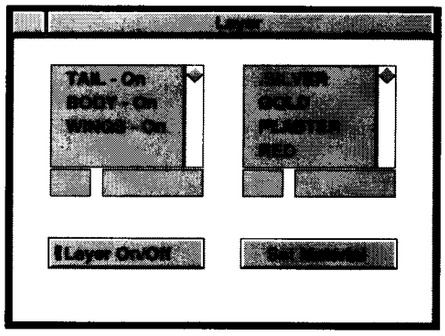

Figure 3-14 Layers palette.

A box on the left side of the palette automatically lists all the layers (if any) in your drawing. Each layer in the list is marked to show if it is currently turned on or off.

A box on the right side of the palette lists the materials and colors that may be applied to a layer. A material is similar to a color, with additional properties such as reflectiveness.

To turn a drawing layer on or off:

1. Select the layer from the list.
2. Click ***Layer On/Off*** as appropriate.

A layer that is turned off does not appear on screen.

To apply a color or material to a drawing layer:

1. Select the layer from the list.

   The current color or material of the selected layer is indicated directly below the layer list box.

2. Select a color or material from the list on the right.

   The color or material you've selected is indicated directly below the color/material list box.

   The example illustrated in Figure 3-9 shows that the "Tail" layer of an airplane drawing is currently Gold, with Silver selected in the color/material list box.

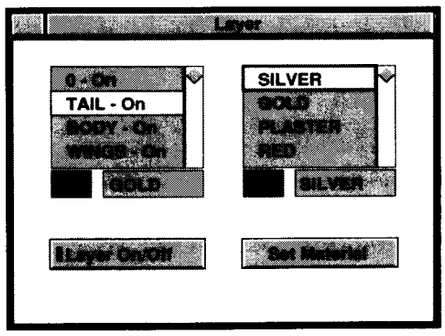

Figure 3-15 Layer palette with Gold tail layer and Silver selected.

3. Click ***Set Material***.

Scripting: The Script Palette

IRISVIEW allows you to record your drawings as you manipulate them, save the recording, and play it back at any time. When the recording is played back it takes over the entire screen for a more elegant presentation. Recordings may also be edited.

The Script palette is used to control the recording feature. The palette appears when you click the ***Script*** button at the top of the main screen.

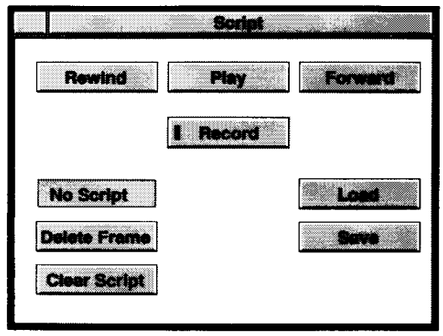

Figure 3-16 Script palette.

Creating a Recording

To create a recording of your work:

1. Click ***Record*** on the Script palette.

   The palette closes automatically, and a ***Pause*** button appears with a frame counter on the right side of the main screen.

2. Manipulate your drawing using any of IRISVIEW's control buttons.

   If you wish to reposition the drawing without recording the movement, click the ***Pause*** button on the right side of the screen. When the drawing is properly positioned, click ***Pause*** again to toggle it off and resume the recording.

3. Bring the Script palette back on screen by clicking the ***Script*** button.

4. Click the ***Record*** button to toggle it off and stop the recording.

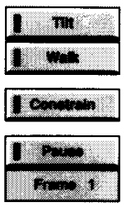

Figure 3-17 Pause button and frame counter.

Playing Back a Recording

To play back an on-screen recording:

1. Press and hold the ***Rewind*** button on the Script Palette until the frame indicator reads "Frame 1."

   You may also click ***Rewind*** to rewind the recording one frame at a time.

2. Click ***Play.***

The recording plays back inside a white frame that fills the entire screen.

Note: If you want the recording to play continuously, let the recording play all the way through one time, and then press the **R** key on your keyboard.

Press any key or click the mouse button to return to the IRISVIEW main screen.

Saving a Recording

To save a recording you've made:

1. After having made the recording and while it is still on screen, click ***Save*** on the Script palette.

   The Script Save dialog box appears.

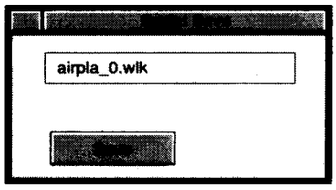

Figure 3-18 Script Save dialog box.

The script filename appears at the top of the palette with a *.wlk* extension indicating an IRISVIEW script file. The filename also includes a unique identifying number that reflects the number of copies you've made of that file. The script filename can't be altered within IRISVIEW.

2. Click ***Save***.

   The Script file is created. The dialog box remains on screen with the filename altered to reflect a new identifying number.

   You may make as many copies of a script file as you want.

3. Click the palette close box when you're finished saving the desired number of copies.

Note: If you only wish to save your IRISVIEW settings (position, lights, materials etc.) without creating an animated script, simply record a single frame and save it.

Loading a Recording

To load a recording you've previously saved:

1. Click ***Load*** on the Script palette.

   The Script Load dialog box appears.

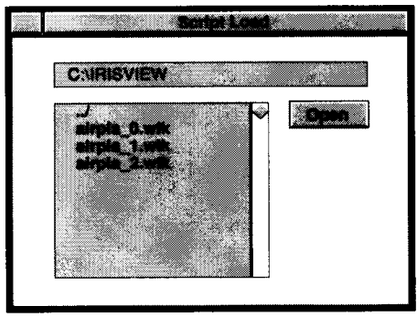

Figure 3-19 Script Load dialog box.

2. Select the desired script from the list in the dialog box.
3. Click *Open*.

Editing a Recording

IRISVIEW allows you to break into a recording at any frame, record a new portion, and then continue with the rest of the original recording. This is referred to as "insert" editing.

1. Load the desire recording or create a new one.
2. Click or press the *Forward* button to advance to the proper edit point.

   The *Rewind* button may also be used to locate the exact frame.
3. Click *Record*.
4. Manipulate the drawing in the desired manner.
5. Click the *Script* button to bring the Script palette back on screen.
6. Click *Record* to toggle the button off.

The original recording now includes the new portion.

Note: When you resave a script you've edited, a new script file is created. The original script file remains unaltered.

To delete a single frame of a recording:

1. Locate the appropriate frame using the *Forward* and *Rewind* buttons.
2. Click *Delete Frame*.

Erasing a Recording

A recording may be erased while it is still on screen by clicking *Clear Script*.

Creating an Output File: The Output Palette

Output files can be created in either the PostScript or HP-GL format. The Output palette is used to control this feature. The palette appears when you click the ***Output*** button at the top of the main screen.

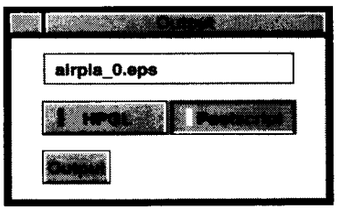

Figure 3-20 Output palette.

The drawing filename appears at the top of the palette with an *.hp* or *.eps* extension indicating the current output format. The filename also includes a unique identifying number that reflects the number of copies you've made of that file.

To save an output file:

1. Click either ***HPGL*** or ***PostScript*** to determine the format of the output file.

   The filename extension changes (if necessary) to indicate the selected format.

2. Click ***Output***.

Saving an output file may take several minutes depending on your computer configuration and the complexity of the drawing.

Appendix A

Preparing Drawings for Use with IRISVIEW

AutoCAD Drawing Layers

IRISVIEW allows you assign color and materials to individual drawing layers so long as the layer is accessible to the program. When creating layers within AutoCAD, FREEZE layers that you don't wish to view before doing the DXFOUT. The contents of layers that are simply turned off with the LAYER OFF command are still exported to the DXF file increasing its size unnecessarily.

Make sure the layer name is recognizable as you will be using it to select layers within IRISVIEW.

AutoCAD DXFOUT Command

Do not select "Entities-only" (E) when saving the file with the DXFOUT command. IRISVIEW requires that the viewport information be stored in the DXF file in order to set up the initial view.

If only Entities are saved there is no initial view loaded and you will get an error message stating that "Camera position is on top of the target."

In order to speed the loading of the DXF file into IRISVIEW you may choose the "BINARY DXF" option (B) rather than selecting the number of ASCII digits (6-16). BINARY DXF creates the much smaller 6-digit file with the accuracy of the 16-digit file format.

AutoCAD Font Files

If your drawing has AutoCAD text in it, we suggest that you turn off the text (dimensions etc.) by freezing the text layer(s) before exporting the DXF file. AutoCAD text will display in IRISVIEW, but since it is drawn as lines, it will not shade.

If you must display the AutoCAD text, be sure to have the required *.SHX* files in one of the following places:

- the directory in the ACAD environment variable
  - **`SET ACAD=C:\ACAD`**
- the DOS APPEND search path
  - **`APPEND C:\ACAD`**
- the same directory as the DXF file

Autodesk's AME™ Package

If you are creating a model with AME, make sure to run the SOLMESH command on the model before exporting it. This assures that AME exports the geometry required by IRISVIEW in order to render the drawing as a solid image.

You should also leave the AME_FRZ layer turned off as it only contains the AME construction information which creates needless screen clutter.

CADKEY® Drawings

The ALCADMY CDL-DXF converter utility doesn't generate true polygons when processing polygons containing more than four sides. Instead it converts them to polylines which will not shade in IRISVIEW.

If you want your drawings to shade in IRISVIEW, the polygons in your original drawing must have no more than four sides.

Index

T

W

Z